

CORPORACIÓN CENTROAMERICANA DE SERVICIOS DE NAVEGACIÓN AÉREA (COCESNA)

Module 8

Outline the air navigation services provider role/procedures

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**Global Aeronautical Distress and Safety System (GADSS)
Workshop**
Online from 8 to 10 February 2022

Objective



The purpose of this module is to raise awareness regarding the role for the ***ANSP/ATSU/RCCs*** and promote discussion to enhance the development and implementation of adequate operational procedures to ensure the effectiveness of the GADSS functioning.

Definitions

- ANSP. Air navigation services provider (the company or organization providing ATS, not the individual ATS unit).
- ATS. Air traffic services.
 - *Air traffic service. A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).
- ATSU. Air traffic services unit. An overarching term covering different types of ATS unit, including area control centres, approach control units, and aerodrome towers.
 - *Air traffic services unit. A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.
- RCC. Rescue coordination centre.

Review: GADSS components

GADSS contains three main elements:

1. Aircraft tracking;
2. Location of an aircraft in distress (achieved through autonomous distress tracking (ADT) of aircraft in flight); and
3. Post-flight localization and recovery (PFLR).

Review: GADSS requirements for Air Operators

Annex 6 — Operation of Aircraft Part I

- 6.18.1 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023, shall autonomously transmit information from which a position can be determined by the operator at least once every minute, when in distress, in accordance with Appendix 9.
- 6.18.2 Recommendation.— All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023, should autonomously transmit information from which a position can be determined at least once every minute, when in distress, in accordance with Appendix 9.
- 6.18.3 The operator shall make position information of a flight in distress available to the appropriate organizations, as established by the State of the Operator.
- Note.— Refer to 4.2.1.3.1 for operator responsibilities when using third parties.
 - The operator shall develop policies and procedures for third parties that perform work on its behalf.

APPENDIX 9. LOCATION OF AN AEROPLANE IN DISTRESS

(Chapter 6, 6.18, refers)

1. PURPOSE AND SCOPE

Location of an aeroplane in distress aims at establishing, to a reasonable extent, the location of an accident site within a 6 NM radius.

2. OPERATION

2.1 An aeroplane in distress shall automatically activate the transmission of information from which its position can be determined by the operator and the position information shall contain a time stamp. It shall also be possible for this transmission to be activated manually. The system used for the autonomous transmission of position information shall be capable of transmitting that information in the event of aircraft electrical power loss, at least for the expected duration of the entire flight.

2.2 An aircraft is in a distress condition when it is in a state that, if the aircraft behaviour event is left uncorrected, can result in an accident. Autonomous transmission of position information shall be active when an aircraft is in a distress condition. This will provide a high probability of locating an accident site to within a 6 NM radius. The operator shall be alerted when an aircraft is in a distress condition with an acceptable low rate of false alerts. In case of a triggered transmission system, initial transmission of position information shall commence immediately or no later than five seconds after the detection of the activation event.

- Note 1.— Aircraft behaviour events can include, but are not limited to, unusual attitudes, unusual speed conditions, collision with terrain and total loss of thrust/propulsion on all engines and ground proximity warnings.
- Note 2.— A distress alert can be triggered using criteria that may vary as a result of aircraft position and phase of flight. Further guidance regarding in-flight event detection and triggering criteria may be found in the EUROCAE ED-237, Minimum Aviation System Performance Specification (MASPS) for Criteria to Detect In-Flight Aircraft Distress Events to Trigger Transmission of Flight Information. CRC-FMTO-006

APPENDIX 9. LOCATION OF AN AEROPLANE IN DISTRESS

(Chapter 6, 6.18, refers)

2.3 When an aircraft operator or an air traffic service unit (ATSU) has reason to believe that an aircraft is in distress, coordination shall be established between the ATSU and the aircraft operator.

2.4 The State of the Operator shall identify the organizations that will require the position information of an aircraft in an emergency phase. These shall include, as a minimum:

- a) air traffic service unit(s) (ATSU); and
- b) SAR rescue coordination centre(s) (RCC) and sub-centres.

- Note 1.— Refer to Annex 11 for emergency phase criteria. Note 2.— Refer to Annex 12 for required notifications in the event of an emergency phase.

2.5 When autonomous transmission of position information has been activated, it shall only be able to be deactivated using the same mechanism that activated it.

2.6 The accuracy of position information shall, as a minimum, meet the position accuracy requirements established for ELTs.

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Current Annex 11 Air Traffic Services Requirements

Annex 11: Notification of rescue coordination centres

5.2.1 Without prejudice to any other circumstances that may render such notification advisable, air traffic services units shall, except as prescribed in 5.5.1, notify rescue coordination centres immediately an aircraft is considered to be in a state of emergency in accordance with the following:

a) Uncertainty phase when:

- 1) no communication has been received from an aircraft within a period of thirty minutes after the time a communication should have been received, or from the time an unsuccessful attempt to establish communication with such aircraft was first made, whichever is the earlier, or when
- 2) an aircraft fails to arrive within thirty minutes of the estimated time of arrival last notified to or estimated by air traffic services units, whichever is the later, except when no doubt exists as to the safety of the aircraft and its occupants.

Annex 11: Notification of rescue coordination centres

b) Alert phase when:

- 1) following the uncertainty phase, subsequent attempts to establish communication with the aircraft or inquiries to other relevant sources have failed to reveal any news of the aircraft, or when
- 2) an aircraft has been cleared to land and fails to land within five minutes of the estimated time of landing and communication has not been re-established with the aircraft, or when
- 3) information has been received which indicates that the operating efficiency of the aircraft has been impaired, but not to the extent that a forced landing is likely, except when evidence exists that would allay apprehension as to the safety of the aircraft and its occupants, or when
- 4) an aircraft is known or believed to be the subject of unlawful interference.

Annex 11: Notification of rescue coordination centres

c) Distress phase when:

- 1) following the alert phase, further unsuccessful attempts to establish communication with the aircraft and more widespread unsuccessful inquiries point to the probability that the aircraft is in distress, or when
- 2) the fuel on board is considered to be exhausted, or to be insufficient to enable the aircraft to reach safety, or when
- 3) information is received which indicates that the operating efficiency of the aircraft has been impaired to the extent that a forced landing is likely, or when
- 4) information is received or it is reasonably certain that the aircraft is about to make or has made a forced landing except when there is reasonable certainty that the aircraft and its occupants are not threatened by grave and imminent danger and do not require immediate assistance.

Annex 11: Notification of rescue coordination centres (cont.)

5.2.2 The notification shall contain such of the following information as is available in the order listed:

- a) INCERFA, ALERFA or DETRESFA, as appropriate to the phase of the emergency;
- b) agency and person calling;
- c) nature of the emergency;
- d) significant information from the flight plan;
- e) unit which made last contact, time and means used;
- f) last position report and how determined;
- g) colour and distinctive marks of aircraft;
- h) dangerous goods carried as cargo;
- i) any action taken by reporting office; and
- j) other pertinent remarks.

5.2.3 Further to the notification in 5.2.1, the rescue coordination centre shall, without delay, be furnished with:

- a) any useful additional information, especially on the development of the state of emergency through subsequent phases; or
- b) information that the emergency situation no longer exists.
 - Note.— The cancellation of action initiated by the rescue coordination centre is the responsibility of that centre.

Annex 11: Notification of rescue coordination centres (cont.)

5.5 Information to the operator

5.5.1 When an area control or a flight information centre decides that an aircraft is in the uncertainty or the alert phase, it shall, when practicable, advise the operator prior to notifying the rescue coordination centre.

Note.— If an aircraft is in the distress phase, the rescue coordination centre has to be notified immediately in accordance with 5.2.1.

5.5.2 All information notified to the rescue coordination centre by an area control or flight information centre shall, whenever practicable, also be communicated, without delay, to the operator.

Current Annex 12 SAR Requirements

Annex 12: Information concerning emergencies

5.1.1 Any authority or any element of the search and rescue organization having reason to believe that an aircraft is in an emergency shall give immediately all available information to the rescue coordination centre concerned.

5.1.2 Rescue coordination centres shall, immediately upon receipt of information concerning aircraft in emergency, evaluate such information and assess the extent of the operation required.

5.1.3 When information concerning aircraft in emergency is received from other sources than air traffic services units, the rescue coordination centre shall determine to which emergency phase the situation corresponds and shall apply the procedures applicable to that phase.

Annex 12: Procedures for rescue coordination centres during emergency phases

5.2.1 Uncertainty phase

Upon the occurrence of an uncertainty phase, the rescue coordination centre shall cooperate to the utmost with air traffic services units and other appropriate agencies and services in order that incoming reports may be speedily evaluated.

5.2.2 Alert phase

Upon the occurrence of an alert phase the rescue coordination centre shall immediately alert search and rescue units and initiate any necessary action.

Annex 12: Procedures for rescue coordination centres during emergency phases

5.2.3 Distress phase

Upon the occurrence of a distress phase, the rescue coordination centre shall:

- a) immediately initiate action by search and rescue units in accordance with the appropriate plan of operation;
- b) ascertain the position of the aircraft, estimate the degree of uncertainty of this position, and, on the basis of this information and the circumstances, determine the extent of the area to be searched;
- c) notify the operator, where possible, and keep the operator informed of developments;
- d) notify other rescue coordination centres, the help of which seems likely to be required, or which may be concerned in the operation;
- e) notify the associated air traffic services unit, when the information on the emergency has been received from another source;
- f) request at an early stage such aircraft, vessels, coastal stations and other services not specifically included in the appropriate plan of operation and able to assist to:
 - 1) maintain a listening watch for transmissions from the aircraft in distress, survival radio equipment or an ELT;
Note.— The frequencies contained in the specifications for ELTs given in Annex 10, Volume III, are 121.5 MHz and 406 MHz.
 - 2) assist the aircraft in distress as far as practicable; and
 - 3) inform the rescue coordination centre of any developments;
- g) from the information available, draw up a detailed plan of action for the conduct of the search and/or rescue operation required and communicate such plan for the guidance of the authorities immediately directing the conduct of such an operation;
- h) amend as necessary, in the light of evolving circumstances, the detailed plan of action;
- i) notify the appropriate accident investigation authorities; and
- j) notify the State of Registry of the aircraft.

The order in which these actions are described shall be followed unless circumstances dictate otherwise.

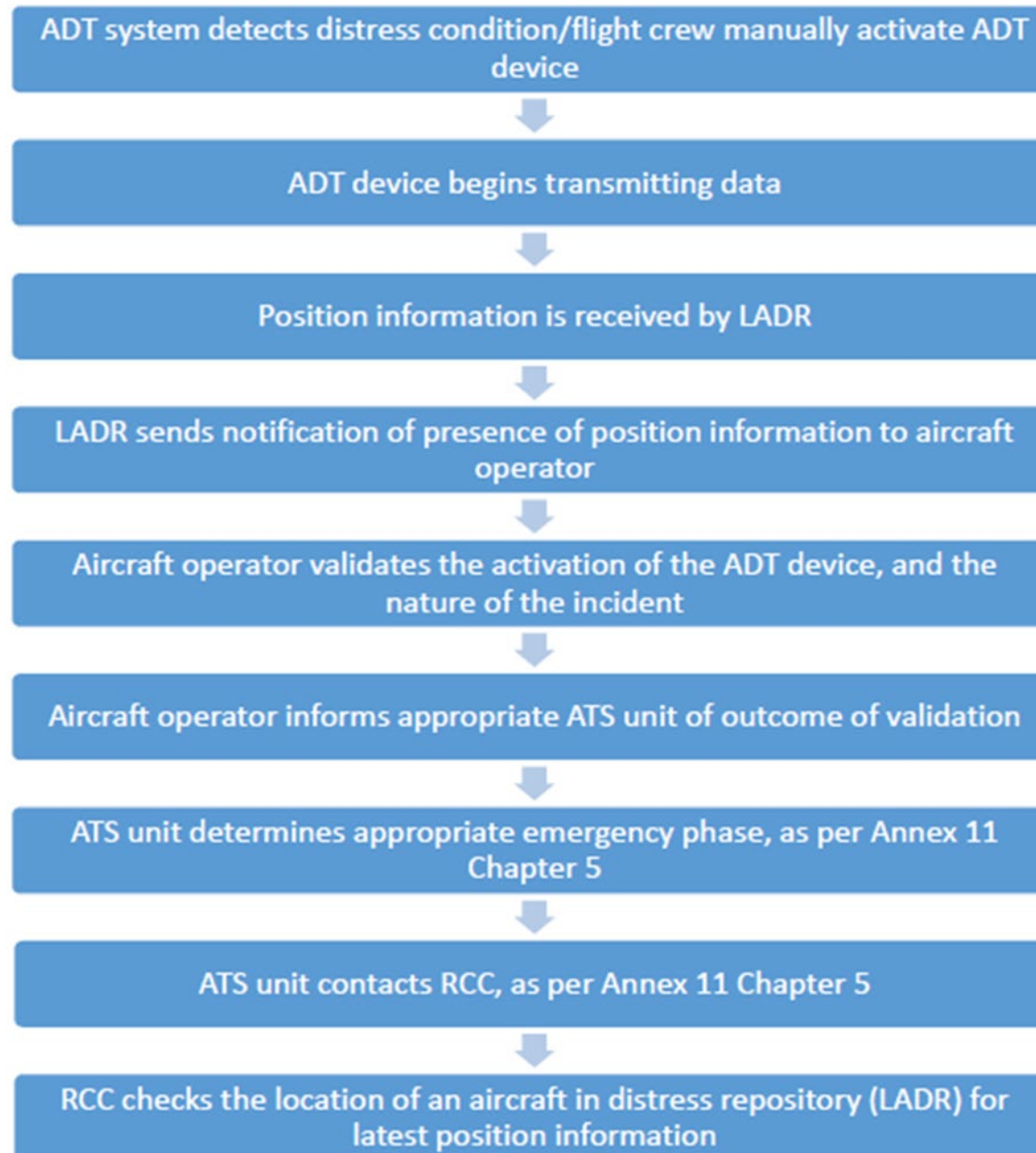
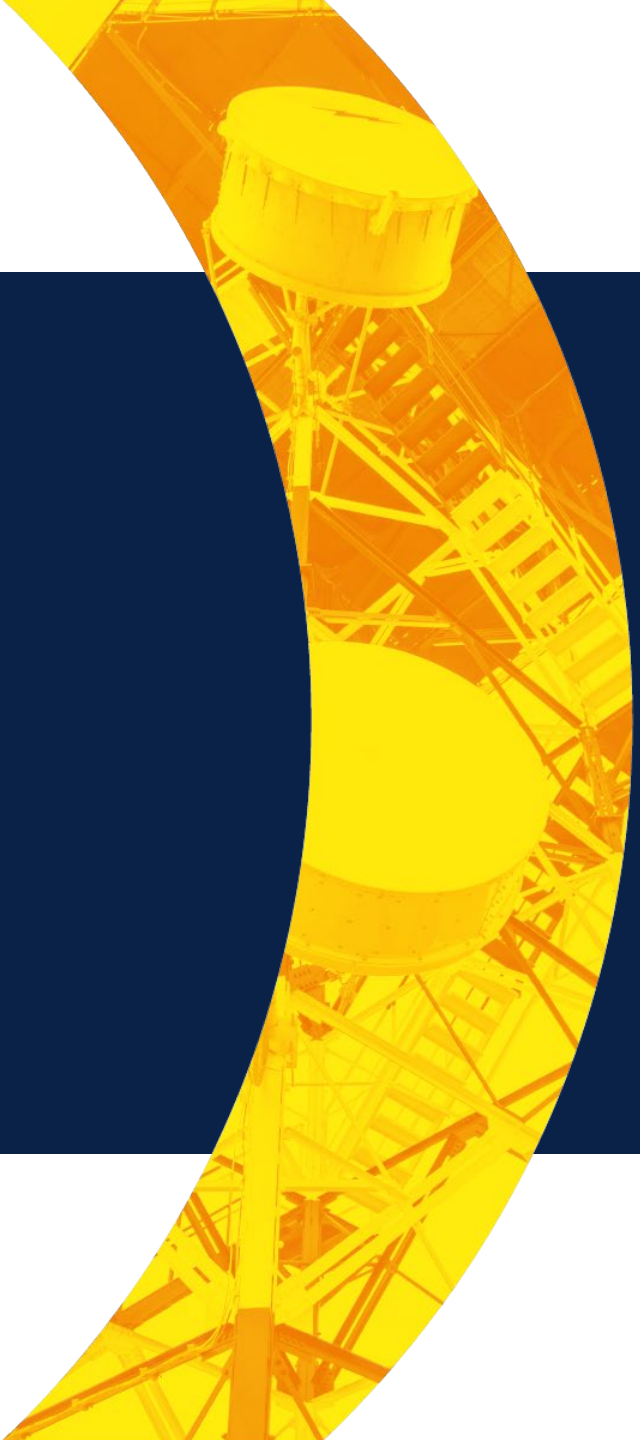


Figure 1. Schematic sequence of events arising from an autonomous distress tracking device activation.

Key Points to consider

- ADT is another method for the ANSP/ATS unit to be notified
- ICAO intent is to not make fundamental changes to the established alerting procedures specified in ICAO Annex 11, Chapter 5 Alerting service
- Significant changes for the air navigations services include (1) receipt of ADT information and (2) the locational of an aircraft in distress repository (LADR)
- These and other changes will require changes to our current processes and procedures on the national and regional levels, and with other ICAO regions.
- COCESNA, as an ANSP and also SAR point of contact in the Cospas-Sarsat system would receive the Cospas-Sarsat ELT(DT) message and also notification from the LADR.
 - Views on handling two different methods for delivery of ADT messages.
- Unless additional information was available, the initial ADT notification would be handled in the Alert Phase. Immediate effort would be made to contact the aircraft.
- The ADT system is for aircraft in flight.
 - Module 9 Rescue Coordination Center discusses the coordination between the ATS unit and the RCC.
- Outline process for contacting the RCC.
- Outline process for handing off activated ADT device going into the next FIR.



Updated procedures



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ATSU notification and coordination

When a distress event is validated by the operator, or the operational state of the aeroplane cannot be determined, the operator contacts the relevant ATSU(s) using the latest known position and expected track of the aeroplane. The operator may use the contact directory service for obtaining the ATSU identification (ID) and point of contact. Once the operator has contacted the ATSU and it is established that there may be an emergency, the operator must ensure that all information that may be of use to the ATSU and/or RCC is available on request, including all aeroplane tracking information. In this case, and following the declaration of Distress phase (DETRESFA) by the relevant ATSU, the operator might use the available mean of remotely activating the Distress Tracking device from the ground (i.e. using the RLS as explained in section 3.1.2.5).

As soon as the operator is made aware that the aeroplane has resumed normal operations or has safely landed, the operator should notify the ATSU that the aeroplane's distress condition has been cancelled.

Activation of aeroplane operator contingency procedures

Once it is confirmed that the aeroplane is in a distress situation, the operator should activate its contingency procedures and maintain close coordination with the ATSU until the distress event is resolved. Such contingency procedure might allow the remote commanding of the ELT(DT) to be able to localize the aeroplane.

Availability of data

The operator must ensure that the data received from the ADT system are made available to appropriate organizations, as identified by the State of the Operator. If the distress event results in an accident or serious incident, retention of the data is governed by the requirements of Annex 13 — Aeroplane Accident and Incident Investigation. If the aeroplane recovers and lands safely, there may be no requirement to retain the data. However, it may be useful to retain these data for a given period of time (e.g. 30 days). This may also be required by the State, as described in its national regulations.

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ATSU Processes

- Existing processes as described in Annex 11 are still applicable. The introduction of distress tracking does not alter these processes except with regards to the availability of additional data on the position of the aeroplane.
- When an ATSU has reason to believe that an aeroplane is in distress, coordination will be established between the ATSU and operator. Flight crews of flights operating under instrument flight rules (IFR) flight plans would advise ATC as soon as a distress or unusual situation is detected on board.
 - If the above information or event is received or detected by ATC, a confirmation attempt would follow, confirming, escalating or terminating the emergency phase. During the distress phase, the information, including known coordinates, would be relayed via operational hierarchy to the appropriate RCC(s) for further action.

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- RCC processes
 - The RCC will greatly benefit from ADT, which enables the timely detection of an aeroplane in distress and provides the last known position (LKP) of the aeroplane. Current RCC processes are established under the provisions of Annex 11 and Annex 12 — Search and Rescue, and apply to aeronautical RCCs (ARCCs). The International Convention on Maritime Search and Rescue establishes a global maritime search and rescue system applicable to maritime RCCs (MRCCs). To ensure close coordination between aeronautical and maritime search and rescue services, States are recommended to either establish joint RCCs (JRCCs) or ensure the closest practicable coordination between ARCCs and MRCCs.
 - Note.— In this manual, the term “RCC” will be used to apply to either an ARCC, MRCC or JRCC, or subsequent Rescue Sub Centers (RSC).
 - Although the ADT process is new, it is anticipated that the alerting process for the RCC will not fundamentally change.
 - The distress alert notification processes associated with ADT, based on Annex 11, Chapter 5, can be summarized as follows:
 - a) if an ATSU detects an aeroplane in distress, it will notify the RCC and operator;
 - b) if the operator detects an aeroplane in distress, it will notify the ATSU, which will in turn notify the RCC;
 - c) if an ELT(DT)) is activated, the RCC will be notified via the COSPAS-SARSAT system and will subsequently notify the ATSU; and
 - d) if an ADT device is activated, the RCC if notified by the ADT system provider will subsequently notify the ATSU.

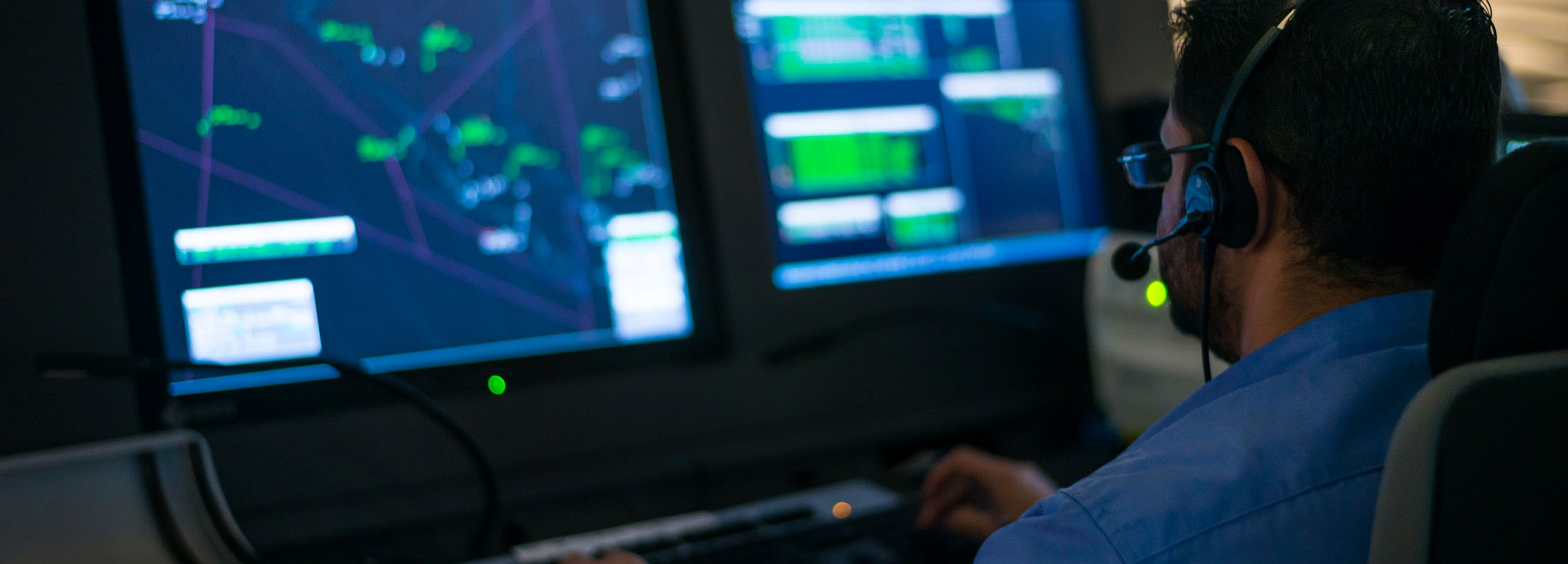
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- As specified in Annex 11, Chapter 5, the ATSU is expected to notify the RCC immediately when an aeroplane is considered to be in a state of emergency. In addition, the notification is expected to contain as much information as is available. Such information, listed in Chapter 5, closely aligns with the contents of the Missed 4D/15 Position Report Form for Operator, which the operator should provide when notifying the ATSU, as discussed in Chapter 2 of this manual.
- Once notified of a distress event, the RCC will initiate action based on the preparatory measures and operating procedures set forth in Annex 12. With regard to preparatory measures, the RCC is required to have readily available at all times up-to-date information concerning its search and rescue region, including ATSUs and addresses and telephone numbers of all operators, or their designated representatives, engaged in operations in the region.
- If the ATSU was not the notification source, the RCC should contact the ATSU to confirm the possible distress event and have the ATSU gather further information, which would be the list of information in Annex 11, Chapter 5, and the most recent 4D/15 aeroplane position data leading up to the ADT activation. These actions are taken concurrently as the RCC immediately initiates search and rescue actions. When the information concerning the emergency is received from another source, such as the ELT alert sent directly to the RCC via the COSPAS-SARSAT system, the RCC will notify the associated ATSU and also notify the operator, where possible, and keep the operator informed of all developments.
- The responsible RCC and associated ATSU serving the flight/upper information region (FIR/UIR) in which the aeroplane is operating coordinate their activities and work closely together. The RCC is expected to provide the ATSU with information on the planned search and rescue actions initiated by the RCC so that such information can be passed on to the aeroplane.
- If the aeroplane in distress continues in flight and crosses into another or multiple other search and rescue region(s), the first RCC originally notified will contact and coordinate with the other RCC(s) to decide which RCC will be responsible for coordinating the search and rescue operation. If coordination is handed off to another RCC, then its associated ATSU would be expected to support that RCC.
- The RCC and ATSU will keep each other informed as to changes in the emergency phase after the initial declaration and as to whether the aeroplane has resumed normal operations or has safely landed, and, as soon as practicable, notify the operator concerned.

Discussion

- In light with the information provided in previous modules:
- How current procedures for ATS and RCCs will adjust to GADSS functioning?
- How need to be adapted?
- What will change?



Questions?