GUIDANCE MATERIAL ON AIRPORT PREPAREDNESS FOR EFFECTIVE HUMANITARIAN ASSISTANCE AND DISASTER RESPONSE

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1) https://www.icao.int/HADRA/Pages/default.aspx

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Glossary and Abbreviations

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A-CDM	Airport-Collaborative Decision Making
ACI	Airports Council International
AEP	Aerodrome Emergency Plan
AIP	Aeronautical Information Publications
AIS	Aeronautical Information Service
ANSP	Air Navigation Services Providers
ATC	Air Traffic Control
ATS	Air Traffic Services
CAA	Civil Aviation Authority
CANSO	Civil Air Navigation Services Organisation
CART	Council Aviation Recovery Task Force
CCT	Crisis Coordination Team
CIQ	Custom, Immigration and Quarantine
CSO	Civil Society Organization
EMT	Emergency Medical Team
ETA	Estimated Time on Arrival
EOC	Emergency Operations Centre
ERP	Emergency Response Plan
FITTEST	Fast IT and Telecommunications Emergency and Support Team
GARD	Get Airports Ready for Disaster
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IFALPA	International Federation of Airline Pilots' Associations
INSARAG	International Search and Rescue Group
IPCC	International Panel on Climate Change
LCA	Logistics Capacity Assessment
LOG.IE	Logistics Information Exchange
MCDA	Military and Civil Defence Assets
NDMA	National Disaster Management Authority

NGO	Non-Governmental Organization
NOTAM	Notice to Airman
OSOCC	On-site Operations Coordination Centre
POD	Point of Departure
RDC	Reception and Departure Centers
SARPs	Standards and Recommended Practices
UN CEFACT	United Nations Centre for Trade Facilitation and Electronic Business
UNDAC	UN Disaster Assessment and Coordination
UNDP	United Nations Development Programme
UNHAS	United Nations Humanitarian Air Services
USAR	Urban Search and Rescue
WFP	World Food Programme
WHO	World Health Organization

I
Setting the scene

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Context

Air transport plays an essential role in providing aid and relief during and after a disaster. Airports are important hubs for humanitarian assistance and disaster response. The continued support and influx of goods and supplies is dependent on air transport. During a disaster, airports become staging points for rescuers, relief supplies, goods deliveries, and people evacuation, assisted by airlines, Air Navigation Services Providers (ANSPs) and ground-handlers. However, during a disaster, the infrastructure and persons supporting aviation are vulnerable to the same risks and damage as any other infrastructure and persons in the country or region. Setting up the right mechanisms to facilitate the timely provision of emergency relief services during and in the aftermath of a disaster is crucial. In the short-term, efficient emergency relief activities contribute to the recovery efforts of the country and in the mid- to long-term, it helps create optimum conditions for progressing the UN Sustainable Development Goals.

Existing climate-related risks and new risks for natural and human systems will be amplified by climate change[2]. In regions prone to natural disasters, such as the hurricane belt in the Caribbean climate change is expected to contribute to an additional US$ 1.4 billion to annual losses from cyclone wind damage. In addition, more frequent epidemic-prone diseases[3] will challenge the resilience of societies. Between 2011 and 2018, the World Health Organization (WHO) tracked 1483 epidemic events in 172 countries. Since 2020, the COVID-19 pandemic has challenged the resilience of our society in an unprecedented manner. As disasters grow in numbers and in complexity and in light of the essential role of disaster response, awareness raising on the current coordination mechanisms to improve this response becomes essential.

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2) International Panel on Climate Change (IPCC) Assessment Report (AR) 5 - International Panel on Climate Change Assessment Report 5 Climate Change 2014: Impacts, Adaptation, Vulnerability, Summary for Policymakers

3) A World at Risk, Annual Report on Global Preparedness for Health Emergencies, Global Preparedness Monitoring Board, September 2019

Problem Statement

Start of emergency response. In the aftermath of a disaster, effective emergency response, search and rescue, aerial firefighting operations and emergency medical operations is only possible if the required experts and material are shipped into affected locations as quickly as possible. Aviation is best able to meet this time-sensitive objective; and airports constitute the logistics and humanitarian hubs for the areas and States affected.

However, aviation stakeholders may not be prepared to accommodate the large number of flights and to handle considerably more cargo than business-as-usual operations, in particular when infrastructures are degraded. In addition, information flows between the aviation and humanitarian communities are not always established to guarantee the optimized used of available airport capacity. Also, during an immediate post-disaster situation, both relief providers and aviation stakeholders might be unclear about their respective roles and mutual expectations. It leads to inefficiencies, disorganization and delays.

Recovery to normal operations. At the same time, the recovery of an airport to normal operations contributes to a country's livelihood and economy. The speed of returning to normal operations after a disaster can be critical to some countries. Enhanced preparedness to manage disasters will expedite the return to normal operations and facilitate the economic recovery of a country.

Need for collaboration. Close collaboration between aviation and humanitarian stakeholders are paramount for effective emergency response. As an example, back in 2011 the devastating earthquake in Haiti led to the disruption of Air Traffic Management and other aviation services. Nonetheless, vital relief goods were sent with limited initial coordination and the absence of planned alternatives, leading to airport saturation. Following the COVID-19 pandemic outbreak, the World Food Programme (WFP) in collaboration with the International Civil Aviation Organization (ICAO), the World Health Organization (WHO), the UN system and the international Non- Governmental Organization (NGO) community, used its logistics capacity and expertise to quickly stand up a network of response hubs, from which passenger and cargo flights operated.

The breakout of COVID-19 has shown that the aviation infrastructure and its processes are very vulnerable to disruptions that generate a ripple effect on the aviation network. Therefore, enhanced preparedness must harmonize local procedures with the wider network. For instance, the lack of timely data and information on the status of operating restrictions at international airports affects the ability to make informed operational decisions.

As such, enhanced preparedness, supported by sound coordination and communications mechanisms will improve the resilience of the overall emergency response. This would have an impact on the longer-term ability of a State to recover from the event and operate normal international aviation services.

Objective of the guidance

This document was developed for situations when a country has made a request for international assistance or accepted international assistance in the context of the UN General Assembly Resolution 46/182 "Strengthening of the coordination of humanitarian emergency assistance of the United Nations".

This guidance material supports governments, regional organizations, the humanitarian community and the international civil aviation stakeholders by providing key considerations and practices for implementing effective preparedness and response measures, in line with the Sendai Framework for Disaster Risk Reduction[4] and consistently with the Standards and Recommended Practices on international aviation developed by ICAO. It raises awareness on best practices to ensure national and regional capacity and capability are available to identify, prepare for and respond to risks, including coping with a large influx of international humanitarian personnel and relief aid.

This guidance material explains how to implement a comprehensive collaboration framework, whereby the information needs of all stakeholders are understood and adequate coordination mechanisms are established.

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4) https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030

II.
International assistance in disaster response: stakeholders' roles and responsibilities

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Roles and responsibilities for each stakeholder involved in international assistance during and after a disaster should be clearly defined by national authorities and understood by all. In addition, the established coordination mechanisms should consider different possible scenarios.

1. Stakeholders

1.1 In the affected States

States affected by a disaster need to activate international response mechanisms, in line with applicable global, regional and national laws and norms, as well as within the framework of bilateral Treaties and agreement. UN General Assembly Resolution 46/182 "Strengthening of the coordination of humanitarian emergency assistance of the United Nations" outlines a framework for humanitarian assistance and a set of guiding principles, which include the following:

- Humanitarian assistance must be provided in accordance with the principles of humanity, neutrality and impartiality

- The sovereignty, territorial integrity and national unity of States must be fully respected in accordance with the Charter of the United Nations. In this context, humanitarian assistance should be provided with the consent of the affected country [...]

- Primarily, each State has the responsibility to take care of the victims of natural disasters and other emergencies occurring on its territory.

States whose populations are in need of humanitarian assistance are called upon to facilitate the work of these organizations in implementing humanitarian assistance. As far as aviation is concerned, authorities that are involved are, among others:

- National Disaster Management Authorities (NDMA)
- Civil Aviation Authorities (CAAs)
- Airport authority
- National Military authority

National Disaster Management Authorities: National Disaster Management Authorities (NDMA) are responsible for formulating policies for disaster management domestically, coordinating national disaster responses as well as coordinating international disaster response as part of international cooperation with all stakeholders, including relevant agencies within the State.

Civil aviation authorities: Civil Aviation Authorities (CAAs) are specifically responsible for the oversight and regulation of civil aviation with a focus on aviation safety, security, facilitation, airspace policy, economic regulation, efficiency, sustainability, consumer protection and respect for the environment. They are responsible for the implementation of the 19 Annexes to the Chicago Convention on International Civil Aviation (Chicago Convention), which recognize the potentially disruptive impact of disasters on civil aviation operations and require that States adopt a number of preparedness measures, with a delegated authority to the CAAs. The CAAs act as the coordinating entity for civil aviation matters in an affected State.

Airport authority: airport authorities are public and/or private entities responsible for the maintenance and operations of airport services, in full compliance with ICAO Standards and Recommended Practices (SARPs) and applicable regional, national and local legislation. Annex 14, Volume I to the Chicago Convention provides the regulatory framework for airport operators, including provisions related to emergency planning and response. In this domain, it is complemented with guidance material included in ICAO Doc 9137 Airport Services Manual, Part 7 Airport Emergency Planning. Each airport authority is responsible for the establishment and testing of its emergency plan.

Regional organizations/cooperation mechanisms: In some regions, crisis coordination arrangements for disaster risk management and response may have been established at the regional level. These organizations/ mechanisms may propose guidance for States - help States in enhancing the level of preparedness to threat scenarios, harmonize crisis management approach across the region and assume other functions as assigned by the respective member States. The following three areas of action should be considered in particular: command, communication and coordination[5].

1.2 Foreign Militaries

Military airports, other facilities and transport assets may provide essential support for the movement of disaster relief shipments, both during export from donor locations as well as at arrival into destination country. The Guidelines on the Use of Foreign Military and Civil Defence Assets (MCDA) in Disaster Relief (Oslo Guidelines[6]), address the use of MCDA following natural, technological and environmental emergencies in times of peace.

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5) Airport Services Manual, Part 7 Airport Emergency Planning (ICAO Doc 9137, Second Edition)

6) https://www.unocha.org/publication/oslo-guidelines-use-foreign-military-and-civil-defence-assets-disaster-relief

1.3 Assisting actors providing goods and equipment, services, technical advice and other assistance

Assisting actors providing goods and equipment will require assistance with the cross-border movement of relief consignments. They may or may not be the "importer/exporter" on record. These actors include other States, international or domestic humanitarian organization, foreign individual or private company and diaspora.

In particular, Urban Search and Rescue (USAR) teams, Emergency Medical Teams (EMTs) and UN Disaster Assessment and Coordination (UNDAC) Team and other humanitarian responders are deployed in the immediate aftermath of a disaster, depending on the disaster typology and the needs prioritization. Their deployment requires the operational availability of airport infrastructure, which has an impact on aviation facilitation (Customs, Immigration and Quarantine – CIQ processes). The very short timeframe for their deployment, as well as the size of the teams constitute unique features compared to other humanitarian actors.

Common services such as the World Food Programme (WFP) managed United Nations Humanitarian Air Service (UNHAS), Fast IT and Telecommunications Emergency and Support Team (FITTEST) and Logistics Cluster may be established, becoming another active user of airport infrastructure.

Assisting States, international or domestic humanitarian organization, foreign individual or foreign private companies may also provide services to the affected State in order to support disaster relief operations. This encompasses advice and technical assistance, which is not necessarily linked to the donation of goods or money. Many non-government organizations (NGOs), UN entities and others offer essential humanitarian services, expertise and technical assistance.

1.4 International aviation stakeholders

The International Civil Aviation Organization (ICAO) is a UN specialized agency, established by States in 1944 to manage the administration and governance of the Convention on International Civil Aviation (Chicago Convention).

In a disaster situation, ICAO's activities, including direct in-country support, are limited to providing[7] advice and assistance to States that would support the continued viability of international civil aviation operations in the face of crises or disasters.

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7) https://www.icao.int/safety/CAPSCA/Pages/default.aspx

8) Annex 9 – Facilitation, Annex 11 - Air Traffic Services, Annex 14, Volume I - Aerodromes

The ICAO advice addresses both the immediate needs of States to recover from a crisis or disaster, as well as recommendations to States on enhancing the resilience of their aviation infrastructure in respect of events that have a high probability to recur in the future.

Indeed, some ICAO programmes play a major role in emergency preparedness planning and assistance in their implementation. ICAO also audit Standards and Recommended Practices (SARPs) to identify gaps in emergency preparedness planning and response. Any State request for direct in country assistance from ICAO shall be made to the Secretary General, through the accredited Regional Office.

ICAO has developed a series of Standards and Recommended Practices (SARPs) of relevance[8] in case of crises and disasters, for implementation by ICAO Member States.

Finally, international organizations concerned, such as the International Air Transport Association (IATA), Airports Council International (ACI), the Civil Air Navigation Services Organization (CANSO), the International Federation of Air Traffic Controllers' Associations (IFATCA) and the International Federation of Airline Pilots' Associations (IFALPA), are valuable advisers on the practicability of overall plans and elements of contingency plans bringing industry experience and feedback. They also support airlines, airports, air navigation services providers and pilots with the implementation of ICAO SARPs and provide operational input in aviation crisis management mechanisms.

Appendix A provides a more detailed description of these stakeholders.

2. Working with Humanitarian stakeholders: overview of important elements to consider in emergency response management

2.1 Humanitarian Coordination Methodology

Humanitarian coordination methodology is established and continuously maintained and reinforced since early 1990s. OCHA is custodian of the international coordination methodology in the domain of humanitarian response, and actually developed methodologies and tools. This includes strategic level coordination between an affected country and international aid community, in-country coordination between a National Disaster Management Authority (NDMA) together with respective ministries and responding actors, and tactical coordination methodology such as, between an affected airport and incoming humanitarian actors, and so on.

At airports, the coordination methodology is known as "Reception Departure Centre" or RDC. It aims to facilitate the entry of humanitarian assets and to minimize the operational burden on the airport due to the involvement of large numbers of humanitarian actors (for the details of RDC methodology, see below section "How can airports and incoming actors work together?").

To cope with this expected influx of humanitarian actors, firstly it is important to understand the nature and role of the stakeholders engaged in the aftermath of a major disaster.

2.2 What can airport operators expect during the deployment of international support?

In the aftermath of a major disaster, it is expected that USAR teams, EMTs and other humanitarian responders arrive into an affected country via an airport. These incoming teams are featured by their arrival time, size, type of organization and target disasters. USAR teams and EMTs are usually mandated to respond in the very early phase of disaster (e.g. within 48 hours from the occurrence). They come with established settings with a large number of personnel and equipment. In comparison, other humanitarian responders such as NGOs usually have smaller teams but are greater in number. Hosts of the deployment are not uniform in their organizational background. Some of them are governmental whereas others are non-governmental. In the governmental grouping, this is further divided into civilian or military. Likewise, in the non-governmental, it is further categorized into business based organizations and Civil Society Organization (CSO) type of teams. USAR teams are meant to save lives by extricating victims from reinforced concrete building in urban setting, and accordingly this is likely to be deployed as a result of major earthquakes and building collapse involving disasters. On the other hand, EMTs are likely deployed to wider variety of disasters.

UNDAC

UNDAC is a team of experts of humanitarian coordination that is deployed by OCHA right after a major disaster. UNDAC team consists of a group of individuals (UNDAC members) that are registered in OCHA's roster as humanitarian coordination experts. UNDAC is deployed with consent between an affected country and OCHA, and mandated to support the country's disaster management coordination capacity. UNDAC members normally arrive at the airport individually or as a group of several members without any large facilities, but with some carry-on luggage. The team is expected to arrive as one of the quickest international individual and setup coordination foundation. This includes coordination at airport with the RDC methodology. A UNDAC team is normally deployed with so called "Humanitarian Partners". This varies from camp support with heavy or light camp modules, IT support, mapping and so on. DP-DHL is an example of "Humanitarian Partner" and provides logistics support mainly at an airport, based on their expertise[9].

USAR

For the USAR teams, the UN General Assembly Resolution 57/150 urges "all States, consistent with their applicable measures relating to public safety and national security, to simplify or reduce, as appropriate, the customs and administrative procedures related to the entry, transit, stay and exit of international urban search and rescue teams and their equipment and materials, taking into account the Guidelines of the International Search and Rescue Advisory Group, particularly concerning visas for the rescuers and the quarantining of their animals, the utilization of air space and the import of search and rescue and technical communications equipment, necessary drugs and other relevant materials".

The capacity of USAR teams is categorized as Heavy, Medium and Light[10]. There is an internationally acknowledged accreditation system known as INSARAG External Classification (IEC). About 60 teams around the globe are internationally certified. They are called IEC teams and are trained to support coordination, including Reception Departure Centre (see "How can airports and incoming actors work together?"), a coordination hub that is established in an airport.

EMTs

EMTs are deployed to provide medical services to affected people directly by setting a field clinic/hospital and indirectly by being embedded into existing medical facilities. Their capacity and size are defined according to the following typology. Type 1 is clinical care provider that is further divided into fixed and mobile types. Both types are comparably light in size. Type 2 is larger team with inpatient surgical emergency care capacity, with major medical operations. Type 2 comes with a large camp facility, including high volume water purification and waste management capacity. Type 3 is with inpatient referral care capacity, larger than the Type 2, and may include Intensive Care Units. Other than these, are light teams called "specialized care teams" that are designed to be embedded in local healthcare facility or other medical teams. Similar to USAR teams, there is an international accreditation system by WHO that has currently certified about 30 teams. These teams also comply with international humanitarian coordination methodology, and come with RDC trained personnel to facilitate arrival of incoming EMTs together with airport authority[11].

UNDAC and the UN Global Logistic Cluster work together with the airport authority for facilitation and early coordination of incoming humanitarian teams in time of crisis when a sudden influx of relief aid is expected.

See Get Airports Ready for Disaster (GARD) Programme, Section 4 "Capacity Building"

INSARAG Guidelines 2020 and Coordination Manual https://www.insarag.org/methodology/insarag-guidelines/

EMT Bluebook and EMTCC coordination Manual

2.3 What are the impacts on airport operations?

Historical experience has proved that each disaster scenario is distinctive. Consequently, though disaster responses are based on a general framework, each disaster requires a unique response, which is adapted to the extent of the damage and areas affected. Airports' operations in the affected country or region may be interrupted for a short or extended period in the aftermath of a disaster and the local/regional aviation system's capacity to support the emergency response may be therefore seriously challenged.

How the aviation system and airports in particular will be affected by the disaster, will be subject to the emerging disaster scenario, and may touch any of the following, and not limited to: airports and airfields infrastructure and services, ATS, Civil Aviation Authority functionality, local/regional airlines and their respective fleets, and aviation staffing.

Should United Nations Humanitarian Air Service be established, a number of qualified aviation operations and safety officers will arrive on-site to facilitate aviation response and collaborate with State's aviation stakeholders. In some cases, numerous air operators may show up for support without or with little previous coordination, thus adding considerable pressure into the aviation system in the affected Country. It is important that these air operators coordinate the need for their presence and their arrival with the above mentioned entities in advance.

As mentioned in IATA's publication Fuel Operations after Natural Disasters: Experiences from the industry, 1st Edition, Feb. 2018: ""Especially, in the event of a disaster, the lifeline of the occurrence area and its surrounding areas, such as, the transportation and energy supply will be cut off, so in such a case recovery measures using aircraft will play a very important role."

The 2019 29th ACI World Annual General Assembly's Resolution on Airports and Emergency Humanitarian Response stated the following, within other aspects:

- "Proposes that member airports include disaster relief in the situations covered in their Emergency Response and Business Continuity Plans, prioritized according to an assessment of the risk of different types of disasters occurring in the area of the airport;

- Suggests that in case of crisis, airports have in place the ability to provide additional "surge" capacity such as ability to handle larger aircraft than normal, overflow areas for aircraft parking, storage space for goods, security measures, personnel, equipment and logistics capability;

- Suggests that if the airport is damaged, it should be able to make a rapid assessment of the damaged areas, the reduction in capacity and the type and volume of traffic can it still handle, as well as find solutions to keep the airport open, e.g. if part of the runway has been damaged, it may continue to operate with a displaced runway threshold;

- Suggests that its member airport operators work with governmental agencies such as the national disaster management agency (if existent), the civil protection agency, the civil aviation authority and other relevant authorities, including military, to plan how to act as a logistics hub for disaster relief."

In the event of a major disaster relief operation, the point of entry for international emergency and rescue teams will often be the airport closest to the affected areas. This can have a significant impact on airport operations, which may already be degraded due to the event that has taken place. The types of operations and impacts can include:

- Arrival of numerous relief flights with various types of aircraft that may not be normally operated at the airport. For example, an aircraft configured to carry a HEAVY USAR team as mentioned above (for instance, 25 tons or 100 m3 of equipment, 70 pax, 5 K9) and various controlled substances are likely to land by commercial carrier such as Boeing 777 or Airbus 330;

- The use of the airport as a staging area for relief teams that will be deployed across the affected areas;

- Increased need for storage of aircraft on the airport, as well as increased need for hangar storage space for goods and equipment shipped in to the point of entry;

A number of other non-aviation specific facilities and services are required to facilitate the establishment and day-to-day operations of incoming humanitarian teams. The non-exhaustive list below provides a few examples:

- Cash exchanging service;
- Counter for local transportation (car rental);
- Cell phone and ICT device rental and supplier;
- Accommodation;
- Shower/toilet facilities;
- Restaurant and food stands or any kinds of catering service;
- Connecting transportation from airport terminal.

In addition to managing the aftermath of the event, airport operators will have to manage the sudden increase in demand or the diverse operational requirements that such a relieve effort will require. Adequate pre-planning and development of contingency measures is necessary so as to be able to face these types of situations.

2.4 How can airports and incoming actors work together?

At a high-level, the establishment of local coordination mechanisms is necessary to address both operational and safety related issues. The Airport Authority has a paramount importance in facilitating such mechanisms.

Reception and Departure Centre

In many disasters, there is a need to establish a Reception and Departure Centre (RDC)[12] as a part of the On-site Operations Coordination Centre (OSOCC). Ideally these are established by the national emergency management authorities, of which the national CAA can be a member, but UNDAC internationally classified USAR teams and EMTs are trained and equipped to establish and support these as well. The RDC should be located at the arrival point of international relief teams to facilitate and coordinate their arrival and further deployment. The RDC's primary responsibility is to register teams, provide an initial information briefing, direct teams to the OSOCC or respective coordination hub, and pass processed information of incoming teams to the OSOCC in order to facilitate its operational planning.

The RDC functions as a coordinating body for international relief traffic. It is intended to support the airport authorities with these activities. As the RDC may be the first point of contact for relief teams when arriving in the affected country, it must be prepared to facilitate the same basic services as that expected of an OSOCC. Some of the services expected by an RDC include situational updates, operational information, logistical support, and the facilitation of immigration/customs procedures for staff, equipment and humanitarian aid.

- Number of coordination staff

RDC is established and run by group of UNDAC members and humanitarian partners. In its early phase, it can be manned by USAR teams and/or EMT. The number of coordination staff depends on the situation and it varies from a few to up to 10 staff members.

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https://www.unocha.org/asia-and-pacific-roap/asia-disaster-guide;

https://www.insarag.org/wp-content/uploads/2016/04/INSARAG_Guidelines_V1_Policy1.pdf

- Location of RDC

RDC methodology has mentioned two options to establish an RDC. These are "after custom" or "before custom". In any case, it should be able to communicate with incoming teams for registration and facilitation of their border crossing procedures, and equally importantly, not to disturb airport operations. The location is decided with consent of the airport authority and should not be established without any permission.

- Required facility

The RDC does not require large space for its operation. This could be a small corner of approximately 3M*3M area to be able to set up a few working desks and briefing purpose. The necessary tool for RDC operations are communication tools, office equipment, information aid and so on. Electricity is ideally brought by the RDC staff in order not to put additional burden on the airport authority. If not, they may enquire if the RDC is allowed to use electricity provided on site. As information communication set-up is a high priority among RDC tasks, RDC staff normally run for setting up internet connection device, one well-known product is called BGAN, in the vicinity of outside of airport terminal. It is important for RDC staff to support border-crossing procedure of incoming teams, and they may request an airport to use security identification to walk around restricted area.

- First engagement between Airport and RDC staff

The RDC methodology suggests that RDC staff talks to the airport staff upon their arrival. RDC staff will then seek for meeting with airport operation manager who is in charge of the incident control of the disaster. In the meeting with delegated personnel, RDC staff should firstly explain about who they are and why they are at airport with some technical information about how RDC is able to support airport operations. Once permission is given, RDC staff commence establishing their working environment. They should explain and report to the delegated personnel of the airport on what is happening and what may be happening onward. The key to success RDC or coordination at airport is to establish close communication between the airport side and RDC staff.

UNDAC is deployed by OCHA with consent of the host government. However, this official announcement might not yet have reached all authorities. In this case, the while the airport authority seeks information from its line ministry, the RDC staff should provide a credentials.

Cross-Border Facilitation Measures for Disaster Relief

A number of international instruments call for the easing of restrictions on overflight, landing, carrier

privileges (e.g., concerning cabotage), and the waiver of any associated fees or taxes (without particular reference to recognition by the UN). In particular:

Annex 9 of the Chicago convention of the International Civil Aviation on "Facilitation" requests ICAO Member States to "facilitate the entry into, departure from and transit through their territories of aircraft engaged in relief flights performed by or on behalf of international organizations recognized by the UN or by or on behalf of States themselves", as well as to "ensure that personnel and articles arriving on relief flights . . . are cleared without delay."

   a. UN CEFACT Policy Recommendation on Cross Border Facilitation Measures for Disaster Relief
   b. Guidelines for the domestic facilitation and regulation of international disaster relief and initial recovery assistance

In some cases such as aerial forest firefighting, due to a multitude of aircraft types and crews for which regulations and certifications are not harmonized between states, the ability to operate from one State to another is compromised, which can greatly slow down the emergency response time.

Consistent communication strategy

A communication strategy identifies the type of information to be delivered, the target audience, the format for communicating it, and the timing of its release and distribution. The essence of developing an effective, efficient and most importantly trustful communication strategy narrows down to clearly answering the following questions:

   • What type of data/information are we compiling, validating or sharing?
   • Who are our direct and indirect stakeholders?
   • How are we compiling, validating or sharing our information? and

In the event of a crisis affecting aviation infrastructure and services, ICAO can play a key role in supporting effective information exchange between the aviation sector and the humanitarian community. The role of States cannot be substituted but complementary tools can be envisaged to facilitate the timely flow of reliable aviation information to the humanitarian community.

What is likely to be required for working together at the airport?

In the case of a major event, numerous entities will congregate at the airport. The airport has a central role in providing facilities, connectivity and logistics to these organizations. These arrangements may include the availability of resources such as working space, electricity, internet connection, office supply and so on. Also this is extended to procedure support, such as permission to get security passes for coordination staff, use of areas, detailed information about airport facilities such as warehouse/ ground handling areas/ parking lots, and negotiation for Customs, Immigration and Quarantine (CIQ) process on behalf of entire humanitarian community.

In return, coordination staff may be able to provide information about who is deploying, what kind of teams with what size. Point of Departure (POD), Estimated Time on Arrival (ETA), aircraft type, contact information, and so on. That may be of some help for airport authority to plan ahead.

The Requesting or Receiving Party shall also ensure that the Operational Focal Points are available on standby at the Customs, Immigration and Quarantine (CIQ) facility during this process to facilitate the clearance of the arriving assets and capacities. Where necessary and appropriate, the coordination centre for humanitarian assistance shall facilitate the processing of exemptions and facilitate the process for transit or personnel, equipment, facilities and materials in respect of the provisions of the assistance

III
CHALLENGES OBSERVED DURING DISASTER RESPONSE

III. Challenges observed during disaster response

As previously highlighted, each disaster develops within a unique scenario, which requires the adoption of a flexible response to adapt the plans to the reality. Nevertheless, the below challenges and bottlenecks may be taken into consideration a priori.

1. Identification of operational issues in the case of disasters

Communication flow The main bottlenecks in the aftermath of a natural disaster reside is the availability of reliable and timely information about the changes and possible degradation in airport capacity and operational capability. It is correlated to the ability of airports to accommodate large influx of passengers and cargo. The humanitarian aid system strives to provide much needed life-saving help and support. Effective coordination allows all stakeholders to complement each other[13] and the Logistics Cluster plays a critical role in facilitating this.

- Lack of updated airport's operational status and airport's services information;
- Lack of updated alternate airports' or airfields' operational status and services information;
- Lack of information regarding entities in charge of the coordination and management of the emergency.

Gap between humanitarian needs and operational capabilities during disasters A challenge is to balance the needs of the humanitarian communities and the capabilities of the aviation sectors and to adjust the guidance provided depending on whether or not the airport has been damaged and is operating under degraded capacity.

Examples of related bottlenecks may be:

- Lack of aircraft's parking stands, inadequate ground handling capabilities and/or overloading of cargo storage facilities;
- Lack of technical personnel to operate the different systems due to being personally affected by the disaster;
- Logistics capacities and resources related to impact of the disaster on airport facilities;
- Increased traffic on airports that are not prepared for that.

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13) https://www.humanitarianresponse.info/en/coordination/clusters/document/iasc-guidance-note-using-cluster-approach-strengthen-humanitarian; https://interagencystandingcommittee.org/system/files/2020-11/Reference%20Module%20for%20Cluster%20Coordination%20at%20Country%20Level%20%28revised%20July%202015%29.pdf.

Training needs. There is a significant growth in the number of States that have set up national disaster management authorities, civil protection systems and legislation to regulate incoming aid, leading to a more central role for affected States and populations. It also means that outreach and training activities should target all stakeholders and the essential aspects of coordination between the humanitarian sector and the aviation sector should be conveyed. Similarly, the number of NGOs and private companies supporting humanitarian action increases. It makes the disaster response coordination more complex and requires the standardization of procedures and communications protocols, as well as their harmonized understanding and implementation.

Examples of related bottlenecks may be:

- Lack of awareness regarding other stakeholders present in the emergency;
- Duplication of efforts.

Local communities and affected people are expected to play a more proactive role.

Access to communication technologies is growing fast. As a result, more individuals have access to information about hazards, risks, humanitarian response and their rights in emergencies. They should become an active part of the disaster response strategy, supplementing the official information available.

Examples of related bottlenecks may be:

- To facilitate the necessary dynamic flow of information and communication while at the same time assuring the communication and information shared is reliable and endorsed by the relevant authorities.

The climate crisis. It will shape almost every aspect of humanitarian response, adding a level of complexity and a layer of risk. Preparedness activities have to factor-in this risk. Climate change mitigation and adaptation plans and actions help better anticipate and reduce these risks.

Examples of related bottlenecks may be:

- The repeated frequency of disasters challenge the existing contingency plans and the available response capacity.

2. Identification of operational issues in the case of pandemics and public health emergencies

The identification of operational bottlenecks in the case of pandemics and public health emergencies present specific challenges, which the COVID-19 pandemic exemplified.

Travel restrictions and the closing of borders probe the main bottlenecks in the case of pandemics and public health emergencies, as they have a ripple effect on operations. In the most recent COVID-19 pandemic, the ability to plan humanitarian missions or even individual travel encountered various challenges, including the inconsistent and continuously changing health protocols.

The ability to fly into a destination depends on the availability of a flight permission (to overfly and to land). In addition, the availability and reliability of data and information flow across the supply chain support sound decision-making and ensure a seamless operation. In order to safely plan a flight/mission, information about the destination and other factors, such as the availability of alternate airports are critical.

The ability to adapt quickly to a changing environment and requirements can prevent delays or even the non-arrival of critical items to locations suffering from the public health emergency. With the outbreak of COVID-19, demand soared for ventilators, facemasks, protective gear, gloves and disinfectants. When space in the belly of passenger aircraft dried up, airlines were innovative in availing additional cargo capacity. The quick move to adapt to receiving and handling different types of aircraft was key in ensuring that critical goods and essential workers arrive where they are needed, when they are needed.

Communications protocols need to integrate elements on public health and medical procedures. Their operational impact, such as measures to limit the spread of infectious disease, have to be understood and implemented by non-medical specialist. During a pandemic or a public health emergency, additional actors need to be involved. Medical and health professionals should be part of the strategic or tactical planning and execution of flight operations. In this respect, the ICAO Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA) programme offers a voluntary cross-sectorial, multi-organizational collaboration programme managed by the International Civil Aviation Organization (ICAO) with support from the World Health Organization (WHO). It brings together international, regional, national and local organizations to combine efforts to improve preparedness planning and response to public health events that affect the aviation sector.

In order to respond to the challenges posed by the outbreak of the COVID-19 pandemic, ICAO has developed a series of material to facilitate the implementation of mitigation measures, in close cooperation with all international aviation stakeholders, UN entities and under the leadership of the ICAO Council Aviation Recovery Task Force (CART). In developing the measures contained in these documents, the CART was guided by the following considerations:

1. Remain Focused on Fundamentals: Safety, Security, and Efficiency;
2. Promote Public Health and Confidence among Passengers, Aviation Workers, and the General Public; and
3. Recognize Aviation as a Driver of Economic Recovery.

Based on these guiding considerations, the CART further agreed that these measures should be:

- implemented in a multi-layer approach commensurate to the risk level and shall not compromise aviation safety and security;

- able to capitalize on the sector's longstanding experience and apply the same principles used for safety and security risk management. This includes monitoring compliance, reviewing the effectiveness of measures at regular intervals, and adapting measures to changing needs as well as improved methods and technologies

- able to minimize negative operational and efficiency impacts while strengthening and promoting public confidence and aviation public health;

- consistent and harmonized to the greatest extent appropriate, yet flexible enough to respond to regional or situational risk-assessment and risk-tolerance. The acceptance of equivalent measures based on shared principles and internationally recognized criteria will be a fundamental enabler to restore air services on a global level;

- supported by medical evidence and consistent with health best practices;

- non-discriminatory, evidence-based, and transparent;

- cost effective, proportionate and not undermining to the equal opportunity to compete;

- highly visible, and communicated effectively and clearly to the aviation community as well as the general public; and

- consistent with international requirements, standards, and recommended practices applicable to aviation and public health.

IV
PREPAREDNESS FOR REPAREDNESSS FOR ENHANCED COOPERATION

IV. Preparedness for enhanced cooperation

1. Disaster Preparedness Planning

Infrastructure resiliency, and procedural and organizational robustness are necessary to address coordination challenges during a major disruption or disaster. Especially when there is limited or no reliable information and high time pressure, normal operation procedures no longer fully apply. A thorough understanding of the vulnerabilities, robustness and resilience of the aviation system during and after a disaster is critical in order to take appropriate preparedness measures, adapted to the multiple risks identified.

The occurrence of extreme events does not only disrupt the location in which they occur but may impact neighboring countries and extend to the whole region. This is especially true for international aviation, where an operational disruption at one airport has spillover effects across the aviation network. In the immediate aftermath of a crisis event, airports are faced with two critical challenges: 1) the disruption of the airport and ATC infrastructure, limiting air traffic and reducing cargo handling capacity; and 2) the need to sustain operating conditions allowing the airport to serve as a logistics hub for the humanitarian response operations and recovery.

Based upon the experience gained over the past years, countries have adopted a series of UN frameworks addressing disaster reduction, including the Sendai Framework for Disaster Risk Reduction. The Sendai Framework introduces calls for **disaster risk management,** as opposed to **disaster management** and underlines disaster risk management as a key enabler to sustainable development.

The 39th Assembly of ICAO directed "the Council to establish a crisis response policy"[14]. One of the key activities under that policy is ICAO's assistance to States in incorporating disaster risk reduction priorities relevant to aviation and consistent with the intent of the Sendai Framework for Disaster Risk Reduction, in the development of the State emergency response plans. In this context, risks relate to aircraft accidents, natural and man-made disasters, acts of unlawful interference and pandemics that significantly impact international air transport and affect public confidence in the safety and security of air transportation. In addition, the Ministerial Declaration of the High-level Conference on COVID-19 adopted on 22 October 2022, included a commitment

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14) Assembly Resolution A39-24 Strategy on Disaster Risk Reduction and Response Mechanisms in Aviation

"to ensuring that ICAO is well positioned to support the long-term resilience of international aviation and incorporate the lessons learned from the current and past pandemics, by enhancing its crisis response capability, and regularly reviewing and updating ICAO's Standards and Recommended Practices and guidance materials as may be required".

When developing disaster preparedness planning, it is crucial that States integrate aviation preparedness from the outset, considering that the aviation sector, while potentially affected by a disaster, can also act as an important vector for efficient response and longer-term recovery.

The multi-sector, integrated approach advocated by the Sendai Framework for Disaster Risk Reduction is consistent with the role of States, which need to ensure that proper communications and coordination mechanisms are set-up to allow for the provision of immediate assistance after a natural disaster.Such coordination is undertaken through the involvement of various national agencies and authorities.

1.1 Enhanced Disaster Preparedness and Resilience

The convergence between disaster risk reduction, sustainable development, financing for development, and climate change mitigation and adaptation presents a unique opportunity for increased coherence and impact at the global and the local levels. Several guidance documents have been developed to help States and international aviation stakeholders engage in a resilient path. Specifically, on the issue of the resilience of the international aviation sector in the face of extreme weather events due to climate change, ICAO has developed a "Climate Adaptation Synthesis"[15] which identifies potential impacts of climate change that may affect the global aviation sector, together with concrete adaptation and resiliency measures that may be implemented to tackle them. The ICAO Eco-Airport Toolkit[16] provides practical and ready-to-use information to improve airport climate resilience. Also, as disaster risk management activity suggests upfront investments, it should be supported by a strong business case based on robust data that illustrates costs and benefits of the proposed activities. and will form the basis for a dialogue with all involved stakeholders (see Appendix C). ICAO has developed guidance to States and private sector stakeholders on investments in aviation infrastructure[17] or on assessing the role of aviation in national economies worldwide[18].

2. Emergency plans

2.1 Airspace contingency plan

Often during an emergency situation there is little or no information available for operators to make

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15) https://www.icao.int/environmental-protection/Pages/Climate-Adaptation.aspx

16) https://www.icao.int/environmental-protection/Pages/Ecoairports.aspx

17) https://www.icao.int/sustainability/Pages/eap-infrastructure-management.aspx

18) Aviation Satellite Account (icao.int);

operational decisions. Communication and coordination are essential to ensure the right flow of information is exchanged, and the effective use of resources. This is particularly important during a natural disaster when air operators play an essential role in transporting goods and passengers for humanitarian relief, and for evacuations.

As per ICAO Annex 11, Attachment C, ICAO will be available for monitoring developments that might lead to events requiring airspace contingency arrangements to be developed and applied and will, as necessary, assist in the development and application of such arrangements. During the emergence of a potential crisis, competent staff established in the Regional Office(s) concerned and at ICAO Headquarters in Montreal monitor continuously information from all relevant sources, arrange for the constant supply of relevant information received by the State aeronautical information service at the location of the Regional Office and Headquarters, liaise with international organizations concerned and their regional organizations, as appropriate, and exchange up-to-date information with States directly concerned and States which are potential participants in contingency arrangements. In the event a State would not be able to discharge its obligations under the Chicago Convention, upon analysis of all available data, authority for initiating the action considered necessary in the circumstances will be obtained from the State(s) concerned.

2.2 Aerodrome emergency plan

Aerodromes are a critical asset during a regional disaster or major occurrence. They can provide vital resources and functions to assist during and after the emergency. However, in some circumstances aerodromes may require assistance to maintain and restore operations. Moreover, aerodromes may have unique challenges in either providing or receiving assistance during a disaster.

According to ICAO Annex 14,Vol I paragraph 9.1.1, "An Aerodrome Emergency Plan shall be established at an aerodrome, commensurate with the aircraft operations and other activities conducted at the aerodrome." An Aerodrome Emergency Plan (AEP) is a document that establishes the guidelines for the management of major emergencies, and defines the roles and responsibilities of the principal responding agencies. Basically, an AEP aims at providing a timely and coordinated response to and recovery from an emergency at an aerodrome. Although AEPs are traditionally focusing on aircraft accidents, the principles laid down in Annex 14, Vol I are applicable in a number of different scenarios. The information provided in section II.2. of this document should provide additional elements for consideration to enhance coordination when a disaster requires support from the international community.

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19) Emergency Preparedness and Contingency Planning Handbook, First Edition (2014), Airports Council International

In line with the obligations of the States, the airport operator is strongly encouraged to consider generally foreseeable events such as industrial action or labour unrest affecting the provision of aerodrome operations. It should also support relevant entities in assessing risk to civil air traffic due to military conflict or acts of unlawful interference with civil aviation, as well as review the likelihood and possible consequences of natural disasters or public health emergencies. The success of the response has been shown to be dependent on the planning, organization and exercises, including division of areas and tasks and the communication and preparedness of the responding personnel and co-ordination between agencies.

Analysis of potential hazards and risks could be used to identify the type and quantity of resources needed to achieve specific AEP goals. Using the "risk management" approach should assist an aerodrome's management in producing a more efficient Emergency Response Plan (ERP) process (see Appendix C).

The AEP should clearly define the obligations, controls and limitations placed on the aerodrome operator by government agencies. Depending on the location of the aerodrome, and depending on national regulations or mutual aid agreements, the AEP might include the integration of military operations during an emergency.

The aerodrome operator is responsible for establishing, promulgating and implementing the AEP and ensuring efficient coordination among all applicable service providers at the aerodrome, as well as agencies associated with response to an emergency. Indeed, a number of agencies on the airport site or outside of the airport perimeter should be involved for an effective response, these are for example, but not limited to rescue and firefighting, police, medical services, immigration, customs[20].

According to ICAO Annex 19, Appendix 2, paragraph 1.4, the aerodrome operator must ensure through its Safety Management System that its ERP is properly coordinated with the ERPs of those organizations with which it must interface during the provision of its products and services.

The aerodrome operator should delegate a person to manage an Emergency Operations Centre (EOC), which is responsible for coordinating the activities of all agencies and services responding to an emergency. The aerodrome operator/EOC also arranges necessary meetings of the aerodrome emergency plan coordinating committee committee – which is composed of key personnel from participating agencies – to critique the plan after it has been tested or implemented.

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20) ICAO Doc. 9137, Airport Services Manual, Part 7, Chapter 3

The aerodrome operator should be prepared for dangerous goods on board aircraft in an emergency and include in the AEP measures for handling dangerous goods during an emergency. Those processes should correspond to processes which ensure cargo safety at the aerodrome. Items on board aircraft in emergency may include lithium batteries and other explosive or flammable goods[21].

2.3 Coordination ATC and Aerodrome

A formal coordination process between the emergency response procedures of ATC services and the aerodrome operator's ERP should be in place. As a result, stakeholders should develop an interface between their respective emergency plans.

Depending on the aerodrome's capacity, interruption of regular operations or even closure for a period of time may be necessary in the event of an emergency. If the aerodrome operation is disturbed by an emergency or for any other reason, a Notice to Airmen (NOTAM) should be issued in accordance with Aeronautical Information Service (AIS) procedures (see paragraph 3 "Enhanced Information Flow"). SARPs for NOTAMs and other elements of the Integrated Aeronautical Information Package which may be relevant are contained in ICAO Annex 15, Aeronautical Information Services. Where applicable, a Memorandum of Understanding with surrounding aerodrome facilities may be developed to ensure potential alternate aerodromes are available when diversions are required.

For Air Navigations Services, guidance material relating to the development, promulgation and implementation of contingency plans is contained in Attachment C to Annex 11 *Air Traffic Services.* The guidelines have been developed in recognition of the fact that circumstances before and during events causing disruptions of services to international civil aviation vary widely and that contingency measures, including access to designated aerodromes for humanitarian reasons, in response to specific events and circumstances must be adapted to these circumstances. They set forth the allocation of responsibility among States and ICAO for the conduct of contingency planning and the measures to be taken into consideration in developing, applying and terminating the application of such plans. The guidelines are based on experience which has shown that the effects of disruption of services in particular portions of airspace are likely to affect significantly the services in adjacent airspace, thereby creating a requirement for international coordination, with the assistance of ICAO as appropriate (see "Crisis Coordination Teams" in section 3 below).

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21) ICAO Annex 18 "Safe Transport of Dangerous Goods by Air";

https://www.icao.int/safety/DangerousGoods/Pages/annex-18.aspx

2.4 Post-operation review –lessons learned

An important aspect of building a resilient aviation system and enhancing crisis response operations is how to capture the lessons learned and continuously improve the system. Priority 4 under the Sendai Framework for Disaster Risk Reduction is enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction. In this spirit, the development of lessons learned should be a collaborative endeavour, with all stakeholders involved in the crisis response. Lessons learned should span across generic subjects such as the existence and relevance of the emergency plans, the results achieved in light of the initial objectives, the identification of root-cause and remediation actions, as well as subjects that are specific to the role of stakeholders in the response.

For airports, questions guiding the lessons learned process are available in Annex G. However, all stakeholders, States, air navigation service providers, airports, and airline operators, the humanitarian community, logistics companies should conduct post-operation reviews that will assist States in building local capacity that will sustain projected stressors and determine how the results can be used in the context of collaborative preparedness activities. Developing use cases could benefit other States or regions.

3. Enhanced information flow

The development of an effective information flow and communication activities between interested stakeholders, especially between the aviation sector and the humanitarian community, is a key element of enhanced preparedness to future disaster response.

3.1 Total Optimization and Partial Optimization of humanitarian flows

An airport is a critical hub for international incoming relief supplies and teams. However, it is equally important to move these relief supplies and teams from the airport to the actual field where humanitarian activities are conducted. Otherwise, the airport will experience serious congestion, which may affect its operations.

From the perspective of maintaining efficient airport operations during a disaster, it is necessary to consider how an airport can maintain high throughput of incoming relief supplies and relief teams when there might be a degradation of airport capacity and operational capability caused by that disaster. A comprehensive approach is needed to address this challenge and collaborative decision-making will be needed to ensure information and the smooth processing of passengers and cargo. The Airport Collaborative Decision-making (A-CDM) helps improve the performance of airport operations.

An enhanced cooperation role for the airport authority with stakeholders, such as ground transportation, could be an extended element of the airport contingency plan, whereby coordination between airside and landside would be improved.

3.2 Airport Status Information Tool (ASIT), a blockchain-based technical solution

Since February 2021, ICAO and its partners in the framework of the Humanitarian Assistance and Disaster Response in Aviation (HADRA) Expert Group have been working alongside the technology firm Block Aero to implement a blockchain technology tool that will allow the humanitarian and aviation stakeholders to have access to timely and reliable information critical to crisis planning and response. Such information is typically disseminated by OCHA to its partners. This communication tool may also have the effect of prompting a discussion among the various entities and relevant agencies involved in the implementation of emergency response plans at the national level. It is being developed based on an iterative approach, and subject to a series of beta tests.

- Inter and intra agent (stakeholders) communication management;
- Data Compilation;
- Data Validation;
- Data Dissemination; and
- Stakeholder engagement;

With appropriate implementation of combination of blockchain / AI / web 3.0 technology the following results are achieved:

- Automated API data feeds
- Standardized reporting format
- Standardized reporting process
- Known sources
- Version control and traceability
- Validation by state authorities
- Immutable record of events
- Analytics for continuous improvement of emergency information management

3.3 Crisis Coordination Team

The activation of a Crisis Coordination Teams (CCT) should typically enable the identification of the operational challenges resulting from a disaster and engaging with the relevant local and regional stakeholders to ensure safe operations. The humanitarian community could be engaged upon the activation of a CCT. The establishment of a Crisis Coordination Team would provide added value to the delivery of humanitarian assistance after a disaster. The generic terms of reference of a CCT could be complemented with case studies and best practices from National Disaster Management Authorities, including proposed guidance on the prior prioritization request for humanitarian flights.

CCTs have been successfully implemented at the tactical level in several ICAO Regional Offices. Another successful initiative is the IATA teams embedded in the U.S. Federal Aviation Administration (FAA) Command Center and Eurocontrol, which support airline operators during contingency scenarios. However, the availability of reliable information on the status of local airports remains a challenge during a disaster.

Aeronautical Information Services[22] encompasses States' obligations in relation to the provision of timely and reliable aeronautical data and information covering its own territory and those areas over the high seas for which it is responsible for the provision of Air Traffic Services. Such information should be made available to the air traffic management community in order to ensure the safety, regularity and efficiency of air navigation. Aeronautical information shall be shared in a suitable format via the relevant aeronautical information products.

Notice to Airmen (NOTAM) is of particular importance during and after a disaster. A NOTAM is "a notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations." NOTAMs are issued under the authority of the CAA. They are an invaluable source of information, as soon as aircraft operations are affected. States are required to issue NOTAMs under a number of circumstances, some of which are listed here:

- Lack of aircraft's parking stands, inadequate ground handling capabilities and/or overloading of cargo storage facilities;
- Lack of technical personnel to operate the different systems due to being personally affected by the disaster;
- Logistics capacities and resources related to impact of the disaster on airport facilities;
- Increased traffic on airports that are not prepared for that.

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22) Annex 15 to the Chicago Convention on International Civil Aviation (Chicago Convention) – Aeronautical Information Services

However, under certain circumstances, the authority in charge of issuing NOTAMS and similar aeronautical information may not be functional. The possibility for another State, ICAO or a Regional Organization to perform this function shall be considered in the contingency plan.

Aeronautical Information Publications (AIP) are intended primarily to satisfy international requirements for the exchange of aeronautical information of a lasting character essential to air navigation. It constitutes the basic information source for permanent information and long duration temporary changes.

On-site Operations Coordination Center (OSOCC)

The On-Site Operations Coordination Centre (OSOCC)

concept was originally developed by UN OCHA and the International Search and Rescue Advisory Group (INSARAG) network. It was designed to assist affected countries in coordinating international search-and-rescue efforts following an earthquake. However, OSOCC's emergency management principles make it a valuable tool in any sudden-onset disaster involving international relief resources. Over the last decade, the OSOCC concept has been used during numerous disasters including floods, hurricanes, tsunamis and complex emergencies.

An OSOCC is set up to help local authorities in a disaster-affected country to coordinate international relief. Following a disaster, the OSOCC is established as soon as possible by the first arriving international urban search-and-rescue team or United Nations Disaster Assessment and Coordination team deployed by OCHA.

An OSOCC has three primary objectives:

- To be a link between international responders and the Government of the affected country.
  To provide a system for coordinating and facilitating the activities of international relief efforts at a
- disaster site, notably following an earthquake, where the coordination of many international USAR teams is critical to ensure optimal rescue efforts.
- To provide a platform for cooperation, coordination and information management among international
- humanitarian agencies.

The OSOCC's size and functions vary according to the scale of the disaster. However, the basic structure (shown in the graphic below) should be modified to suit the requirements of each situation.
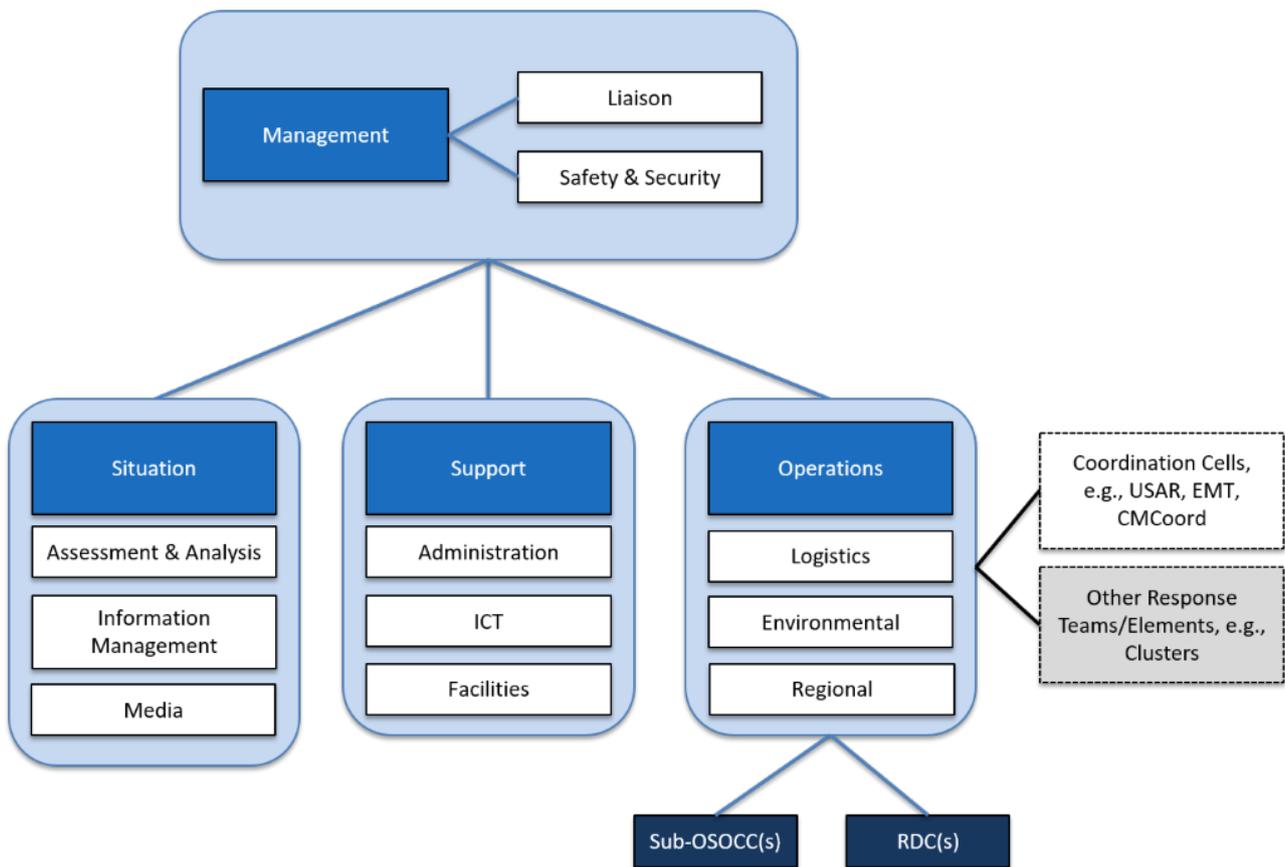
The contingency planning activities undertaken by the States should cover the aspects related to the implementation and functioning of a specific Air Operations Control Center. This should be a specialized element with the relevant authority for the function, and it should work in close coordination with the OSOCC for all aspects related to aviation operations.

Virtual On-Site Operations Coordination Centre (Virtual OSOCC): It is a real-time disaster coordination mechanism managed by OCHA and established to facilitate the access of all stakeholders involved in crisis response to relevant operational information. It is usually activated during the two to three weeks after the outbreak of an emergency.

Logistics Capacity Assessment (LCA): It lists the key logistics information of over 100 countries. It is open to the public. The information is regularly updated as a result of the collaboration between the humanitarian and the private sector partners[23].

Logistics Information Exchange (LOG.IE): It is a data analysis tool designed to contribute to enhanced planning in the preparedness, readiness and response phases of a disaster. In relation to the preparedness and readiness phase, the tool includes historical data (e.g. hurricane paths, fault lines, flood areas…)

and information on the infrastructure capacity from the Logistics Capacity Assessment. In relation to the response phase, the tool provides close to real time updates on road closure, airport closure, routing options or regulations.

23) https://dlca.logcluster.org/display/public/DLCA/LCA+Homepage

4. Capacity building

This section provides a non-exhaustive overview of several trainings that are available. They meet different purposes and individual stakeholders should assess their own needs prior to engaging in a training.

4.1 General considerations

In general, the trainings should consider the different potential scenarios for which challenges should be identified, for example:

- Scenario 1: country localized disaster, or
- Scenario 2: multi-country disaster, w
    o is manageable by the affected country/group of countries; or
    o requires external support to the affected country/group of countries.

For any of the two scenarios above, the following elements could be considered for the preparation of the response plans (non-exhaustive list):

- ATC limited and/or non-operational *(alternatives to be considered)*
- Aviation infrastructure partially or totally affected *(identification of various options)*
- Aviation services partially or totally affected *(alternatives to be considered)*
- Aviation staff not able to work *(identification of alternate staff options)*
- Local airlines and air operators affected *(alternatives services to be considered)*
- Civil Aviation Authority unable to operate *(identification of various options)*
- Possible support from the military *(local or foreign)*
- Updating the aeronautical information and info dissemination *(identification of various options)*
- Saturation of airspace by foreign aircraft *(ordering and controlling)*
- Facilitating the mission of relief organizations and military operations *(coordination protocols)*
- Operation in remote areas *(best possible normalization of operating conditions)*
- Design, coordination and issue of emergency procedures *(implementation of existing protocols and coordination mechanisms)*
- Utilization of new technologies *(understanding of their use, benefits and application, coordination)*

Trainings could take place through dedicated regional working groups and a common methodology could be developed for this purpose, which would foster meetings and drills extended beyond aviation stakeholders. This could be an opportunity to set-up a model chart of actions and lists of contacts, and updating related provision

4.2 Get Airports Ready for Disaster (GARD)

Get Airports Ready for Disaster (GARD) is a public-private partnership between the United Nations Development Programme (UNDP) and Deutsche Post DHL (DP DHL) to address the need for preparedness and response capacity of airports in disaster situations. GARD assesses the capacity of an airport to manage the influx of humanitarian aid and rescue personnel in disaster response situations; it trains airport staff and disaster responders on how to manage this influx; and it helps authorities to develop an action plan to increase the response capacity in case of disaster and to guide response operations at the airport.

Since its setup in 2009, GARD has been conducted at more than 50 airports in 26 countries and trained 1,250 staff. National ownership is critical for both the sustainability of the capacity building aspect of GARD workshops as well as for the effectiveness of follow-up measures. Nominating a GARD Owner and holding pre-training meetings ensure that all stakeholders are well informed about the role of the GARD Owner and expectations of the workshop. A GARD intervention has proven most impactful in contexts where the national authorities embedded it within their airport and national disaster preparedness plans.

The offer of GARD is demand driven. For every country, the GARD training package is tailored to address the priorities of the requesting airport authority and national government. The standard GARD workshop format is complemented by three other options: GARD Plus, GARD Train the Facilitator and Digital GARD.
GARD Plus is a workshop format aimed at monitoring the progress of implementation of the airport capacity assessment recommendations established following the standard one-week GARD workshop. As part of GARD Plus, the key measures which had been identified during the initial GARD workshop are typically reviewed and updated. To foster the knowledge gained during the GARD workshop, GARD Plus may also include a practical simulation exercise.

In view of the increasing demands to better prepare regional airports for natural disasters, GARD Train the Facilitator has been established to scale up the GARD program within countries that are above average risk. The GARD Train the Facilitator program trains local topic experts to become facilitators and conduct GARD workshops in their own countries. GARD Train the Facilitator was piloted at the Calicut International Airport in Kozhikode City, India, in 2016. 14 airport operations experts from across India gathered for a five-day training workshop to learn how to evaluate the current level of preparedness at airports, conduct training exercises, and develop specific recommendations and ready an action plan to ensure that airports are prepared for future disasters.

Digital GARD is currently being developed by the project team. The two-day virtual workshop includes online sessions and an on-site visit to the airport. The aim of Digital GARD is to facilitate the organization of a standard GARD workshop or to offer remote assistance when a standard workshop cannot be organized.

4.3 Compliance with Standards and Recommended Practices (SARPs) and trainings

ICAO audit programme

The Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA) provides a mechanism for ICAO to collect and analyze safety information from Member States and other stakeholders in order to identify and prioritize appropriate oversight and monitoring activities to be carried out by ICAO.

Audits and other monitoring activities are performed by USOAP to determine the safety oversight and accident/incident investigation capabilities of its Member States by:

- Assessing their effective implementation of the 8 Critical Elements (CEs) in 8 audit areas (i.e. LEG, ORG, PEL, OPS, AIR, AIG, ANS and AGA) through Protocol Questions (PQs); and
- Verifying the status of the Member States' implementation of:

  - Safety-related ICAO Standards and Recommended Practices (SARPs);

  – Associated procedures; and

  – Guidance material.

Computer-based training (CBT) is offered through ICAO's Global Aviation Training (GAT) in two Phases.

- Phase 1 CBT provides a general overview of the USOAP CMA, as well as auditing techniques that are used; and
- Phase 2 consists in a separate CBT for each of the audit areas. It enables the learner to gain knowledge on auditing techniques to be applied and enhances their competencies in the specific audit area of the module as it relates to USOAP. The course focuses specifically on identifying Protocol Questions, developing related auditing techniques, and exploring key documents and guidance material.

The Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA)

The CAPSCA programme assesses compliance with ICAO SARPs and the International Health Regulations (IHR). It provides training, including workshops and table-top simulation exercises as well as practical simulations. These are followed-up by tailored-made recommendations for the stakeholders involved.

The Global Aviation Training hub

The Global Aviation Training (GAT) is responsible for the overall planning, management and coordination of ICAO aviation training activities. GAT facilitates the global implementation of ICAO provisions, sets acceptable training and qualifications standards and frameworks, and provides guidance to States and the industry in skills development.

GAT manages training in an orderly sequence starting with assessments of training organizations to evaluate their level of compliance with international standards, followed by the standardization of design and development of their course material in three stages: analysis, design, and production to identify training needs and the permanent cycle of evaluation. In addition, GAT generates partnership agreements with higher education institutions, industry stakeholders and international organization to implement ICAO-recognized courses throughout its global network of Partners that share access to the ICAO partnership training catalogue. GAT also defines training standards and encourages States to harmonize their training programmes.

GAT established targeted partnerships on urgent post-pandemic recovery topics, such as the collaboration with CAA International (UK CAAi) on "CAA Operational Recovery during a pandemic", and the collaboration with the International Air Cargo Association (TIACA) on "Safe Supply Chain", which includes topics concerning the safe transportation of vaccines, as well how to safely handle the increased cargo movements during the pandemic.

With regard to ICAO course development, GAT has focused on topics addressing challenges faced by civil aviation during the pandemic and post pandemic. The strategies consist of continuing the development of self-study online courses, and considering course development in both traditional classroom and virtual classroom formats, when applicable. So far, 40 ICAO virtual classroom courses are offered in the GAT training portfolio. Meanwhile, Key Competencies Programme (KCP) has been developed based on the ANB webinars to provide learners with key competencies on COVID-19 issues through a series of online training courses.

ACI training

In pursuit of promoting safer airport operations ACI has developed the Airport Excellence (APEX) Programmes, which currently includes APEX in Safety and APEX in Security.

The programme is based on ICAO standards, national regulations and ACI best practices and consists of a peer review of an airport by other airport professionals with the aim of improving operational safety,

security and resilience. The APEX Programmes combine the mandate for regulatory compliance with day-to-day operational needs to maximize operational efficiency and safety and/or security standards. Moreover, APEX Reviews are tailored to the individual needs of airports and APEX Reports propose effective and targeted solutions to airport operators.

IATA training and tools for emergency response

IATA offers different courses to assist airlines and airports in preparing for emergencies and crises[24]. A list of these courses are included in the following;

1. Emergency Planning and Response for Airlines (LIVE virtual classroom)
2. Emergency Planning and Response for Airlines (Classroom)
3. Emergency Response Fundamentals for Airports and GSPs (LIVE virtual classroom)

The IATA Emergency Response Best Practices Handbook includes information to help airlines deal with all aspects of emergency response preparedness. Developed by the IATA Emergency Response Planning Task Force, in collaboration with IATA member airlines, the handbook is designed to enable operators to:

- Create a robust emergency response plan, aligned with industry best practices;
- Benefit from lessons learned, improvements and best practices gained from live activations;
- Learn how to handle communications during a crisis situation;
- Navigate the intricacies of social media during an incident under the full glare of public scrutiny; and
- Gain accurate and reliable resources to optimize your activation protocols.

IATA has also developed a template emergency response plan related to public health emergency[25]. Several resources were made available for airlines and aviation stakeholders with the outbreak of the COVID-19 pandemic[26].

4.4 Simulation exercises

Pre-plan Simulation

They consist in implementing pilot tests to simulate airport response in the event of a disaster. Different variables are considered, such as runway condition, overflight conditions, runway lights, status of the tower, and the development of contingency plans can be guided by the following questions: has the approach been tested? can a large airplane land? are there water damages? debris removal? Airport security status? Access to and from the airport? Is there slot coordination?. Such pre-plan simulations are useful in identifying the elements to integrate in the contingency plan.

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24) https://www.iata.org/en/training/courses/

25) https://www.iata.org/contentassets/f1163430bba94512a583eb6d6b24aa56/airlines-erp-checklist.pdf

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The International Search and Rescue Advisory Group (INSARAG) is a network of disaster-prone and disaster-responding countries and organizations dedicated to urban search and rescue (USAR) and operational field coordination. INSARAG was established in 1991 to facilitate coordination between the international USAR teams that make themselves available for deployment to countries experiencing devastating events of structural collapse due primarily to earthquakes.

As part of the implementation of the General Assembly Resolution 57/150 on "Strengthening the effectiveness and coordination of urban search and rescue assistance", the INSARAG organize multi-stakeholders training exercises to strengthen the national response capacity of the host country.

INSARAG simulation exercises seek to strengthen a country's response capacity to a major earthquake disaster and to enhance its ability to work with international partners and agencies during the initial humanitarian phase of any emergency .

V
CONCLUSIONS

V. Conclusions

At the international level, a number of Standards, guidance documents and methodologies exist, which each covers a different aspect of a coordinated disaster response in aviation. The objective of this guidance is to raise awareness on their existence, but also, through the identification of more innovative coordination mechanisms, to encourage a dialogue between aviation stakeholders and the humanitarian community. A key to successful disaster response is collaboration, from the preparedness activities to the launch of international relief operations. A possible next step could be to increase the interactions between the stakeholders involved in disaster response and aviation through joint trainings and tabletop exercises supported by advanced information technology. This incremental approach can lay down the foundations for lasting enhancements in disaster response.

This document complements the efforts undertaken by a number of other stakeholders and groups of experts, in a dynamic environment and will hopefully be used as an opportunity to start a conversation at the local, national and regional levels, so that the relevant stakeholders are not only identified but connected, that their needs are understood and opportunities for cooperation are multiplied.

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LIST OF ANNEXES

A. Stakeholder mapping and description of role

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C. General Approach for an Enhanced Disaster Preparedness Plan

D. Case studies Lessons learned

E. Guidance and Checklist for Airport Post-Operation Review

ANNEX I – KEY STAKEHOLDERS

Annex 1 provides a comprehensive list of key stakeholders involved in airport preparedness for effective humanitarian assistance and disaster response and a description of their activities.

Government Authorities of Affected States

- **National Government:**
    - Providing global framework/funding for the CAA to operate in.
- **Civil Aviation Authority (CAA):**
    - Civil Aviation Authorities (CAAs) are specifically responsible for the oversight and regulation of civil aviation with a focus on aviation safety, security, airspace policy, economic regulation, efficiency, sustainability, consumer protection, and respect for the environment.
- **Met Office: providing meteorological services (weather reports) for the ANSP and airmen.**
- **National Disaster Management Authorities (NDMA)**
    - A government agency whose primary purpose is to coordinate the response to natural or man-made disasters and for capacity-building in disaster resiliency and crisis response
    - NDMA are responsible for formulating policies for disaster management domestically and coordinating international disaster response status as part of international cooperation.
- **Law enforcement, Medical and Firefighters services**

Annex 1 provides a comprehensive list of key stakeholders involved in airport preparedness for effective humanitarian assistance and disaster response and a description of their activities.

United Nations Organizations

- **ICAO (International Civil Aviation Organization):**
    - Specialized UN agency, international aviation standards.
    - Monitor continuously information from all relevant sources, to arrange for the constant supply of relevant information received by the State aeronautical information service at the location of the Regional Office and Headquarters, to liaise with international organizations concerned and their regional organizations, as appropriate, and to exchange up-to-date information with States directly concerned and States which are potential participants in contingency arrangements.
    - ICAO's activities, including direct in-country support, are limited to providing advice and assistance to States that would support the continued viability of international civil aviation operations in the face of crises or disasters. The ICAO advice addresses both the immediate needs of States to recover from a crisis or disaster, as well as recommendations to States on enhancing the resilience of their aviation infrastructure in respect of events that have a high probability to recur in the future.

United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA):

- Main UN body for coordinating humanitarian affairs.
- The UN Humanitarian Coordinator (RC/HC). The HC is responsible for leading and coordinating the efforts of responding international emergency and humanitarian organizations (both UN and non-UN) and is in close contact with the national government in the affected country. In the absence of an HC and where there is a UN Resident Coordinator, they will lead the international response. In some cases the RC/HC is a combined position. OCHA supports the HC (and RC in emergency situations), in conjunction with the government of the affected State, regarding any request for or coordination of international assistance.

The humanitairan Cluster approach

- In December 2005 the IASC Principals generally welcomed the "cluster approach" as a mechanism that can help to address identified gaps in response and enhance the quality of humanitarian action. It is part of a wider reform process aimed at improving the effectiveness of humanitarian response by ensuring greater predictability and accountability, while at the same time strengthening partnerships between NGOs, international organizations, the International Red Cross and Red Crescent Movement and UN agencies. At the global level, the aim of the cluster approach is to strengthen system-wide preparedness and technical capacity to respond to humanitarian emergencies by ensuring that there is predictable leadership and accountability in all the main sectors or areas of humanitarian response. Similarly, at the country level the aim is to strengthen humanitarian response by demanding high standards of predictability, accountability and partnership in all sectors or areas of activity. It is about achieving more strategic responses and better prioritization of available resources by clarifying the division of labour among organizations, better defining the roles and responsibilities of humanitarian organizations within the sectors, and providing the Humanitarian Coordinator with both a first point of call and a provider of last resort in all the key sectors or areas of activity.
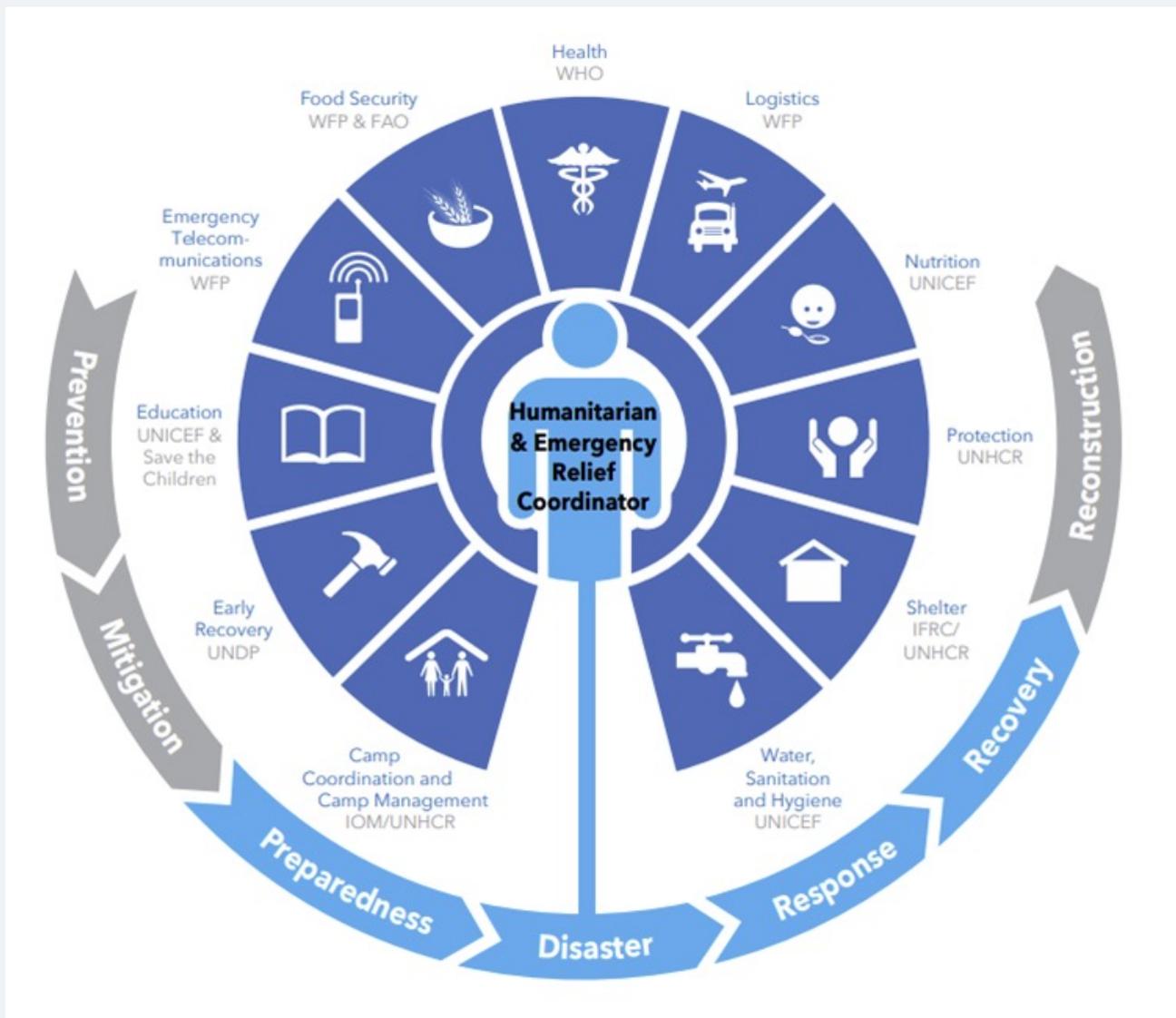
- Additionally to the above, the WFP is the Global Lead Agency of the Logistics Cluster. The cluster approach was adopted in 2005 by the Inter-Agency Standing Committee (IASC), to address consistent gaps and weaknesses and to improve international responses to humanitarian crises. The Emergency Relief Coordinator/UN Under Secretary General, can activate one or more clusters when there exists response and coordination gaps in addressing humanitarian needs, and the existing national response or coordination capacity is unable to meet needs in a manner that respects humanitarian principles.

- The Logistics Cluster provides coordination and information management to support operational decision-making and improve the predictability, timeliness and efficiency of the humanitarian emergency response. Where necessary, the Logistics Cluster also facilitates access to common logistics services. Due to its expertise in the field of humanitarian logistics, the World Food Programme was chosen by the IASC as the lead agency for the Logistics Cluster.

- Above all, the Logistics Cluster fosters a network of over 700 humanitarian stakeholders and partners, (UN, INGO, NNGO, NDMA, private sector and academic sector)

- Note that following the Oslo Guidelines on The Use of Foreign Military and
- Civil Defence Assets In Disaster Relief , the Logistics Cluster provides coordination between the humanitarian sector and the Foreign Military assets: " If a UN Joint Logistics Centre (UNJLC) (= Logistics Cluster) is established, CMCS (Civil-Military Coordination Center) will coordinate the UN MCDA (Military and Civil Defense Assets) used to support logistics with the UNJLC, which is a primary tool for humanitarian logistics in most large-scale emergencies.

World Health Organization (WHO)

- The WHO is the UN specialised agency for health matters and works in disasters: to ensure that health needs are properly assessed and monitored; to provide coordination between national and international health partners; to mobilize national and international expertise and/or supplies to meet specific health threats; and to identify critical gaps in the public health aspects of response that need rapid filling, either by the combined effort of all stakeholders or by WHO itself as provider of last resort. WHO is the global lead for the Health Cluster and the custodian of the Emergency Medical Team (EMT) coordination concept which is an important part of emergency response.

United Nations Disaster Assessment Team (UNDAC)

- TUNDAC is part of the international emergency response system for sudden-onset emergencies. It is designed to help the United Nations and governments of disaster-affected countries during the first phase of a sudden-onset emergency.
- Assessment, coordination, and information management are UNDAC's core mandates in an emergency response mission. Specifically, but not exclusively, in response to earthquakes, UNDAC teams set up and manage the On-Site Operations Coordination Centre (OSOCC) which amongst other purposes, assists the coordination of international Urban Search and Rescue (USAR) teams responding to the disaster - essential if USAR assistance is to function effectively.

International Search and Rescue Advisory Group (INSARAG)

- The International Search and Rescue Advisory Group (INSARAG) is a network of disaster-prone and disaster-responding countries and organizations dedicated to urban search and rescue (USAR) and operational field coordination. INSARAG was established in 1991 to facilitate coordination between the international USAR teams that make themselves available for deployment to countries experiencing devastating events of structural collapse due primarily to earthquakes. Ever since INSARAG has never stood still but constantly adapted its globally recognized and accepted quality standards and methodology to save more lives

International First Responders

- **Urban Search and Rescue (USAR) teams**
  - Urban search and rescue is a type of technical rescue operation that involves the location, extrication, and initial medical stabilization of victims trapped in an urban area, largely but not exclusively, due to structural collapse in the case of natural disasters.

- **Emergency Medical Teams (EMTs)**
  - EMTs are groups of health professionals (doctors, nurses, paramedics etc.) that treat patients affected by an emergency or disaster. They come from governments, charities (NGOs), militaries, and international organizations such as the International Red Cross/Red Crescent movement. They work to comply with the classification and minimum standards set by WHO and its partners and come trained and self-sufficient so as not to burden the national system.
  - Emergency medical teams have a long history of responding to sudden-onset disasters (SOD) such as the Haiti earthquake, the Indian Ocean Tsunami, and the floods in Pakistan.
  - EMTs historically have had a trauma and surgical focus, but Ebola has shown us their value in outbreak response and other forms of emergency.

Airport authority/airport management and other actors at the Airport

- **Airport Management:** strategic planning and responsible for daily airport operations. Airport management could be comprised of:
  - Airport Operations and Safety. Covers all operational aspects/safety regulations.
    - Apron Management. Safely manages apron operations, movement of vehicles. Apron management is in most of the cases not considered as Air Traffic Control Services (ATCS) and therefore will be delegated to a division of airport management. However, is in touch with ATC. On smaller airports, a wide variety of services are normally offered by Fixed Based Operators (FBOs), who have a distinct frequency to call for fuel, maintenance, etc.
      - Ground Handling: Sometimes part of an airline, or separate maintenance company, sometimes part of the operator that is running the airport.
      - Fuel Services. Mostly private companies offering fuel.
      - Aircraft Maintenance. Sometimes part of an airline, or separate maintenance company, sometimes part of the operator that is running the airport.
    - Airport Terminal Operations: Responsible for operations within the Terminal.
  - **Medical Services.** Station for emergency medical care at the airport.
  - **Rescue and Fire Fighter Serice**
  - **Mutual Aids Services.** Mutual agreement and responsibility sharing between on-airport emergency services that will share responsibility with emergency services outside the airport in case of a large casualty/disaster (Mass Casualty Incidents or MCIs).

- **Airport Rescue Coordination Center (RCC).** Primary facility at the airport for coordinating search and rescue activities. Usually facilitated by a military or civilian service. Comprises of:
  - **Public Information Service**
  - **Emergency Operations Centers**
  - **Mobile Command Posts**
- **Commercial Service Providers:** all commercial enterprises/business that are operating on the airport, transportation services included.

Air Navigation Service Provider (ANSP)

Public or a private legal entity providing Air Traffic Services (ATS) on behalf of a company, region or country, which is provided for the purpose of preventing collisions (between aircraft and on the maneuvering area between aircraft and obstructions) and expediting and maintaining an orderly flow of air traffic. Some of the units could be situated at the airport, just outside the airport, or in a different location. An ANSP normally includes the following units:

- **Air Traffic Flow Management (ATFM):** unit managing long/medium term planning of air traffic to ensure a balanced flow of incoming and outgoing air traffic.
- **Aeronautical Information Service (AIS):** a service to ensure the flow of necessary for the safety, regularity and efficiency of international air navigation. The AIS provides the AIP, Amendments and Supplements, AIC and aeronautical charts.
- **Area Control Center (ACC) or "radar":** unit providing air traffic control service for controlled flights in control areas/higher en-route segment.
- **Approach:** unit providing Air Traffic Control Services (ATCS) to controlled flights arriving at, or departing from one or more aerodromes. On busy aerodromes, the unit is split into a separate Arrival and Departure unit or even has designated 'feeders' who may act between Approach and Tower to line up traffic for a particular approach.
- **Tower:** Unit responsible for controlled air traffic taking off and landing. On smaller airports, Tower is also responsible for taxiing traffic on the maneuvering area.
- **Ground:** Unit responsible for controlled air traffic on the maneuvering area. Often, the Ground control unit is integrated with the Tower control unit on smaller aerodromes. In some cases, a special "Clearance Delivery" controller provides en-route clearances prior to engine start-up.

International Aviation Organizations

Public or a private legal entity providing Air Traffic Services (ATS) on behalf of a company, region or country, which is provided for the purpose of preventing collisions (between aircraft and on the maneuvering area between aircraft and obstructions) and expediting and maintaining an orderly flow of air traffic. Some of the units could be situated at the airport, just outside the airport, or in a different location. An ANSP normally includes the following units:

- **International Air Transportation Association (IATA):**
  - Trade association for the world's airlines, helping to formulate industry policy on critical aviation issues.
- **Civil Air Navigation Services Organization (CANSO):**
  - Global and regional voice of air traffic management (ATM).
- **Airports Council International (ACI):**
  - Non-profit worldwide professional association of airport operators.
- **International Federation of Air Line Pilots Associations (IFALPA)**
  - International Federation of Airline Pilots' Associations
- **International Federation of Air Traffic Controllers' Associations (IFATCA)**
  - a ***non-profit*** and ***non-political*** federation of air traffic controllers' associations which promotes **safety, efficiency and regularity** in International Air Navigation

Local and Foreign Militaries and Coast Guard and Harbour Patrol

Local and Foreign Military forces have become active players in international emergency response and governments will continue to rely upon rapidly deployable military capability for support in humanitarian operations. Coast Guard and Harbour Patrol services may also be important when an aerodrome is located close to an ocean or large areas of water.

- **Civil-Military Operations Center (CMOC):** operational center for civil-military coordination, includes UN CMCoord Officers.
  - The national military will be present in the initial disaster response, which could be outside or at the airport. There is a communication line between the national military and responding international military forces as well as international emergency response organisations, via established frameworks, so that specific needs/capacity gaps could be coordinated. There is a direct link with the ANSP to coordinate military/civilian air traffic during the initial response, in case the ATC infrastructure has collapsed or is working insufficiently. Where necessary, the military can step up/take over ATC if necessary, with mobile ATC units and military ATC personnel that can handle air traffic temporarily.

- Military airports, other facilities and transport assets may provide essential support for the movement of disaster relief shipments, both during export from donor locations as well as at arrival into the destination country.

- Military airports, other facilities and transport assets may provide essential support for the movement of disaster relief shipments, both during export from donor locations as well as at arrival into the destination country.

Relevant stakeholders at the airport

- **Freight Forwarder:** Cargo handling operator, mostly either part of a larger airline or purely focusing on the delivery of cargo (payload) to various locations. Freight forwarder could be shipping governmental aid in case of a natural disaster or those goods could be brought by military aircraft.
- **Airline:** Mostly carrying people and goods (payload).
- **Airline Operational Control Center:** Managing flight operations, mostly dealing with Dispatchers who will file flight plans on behalf of the pilots, personnel maintaining the airlines' route network and who have established contacts with ANSPs. Could also be situated outside the airport.

Assisting actors providing services, technical advice and other

- Any assisting international or domestic humanitarian organization, assisting State, foreign individual, foreign private company providing charitable relief or other foreign entity responding to a disaster in the affected state by providing services to the affected state to assist disaster relief operations. This encompasses advice and technical assistance which is not necessarily linked to the donation of goods or money. Many non-government organizations (NGOs), INGOs, UN entities and others offer essential human services, expertise and technical assistance. Like donors of physical goods assisting actors providing services can also be classified as either registered or unregistered.
- Private sector companies are increasingly involved in disaster response, often as part of their commitment to a corporate social responsibility strategy. This involvement can take many forms, including as donors and as direct service providers of aid. Some companies, like DHL and Ericsson, have been working to support humanitarian operations for years and are now being joined by a growing number of private sector actors involved in disaster response. The vast majority of private companies' involvement in disaster relief occurs independently of humanitarian coordination structures.

ANNEX B

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Annex C
General Approach to an Enhanced
Disaster Preparedness and Resilience Plan

The vulnerability of the aviation infrastructure to weather events can cause considerable financial damages to aviation and the local economy, beyond the direct damages to the infrastructure. Passenger compensations in case of flight delays/cancellations, injuries due to turbulence, additional fuel, longer staff working times and higher insurance premiums are just a few examples of the incurred direct operating costs. Disruptions to aviation operations due to adverse weather conditions will also considerably affect the flow of passenger and cargo, in the short- and medium-term and incurs a loss in revenue generation.

One of the key enablers to effective and accurate cost-benefit analysis is the availability of 'good data'. As we transition to increased digitization in the systems that manage aviation operations, more robust forecasting models can be developed. Enhanced preparedness to disasters relies upon a more acute understanding of the risks, exposure to risks and the possible risk mitigation options. The collection and analyzes of data and lessons learned from different sectors, aviation and non-aviation, enriches the local assessment of vulnerabilities and the need for enhanced preparedness. The role of policy-makers, at the local and national levels is key to articulate this cooperation, in line with the national disaster response strategy.

Developing the value proposition for enhanced preparedness is critical to gain the support of policy makers and ensure implementation of recommendations. A value proposition should answer the following questions:

a. What are the current and emerging risks?

b. What is the expected frequency and severity of emerging risks?

c. What are the most vulnerable assets and procedures?

d. What is the cost of operational disruptions and delayed recovery back to normal operations?

e. What are the savings when introducing enhanced preparedness?

f. Is the cost-benefit analysis positive?

The value proposition should include a comprehensive cost-benefit analysis and be transparent on the assumptions used. It should weigh potential impacts on economic results against investments in resilient infrastructure and procedures. It is important to engage the decision-makers at the early stage of developing the value proposition. A team of representatives of the different internal and external stakeholders should be assembled to provide input and recommendations regarding the value proposition. Depending on which entity is conducting the assessment, the list of external stakeholders will be identified. For example, for an airport the stakeholders will be different than an air navigation service provider.

Regular consultations with the internal and external stakeholders will create a sense of ownership of the value proposition and support the implementation of the recommendations. Examples of internal and external stakeholders are included in the following table:
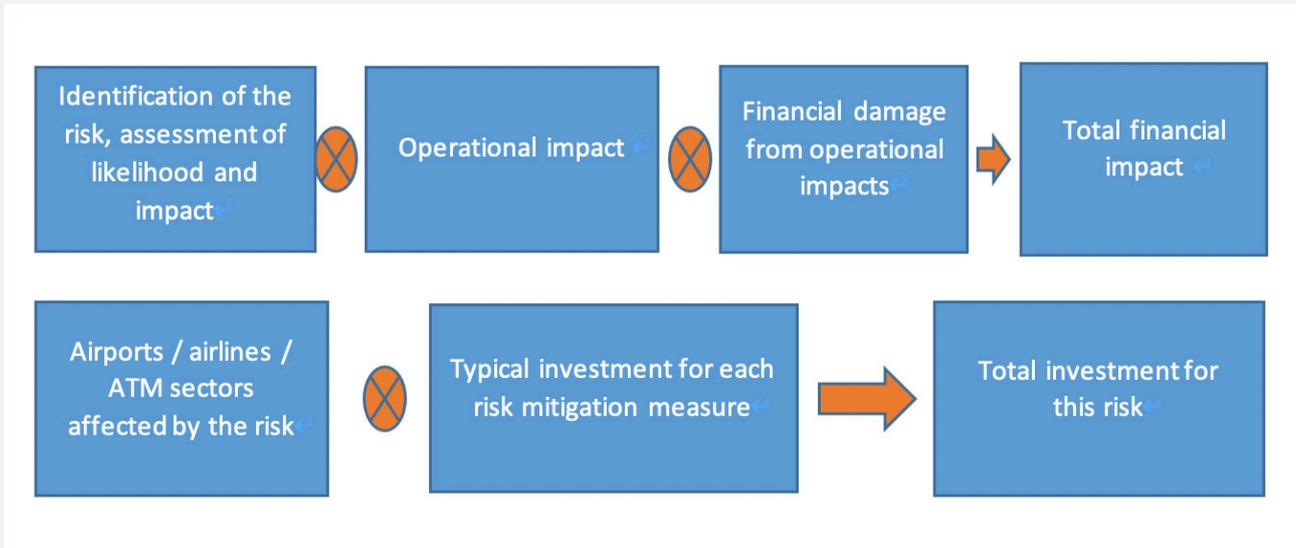
Internal stakeholders	External stakeholders
Top Management Finance Dept. Operations (supervisor and a sample of teams) Maintenance / Engineering Organization Planning Environment Team (if separate)	Government / Ministries Regulator System suppliers Humanitarian aid agencies and NGOs Academia and research institutes Sample of customers (for an airport or an ANSP this would include a sample of top operating airlines) Partners (partners for an airport would include the ANSP and the ground handling service provider)

Risk Identification / Assessment

In order to develop a resilience strategy, a stress assessment of the vulnerability of critical infrastructure to disasters should be carried out. Ideally a self-assessment should be carried out for disaster prone areas with input from airline operators and humanitarian aid agencies. When doing a self-stress or vulnerability assessment thresholds at which an impact could occur should be considered.

In addition to conducting a stress self-assessment, it is important to consider information about how risks could change and how often sensitivity thresholds may be crossed in the future, including a determination of how frequently specific sensitivity thresholds may occur over time. The capacity to prepare for and recover from future exposure to disasters can be determined in consultation with internal and external stakeholders. Using the outcome of the vulnerability assessment, and identification of costs and benefits of preparedness, resilience strategies can be developed and further improved by consultation with stakeholders. Once a strategy is agreed, sources of funding must be identified to start with the implementation.

When considering appropriate approaches to building resilience into aviation infrastructure a risk-based asset management approach could be taken. According to a study by the U.S. Department of Transportation ("DOT"), physical, climatic, seismic and other external threats can be addressed in risk-based asset management programs. While risk-based asset management is not a complete answer to addressing all threats to aviation and other transport assets, it can serve as an important component in making assets robust and the asset-improvement and repair practices of bodies such as governments, CAAs and airports in advance of crises or in during times of crisis. Planning for every threat is likely impossible; however, integrating redundancy, robustness and resiliency (the so-called **"Three Rs"** as defined by the U.S. Federal Emergency Management Agency, "FEMA") into infrastructure and contingency planning may help major aviation stakeholders to more proficiently cope with a wide and unpredictable range of threats. This general preparedness has been called an "all hazards" approach that suggests that planning for one kind of hazard or threat can increase an entity's ability to deal with others.

"Risk-Based Transportation Asset Management: Building Resilience Into Transportation Assets",

U.S. Department of Transportation, Federal Highway Administration, March 2013.

Federal Emergency Management Agency (FEMA), Fundamentals of Emergency Management, independent Study 230.b, 25 May 2011.

Annex D Case studies

CASE STUDY ON HOW THE ARUBA AIRPORT AUTHORITY N.V. IS ADDRESSING THE CHALLENGES OF DEALING WITH COVID-19 AT THEIR AIRPORT

Aruba is an island in the Caribbean and a constituent country of the Kingdom of the Netherlands and is highly dependent on tourism. Its airport: Aeropuerto Internacional Reina Beatrix is vital to the tourism industry and Aruba's citizens.

The Aruba Airport Authority N.V. (AAA) developed a number of plans and scenarios that deal with keeping the airport open, operational and safe, while mitigating the different impacts of the virus. Since this pandemic is still ongoing and is affecting transportation, tourism, and other industries in many ways, it was important that the AAA had a plan that incorporated many stakeholders. A number of additional more detailed documents were developed from this plan.

COVID-19 Plan of Action AAA N.V.
COVID-19

COVID-19 is the infectious disease caused by the most recently discovered coronavirus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. People can catch COVID-19 from others who have the virus. The disease can spread from person to person through small droplets from the nose or mouth which are spread when a person with COVID-19 coughs or exhales.

Purpose of the COVID-19 Plan of Action

The objective of the Plan is to guarantee the continuation of Airport operations during the coming weeks/ months as the Airport is a critical infrastructure during normal circumstances, but even more critical during crisis and emergency situations as this is the only Airport serving the island.

The aim is to accomplish above whilst safeguarding as much as possible the health and wellbeing of the entire staff.

The purpose of this plan is to delineate AAA's actions during several stages and scenario's related to the COVID-19 outbreak. The Plan focusses on preventive as well as reactive measures to be taken.

Preventative Measures at AAA N.V.

The following actions were taken as of March 4, 2020 (and were still ongoing when this case study was written):

a) Flyers on 'How to wash your hands properly' will be put up in all AAA restrooms (SSRC)

b) "If you're sick, stay home" policy will be mandatorily enforced for all Employees with confirmed respiratory illnesses (HR)

c) Should Medwork advice otherwise, AAA reserves the right to require employee to stay home (BVVD) (HR)

d) Total Services will immediately start using only anti-bacterial disposable cleaning wipes instead of cloths to clean critical surfaces like phones, keyboards, desks (Ops)

e) All offices and Ops employees will be equipped with wipes and hand sanitizers (Ops)

f) ASU will be instructed to use wipes and disinfectant spray during shifts to intermittently disinfect busses, only when busses are empty (Ops)

g) All security checkpoints will be equipped with wipes and hand sanitizers (Ops)

h) Security officers must replace gloves with higher frequency during shifts (Ops)

i) PR and IT will put up infographics on COVID-19 that can be presented in a quick and effective way (Comm)

j) A dedicated COVID-19 chat group on WhatsApp will be created where all staff can be informed on the latest update (Ops/Comm)

k) AAA will start providing our Stakeholder with frequent updates and remind them to take preventive measures (Comm)

The Aruba Airport Authority N.V. identified four scenarios in their Plan of Action:

1. COVID-19 confirmed case in Aruba
2. CODID-19 confirmed case within the Airport Community
3. COVID1-19 confirmed case with AAA employees
4. Dealing with multiple infected cases within AAA.

Plan effectiveness

The plans and measures that AAA has implemented has allowed them to open the airport and successfully kept its infrastructures up and running. Having this critical infrastructure operational allows Aruba to once again be linked to the rest of the world and allows the return of travel, tourism and other forms of commerce.

CASE STUDY: NARITA INTERNATIONAL AIRPORT

Introduction

On March 11, 2011, a massive earthquake with a magnitude of 9.0, the largest ever recorded in Japan, occurred off the North-East coast of the country. Thus, the North-East region of Japan was strongly shaken. In addition, a large tsunami exceeding 9 meters at its maximum was observed along the Pacific coast, causing great damages in multiple areas.

This earthquake was not limited to its vibrations causing damages to buildings but was also followed by a large-scale tsunami bringing even more harm to the area. This earthquake is now called the "Great East Japan Earthquake" due to the unprecedented scale and extent of the damages it caused.

Damages at Narita International Airport

At Narita International Airport, the main gateway of Japan and Tokyo metropolitan area, there was no significant damage to the runways and taxiways, neither to the structure of the terminal buildings.

On the other hand, for non-structural components, damages happened over a large area. In the terminals, despite the ceiling and parts of the duct systems collapsing in some areas, emergency stop of the elevators and escalators, and merchandise falling in the stores, no gas leaks or fires where caused by the earthquake.

Although a large aftershock followed immediately after the main shock, no passengers were injured. The passengers were asked to evacuate the terminal buildings to ensure their safety. The evacuation was subsequently cancelled based on the result of the risk assessment regarding the damages to the building.

Disaster Response

The runways were closed and inspected immediately after the earthquake, and the emergency response headquarters was promptly activated to collect the damages status, inspect the facilities, and perform prompt restoration work. As of the airside operations, although some flights resumed during the day of the disaster, many flights were cancelled for both departures and arrivals. In addition, as ground transportation to/from the airport such as railways and buses stopped, about 8 500 passengers were stuck in the terminal buildings. Items such as sleeping bags, blankets, light meals, and water were distributed to those passengers who stayed in the terminal over night to ensure their health.

Receiving Disaster Relief Aircraft and Relief Materials

Following the great earthquake, relief teams and relief supplies arrived from all around the world. Narita Airport provided support for various activities of the relief effort and became one of the bases for the transportation of relief supplies sent from various countries.
A total of 47 rescue aircraft landed in the Narita Airport originating from 23 countries and regions, including return support flights which were requested from the Ministry of Foreign Affairs as special charter aircrafts.

As for the reception of relief supplies, coordination was made with the Cabinet Office Emergency Disaster Response Headquarters, Tokyo Customs, airlines, customs, and other relevant organizations to facilitate the acceptance of relief supplies. Amongst them, Narita Airport made available some cargo warehouses at the airport as a temporary storage spaces for blankets, water, and other relief supplies arriving from the donor countries until they were delivered to the affected area in Japan.

Materials arriving at Narita Airport

According to the Tokyo Customs, relief supplies from countries and regions, international organizations, NGOs, NPOs, and private enterprises arriving at Narita Airport totalized 3 409 tons (approximately 36% of the nationwide total quantities), and 831 cases (65% of the nationwide total).
Categories of items with large volume cleared by the customs were "Blankets and clothing, etc.," "water," "food," and "prefabricated, tent, construction machinery, etc." in this order.
A large amount of daily use goods was cleared at first, but afterwards, there were many customs clearances for goods related to the restoration and reconstruction support

Introduction

Huracán Odile

Hurricane Odile is the most intense landfalling tropical cyclone in the Baja California Peninsula during the satellite era and the seventh-most intense tropical cyclone worldwide in 2014. Sweeping across the peninsula in September 2014, Odile inflicted widespread damage, particularly in the state of Baja California Sur. After meandering for several days, Odile began to track northwestward, intensifying to hurricane status before rapidly reaching its Category 4 hurricane peak intensity on September 14. The cyclone slightly weakened before making landfall near Cabo San Lucas with winds of 125 mph (205 km/h).

The most significant storm impacts occurred on the Baja California Peninsula, where damages amounted to MXN$16.6 billion (US$1.25 billion). Power outages spurred by Odile's intense winds and rain cut electricity to 92% of the population of Baja California Sur. Severe flooding also occurred, causing rivers to swell and the mass evacuation of people out of hazardous low-lying areas.

Damages at Los Cabos International Airport

At the Airport, there was no structural damage to the runway, its taxiways and its commercial and general aviation aprons.

Despite there was no damage to the structures of the terminal buildings in general; there were significant damages that impeded the immediate continuity of the airport operations. In the three terminal buildings there were air conditioning ducts that fell, anticyclone glass that were destroyed, damaged ceilings and supporting structures, and water leakage up to 15cm high. However, the most significant damage was in Terminal II Building (international flights area) where the roof collapsed generating a hole through which the wind entered along with the rain thus damaging the check-in area, the baggage claim area and the customs area. In Terminal Building I (domestic flights), wind and rain entered the facility due to damages to the roof protecting the boarding gates; completely damaging the commercial areas.

The air navigation equipment did not suffer structural damage, however the air traffic control tower (ATC) had considerable damage that forced the personnel to provide the ATC services in the apron control sub-tower.

There were no injuries to passengers because at the time of the hurricane's passage they were already sheltered in place.

Disaster Response

As the wind intensity decreased, the emergency response team (ERT) inspected the state of the runway, taxiways and parking aprons. Once this was completed the ERT began the assessment of the terminal buildings, service buildings, equipment, fire extinguishing units and ground support material, providing technical reports to the Emergency Operations Center (EOC). Then the EOC could make a global assessment in collaboration with all stakeholders to confirm that the airport facilities were safe and had the capacity to receive and facilitate the arrival of the rescue flights.

Receiving Disaster Relief Aircrafts and Materials

Following the assessment of the civil infrastructures of Los Cabos, the state government declared an emergency in the geographical area of the Baja California peninsula (basic services, electricity and water were completely lost).

Thus, the mobilization of around 28 000 responders and relief workers (national and from abroad) and the start of more than 600 air operations began; this massive disaster relief operation being coordinated locally by the federal government, the airlines and the Grupo Aeroportuario del Pacifico (GAP).

The Los Cabos Airport was used as a safe area for people evacuated from the vicinity of the airport. But mainly the airport was used as a base for the reception of humanitarian aid, safeguarding of supplies and rescue material, sanitation, construction, and salvage operations. Then allowing the authorities to deliver the resources to the areas of greatest impact.

Destination Recovery

Twenty days after Odile struck the area, Terminal II and the general aviation buildings (FBO) were rehabilitated to re-start commercial and private air operations. in this sense the entire commercial. On October 3, 2014, the first national commercial flights (Interjet) landed at Los Cabos International Airport, with 165 passengers onboard. On October 6, 2014, the international operations resumed with 9 passengers onboard a United Airlines flight. However, it was not before March 13, 2015 that Terminal building I was finally reopened for air operations, operating 5 national airlines while terminal II building was left with 11 international airlines.

CASE STUDY: GETTING AIRPORTS READY FOR DISASTERS

In Nepal

Nepal was the first location to receive a GARD training in 2010 after the program's pilot workshop. Due to its high seismic risk, Nepal benefitted from several other GARD workshops. A joint GARD workshop for the Tribhuvan International Airport (Kathmandu) and Nepalgunj Airport was held in January 2017, gathering 46 participants. In 2019, two other GARD Workshops were held at the Nepalgunj and the Dhangadhi airports aimed at training local authorities to replicate GARD workshops in other airports in Nepal.

The outcomes of the Action Plan from the GARD workshop in Kathmandu have successfully been incorporated into the Tribhuvan International Airport Disaster Response Plan. The Airport Disaster Response Plan was tested during a national disaster response and learning exercise in September 2018 under the leadership of the Nepalese Army. Airport preparedness was included as a key element in the simulation and strengthened capacities to respond at the airport.

In Peru

Six airport managers joined the GARD training at the José Abelardo Quinones Gonzales International Airport in Chiclayo, Peru in August 2018. The Peruvian National Institute of Civil Defense chairs a working group to follow-up on the Action Plan at the airport and is highly committed to integrate the actions into the country's disaster preparedness plan. Additionally, a set of capacity development activities have been proposed for domestic airports such as the air force base in Las Palmas in Lima. In 2019, a GARD Plus workshop was held at Las Palmas, Lima in order to identify potential areas for improvement which were incorporated in the revised Airport Surge Capacity Assessment (ASCA) Report and Action Plan.

In Indonesia

GARD was piloted at two airports in Makassar and Palu in Indonesia in 2009. The GARD team trained three local DHL experts who then joined the training team to work with 17 trainees - airport authorities, members of airport operations and disaster management agencies - at the Makassar and Palu airports. After the workshop, the two airports benefitted from a set of recommendations to guide future airport relief operations. In 2011, GARD workshops were conducted at two airports in Denpasar and Kupang. In 2012, GARD workshops were conducted in Medan and Banda Aceh. After the pilot workshop in 2009, this was the third time GARD has been successfully introduced in Indonesia and assessed two additional airports. In 2016, two other GARD workshops were conducted in Lombok and Denpasar gathering 75 participants. Based on the outcomes of the

recent GARD workshops in Indonesia, the Ministry of Transportation is finalizing guidance material on Airport Disaster Preparedness. Once finalized and endorsed by all relevant national stakeholders, it will become mandatory for airport authorities to conduct GARD workshops at airports across the country. In January 2019, the Ministry established a "quick response team" for emergency operations that refers to GARD outcomes.

In Mauritius, Seychelles and the Maldives

The GARD workshop was conducted on the African continent for the first time in 2016. The GARD workshop in Mauritius took place in February 2016 and prepared airport staff for disaster scenarios such as cyclones, storms and floods. The workshop was joined by airport managers from the islands of Rodrigues and Seychelles, who are exposed to similar hazards. In August 2016, 38 participants were trained during a workshop at the Seychelles International Airport. Airport managers from Mauritius and the Maldives joined as well and shared experiences with the group. A regional network and exchange platform on disaster preparedness at airports was established for Island states in the Indian Ocean.

Annex E Guidance and Checklist for Airport Post-Operative Review

GUIDANCE FOR AIRPORT POST-OPERATIVE REVIEW

The following elements can help structure a comprehensive post-operative review at the airport level. It would require the involvement of non-airport stakeholders in order to capture the various aspects of the disaster reponse. The objective would be to identify lessons learned and trigger corrective actions to enhance preparedness.

I. Identification of the event

Description of the disaster

- Location of disaster and airports affected;
- Nature of disaster;
- Date(s);
- Duration;
- Estimated loss or costs (USD)

II. Description of the impacts of the disaster on:

- General services

("General services" include all services related to the national recovery efforts for the wellbeing and health of the population and exclude aeronautical matters)

      a) Was a National Contingency Plan or an Emergency Plan activated?

      b) What shortcomings or outright failures has the National or State Emergency entity experienced and/or identified for the State to be able to recover from the disaster and that affected the safety, efficiency and regularity of international aviation?

      c) Please specify which of the specific non-aviation related infrastructure, if any, failed totally or were not operating at full effectiveness.

- Airport infrastructure

("Airport Infrastructure" includes terminal airside/landside handling, movements across ramps, taxiways and runways, electrical issues, water infiltration mitigation, fuel storage and supply, etc.)

      a) What shortcomings or outright failures has your airport experienced and/or identified with regards to the inability of non- airport infrastructure to continue supporting safe flight operations? Shortcomings could include inability to withstand wind and water damage, or inability to function with electrical outages.

      b) Please specify which of the specific infrastructure elements, if any, failed totally or were not operating at full effectiveness.

      c) How long were the specified infrastructure elements non-operable or operating below standard?

      d) What infrastructure worked as expected, or sufficiently well given the circumstances, and why?

      e) What recovery actions were not effectively conducted due to cost-related matters?

      f) Does the current Aerodrome Emergency Plan cover all relevant infrastructure, services and key stakeholders?

- ATM infrastructure

("ATM Infrastructure" meaning systems and physical locations, such as air navigation service communications, tower functions, navigation aids, Air Route Traffic Control Centers, etc.)

      a) What shortcomings or outright failures have you experienced and/or identified with regards to the inability of ATM infrastructure to continue supporting safe flight operations?

      b) Please specify which specific infrastructure elements, if any, failed totally or were not operating at full effectiveness.

      c) How long were the specified infrastructure elements non-operable or operating below standard?

      d) What infrastructure worked as expected, or sufficiently well given the circumstances, and why?

      e) Had an ATM Contingency Plan been activated?

- Ground Handling Services

("Ground Handling Services" means ground administration and supervision, passenger handling, baggage handling, freight and mail handling, ramp handling, aircraft services, fuel and oil handling, aircraft maintenance (light maintenance), flight operations and crew administration, surface transportation and catering services.)

> a) What shortcomings or outright failures have you experienced and/or identified with regards to the inability to provide the required ground handling services for the provision of humanitarian support?
>
> b) How long were the services non-operable or operating below standard?
>
> c) What elements worked as expected, or sufficiently well given the circumstances, and why?

- Telecommunications

("Telecommunications" means systems established to facilitate the real-time sharing of information)

> a) What shortcomings or outright failures have you experienced and/or identified with regards to the inability to exchange information with own staff/aviation stakeholders/humanitarian stakeholders (where applicable)?
>
> b) How long were the services non-operable or operating below standard?
>
> c) What elements worked as expected, or sufficiently well given the circumstances, and why?
>
> - Did the disaster have an impact on your staffing level? For example, was critical staff able to access the airport to carry out their functions?
>
> - Any other impact

III. General overview of humanitarian operations:

- Has a Disaster Risk Management Strategy been developed? Were national institutions encouraged to develop national plans, including resource requirements, to support national and local preparedness? If yes, did the Roles and Responsibilities for Preparedness of relevant actors clarified?

- Was a national multi-hazard risk assessment, irrespective of scale established and risk profile populated?

- Was a national early warning systems established? If yes, did all the stakeholder groups agree on the appropriate early warning indicators, the thresholds for action, the process for contingency planning, the funding arrangements and the types of actions that would be appropriate at different phases in different contexts?

- If a national disaster management agency or office existed prior to the emergency, what role did you play in this structure?

- If the affected State requested international assistance, how much were you involved and what support were you requested to provide?

- Considering that most of the humanitarian support come by air in the initial phase of a humanitarian response, what mechanism do you have to identify the most suitable airport to be a humanitarian logistics hub?

- How much were you informed about the arrival of aid and how did you prioritize the landing?

- Were NOTAMs published in a timely and accurate manner to inform relevant stakeholders on actual airport status?

- Was any humanitarian support provided to the airport directly? Which means of support were of most help?

IV. Main challenges for the routing of humanitarian support by air and provide a short description for each challenge encountered:

- Customs, Immigration and Health

- Transport of cargo (e.g. dangerous goods)

- Airport operational capacity

- Apron management

- Runway and taxiway status

- Availability of Air Traffic Management Services (ARTCC, Airport ATC Tower, FSS), navigation aids, meteorological service.

- Safety Risk Assessment

- Availability of kerosene

- Availability of K-loaders

- Availability of ground-handling personnel

- Lack of operational information

- Lack of a single and verified source of information

- Civil/Military cooperation

- Competing flights (non-humanitarian or with non-priority supply)

- Aerodrome Emergency Plan

- Aircraft Rescue and Firefighting (ARFF) availability/capacity

- Coordination with ATC

- Coordination with AIM

- Coordination with airport security

- Availability of human resources

- Other

V. Actions put in place to overcome the challenges encountered and identified above (for example new system back-ups for better communications technology or electric equipment, systems redundancy such as virtual towers, additional fuel storage...):

VI. ICAO has developed a range of Standards and Recommended Practices (SARPs) to be implemented by its Member States. Some provisions are of direct relevance to disaster response. Similarly, Airports Council International (ACI) and the International Air Transport Association (IATA) have developed guidance to support airports and airlines respond to disasters.

- Did you know of these ICAO SARPs and industry guidance prior to the occurrence of the natural disaster?

- Have these ICAO SARPs and industry guidance been useful in responding to the disaster?

- Would you have suggestions for improvements?

VII. Lessons learned and recommendations on:

- The availability of required information (guidance and tools) to enhance decision-making;

- The efficiency and effectiveness of coordination mechanisms;

- Preparedness activities;

   o Do you now consider new emerging risks when you review your contingency plan?

   o Do you document, train and rehearse such plans on a regular basis?

   o Have previous prepared actions like the conduction of trials and simulations provided positive feedback to improve contingency plans and ensure all the awareness and readiness of all involved Stakeholders?

- Would you have specific recommendations to overcome the challenges you experienced in the specific crisis reported?

CHECKLIST FOR AIRPORT POST-OPERATIVE REVIEW

Here are some examples of items/questions that could be covered during a post-operative review following a disaster. These items would be considered, in addition to more generic post-operative review subjects.

IF THE AIRPORT WAS NOT AFFECTED

	Yes	No	Comment
Did the airport continue with scheduled operations?			
Did the airport cancel arrival of passengers to the affected area?			
Were landside access and transportation affected?			
Was the supply chain for operational critical supplies affected?			
Was the capacity sufficient for an adequate supply of resources and evacuation of people?			
Did the airport apply procedures of the Emergency Plan or are new procedures required?			
Was the airport used efficiently in the relief effort?			
Did the airport provide sufficient capacity? Did the airport provide sufficient capacity?			

IF THE AIRPORT WAS NOT AFFECTED

	Yes	No	Comment
Was the airport affected in ways according to scenarios developed in the Emergency Plan? If so, did it perform as planned?			
Did the airport conduct a capacity assessment regarding its infrastructure? If not, do we need to include more scenarios in the Emergency Plan?			
Does the airport need to take immediate (short-term) actions to improve capacity or correct deficiencies?			
Was the airport capacity sufficient for an adequate supply of resources and evacuation of people?			
Did the airport apply procedures of the Emergency Plan or are new procedures required?			

	Yes	No	Comment
Did the airport have enough resources to maintain the emergency deployment?			
Were all involved parties familiar with the Emergency Plan and did they adhere to the plan?			
Was the airport used efficiently in the relief effort?			
Did the airport provide sufficient capacity?			