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SAFETY

Timely recovery and effective read-out of the flight recorders

6.361 Has the State established and implemented procedures to ensure the timely recovery and effective read-out of the flight recorders in compliance with Attachment D to Annex 13?



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Let's build it together

- ✈ Stage 1 – Gathering relevant information
- ✈ Stage 2 - Defining the framework
- ✈ Stage 3 - Writing the procedure



Let's build it together

✈ Exercise: Timely recovery and effective read-out of the flight recorders

- ✈ To do the exercises, we will use our fictional scenario:
 - ✈ State – Coronaland
 - ✈ Authority – Civil Aviation Authority of Coronaland (CAAC)
 - ✈ The accident investigation unit is not independent, being part of the CAAC



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Let's build it together

✈ Stage 1 – Gathering relevant information

✈ Stage 2 - Defining the framework

✈ Stage 3 - Writing the procedure



Stage 1 – Gathering relevant information

✈ Gather all information relevant to the development of the procedure

✈ Since the procedure of our exercise comes out from a PQ, we need to know the content of:

✈ the question of the Protocol USOAP

✈ the ICAO references to that PQ

✈ the Guidance for Review of Evidence



Timely recovery and effective read-out of the flight recorders

6.361 Has the State established and implemented procedures to ensure the timely recovery and effective read-out of the flight recorders in compliance with Attachment D to Annex 13?

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Key elements:

1. Established and implemented
2. Timely recovery
3. Effective read-out
4. Compliance with Attachment D

6.361 Has the State established and implemented procedures to ensure the timely recovery and effective read-out of the flight recorders in compliance with Attachment D to Annex 13?

Established and implemented

- This PQ requires evidence of implementation

6.361 Has the State established and implemented procedures to ensure the timely recovery and effective read-out of the flight recorders in compliance with Attachment D to Annex 13?

Timely recovery

- That means not delaying on the recovery of the equipment, regardless of the conditions of the site (water, jungle, urban areas, etc.)
- Require previous arrangements for recovery from water (access to boats and divers)

6.361 Has the State established and implemented procedures to ensure the timely recovery and effective read-out of the flight recorders in compliance with Attachment D to Annex 13?

Effective read-out

- Ensuring access to qualified laboratories
- Ensuring the appropriate participation of all necessary personnel (e.g. operator, manufacturer, etc.)

6.361 Has the State established and implemented procedures to ensure the timely recovery and effective read-out of the flight recorders in compliance with Attachment D to Annex 13?

Compliance with Attachment D

- Process to select the laboratory for the read-out
- Invitation to the read-out session



ICAO references

STD

A13

5.7

GM

A13

Att. D

Doc 9962

6.1.8

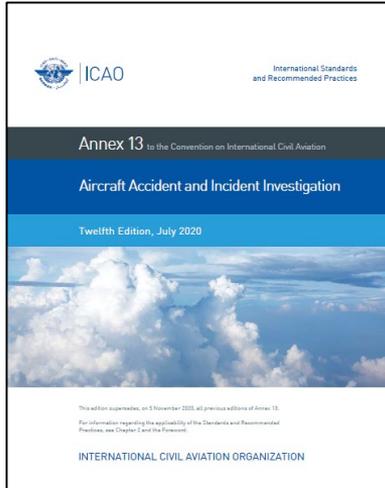
Doc 9756

Part I, 5.6 & App. 2 to C5

Part II, App. 6, Section 10



ANNEX 13



RESPONSIBILITY OF THE STATE CONDUCTING THE INVESTIGATION

Recorded data — Accidents and incidents

Flight recorders

5.7 Effective use shall be made of flight recorders in the investigation of an accident or an incident. The State conducting the investigation shall arrange for the read-out of the flight recorders without delay.



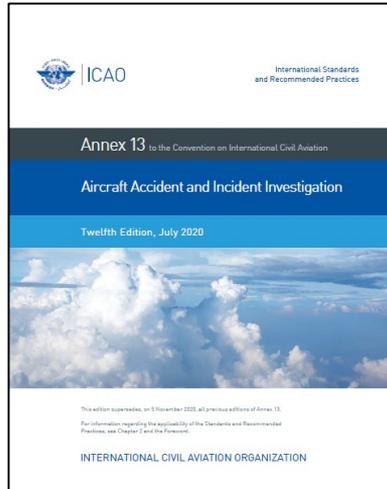
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Stage 1 – Gathering relevant information

ATTACHMENT D. GUIDELINES FOR FLIGHT RECORDER READ-OUT AND ANALYSIS

ANNEX 13



Initial response

Choice of facility

Participation by the State of Manufacture (or Design) and the State of the Operator

Recommended procedures



Chapter 6

INVESTIGATION POLICIES AND PROCEDURES

6.1 GENERAL

DOC 9962

6.1.8 If an accident or incident being investigated by [Name of State] has a flight data recorder (FDR) or cockpit voice recorder (CVR), or both, the [Accident Investigation Authority] should make immediate arrangements to recover and protect the flight recorders. The [Accident Investigation Authority] should arrange read-out of the recorders as soon as it is practical to do so at an appropriate flight recorder read-out facility. As per Attachment D to ICAO Annex 13, it is essential that flight recorders be read out as early as possible after an accident. Early identification of problem areas can affect the investigation at the accident site, where evidence is sometimes transient. Early identification of problem areas may also result in urgent safety recommendations, which may be necessary to prevent a similar occurrence.





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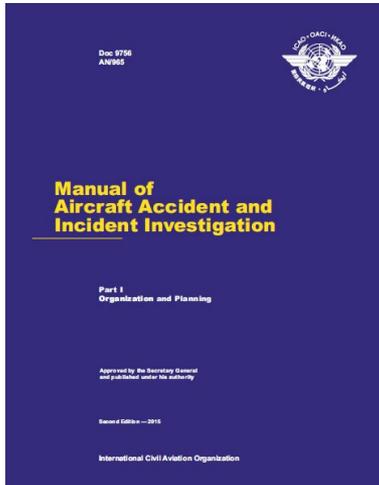
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Stage 1 – Gathering relevant information

Appendix 2 to Chapter 5

DOC 9756 PART I

ECAC GUIDANCE ON UNDERWATER LOCATION AND RECOVERY OF AIRCRAFT WRECKAGE AND FLIGHT RECORDERS



Foreword

1. Introduction

2. Preparation for Underwater Location and Recovery Operations

3. Challenges and Priorities On-Site

4. Other Issues

5. Conclusion

Photographs, and Credits

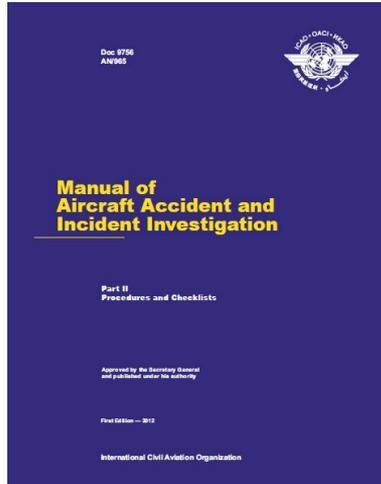
Appendix 6

MAJOR ACCIDENT INVESTIGATION GUIDE

Section 10

FLIGHT RECORDERS GROUP CHAIRPERSON

DOC 9756
PART II



**BEFORE LEAVING FOR THE ACCIDENT SITE
AFTER ARRIVING AT THE ACCIDENT SITE**

EVENT 6. Flight recorder recovery

POST-FIELD PHASE

EVENT 20. Read-out of flight recorders

EVENT 34. Analysis of flight recorders data

EVENT 53. Analysis and report of the Flight Recorders Group

EVENT 64. Operations analysis and findings

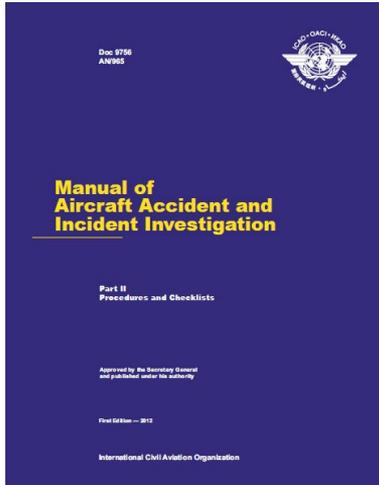


Appendix 6

MAJOR ACCIDENT INVESTIGATION GUIDE

DOC 9756 PART II

INVESTIGATOR-IN-CHARGE
DEPUTY INVESTIGATOR-IN-CHARGE
HEAD OFFICE COORDINATOR
SITE SAFETY COORDINATOR
ADMINISTRATION COORDINATOR
MEDIA RELATIONS COORDINATOR
OPERATIONS
MEDICAL/HUMAN FACTORS
WITNESS
FLIGHT RECORDERS
METEOROLOGY





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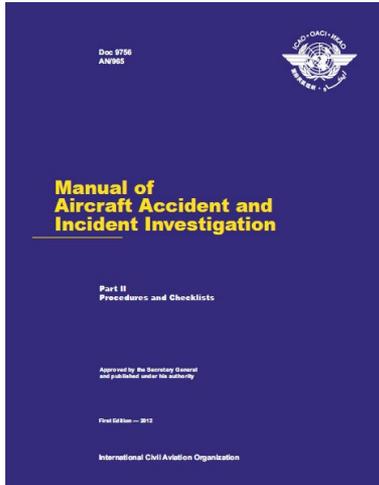
Stage 1 – Gathering relevant information

Appendix 6

MAJOR ACCIDENT INVESTIGATION GUIDE

DOC 9756
PART II

AIR TRAFFIC SERVICES/AIRPORTS
SURVIVABILITY
CABIN SAFETY
MAINTENANCE & RECORDS
SYSTEMS
STRUCTURES
CRASHWORTHINESS
POWERPLANTS
SITE SURVEY
PHOTO/VIDEO





Guidance for Review of Evidence

- 1) Verify procedures for recovery and handling of recorders, including damaged recorders and recorders recovered from water
- 2) Verify that the recovery and/or read-out are not impeded or delayed for:
 - a) administrative reasons (e.g. senior management or IIC may feel that it is necessary for the IIC to be present at all investigative activities and therefore delay recorder read-out until on-site documentation is complete);
 - b) judicial reasons (apprehensions about chain of custody or the need to delay read-out until judicial authorities determine their role and plan); or
 - c) financial reasons (inability of staff to initiate read-out without high level travel or funding approval).



Guidance for Review of Evidence

- 3) For underwater recovery, verify that the State has established and implemented a clear plan for initiating, funding, and overseeing underwater recovery and how these aspects will be conducted.
- 4) Verify that the procedures cover not only the choice of the read-out facility, but also the mode of participation of the State of Design/Manufacture and the State of the Operator in the flight recorder read-out and analysis activities.



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Stage 2 – Defining the framework

- ✈ “Brainstorm” to find out which tasks would be part of the procedure
- ✈ We may use the template we developed to guide us in the process

NUMBER:		TITLE:			
Process:					
Reference:					
Step	WHAT <small>(Detailed description of the task)</small>	WHO <small>(Designated person responsible for the execution)</small>	HOW <small>(Determination of the way the task will be performed and means to be used)</small>	WHEN <small>(Establish the timeline for the procedure, determining the deadlines for relevant tasks)</small>	In COORDINATION with whom <small>(Identify the persons to coordinate the execution of the task with whom applicable)</small>
1					
2					
3					
4					
5					
6					
...					
n					
NOTES					
N1					
N2					
...					
Nn					
ATTACHMENTS					
#	TITLE		DESCRIPTION		
A					
B					
...					
n					

NUMBER:		TITLE:			
Process:					
Reference:					
Step	WHAT <small>(Detailed description of the task)</small>	WHO <small>(Designated person responsible for the execution)</small>	HOW <small>(Determination of the way the task will be performed and means to be used)</small>	WHEN <small>(Establish the timeline for the procedure, determining the deadlines for relevant tasks)</small>	In COORDINATION with whom <small>(Identify the persons to coordinate the execution of the task with whom applicable)</small>
1					
2					
3					
4					
5					
6					
...					
n					
ATTACHMENTS					
#	TITLE	DESCRIPTION			
A					
B					
...					
n					

Note – the template is just a tool, and even after filling its fields we won't have the procedure



NUMBER: 13

TITLE: Timely recovery and read-out of flight recorders

Process: Notification

Reference: PQ 6.361 – Has the State established and implemented procedures to ensure the timely recovery and effective read-out of the flight recorders in compliance with Attachment D to Annex 13?



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
1	Gathering information about the recorders				



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
1	Gathering information about the recorders	Investigator on duty			



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
1	Gathering information about the recorders	Investigator on duty	<p>The Investigator on duty will gather and share with the Investigator-in-charge all the information available with both the operator and the aircraft manufacturer regarding the flight recorders.</p> <p>Note 1: As a minimum, the information related to the recorder’s manufacturer and model, and the position of the recorders in the aircraft must be collected.</p> <p>Note 2: Contact with the manufacturer and foreign operators shall be made through the correspondent accredited representative.</p>		



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
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Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
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Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
2	Preliminary selection of the laboratory				



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
2	Preliminary selection of the laboratory	Investigator on duty			



Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
2	Preliminary selection of the laboratory	Investigator on duty	<p>Based on the information collected (manufacturer, model, lab availability, etc.), the Investigator on duty will make a preliminary selection of the lab for reading the recorders, informing the Investigator-in-charge and the Administrative Assistant by email.</p> <p>Note 1: The AIG Section has a list of pre-qualified and reliable laboratories for reading recorders, and the selection process should prioritize the use of one of them.</p> <p>Note 2: Whenever practicable, the selection of the laboratory will avoid laboratories in the State of the Manufacturer (to minimize the possibility of eventual conflicts of interest).</p> <p>Note 3: In the case of damaged recorders (including those recovered from water), this preliminary selection will be confirmed later.</p>		



Stage 2 – Defining the framework

Step	WHAT <small>(Detailed description of the task)</small>	WHO <small>(Designated person responsible for the execution)</small>	HOW <small>(Determination of the way the task will be performed and means to be used)</small>	WHEN <small>(Establish the timeline for the procedure, determining the deadlines for relevant tasks)</small>	In COORDINATION with whom <small>(Identify the persons to coordinate the execution of the task with when applicable)</small>
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Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
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RECOVERY FROM WATER



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Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
3A	Recovery from water				



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
3A	Recovery from water	Investigator on duty			



Stage 2 – Defining the framework

Step	WHAT <small>(Detailed description of the task)</small>	WHO <small>(Designated person responsible for the execution)</small>	HOW <small>(Determination of the way the task will be performed and means to be used)</small>	WHEN <small>(Establish the timeline for the procedure, determining the deadlines for relevant tasks)</small>	In COORDINATION with whom <small>(Identify the persons to coordinate the execution of the task with when applicable)</small>
3A	Recovery from water	Investigator on duty	<p>The Investigator on duty will activate the services of Scubba Maritime Services, informing the Investigator-in-charge by phone the name of the focal point and the meeting place (pier) for the start of the activities related to the recovery of the wreckage.</p> <p>Note 1: Scubba Maritime Services has been contracted (Contract 13/2021 - Maritime accident investigation support services) to provide transportation, recovery and diving services.</p> <p>Note 2: The contact with Scubba will be made through the phone 3343-2252 or 3343-2257.</p> <p>Note 3: The content of the contract (including a list of all the services that can be provided) is available in the investigation kit.</p>		



Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
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Stage 2 – Defining the framework

Step	WHAT <small>(Detailed description of the task)</small>	WHO <small>(Designated person responsible for the execution)</small>	HOW <small>(Determination of the way the task will be performed and means to be used)</small>	WHEN <small>(Establish the timeline for the procedure, determining the deadlines for relevant tasks)</small>	In COORDINATION with whom <small>(Identify the persons to coordinate the execution of the task with when applicable)</small>
3A	Recovery from water	Investigator on duty	<p>The Investigator on duty will activate the services of Scubba Maritime Services, informing the Investigator-in-charge by phone the name of the focal point and the meeting place (pier) for the start of the activities related to the recovery of the wreckage.</p> <p>Note 1: Scubba Maritime Services has been contracted (Contract 13/2021 - Maritime accident investigation support services) to provide transportation, recovery and diving services.</p> <p>Note 2: The contact with Scubba will be made through the phone 3343-2252 or 3343-2257.</p> <p>Note 3: The content of the contract (including a list of all the services that can be provided) is available in the investigation kit.</p>	Within three hours after the institution of the investigation	Investigator-in-charge Scubba focal point



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
4A	Briefing about the recorders				



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
4A	Briefing about the recorders	Investigator-in-charge			



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
4A	Briefing about the recorders	Investigator-in-charge	<p>The Investigator-in-charge will meet with the Scubba team and brief all personnel engaged in the recovery operation with the collected information regarding the flight recorders and other aspects inherent to the operation.</p> <p>Note 1: The investigation manual contains guidance on the aspects that should be covered in the briefing in accordance with the scenario.</p> <p>Note 2: When there is uncertainty regarding the feasibility of the recovery, Scubba will provide submarines to allow a better assessment of the situation.</p>		



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
4A	Briefing about the recorders	Investigator-in-charge	<p>The Investigator-in-charge will meet with the Scubba team and brief all personnel engaged in the recovery operation with the collected information regarding the flight recorders and other aspects inherent to the operation.</p> <p>Note 1: The investigation manual contains guidance on the aspects that should be covered in the briefing in accordance with the scenario.</p> <p>Note 2: When there is uncertainty regarding the feasibility of the recovery, Scubba will provide submarines to allow a better assessment of the situation.</p>	Within one hour after arriving at the pier	



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
4A	Briefing about the recorders	Investigator-in-charge	<p>The Investigator-in-charge will meet with the Scubba team and brief all personnel engaged in the recovery operation with the collected information regarding the flight recorders and other aspects inherent to the operation.</p> <p>Note 1: The investigation manual contains guidance on the aspects that should be covered in the briefing in accordance with the scenario.</p> <p>Note 2: When there is uncertainty regarding the feasibility of the recovery, Scubba will provide submarines to allow a better assessment of the situation.</p>	Within one hour after arriving at the pier	Team member Administrative Assistant

RECOVERY FROM OTHER SCENARIOS



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
3B	Briefing about the recorders				



Stage 2 – Defining the framework

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3B	Briefing about the recorders	Investigator-in-charge			



Stage 2 – Defining the framework

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3B	Briefing about the recorders	Investigator-in-charge	<p>The Investigator-in-charge will brief all team members and any person engaged in clearing the area of the occurrence (e.g. police, firefighters, civil defence, national guard, etc.) with the collected information regarding the flight recorders.</p> <p>Note 1: For low profile occurrences where the investigation team does not deploy to the site, any available flight recorder will be requested from the operator.</p> <p>Note 2: Whenever possible, the Investigator-in-charge will make use of pictures, diagrams and photographs to illustrate the recorder model and its position in the aircraft.</p>		



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
3B	Briefing about the recorders	Investigator-in-charge	<p>The Investigator-in-charge will brief all team members and any person engaged in clearing the area of the occurrence (e.g. police, firefighters, civil defence, national guard, etc.) with the collected information regarding the flight recorders.</p> <p>Note 1: For low profile occurrences where the investigation team does not deploy to the site, any available flight recorder will be requested from the operator.</p> <p>Note 2: Whenever possible, the Investigator-in-charge will make use of pictures, diagrams and photographs to illustrate the recorder model and its position in the aircraft.</p>	Within 15 minutes after arriving at the site	



Stage 2 – Defining the framework

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Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
4B	Cooling the recorders under fire				



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
4B	Cooling the recorders under fire	Investigator-in-charge			



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4B	Cooling the recorders under fire	Investigator-in-charge	<p>In cases where the aircraft is on fire, the Investigator-in-charge will coordinate with the head of firefighting operations to focus action on the area of the aircraft where the recorders are located, in order to increase the probability of recovery of the fires.</p> <p>Note 1: This task can be delegated to a team member.</p> <p>Note 2: When a minimum of safety is achieved in the relevant area of the wreckage, the Investigator-in-charge will request the firefighting team to recover the recorders.</p>		



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
4B	Cooling the recorders under fire	Investigator-in-charge	<p>In cases where the aircraft is on fire, the Investigator-in-charge will coordinate with the head of firefighting operations to focus action on the area of the aircraft where the recorders are located, in order to increase the probability of recovery of the fires.</p> <p>Note 1: This task can be delegated to a team member.</p> <p>Note 2: When a minimum of safety is achieved in the relevant area of the wreckage, the Investigator-in-charge will request the firefighting team to recover the recorders.</p>	Within 15 minutes after arriving at the site	



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
4B	Cooling the recorders under fire	Investigator-in-charge	<p>In cases where the aircraft is on fire, the Investigator-in-charge will coordinate with the head of firefighting operations to focus action on the area of the aircraft where the recorders are located, in order to increase the probability of recovery of the fires.</p> <p>Note 1: This task can be delegated to a team member.</p> <p>Note 2: When a minimum of safety is achieved in the relevant area of the wreckage, the Investigator-in-charge will request the firefighting team to recover the recorders.</p>	Within 15 minutes after arriving at the site	Head of firefighting Team member assign to the task



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
5	Preparing the logistics for sending the recorders				



Stage 2 – Defining the framework

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5	Preparing the logistics for sending the recorders	Administrative Assistant			



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
5	Preparing the logistics for sending the recorders	Administrative Assistant	The Administrative Assistant will start the process for sending the recorders to the laboratory selected preliminarily, as well as booking air tickets for the investigator(s) who will participate in the activities in the laboratory when applicable, informing the Chief Investigator and the Investigator-in-charge by email.		



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
5	Preparing the logistics for sending the recorders	Administrative Assistant	The Administrative Assistant will start the process for sending the recorders to the laboratory selected preliminarily, as well as booking air tickets for the investigator(s) who will participate in the activities in the laboratory when applicable, informing the Chief Investigator and the Investigator-in-charge by email.	Within twelve hours after the institution of the investigation	



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
5	Preparing the logistics for sending the recorders	Administrative Assistant	The Administrative Assistant will start the process for sending the recorders to the laboratory selected preliminarily, as well as booking air tickets for the investigator(s) who will participate in the activities in the laboratory when applicable, informing the Chief Investigator and the Investigator-in-charge by email.	Within twelve hours after the institution of the investigation	Chief Investigator Investigator-in-charge



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
6	Packing the recovered recorders				



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
6	Packing the recovered recorders	Investigator-in-charge			



Stage 2 – Defining the framework

Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
6	Packing the recovered recorders	Investigator-in-charge	<p>Immediately after recovering the recorders, the Investigator-in-charge will store them in the appropriate containers, which are available in the investigation kit.</p> <p>Note 1: Oxidation is the biggest threat generated by submersion in water and this process is accelerated when equipment is removed from the water and exposed to air. Therefore, it is essential that, when recovering the recorder, it is placed back in an aqueous environment (preferably distilled water) as soon as possible, limiting its exposure to air to a minimum time (10 to 20 seconds maximum).</p> <p>Note 2: The Investigation Manual provides more details about the conservation of recorders recovered from water.</p> <p>Note 3: As per recorders recovered from other scenarios, it is important to consider all kinds of hazards involved, including biological hazards. Nevertheless, it is important to emphasize that under no circumstances should recorders be rinsed.</p>		



Step	WHAT (Detailed description of the task)	WHO (Designated person responsible for the execution)	HOW (Determination of the way the task will be performed and means to be used)	WHEN (Establish the timeline for the procedure, determining the deadlines for relevant tasks)	In COORDINATION with whom (Identify the persons to coordinate the execution of the task with when applicable)
6	Packing the recovered recorders	Investigator-in-charge	<p>Immediately after recovering the recorders, the Investigator-in-charge will store them in the appropriate containers, which are available in the investigation kit.</p> <p>Note 1: Oxidation is the biggest threat generated by submersion in water and this process is accelerated when equipment is removed from the water and exposed to air. Therefore, it is essential that, when recovering the recorder, it is placed back in an aqueous environment (preferably distilled water) as soon as possible, limiting its exposure to air to a minimum time (10 to 20 seconds maximum).</p> <p>Note 2: The Investigation Manual provides more details about the conservation of recorders recovered from water.</p> <p>Note 3: As per recorders recovered from other scenarios, it is important to consider all kinds of hazards involved, including biological hazards. Nevertheless, it is important to emphasize that under no circumstances should recorders be rinsed.</p>	Immediately after recovering the recorders	



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6	Packing the recovered recorders	Investigator-in-charge	<p>Immediately after recovering the recorders, the Investigator-in-charge will store them in the appropriate containers, which are available in the investigation kit.</p> <p>Note 1: Oxidation is the biggest threat generated by submersion in water and this process is accelerated when equipment is removed from the water and exposed to air. Therefore, it is essential that, when recovering the recorder, it is placed back in an aqueous environment (preferably distilled water) as soon as possible, limiting its exposure to air to a minimum time (10 to 20 seconds maximum).</p> <p>Note 2: The Investigation Manual provides more details about the conservation of recorders recovered from water.</p> <p>Note 3: As per recorders recovered from other scenarios, it is important to consider all kinds of hazards involved, including biological hazards. Nevertheless, it is important to emphasize that under no circumstances should recorders be rinsed.</p>	Immediately after recovering the recorders	Team member Administrative Assistant



Stage 2 – Defining the framework

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7	Final selection of laboratory for the read-out				



Stage 2 – Defining the framework

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7	Final selection of laboratory for the read-out	Investigator on duty			



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7	Final selection of laboratory for the read-out	Investigator on duty	<p>The Investigator on duty will confirm the laboratory to be used for read-out services, informing Investigator-in-charge and Administrative Assistant by email.</p> <p>Note 1: The level of damage of the recorders may affect the capacity of the laboratory selected preliminarily, imposing undesirable delays or even preventing the use of such laboratory.</p> <p>Note 2: If the laboratory selected preliminarily is not confirmed, the Administrative Assistant will make new logistical arrangements immediately, so as not to delay the read-out service.</p>		



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7	Final selection of laboratory for the read-out	Investigator on duty	<p>The Investigator on duty will confirm the laboratory to be used for read-out services, informing Investigator-in-charge and Administrative Assistant by email.</p> <p>Note 1: The level of damage of the recorders may affect the capacity of the laboratory selected preliminarily, imposing undesirable delays or even preventing the use of such laboratory.</p> <p>Note 2: If the laboratory selected preliminarily is not confirmed, the Administrative Assistant will make new logistical arrangements immediately, so as not to delay the read-out service.</p>	Immediately after recovering the recorders	Investigator-in-charge Administrative Assistant



Stage 2 – Defining the framework

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8	Invitations for the participation in the read-out				



Stage 2 – Defining the framework

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8	Invitations for the participation in the read-out	Investigator-in-charge			



Stage 2 – Defining the framework

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8	Invitations for the participation in the read-out	Investigator-in-charge	<p>The Investigator-in-charge will invite, by email, all the people who can contribute to the activities of read-out the recorders and analysing their contents, and in particular, the representatives of the operator and the manufacturer.</p> <p>Note 1: It is essential that participants in the analysis activities are able to contribute to such activities, having the appropriate level of technical knowledge to ensure effective participation.</p> <p>Note 2: In case of fatality of pilots, it is recommended that the operator's representative, in addition to having technical knowledge about the aircraft and its operation, knows the deceased pilots, to the point of recognizing and differentiating the voice of each one of them.</p>		



Stage 2 – Defining the framework

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Stage 2 – Defining the framework

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Let's build it together

- ✈ Stage 1 – Gathering relevant information
- ✈ Stage 2 – Defining the framework
- ✈ Stage 3 – Writing the procedure**



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Writing the procedure

✈ After this “brainstorm” and with the template completed, we will probably be able to write the procedure

DISCLAIMER



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PROCEDURE No 13/CAAC-AIG – RECOVERY AND READ-OUT OF FLIGHT RECORDERS

INTRODUCTION

The conditions of accessibility or damage of the aircraft may affect significantly the progress of the investigation, especially due to the delay in the examination of relevant parts and data. In those scenarios, a well-structured approach to address the difficulties of access can represent a huge decrease in the loss in terms of time.

In the particular case of accidents in the water, the recovery of submerged wrecks represents an additional challenge, for which CAAC prepared itself, signing a pre-agreement for the provision of reimbursable services with the company Scubba Maritime Services.

This procedure aims at complying with such requirement.

PROCEDURE

1 The Investigator on duty will gather and share with the Investigator-in-charge, within three hours after the institution of the investigation, all the information available with both the operator and the aircraft manufacturer regarding the flight recorders.

Note 1: As a minimum, the information related to the recorder's manufacturer and model, and the position of the recorders in the aircraft must be collected.

Note 2: Contact with the manufacturer and foreign operators shall be made through the correspondent accredited representative.

2 Based on the information collected (manufacturer, model, lab availability, etc.), the Investigator on duty will, within three hours after the institution of the investigation, make a preliminary selection of the lab for reading the recorders, informing the Investigator-in-charge and the Administrative Assistant by email.

Note 1: The AIG Section has a list of pre-qualified and reliable laboratories for reading recorders, and the selection process should prioritize the use of one of them.

Note 2: Whenever practicable, the selection of the laboratory will avoid laboratories in the State of the Manufacturer (to minimize the possibility of eventual conflicts of interest).

Note 3: In the case of damaged recorders (including those recovered from water), this preliminary selection will be confirmed later.

FOR THE RECOVERY OF RECORDERS FROM WATER

3A-The Investigator on duty will, within three hours after the institution of the investigation, activate the services of Scubba Maritime Services, informing the Investigator-in-charge by phone the name of the focal point and the meeting place (pier) for the start of the activities related to the recovery of the wreckage.

Note 1: Scubba Maritime Services has been contracted (Contract 13/2021 - Maritime accident investigation support services) to provide transportation, recovery and diving services.

Note 2: The contact with Scubba will be made through the phone 3343-2252 or 3343-2257.

Note 3: The content of the contract (including a list of all the services that can be provided) is available in the investigation kit.

ge will, within one hour after arriving at the pier, meet with the Scubba team engaged in the recovery operation with the collected information regarding other aspects inherent to the operation.

The manual contains guidance on the aspects that should be covered in the briefing in the scenario.

In case of uncertainty regarding the feasibility of the recovery, Scubba will provide submarines to allow the recovery in the event of the situation.

RECORDERS FROM OTHER SCENARIOS

ge will, within 15 minutes after arriving at the site, brief all team members in clearing the area of the occurrence (e.g. police, firefighters, civil defence), with the collected information regarding the flight recorders.

In scenarios where the investigation team does not deploy to the site, any available flight information requested from the operator.

Whenever possible, the Investigator-in-charge will make use of pictures, diagrams and photographs to identify the recorder model and its position in the aircraft.

If the aircraft is on fire, the Investigator-in-charge will coordinate, within 15 minutes after the occurrence, with the head of firefighting operations to focus action on the area of the recorders are located, in order to increase the probability of recovery of the fires. *When the recovery is delegated to a team member.*

In case of safety is achieved in the relevant area of the wreckage, the Investigator-in-charge will coordinate with the firefighting team to recover the recorders.

The Investigator on duty will, within twelve hours after the institution of the investigation, start the recovery of the recorders to the laboratory selected preliminarily, as well as booking air transport(s) who will participate in the activities in the laboratory when applicable, informing the Investigator and the Investigator-in-charge by email.

After recovering the recorders, the Investigator-in-charge will store them in the investigation kit, which are available in the investigation kit.

The biggest threat generated by submersion in water and this process is accelerated when the recorders are moved from the water and exposed to air. Therefore, it is essential that, when recovering recorders, they are placed back in an aqueous environment (preferably distilled water) as soon as possible, to ensure they are kept in a minimum time (10 to 20 seconds maximum).

The Manual provides more details about the conservation of recorders recovered from water. In other scenarios, it is important to consider all kinds of hazards involved, including electrical hazards. Nevertheless, it is important to emphasize that under no circumstances should the recorders be rinsed.

The Investigator on duty will confirm, immediately after recovering the recorders, the laboratory to be used for the read-out services, informing Investigator-in-charge and Administrative Assistant by email. *The location of the recorders may affect the capacity of the laboratory selected preliminarily, which may result in possible delays or even preventing the use of such laboratory.*

If the laboratory selected preliminarily is not confirmed, the Administrative Assistant will make new arrangements immediately, so as not to delay the read-out service.

The Investigator-in-charge will invite, by email, immediately after recovering the recorders, all the representatives of the operator and the manufacturer.

It is essential that participants in the analysis activities are able to contribute to such activities, having the necessary level of technical knowledge to ensure effective participation.

In the event of fatality of pilots, it is recommended that the operator's representative, in addition to having the necessary knowledge about the aircraft and its operation, knows the deceased pilots, to the point of being able to identify and differentiating the voice of each one of them.

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INTRODUCTION

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In the particular case of accidents in the water, the recovery of submerged wrecks represents an additional challenge, for which CAAC prepared itself, signing a pre-agreement for the provision of reimbursable services with the company Scubba Maritime Services.

This procedure aims at complying with such requirement.

PROCEDURE

- 1 The Investigator on duty will gather and share with the Investigator-in-charge, within three hours after the institution of the investigation, all the information available with both the operator and the aircraft manufacturer regarding the flight recorders.

Note 1: As a minimum, the information related to the recorder's manufacturer and model, and the position of the recorders in the aircraft must be collected.

Note 2: Contact with the manufacturer and foreign operators shall be made through the correspondent accredited representative.

- 2 Based on the information collected (manufacturer, model, lab availability, etc.), the Investigator on duty will, within three hours after the institution of the investigation, make a preliminary selection of the lab for reading the recorders, informing the Investigator-in-charge and the Administrative Assistant by email.

Note 1: The AIG Section has a list of pre-qualified and reliable laboratories for reading recorders, and the selection process should prioritize the use of one of them.

Note 2: Whenever practicable, the selection of the laboratory will avoid laboratories in the State of the Manufacturer (to minimize the possibility of eventual conflicts of interest).

Note 3: In the case of damaged recorders (including those recovered from water), this preliminary selection will be confirmed later.

FOR THE RECOVERY OF RECORDERS FROM WATER

3A-The Investigator on duty will, within three hours after the institution of the investigation, activate the services of *Scubba Maritime Services*, informing the Investigator-in-charge by phone the name of the focal point and the meeting place (pier) for the start of the activities related to the recovery of the wreckage.

Note 1: Scubba Maritime Services has been contracted (Contract 13/2021 - Maritime accident investigation support services) to provide transportation, recovery and diving services.

Note 2: The contact with Scubba will be made through the phone 3343-2252 or 3343-2257.

Note 3: The content of the contract (including a list of all the services that can be provided) is available in the investigation kit.

4A-The Investigator-in-charge will, within one hour after arriving at the pier, meet with the Scubba team and brief all personnel engaged in the recovery operation with the collected information regarding the flight recorders and other aspects inherent to the operation.

Note 1: The investigation manual contains guidance on the aspects that should be covered in the briefing in accordance with the scenario.

Note 2: When there is uncertainty regarding the feasibility of the recovery, Scubba will provide submarines to allow a better assessment of the situation.

FOR THE RECOVERY OF RECORDERS FROM OTHER SCENARIOS

3B- The Investigator-in-charge will, within 15 minutes after arriving at the site, brief all team members and any person engaged in clearing the area of the occurrence (e.g. police, firefighters, civil defence, national guard, etc.) with the collected information regarding the flight recorders.

Note 1: For low profile occurrences where the investigation team does not deploy to the site, any available flight recorder will be requested from the operator.

Note 2: Whenever possible, the Investigator-in-charge will make use of pictures, diagrams and photographs to illustrate the recorder model and its position in the aircraft.

4B- In cases where the aircraft is on fire, the Investigator-in-charge will coordinate, within 15 minutes after arriving at the site, with the head of firefighting operations to focus action on the area of the aircraft where the recorders are located, in order to increase the probability of recovery of the fires.

Note 1: This task can be delegated to a team member.

Note 2: When a minimum of safety is achieved in the relevant area of the wreckage, the Investigator-in-charge will request the firefighting team to recover the recorders.

- 5 The Administrative Assistant will, within twelve hours after the institution of the investigation, start the process for sending the recorders to the laboratory selected preliminarily, as well as booking air tickets for the investigator(s) who will participate in the activities in the laboratory when applicable, informing the Chief Investigator and the Investigator-in-charge by email.
- 6 Immediately after recovering the recorders, the Investigator-in-charge will store them in the appropriate containers, which are available in the investigation kit.

Note 1: Oxidation is the biggest threat generated by submersion in water and this process is accelerated when equipment is removed from the water and exposed to air. Therefore, it is essential that, when recovering the recorder, it is placed back in an aqueous environment (preferably distilled water) as soon as possible, limiting its exposure to air to a minimum time (10 to 20 seconds maximum).

Note 2: The Investigation Manual provides more details about the conservation of recorders recovered from water.

Note 3: As per recorders recovered from other scenarios, it is important to consider all kinds of hazards involved, including biological hazards. Nevertheless, it is important to emphasize that under no circumstances should recorders be rinsed.

- 7 The Investigator on duty will confirm, immediately after recovering the recorders, the laboratory to be used for read-out services, informing Investigator-in-charge and Administrative Assistant by email.

Note 1: The level of damage of the recorders may affect the capacity of the laboratory selected preliminarily, imposing undesirable delays or even preventing the use of such laboratory.

Note 2: If the laboratory selected preliminarily is not confirmed, the Administrative Assistant will make new logistical arrangements immediately, so as not to delay the read-out service.

- 8 The Investigator-in-charge will invite, by email, immediately after recovering the recorders, all the people who can contribute to the activities of read-out the recorders and analysing their contents, and in particular, the representatives of the operator and the manufacturer.

Note 1: It is essential that participants in the analysis activities are able to contribute to such activities, having the appropriate level of technical knowledge to ensure effective participation.

Note 2: In case of fatality of pilots, it is recommended that the operator's representative, in addition to having technical knowledge about the aircraft and its operation, knows the deceased pilots, to the point of recognizing and differentiating the voice of each one of them.



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Protection of investigators against biological and other hazards

6.373 Has the investigation authority established and implemented procedures and guidance material for the protection of investigators against biological hazards and other hazards at the accident site?