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Information Article

Search & Rescue Phases + associated Emergency Radiotelephony Code-words

Relevance:

1. ***Airline*** (Aircraft Operator) ***Crisis Response*** - an overview to assist better understanding of some of the more significant ***terminology*** used by e.g. Air Traffic Service Units, Search & Rescue (SAR) Units etc. - in preparation for and during SAR operations
2. ***Airline*** (Aircraft Operator) ***Crisis Response*** - an overview of the ***code-word*****s** used in radiotelephony (including aviation use) to alert responders to a degree of distress, urgency or of a safety issue

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The Aeronautical Search & Rescue (SAR) Incident

Uncertainty Phase (INCERFA)

An uncertainty phase is typically declared by the 'appropriate' Air Traffic Services Unit (ATSU):

- In respect of an aircraft for which a flight plan has been filed when:
  - no communication has been received within a period of 30 minutes after the time it should have been received *OR* from the time a first unsuccessful attempt was made to establish communication with the aircraft - whichever is the earlier *AND* / *OR*
  - the aircraft fails to arrive within 30 minutes of the ETA last notified or estimated, whichever is the later
  - the evaluation of other circumstances e.g. knowledge that the aircraft is experiencing difficulties - makes it advisable to declare the uncertainty phase
- In respect of an aircraft (for which ***no*** flight plan has been filed) when information that the aircraft is overdue or missing is received from any source e.g. an ATSU, the aircraft operator, relatives of the pilot or any other appropriate person etc. In such cases the appropriate Rescue Co-ordination Centre (RCC) should be notified and thereafter monitor the progressing situation

Alert Phase (ALERFA)

An alert phase is declared by an ATSU or RCC when:

- Attempts made during the uncertainty phase to establish contact with an aircraft or to gain any news from other sources have failed - and the aircraft is now clearly overdue
- An aircraft, which has been cleared to land, has failed to land within 5 minutes of the estimated time of landing - and communication with the aircraft has been lost
- Information has been received which indicates that the operating efficiency of an aircraft for which the uncertainty phase was declared (and / or that of another aircraft) has become impaired, but not to the extent that a forced landing is likely
- There is reason to believe that the operation of an aircraft is subject to 'unlawful interference' or equivalent circumstances

In such cases the appropriate RCC shall be informed (if not already aware) and the latter will initiate / continue with its own preparations together with the alerting of relevant and related organisations, authorities etc.

Distress Phase (DETRESFA)

A distress phase is declared by an ATSU or RCC when:

- Attempts made during the alert phase to establish contact with an aircraft and to gain information through more widespread enquiries have failed - and that aircraft is clearly missing and probably in distress and / or
- The fuel on board is considered exhausted or insufficient for the aircraft to reach safety and / or
- Information is received which indicates that the operating efficiency of an aircraft has become impaired - to the extent that a forced landing is likely and / or
- Information is received, or it is reasonably certain that an aircraft is about to make or has made a forced landing or has crashed and / or
- A downed aircraft is located as the result of a sighting or of homing on to an aircraft's 'Emergency Locator Beacon' (or equivalent) transmissions etc.

The appropriate RCC shall be informed (if not already aware) and, in turn, shall notify and activate other required agencies and authorities. When a distress situation exists (without an associated RCC activation) the appropriate ATSU shall mobilise the appropriate resources

It is for the above reasons that each ATSU is entrusted with the task of 'alerting services' for all aircraft known to it, whether the aircraft is being provided with air traffic services or not

Each Area Control Centre (ACC [overarching / parent ATSU]) serves as a collecting point for information relating to the state of emergency of an aircraft operating within the associated / appropriate Flight Information Region (FIR) - and also the conducting of ***initial*** SAR Ops - until relieved by the associated / appropriate RCC

Accordingly, an RCC will typically (but not always) receive notification that an aircraft is, or is considered to be in a state of emergency - from the ACC with which it (the RCC) is associated. The RCC will not typically be notified, however, when the nature of the emergency is such that ***local*** search and rescue facilities are considered capable of dealing with the emergency e.g. in certain incidents occurring at or near an aerodrome

Contents of Notification

Notification from an ATSU to an RCC will contain (as available) the following information - in the order listed:

- ✓ **INCERFA**, **ALERFA** or **DETRESFA**, as appropriate to the phase of emergency
- ✓ Details of agency and person calling
- ✓ Nature of emergency
- ✓ Significant information from the flight plan / aircraft operator HQ / wherever
- ✓ Time of last communication, by whom received and frequency used

- ✓ Last position report and how determined
- ✓ Colour and distinctive markings of aircraft
- ✓ Any action taken by reporting officer / person
- ✓ Number of persons (souls) on board (POB [SOB])
- ✓ Details of any survival equipment carried
- ✓ Any other information deemed relevant

The Aeronautical SAR Operation - Sequence of Events

*The Uncertainty Phase (**INCERFA**)*

The uncertainty phase is typically declared by an 'associated / involved' ATSU. Upon INCERFA declaration the appropriate ATSU should:

- Verify the information received if necessary
- ***When a flight plan had been filed***, maintain close liaison with any other appropriate ATSU(s), aircraft, Police, Coastguard, Navy and Merchant shipping etc. in order that:
    - New information (obtained e.g. via a communication search, a verification of the flight plan, a review of the weather information passed to the pilot before and during the flight etc.) - might be rapidly available (re the involved aircraft) for evaluation, plotting, decision making etc.
    - Duplication of action can be avoided (as this might lead to unnecessary overloading of communication channels)
- When no flight plan has been filed, attempt to obtain information from which the route, stopping places, times of departure(s) and arrival(s) etc. (of the involved aircraft) might be reconstructed - and start an associated 'best guess' plot of the associated aircraft's flight route - using said information
- Perform a 'communications search' - the purpose being twofold - namely, continuation of efforts to contact the involved aircraft on all appropriate frequencies and, if that fails, determination of its probable whereabouts by:
    - Making enquiries at all aerodromes where it might have landed and taken-off, including the aerodrome of departure and
    - contacting other appropriate info sources, such as aircraft known or believed to be / to have been on the same route and / or within communication range

If the communication search or flight reconstruction indicates that the aircraft has landed safely, the ATSU shall close the incident and inform all other agencies currently involved / needing to know

If, however, apprehension as to the safety of the aircraft and its occupants still exists, the 'uncertainty' phase shall be upgraded to the 'alert' phase

*The Alert Phase (**ALERFA**)*

The alert phase is typically declared by the appropriate ATSU or the RCC

Upon ALERFA declaration the ***senior RCC manager on duty*** shall oversee (via the SMC when appointed - see below) the following actions:

- Immediately appoint a Search Mission Co-ordinator (SMC), alert other, appropriate staff and activate the necessary search and rescue etc. facilities - as required
- Log all incoming information and progress reports, details of actions taken and subsequent developments
- Verify the information received - as required / if possible
- Endeavour to obtain any information concerning the involved aircraft from sources that ATSUs might not have already checked (i.e. via their normal communications circuit) e.g. via
    - Communication stations associated with radio navigation aids, radar facilities (including air defence / military), direction finding networks etc + any other communication stations with which the aircraft might possibly have * communicated (such stations should henceforth be requested to guard [listen out on] specified radio frequencies until advised otherwise)

      * Including (if available / relevant) associated satellite data used by appropriate equipment on board the missing aircraft and on the ground e.g. ACARS, ADS-B and similar systems
    - All aerodromes and / or landing strips (along and near the proposed route of the aircraft) not yet been checked, in addition to others where it is potentially feasible that the aircraft *might* have landed
    - All other agencies, facilities etc. potentially capable of obtaining additional information and / or verifying information already obtained
- Thoroughly evaluate the flight plan, weather, terrain, possible communication delays, last known position, last radio calls received, pilot's qualifications / experience / condition etc.

  Also allow for the possible performance of the aircraft under appropriate, adverse conditions - if thought relevant
- Estimate the time of fuel exhaustion (of the aircraft concerned)
- Maintain close liaison with appropriate ATSUs so that new / updated info can be made immediately available for evaluation, position plotting, decision-making etc. When so requested, ATSUs may also assist by providing comms facilities - particularly passing / relaying instructions, information etc. e.g. to the aircraft in distress, aircraft reporting / relaying the distress situation, associated search and rescue aircraft etc.

  Also by informing other aircraft operating in the vicinity of details of the situation and also monitoring and keeping the RCC informed re the progress of e.g. any aircraft, the efficiency of which has been impaired, but not to the extent that a forced landing is likely

- Plot relevant details obtained through the actions described above to determine the probable position(s) of the aircraft - whilst accounting for its associated maximum range of action from its last known position
- Initiate search and rescue action, if so indicated by the situation appraisal - and notify any action taken to the ACC - for onward relay to other aircraft involved (if possible / as required) and other, concerned ATSUs (as required)
- Whenever practicable / possible / required, communicate (and provide updates) to the involved / missing etc. aircraft's operating agency (e.g. parent airline; military organisation) all information received and actions taken

Typically an 'area of probability' (based upon the 'best guess' position of where the involved / missing etc. aircraft might be located) would have been be calculated by this point - to be upgraded to a 'search area' during the distress phase, if so required

If the efforts to locate the involved aircraft indicate that a state of potential emergency no longer exists, the RCC will close the incident and immediately inform all involved ATSUs, the involved aircraft's operating agency and any other centre, service, facility, person etc. that it had previously alerted and / or activated and / or notified

If, however, the aircraft has not been located by the time all the above efforts have been completed or the time of estimated fuel exhaustion has been reached, whichever occurs first (and thus the aircraft and its occupants must be considered to be in grave and imminent danger and in need of immediate assistance) the 'alert' phase shall be upgraded to the 'distress' phase

The Distress Phase (***DETRESFA***)

The distress phase may be declared by an ATSU or an RCC. Upon such declaration the RCC's 'SMC' (when appointed) should:

- Examine the appropriate part(s) of the pre-prepared, generic (template) plan of operations for search and rescue ops in the relevant Search & Rescue Region(s) (SRR)
- Adapt the generic template to produce a specific plan of action and pass relevant details to:
    - Senior RCC manager on duty for approval and permission to proceed
    - Subordinate units of the RCC required for implementation of the plan
    - The appropriate ACC - for onward transmission of the plan to other appropriate ATSUs e.g. for air traffic co-ordination purposes, appropriate NOTAM (Notice to Airmen) action etc.
    - All other RCCs associated with the planned route of the aircraft (if any), together with any whose SRRs lie within the radius of action of the aircraft, as determined from its last known position

- Direct the operation (as expeditiously, effectively and efficiently as is possible) to its conclusion (whatever that might be)
- If necessary, create a Rescue Sub-Centre(s) (RSC) and appoint a subordinate 'On-scene Co-ordinator(s)' (OSC) etc. - with the following accountabilities:
    - Controlling, co-ordinating etc. all SAR efforts in the assigned RSC
    - Providing and briefing mission details to participating / joining resources
    - Establishing comms links with all SAR facilities deployed within the RSC and acting as a link between the RCC and said deployed SAR facilities, as required
    - Re-transmitting / relaying position & other reports to 'whoever' - as required
    - Reporting / updating RSC weather & search conditions to 'whoever' - as required
    - Ascertaining the endurance of SAR units within the RSC and reporting / updating this information to 'whoever' - as required
    - Regularly keeping the RCC / SMC fully advised of appropriate developments
    - Submitting consecutively numbered Situation Reports (SITREPS) to the RCC at pre-agreed times and / or when important changes occur
- Maintain close liaison with appropriate ATSU(s) in order that:
    - New information obtained through continued attempts to contact the aircraft or through widespread enquiries will be made available immediately for evaluation, plotting and decision making
    - When requested to do so, the ATSU may assist by:
        - Providing communication facilities, in particular by passing instructions or information to the aircraft in distress (if possible), aircraft reporting the distress, search aircraft etc.
        - Informing other aircraft operating in the vicinity of the of the emergency and, if need be, restricting normal air traffic ops in the search area
        - Monitoring and keeping the RCC informed of all relevant information
- Keep the 'senior RCC manager on duty' regularly updated as events 'unfold'

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Standard Aeronautical (& other) Code Words e.g. for Emergency / Urgency / Safety Notifications

MAYDAY

'Mayday' is an emergency code word used internationally as a distress signal in telegraphy, visual and / or radio telephony voice communications. It derives from the French *'venez m'aider'*, meaning literally something like 'come help me'. It is mainly used to signal a life-threatening emergency - typically (but not exclusively) affecting aircraft and shipping

More specifically, a '**MAYDAY**' situation is one in which a vessel, aircraft, vehicle or person is in grave and imminent danger and requires immediate assistance. This is referred to as a state of **distress**

When used to make a distress call, the code word is always spoken three times consecutively (i.e. "Mayday / Mayday / Mayday") to prevent mistaking it for some similar sounding phrase (e.g. perhaps under distorted radio transmission / reception conditions) - and also to distinguish an actual Mayday call from a message ***about*** a Mayday call. The details of the state of distress ***(emergency message)*** then follow the code word - usually in a specified format

An equivalent Morse-code Mayday signal is '**SOS**' - (Morse code version shown below):

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PAN PAN

Similarly, a call etc. of '**PAN PAN**' (repeated three times just like a 'MAYDAY' call) is used to signify that there is a degree of urgency on board a vessel, aircraft or other vehicle - but that, for the time being at least, there is no immediate danger to anyone's life or to the vessel, aircraft etc. itself. This is referred to as a state of **urgency**. The details of the state of urgency then follow the code word

This call is distinct from a 'Mayday' call. An equivalent Morse-code signal is '**XXX**'

SECURITE (sek-ew-rit-ay)

'When a radio telephony etc. transmission begins with the words **'SECURITE / SECURITE / SECURITE'** it means that the following message concerns important **safety information**. The most common use of this in aviation is to advise of significant navigational warnings & meteorological information

An equivalent Morse-code signal is **'T T T'**