




Cologne Bonn Airport

Manual for the recovery of damaged aircraft at Cologne Bonn Airport



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Flughafen Köln/Bonn GmbH

Manual for the recovery of damaged aircraft at Cologne Bonn Airport

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Author: Marcel-Sinan Altinkum (PA)

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	22/10/2020	Div.	Removal of the Recovery Contract+fees, as there is a separate document; Formal adjustments by Ms Damaschke so that the document can be uploaded to the DAW.	PO
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List of abbreviations

a/c	aircraft
ADV	Arbeitsgemeinschaft deutscher Verkehrsflughäfen e. V.
AF	Airport fire brigade FKB
AIP	Airport Improvement Plan
AL	Department Aviation of FKB
ARM	Aircraft Recovery Manual of a certain a/c type
ARTS	Aircraft-Recovery-Transport-System
ASM, Part 5	ICAO Airport Service Manual, Part 5
AUR	Airport User Regulation
BFU	Federal Bureau of Aircraft Accident Investigation (Bundesstelle für Flugunfalluntersuchung)
CGN	Cologne Bonn Airport
DTM	Duty Traffic Manager
EASA	European Union Aviation Safety Agency
FKB	Flughafen Köln/Bonn GmbH
ICAO	International Civil Aviation Organization
LuftVZO	Luftverkehrs-Zulassungs-Ordnung
MRO	Maintenance, Repair and Overhaul
R-L	Recovery leader
R-Coor	Recovery coordinator
R-Crew	Recovery crew
R-CL	Recovery crew leader
Techn. airline	Technician of airline
THW	Technisches Hilfswerk

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Preface


This manual of Flughafen Köln/Bonn GmbH (FKB) describes the basics of aircraft recovery operations and is intended to provide information on the organisation, processes and documentation of an aircraft recovery operation at Cologne Bonn Airport (CGN). Besides general topics, the contents are largely limited to the procedures and available resources commonly used at CGN. The content of this manual is therefore primarily aimed at those involved in the recovery of aircraft and airlines that regularly fly to the airport or use it as an alternative airport.

All procedures and measures described below are based on the specifications and recommendations of the International Civil Aviation Organization (ICAO) and the European Aviation Safety Agency (EASA). The rules of the Airport User Regulations (AUR) as well as the measures to be derived from the Aerodrome Manual of the CGN continue to apply. **All parties for whom this manual serves as the basis of the recovery operation at CGN are responsible for the implementation of and compliance with all regulations and safety provisions resulting herefrom.** With the entry into force of this manual, all internal FKB regulations in this regard cease to apply, in particular OHB B_311 Recovery Organisation from 26/02/2016.

The term "recovery" in this manual refers to an aircraft that is unable to move by its own power or by the normal use of a suitable aircraft tug on or adjacent to the movement area of the airport. According to the ICAO Airport Service Manual (ASM), Part 5, there are three types of recovery:


- "aircraft debogging",
- "aircraft recovery"
- "aircraft salvage".

The recovery of an aircraft can only be initiated after the Federal Aircraft Accident Investigation Bureau (Bundesstelle für Flugunfalluntersuchung – BFU) and, in the case of personal injuries, the police and the public prosecutor's office have released the damaged aircraft. If the recovery case occurs after an accident involving an aircraft of the German Armed Forces, the „General Flugsicherheit in der Bundeswehr“ (General Air Safety in the German Armed Forces) must also give permission for the aircraft to be recovered. As the owner of a commercial airport, FKB is only responsible for recoveries that take place on the airport's premises. Outside the external property border, FKB is only involved if an airline issues a recovery order for the recovery of the damaged aircraft that is not located on the airport property.

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In addition, according to § 45 LuftVZO, FKB is obliged to keep the airport in an operationally safe condition at all times, i. e. it must also ensure that the runway system is cleared of any immobile aircraft (see also Chapter 4.5). If an aircraft remains unable to move at the airport, FKB may remove it from the flight operation areas after clearance, even without a special order from the aircraft holder, at the latter's expense, or commission competent third parties to remove it, as far as this is necessary for the handling of air traffic. If no significant contractual obligations have been violated or if life, body or health have been culpably injured, FKB shall only be liable for damages if it has caused them intentionally or through serious negligence. Liability is also limited to the predictable, typically occurring damage. This also applies if the aircraft operator has instructed FKB to remove an immobile aircraft from the flight operation areas or to assist in such removal.

With all measures and processes, the safety of people always comes first. The principle of "Safety First" applies. Furthermore, the prompt removal of the damaged aircraft and, due to the high value of the aircraft, the avoidance of additional damage caused by the recovery operation are of central importance. A recovery operation is typically considered to be terminated as soon as the aircraft is removed from the accident site and safely placed at a temporary destination so that normal operations can be resumed at the airport. Following the recovery incident, a detailed documentation of the events, a final meeting and the preparation of the final report take place.

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1 Legal basis and applicable documents

This manual and its structure as well as content are based on various laws and directives issued by the authorities responsible for air traffic. These are mainly the following documents:

- ICAO Annex 14 (Aerodrome Design and Operations)
- ICAO Doc 9137 Airport Services Manual Part 5 (Removal of Disabled Aircrafts)
- ICAO Doc 9137 Airport Services Manual Part 1 (Rescue and Fire Fighting)
- EASA AMC & GM Annex to ED Decision (Acceptable Means of Compliance and Guidance Material to Authority, Organisation and Operations Requirements for Aerodromes)
- LuftVZO (Luftverkehrs-Zulassungs-Ordnung), especially § 45 LuftVZO


In addition, the following applicable documents are taken into account in the event of the recovery of an aircraft:

- Specific Aircraft Recovery Manual (ARM):
- Specific Loadsheet for the crashed flight
- AUR of FKB
- Aerodrome Manual of FKB
- Airport Improvement Plan (AIP) of FKB
- Emergency Response Plan of FKB
- ArbSchG (Arbeitsschutzgesetz der Bundesrepublik Deutschland/Occupational Health and Safety Act of the Federal Republic of Germany)
- Recommendations of the airline (Aircraft Recovery Process Document)

2 Classification of the recovery case

2.1 Recovery categories

In order to assess the severity of damage, a recovery case at FKB is initially categorised into three classes according to its difficulty, after a first inspection has determined what damage has occurred to the aircraft. The following table shows these classes and their definitions.


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RECOVERY CATEGORY	DEFINITION
L EASY RECOVERY CASE	If tyre damage or blocked brakes have occurred or if the aircraft has left the runway/taxiway with one or more landing gear(s) but the landing gear(s) are extended and locked and the aircraft is towable.
M MEDIUM RECOVERY CASE	If one or more landing gears are not extended or are only partially extended, but the aircraft is expected to be capable of towing after lifting.
S SEVERE RECOVERY CASE	If one or more landing gears are torn out of the structure or damaged in such a way that towing on the landing gears is no longer possible after lifting. In addition, the case of such extensive damage to the aircraft exists that repair is no longer economically viable (scrapping).

Table 1: Recovery categories at CGN

2.2 Aircraft categories

Furthermore, the recovery case that has occurred and the necessary recovery preparation can be classified on the basis of aircraft classes (Aerodrome Reference Code) in accordance with the ICAO specifications in Annex 14.


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Code letter (ICAO)	Wing span	Outer main gear wheel span	Typical aeroplane
A	< 15 m	< 4,5 m	Dassault Falcon 10, Piper Malibu, Learjet 55
B	15 – 24 m	4,5 – 6 m	Cessna 525, Dassault Falcon 2000, Embraer ERJ-145, Bombardier CRJ-200
C	24 – 36 m	6 – 9 m	Gulfstream V, Dash 7, ATR42- 500, Saab 2000, B737, A320, MD88, Fokker 100
D	36 – 52 m	9 – 14 m	A300/310, B757/767, Tupolev 154
E	52 – 65 m	9 – 14 m	A330/340/350, B747-400, B777/787, MD11
F	65 – 80 m	14 – 16 m	B747-8, A380, AN124, AN225

Table 2: aircraft categories according to ICAO Annex 14

2.3 Recovery matrix

For the exact classification of the occurred recovery case, the connection between the difficulty of the recovery case and the aircraft category according to ICAO is therefore presented in a matrix. This can be used professionally by the recovery management on the basis of the existing experience and competencies. In addition to the recovery preparation, the matrix is also intended to support the documentation of the recovery.

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Recovery matrix of FKB for the recovery of aircrafts						
	Aircraft category according to ICAO Annex 14					
Recovery category	A	B	C	D	E	F
Easy (L)						
Medium (M)						
Severe (S)/Scrapping						


Table 3: Recovery matrix at CGN

3 Structural organisation

3.1 Organisational chart and functional description

The registered owner or proprietor of the aircraft is responsible for the recovery of damaged or immobile aircraft. If the owner or proprietor is unable to carry out the recovery himself, he must appoint a responsible agent to carry out the recovery. This can either be FKB as the airport operator itself or a third party company that carries out the recovery on behalf of the airline.

The following illustrations show the currently valid organisational structures, as well as the descriptions of the individual functions during a recovery at CGN.

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3.1.1 Recovery by FKB

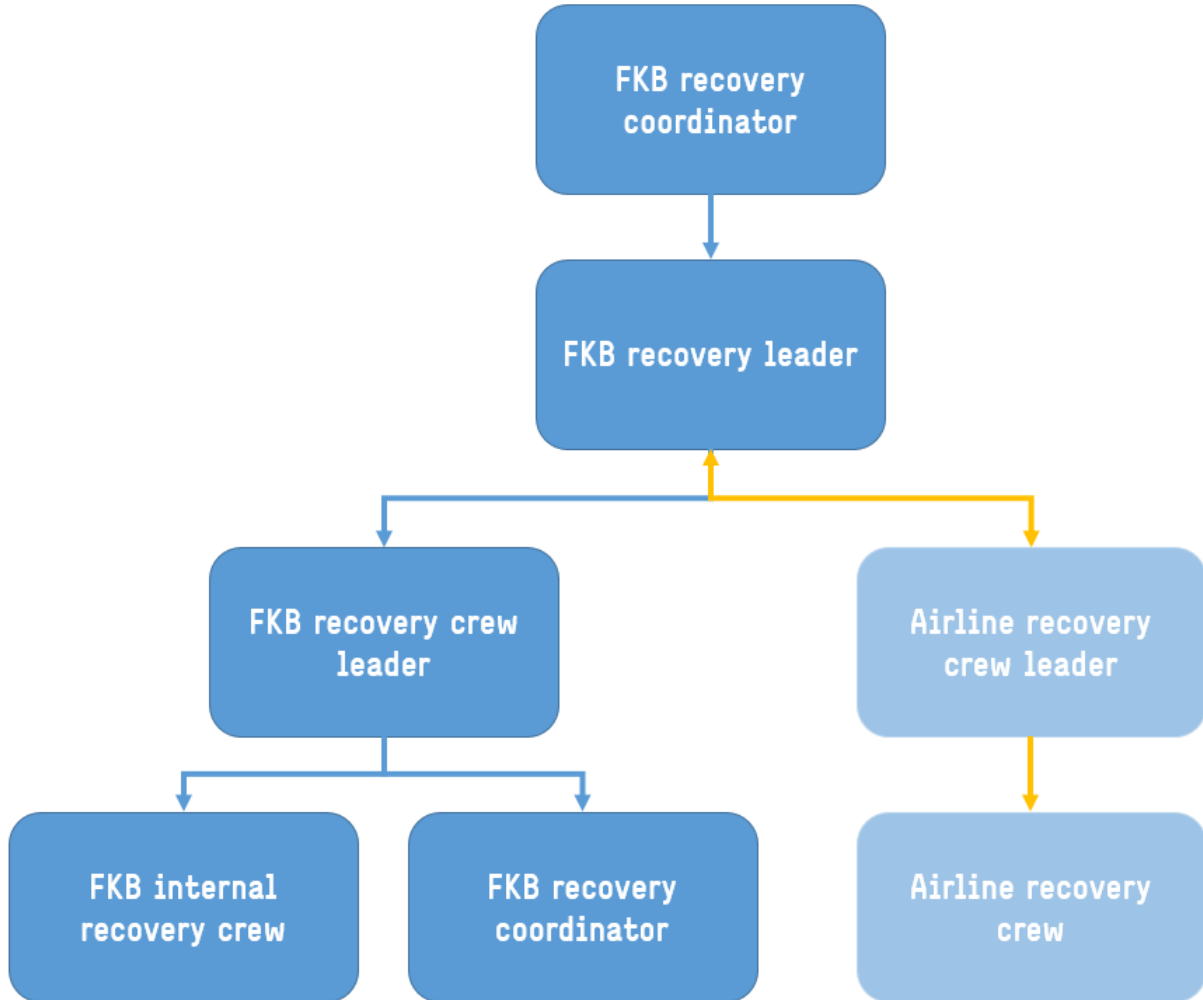



Figure 1: Organisational chart in case of aircraft recovery by FKB

Note: If the airline has contracted FKB for aircraft recovery, it may still support the recovery with aircraft technicians or additional equipment if necessary. In these circumstances, the airline recovery crew is involved in the recovery. Therefore, a transparent way of representing the airline recovery crew and its leader in the organisation chart has been chosen. In addition, the airline might use different terminology for the airline recovery crew and specifically for the airline recovery crew leader. The areas of responsibility nevertheless remain the same.


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Task descriptions for the different functions:


- **Recovery coordinator (always from FKB)**
 - Corresponds to the position of "aerodrome coordinator of operations for the removal of an aircraft disabled on or adjacent to the movement area" as required in ICAO Annex 14 and ICAO ASM, Part 5.
 - Interface between recovery manager (internal/external) and FKB internal interfaces (Duty Traffic Manager, leader crisis unit, fire brigade, management, etc.)
 - Review and approval of the recovery concept of the recovery leader
 - Represents the interests of FKB in maintaining or restoring proper flight operations
 - Constant exchange with the crisis unit of FKB
 - Also responsible for work safety (regardless of who carries out the recovery)

- **Recovery leader FKB**
 - Responsible for the operational execution of the recovery of the aircraft
 - Concludes recovery contract with airline in case of commissioning FKB.
 - If necessary, commission and conclusion of contracts with external companies, e.g. for the defuelling of the aircraft or for the provision of recovery equipment.
 - Prepares the recovery concept in cooperation with airlines and third parties involved in the recovery.
 - Coordinates the recovery concept with the recovery coordinator.
 - Coordinates and communicates with the airline regarding the preparation of the recovery plan.
 - If necessary, orders external resources/equipment for support (e.g. Technisches Hilfswerk - THW, German Armed Forces, Aircraft Recovery Transport Systems, etc.).
 - Responsible for the selection and operation of the recovery equipment.
 - Instructs third parties involved in the recovery (e.g. in safety precautions).
 - Documentation of the recovery and initiation of a final meeting

- **Recovery crew leader FKB**
 - Coordinates and instructs the recovery crew

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- Leads the execution of the recovery in accordance with the recovery concept
 - Supervision of the practical execution of the recovery
 - Provision of the recovery equipment
 - Coordinates with the recovery leader regarding the implementation of the recovery concept
 - Coordination with the recovery crew leader of the airline, especially for all technical work at the aircraft
 - Responsible for the operational readiness, maintenance and upkeep of the FKB's own recovery equipment
 - Carrying out recovery exercises in cooperation with all parties involved
- **Recovery crew leader of the airline**
 - Coordination and instruction of the airline recovery crew
 - Constant consultation with the recovery crew leader of the FKB
 - Supervision of the technical support at the aircraft by the airline recovery crew
 - Provision of airline's own recovery equipment
 - Consultation with the FKB recovery leader regarding the implementation of the recovery concept
- **Recovery crew from the FKB, airline or third party**
 - Carrying out the recovery in accordance with the recovery concept
 - Carrying out tasks according to the instructions of the recovery crew leaders
 - Operating the recovery equipment
 - Cooperation with the recovery crews of other involved partners

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3.1.2 Recovery by airline or third party

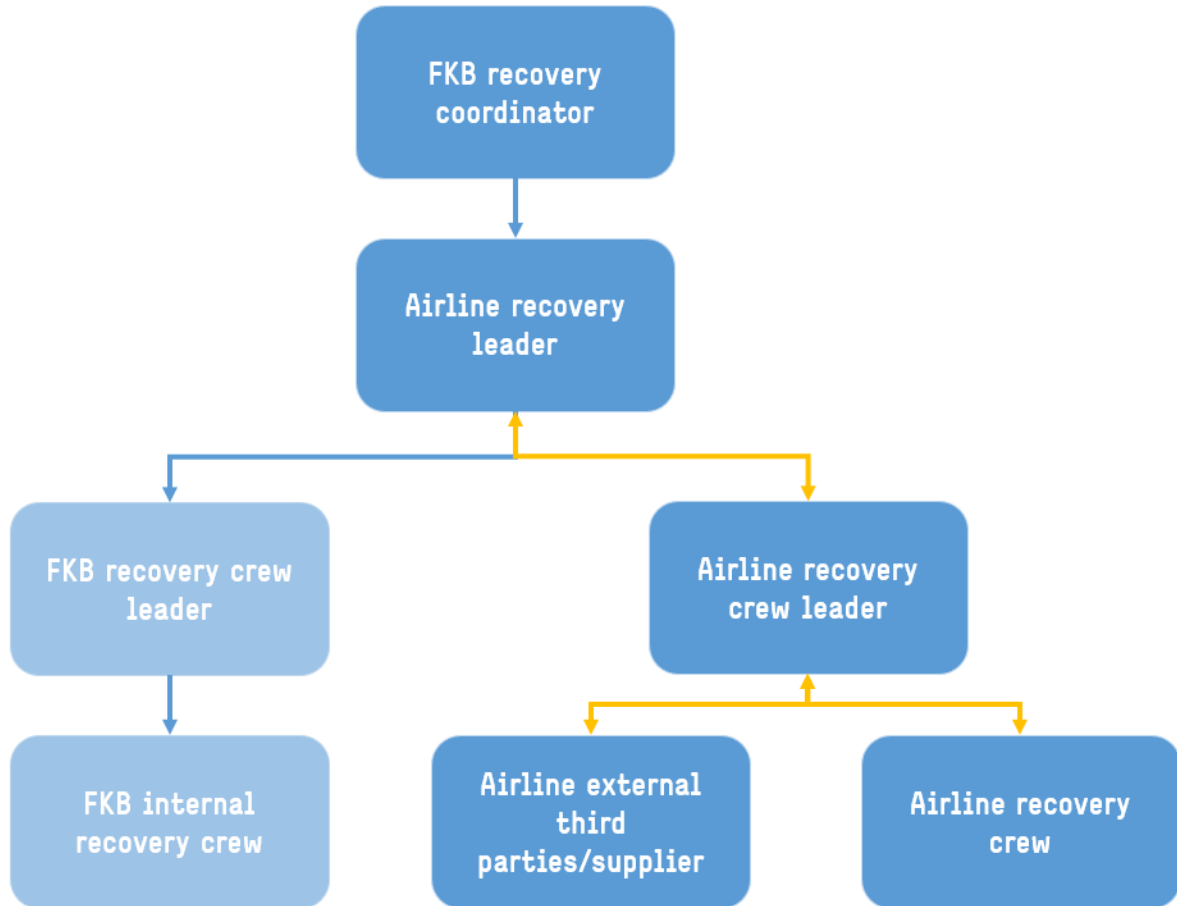



Figure 2: Organisational chart in case of aircraft recovery by airline or third party

Note: If the airline carries out the recovery of the aircraft itself or commissions a third party company to do so, FKB can still support the recovery with additional equipment and associated personnel if necessary. Under these circumstances, the FKB recovery crew is involved in the recovery. Therefore, a transparent representation of the FKB recovery crew and its leader has been chosen in the organisational chart. In addition, the airline may use different terminology for the its recovery crew and specifically for its recovery crew leader. The areas of responsibility nevertheless remain the same. The tasks of the airline recovery leader and the airline recovery crew leader can also be carried out by the same person.


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Task description for the different functions:

- **Recovery coordinator (always from FKB)**
 - Corresponds to the position of "aerodrome coordinator of operations for the removal of an aircraft disabled on or adjacent to the movement area" as required in ICAO Annex 14 and ICAO ASM, Part 5.
 - Interface between recovery manager (internal/external) and FKB internal interfaces (Duty Traffic Manager, leader crisis unit, fire brigade, management, etc.)
 - Review and approval of the recovery concept of the recovery leader
 - Represents the interests of FKB in maintaining or restoring proper flight operations
 - Constant exchange with the crisis unit of FKB
 - Also responsible for work safety (regardless of who carries out the recovery)

- **Recovery leader from airline or third party**
 - Overall responsibility for the operational implementation of the recovery of the aircraft
 - If necessary, commissioning and concluding contracts with external companies, e.g. for the defuelling of the aircraft or for the provision of recovery equipment
 - Prepares the recovery concept in cooperation with third parties involved in the recovery
 - Coordinates the recovery concept with the FKB recovery coordinator
 - Constant communication and coordination with the FKB recovery coordinator
 - If necessary: orders external resources/equipment for support
 - Responsible for the selection and operation of the recovery equipment (if necessary by the FKB recovery crew)
 - Instructs third parties involved in the recovery (e.g. in safety precautions)
 - Documentation of the recovery and initiation of a final meeting

- **Recovery crew leader of the airline or third party**
 - Coordinates and instructs the recovery crew
 - Leads the execution of the recovery according to the recovery concept
 - Supervision of the practical execution of the recovery

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- Providing the recovery equipment
 - Coordination with the recovery leader regarding the implementation of the recovery concept
 - Coordination with the recovery crew leader of the FKB
- **Recovery crew leader FKB**
 - Coordination and instruction of the FKB recovery crew
 - Constant coordination with the recovery crew leader of the airline
 - Supervision of the technical support at the aircraft by the FKB recovery crew
 - Provision of FKB's own recovery equipment & associated personnel
 - Coordination with the recovery leader regarding the implementation of the recovery concept
- **Recovery crew of FKB, airline or third party**
 - Carrying out the recovery in accordance with the recovery concept
 - Carrying out tasks according to the instructions of the recovery crew leaders
 - Handling the recovery equipment
 - Cooperation with the recovery crews of other involved partners


3.2 Contact persons and phone numbers

The appendix (Part 1) lists important contact persons and telephone numbers of the FKB as well as of the third-party companies and organisations providing support in the event of a recovery.

3.3 The recovery organisation of FKB

3.3.1 Service range

The FKB recovery team is capable of recovering all types of aircraft up to and including the Boeing 747 family. Complete recovery is possible for all types of aircraft (if necessary, with the support of third-party companies).

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A complete load or complete reload becomes necessary if an aircraft can no longer be made capable of moving with the equipment available at CGN. FKB can only carry out this independently for ICAO category A aircraft. For all other aircraft types up to Boeing 747, only partial loading (e.g. of a main landing gear) can be carried out independently. In the event that an aircraft of ICAO category B to F has to be loaded completely, there is a contract with Frankfurt/Main Airport for the joint use of the Aircraft Recovery Transport System (ARTS-2/2x) (see Annex 7).

The primary task of the FKB recovery crew is to use/operate the recovery equipment of FKB. In the event of mechanical or electronic repair or maintenance work on the aircraft, the airline must send competent technicians to carry this out (see also chapter 4.5).

3.3.2 Trainings

For all recovery coordinators, recovery leaders, recovery crew leaders and the recovery crew, a detailed practical training course, including work safety training, is held once a year. This goes beyond the planning exercises ("tabletop exercises") recommended in ICAO ASM Part 5 for aircraft recoveries at the respective airport. In addition to FKB, the German Armed Forces stationed at the airport and the local THW are taking part in the recovery exercise. It is intended to integrate other participating companies (such as airlines and refuelling services) in the recovery training.


In addition, the recovery coordinators, recovery leaders and recovery crew leaders are sent to annual recovery seminars organised by the Arbeitsgemeinschaft deutscher Verkehrsflughäfen e. V. (ADV) in order to expand their know-how regarding new recovery equipment and to exchange experiences with recovery officers from other airports in German-speaking countries.

The entire training and examination concept for recovery operations at FKB can be viewed on request.

3.4 Recovery equipment of FKB

3.4.1 Operating of the recovery equipment

The inventory of recovery equipment at FKB is - in relation to other airports of the same size - above average. A list of all parts of the recovery equipment, including the respective number of

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pieces, storage location, length, load-bearing capacity and colour, is kept and constantly updated. The list of recovery equipment can be viewed on request.

In addition to its own equipment, there is also cooperation with the German Armed Forces based at CGN and the local THW regarding the support of FKB with recovery equipment in the event of a recovery. Furthermore, there is a contract with Frankfurt Airport which stipulates that FKB may use the Aircraft Recovery Transport System (ARTS-2/2x) of the Frankfurt Airport operator under its supervision (see Annex 7).

FKB's own equipment may only be operated by employees appointed by FKB. **The operation of FKB's own recovery equipment by other persons is therefore not permitted.**

3.4.2 Equipment maintenance


The FKB recovery crew leaders are responsible for the operational readiness, maintenance and upkeep of FKB's own recovery equipment. In accordance with the manufacturer's specifications, all components of the recovery equipment are regularly maintained. The maintenance status of the recovery equipment is always documented. As soon as the expiry date specified by the manufacturer is reached, the equipment is replaced.

Special maintenance instructions are found for the lifting bags. Initially they have to be maintained every five years, later every two years and finally every year. As soon as the lifting bags have reached their 20th year of life, they are replaced by new ones. The tests of the lifting bags are carried out externally by the manufacturers themselves in order to ensure the maximum possible safety.

3.5 Requirements for the airline

In the event of a recovery case, airlines must inform the BFU about the damaged aircraft as soon as possible so that it can quickly authorise the recovery of the aircraft.

After the occurrence of a recovery case, the airline must also have made a decision **within 30 minutes of the alert** and communicated it to the FKB as to whether it will carry out the recovery independently or commission the FKB or a third-party company to do so. If this does not happen within the specified time interval, the FKB will exercise its right described in the foreword to

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this manual, in the FBO and in the Aerodrome Manual, to remove the aircraft from the flight operation areas after clearance even without a special order from the aircraft holder at the latter's expense or to commission competent third parties with the removal, insofar as this is necessary for the handling of air traffic.

In the course of the recovery operation, the recovery leaders provided by airlines must permanently coordinate with the recovery coordinator appointed by FKB. Even in the event that FKB carries out the recovery independently, a representative of the airline should always be on site. This can be the aircraft operator of the damaged aircraft, the owner of the aircraft or a representative chosen by him. In addition, the specific Aircraft Recovery Manual of the type of Aircraft involved in the accident, as well as the load sheet for the flight involved in the accident, should be made available to the recovery leader of the FKB.

In addition, each aircraft operator should establish a core team that is responsible for all possible aircraft recovery cases. The recovery team of the FKB - in case the recovery is fully or partially carried out by the FKB - deploys the recovery equipment specific to the aircraft, which is not the property of the FKB and is ordered separately by the FKB, on the aircraft and operates it on the instructions of the recovery crew leader of the FKB.

Maintenance engineers and aircraft technicians are an elementary part of the airline's aircraft recovery team and should be available on site at all times. They analyse the aircraft damage, prepare the necessary temporary repairs and can support the recovery team with technical and expert knowledge in the recovery case. Even in the event of recovery by the FKB, contact with maintenance engineers and aircraft technicians must be ensured and, if required, be available to the recovery leader, as it may be necessary, for example, for the recovery to have engines or other parts of the aircraft dismantled by the maintenance engineers and aircraft technicians.

For the occurrence of an aircraft recovery case, the airline should maintain a recovery process document (referred to in ICAO ASM Part 5 as the "Aircraft Recovery Process Document"). This should describe in detail all necessary steps from the first notice of the crashed Aircraft and contain recommendations on how to proceed with the recovery operation. On this basis, the recovery concept is developed by the recovery leader in charge.



4 Procedural organisation

4.1 Process flow chart

On the following pages, the process flow diagram shows the work steps and the decisions to be made during a recovery of an aircraft. It is subdivided into the following processes: "Aircraft accident", "Recovery of Aircraft 1" and "Recovery of Aircraft 2".

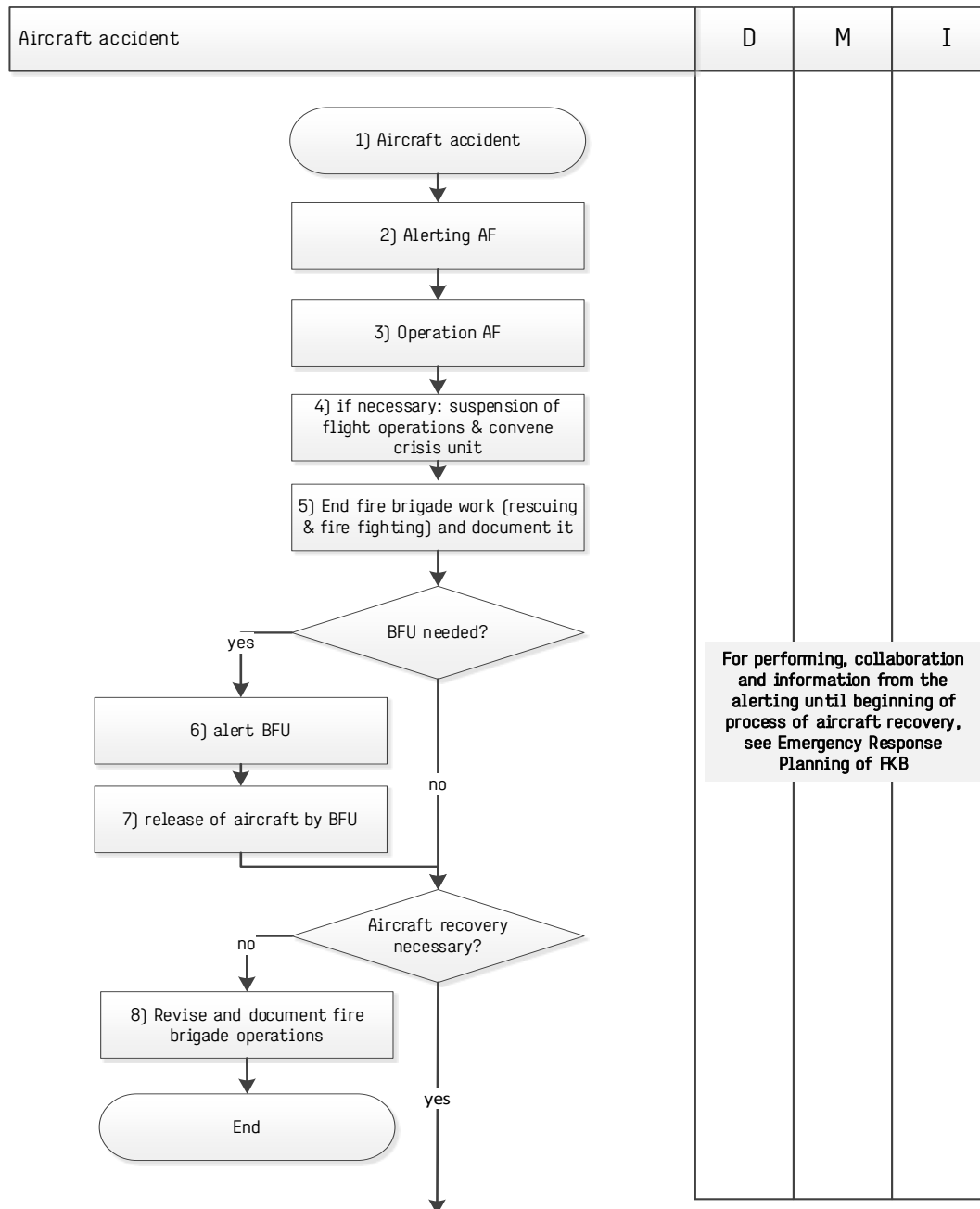


Figure 3: Process flow diagram, Part 1: „Aircraft accident“

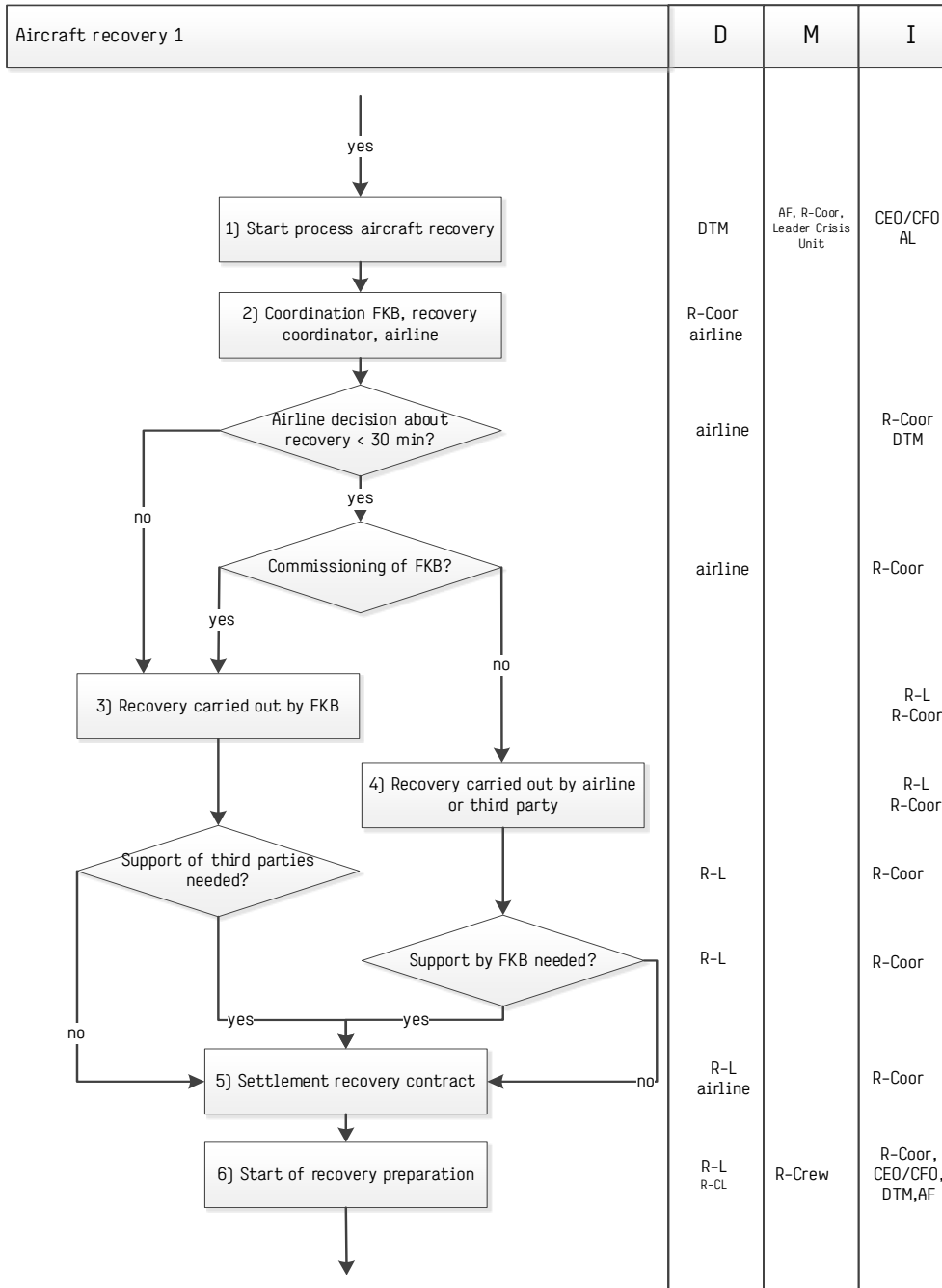


Figure 4: Process flow chart, Part 2: „Aircraft recovery 1“

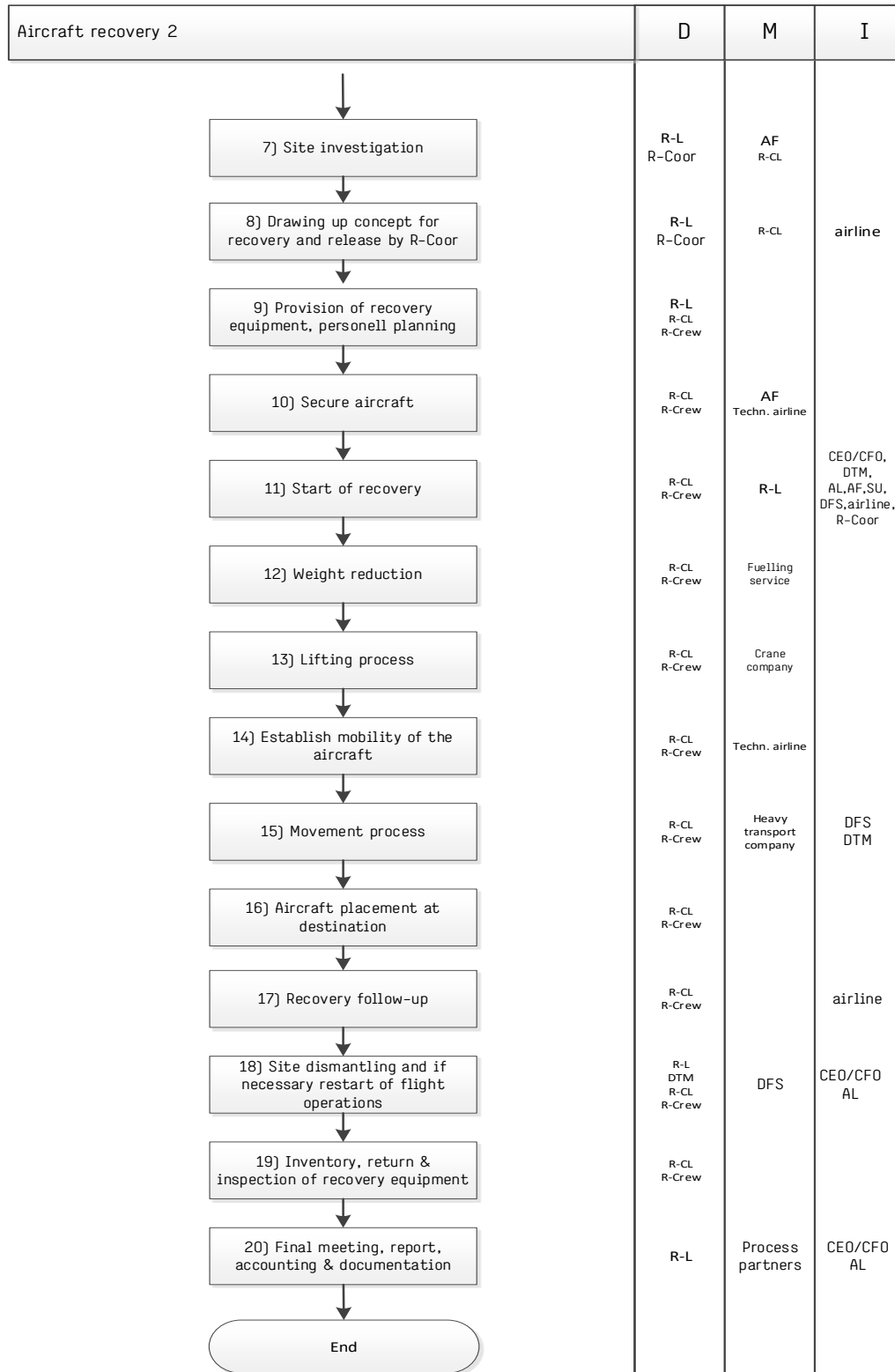



Figure 5: Process flow chart, Part 3: „Aircraft recovery 2“

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Note: On the right-hand side of the process flow diagram are always the performing (D), collaborating (M) and informing (I) parties. The abbreviations used can be found in the list of abbreviations in the recovery manual. A rectangle stands for a work step, a rhombus for a yes/no decision that must be made by the person carrying out the work. The function designation (e.g. recovery leader - R-L) applies irrespective of whether the individual roles (with the exception of FKB recovery coordinator) are provided by FKB staff, airline staff or third-party contractors.


Description: Immediately after the accident of the aircraft, the airport fire brigade is alerted and takes over the initial operation at the aircraft. At the same time, the Duty Traffic Manager (DTM) must decide whether flight operations must be interrupted and whether the head of the crisis unit must be contacted in this situation.

If the accident occurred during a flight phase (including take-off and landing) or if there was an intention to fly (e.g. in the case of a taxiing movement), the BFU must be informed immediately of the incident so that it can begin the investigation as quickly as possible and then allow the aircraft to be removed. If the accident occurs, for example during a towing operation, BFU does not have to be informed of the incident.

A decision must then be made as to whether recovery is necessary: if the aircraft is unable to move under its own power or by the normal use of a suitable aircraft tug on or next to the movement area of the airport, the actual recovery process is initiated.

First of all, the airline must decide within 30 minutes of the accident which company will carry out the recovery, in consultation with the FKB recovery coordinator. Subsequently, it must be considered whether further support such as recovery equipment or personnel (possibly by third-party companies) is necessary and the recovery contracts must be concluded on this basis (see Chapters 4.5 and 5.2).

The further procedure for the recovery process is described in chapter 5.3.

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4.2 Recovery order

The airline is responsible for the recovery of damaged or immobilised aircraft. It internally appoints a person responsible for the recovery. If the airline is not able to carry out the recovery itself, it can issue a recovery order. This order can either be given to FKB or to an external third party. This should always be done in a written form and signed by airline or its representative. In the case of a recovery order placed by FKB, a template for a recovery contract is kept ready; this is available on the intranet.

If it is necessary for the handling of commercial air traffic, the aircraft may also be removed from the flight operation areas without a special order from the aircraft holder. This requires the approval of the management or the DTM of FKB.


In the event of a recovery of an aircraft, FKB can request assistance from third parties, provided it has been commissioned with the recovery by the airline. These include the THW and the German Armed Forces, which participate in the annual recovery exercises. In addition, crane companies, catering companies, civil engineering and road construction companies, heavy transport companies, hazardous materials disposal companies, Maintenance, Repair and Overhaul (MRO) service providers and other companies can be commissioned by FKB to assist in the recovery process.

4.3 Recovery procedure

The measures listed here for a recovery of an aircraft do not guarantee completeness. An individually coordinated recovery concept must be drawn up for the respective recovery event.

The recovery leader has overall responsibility for the recovery process. During the course of the recovery, routine situation meetings are to be held, in particular between the recovery leader, the recovery coordinator and the recovery crew leader (from FKB, airline and third party companies), in order to ensure a constant flow of information. The recovery leader is responsible for this. At these meetings, the current status of the recovery should be shown, problems and difficulties reported and solutions discussed. The results of the meetings should be included in the documentation of the recovery.

In the following, the functionaries carrying out the individual tasks are named in analogy to the process flow diagram in chapter 5.1. The information applies regardless of whether the individual roles (with the exception of the FKB recovery coordinator) are performed by FKB staff, airline staff or third-party contractors.

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4.3.1 Recovery preparation

The recovery preparation starts after the occurrence of the recovery case, the evacuation of passengers and crew, fire fighting and the alerting of the BFU, the police and the public prosecutor's office. The recovery preparation starts as soon as airlines have communicated who will carry out the recovery and usually have concluded the recovery contract.

4.3.1.1 Site investigation


- The recovery leader and the recovery coordinator (if necessary also the recovery crew leaders) are responsible for carrying out the evacuation.
- Following the evacuation of the a/c and, if necessary, the fire-fighting, a first superficial assessment of the a/c and its position/location takes place.
 - General situation (location, time, weather)
 - Damage event (degree of damage to the a/c, type and quantity of load, dangerous goods)
 - Check the accident site, the load-bearing capacity of the ground, existing infrastructure (e.g. power connection)
 - Danger prevention (fire protection measures, collection of leaking mineral oil products, securing hazardous goods)
 - Check whether there are any harmful composite materials in the vehicle and, if necessary, take certain measures for the work safety of the recovery crew.

4.3.1.2 Creation of the recovery concept

- The recovery leader and the recovery coordinator are responsible for implementation.
- Depending on the damage and the available resources, the intended recovery concept is to be discussed with all parties involved and defined by the recovery leader.
- The recovery concept must be checked and approved by the recovery coordinator before it is implemented.
- Determination of the weather data and the estimated time required for recovery by the recovery leader and communication to all parties involved.

4.3.1.3 Provision of recovery equipment, personnel planning

- The recovery leader, the recovery crew leader(s) and the recovery crew(s) are responsible for carrying out the operation.

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- The operational command is to be set up in the immediate vicinity of the operation site.
- The planning of the required number of persons in the recovery crew is to be carried out, including the organisation of the release from the actual activity of the employees.
- The recovery team (especially the recovery crew leader) is to be instructed in the recovery concept by the recovery leader.
- The recovery crew shall be divided into appropriate groups and, if necessary, their respective replacements shall be organised.
- The supply and care of the recovery crew must be organised.
- The recovery equipment and the communication equipment must be assembled or ordered from other sources (e.g. third party companies).
- The necessary technology, auxiliary materials and additional personnel in accordance with the recovery concept must be rented or ordered.

4.3.1.4 Securing of the aircraft

- Performing are the recovery crew leader(s) and the recovery crew(s).
- Central aspects of securing the a/c are:
 - The avoidance of unplanned movements of the aircraft,
 - The avoidance of further damage to the aircraft caused by the recovery operation,
 - Protecting the recovery crew from dangerous parts of the a/c,
 - Stabilisation of the aircraft with retaining straps, tension ropes, ground anchors, etc.,
 - Stabilisation of the ground to prevent the a/c from slipping,
 - Securing of the aircraft by LVG technicians (e.g. securing batteries, accumulators),
 - Removal of hazardous materials from the transport vehicle,
 - Securing oxygen generators (central/decentral) and disconnecting oxygen supplies,
 - Securing the power connections and
 - Other measures as required.

4.3.2 Recovery implementation

The recovery is carried out by the recovery crew according to the previously prepared recovery concept. The recovery leader is responsible for the overall execution of the recovery and the associated work safety of all involved.

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4.3.2.1 Weight reduction

- The recovery crew leader(s) and the recovery crew(s) shall be in charge.
- The luggage, cargo and catering in the aircraft shall be unloaded.
- On request the aircraft is to be defuelled by the fuelling service.
- To reduce the weight, (possibly damaged) parts of the aircraft, such as cabin parts, are to be dismantled by the airline.

4.3.2.2 Lifting process


- The recovery crew leader(s) and the recovery crew(s) are the performing parties.
- The anchorage points for the bracing of the a/c are to be determined (ARM).
- The bracing of the a/c is to be attached.
- A terrain and height compensation for lifting bags or hydraulic jacks is to be established (railway thresholds, excavation, backfilling and subsoil stabilisation).
- The lifting bags or hydraulic jacks are to be used.
- If necessary, use a mobile crane with special lifting straps and lifting beams.
- The a/c must be balanced and then lifted.

4.3.2.3 Establish mobility of the aircraft

- The recovery crew leader(s) and the recovery crew(s) are in charge.
- If possible, the retracted landing gear of the aircraft shall be deployed by the airline.
- Any damaged landing gear shall be repaired or replaced. The landing gears shall be locked.
- If the a/c cannot roll on its own landing gears, it must be loaded onto a recovery dolly (fuselage pick-up).
- Necessary ground anchors are to be installed. If necessary, a ramp/road construction is also necessary.
- The recovery route must be prepared by removing obstacles, preparing the ground, levelling the ground, cordoning off the recovery route and securing media routes.

4.3.2.4 Movement process

- The recovery crew leader(s) and the recovery crew(s) shall be in charge.
- The route to the stand/repair site shall be determined.

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- The destination and the route are to be chosen in such a way that the transport process can proceed as quickly as possible and without obstacles (if necessary, use the parking position of an a/c).
- The subsoil conditions (especially media routes) as well as the existence of sufficient free spaces between all parts of the transport vehicle and the ground must be taken into account during the movement process.
- The a/c is moved using towing vehicles,
 - a) by towing with a push-back and securing vehicles or
 - b) by using slings on the landing gear. In any case, a brake vehicle must be used to secure the truck against unintentional rolling.
- Continuous, uninterrupted transport to the destination must be ensured.


4.3.2.5 Placement at destination

- The recovery crew leader(s) and the recovery crew(s) are in charge of implementation.
- Secure against unintentional movement: Lashing, wedging, attaching weights.
- Create stability: e.g. use hydraulic jacks.
- To remove recovery dollies, etc. possibly again
 - Determine the anchorage points for bracing the truck (ARM)
 - Attach braking
 - Prepare terrain and height compensation for lifting bags or hydraulic jacks (railway thresholds, subsoil stabilisation).
 - Bring hydraulic jacks into operation
 - Use mobile crane with special lifting straps and cross beams.

4.3.3 Recovery follow-up

The recovery coordinator and the recovery leader jointly determine the end of the recovery operation.

The recovery follow-up begins after the recovery operation has been completed or after the immobilised aircraft has been placed at its destination. The central aspect here is the restoration of the flight operation areas and facilities to a proper and operationally safe condition and of the recovery equipment to its original condition.

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4.3.3.1 Site dismantling


- The recovery leader is responsible for arranging for the site to be dismantled.
- The dismantling of ground stabilisation measures and the rehabilitation of damaged flight operation areas and facilities must be carried out.
- Regular flight operations shall be reactivated if they were interrupted by the accident.
- The operations command is to be dismantled and, if necessary, renaturalisation is to be initiated at the site of the accident.

4.3.3.2 Inventory, return & inspection of recovery equipment

- The recovery crew leader(s) and the recovery crew(s) are responsible for carrying out the inspection.
- Equipment is to be inspected for damage and reuse.
- Repair and preservation of the equipment shall then take place.
- All components of the recovery equipment that are damaged or cannot be reused must be listed and invoiced to the airline.
- The requested equipment from third party companies has to be returned.

4.3.3.3 Final meeting, final report & accounting

- The recovery leader is responsible for carrying out the recovery.
- The documentation that takes place during the recovery is completed. It is used for later evaluation or, if necessary, for the preservation of evidence.
- The final meeting is called by the recovery leader. Problems during the recovery process are to be pointed out and possible solutions are to be developed. The protocol of the final meeting is included in the documentation.
- Necessary organisational and material changes are to be made in order to avoid problems during recovery in the future.
- Invoicing shall be done on the basis of the conditions laid down in the recovery order. The recovery leader has to supervise the contents of the invoicing.

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4.3.4 Documentation of a recovery

The entire recovery operation must be documented in detail by the recovery leader or a responsible person appointed by him. All measures taken to implement the recovery concept must be documented chronologically.

Further components of the documentation of a recovery are the classification of the recovery case in the recovery matrix, the resulting recovery concept, the number of persons involved in the recovery, the recovery equipment used, meeting protocols (also of the final meeting), the detailed description of the recovery procedure and the final report. In addition, the documentation must include all damage to the aircraft, infrastructure and equipment that can only be recognised after the recovery.

In addition, the essential work steps must be documented photographically. It should be ensured that the documentation meets the requirements for sufficient preservation of evidence on the condition of the a/c before the next work step. The recovery leader is also responsible for appointing a person responsible for the photographic documentation.

All documentation material of the recovery of the aircraft is to be made available to the FKB afterwards in the event that the airline (or a third party company commissioned by it) carries out the recovery. Conversely, FKB also hands over its entire recovery documentation to the airline if FKB recovers the aircraft.

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Annex

Contact person for recovery of aircraft by FKB

If the FKB is commissioned to carry out the recovery, the on-call recovery leader must be notified.

Contact persons			
Position	Name	Line	Phone number
On-call recovery leader		Internal	02203 40 / 5566
Recovery representative	Herr Hans Dieter Metzen	Internal	02203 40 / 4046
		Mobile	0162 2438340
Recovery leader	Herr Hans-Dieter Metzen	Internal	02203 40 / 4046
		Mobile	0162 2438340
Recovery leader	Herr Jürgen Hahn	Internal	02203 40 / 4191
		Mobile	0162 2438327
Recovery leader	Herr Carsten Reese	Internal	02203 40 / 4039
		Mobile	01525 4766610
Recovery leader	Herr Christian Sperling	Internal	02203 40 / 3061
		Mobile	0162 2438498
Recovery leader	Herr Dirk Wenig	Internal	02203 40 / 4407
		Mobile	0162 2438399

Contact persons in case of aircraft recovery by third parties

Contact person			
Position	Name	Line	Phone number
Recovery representative	Herr Hans-Dieter Metzen	Internal	02203 40 / 4046
		Mobile	0162 2438340