CANSO Emergency Response Planning Guide

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Contributors

Airservices Australia

Civil Aviation Authority of Singapore (CAAS)

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Federal Aviation Administration (FAA)

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NATS

CANSO Emergency Response Planning Guide

Introduction

Aviation provides a safe, reliable infrastructure to move passengers and cargo around the world. The benefits of this infrastructure are open to billions of people, connecting us more than ever before and boosting the global economy. When there are disruptions to air navigation services, whether the situation stems from a disruption of air traffic services or an aircraft emergency, it has a tremendous impact. Therefore, it is critical that every air navigation service provider (ANSP) is able to ensure emergency response plans are in place to quickly restore services after an emergency.

The Civil Air Navigation Services Organisation (CANSO) has produced the *CANSO Emergency Response Planning Guide* to bring together best practices, knowledge and experience related to contingency plans and procedures from ANSPs around the world. This Guide helps ANSPs develop a formal emergency response plan that documents the orderly and efficient transition from normal to emergency operations and return to normal operations.

Context

The material found in this Guide is taken from the *CANSO Standard of Excellence in Safety Management Systems* (SoE in SMS) and the related *CANSO Safety Management Systems Implementation Guide* (Version 2.1). The SoE in SMS provides a framework for the implementation and continuous improvement of safety management systems within ANSPs that:

— Exceeds the existing domestic and international regulatory framework
— Allows each ANSP to build a safety management system appropriate to its size and operational complexity
— Captures and shares the knowledge of ANSPs with mature safety management systems already fully integrated into their operations

The SoE is aligned with International Civil Aviation Organization (ICAO) Annex 19, Safety Management. It emphasises a phased implementation of a SMS, allowing the ANSP to move through five levels of maturity, from an initial, 'Informal' level to an advanced, 'Optimised' level. The five levels of maturity as they pertain to emergency response plans, and the outcomes expected for each level, are addressed on page 4.

This Guide is designed to help ANSPs in the earlier maturity phases develop these formal plans and procedures. As an ANSP matures, the objectives for emergency planning will increase. This Guide addresses outcomes for the first three phases of SMS maturity, from 'Informal' to 'Defined' to 'Managed'.

Objective

The *CANSO Emergency Response Planning Guide* aims to provide CANSO Members with guidance that:

— Transfers learning across the industry and builds a consistent approach to ANSP safety management practices across the globe
— Allows ANSPs to plan for a comprehensive and coordinated emergency response at the corporate, group and project levels, assuring that risks to operational service delivery are reduced to 'as low as reasonably practicable' (ALARP) levels
— Is aligned to the CANSO SoE in SMS

Guide Status

This Guide does not supersede either domestic or international regulations or regulatory guidance on SMS implementation. It draws on the experience of CANSO Members and aims to complement and supplement existing guidance. CANSO recommends the use of this guidance, but application is not binding.

Related Industry Guidance
　　　This Guide provides an ANSP perspective on emergency response planning. Additional industry perspectives are available from CANSO partner organisations:

— International Air Transport Association Emergency Response Best Practices Handbook: **www.iata.org/publications/pages/index.aspx**

— Airports Council International Emergency Preparedness and Contingency Planning Handbook: **www.aci.aero/Publications/New-Releases/Emergency-Preparedness-and-Contingency-Planning-Handbook-First-Edition-2014**

Coordination of Emergency Response Planning

Outcomes by Level

The following objectives for each of the five maturity levels are taken from the CANSO SoE in SMS.

Objective	Informal	Defined	Managed	Assured	Optimised
4.1 Emergency response procedures and an emergency response plan that documents the orderly and efficient transition from normal to emergency operations and return to normal operations.	The organisation has sound primary air traffic management systems but does not have redundant capabilities or back-up systems.	There are procedures and some redundant capabilities and resources to cope with abnormal and unexpected situations.	All primary systems have redundant capabilities, and emergency response procedures have been developed, documented and distributed to appropriate staff. The emergency response plan is properly coordinated with the emergency response plans of those organisations it must inter- face with during the provision of its services. (Annex 11 – 1.4)	Primary air traffic management systems are reliable and have redundant capabilities and back-up systems. The emergency response plan and procedures have been rehearsed through desktop or operational exercises.	The emergency response planning processes and emergency procedures and plans are regularly exercised and revised to keep them up- to-date.
Outcomes	No emergency response planning has been carried out. No planned redundant capabilities exist.	The primary risks to the organisation from abnormal and unexpected situations have been analysed. Emergency response procedures are documented for the most likely abnormal situations. Redundant capabilities are in place for high-risk functions.	Redundant capabilities are in place for all primary systems. Emergency response procedures have been published. An emergency response plan has been published. The emergency response plan has been coordinated with interfacing organisations.	Redundant capabilities and back-up systems exist for all primary systems. The schedule for rehearsal of the emergency response plan and procedures has been determined.	The schedule for regularly reviewing the organisation's key risks has been determined. Regular lessons learned exercises are conducted on the effectiveness of the emergency response plan.

Objectives

It is essential that an organisation has a clear set of actions understood by all relevant personnel in the event of an emergency. This document provides guidance on both emergency procedures and creating and maintaining emergency response plans.

Emergency Response Overview

ICAO Annex 11, Air Traffic Services, Chapter 2.30 (Amendment 46) states, *inter alia*, that "air traffic services authorities shall develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of air traffic services and related supporting services in the airspace for which they are responsible for the provision of such services."

Emergency/Contingency Procedures

Organisations should develop emergency/contingency procedures to help maintain the safety of operations during system failures or other abnormal or unexpected situations. It is essential to recognise that reacting to these kinds of failures without a plan of action is likely to result in a significant increase in risk to the organisation. Even with defined and documented procedures, the level of risk is likely to increase during such abnormal or unexpected situations as:

— Losses of major air traffic systems (e.g., communications, surveillance, flight data)
— Losses or failures in support facilities (e.g., power, air conditioning, building integrity)
— Aircraft emergencies (e.g., emergency descent, hijack, air defence security)
— Disruption of air traffic services (e.g., bomb threat or other action requiring evacuation of the operations room, emergency dispersal of traffic, closure of an adjacent air traffic centre)

— Closure or zero flow rating of traffic in national airspace as a result of adverse environmental conditions
— (e.g., hurricane, typhoon, volcanic activity)

It is advisable for ANSPs to develop, document, train and practice emergency/contingency procedures for the safe handling of these types of failures. Figure 1 provides guidance on assessing emergency scenarios..

In the context of ICAO obligations, contingencies can be organised along a "contingency lifecycle" (see Figure 2) composed of the following phases:

— Normal operations
— Emergency situations
— Degraded modes of operation
— Service continuity
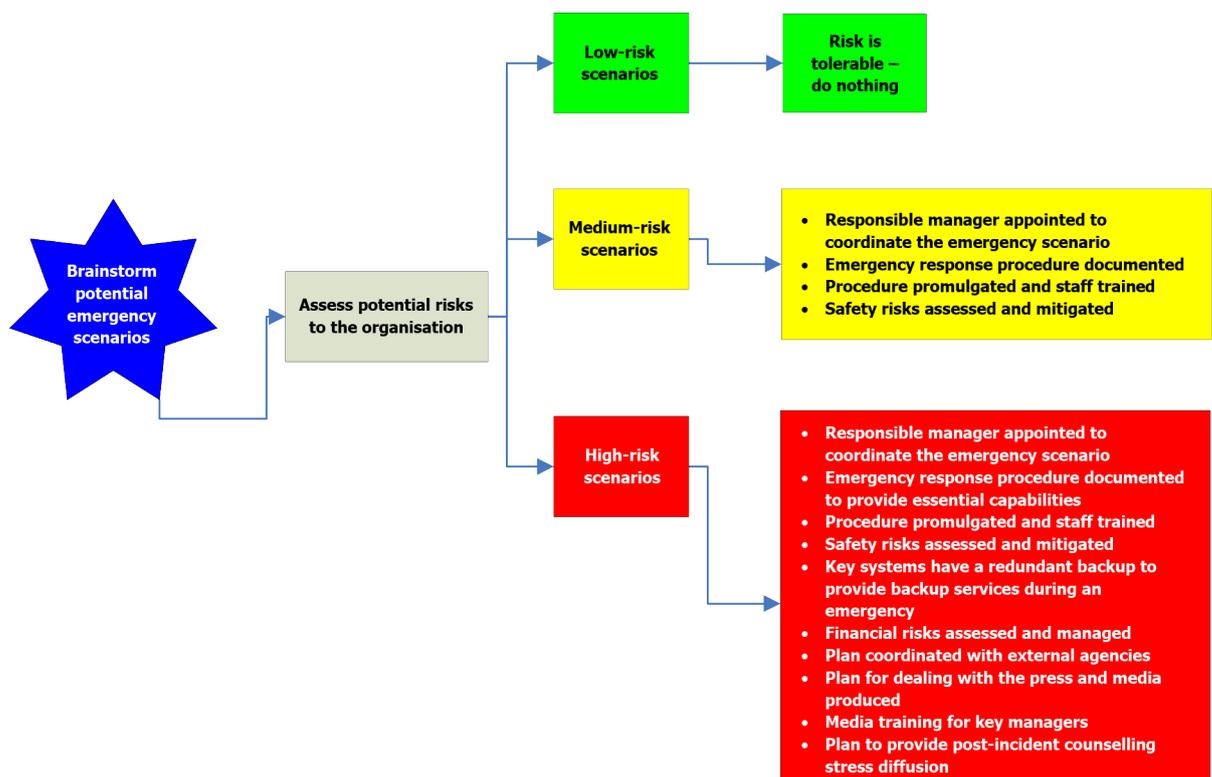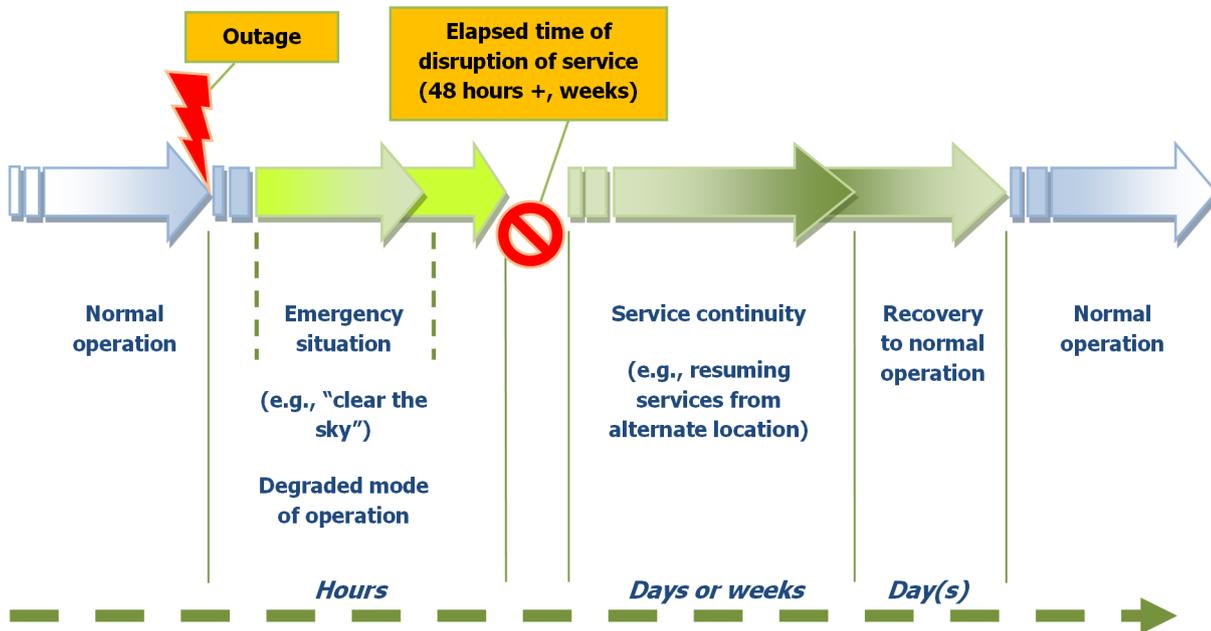— Recovery to normal operations
— And back to normal operations

Figure 1 - Assessing Emergency Scenarios

Outage

Elapsed time of disruption of service (48 hours +, weeks)

Normal operation

Emergency situation

(e.g., "clear the sky")

Degraded mode of operation

Service continuity

(e.g., resuming services from alternate location)

Recovery to normal operation

Normal operation

Hours

Days or weeks

Day(s)

Figure 2: Generic Contingency Lifecycle

In the figure above, the durations of the various phases shown are not necessarily representative of the length of those phases; durations will differ from one event and environment to another. The lifecycle illustration should also not necessarily be understood as a strict sequence of modes of operation. For instance, depending on the cause/type of disruption:

— A system (technology, people and procedures) working in normal operations can evolve directly into an emergency situation
— A system can deteriorate into a degraded mode of operation that further deteriorates into an emergency situation
— An emergency situation can be followed by a service continuity mode of operation
— In some situations, it might be necessary to move straight from normal operations into a service continuity mode of operation
— The outage may lead to a disruption whose elapsed time is that of days or weeks

In addition, it is desirable for primary air traffic systems to have back-up or redundant capabilities. This can be achieved by:

— Engineering a high-integrity system in a main and standby redundant configuration. In these circumstances, common-cause failures (where the standby system fails at the same time and from the same cause as the main system) are a major problem and are difficult to design out
— Providing a high-integrity architecture using several lower-integrity systems on different operational platforms. This methodology is typically employed in the aircraft industry. It may appear to be more expensive upon first inspection, but it is likely to be cheaper in the long run

Chapter 9 of the *CANSO Safety Management System Implementation Guide* provides additional guidance on various risk mitigation and management strategies.

Development and Assurance

The techniques used to develop and assure emergency/contingency procedures are similar to those used to develop standard operating procedures. Figure 3 shows a process that organisations may follow to develop, document, train and assure a set of emergency response procedures.

For emergency procedures, it is advisable to hold a desktop review or simulation to assure that everyone involved understands what is required of them. It is also advisable to run a full-scale simulation for major incident procedures to help identify potential shortcomings. In combination, these simulations provide assurance that the

procedures are fit for their intended purpose and will help to restore safe air traffic services.

Once documented, emergency procedures must be readily available in hard-copy form at operational units so that managers can easily access them in stressful situations. If these procedures are documented in a larger manual or in an electronic format, it is less likely that they will be consulted in an emergency.
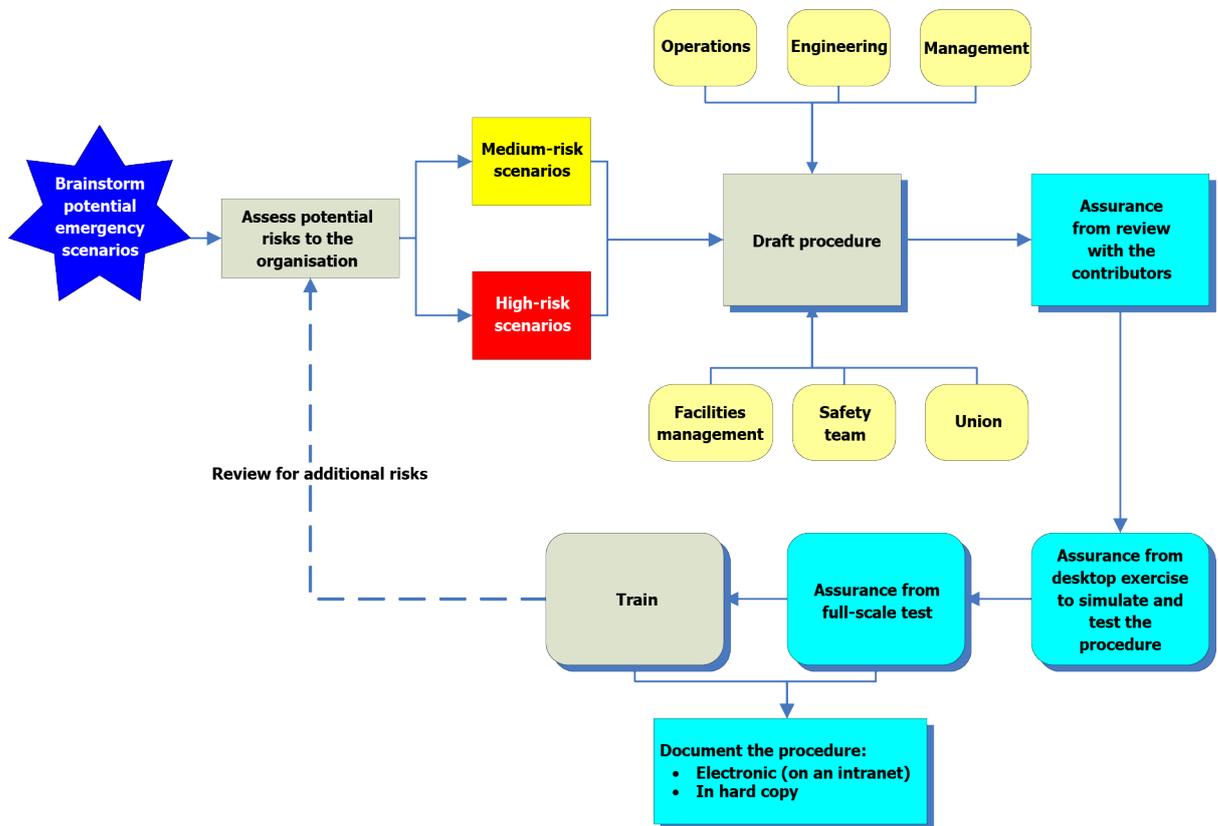

Figure 3: Development and Assurance of Emergency/Contingency Procedures

Emergency Response Plan

Emergency response plans assist ANSPs in providing for the safe and orderly flow of air traffic in the event of disruptions to air traffic services and related supporting services. They are aimed at preserving the availability of major air routes within the air transportation system where ANSPs are designated to provide services, and to assure access to designated aerodromes for humanitarian reasons. An ANSP, like any organisation supporting flight operations, should have an emergency response plan to complement its contingency procedures.

An emergency response plan:
— Provides for the orderly and efficient transition from normal to emergency/contingency operations and the subsequent return to normal operations
— Must be properly coordinated with the emergency response plans of those organisations that it must interface with during the provision of its services (see page 10 below)
— Outlines what actions should be taken following an accident and who is responsible for each action

An emergency response plan is generally required for:
— Aircraft emergencies (e.g., emergency descent, hijack, air defence security). In these circumstances, the responsibility for handling the incident may rapidly pass to another government agency; however, it is essential that the ANSP retains the ability to handle the remainder of the air traffic in its airspace
— Disruption of air traffic services (e.g., bomb threat or other action requiring evacuation of the operations room, emergency dispersal of traffic, closure of an adjacent air traffic centre). In these circumstances, the State is likely to take a close interest in the restoration of air traffic services; it is important that the ANSP is able to demonstrate that it has a plan to restore these services safely

An emergency response plan may address procedures for avoiding airspace; current and alternative routes; simplified route networks; procedures to cope with degraded navigational capability; and/or procedures to cope with degraded communications or surveillance capability. Appendix B of the ICAO Safety Management Manual provides detailed guidance concerning the specific areas that should be included in an emergency response plan:
— Governing policies
— Affected organisations
— Notifications
— Initial response
— Additional assistance
— Crisis management centres
— Records
— Accident sites
— News media
— Formal investigations
— Family assistance
— Post–critical incident stress counselling
— Post-occurrence reviews

Training and exercises are necessary to assure that capabilities match the plan and to reveal any gaps or deficiencies. The plan should be assigned an owner within the organisation, and the owner should regularly review the plan to assure that employees are aware of and trained on the actions to take in the event of an emergency. A hard-copy action plan detailing whom to contact and who is responsible for what action should be readily available to operational staff.

Coordination

Since disruptions in one portion of airspace affect adjacent areas, it is advisable to develop an emergency response plan in conjunction with other agencies, such as airlines, airport operators, police, security services, regulators and the State (see Figure 4). In addition to containing individual emergency response plans, the SMS manual of each organisation should outline the coordination of these plans across the industry during emergency situations. When international coordination is required, it is the responsibility of ICAO to facilitate or initiate the necessary coordination, while international organisations such as the International Air Transport Association, EUROCONTROL and the International Federation of Airline Pilots' Associations serve as valuable advisors
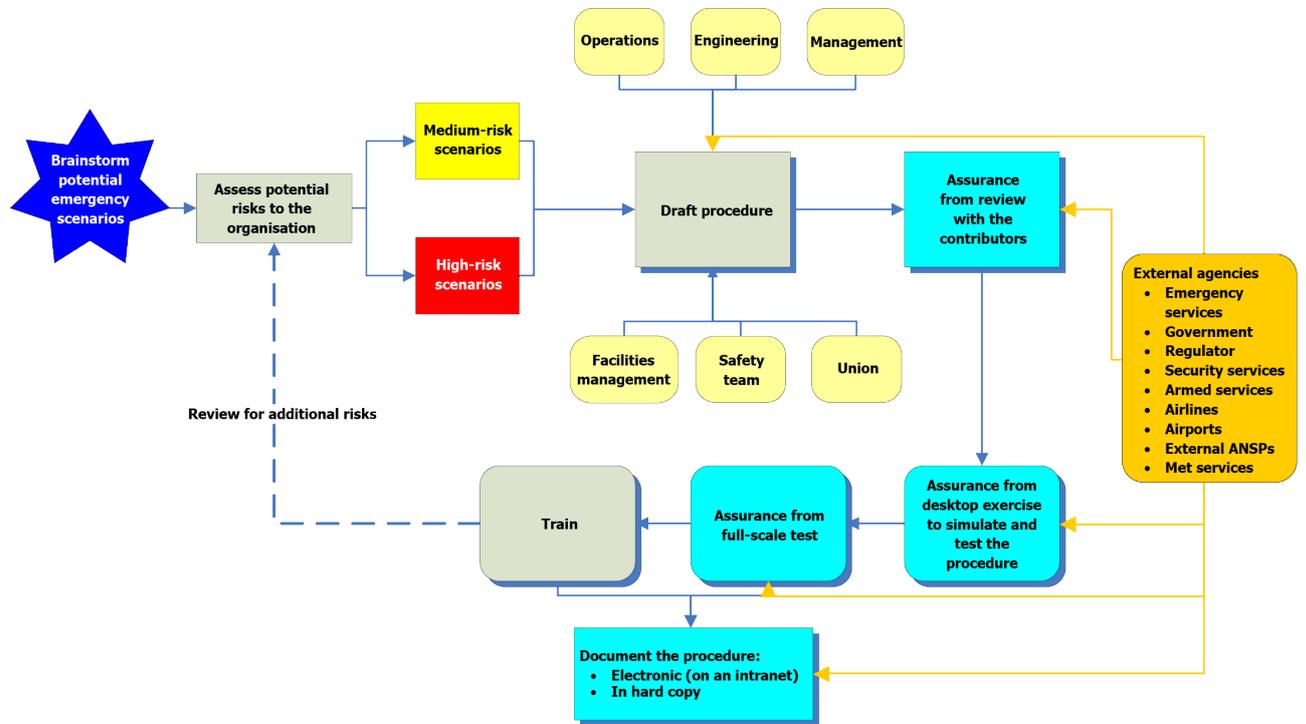

Figure 4: Emergency Response Plan Coordination

Occurrence Response Hierarchy

Some organisations provide a hierarchy for response during a safety occurrence, such as the following gold/silver/bronze command structure:

| Gold	Strategic
Silver	Tactical
Bronze	Operational

Gold

The Gold Commander is in overall control of the organisation's resources at the incident. The commander remains away from the scene of the incident and formulates the strategy for dealing with the emergency. If the Gold Commanders for various organisations are not co-located at an incident, they will remain in contact with one another via video conference or telephone. For the purposes of this guide, the Gold Commander is likely to be the head of the organisation.

Silver

The Silver Commander is the tactical commander who manages the Gold Commander's strategic direction and consequently converts it to actions completed by the Bronze team. Silver Commanders should be located away from the immediate scene of the incident and work closely with Silver Commanders from other agencies. They will not become directly involved in dealing with the incident itself. For the purposes of this guide, the Silver Commander is likely to be the manager directly in charge of an operational air traffic service unit.

Bronze

A Bronze Commander directly controls the organisation's resources at the incident and will be found with his/her staff working at the scene. If an incident is geographically widespread, different Bronze Commanders may assume responsibility for different locations. If the incident is of a complex nature, as is often the case, Bronze Commanders are given individual tasks or responsibilities at an incident. For the purposes of this guide, the Bronze Commander is likely to be the operational manager dealing with the air traffic or engineering incident.
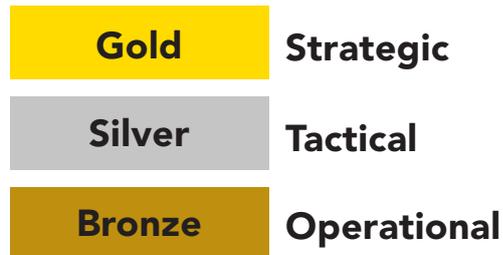
Lessons Learned

Below are some lessons learned by ANSPs pertaining to coordination of emergency response planning.

1. Assure that there is a manager responsible for the coordination of emergency response planning, and that the manager has the resources and seniority necessary to create, test and, where necessary, put into practice the emergency response plan.

2. A dedicated meeting room to coordinate the emergency response plan, with plentiful telephone, internet and video conference facilities, will help to move the focus of senior managers and the press away from the operations room, and will allow operational staff to manage air traffic services without interference.

3. A conference call facility with 100 or more lines proves highly valuable when managing a large-scale emergency. The ability for the moderator to mute all incoming lines can also prove invaluable when managing a large telephone conference.

4. It is essential to have sufficient staff to manage an emergency that might last for several days. This means establishing a shift system and an effective hand-off process. On-call arrangements for the staff involved are also essential. Operational staff must be supported by senior managers, lawyers, media specialists and safety professionals.

5. With a view to possible litigation, it is important to maintain a log of events and decisions made throughout the emergency and recovery processes.

6. If the emergency involves fatalities, it may be necessary to move air traffic control staff to a safe house for their protection for the duration of the emergency.

7. Critical Incident Staff Management processes may help to speed the recovery of any staff involved in the emergency.

8. It is essential to coordinate plans with external emergency services and to establish how to control access to operational sites that may be surrounded by the media.

9. For large-scale emergencies, media training for senior staff is essential to assure that the appropriate messages are delivered to a news-hungry public. Organisational internet and social media sites can also provide effective distribution of internal information.

CANSO Members

CANSO – the Civil Air Navigation Services Organisation – is the global voice of air traffic management (ATM) worldwide. CANSO Members support over 85% of world air traffic. Members share information and develop new policies, with the ultimate aim of improving air navigation services (ANS) on the ground and in the air.

CANSO represents its Members' views to a wide range of aviation stakeholders, including the International Civil Aviation Organization, where it has official Observer status. CANSO has an extensive network of Associate Members drawn from across the aviation industry. For more information on joining CANSO, visit www.canso.org/joiningcanso.
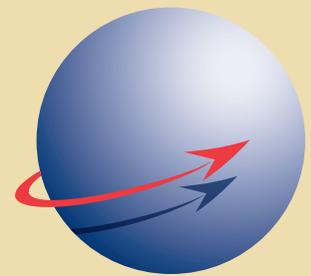
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— Dirección General de Control de Tránsito Aéreo (DGCTA)
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— ENANA-EP ANGOLA
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