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FUTURE
SKIES

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CADENA: CONTINGENCY PLANNING AND RESPONSE

For: ICAO NAM/CAR/CONT/3

Date: May 9-11, 2023

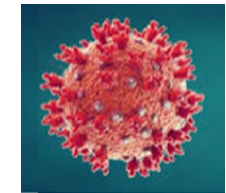
By: CADENA Team - Al Castillo and Midori Tanino

Key Points

- Collaboration among stakeholders during a contingency event is a **MUST**
 - Collaboration starts with information sharing
 - YOU are the stakeholders
- All stakeholders must always be prepared for contingency events
- CADENA has proven its effectiveness during contingency events
 - Use CADENA contingency procedures, when applicable

CADENA: Contingency Planning and Response

- CADENA has gained extensive experience in dealing with disruptions to Air Traffic operations in the LAC region since 2016
- CADENA understands the importance of preparing for disruptions and gathering and sharing operational information



No Country Left Behind (NCLB)

The **No Country Left Behind** (NCLB) initiative highlights ICAO's efforts to assist States in implementing ICAO Standards and Recommended Practices (SARPs). The main goal of this work is to help ensure that SARP implementation is better harmonized globally so that all States have access to the significant socio-economic benefits of safe and reliable air transport.

The NCLB effort also promotes ICAO's efforts to resolve Significant Safety Concerns (SSCs) brought to light through ICAO's safety oversight audits as well as other safety, security and emissions-related objectives.



Included in PfA to Annex 11 and PANS-ATM Doc 4444

(Annex 11) 3.7.5.1 States shall ensure that an air traffic flow management (ATFM) service is established and that it supports cross-border ATFM collaboration.

(Annex 11) 3.7.5.3 The appropriate ATS authority shall determine the capacity of the air traffic control services in the form of declared capacity and operational capacity for the following: a) all controlled airspace; b) all controlled aerodromes included in the regional air navigation plan; and c) other controlled aerodromes identified by the State.

(Doc 4444) 3.2.1.2 The appropriate ATS authority shall establish ATFM unit(s) and designate the area(s) of responsibility.

(Doc 4444) 3.2.1.5 Flow management positions should be established for each appropriate ATC unit to support ATFM units and to ensure proper conduct of ATFM activities.

Operational Coordination and Information Sharing

CADENA became operational quickly and all ANSPs/airlines can participate with a small investment

- 2016 Jun – Established
- 2016 Aug – 1st CADENA meeting
- 2016 Dec – Started regional ATFM/CDM Operational Planning Web Conferences
- 2017 Aug – Initial version of the CADENA Operational Information System (OIS) launched

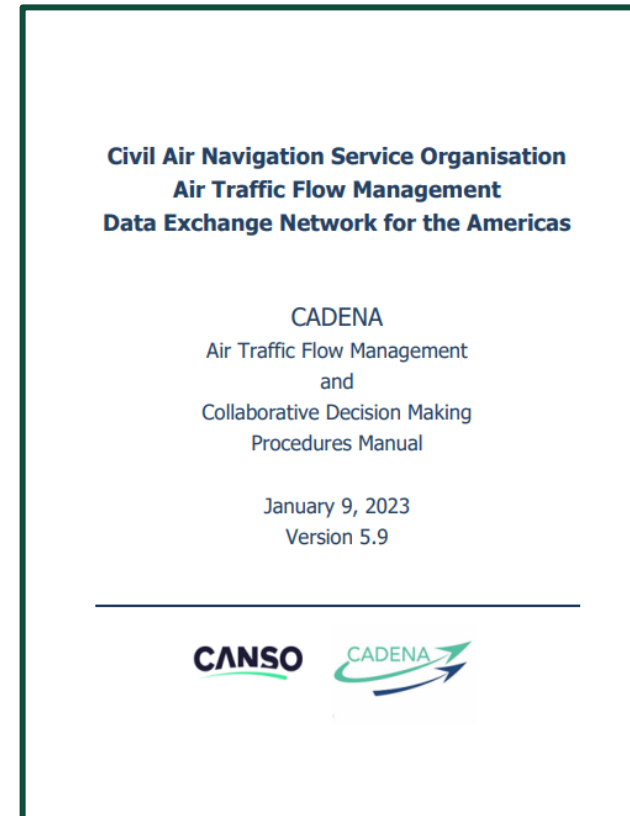
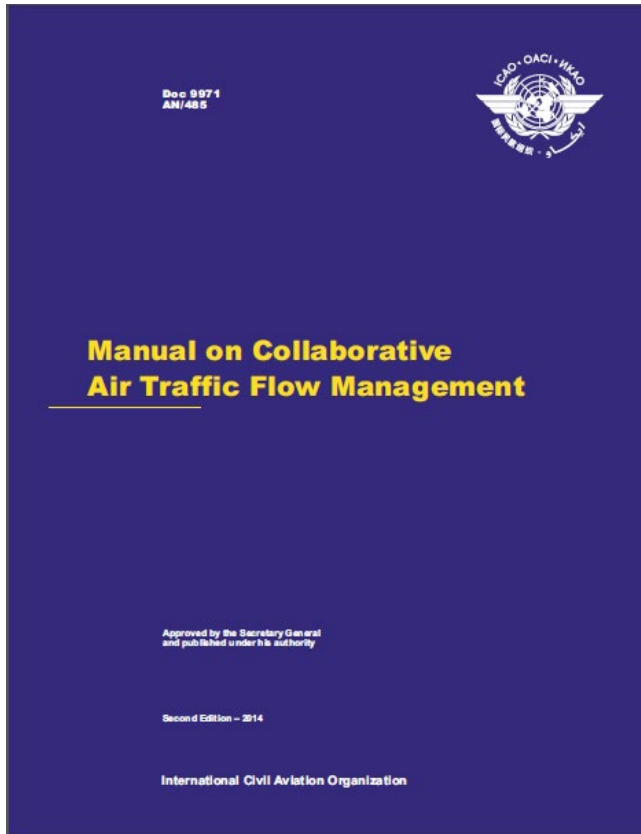


You need only:

1. Computer
2. Internet Access
3. Human Resource

In Concert with ICAO

CADENA is designed to implement the processes and procedures from ICAO DOC 9971



Contingency Events

15 Contingency Events

ACCs

- Evacuation
- Radar failure
- A/G communication failure
- Telephone or landline failure
- Power failure
- FDPS failure
- ATFN outage
- Staffing shortages
- Work stoppages (strikes)

Severe weather / natural phenomena

- Hurricanes / tropical storms
- Volcanic eruption
- Earthquakes

Airports

- Aircraft accidents / incidents

FMU outages

- FMU services not available

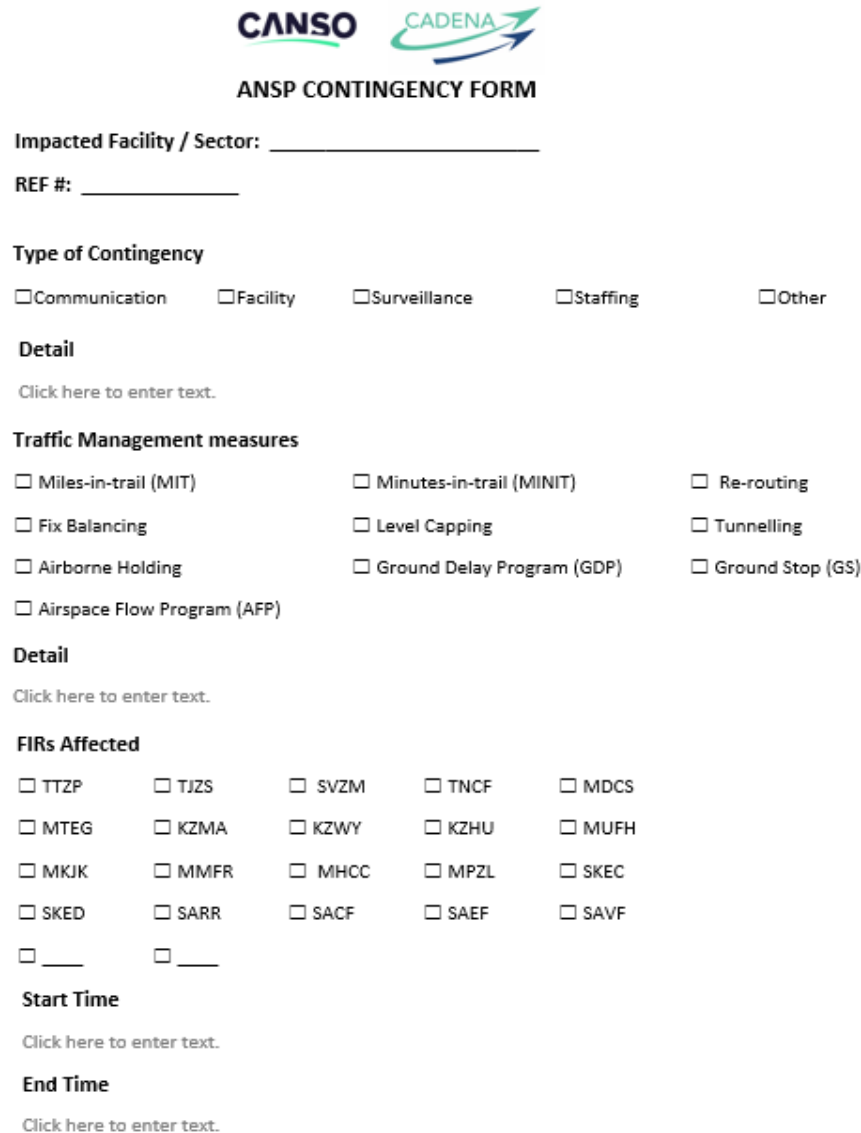
Off-Nominal (Unusual) Events

- Off-Nominal event

Information Gathering and Procedures

- 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 them 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

ANSP Contingency Form - Supports Information Gathering



CANSO **CADENA**
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.](#)

ANSP Contingency Form – used to help collect pertinent contingency event information and to display all of the available information in one form

Enter the Contingency Form via CADENA OIS

- Impacted Facility/Sector
- Type of Contingency
- Traffic Management Measures
- FIRs Affected
- Start Time and End Time

Entered Contingency Form is publically shared via CADENA OIS

CADENA Advisory



The screenshot shows the CADENA OIS interface with a table of Regional Advisories. The table has columns for ID, ANSP / Airline, Type, Start Date, End Date, Summary, Reason, and a Details button. The data is as follows:

ID	ANSP / Airline	Type	Start Date	End Date	Summary	Reason	Details
988	SENEAM	FYI	02/MAY/2023 05:00	05/MAY/2023 11:50	MMMX RWY CLOSURE	MAINTENANCE	Details
987	SENEAM	FYI	03/MAY/2023 16:30	03/MAY/2023 17:00	MMMX RWY CLOSURE	ROUTINE REVISION	Details
976	ATO	FYI	04/MAY/2023 07:19	10/MAY/2023 09:28	SpaceX Starlink 5-6 Rocket Launch	SpaceX Starlink 5-6 Rocket Launch	Details
975	ATO	FYI	28/APR/2023 21:12	04/MAY/2023 23:28	SpaceX mPower-B Rocket Launch	SpaceX mPower-B Rocket Launch	Details
961	ATO	FYI	28/APR/2023 21:12	04/MAY/2023 22:59	SpaceX mPower-B	Planned Rocket Launch, Kennedy Space Station FL	Details
960	ATO	FYI	26/APR/2023 23:24	03/MAY/2023 01:18	SpaceX ViaSat 3.1	Planned Rocket Launch, Kennedy Space Center FL	Details

- Advisory is entered via the CADENA OIS
 - Advisory Type: Urgent or FYI
 - Start Time and End Time
 - Summary
 - Reason
 - Details – including NOTAM(s)
- Entered Advisory is publically shared via CADENA OIS
- Email push notification is sent, if registered

Contingency Events and Checklists

1: Evacuation of an ACC	Impacted Facility: ACC (Name)
Initial ATFM Action	Follow-Up ATFM Actions
<ul style="list-style-type: none"> • Whichever FMU receives the information first, notify your adjoining FMUs • Stop departure traffic under your FMU's jurisdiction that is filed to/through the impacted ACC's airspace • Coordinate airborne holding, if necessary • Coordinate re-routes for existing, airborne traffic, if necessary • Notify stakeholders, as able • Post an Urgent Advisory on the CADENA OIS 	<ul style="list-style-type: none"> • Notify CADENA and ICAO leadership as soon as possible • Gather information on: <ul style="list-style-type: none"> ○ How long is the ACC expected to be out of service? ○ What is the impact to demand and capacity? ○ Have aircraft diverted? ○ If so, how many and to which airports? • CADENA leadership will, as soon as possible, schedule and conduct a CADENA CDM web conference, including airspace users, to relay available information and establish next steps <i>NOTE: The situation may require scheduling a daily webex for the first few days of the event</i> • For a potential long-term evacuation, discuss and coordinate alternate routes • Evaluate potential demand on the alternate routes and coordinate TMMs, as applicable • Ensure the appropriate NOTAM is issued and updated

Contingency Events and Checklists -- mitigate the impact of such events through a ready-reference checklists when the unexpected happens. They describe the initial and follow-up ATFM actions that the impacted ANSPs should take depending on the event.

CADENA Ad Hoc Web Conferences

CADENA Ad Hoc Web Conferences allow participating ANSPs and stakeholders to discuss and work on solutions to disruptive operational issues

- Any CADENA member can initiate and host the CADENA Ad Hoc Web Conference
- Responsibilities of Ad Hoc Web Conference Host and participants are described in the CADENA Procedures Manual section 3.4
 - Pre-conference responsibilities
 - Conference responsibilities
 - Post-conference responsibilities
- Use Virtual Support Team (VST) for support



Contingency Event Training

Our goal is to train like we respond!

- Operational and personnel safety come first!
- Ensure good communication and teamwork among all the stakeholders.
- Use the capabilities of the CADENA VST.
- Use the procedures in the CADENA ATFM/CDM Procedures Manual.
- Use the capabilities in the CADENA OIS, Flight Radar 24, and CADENA WhatsApp.



CADENA ATFM and CDM Procedures Manual consists of sections that describe contingency event handling and contingency related forms and checklists.

- CADENA offers annual hurricane training every spring (since 2017).
- CADANA also offers quarterly contingency training.
- CADENA's contingency training is realistic and scenario-based and ANSPs, airlines, and other stakeholders play their roles to ensure that they became proficient in the procedures.

Hurricane Briefing Template

HURRICANE (NAME) UPDATE – 1400 UTC – DATE



ANSP Name

PROJECTED PATH IN YOUR AIRSPACE

- THE CADENA HOST WILL ADD A GRAPHIC OF THE PROJECTED PATH
- ADD SLIDES, IF NEEDED
- Recommend a screenshot from: <https://www.nhc.noaa.gov/>

HURRICANE (NAME) UPDATE – 1400 UTC – DATE



ANSP Name

IMPACTED ROUTES	PLANNED TRAFFIC MANAGEMENT MEASURES
<ul style="list-style-type: none"> • ADD GRAPHICS, IF ABLE • ADD SLIDES, IF NEEDED • Recommend a screenshot from a website like: https://skyvector.com/ <p>Use "World Hi" Add layers, if applicable</p>	<ul style="list-style-type: none"> • FOR EXAMPLE: REROUTES, MIT, MINIT • LIST THE IMPACTED NEIGHBORING ANSPs

HURRICANE (NAME) UPDATE – 1400 UTC – DATE



ANSP Name

PROJECTED IMPACT

DAY 1

AIRPORT CLOSING (DATE/TIME)
STAFFING ISSUES
EQUIPMENT OUTAGES

DAY 2

AIRPORT CLOSING (DATE/TIME)
STAFFING ISSUES
EQUIPMENT OUTAGES

WHEN APPLICABLE

AIRPORT RE-OPENING (DATE/TIME)

HURRICANE (NAME) UPDATE – 1400 UTC – DATE



ANSP Name

OTHER ISSUES

- 1
- 2
- 3

"TELL US WHAT WE DO NOT KNOW"

"PLEASE KEEP YOUR NOTAMS UP-TO-DATE"

Hurricane Event Contingency Training

EXERCISE **CADENA Contingency Form**

Impacted Facility / Factor: Kingston and Mexico FIR
REF: Hurricane Charlie Update March 29, 2023 at 1400 UTC

Type of Contingency
 Communication Facility Surveillance Staffing Other

Detail
 Hurricane Charlie has passed over Jamaica and is approaching the Yucatan peninsula. The Hurricane is expected to make landfall within the next 24 hours near Cancun

Traffic Management measures
 Minus-in-trail (MIT) Minus-in-trail (MINT) Re-routing
 Fix Balancing Level Capping Turnback
 Airborne Holding Ground Delay Program (GDP) Ground Stop (GS)

Detail
 Expect minus-in-trail, minus-in-trail to select airports and tactical reroutes in the Kingston and Mexico FIR due to the track of Hurricane Charlie.

FIRs Affected
 TFFP TUL SOWM TNCF MDCS
 MTRG GNER GOWP KZRL M-PH
 MLEK MRFRA MAMC MRLI GASC
 SBD SARR SASF SANS SAUF

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29th, 2023

ANSP ECNA

HURRICANE CHARLIE NOTICE NO. 15 MARCH 29th, 2023 1100 UTC

CHARLIE is located at 0900 UTC on Lat 18.8N and Long 80.9W. This position places it 40nm (65km) East of Grand Cayman, and 440nm (710km) E of Tulum, Mexico. CHARLIE is forecast to maintain its hurricane category later today. CHARLIE moves near W (280 degrees) at the rate of 34kt (63km/h). A general motion towards W / WNW is expected during the next few days. On the forecast track, CHARLIE's core is away from the W coast of Jamaica. It is forecast to move near or over the Cayman islands this morning and then approach the Yucatan peninsula in Mexico tonight or early on Friday. Maximum winds are in the order of 65kt (121km/h) with higher gusts. Hurricane force winds extend up to 115nm (215km) from the center. The estimated minimum pressure is 980hpa (735.06mm). Tropical storm conditions influence the south of the FIR and along the south coast of Cuba today and early on Thursday.

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29th, 2023

ANSP ECNA

Exercise: CADENA Hurricane Charlie Planning Web Conference

March 29, 2023
1400 UTC

CADENA

CANSO

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29th, 2023

ANSP ECNA

PROJECTED IMPACT

DAY 1
 AIRPORT CLOSING: NONE
 STAFFING ISSUES: NONE
 EQUIPMENT OUTAGES: NIL

DAY 2
 AIRPORT CLOSING: NONE
 STAFFING ISSUES: NONE
 EQUIPMENT OUTAGES: NIL

WHEN APPLICABLE
 AIRPORT RE-OPENING: DOES NOT PROCEED

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29th, 2023

ANSP ECNA

OTHER ISSUES

ECNA WILL KEEP OBSERVING THE EVOLUTION AND TRACK OF HURRICANE "CHARLIE". THE TACTICAL MEASURES TO PUT INTO PRACTICE IN THE COMING DAYS WILL DEPEND ON CHARLIE'S POSITION AND DEVELOPMENT.

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29, 2023

JCAA

PROJECTED PATH

HURRICANE CHARLIE UPDATE – 1400 UTC – MARCH 29, 2023

IMPACTED ROUTES

ROUTES WITHIN THE WEST SECTOR & SOME SECTIONS OF THE EAST SECTOR OF THE FIR IMPACTED; EASTERLY DEVIATIONS ANTICIPATED.

- ✓ UM335
- ✓ UL465
- ✓ UG44
- ✓ UM330
- ✓ UG877
- ✓ UG448
- ✓ UG633
- ✓ UG536
- ✓ UM782

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29th, 2023

ANSP ECNA

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29th, 2023

ANSP ECNA

IMPACTED ROUTES

- A290/UM779
- G430/UP406
- M/UM221
- UG782
- R/UG44
- R30/UM330
- M/UM335
- Q/UG877
- Q/UG448
- M/UM338
- UL485

PLANNED TRAFFIC MANAGEMENT MEASURES

➤ TO BE TACTICALLY TAKEN DEPENDING ON CHARLIE'S TRAJECTORY.

CADENA

CANSO

HURRICANE CHARLIE UPDATE – 1400 UTC – MARCH 29, 2023

HURRICANE CHARLIE UPDATE – 1400 UTC – MARCH 29, 2023

JCAA

AIRCARRIER	CLOSURE DATE	STAFF ISSUES	EQUIPMENT OUTAGES	IMPACT DATE (HH)	STATUS
MKSP	03/28/23	STBY STAFF AVAILABLE	PAPIS, ILS DTS & VOR/DME DTS BY V DEBRIS	04/02/23	CLOSED
MKCS	03/29/23	EMR STAFF AVAILABLE	NONE	03/30/23	CLOSED EXCEPT HL FLIGHTS
MKBS	03/29/23	NONE	NONE	03/30/23	CLOSED
MWCR	03/29/23	NONE	NONE	03/30/23	CLOSED
MWCB	03/29/23	NONE	GEN VOR/DME US	03/30/23	CLOSED

HURRICANE CHARLIE UPDATE – 1400 UTC – MARCH 29, 2023

JCAA

PLANNED TRAFFIC MANAGEMENT MEASURES (MAR/29/23-MAR/31/23)

BEROUTE

- WEST SECT. TFC. REROUTED TO EAST SECTOR
- NBND TFC (NIBED UM221 COLBY) &
- SBND TFC (PUTUL UP406->SIA->HANCK UL347 KASOR).

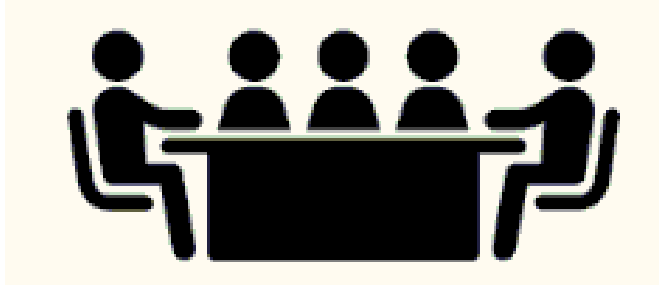
NOTES

- 40NM BTW TFC AT DIFF. LVLs, SIM. RTE
- 80NM BTW TFC AT SIM. LVLs, SIM. RTE

IMPACTED NEIGHBORING ANSPs

- HAVANA, CENAMER & NORTHERN SECTION OF PANAMA impacted.

How CADENA Built a Collaborative Communication Environment



CANSO CADENA Volcanic Ash

Information | Regional TMM 4 | Active Reroutes 1 | Delays 2 | Advisories 11 | Español

CADENA Operational Information System (OIS)

Regional Operations Plan
 ↓ JCAA Jamaica: 03/May/2023 12:44

Anticipated Demand Information MEDIUM

TMM Planned AIC 02/23 ALL TRAFFIC DEPARTING MIAMI DESTINED BOGOTA SHALL ROUTE IN KINGSTON FIR VIA EMABU UP525 SINID.

Urgent Advisory NONE

Weather SIGNIFICANT FEATURE: A WEAK HIGH-PRESSURE RIDGE IS ACROSS JAMAICA THE RIDGE LINGERS THROUGH TO THURSDAY. THEREAFTER, THURSDAY AFTERNOON, A TROUGH MOVES ACROSS THE ISLAND. 24-HOUR FORECAST: THIS MORNING... MAINLY SUNNY. THIS AFTERNOON... PARTLY CLOUDY ACROSS HILLY AREAS AND POSSIBLE SHOWERS ACROSS NORTHWESTERN PARISHES. WINDY ALONG THE SOUTH COAST. TONIGHT... FAIR. CLOUDS GENERALLY ACROSS THE ISLAND: THIS MORNING ... FEW022 THIS AFTERNOON... SCT020 SCT035 WINDS AND TEMPERATURES (NO DATA AVAILABLE) AERODROME FORECAST TAF MKJP 031115Z 0312/0412 36005KT 9999 FEW022 BECMG 0313/0315 15022KT BECMG 0401/0403 12012KT BECMG 0405/0407 36005KT= TAF MKJS 031115Z 0312/0412 14004KT 9999 FEW022 BECMG 0314/0316 05015KT SCT020 SCT036 BECMG 0401/0403 VRB02KT FEW022= KINGSTON FIR SCT025 SCT050. ISOL SHRA.

THE NEXT CADENA PLANNING WEB CONFERENCE WILL BE HELD ON THURSDAY, MAY 4, 2023 AT 1400 UTC

UTC: 03/May/2023 15:29:40

CANSO LATIN AMERICA AND CARIBBEAN

SHAPING OUR FUTURE SKIES

CADENA Operations Planning Web Conference

MONDAY, April 17, 2023
1400 UTC



CADENA Operational Information System (OIS)

Regional Operations Plan
↓ JCAA Jamaica: 03/May/2023 12:44

Anticipated Demand Information MEDIUM

TMM Planned AIC 02/23 ALL TRAFFIC DEPARTING MIAMI DESTINED BOGOTA SHALL ROUTE IN KINGSTON FIR VIA EMABU UP525 SINID.

Urgent Advisory NONE

Weather SIGNIFICANT FEATURE: A WEAK HIGH-PRESSURE RIDGE IS ACROSS JAMAICA THE RIDGE LINGERS THROUGH TO THURSDAY. THEREAFTER, THURSDAY AFTERNOON, A TROUGH MOVES ACROSS THE ISLAND. 24-HOUR FORECAST: THIS MORNING:... MAINLY SUNNY. THIS AFTERNOON:... PARTLY CLOUDY ACROSS HILLY AREAS AND POSSIBLE SHOWERS ACROSS NORTHWESTERN PARISHES. WINDY ALONG THE SOUTH COAST. TONIGHT:... FAIR. CLOUDS GENERALLY ACROSS THE ISLAND: THIS MORNING ...: FEW022 THIS AFTERNOON...: SCT020 SCT035 WINDS AND TEMPERATURES (NO DATA AVAILABLE) AERODROME FORECAST TAF MKJP 031115Z 0312/0412 36005KT 9999 FEW022 BECMG 0313/0315 15022KT BECMG 0401/0403 12012KT BECMG 0405/0407 36005KT= TAF MKJS 031115Z 0312/0412 14004KT 9999 FEW022 BECMG 0314/0316 05015KT SCT020 SCT036 BECMG 0401/0403 VRB02KT FEW022= KINGSTON FIR SCT025 SCT050. ISOL SHRA.

THE NEXT CADENA PLANNING WEB CONFERENCE WILL BE HELD ON THURSDAY, MAY 4, 2023 AT 1400 UTC

UTC: 03/May/2023 15:29:40

Exchange:

- MS documents (Word, PPT, Excel)
- Text, pdf, and picture

Enter:

- ATM Solutions
- Advisories/Notices
- Airport delay
- ATFM Daily Plan
- Calendars
- PASA Route Request

Store:

- Routes (PASA, UPR)
- Forms (Contingency)
- Capacity info (Airport/Airspace)

<https://www.cadenaois.org> Public domain for read only. Member domain to read and upload information.

WhatsApp CADENA OPS Group

~ Scott Pressley - [Redacted] 8:53 PM
Do we know what the RWY closure at MMMX is for?

Joe Hof 8:54 PM
Checking

Mario Hernandez 9:14 PM
Good morning everybody, this RWY closure at MMMX is done for routine revision purposes only. Airport operator do this weekly for both RWYs, one on Tuesdays and the other one on Wednesdays... That 30 minutes closure impacts operations deeply because they program same 5 operations during the 1600 to 1700 period.

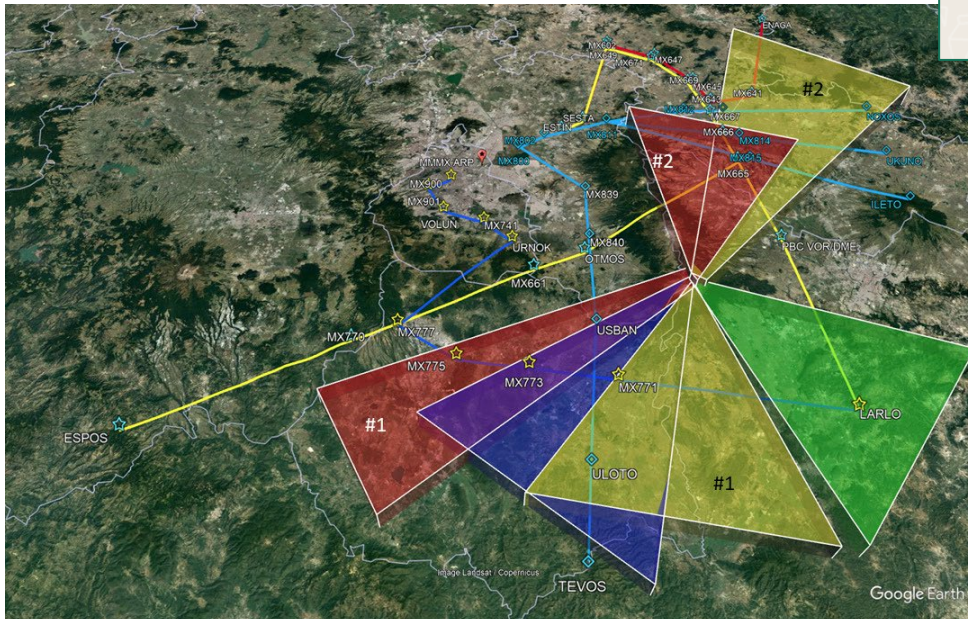
~ Scott Pressley - [Redacted] 9:14 PM
Thank you!

~ Brandon Tal +1 (786) 580-1856 12:41 AM
Good afternoon guys we are hearing in the command center that MUHA is closed. Does anyone have any further details? Thank you.

Ricardo Martínez González 12:45 AM
Good afternoon. MUHA is closed due operational reasons, expected time to resume ops 18:30

Deano Ledford 5:47 AM
Forwarded
Good afternoon all, Nassau has regained limited functionality to our radar processors and are now accepting arrivals with 20nm in-trail and are releasing all departures at a minimum of 4mins intervals.

Mario Hernandez 5:48 AM
Thanks for the update Deano!!!



OBSERVED ASHES AT FL230 BY 07/2000Z

#2 RED POLYGON: OBSERVED ASHES AT FL300 BY 07/2000Z

#1 YELLOW POLYGON: ASH DISPERSION FCST AT FL230 BY 08/0800Z

#2 YELLOW POLYGON: ASH DISPERSION FCST AT FL300 BY 08/0800Z

BLUE POLYGON: ASH DISPERSION FCST AT FL230 AND FL300 BY 08/0800Z

GREEN POLYGON: ASH DISPERSION FCST AT FL230 BY 08/1400Z

SOURCE: WASHINGTON VAAC ADVISORY NR: 2023/284 AT 07/1923Z

NEXT ADVISORY: 08/0130Z

IMAGE PROVIDED BY: GOOGLE EARTH

Ricardo Martínez González 8:32 PM
Buenos días. At the moment, RESISTENCIA FIR (SARR) is without communications. No frequencies available on the entire FIR. A NOTAM will be issued where no ATS SERVICE will be provided. Stand by for the Notam number

~ Al Castillo - [Redacted] 8:33 PM
Thank you Flavia

Joe Hof 1:37 AM
CADENA has been advised that a departure from the HAV airport had to return due to an emergency. The flight landed and has been towed off the runway. The airport is now open and operations are returning to normal

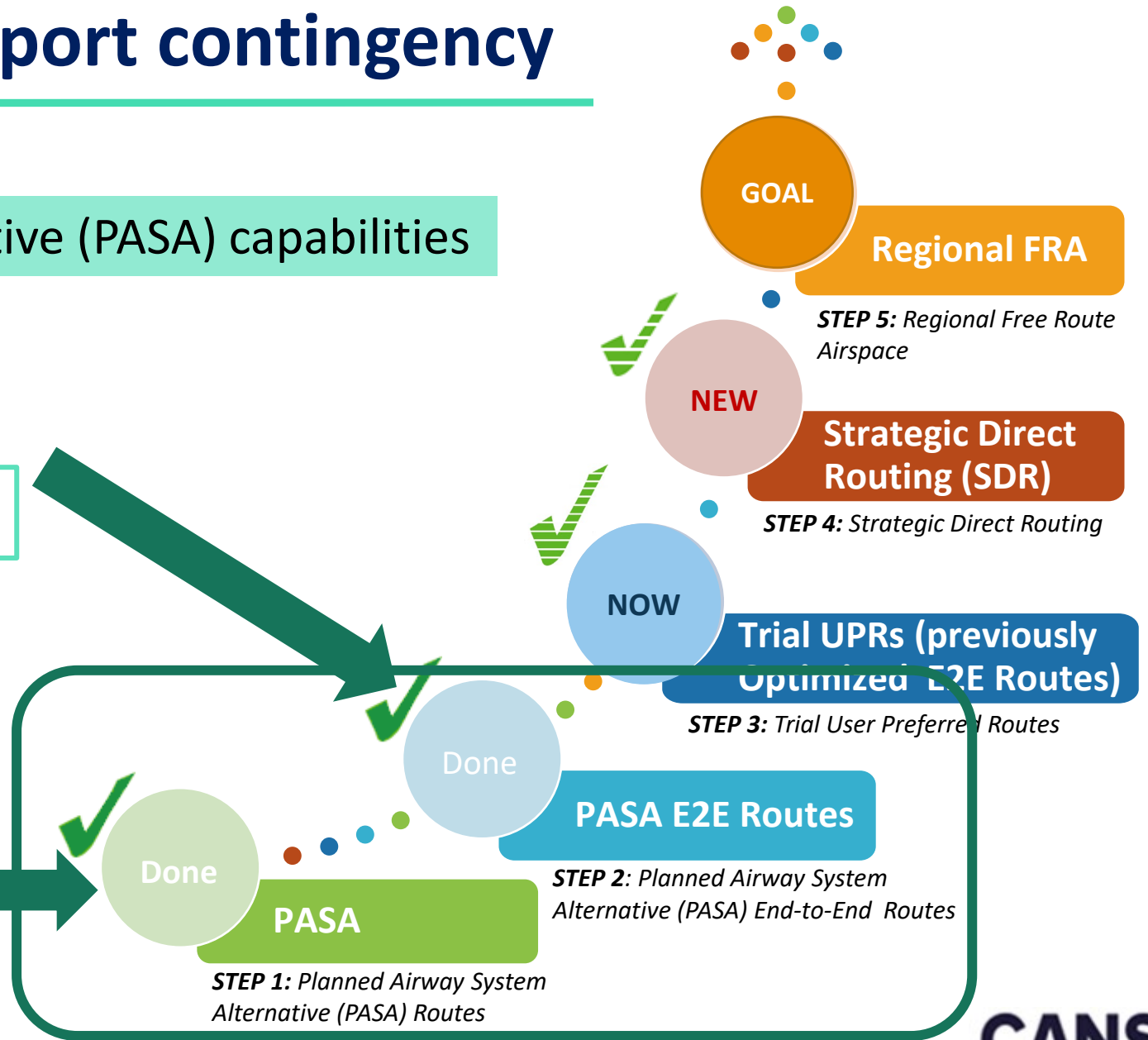
IMPORTANT: THIS ILLUSTRATION IS MERELY INFORMATIVE AND FOR SITUATIONAL AWARENESS ONLY. SHALL NOT TO BE USED FOR FLIGHT PLANNING PURPOSES.

CADENA Products - support contingency

Planned Airway System Alternative (PASA) capabilities

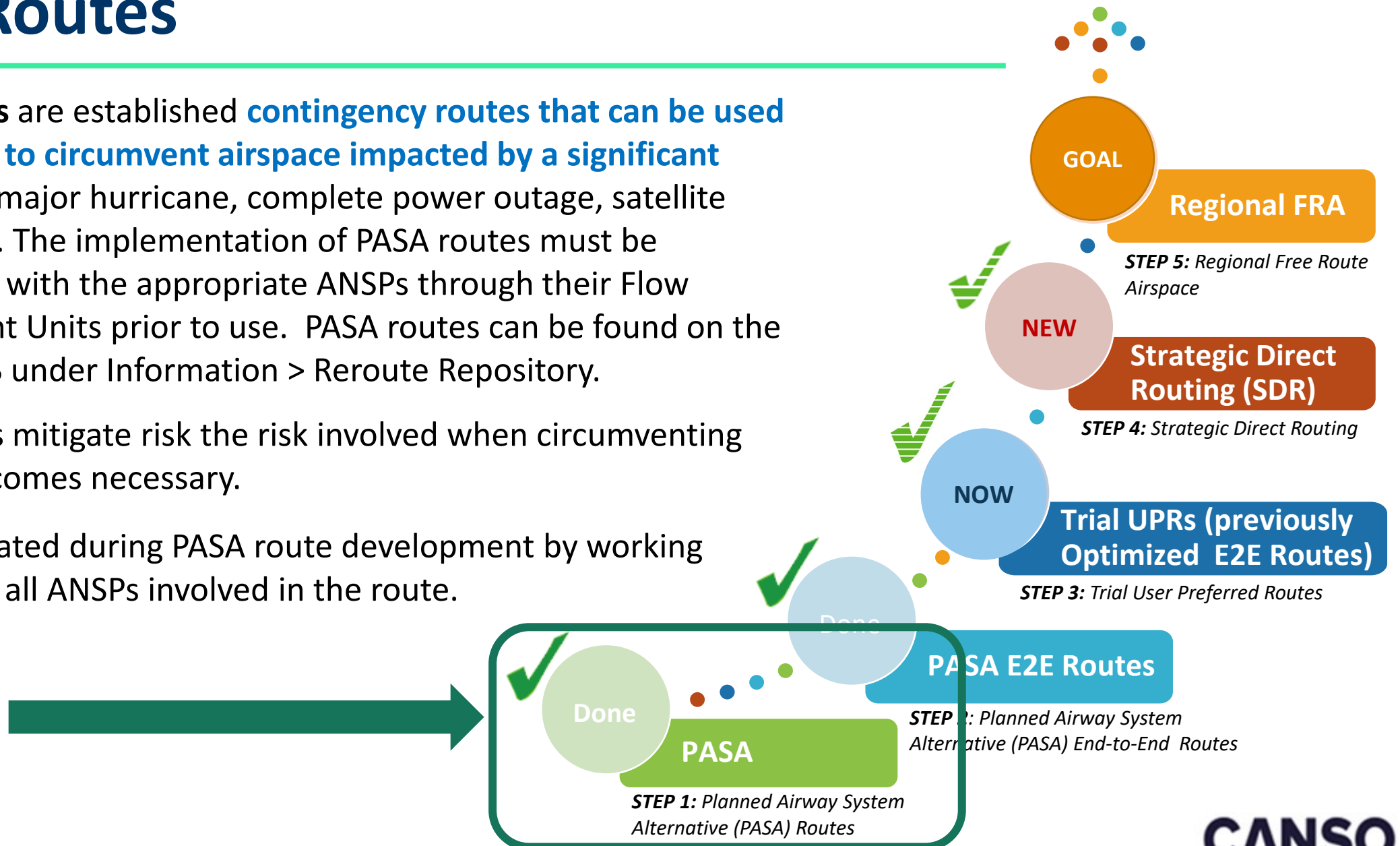
PASA End-to-End Routes

PASA Routes



PASA Routes

- **PASA Routes** are established **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.). The implementation of PASA routes must be coordinated with the appropriate ANSPs through their Flow Management Units prior to use. PASA routes can be found on the CADENA OIS under Information > Reroute Repository.
- PASA Routes mitigate risk the risk involved when circumventing airspace becomes necessary.
- Risk is mitigated during PASA route development by working closely with all ANSPs involved in the route.



CADENA OIS PASA Routes Repository

AVOID ZHU THROUGH ZAB

ORIG	DEST	EASTBOUND THROUGH KZMA		
MEXICO	KMIA AND BEYOND	... AXOMU UM346 CANOA ...	AVOID KHU - EAST	BI-DIRECTIONAL ROUTE
CENAMER	KMIA AND BEYOND	... CTM ANIKO CZM UG765 FIS ...	AVOID KZHU - EAST	BI-DIRECTIONAL ROUTE
MMUN	KMIA AND BEYOND	MMUN NUDAL UV106 FRANT UG765 FIS ...	AVOID KZHU - EAST	
MMUN	KATL	... CUN UJ18 URTOK UG765 MAXIM G765 FIS PLYER JAWJA DAWWN ...	AVOID ZHU - EAST	INCLUDES ZMA FEEDBACK
ORIG	DEST	WESTBOUND THROUGH ZMA		
KATL	MMUN	... WALET YUESS OTK TEPEE BRDGE RSW KARTR Q81 TUNSL Y196 CANOA UB879 CUN ...	AVOID ZHU - EAST	WITH SENEAM DATA
ZMA	MMM	... ENDEW Q81 TUNSL Y196 CANOA UM346 AXOMU UR522 PAZ UJ55 DATUL ...	AVOID KHU - EAST	
ORIG	DEST	WESTBOUND THROUGH ZAB		
MEXICO	KZAB AND BEYOND	... MOV MRF ...	AVOID KZHU - WEST	
ZMA	KZAB AND BEYOND	... CANOA ELUNI COFRE UM506 SESNO UJ15 MOV UJ2 CUU UJ47 CJS ELP ...	AVOID KZHU - WEST	

CANOA .. ELP

CANOA ELUNI COFRE UM506 SESNO UJ15 MOV UJ2 CUU UJ47 CJS ELP

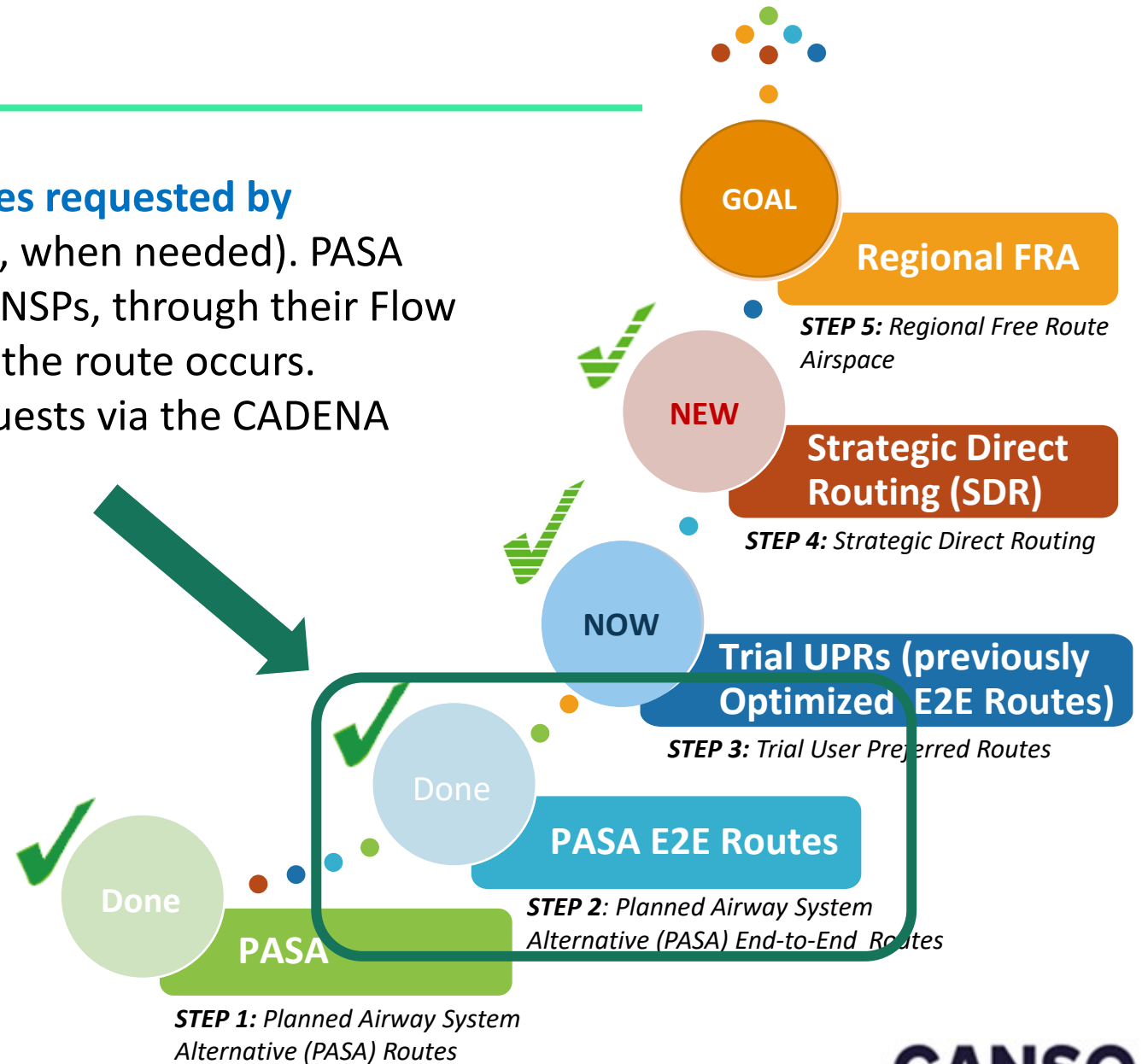


KZHU = Houston Center Airspace

Used during radar outages, hurricane, and ATC Zero events

PASA E2E Routes

- **PASA End-to-End Routes** are **temporary routes requested by airlines/stakeholders on an ad hoc basis** (i.e., when needed). PASA End-to-End Routes must be approved by all ANSPs, through their Flow Management Units, in which any segment of the route occurs. Airlines/stakeholders submit these route requests via the CADENA Operational Information System webpage.
- PASA Route risk is mitigated by following a standardized coordination process that involves all impacted ANSPs and by having a centralized point of coordination (i.e. CADENA).



CADENA OIS: PASA E2E Routes



CADENA OIS

- Main
- Weekly Conf
- Hurricane Conf
- Contingency Form
- ADP Link Files
- PASA Route Requests**
- Contact List
- Lessons Learned
- CADENA Manuals

DELTA Delta Air Lines

Español Chat 1 ? Help Settings Logout

▼ Create new PASA Route Request

To ANSP(s) Send to Requestor City Pair SPJC KATL En-Route

Flight # DAL150 Flight Date 22/Apr/2021 Dept Time 22 : 00 UTC

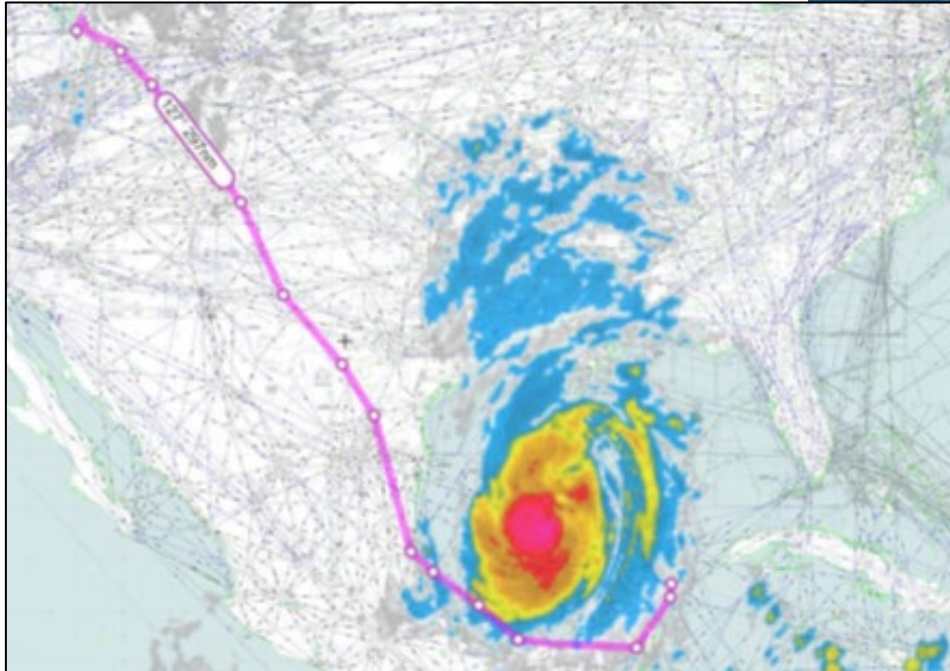
Route SPJC ISREN2F ISREN DCT GYV DCT TINPA DCT LEVOR DCT GCM DCT IKBIX Y183 PEAKY Q87 MATLK Q77 SHRKS DCT LAIRI DCT LARZZ JJEDI2 KATL

Some locations or airways in the route ISREN2F, Y183, Q87, Q77, JJEDI2 are not found in the System.
They are ignored in the plotting, but the route request can still be submitted.
If you think they are valid locations or airways and should be part of the System, please let Cadena Support know.

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Samples: CADENA PASA E2E Routes

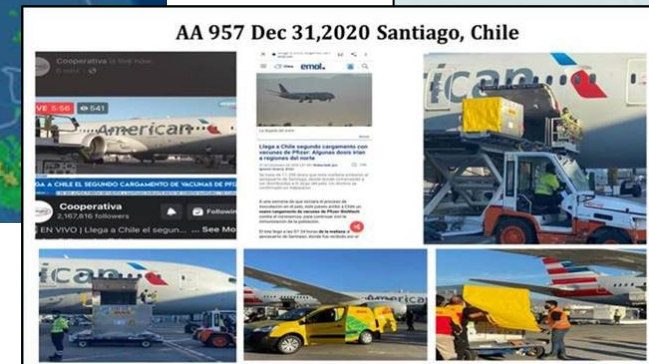
PASA ROUTE REQUEST DEC 31, 2020



PASA ROUTE REQUEST OCT 7, 2020



PASA ROUTE REQUEST NOV 16, 2020



Some Statistics (as of March 2023)

CADENA has held 125 contingency ad-hoc CDM web conferences and 9 high-impact Space Launch and Recovery CDM web conferences

	Hurricanes and Tropical Storms	Volcanic	ATC-Zero	Equipment outages	Airport incidents	Space launch impact
2017	4		3	1	1	
2018	3	1		6	5	
2019	4		2	3	3	
2020	9		12	1	6	4
2021	7	3	9	9	7	2
2022	6	2	5	5	5	2
2023			1	1	1	1

OIS BENEFITS - Operational Examples

La Soufrière Volcano in Saint Vincent and Grenadines

La Soufrière volcano began visibly active in December 2020, before a full-blown eruption on 9 April 2021



Event was Communicated via

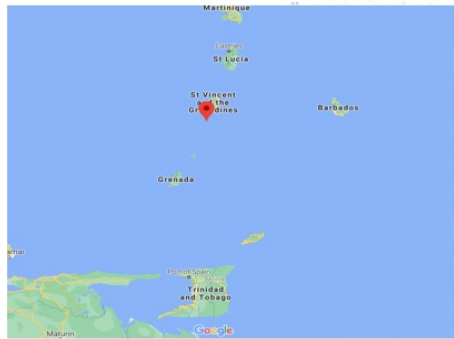
- WhatsApp CADENA Ops Group
- CADENA OIS Urgent Advisories and the associated push email notifications
- CADENA Ops Group email notifications
- Weekly Operational Web Conferences
- Piarco ACC updates posted on the CADENA OIS

CADENA Status Update of La Soufrière Volcano

Status Briefing
uploaded to the
CADENA OIS



CADENA LA SOUFRIERE OVERVIEW



LA SOUFRIERE VOLCANO UPDATE – 1400 UTC – APRIL 10, 2021

PIARCO UTA/CTA/FIR GENERAL INFORMATION

EQUIPMENT OUTAGES	TMMS PLANNED	REMARKS
TBPB A0539/21 NOTAMR A0534/21 Q) TTZP/QNMAW/V/BO/AE/000/99 9/1304N05929W175 A) TBPB B) 2104092325 C) 2104101600 E) DVOR/DME 'BGI' 112.7 MHZ CH74X COMPLETELY WITHDRAWN. DO NOT USE	REROUTES WILL BE IMPLEMENTED TACTICALLY PLEASE REFER TO SLIDE 7 FOR ROUTE IMPACTS	NONE

LA SOUFRIERE VOLCANO UPDATE – 1400 UTC – APRIL 10, 2021

PIARCO UTA/CTA/FIR GENERAL INFORMATION

DEMAND	Weather	Staffing
Low to Medium	VOLCANIC ASH – Affecting large portion of the Piarco UTA/CTA/FIR. Please see SIGMET on next page. No other Significant Weather in the forecast within the Piarco FIR.	Adequate

Space Operations



FAA Space Operations share information, such as:

- ✓ Launch schedules
- ✓ Launch sites
- ✓ Launch AHAs with coordinates
- ✓ Re-entry AHAs with coordinates



Figure A. Transporter Launch Aircraft Hazard Area (AHA)

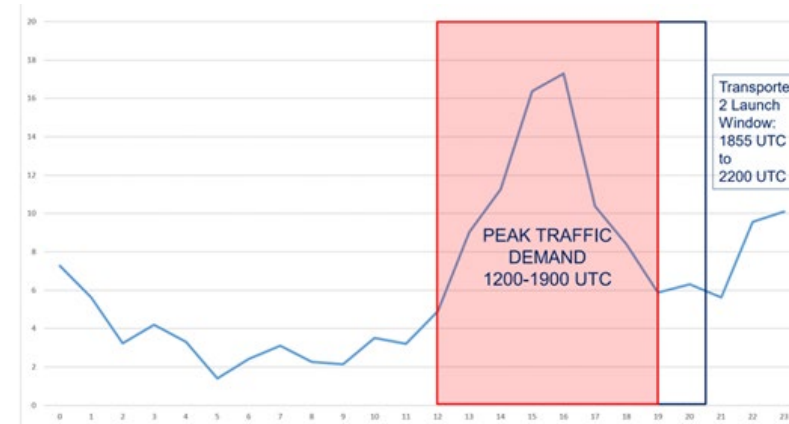


Figure B. Historical Peak Traffic 2019

How CADENA helped during the Radar Outage Situation in Panama

- On March 2, 2023, Panama lost the radar signal leading to a surveillance outage in the Panama FIR north sector. Panama issued MINITs to support non-radar operations.
 - MINITs caused big issues to neighboring ANSPs.
 - Airlines experience a huge delay.
 - CADENA Contingency Procedure was not followed because Panama is not a participating CADENA ANSP.
- CADENA held Ad Hoc web conferences on March 2, 3, and 6 to facilitate the coordination of reroutes, inform surrounding ANSPs and stakeholders, and provide a forum for questions.
 - Generated the reroutes for airlines to avoid the problem area and coordinated an eastbound route with Colombia and westbound route with COCESNA.
 - Regional teamwork and cooperation was outstanding!
- The radar was returned to service on March 8, 2023.



World Pandemic

COVID Situation

- Display of:
 - The daily COVID-19 operational limitations report
 - Alternate aerodromes information
 - Airline and ANSP outlook for future air traffic operations
- Coordination regarding:
 - ATC-Zero events (ACC closures)
 - Vaccine Priority Flights
 - PASA Route Requests
- Push email notifications

Power Outage

On the second day of the 9th CADENA RIG Meeting in Miami, FL, February 25-27, 2020 at about 1545 UTC, Fernando Soto received information from COCESNA regarding a power outage at the CENEMER ACC and the associated loss of surveillance and loss of all but two enroute frequencies.

- The CADENA Team immediately used the associated checklists.
- Sent out an invitation to participate in an ad hoc webex on the matter.
- Gathered as much operational information as possible on the outages.
- Hosted an ad hoc webex to brief the stakeholders and answer question.
- The airline representatives provided assistance and operational input from the airlines' perspective.
- Ground stops were coordinated and alternate routes were coordinated.
- When power was restored at CENAMER, the stakeholders were briefed on the ad hoc webex and operations returned to normal at 1800 UTC. Ground stops were released and alternate routes were terminated.



CADENA: Contingency Planning and Response

CADENA information available to you:

- CADENA ATFM/CDM Procedures Manual
- CADENA OIS Manual
- CADENA OIS Usage including PASA routes database
- CADENA Contingency Training Materials

Questions?

Thank You!