

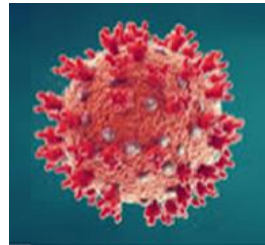
# CADENCE'S CONTINGENCY PLANNING APPROACHES

For: ATM/SG/11

Date: October 4, 2023

By: Midori Tanino – FAA ATO International CADENA PM & CADENCE TF co-chair

# Contingency Planning and Response



# 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
- Cost effective means to share information and collaboration exist

# CADENA

## CANSO ATFM Data Exchange Network for Americas

CADENA has gained extensive experience in dealing with disruptions to Air Traffic operations in the LAC region since 2016





# CADENA Key Regional Stakeholders

## ANSPs

- EANA (Argentina)
- BANSA (Bahamas)
- COCESNA (Central America)
- UAEAC (Colombia)
- ECNA (Cuba)
- DC-ANSP (Curacao)
- IDAC (Dominican Republic)
- DGAC (Ecuador)
- FAA (USA)
  - ZMA, SJU, ZHU, ATCSCC
  - Space Operations Office
- OFNAC (Haiti)
- JCAA (Jamaica)
- SENEAM (Mexico)
- TTCAA (Trinidad & Tobago)
- INAC (Venezuela)

## State/Territory/Group

- ANSA (Aruba)
- DGAC (Costa Rica)
- MWCR (Cayman Islands)
- TNCM (Sint Maarten)
- CARRG (Caribbean Aviation Resilience and Recovery Group)



# In Concert with ICAO: No Country Left Behind

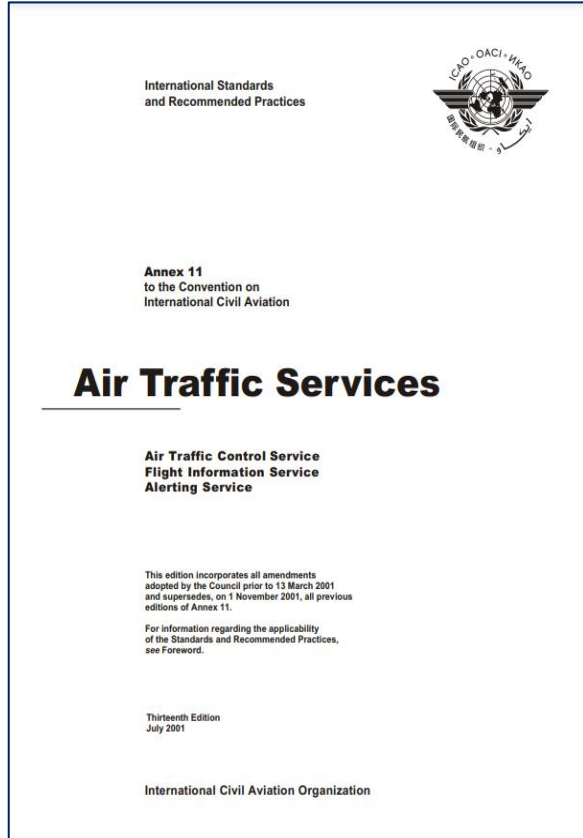


## You need only:

1. Computer
2. Internet Access
3. Human Resource

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

# In Concert with ICAO: Annex 11



- Section 2.32 – Contingency Arrangements
- Attachment C – Material Relating to Contingency Planning

# 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

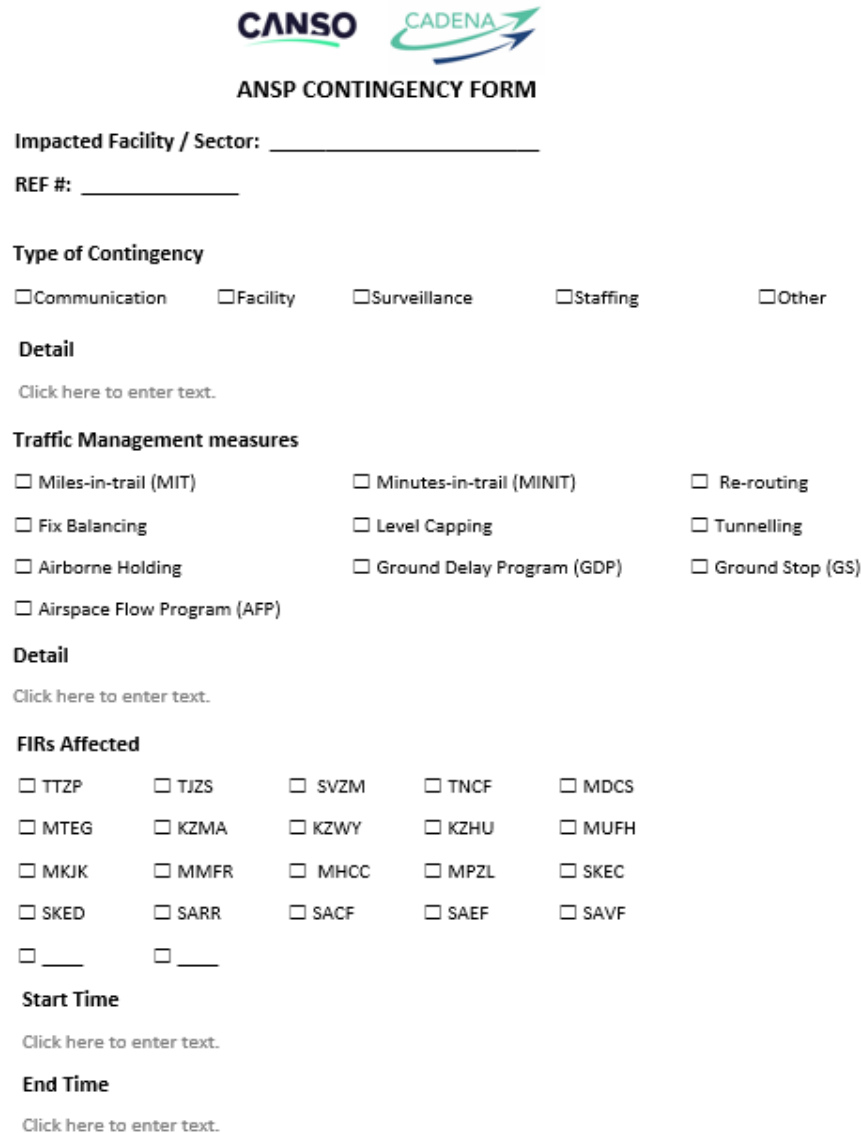


# Contingency Events and Checklists

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

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

# 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 ☐ MDSC  
☐ 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. At the top, there is a header bar with a menu icon and the text "CADENA OIS". Below this, a section titled "Regional Advisories" contains a table with the following columns: ID, ANSP / Airline, Type, Start Date, End Date, Summary, Reason, and a Details button. The table lists six advisories, each with a unique ID, an associated airline or authority, a type (FYI), specific start and end dates and times, a summary of the event, a reason for the advisory, and a button to view more details.

ID	ANSP / Airline	Type	Start Date	End Date	Summary	Reason	
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-8 Rocket Launch	SpaceX mPower-8 Rocket Launch	Details
961	ATO	FYI	28/APR/2023 21:12	04/MAY/2023 22:59	SpaceX mPower-8	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

# 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 participating CADENA ANSP can initiate and host the CADENA Ad Hoc Web Conference
- Responsibilities of Ad Hoc Web Conference Host and participants are described in the CADENA ATFM/CDM 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 Virtual Support Team.
- 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 / CDM Procedures Manual** includes 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 Event Contingency Training

CANSO LATIN AMERICA AND CARIBBEAN

SHAPING  
OUR  
FUTURE  
SKIES  
canso.org

## Exercise: CADENA Hurricane Charlie Planning Web Conference

March 29, 2023  
1400 UTC

**EXERCISE** **CADENA**  
**Contingency Form**

Impacted Facility / Sector: 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  
☒ Miles-to-Trail (MTT) ☐ Miles-to-Trail (MMT) ☐ Re-routing  
☐ Fix Balancing ☐ Level Capping ☐ Turnbacking  
☐ Airborne Holding ☐ Ground Delay Program (GDP) ☐ Ground Stop (GS)

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

Facility Affected  
☐ TPOP ☐ TOL ☐ SLOW ☐ TACF ☐ MISC  
☐ MISC ☐ SIGNA ☐ GDM ☐ KZRU ☐ MUPH  
☐ MLEK ☐ MURFA ☐ MAMC ☐ MRL ☐ SASC  
☐ SBD ☐ SARA ☐ SACP ☐ SAFP ☐ SAMP

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29<sup>th</sup>, 2023

**ANSP** **ECNA**

**HURRICANE CHARLIE NOTICE NO.15 MARCH 29<sup>th</sup>, 2023 1100 UTC**

CHARLIE is located at 0900 UTC on Lat 18.8N and Long 80.9W. This position places it 40nm (55km) 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 (38km / 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 (185km) from the center. The estimated minimum pressure is 980hpa (735.05mm). 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 29<sup>th</sup>, 2023



CADENA



CANSO

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29<sup>th</sup>, 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 29<sup>th</sup>, 2023

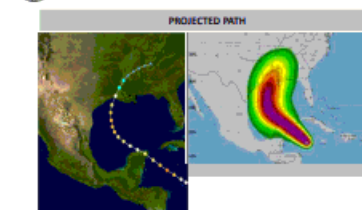
**ANSP** **ECNA**

**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**



CANSO

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. EASTERN DEVIATIONS ANTICIPATED.

- ✓ UM335
- ✓ UL465
- ✓ URG44
- ✓ UM330
- ✓ UG877
- ✓ UG448
- ✓ UG633
- ✓ UPS36
- ✓ UM782

CANSO

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29<sup>th</sup>, 2023



CANSO

HURRICANE CHARLIE UPDATE – 1400 UTC – March 29<sup>th</sup>, 2023

**ANSP** **ECNA**

**IMPACTED ROUTES**

SATELLITE DEVIATIONS ON:  
➤ ABRJ/UM779  
➤ G430/UP406  
➤ M/UM221  
➤ UG782  
➤ R/URG44  
➤ R330/UM330  
➤ M/UM335  
➤ Q/UG877  
➤ Q/UG448  
➤ M/UM328  
➤ UL345

**PLANNED TRAFFIC MANAGEMENT MEASURES**

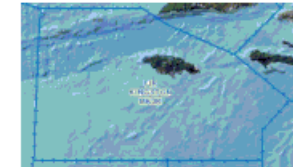
TO BE TACTICALLY WHEN DEPENDING ON CHARLIE'S TRAJECTORY.



CADENA

CANSO

HURRICANE CHARLIE UPDATE – 1400 UTC – MARCH 29, 2023



HURRICANE CHARLIE UPDATE – 1400 UTC – MARCH 29, 2023  
**JCAA**

ANSP/ECNA	CLOSING DATE	STAFF ISSUES	EQUIPMENT OUTAGES	IMPACT DATE (HRS)	STATUS
MNCP	03/28/23	STBY STAFF AVAILABLE	PAPIS, ILS OTS & VOR/DME OTS. RAVY DEARIS	04/02/23	CLOSED
MNCS	03/29/23	ENR. STAFF AVAILABLE	NONE	03/30/23	CLOSED EXCEPT H. FLIGHTS
MNCS	03/29/23	NONE	NONE	03/30/23	CLOSED
MNCR	03/29/23	NONE	NONE	03/30/23	CLOSED
MNCR	03/29/23	NONE	GCM VOR/DME US	03/30/23	CLOSED

CANSO

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).

**MTS**

- 40NM BTW TFC AT DIFF. LVLS. SIM. RTE
- 80NM BTW TFC AT SIM. LVLS. SIM. RTE

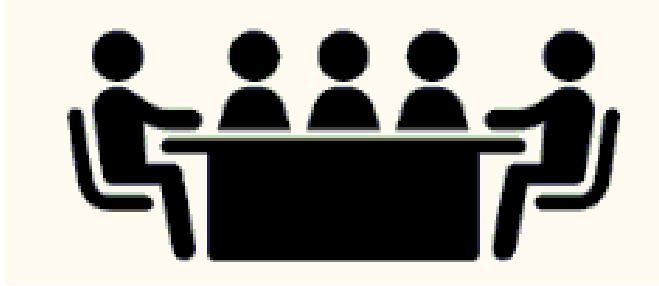
**IMPACTED NEIGHBORING ANSPs**

- HAVANA, CENAMER & NORTHERN SECTION OF PANAMA impacted.

CANSO

**CANSO**

# How CADENA Built a Collaborative Communication Environment



**CANSO** LATIN AMERICA AND CARIBBEAN

SHAPING OUR FUTURE SKIES  
canso.org

## CADENA Operations Planning Web Conference

MONDAY, April 17, 2023  
1400 UTC

**CANSO** **CADENA**

Volcanic Ash

Information Regional TMM<sup>4</sup> Active Reroutes<sup>1</sup> Delays<sup>2</sup> Advisories<sup>11</sup> 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



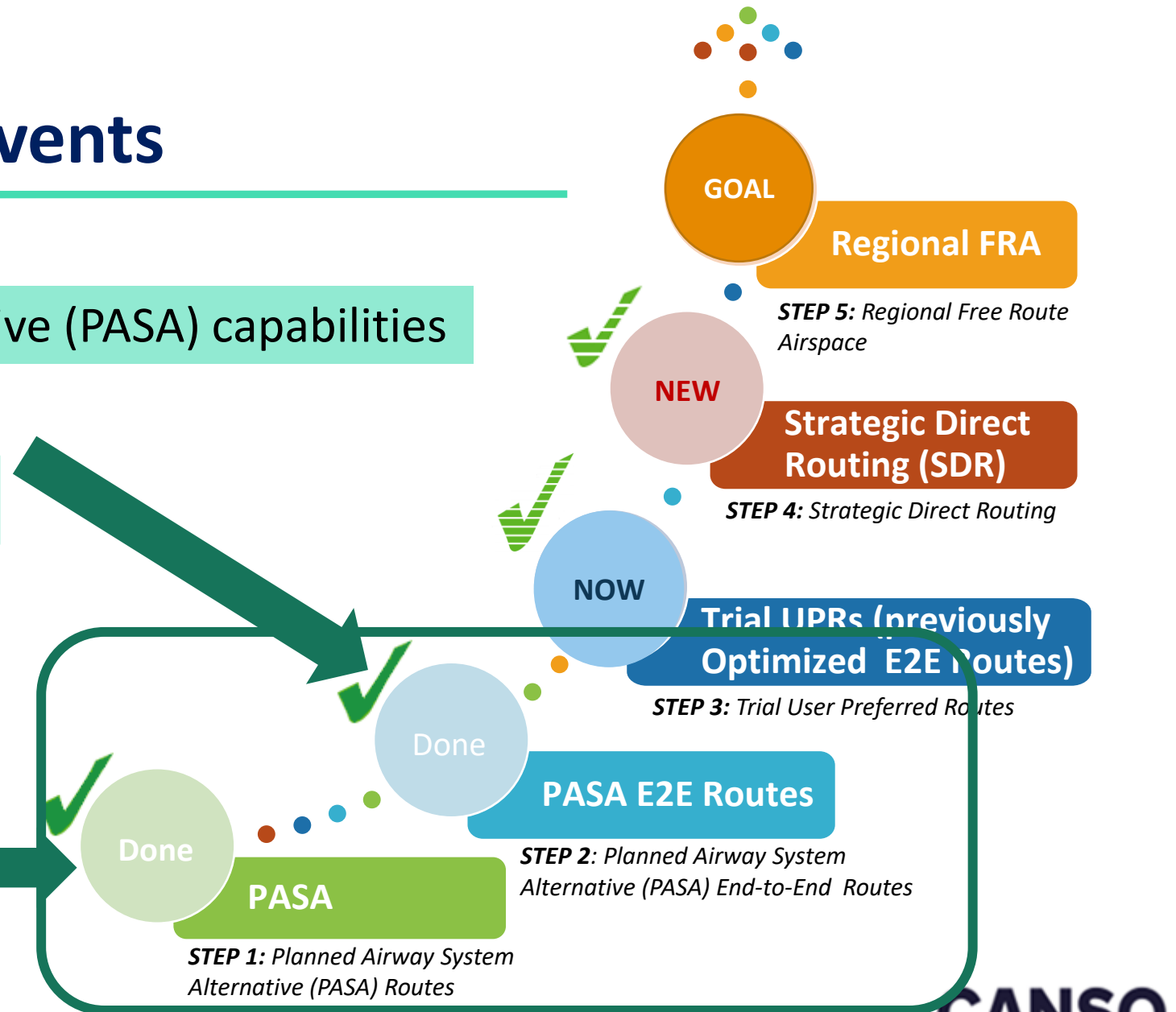
# CADENA Products

## - support contingency events

Planned Airway System Alternative (PASA) capabilities

PASA End-to-End Routes

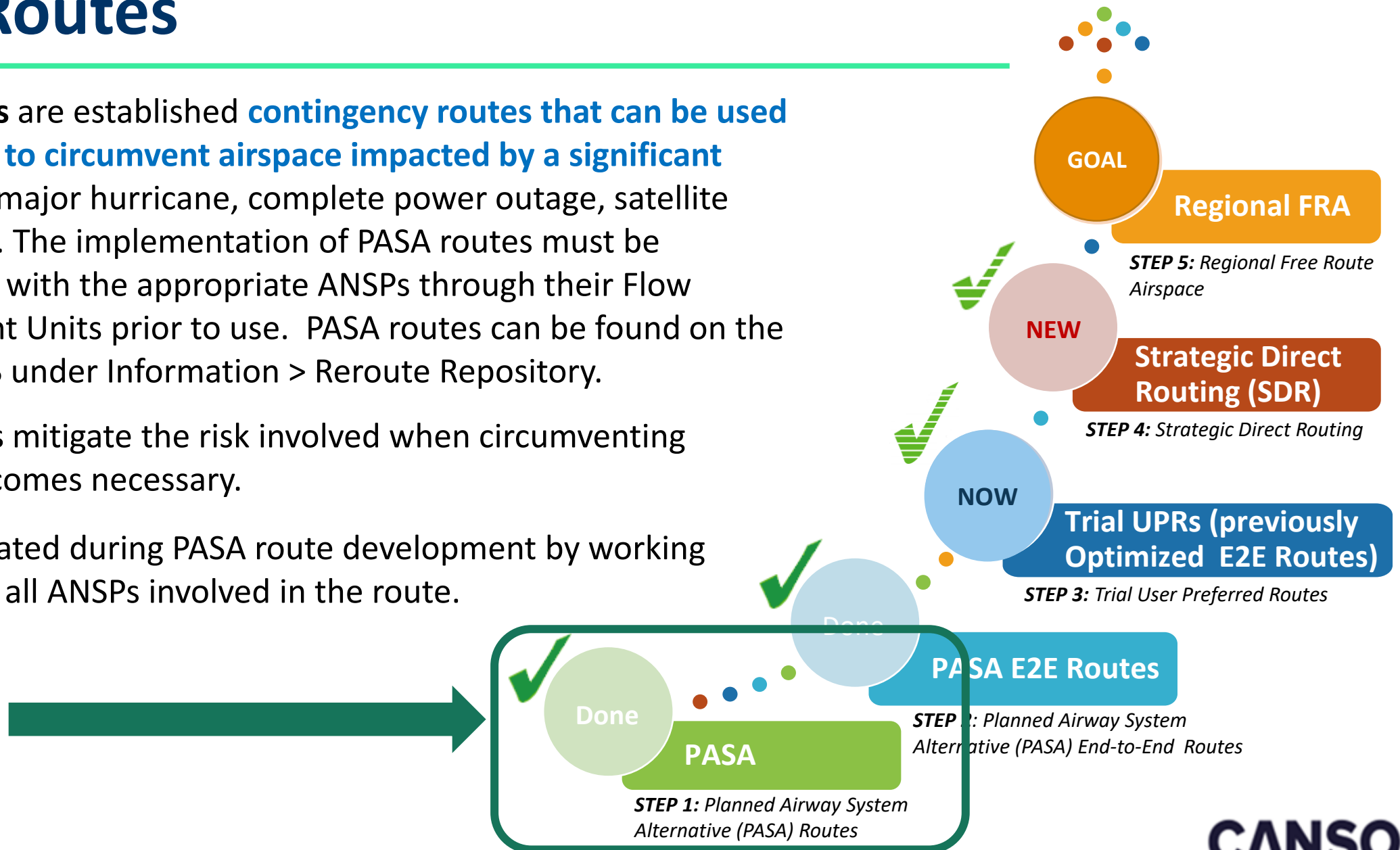
PASA Routes





# 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 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 Route Repository

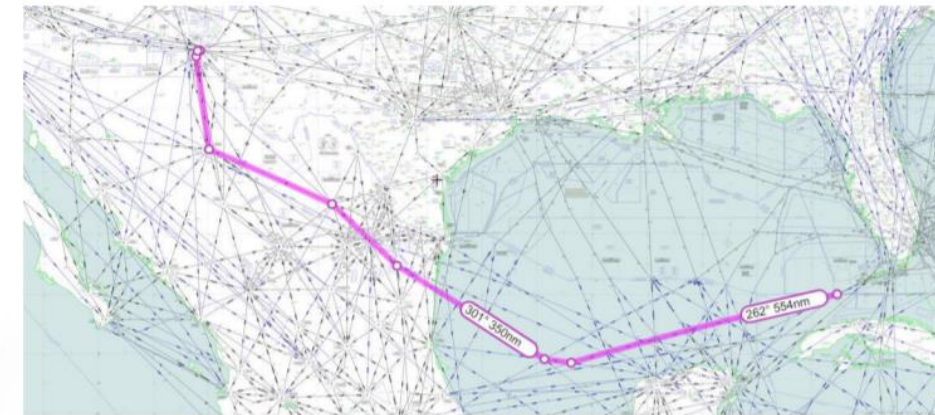
## AVOID ZHU THROUGH ZAB

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	MMMX	... 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	

*KZHU = Houston Center Airspace*

CANOA .. ELP

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

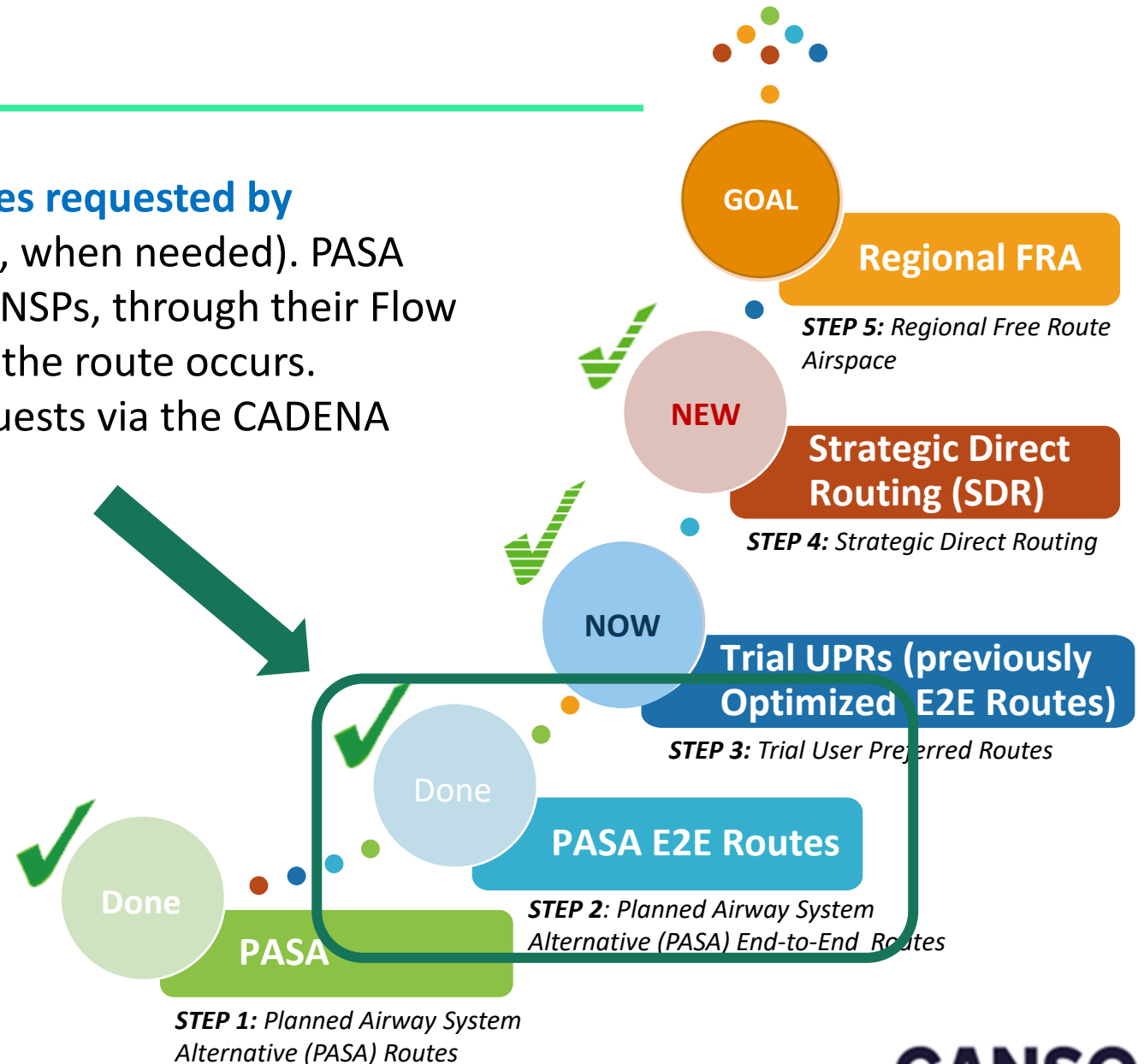


Used during radar outages, hurricanes, and ATC Zero events



# 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 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

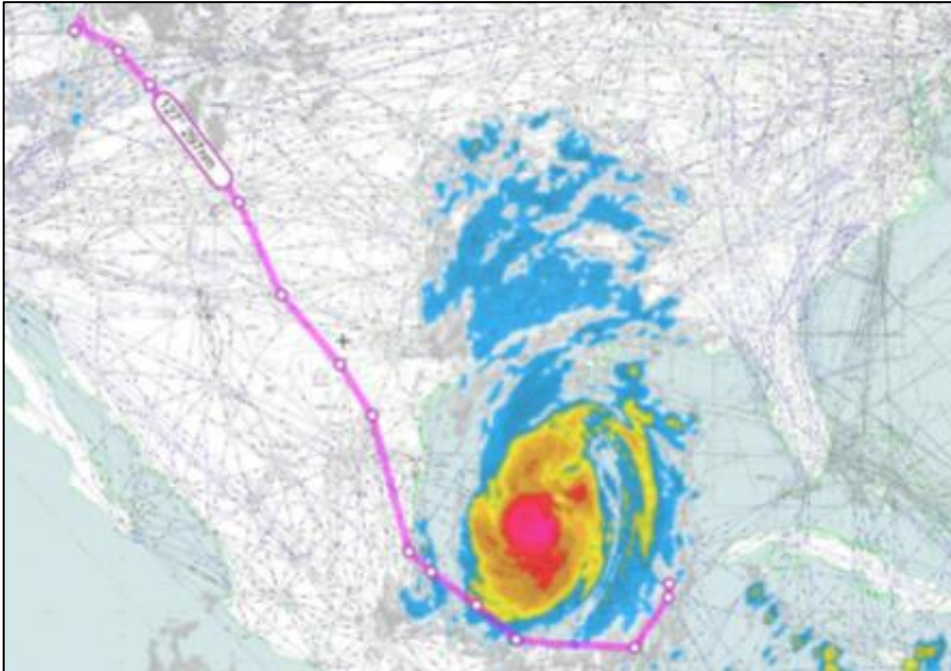
SPJC ISREN2F ISREN DCT GYV DCT TINPA DCT LEVOR DCT GCM DCT IKBIX Y183 PEAKY Q87 MATLK Q77 SHRKS DCT LAIRI DCT LARZZ JJEDI2 KATL

Plot Save as Template Submit

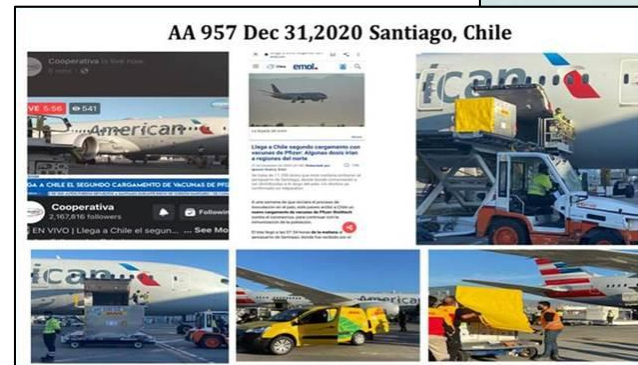
Some locations or airways in the route ISREN2F, Y183, Q87, Q77, JJEDI2 are not found in the System.  
They are ignored in the plotting, but the route request can still be submitted.  
If you think they are valid locations or airways and should be part of the System, please let Cadena Support know.

# Examples: CADENA PASA E2E Routes

PASA ROUTE REQUEST DEC 31, 2020



PASA ROUTE REQUEST OCT 7, 2020



# Some Statistics (as of September 23, 2023)

CADENA has held 131 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	2		2	2	2	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



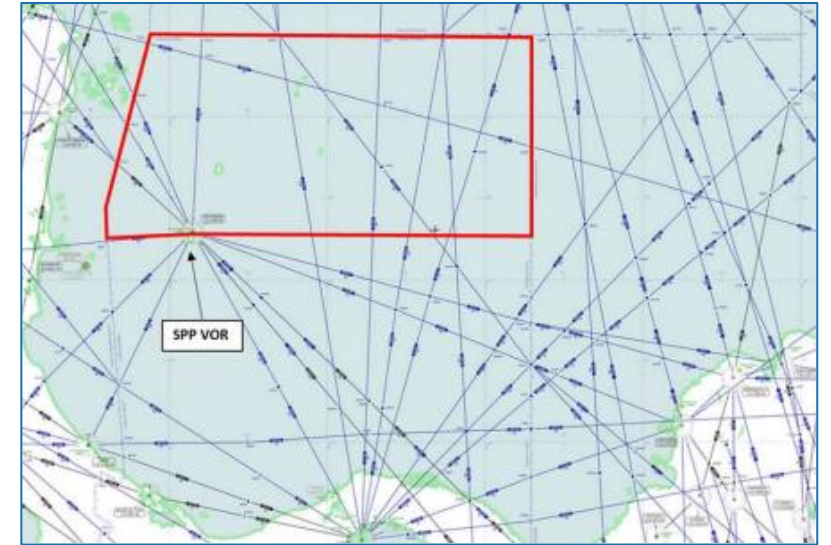
### Event was Communicated via

- 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



# 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 experienced 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.



# OIS BENEFITS– Examples

**Qualitative Benefits** - understood intuitively

- More information sharing, better decisions
- Better coordination, better decisions
- Better decisions, more benefits



Numbers in this briefing should not be interpreted literally, however, **the savings achieved by stakeholders are real.**

## **Quantitative (monetary) Benefits**

- UAL - Hurricane Maria Recovery Operation Case Study – \$1.0M-\$5.4M
- JBU - Return Home from Hurricane Maria Case Study – \$182.0K
- AAL - Jamaica Loss of Radar Surveillance Case Study – \$225.0K
- CPA - Jamaica Loss of Radar Surveillance Case Study – \$175.5K
- UAL - Colombia Loss of Satellite Comm Case Study – \$192.0K
- VOL - Filed FPLs via CADENA OIS while AFTN outage - \$690.8K

# Summary of UPR Trial Benefits



	As of August 31, 2023			1-Year			
		City Pairs		Time (min)	Fuel (kg)	CO2 (kg)	Cost (USD)
1	Jul 9 - Oct 6, 2021	KATL<->SPJC	DAL	2,089	267,520	845,360	384,033
2	Jul 27 - Oct 25, 2021	KATL<->SBGR	DAL	1,175	140,693	444,590	209,625
3	Aug 6 - Nov 3, 2021	TTPP<->KMIA	BWA	1,038	86,055	271,934	160,170
4	Sep 1 - Nov 27, 2021	KIAH<->MMPR	UAL	2,263	97,204	307,168	296,027
6	Dec 6, 2021 - Mar 5, 2022	SAEZ<->KMIA	ARG	1,115	118,970	375,944	209,420
7	Use DAL KATL<->SPJC	KMIA<->SPJC	AAL	2,089	267,520	845,360	384,033
8	Aug 29 - Nov 27, 2022	MMUN-->SAEZ	ARG	410	46,939	148,327	106,347
9	Oct 20, 2022 - Aug 31, 2023	SKBO-->KATL	DAL	1,314	182,924	578,038	280,659
10	Nov 25 - Dec 25, 2022	MPTO-->KLAX	CMP	1,166	40,723	128,684	149,782
11	Dec 1, 2022 - Aug 31, 2023	KATL<->SAEZ	DAL	4,277	420,064	1,327,401	770,393
12	Dec 1, 2022 - Aug 31, 2023	KATL<->SCEL	DAL	2,755	383,446	1,211,690	588,241
13	Feb 23-May 23, 2023	KIAH<->MMSD	UAL	10,038	439,326	1,388,272	833,113
14	May 3 - Aug 31, 2023	SKBO->KJFK	DAL	1,056	119,407	377,325	203,019
		<b>TOTAL</b>		<b>30,784</b>	<b>2,610,790</b>	<b>8,250,094</b>	<b>4,574,862</b>

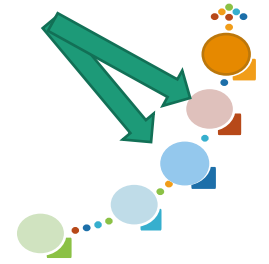
# Summary of SENEAM SDR Trial Benefits



As of 9/14/2023				
1-yr Estimate	Time (min)	Fuel (kg)	CO2 (kg)	Cost (\$)
<b>AeroMexico</b>	1,168	51,157	161,655	\$ 158,749
<b>Delta</b>	517	51,586	163,012	\$ 93,805
<b>Emirates</b>	56	9,492	29,993	\$ 13,386
<b>FedEx</b>	3,136	323,796	1,023,194	\$ 579,142
<b>United</b>	1,626	178,122	562,865	\$ 278,298
<b>VivaAerobus</b>	4,998	216,186	683,148	\$ 677,073
<b>Total</b>	<b>11,501</b>	<b>830,339</b>	<b>2,623,867</b>	<b>\$1,800,453</b>

# Summary of CIIFRA Trial Benefits

## - Estimated Annual Savings



	ETE	FUEL	CO2	COST
	MIN	KG	KG	\$
UPR	30,784	2,610,790	8,250,094	\$4,574,862
SDR	11,501	830,339	2,623,867	\$1,800,453
<b>TOTAL</b>	<b>42,285</b>	<b>3,441,129</b>	<b>10,873,961</b>	<b>\$6,375,315</b>



# Introduction - CADENCE

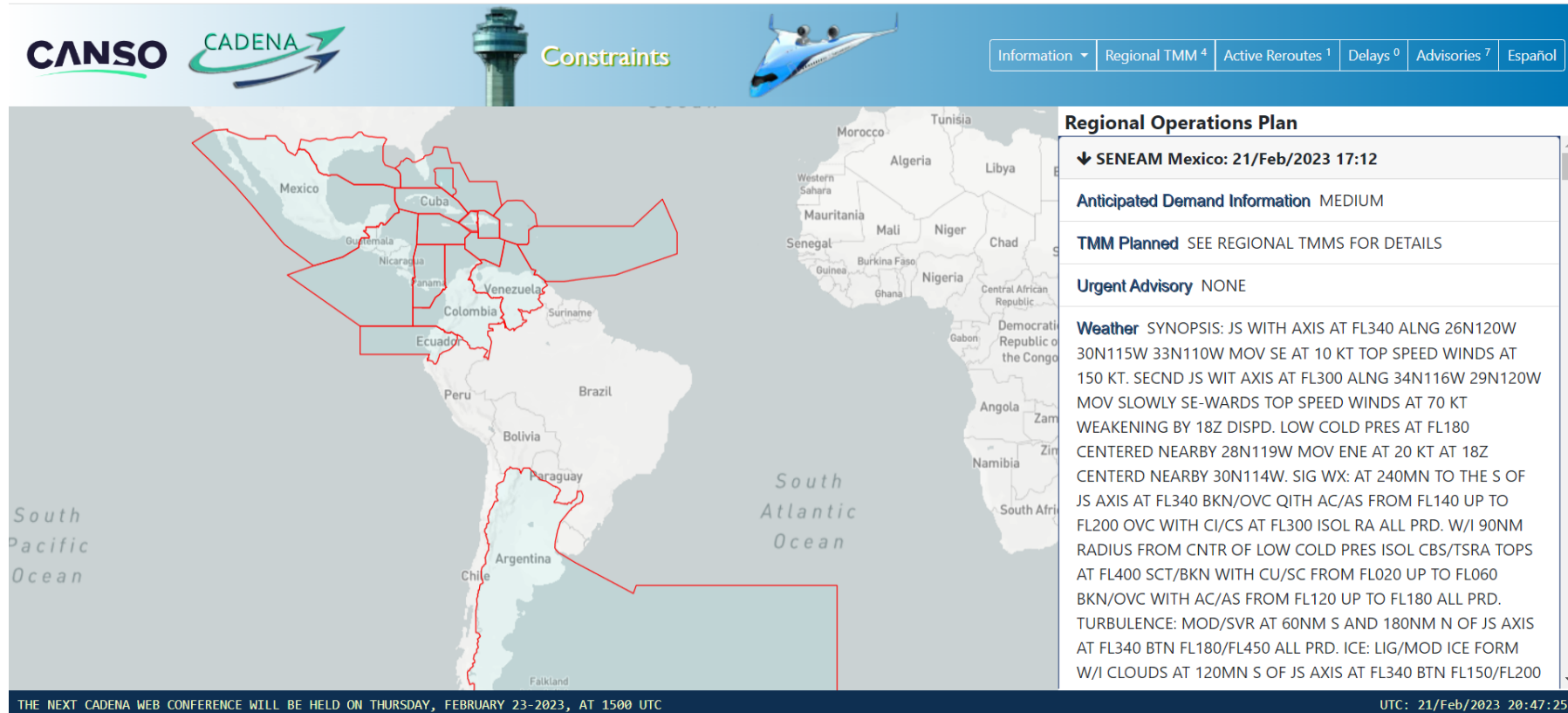
---

The CANSO ATFM Data Exchange Network for Cooperative Excellence Task Force (CADENCE TF) belongs to the CANSO Operations Programmes.

The CADENCE TF is a strategic initiative to help develop/enhance, a network for **operational coordination** and **information sharing** among ANSPs and aviation stakeholders around the world.



# CADENCE Operational Information System (OIS)



## 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.cadenois.org> Public domain for read only. Member domain to read and upload information.

# Background of CADENCE LOA between CGH Technologies and CANSO



CANSO and CGH Technologies virtual signing – CADENCE  
(March 22, 2021)

- CGH Technologies built the CADENA OIS under the contract with the FAA.
- CADENA OIS technology has been transferred from the FAA to CGH Technologies.

- The agreement secures the provision of a purpose-built collaborative software platform based on the successful regional initiative, CADENA.
- CADENA OIS version 3.2 is the baseline for the CADENCE OIS v1.0.
- The baseline CADENCE OIS is offered at no cost to regions and functional groups for 20 years.
- CGH Technologies will support the CADENCE OIS for 20 years.

# Next Step / Recommendation

---

Support the Asia Pacific (APAC) Air Navigation Service Provider (ANSP) Committee (AAC), Work Stream 3 deliverable item:  
***“Exercise regional Operational Contingency Plans (OCPs) via table-top exercises”*** by modifying table-top exercises conducted by CADENA using OIS

Possible contingency exercise scenarios are:

- **Typhoon** event
- **Volcanic** event
- **Radar/Power Failure** event

Questions?

Thank You!

