Agenda
Item 2: **Report of activities of the GESEA and Subgroups**

a) Review of air navigation priorities in the ATM field
b) Deliverables and progress of SG1/SG2 working groups

HARMONIZED IMPLEMENTATION OF STRATEGIC DIRECT ROUTING (EDE)

(Presented by the GESEA)

SUMMARY

The purpose of this working papers is that the Meeting defines the harmonized implementation of Strategic Direct Routing (EDE) in South America. The technical study carried out by the TF of the SAM/IG GESEA SG1 is analyzed.

Reference

- Reports of the workshops/meetings of the SAM Implementation Group (SAM/IG).
- Summary of SG1 GESEA meetings.
- GANP Sixth Edition 2019.

ICAO strategic objectives:	*A - Safety* *B – Air navigation capacity and efficiency* *E – Environmental protection*

1. Background

1.1 The meeting of Subgroup 1 /GESEA 'AirSpace Planning' was agreed by SAM/IG/24 (November 2019) to be held in Bogota – Colombia in April 2020. However, the COVID 19 health emergency required that it be rescheduled in virtual mode.

1.2 SG1 /GESEA held its virtual sessions between 26 May and 3 June 2020. The material, list of participants, and recordings of the deliberations are available in the GESEA cloud available at the following link;

https://onedrive.live.com/?authkey=%21AvxOvPHYpEPdtzU&id=4B2F65A2BBF9F10F%21114693&cid=4B2F65A2BBF9F10F

1.3 SG1 also held follow-up meetings in August and September 2020 on the progress of task groups (TF or GADHOC).

2. **Discussion**

2.1 During the SG1 meeting, IATA's high-level coordination to agree on the implementation of direct flight (DCT) affecting efficient flight and shorter distances was highlighted, resulting in reduced fuel and fume use. This application is feasible in a low traffic scenario and contributes to faster aviation recovery.

2.2 It was agreed that other efficiency contributions could be added with the implementation of more PBN-based STAR/SID procedures and routes. The GESEA is the technical group that should establish operational guidelines for direct flight, based on ASBU FRTO B0/1, taking into consideration the necessary regional harmonization. The Subgroup agreed to work through a TF task group (GADHOC) to implement fast impact elements for efficiency based on DCT, FRTO, etc.

2.3 The DCT-EDE held five virtual meetings, between 17 June and 12 August 2020 accomplishing approximately 24 hours of session, plus the analysis and inputs made via email.

2.4 It has been identified that the implementation of the concept of Strategic Direct Routing (EDE), aligned to the FRTO B0/1- Direct Routing module/element of the Sixth Edition of the GANP, can increase the efficiency of air operations in this scenario of reduced aircraft flows in the Region, without requiring additional expenses in equipment or training processes

2.5 This implementation is based on the presentation at the airport of origin of international flight plans which consider, predictably, direct trajectories between entry/exit points in the flight information regions (FIRs), leading to the reduction of the flown distance. Therefore, when planning the flight with shorter segments, the airline can define a lower fuel endowment in the aircraft aiming to optimize the payload and consumption parameter, as well as reduce CO2 in the atmosphere.

2.6 The deliverable is named "Studies for Implementing Strategic Direct Routing (EDE)" which is shown in the **Appendix** to this working paper. This study has already been circulated to the States/Territory in both languages.

2.7 The implementation of the EDE concept is proposed by 5 November 2020, if feasible and operational conditions exist for States.

3. **Suggested action**

3.1 The Meeting is invited to:

a) Analyse and express opinion on the material and studies carried out by TF DCT EDE, as shown in the Appendix to this working paper;

b) express the situation of each State with respect to the issuance of SUP/AIP, on the implementation of the EDE and on the results observed to date; and

c) discuss other considerations that the Meeting deems relevant.

APPENDIX

VIRTUAL MEETING OF THE GESEA SUBGROUP 1 DCT-FRA AD HOC GROUP

SUMMARY OF STUDIES

Sessions:

1. Wednesday, 17 June 2020
2. Thursday, 2 July 2020
3. Wednesday, 15 July 2020
4. Wednesday, 29 July 2020
5. Wednesday, 12 August 2020

Participants: Delegates of RLA/06/901States

- ✓ Material, presentations and session recordings: available at the following GESEA cloud link (OneDrive):

https://onedrive.live.com/?authkey=%21AvxOvPHYpEPdtzU&id=4B2F65A2BBF9F10F%21182601&cid=4B2F65A2BBF9F10F

The meeting of the Ad hoc Group on strategic direct routing – EDE (in Spanish: Enrutamiento Directo Estratégico) and free route airspace (FRA) was held through 5 virtual meetings, as shown in the box above.

1. JOB CARD

On this matter, the rapporteur presented the proposed JOB CARD, which shall be used to guide the work of the group. The meeting approved the final version of the JOB CARD, shown in **Appendix A**, which will be submitted to the approval of GESEA. The meeting underlined that the JOB CARD was a living document that could be modified, subject to the approval of GESEA.

2. Status of implementation of strategic direct routing (EDE) in the South American Region

In this regard, the States that had already implemented EDE informed about the strategy adopted for such implementation. IATA showed a map summarising the status of implementation in the SAM Region, which is shown in **Appendix B**. References to aeronautical publications associated to EDE implementation in each State are available in the table shown in Appendix B.

3. Review of FRTO – B0/1 – (Global Air Navigation Plan - Version 6)

In this regard, the Meeting reviewed the content of the Global Air Navigation Plan in relation to FRTO B0/1. In general terms, the following aspects were highlighted:

1) Objectives

   a. Provide airspace users with additional flight planning, with route options on a larger scale across FIRs, so that planned distances can be generally reduced compared to the fixed route network.
   b. Strategic direct routing (EDE) will be established at national and regional level, and is made available for **flight planning** (with published terms of use). The EDE shall be considered as a **transition to the implementation of the free route airspace (FRA) concept**. EDE operations enable airspace users to optimise flight and fuel planning.

2) The EDE could be implemented in a limited manner, for example:
   a. Time restriction (fixed or subject to traffic/availability);
   b. Traffic restriction (based on traffic flow and/or level);
   c. Flight level;
   d. Lateral restrictions;
   e. Entry/exit points.

3) The following procedures and processes may need to be considered:
   a. Identify EDE airspace volume (lateral y vertical) and applicable time;
   b. Direct routes may coexist with the ATS route structure;
   c. Adapt airspace design to ensure horizontal and vertical connectivity with EDE.
   d. ATFM procedures for EDE;
   e. Review the LoAs with adjacent ATS units;
   f. Publish data relevant to EDE in the AIP;
   g. Airspace management procedure for the implementation of direct routes;
   h. ATC procedures for EDE coordination, including handover, path changes in direct routing, conflict detection.

4) Operational and dependent relationship with other ASBU elements

   a. NOPS-B0/1 Initial integration of collaborative airspace management with air traffic flow management

      The integration of airspace management and air traffic flow management is a desirable requirement, with a view to optimising EDE implementation in the SAM Region.

   b. FRTO-B0/2 - Airspace planning and Flexible Use of Airspace (FUA)

      The application of FUA could optimise EDE implementation, taking into account that DCT routes could enter special use airspace, in accordance with pre-established procedures.

   c. FRTO-B0/4 - Basic conflict detection and conformance monitoring

      Medium-Term Conflict Detection (MTCD) and Conformance Monitoring tools are considered as requirements to reduce the workload of air traffic controllers in high air traffic volume settings. Accordingly, they can be considered as desirable requirements and should be taken into account when upgrading ATM systems.

d. FICE-B0/1 - Automated basic interfacility data exchange (AIDC)

Similarly, AIDC is considered a desirable tool for EDE implementation, with a view to reducing ATCO workload, especially in high air traffic volume operational environments, particularly when there is handover of EDE flights in both FIRs.

5) Enablers
Regarding enablers, the Global Air Navigation Plan, in FRTO BO/1, lists a series of EUROCONTROL documents that could be used as guidance material. However, EDE implementation in the SAM Region must take into account airspace characteristics and air traffic demand, which is significantly less than in Europe.

6) KPI – Key performance indicators

INTENDED PERFORMANCE IMPACT ON SPECIFIC KPAS AND KPIS

KPA	Focus Areas	Most specific performance objective(s) supported	KPI Impact	KPI
Efficiency	Flight time & distance	Overcome route selection inefficiencies associated with route network design	++	KPI04: Filed flight plan en-route extension

4. Products and activities by the Group

The Meeting defined the products to be developed by the DCT-FRA and by SAM States, with the corresponding dates and responsible parties. The aim is that the products to be developed by the group itself be delivered to GESEA's SG 1 at the next plenary meeting, to be held on 27 and 28 August, via videoconference.

1) Recovery phase

a) Review the status of implementation of strategic direct routing in the CAR/SAM Regions
   i) Responsible: Julio Pereira
   ii) Target date: 17 June 2020

b) Review the content of FRTO B0/1 of the Global Air Navigation Plan
   i) Responsible: Julio Pereira
   ii) Target date: 17 June 2020

c) Implement strategic direct routing in low air traffic volume airspaces, as a function of COVID-19, based on the experience gained in its implementation in some South American States. The EDE has already been implemented in Brazil, Colombia, Ecuador, Guyana, Panama, and Venezuela. This initiative could be applied in the remaining States, in accordance with their operational characteristics, provided there is adequate VHF coverage and ATS surveillance.

i) Responsible: States.
ii) Target date: 5 November 2020

d) Develop an aeronautical publication model for the implementation of FRTO B0/1.
AIP supplements with a NOTAM trigger should be used for provisional implementation during COVID-19. The definitive implementation should be incorporated into AIP ENR 1.10.
Develop an AIP Supplement model.

i) Responsible: Julio Pereira/Fernando Hermoza.
ii) Target date: 29 July 2020

e) Develop a model/guide for safety assessment related to the implementation of FRTO B0/1. Simple assessment based on the model developed by the SRVSOP.

i) Responsible for the model: Fernando Hermoza.
ii) Target date: 12 August 2020

f) Develop an educational brochure to disseminate the EDE concept among ATCOs and pilots, ARO officers.
i) Responsible: Rosanna Baru
ii) Target date: 12 August 2020 (DCT-FRA 5)

2) Normal phase

a) Update the letters of operational agreement for the implementation of EDE

Example: Assess the need to publish waypoints in FIR boundaries to promote direct routes that involve more than one FIR.

i) Responsible: States
ii) Target date: TBD

b) Develop a training guide for ATCOs involved in the implementation of FRTO B0/1. Specific meetings will be held to develop the guide, as needed.

i) Responsible: Rosanna Baru
ii) Target date: 12 August 2020

c) Establish FRTO B0/1 implementation requirements (ATS surveillance coverage, VHF coverage, MTCD, path monitoring)
Radar coverage and VHF coverage are essential requirements for EDE implementation.
MTCD and path monitoring are desirable requirements for reducing ATCO workload.

Verify ATC surveillance coverage, VHF coverage, MTCD availability, and path monitoring

i) Responsible: States
ii) Target date: 12 August 2020 (DCT-FRA 5)

d) Verify the impact on AIDC implementation

AIDC is not a requirement for the application of EDE. In certain cases, when applying EDE, the FPL must provide a LAT/LONG waypoint prior to the transfer point between ATC units, in order for the AIDC to function properly. Verify ATECH, INDRA, and THALES systems.

i) Responsible: Fernando Hermoza/Luis Perales, with the support of State focal points.
ii) Target date: 12 August 2020 (DCT-FRA 5)

e) Establish the key performance indicators
Develop KPI 4 of the Global Air Navigation Plan. Efficiency is already being measured by ADS-B, with the application of the SIMS system. Seek airline support for KPI sampling.

i) Responsible: Julio Pereira
ii) Target date: 12 August 2020 (DCT-FRA 5)

f) Definitively implement strategic direct routing

i) Responsible: States.
ii) Target date: 5 November 2020 (States that have already implemented it on a provisional basis)
TBD (States that implement it on a provisional basis on 5 November 2020)

5. Completion of activities for EDE implementation at the end of the 5 virtual sessions of the DCT-FRA/1 meeting

Recovery phase

a) Review the status of implementation of strategic direct routing in the CAR/SAM Regions
Status: Completed

b) Review the content of FRTO B0/1 of the Global Air Navigation Plan
Status: Completed

c) Implement strategic direct routing in low air traffic volume airspaces, as a function of COVID-19, based on the experience gained in its implementation in some South American States. The EDE has already been implemented in Brazil, Colombia, Ecuador, Guyana, Panama, and Venezuela. This initiative could be applied in the remaining States, in accordance with their operational characteristics, provided there is adequate VHF coverage and ATS surveillance.

Comments by the DCT-FRA/1 meeting: The meeting noted that EDE implementation in the recovery phase should be simple, based on the published reporting points/waypoints/radio aids. States may use, according to the characteristics of each airspace, the AIP supplement models developed by the DCT-FRA group, which are shown in Appendix C and D. In addition to providing fuel savings to users, the implementation of EDE in this phase will be used as a way to gain experience in the application of the concept, at a time of low air traffic demand resulting from COVID-19.

Status: In progress

d) Develop an aeronautical publication model for the implementation of FRTO B0/1

AIP supplements with a NOTAM trigger should be used for the provisional implementation during COVID-19. Final implementation should be incorporated into AIP ENR 1.10.

Comments by the DCT-FRA-1 meeting: The two AIP Supplement models approved by the DCT-FRA/1 meeting are attached as **Appendix C** and **D.** These AIP Supplement models include some options that could be considered by States for the implementation of EDE according to their operational characteristics. One model should be used by States intending to make a full implementation, including departures and take-offs from the FIR concerned, while the other model should be applied by States seeking initial implementation only for overflights.

Status: Completed

e) Develop a safety assessment model/guide for FRTO B0/1 implementation. Simple assessment based on the model developed by the SRVSOP.

Comments by the DCT-FRA-1 meeting: The meeting reviewed and approved the safety assessment template submitted by the ICAO Secretariat, which is attached as **Appendix E**. This template should be used by States to conduct their own safety assessments.

Status: Completed

f) Develop an educational brochure to disseminate the EDE concept among ATCOs and pilots, ARO officers.

Comments by the DCT-FRA-1 meeting: The meeting reviewed the video provided by the delegation of Uruguay, which should be used by SAM States to raise awareness among professionals involved in the implementation and operation of EDE, mainly air traffic controllers and pilots, about the importance of this concept for the recovery of the aviation industry post-COVID.

The video (EDE SAM SG1) is available in the GESEA cloud, at:

https://onedrive.live.com/?authkey=%21AvxOvPHYpEPdtzU&id=4B2F65A2BBF9F10F%21182601&cid=4B2F65A2BBF9F10F

Status: Completed

2) Normal phase

a) Update the letters of operational agreement for the implementation of EDE

Example: Assess the need for publishing waypoints at FIR boundaries to encourage direct routes involving more than one FIR.

Status: In progress

b) Develop a guide for training ATCOs involved in the implementation of FRTO B0/1. Specific meetings will be held to develop the guide, as needed.

Comments by the DCT-FRA-1 meeting: The draft training guide was assessed by the meeting, including the requirements for the implementation of ATC simulators for air traffic controller training in the definitive EDE implementation phase. These drafts are attached as **Appendix F.**

Status: In progress

c) Establish the requirements for implementation of FRTO B0/1 (ATS surveillance coverage, VHF coverage, MTCD, path monitoring)
Radar coverage and VHF coverage are essential requirements for DCT implementation.
MTCD and path monitoring are desirable requirements for reducing ATCO workload.

Verify ATC surveillance coverage, VHF coverage, MTCD availability and path monitoring.

Comments by the DCT-FRA-1 meeting: The meeting felt that a basic requirement for EDE implementation in the recovery phase would be the existence of VHF coverage and ATS surveillance. During this phase, MTCD and path compliance requirements should be considered only if they were required as part of a mitigation measure established in a safety assessment process. In this sense, the meeting requested that the members of the working group coordinate with CNS experts the analysis of VHF coverage/ATS surveillance, as well as the characteristics of the MTCD and path compliance tools existing in ATC systems; for example, if the available MTCD tool is capable of issuing alarms for flights conducted under EDE. The delegation of Ecuador provided a video on path formation, based on their experience with the INDRA tool. This video is available in the GESEA cloud (GESEA\4 SUBGRUPO 1 - PLAN E_A\GRUPOS DE TRABAJO x TF\DCT-FRA\DCT-FRA-1-5).

Status: In progress

d) Verify the impact on AIDC implementation
AIDC is not a requirement for EDE implementation. In some cases, when applying EDE, the FPL must provide a LAT/LONG waypoint prior to the transfer point between ATC units, in order for the AIDC to function properly. Check the ATECH, INDRA, and THALES systems.

Comments by the DCT-FRA-1 meeting: Although AIDC is not a requirement for EDE, the meeting considered that an assessment was needed so as not to affect the implementation of AIDC in the SAM Region, taking into account that this is a safety-related initiative aimed at reducing LHDs. Thus, the meeting requested that members coordinate with appropriate experts the assessment of the impact of EDE implementation on AIDC, as well as, if necessary, appropriate mitigation measures. The meeting also concluded that the AIP Supplement should not make reference to the AIDC, but that each State should consider specific FPL requirements to avoid a negative impact on the proper functioning of AIDC.

Status: In progress

e) Establish key performance indicators
Develop KPI 4 of the Global Air Navigation Plan. Efficiency is already being measured by ADS-B, with the application of the SIMS system. Seek airline support for KPI sampling.

Comments by the DCT-FRA-1 meeting: The secretary made a presentation about the ICAO SIMS system, where information about GANP KPI 4 could be obtained. However, information

from all FIRs is not yet available. IATA presented a template to be completed with fuel, flight time and flight distance data by the Brazilian airlines to support the implementation of DCT routes in Brazil. This template may be used as a basis for collecting data from other airlines to support implementation in other States. This Excel spreadsheet is attached as Appendix G. The sample template is available in the GESEA cloud (GESEA\4 SUBGRUPO 1 - PLAN E_A\GRUPOS DE TRABAJO x TF\DCT-FRA\Informe).

Status: In progress

f) Definitively implement strategic direct routing
States that have already implemented EDE on a provisional basis could implement it definitively on **5 November 2020**. States that have not yet done so could gain experience initially by implementing it provisionally on **5 November 2020.**

Status: In progress

6. Other matters

Under this agenda item, IATA made a presentation on Brazil's fuel savings as a result of the implementation of direct routes at a tactical and strategic level, as shown in Appendix H. A summary of the results can be seen in the table below, showing the importance of EDE implementation as part of the industry's recovery process.

FUEL SAVINGS (KG)				
	Optimised preferred routes	EDE	Tactical routes (ATCO)	TOTAL
APRIL	127485	4005	301560	433050
MAY	150994	3878	261901	416772
JUNE	209813	5359	325248	540419
JULY	329156	11610	504997	845763

Appendix A

FINAL VERSION
DCT-FRA JOB CARD

JOB CARD **STRATEGIC DIRECT ROUTING (FRTO-B0/1)**

PART I

Strategic Objective(s)	**Phase 1 – Strategic direct routing (EDE - FRTO-B0/1)** Recovery scenario Continue implementing strategic direct routing, based on the reduction of air traffic demand, with a view to providing early gains for airspace users and gaining experience in air traffic management with strategic direct routing. Normal scenario Maintain the strategic direct routing already implemented in the recovery scenario, in order to provide airspace users with additional flight planning, with route options on a larger scale across FIRs, so that planned distances can be reduced overall, compared to the fixed route network. Strategic direct routing (EDE) will be established at national and regional level and made available for flight planning (with published conditions of use). EDE is to be considered as a transition to the implementation of the free route airspace (FRA) concept. EDE operations allow airspace users to optimise flight and fuel planning.	Reference: Global Air Navigation Plan – FRTO – B0/1
Macro-activity	Regulation - Implementation	
Activity	Implementation of strategic direct routing in the South American Region	
Proposed by	GESEA – SG1	
Definition of the problem	The implementation of the SAM ATS route network version concept was approved at the SAM/IG/3 meeting (Lima, Peru, 20-24 April 2009) through Conclusion SAM/IG/3-1. The objective was to implement an integrated development concept, including a more comprehensive analysis of the route network, based on air traffic flow statistical data and the navigation capacity of the fleet, aiming at the elimination of unused routes and the exclusion or reduction of "conventional" routes.	

	Building on the concept of route network versions over the past 10 years, the SAM/IG and ATSRO meetings were responsible for the complete restructuring of the SAM ATS route network, which involved the implementation, realignment and elimination of hundreds of ATS routes. The next step in the natural evolution of airspace optimisation is the use of free route airspace (FRA), as set out in the Global Air Navigation Plan, considering strategic direct routing as a transition for the implementation of FRA. The use of fixed ATS routes can no longer provide the efficiency required for airspace users to obtain fuel savings and the reduction of greenhouse gas emissions. In this sense, a change was made in the airspace optimisation strategy in South America through the implementation of ASBU FRTO B0/B1. It is important to note that, according to the GANP, the necessary documents and the guidance material for the implementation of ASBU B0 are already available, and those corresponding to ASBU B1 will be published by 2020.
<<<<<<<Detail **PART II**	<u>Recovery phase</u> a) Review the status of implementation of strategic direct routing in the CAR/SAM Regions b) Review the content of FRTO B0/1 of the Global Air Navigation Plan c) Implement strategic direct routing in airspaces with low air traffic volume, as a function of COVID-19, based on the experience gained in its implementation in some South American States. d) Develop an aeronautical publication model for FRTO B0/1 implementation e) Develop a safety assessment model/guide for FRTO B0/1 implementation f) Develop an educational brochure to disseminate the EDE concept among ATCOs and pilots, ARO officers. <u>Normal phase</u> a) Develop model letters of operational agreement for the implementation of FRTO B0/1 b) Establish the requirements for the implementation of FRTO B0/1 (radar surveillance coverage, VHF coverage, MTCD, path monitoring) c) Develop a training guide for ATCOs involved in FRTO B0/1 implementation d) Establish key performance indicators e) Definitively implement strategic direct routing.

Priority	**High X**	Medium	Low
Justification for acceptance/rejection	N A		
Routing of the issue	SG1	Creation of the GADHOC: ☒ Yes ☐ No	
Ongoing actions	NIL		

References	Global Air Navigation Plan – FRTO B0/1
Interactions with GANP elements	NOPS-B0/1 - Initial integration of collaborative airspace management with air traffic flow management FRTO-B0/2 - Airspace planning and Flexible Use of Airspace (FUA) FRTO-B0/4 - Basic conflict detection and conformance monitoring FICE-B0/1 - Automated basic inter facility data exchange (AIDC) FRTO-B1/1 - FRA
Other interactions	South American airspace CONOPS e-ANP Volume III

Appendix B

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1) **17-Jun**

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Argentina	SACF, SAEF, SARR, SAVF, SAMF		In analysis - To be Confirmed				
Brazil	SBAZ / Amazonica	N0022/20	Available now	FL according to ICAO ANNEX 2(APPENDIX 3) and ICA 100-12 - ANNEX E	Distance between waypoints must not exceed 200NM	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	
Brazil	SBRE / Recife	N0022/20	Available now	FL according to ICAO ANNEX 2(APPENDIX 3) and ICA 100-12 - ANNEX E	Distance between waypoints must not exceed 200NM	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	ARRIVALS: to SBBS and SBCW should join the ATS routes

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1) **17-Jun**

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Central America	MHTG / CENAMER	AIC A 4/20	Available now	At or above FL200	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	DEPARTURES: the DCT must start at the last waypoint on the SID	ARRIVALS: DCT route must end at the STAR initial waypoint of WPY before leaving the CENAMER FIR
Colombia	SKEC / Barranquilla	AIP ENR 1.3-1	Availability now	From FL210 and Above	Avoid Restricted, Dangerous and Prohibited areas	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	
Colombia	SKED / Bogota	AIP ENR 1.3-1	Available now	From FL210 and Above	Avoid Restricted, Dangerous and Prohibited areas	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1) **17-Jun**

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Curacao	TNCF / Curacao	AIC05/20 A0217/20	Available from May 20th	EN-ROUTE: Use published waypoints for entry, inside and exit of FIR and aobove FL280	DEPARTURES: Follow SID to waypoint of your SID name and free route to exit waypoint of FIR	ARRIVALS: From entry waypoint of FIR, use free route to ingress point for STAR.	
Dominican Republic	MDCS / Santo Domingo	A0151/20	Available now	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	Avoid Restricted, Dangerous and Prohibited areas	DEPARTURES: the DCT could start from the last waypoint on the SID	ARRIVALS: the DCT could end at the waypoint where the STAR begins
Ecuador	SEFG / Guayaquil	ENR 1.10	Available now	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	Avoid Restricted, Dangerous and Prohibited areas		

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1) **17-Jun**

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Guyana	SYGC / Georgetown	AIP ENR 1.10-1	Available now	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries			
Jamaica	MKJK / Kingston	AIC A27/20 A0252/20	Available now	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	ARRIVALS: the DCTs could end at the STAR initial WPT or The WPT previous the descend below the minimum safe altitude	DEPARTURES: at The end of the SID (last waypoint in the SID), or The waypoint after crossing the minimum safe altitude	

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1) **17-Jun**

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Mexico	MMFR / Mexico	A2617/20	Available from May 16th	ALL: -At and Above FL200 -distances between lat/long and/or waypoints in FPL item 15 not exceeding 200NM as per ICAO doc4444 appendix 2 -Avoid dangerous, prohibited and restricted areas	EN-ROUTE: Mandatory use of published waypoints at the MMFR FIR boundaries and when crossing the CTAs: MMID, MMZT, MMEX AND/OR MMTY	ARRIVALS: the DCT must end at the STAR initial WPT or within the STAR before leaving the ATS surveillance service	DEPARTURES: at the last SID WPT or as instructed by ATC
Panama	MPZL / Panama	ENR 1.10	Availability now	EN-ROUTE: Mandatory use of published waypoints at the FIR boundaries	ARRIVALS and DEPARTURES: the end/start of the DCT routing should be at the TMA boundary waypoint		

Updated

Direct routing implementation in the LATAM-CAR region (FRTO-B0/1) **17-Jun**

State	FIR	Doc./ reference	DCT Routing Status	Condition 1	Condition 2	Condition 3	Condition 4
Peru	SPIM / Lima		In analysis - To be Confirmed				
Trinidad & Tobago	TTZP / Piarco		Confirmed - Publication expected				
Venezuela	SVZM / Maiquetia		Availability now				

Updated **15-May**

Preferred routes (DCT) implementation in the LATAM-CAR region

State	FIR	Doc./ reference	DCT Routing Status	Route description / Comments
Cuba	MUFH / Habana	approval letter 15/May/2020	Available now	CANOA DCT ULARI – ULARI DCT CANOA CANOA DCT LENUK – LENUK DCT CANOA CANOA DCT NOSAT CANOA DCT EMOSA – EMOSA DCT CANOA MAXIM DCT NUKAN – NUKAN DCT MAXIM ALURU DCT ATUVI – ATUVI DCT ALURU PABEL DCT IKBIX SELEK DCT IKBIX FUNDI DCT LEPON URSUS DCT GAXER GAXER DCT ZEUSS URSUS DCT NIBEO EPSIM DCT ZEUSS BORDO DCT GELOG – GELOG DCT BORDO EMABU DCT ENAMO – ENAMO DCT EMABU VIKRO DCT ENAMO – ENAMO DCT VIKRO GHANN DCT ULDAR – ULDAR DCT GHANN GHANN DCT VIKRO – VIKRO DCT GHANN
Brazil	SBBS / Brasilia	NOTAM J0282/20	Available now	Use of Opticional Routes listed in https://www.aisweb.aer.mil.br/?i=espaco-aereo&p=playbook
Brazil	SBCW / Curitiba	NOTAM K0516/20	Available now	Use of Opticional Routes listed in https://www.aisweb.aer.mil.br/?i=espaco-aereo&p=playbook
USA	Continental NAS	NAS AC90-91K	Available now	
		7210.3BB	Available now	
		HAR	Available now	

Appendix C

SAMPLE AIP SUPPLEMENT

ONLY OVERFLIGHTS

Phone: Fax: E-mail: Sitatex: Telex:	**S T A T E** **AERONAUTICAL INFORMATION** **SERVICE**	AMDT AIP/Supplement N° XX / XX XX XX , 2020

IMPLEMENTATION OF STRATEGIC DIRECT ROUTING IN THE UPPER AIRSPACE OF THE XXX FIR

1. PURPOSE

1.1 The purpose of this AIP Supplement is to report on [or establish processes for] the implementation of strategic direct routing in the upper airspace of the XXXX FIR, following the procedures described below.

2. INTRODUCTION

2.1. In South America, the SAM ATS route network was completely restructured over the past 10 years, involving the implementation, realignment and elimination of hundreds of ATS routes, leading to a more direct and efficient fixed route structure.

2.2. The use of fixed ATS routes no longer provides the efficiency required for airspace users to achieve fuel savings and the reduction of greenhouse gas emissions. The next step in the natural evolution of airspace optimisation is the use of free route airspace (FRA), as set out in the Global Air Navigation Plan, considering strategic direct routing (EDE) as a transition to the implementation of FRA.

3. DEFINITIONS AND ABBREVIATIONS

3.1. For the purposes of this AIP Supplement, the following definition applies:

3.1.1. Strategic direct routing (EDE) – Direct route inserted in the flight plans, using the published significant points (waypoints) and radio aids, with the purpose of planning more efficient routes, based on the procedures established below.

Note: Significant points (waypoints) based on LAT/LONG could be applied, depending on available ATC systems and airspace characteristics. A LAT/LONG waypoint may be required to meet specific requirements of the automated ATC system.

4. OPERATIONAL PROCEDURES FOR EDE IMPLEMENTATION

4.1. Adequate ATS surveillance and VHF communication coverage is an essential requirement for the use of EDE in continental airspace.

4.2. The implementation of ADS-C/CPDLC is an essential requirement for EDE operations in oceanic airspaces.

4.3. EDE will not be applied in partial or total ATS contingency situations.

4.4. Flight plans

4.4.1. The cruise level table of Appendix 3 to (ICAO) Annex 2 shall be applied.

4.4.2. The flight plan shall be based on the published significant points (waypoints) or radio navigation aids.

4.4.3. The flight plan shall contain a significant point (waypoint) at FIR boundaries.

4.4.4. The distance between published significant points (waypoints) inserted in the flight plan shall not be greater than xxx NM (or xxx minutes of flight).

Note: Doc. 4444:
The track of flights operating predominantly in an east-west direction between 70°N and 70°S, by reference to significant points formed by the intersections of half or whole degrees of latitude with meridians spaced at intervals of 10 degrees of longitude. For flights operating in areas outside those latitudes the tracks shall be defined by significant points formed by the intersection of parallels of latitude with meridians normally spaced at 20 degrees of longitude. The distance between significant points shall, as far as possible, not exceed one hour's flight time. Additional significant points shall be established as deemed necessary.

4.4.5. FPLs should contain a reporting point (LAT/LONG) at a maximum distance of XX NM or equivalent to XX minutes before the FIR boundary.

Note: Each State shall establish specific FPL filling requirements to meet ATS system specifications, with a view to avoiding rejection or delay in FPL processing. The attachment to this AIC presents models for filling the FPL form applying the EDE concept, and addresses several cases applicable within the FIR and for international departures/arrivals.

5 ADDITIONAL INFORMATION

Additional information can be obtained through the following contacts:

- Dirección General de Aeronáutica Civil/Directorate General of Civil Aeronautics
  - Nnnnnnn email
- ICAO Lima
  Mr. xxx xxxxx (email: xxxxxx@icao.lima.int)

ATTACHMENT

[The State includes in this attachment, in accordance with the specific requirements of its automated systems, messaging and/or ATS procedures, models for filling in box 12 of the flight plan, as guidance for the staff of ARO AIS services, AFS communications, ATC and air operators.]

Appendix D

MODEL AIP SUPPLEMENT

ALL FLIGHTS, INCLUDING ARRIVALS AND DEPARTURES

Phone: Fax: E-mail: Sitatex: Telex:	**S T A T E** **AERONAUTICAL INFORMATION SERVICE**	AMDT AIP/Supplement N° XX / XX XX XX , 2020

IMPLEMENTATION OF STRATEGIC DIRECT ROUTING IN THE UPPER AIRSPACE OF THE XXXX FIR

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2. INTRODUCTION

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Note: Significant points (waypoints) based on LAT/LONG could be applied, depending on available ATC systems and airspace characteristics. A LAT/LONG waypoint may be required to meet specific requirements of the automated ATC system.

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4.1. Adequate ATS surveillance and VHF communication coverage is an essential requirement for the use of EDE in continental airspace.

4.2. The implementation of ADS-C/CPDLC is an essential requirement for EDE operations in oceanic airspace.

4.3. EDE will not be applied in partial or total ATS contingency situations.

4.4. Flight plans

4.4.1. The cruise level table of Appendix 3 to (ICAO) Annex 2 shall be applied;

4.4.2. The flight plan shall be based on the published significant points (waypoints) or radio navigation aids;

4.4.3. The flight plan shall contain a significant point (waypoint) at FIR boundaries.

4.4.4. The distance between published significant points (waypoints) inserted in the flight plan shall not be greater than xxx NM (or xxx minutes of flight).

Note: Doc 4444:
The track of flights operating predominantly in an east-west direction between 70°N and 70°S, by reference to significant points formed by the intersections of half or whole degrees of latitude with meridians spaced at intervals of 10 degrees of longitude. For flights operating in areas outside those latitudes the tracks shall be defined by significant points formed by the intersection of parallels of latitude with meridians normally spaced at 20 degrees of longitude. The distance between significant points shall, as far as possible, not exceed one hour's flight time. Additional significant points shall be established as deemed necessary.

4.4.5. FPLs should contain a reporting point (LAT/LONG) at a maximum distance of XX NM or equivalent to XX minutes before the FIR boundary.

Note: Each State shall establish specific FPL filling requirements to meet ATS system specifications, with a view to avoiding rejection or delay in FPL processing. The attachment to this AIC presents models for filling the FPL form applying the EDE concept, and addresses several applicable cases within the FIR and for international departures/arrivals.

4.4.6. Flight plans involving departures from airports located in the XXXX FIR shall/may include the last point of the corresponding SID, which will be considered to be the start of the EDE.

Note: Alternatives to this paragraph

- *Flight plans involving departures from airports located in the XXXX FIR shall follow the published routes up to points XXXX, YYYY, ZZZZ, and VVVV; or*

- *Flight plans involving departures from airports located in the XXXX FIR shall follow the published routes up to a radius of XXX NM from the ZZZ VOR.*

4.4.7. Flight plans involving arrivals at airports located in the XXXX FIR shall/may include the first point of the corresponding STAR, which will be considered to be the end of the DTS.

Note: Alternatives to this paragraph.

- *Flight plans involving arrivals at airports located in the XXXX FIR shall follow the published routes from points XXXX, YYYY, ZZZZ and VVVV; or*

- *Flight plans involving arrivals at airports located in the XXXX FIR must follow the published route from a radius of XXX NM of the ZZZ VOR; or*

- *For non-STAR airports, it should be indicated that FPLs could be planned as direct flights to the IAF or include significant points (waypoints) of the route that should be inserted in the FPL.*

5 ADDITIONAL INFORMATION

Additional information can be obtained through the following contacts:

- Dirección General de Aeronáutica Civil/Directorate General of Civil Aeronautics
  - Nnnnnnnn email

- ICAO Lima
  Mr. xxx xxxxx (email: xxxxxx@icao.lima.int)

ATTACHMENT

[The State includes in this attachment, in accordance with the specific requirements of its automated systems, messaging and/or ATS procedures, models for filling in box 12 of the flight plan, as guidance for the staff of ARO AIS services, AFS communications, ATC and air operators.]

Appendix E

SAFETY ASSESSMENT MODEL

EXAMPLE OF RISK ANALYSIS AND MANAGEMENT MATRIX APPLICABLE TO STRATEGIC DIRECT ROUTING (EDE)

Note: The following example of a matrix is considered valid for the period July - December 2020, with flight/overflight flow reduced to 10% - 40% of the operations recorded in December 2019, for the respective ACC.

(1) Flight phase or segment	(2) Hazard identification	(3) Possible consequences	(4) Risk index	(5) Mitigations	(6) Risk index after mitigation	(7) Notes
• **Oceanic** upper airspace • Aircraft transferred and under control and responsibility of the (sector) ACC	Data link failure affects CPDLC and simultaneous HF failure (or HF not available) of the aircraft prevents position reporting to ATC. Absence of aircraft position reports impairs ATCO situational awareness.	This results in a loss of separation between aircraft.	**3C Tolerable** **Remote: 3** **Major: C**	1. Flight plan management. Updated flight plan. ATS message. Doc 4444 Appendix 2. 2. ATS surveillance (ADS-C) available. 3. Procedures and methods on aircraft radio transmitter failure. Doc 4444, Ch 8 and Ch 15. 4. Procedures (and/or SUPPS) applicable to oceanic airspace, in case of communications failure. 5. Table of levels, Annex 2, Appendix 3. 6. ACAS/TCAS on board 7. Automated ATC systems with MTCD (medium-term conflict detection) and/or STCA (short-term conflict alert) 8. Communication via satellite phone.	**2D Aceptable** **Improbable: 2** **Minor: D**	The operational requirements for the application of EDE are shown in the AIP SUP xx/20 of [State]
• **Continental** upper airspace • Aircraft transferred and under control and responsibility of the (sector) ACC	Aircraft radio transmitter failure prevents position reporting to ATC. Absence of aircraft position reports impairs ATCO situational awareness.	This results in a loss of separation between aircraft.	**3C Tolerable** **Remote: 3** **Major: C**	1. Flight plan management. Updated flight plan. ATS message. Doc 4444 Appendix 2. 2. ATS surveillance (radar or ADS-B) available. 3. Procedures and methods on aircraft radio transmitter failure. Doc 4444, Ch 8 and Ch 15. 4. Transponder code 7600 5. Table of levels, Annex 2, Appendix 3. 6. ACAS/TCAS on board	**2D Acceptable** **Improbable: 2** **Minor: D**	The operational requirements for the application of EDE are shown in the AIP SUP xx/20 of [State].

(1) Flight phase or segment	(2) Hazard identification	(3) Possible consequences	(4) Risk index	(5) Mitigations	(6) Risk index after mitigation	(7) Notes
				7. Automated ATC systems with MTCD (medium-term conflict detection) and/or STCA (short-term conflict alert) 8. The ACARS (aircraft communications addressing and reporting system) would allow the position to be received through the aircraft operator.		
• **Oceanic or continental** upper airspace. • Aircraft transferred and under control and responsibility of the (sector) ACC	Severe communication failure in the responsible ACC prevents ATCO from receiving aircraft position reports. The absence of reports impairs ATCO situational awareness.	This results in a loss of separation between aircraft.	**3C Tolerable** **Remote: 3** **Major: C**	1. The State ATS Contingency Plan provides for the temporary suspension of EDE during a contingency.	**1E Acceptable** **Extremely Improbable: 1** **Negligible: E**	The operational requirements for the application of EDE are shown in the AIP SUP xx/20 of [State].
• **Oceanic or continental** upper airspace. • Aircraft transferred and under control and responsibility of the (sector) ACC	Presence of bad weather conditions that require the pilot to ask to deviate from the planned route (path). The deviation authorised by ATC causes a path overlap with another aircraft.	This results in a loss of separation between aircraft.	**1C Acceptable** **Extremely Improbable: 1** **Major: C**	N/A	N/A	

(1) Flight phase or segment	(2) Hazard identification	(3) Possible consequences	(4) Risk index	(5) Mitigations	(6) Risk index after mitigation	(7) Notes

<<<<<<<<<<<<<<<<<<<<<<<<

Appendix

Examples of tables and matrices for the analysis of risks and mitigations

Figure 1: Example of risk likelihood table

Likelihood	Meaning	Value
Frequent	— Likely to occur many times (has occurred frequently)	5
Occasional	— Likely to occur sometimes (has occurred infrequently)	4
Remote	— Unlikely to occur, but possible (has occurred rarely)	3
Improbable	— Very unlikely to occur (not known to have occurred)	2
Extremely improbable	— Almost inconceivable that the event will occur	1

Figure 2: Example of severity table

Severity	Meaning	Value
Catastrophic	— Aircraft or equipment destroyed — Several fatalities	A
Hazardous	— Greatly reduced safety margins, physical stress or a workload such that operations personnel can no longer be relied upon to perform their tasks accurately or completely — Severe injuries — Significant damage to equipment	B
Major	— Significant reduction in safety margins, reduced ability of operations personnel to tolerate adverse operating conditions, as a result of increased workload or as a result of conditions affecting their efficiency — Serious incident — Injuries to people	C
Minor	— Operational limitations — Use of emergency procedures — Minor incident	D
Negligible	— Few consequences	E

Figure 3: Examples of risk assessment matrices

Probability of risk	Severity of risk				
	Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent 5	5A	5B	5C	5D	5E
Occasional 4	4A	4B	4C	4D	4E
Remote 3	3A	3B	3C	3D	3E
Improbable 2	2A	2B	2C	2D	2E
Extremely improbable 1	1A	1B	1C	1D	1E

Risk index range	Description of risk	Recommended action
5A, 5B, 5C, 4A, 4B, 3A	Intolerable	Take immediate action to mitigate risk or suspend the activity. Perform priority safety risk mitigation to ensure that preventive or additional or enhanced controls are in place to reduce the risk index to the tolerable range.
5D, 5E, 4C, 4D 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	Tolerable	May be tolerated based on safety risk mitigation. May require a management decision to accept the risk.
3E, 2D, 2E, 1B, 1C, 1D, 1E	Acceptable	Acceptable as is. No further risk mitigation required.

Appendix F

ATC TRAINING GUIDE

GUIDANCE FOR STRATEGIC DIRECT ROUTING TRAINING

SUBJECT: QUALIFICATION AND TRAINING OF PILOTS, ATCOs AND ARO STAFF WITH RESPECT TO THE IMPLEMENTATION OF STRATEGIC DIRECT ROUTING IN THE SOUTH AMERICAN REGION

SECTION A - PURPOSE

This Training Guide seeks to standardise training to facilitate early implementation of STRATEGIC DIRECT ROUTING (EDE) in the South American Region during the pandemic. Likewise, it provides information for the correct interpretation of the standard practices and procedures of the Global Air Navigation Plan, 6th edition, and the SAM CONOPS.

Recovery phase

a) Implement strategic direct routing in low air traffic volume airspaces, as a function of COVID-19, based on the experience gained in its implementations in some South American States.

SECTION B – SCOPE

The scope is aimed at providing:

a) Airspace users with additional flight planning route options on a larger scale in FIRs, so that planned leg distances can be reduced overall, compared to the **fixed** route network**.**

b) Assistance to organisations for the implementation of the STRATEGIC DIRECT ROUTING Basic Training Package in the South American Region.

This training guide provides acceptable, but not the only, alternatives for States to manage EDE training of aviation personnel.

SECTION C – INFORMATION

a) DEFINITIONS

Qualification: Minimum basic knowledge, usually acquired through education programmes, required to practise a profession.

Qualify: To give someone specialised training to perform a professional activity or a specific job.

Competency. Knowledge, skills and attitudes required to perform the specific tasks that a work activity demands.

NOTE: Competencies are generally acquired and assessed through the performance of the work activity or through various training opportunities**.**

b) ACRONYMS

ASBU	AVIATION SYSTEM BLOCK UPGRADE METHODOLOGY
ATCO	AIR TRAFFIC CONTROLLER
EDE	STRATEGIC DIRECT ROUTING (SPANISH; ENRUTAMIENTO DIRECTO ESTRATÉGICO)
FRA	FREE ROUTE AIRSPACE CONCEPT
GANP	GLOBAL AIR NAVIGATION PLAN
GESEA	SAM AIRSPACE STUDY AND IMPLEMENTATION GROUP
KPI	KEY PERFORMANCE INDICATOR

SECTION D – TEACHING AND TRAINING

1) 2020 OPERATIONAL CONCEPT

A. AIRSPACE CONCEPT

B. THEORETICAL ASSUMPTIONS OF THE OPERATIONAL CONCEPT

2) **GANP GLOBAL AIR NAVIGATION PLAN**

A. INTRODUCTION AND ICAO STRATEGIC OBJECTIVES

B. ASBU

C. FRTO B0/1, HIGHLIGHTING THE FOLLOWING ASPECTS:

- EDE, IMPLEMENTATION AND LIMITATIONS:

A. TIME RESTRICTION (FIXED OR DEPENDING ON TRAFFIC/AVAILABILITY);

B. TRAFFIC RESTRICTION (BASED ON TRAFFIC FLOW AND/OR LEVEL);

C. FLIGHT LEVEL;

D. LATERAL RESTRICTIONS;

E. ENTRY/EXIT POINTS.

PROCEDURES AND PROCESSES TO CONSIDER:

A. IDENTIFY THE EDE (LATERAL AND VERTICAL) AIRSPACE VOLUME AND APPLICABLE TIME;

B. COEXISTENCE OF DIRECT ROUTES WITH THE ATS ROUTE STRUCTURE;

C. ADAPT AIRSPACE DESIGN TO ENSURE HORIZONTAL AND VERTICAL CONNECTIVITY WITH EDE.

D. ATFM PROCEDURES FOR EDE;

E. REVISION OF LOAS WITH ADJACENT ATS UNITS;

F. PUBLICATION OF DATA RELEVANT TO EDE (IN THE AIP SEE APP.1 MODEL AMDT AIP SUP EDE);

G. AIRSPACE MANAGEMENT PROCEDURES FOR THE IMPLEMENTATION OF DIRECT ROUTES;

H. ATC PROCEDURES FOR EDE COORDINATION, INCLUDING HANDOVER, PATH CHANGES IN DIRECT ROUTING; CONFLICT DETECTION.

4) OPERATIONAL AND DEPENDENT RELATIONSHIP WITH OTHER ASBU ELEMENTS

5) GANP (6TH EDITION) MODULES/ELEMENTS

A. NOPS-B0/1 INITIAL INTEGRATION OF COLLABORATIVE AIRSPACE MANAGEMENT WITH AIR TRAFFIC FLOW MANAGEMENT

THE INTEGRATION OF AIRSPACE MANAGEMENT AND AIR TRAFFIC FLOW MANAGEMENT IS A DESIRABLE REQUIREMENT, WITH A VIEW TO OPTIMISING EDE IMPLEMENTATION IN THE SAM REGION.

B. FRTO-B0/2 - AIRSPACE PLANNING AND FLEXIBLE USE OF AIRSPACE (FUA)

THE APPLICATION OF FUA COULD OPTIMISE EDE IMPLEMENTATION, TAKING INTO ACCOUNT THAT EDE ROUTES COULD ENTER SPECIAL USE AIRSPACE, IN ACCORDANCE WITH PRE-ESTABLISHED PROCEDURES.

C. FRTO-B0/4 - BASIC CONFLICT DETECTION AND CONFORMANCE MONITORING

MEDIUM-TERM CONFLICT DETECTION (MTCD) AND CONFORMANCE MONITORING TOOLS ARE CONSIDERED AS REQUIREMENTS TO REDUCE THE WORKLOAD OF AIR TRAFFIC CONTROLLERS IN HIGH AIR TRAFFIC VOLUME ENVIRONMENTS. ACCORDINGLY, THEY CAN BE CONSIDERED AS DESIRABLE REQUIREMENTS AND SHOULD BE TAKEN INTO ACCOUNT WHEN UPGRADING ATM SYSTEMS.

D. FICE-B0/1 - AUTOMATED BASIC INTER FACILITY DATA EXCHANGE (AIDC)

SIMILARLY, AIDC IS CONSIDERED A DESIRABLE TOOL FOR EDE IMPLEMENTATION, WITH A VIEW TO REDUCING ATCO WORKLOAD, ESPECIALLY IN HIGH AIR TRAFFIC VOLUME OPERATIONAL ENVIRONMENTS, PARTICULARLY WHEN THERE IS HANDOVER OF EDE FLIGHTS IN BOTH FIRS.

6) ENABLERS

REGARDING ENABLERS, THE GLOBAL AIR NAVIGATION PLAN, IN FRTO BO/1, LISTS A SERIES OF EUROCONTROL DOCUMENTS THAT COULD BE USED AS GUIDANCE MATERIAL. HOWEVER, EDE IMPLEMENTATION IN THE SAM REGION MUST TAKE INTO ACCOUNT AIRSPACE CHARACTERISTICS AND AIR TRAFFIC DEMAND, WHICH IS SIGNIFICANTLY LESS THAN IN EUROPE.

7) KEY PERFORMANCE INDICATORS (KPIS)

STRATEGIC DIRECT ROUTING (EDE) WILL BE ESTABLISHED AT NATIONAL AND REGIONAL LEVEL AND MADE AVAILABLE FOR FLIGHT PLANNING (WITH PUBLISHED CONDITIONS OF USE).

EDE SHALL BE CONSIDERED AS A TRANSITION TO THE IMPLEMENTATION OF THE FREE ROUTE AIRSPACE (FRA) CONCEPT. EDE OPERATIONS ALLOW AIRSPACE USERS TO OPTIMISE FLIGHT AND FUEL PLANNING.

THE NEXT STEP IN THE NATURAL EVOLUTION OF AIRSPACE OPTIMISATION IS THE USE OF FREE ROUTE AIRSPACE (FRA), AS SET OUT IN THE GLOBAL AIR NAVIGATION PLAN, CONSIDERING STRATEGIC DIRECT ROUTING AS A TRANSITION FOR THE IMPLEMENTATION OF FRA. THE USE OF FIXED ATS ROUTES CAN NO LONGER PROVIDE THE EFFICIENCY REQUIRED FOR AIRSPACE USERS TO OBTAIN FUEL SAVINGS AND THE REDUCTION OF GREENHOUSE GAS EMISSIONS.

IN THIS SENSE, A CHANGE WAS MADE IN THE AIRSPACE OPTIMISATION STRATEGY IN SOUTH AMERICA, THROUGH THE IMPLEMENTATION OF ASBU FRTO B0/B1. IT IS IMPORTANT TO NOTE THAT, ACCORDING TO THE GANP, THE NECESSARY DOCUMENTS AND THE GUIDANCE MATERIAL FOR THE IMPLEMENTATION OF ASBU B0 ARE ALREADY AVAILABLE, AND THOSE CORRESPONDING TO ASBU B1 WILL BE PUBLISHED BY 2020.

3) ASSESSMENT OF IMPACT ON PERFORMANCE

[SEE APPENDIX 2, EXAMPLE OF MATRIX FOR ANALYSING AND MANAGING RISKS APPLICABLE TO STRATEGIC DIRECT ROUTING (EDE)]

4) PRACTICE ON A SIMULATOR

A. IMPLEMENTATION CHECKLIST

Appendix 1 – PUBLICATION OF DATA RELEVANT TO EDE IN THE AIP

Appendix 2 – EXAMPLE OF MATRIX FOR ANALYSING AND MANAGING RISKS APPLICABLE TO STRATEGIC DIRECT ROUTING (EDE)

Appendix G

FUEL SAVINGS template

INFORMAÇÕES GERAIS						PLANEJAMENTO												REAL											
						PRE COVID				POS COVID				∆ Avg por voo				FEV 2020				MÊS CORRENTE				∆ Avg por voo			
Empresa Aérea	ORIGEM	ESTIN	TIPO DE ACFT	Tipo de Rota Utilizada	NR OPR	STD plan fuel	STD plan Flight Time	STD plan Flight Dista	STDplan CO2	STD plan fuel	STD plan Flight Time	STD plan Flight Dista	STDplan CO2	∆ avg plan fuel	∆ avg plan flight time	∆ avg plan flight distan	∆ plan CO2	Avg actual fuel	Avg actual Flight Time	Avg actual Flight Dista	Avg actual CO2	Avg actual fuel	Avg actual Flight Time	Avg actual Flight Dista	Avg actual CO2	∆ avg actual fuel	∆ avg actual flight time	∆ avg actual flight distan	∆ CO2
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0
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									0				0	0	0	0	0				0				0	0	0	0	0
									0				0	0	0	0	0				0				0	0	0	0	0

PLANEJAMENTO				REAL				ANEJAMEN	REAL
vg TOTAL por PAR DE CIDA				vg TOTAL por PAR DE CIDA					
∆ avg plan fuel	∆ avg plan flight time	∆ avg plan flight distan	∆ CO2	∆ avg actual fuel	∆ avg actual flight time	∆ avg actual flight distan	∆ CO2	VARIAÇÃO % avg plan fuel	VARIAÇÃO % avg real fuel
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
0	0	0	0	0	0	0	0	#DIV/0!	#DIV/0!
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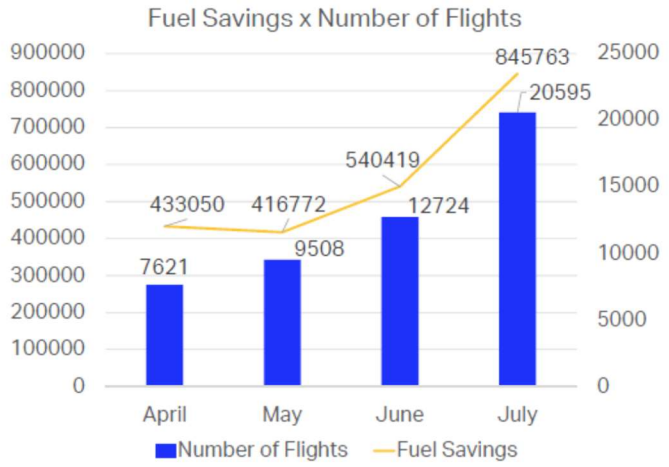
Appendix H

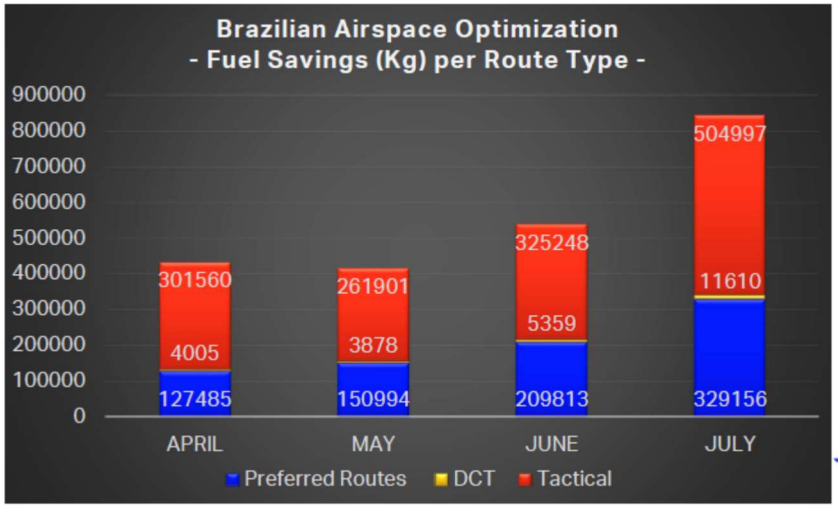
FUEL SAVINGS - BRAZIL

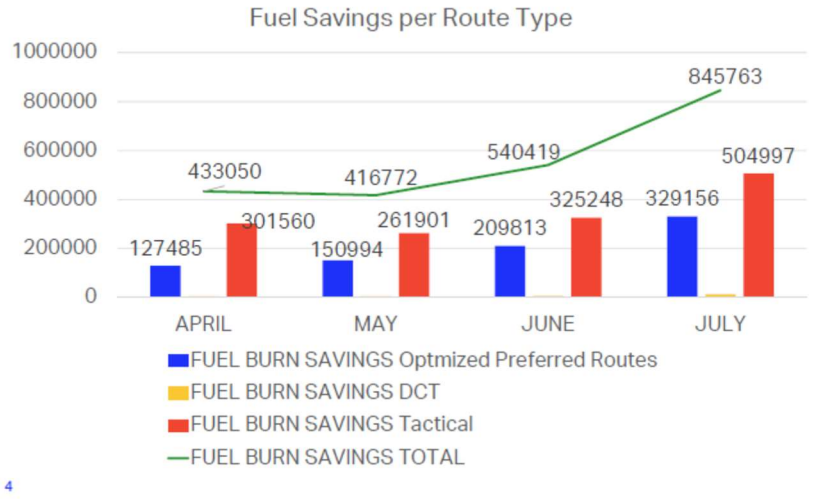
Fuel Savings

DECEA´s Restart Plan

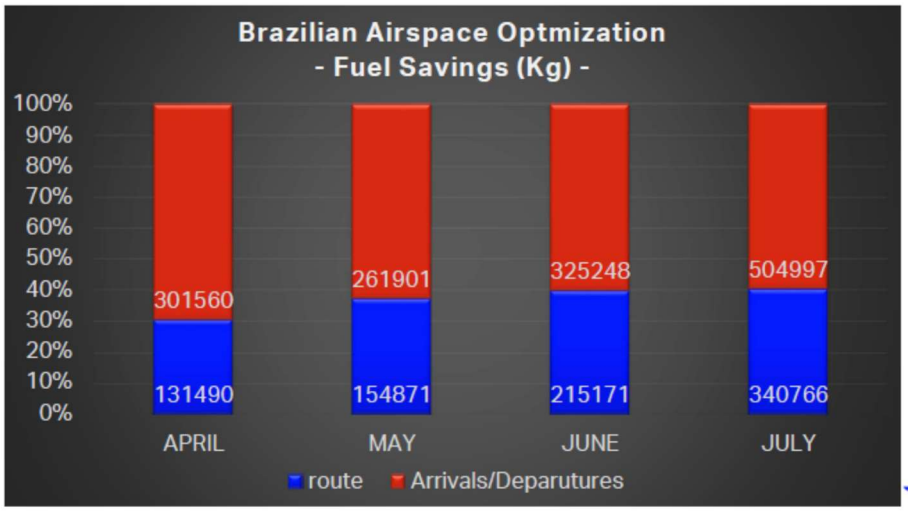
1 16 July 2020




Brazilian Airspace Optimization
- Fuel Savings (Kg) per Route Type -
900000
800000
700000
600000
500000
400000
300000
200000
100000
0
301560
4005
127485
261901
3878
150994
325248
5359
209813
504997
11610
329156
APRIL
MAY
JUNE
JULY
Preferred Routes
DCT
Tactical


Fuel Savings per Route Type
1000000
800000
600000
400000
200000
0
433050
416772
540419
845763
127485
301560
150994
261901
209813
325248
329156
504997
APRIL
MAY
JUNE
JULY
FUEL BURN SAVINGS Optmized Preferred Routes
FUEL BURN SAVINGS DCT
FUEL BURN SAVINGS Tactical
FUEL BURN SAVINGS TOTAL

4



5

Otimização

- Resultados -

Azul

GOL

LATAM

2.240.000kg

April to June

1.120

Air Shuttle – Rio/São Paulo