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WORKING PAPER

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**Third NAM/CAR Regional Contingency and Emergency Planning and Response Meeting
(NAM/CAR/CONT/3)**

Mexico City, Mexico 9 to 11 May 2023

Agenda Item 3: Regional Initiatives for Contingency Planning and Response

CADENA's CONTINGENCY PLANNING AND RESPONSE

(Presented by CANSO)

EXECUTIVE SUMMARY

Since its beginning in 2016, CADENA has gained extensive experience in dealing with disruptions to air traffic operations in the Latin America/Caribbean (LAC) region. Examples include: the long-term impact of the lightning strike in at an Area Control Center (ACC) that disabled its operational capabilities; the devastating impact of powerful hurricanes; the impact of active volcanoes in the LAC region; the power outage at an ACC that resulted in the complete loss of communications, navigation, and surveillance. CADENA understands the importance of preparing for disruptions and gathering the information. This Working Paper presents key information on how CADENA has prepared for, handled and communicated during, and captured benefits and lessons learned from contingency events in the LAC region

Action:	Described in Section 6
<i>Strategic Objectives:</i>	<ul style="list-style-type: none">• Strategic Objective 1 – Safety• Strategic Objective 2 – Air Navigation Capacity and Efficiency• Strategic Objective 3 – Security & Facilitation
References:	<ul style="list-style-type: none">• ICAO Annex 11 - Air Traffic Services• ICAO Doc 9971 - Manual On Collaborative Air Traffic Flow Management• CADENA Air Traffic Flow Management and Collaborative Decision Making Procedures Manual• CADENA Operational Information System (OIS) Manual

1. Introduction

1.1 The LAC region is highly prone to operational disruptions, which can significantly affect air traffic operations. These operational disruptions range from seasonal tropical weather patterns to volcanic ash events, and frequent earthquakes. In addition, the region has also faced a variety of contingency situations, including equipment failures and unplanned personnel actions. In order to cope with these situations, Air Navigation Service Providers (ANSPs) must collaborate closely with other

aviation stakeholders to develop and implement effective contingency plans that mitigate the impact of such events.

1.2 The CANSO ATFM Data Exchange Network for Americas (CADENA) is a CANSO initiative to implement Air Traffic Flow Management (ATFM) in Latin America and Caribbean (LAC) region applying the Collaborative Decision Making (CDM) philosophy. CADENA, established in June 2016, quickly organized its Regional Implementation Group (RIG) and focused on implementing regional ATFM/CDM. The accomplishments of CADENA include establishing Flow Management Units (FMUs) at ANSPs, initiating operational web conferences, launching the Operational Information System (OIS), producing the ATFM/CDM Procedures Manual, preparing contingency forms, and providing various types of training.

1.3 The benefits of CADENA, qualitatively and quantitatively are recognized widely. One of CADENA's many benefits is coordinating and exchanging operational information during contingency events that results in reducing the impact on stakeholders and expediting the recovery.

2. Background

2.1 CADENA operates under the policy of transparency, inclusiveness, and collaboration, and utilizes a multi-nodal regional ATFM/CDM framework. CADENA's success is based on a "step-by-step", "simple-to-achieve solutions" and "do the best you can" approach to implement new capabilities. Most stakeholders can participate with the relative ease needing only to provide (1) a computer, (2) internet access, and (3) human resources. This approach supports ICAO's "No Country Left Behind" policy.

2.2 At the beginning of CADENA, many ANSPs in the region did not have a Flow Management Unit (FMU) nor a solid understanding of the ATFM function. CADENA supported these ANSPs in the building of their FMUs and provided guidance for the establishment of ATFM functions. CADENA prepared the CADENA ATFM/CDM Procedures Manual based on ICAO DOC 9971 and tailored it for the LAC region. CADENA developed multiple forms (e.g., contingency checklist) and templates (e.g., ATFM Daily Plan, AIC/AIP approval process) and made them available to the stakeholders to ensure a harmonized and efficient operation. CADENA continues to offer many types of training including annual hurricane training and quarterly contingency training.

2.3 CADENA recognized the importance of handling contingency events and building capabilities among CADENA participating ANSPs to face such events. The capabilities built to face contingency events include: training of FMU staff, establishing communication methods (e.g., web conferences, CADENA OIS, emails via group lists, WhatsApp Chat Group); developing procedures (e.g., CADENA ATFM/CDM Procedures Manual), documents (e.g., briefing templates and manuals), and forms (e.g., contingency form and contingency check lists); and, establishing the CADENA Virtual Support Team

3. Information on CADENA Contingency Handling

3.1 The CADENA ATFM/CDM Procedures Manual provides details of agreed upon and recommended procedures to enable LAC regional ATFM/CDM processes and procedures. This manual is certainly one of the key documents that makes the LAC region ATFM/CDM work. The LAC region contingency handling procedures and related information are described in this manual (Section 6, CADENA and Contingency Planning).

3.2 To handle contingency events, it is essential that each ANSP has a dedicated FMU with trained personnel. CADENA identified the minimum requirements for ANSPs to establish a functional FMU and FMU personnel qualifications. With adequate guidance and training, almost all the ANSPs in the CAR region have successfully established their FMUs and continue to enhance their contingency handling skills.

3.3 It is important to identify the contingency event so that the proper action can be taken. CADENA has identified fifteen such events and grouped them into 5 categories as shown below:


- ACCs
 - o Evacuation
 - o Radar failure
 - o Air/Ground (A/G) communication failure
 - o Telephone or landline failure
 - o Power failure
 - o Flight data processing system (FDPS) failure
 - o Staffing shortages
 - o Work stoppages (strikes)
- Severe weather / natural phenomena
 - o Hurricanes / tropical storms
 - o Volcanic eruption
 - o Earthquakes
- Airports
 - o Aircraft accidents / incidents
- FMU outages
 - o Equipment failure
 - o FMU services not available
- Off-Nominal (Unusual) Events
 - o Global pandemic (COVID-19, for example)

3.4 Once the contingency event is identified, the appropriate information must be gathered to share with others who are also impacted by the event. CADENA has recognised the following as the key information to be gathered and utilised:

- A description of potential events that can disrupt air traffic operations.
- A checklist of initial ATFM/CDM steps for responding to a disruptive event.

- The process for evaluating the effectiveness of ATFM measures during an event and for adjusting throughout the event.
- The ATFM/CDM-related steps necessary to recover from a disruptive event.
- The CADENA points of contact, roles, and responsibilities.
- The lessons learned documentation and post-event reports.

3.5 CADENA has prepared the ANSP Contingency Form (see below from the CADENA ATFM/CDM Procedures Manual, Section 6.4) to help collect pertinent contingency event information, put all of the available information in one form, and display it on the CADENA OIS for stakeholder situational awareness. This form will be completed and uploaded to the CADENA OIS by the participating ANSP that has taken the lead for a contingency event. This task may be delegated to another participating ANSP or CADENA Headquarters if workload during an event requires. When the ANSP uploads the Contingency Form to the CADENA OIS, a CADENA Advisory will also be issued.



ANSP CONTINGENCY FORM

Impacted Facility / Sector: _____

REF #: _____

Type of Contingency

Communication
 Facility
 Surveillance
 Staffing
 Other

Detail

[Click here to enter text.](#)

Traffic Management measures

Miles-in-trail (MIT)
 Minutes-in-trail (MINIT)
 Re-routing
 Fix Balancing
 Level Capping
 Tunnelling
 Airborne Holding
 Ground Delay Program (GDP)
 Ground Stop (GS)
 Airspace Flow Program (AFP)

Detail

[Click here to enter text.](#)

FIRs Affected

TTZP TJZS SVZM TNCF MDCS
 MTEG KZMA KZWY KZHU MUFH
 MKJK MMFR MHCC MPZL SKEC
 SKED SARR SACF SAEF SAVF
 ____ ____

Start Time

[Click here to enter text.](#)

End Time

[Click here to enter text.](#)

3.6 The CADENA Advisory has two types, Urgent and For Your Information (FYI). The contingency event highly likely will require an Urgent Advisory. If the CADENA participant is registered for the email notification, the CADENA OIS will automatically notify them of the advisory via registered email. The CADENA Virtual Support Team will organize and notify the stakeholders of an Ad Hoc web conference to discuss the event, if it is deemed necessary.

3.7 CADENA has prepared fifteen “Contingency Events and Checklists”, one for each contingency event identified in the previous section of this Working Paper (section 3.3). Contingency Event and Checklists enable ANSPs to mitigate the impact of such events through a ready-reference checklist when the unexpected happens. It describes the initial and following ATFM actions that the impacted ANSP should take depending on the event. (See the CADENA ATFM/CDM Procedures Manual, APPENDIX E.)

3.8 In the event that Ad Hoc web conference is warranted, the CADENA Virtual Support Team will work with the impacted ANSP(s) to prepare the event information briefing materials to present during the web conference. In addition to the ANSP Contingency Form (refer to section 3.5), helpful information should be prepared in an appropriate form. Sample slides for presenting information during a HURRICANE / TROPICAL STORM WEB CONFERENCE and VOLCANO WEB CONFERENCE are provided in the CADENA ATFM/CDM Procedures Manual, APPENDIX B and APPENDIX C.

3.9 It is important for the CADENA Virtual Support Team to be able to reach out to the right Point of Contact (PoC) during a contingency event. The PoC List of CADENA for each of the participating ANSPs and the stakeholders is posted on the CADENA OIS (not in the public view, but through the password protected side) as a ready reference for CADENA participants.

3.10 Training is necessary to be ready for any contingency events. Since 2017, CADENA has offered annual hurricane training every spring. CADANA also offers quarterly contingency event training. CADENA’s contingency training is based on a realistic scenario and ANSPs, airlines, and other stakeholders play their roles to ensure that they became proficient with the contingency event procedures.

4. Communication Methods for Contingency Handling

4.1 CADENA uses several different communication methods to share information during a contingency. Different types of communication methods are used because they offer different types of services and CADENA use the best types available to meet the needs of an event.

4.2 In collaboration with participating ANSPs and airlines, in August 2017, CADENA launched the CADENA OIS, allowing ANSPs to easily share special events, contingency events, and operational information via the web application. Since then, the CADENA OIS has been enhanced several times to provide more capabilities to exchange ATFM/CDM related information and to boost coordination opportunities.

4.3 The CADENA OIS plays a critical role during a contingency event by offering participating ANSPs a basic capability of sharing information including: the ANSP Contingency Form; briefings on the event; CADENA advisories; Contingency Events Checklists; and, the Planned Airway System Alternative (PASA) route database. The CADENA OIS provides functions to issue CADENA advisories and PASA End-to-End (E2E) route requests.

4.4 In addition to the CADENA OIS, Ad Hoc web conferences, group emails, and the WhatsApp application are also used to quickly exchange short messages. The usage of WhatsApp was not considered in 2016; however, CADENA has found it is useful and officially formed the CADENA Ops WhatsApp chat group.

5. Planned Airway System Alternative (PASA)

5.1 PASA routes are contingency routes that can be used temporarily to circumvent airspace impacted by a significant event (e.g., major hurricane, complete power outage, satellite outage, etc.). There are two types of PASA contingency routes: predetermined routes stored in the CADENA database and dynamic end-to-end (E2E) routes that can be created and requested as needed. CADENA has found that both the PASA route database and the PASA E2E routes, help to improve operational predictability, mitigate delays, and enhance safety during these rare events.

5.2 In October 2018, a few PASA routes were identified and used in response to the loss of an ANSP's surveillance capabilities and the closure of a large volume of airspace in the Caribbean region. Recognizing the usefulness of PASA predetermined contingency routes for each FIR, CADENA created the PASA route database based on routes that were already in use by the airlines and have been approved by the participating ANSPs. The implementation of PASA routes must be coordinated with the appropriate ANSPs through their FMU prior to use.

5.2 When an event occurs that requires implementation of the PASA routes from the database, the CADENA Virtual Support Team will schedule and convene an Ad Hoc Web Conference to coordinate the use of specific routes. A member of the CADENA Virtual Support Team will serve as the Host for the Ad Hoc Web Conference. The PASA route database became very handy during the COVID pandemic when ATC-Zero events occurred regularly due to staffing issues. The PASA route database is in an Excel spreadsheet format, is updated quarterly, and can be accessed via the CADENA OIS.

5.3 While the PASA route database contains the predetermined contingency route, the airlines sometimes need more tactical routes to fly. The PASA E2E routes are requested by airlines/stakeholders on an ad hoc basis (i.e., when needed). Airlines/stakeholders can submit these route requests via the CADENA OIS and PASA E2E routes must be approved by all ANSPs through their FMU in which any segment of the route occurs.

5.4 Notable examples of PASA E2E routes include: Delta Airlines' creation of a special route to avoid a hurricane while traveling from the Mexico to the U.S. in October 2020; and, American Airlines successful transport of COVID vaccines from the U.S. to Chile via the coordinated efforts of ANSPs which resulted in the vaccine's timely arrival and safe delivery in December 2020.

5.5 CADENA has developed and maintains a Lessons Learned document based on experiences gained from the various contingency events and from day-to-day operations. The most recent version of the document is available to participating ANSPs after login to the CADENA OIS.

6. Suggested Actions

6.1 The Meeting is invited to:

- a) note the contents of this Working Paper;
- b) discuss the material and provide any feedback;
- c) discuss any relevant matters as appropriate; and
- d) consider adaptation of relevant contents in this paper into State contingency plans.