

# Operations Plan

Recovery COVID-19

**Annex I – Severe Weather Avoidance Plan  
(SWAP)**



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**SISCEAB**  
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do Espaço Aéreo Brasileiro



**Departamento  
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## **PREFACE**

The Severe Weather Avoidance Plan (SWAP) is an initiative of DECEA, airlines and airports with the objective of guiding at a strategic level the actions taken at the tactical level during operational scenarios with severe weather conditions which entails the necessity to avoid a certain airspace, maintaining minimum levels of operational efficiency at SISCEAB.



## **1 PRELIMINARY PROVISIONS**

### **1.1 PURPOSE**

The purpose of this Plan is to guide actions related to the activation of the Severe Weather Avoidance Plan (SWAP).

### **1.2 SCOPE**

The provisions contained in this Plan are mandatory and apply to the ATC bodies involved, air operators and CGNA.

### **1.3 COMPETENCE**

It is the responsibility of the CGNA Commander, DECEA Regional Bodies involved and the person responsible for the operational area of the air operators to comply with this Plan within the scope of the respective organizations.



## **2 DEFINITIONS AND ABBREVIATIONS**

### **2.1 DEFINITIONS**

#### **SWAP NOTICE**

SWAP Activation Forecast Alert Message, issued by CGNA, through collaborative decision making between CIMAER, COT-CDM, the FMCs involved and the airlines, through the positions located within CGNA, and disseminated through the Portal CGNA and ITOP Portal (IATA's Tactical Operations Portal).

NOTE: In the event of major impact events, to be defined in the CGNA / CIMAER service instructions, which typically have a long duration or involve several airports, a specific videoconference may be held with the airline's CCOs.

#### **SWAP ACTIVATION**

Message issued by CGNA, through collaborative decision making between CIMAER, COT-CDM, FMCs involved and the airlines, through the positions within the scope of the CGNA, after the issuance of a SWAP WARNING message, which determines the redirection of flows of departure and / or arrival from the airports of interest in order to minimize the workload of the ATCO (control position), avoid tactical deviations and ensure an orderly circulation in adverse weather scenarios.

#### **CANCELLATION OF SWAP NOTICE.**

Message issued by CGNA, through collaborative decision making between CIMAER, COT-CDM, FMCs involved and the airlines, through the positions within the scope of the CGNA, after the issuance of a WARNING SWAP message that was not activated. The SWAP Warning Message will also be canceled after the expiration of its Validity Period when SWAP is not activated.

#### **SEVERE METEOROLOGICAL CONDITIONS**

For the purposes of this plan, Severe Meteorological Conditions are those related to the convective cells observed or predicted in meteorological systems or in local convective systems with a diameter or greater elliptical axis equal to or greater than 40 NM, with a top at the level equal to or greater than 30,000 feet, in which values equal to or greater than 35 dBZ are observed in reflectivity parameters, or Level 3 or higher, in parameters of Vertically Integrated Liquid (VIL), when observed in meteorological radar images, within the area described in Appendix A.

#### **SWAP DEACTIVATION**

Message issued by CGNA, through collaborative decision-making between CIMAER, COT-CDM, FMCs involved and the airlines, through the positions within the CGNA, after the dispatch of a SWAP ACTIVATION message, which closes the rerouting of flows departure and/or arrival from airports of interest.

#### **SWAP REGULATED ELEMENT**

Fixed, Waypoint or Aid that must be monitored for the purpose of SWAP implementation, when it is meteorologically affected by the presence of a severe convective weather system.

## **ATFM MEASURES**

Procedures adopted to maximize the use of declared capacities and/or adjust the flow of air traffic in a given portion of airspace, along a given route or on a given aerodrome, in order to avoid imbalance.

### **SEVERE WEATHER AVOIDANCE PLAN (SWAP)**

Approved plan to mitigate the effects of severe weather on air traffic flows, avoiding discontinuity in the provision of ATC, contributing to the preservation of operational safety and the ordering of the flow of aircraft in busy air spaces.

### **SWAP REROUTING**

ATFM measure consisting of the use of a collaboratively defined route between CGNA, ATC bodies and airlines, different from that requested in the flight plan, with the aim at deviating from areas with severe weather build ups.

## **2.2 ABBREVIATIONS**

The abbreviations used in this Plan have the following meanings:

ATC	- Air Traffic Control
ATCO	- Air Traffic Controller
ATFM	- Air Traffic Flow Management
CCO	- Airline Operations Control Center
CIMAER	- Integrated Center for Aeronautical Meteorology
CGNA	- Air Navigation Management Center
COT-CDM	- Center for Tactical Operations and Collaborative Decision Making
EOBT	- Estimated Off Block Time
FMC	- Flow Management Cell
FPL	- Flight plan
PLN	- Flight plan
SAGITARIO	- Advanced Air Traffic Information Management System and Operational Interest Report
STSC	- Severe Convective Weather System
SWAP	- Severe Weather Avoidance Plan
TMA	- Terminal Control Area
TWR	- Control tower

### **3 COMPETENCE**

#### **3.1 COMPETE TO CGNA**

- a) To monitor, in coordination with the FMCs and the CGNA / CIMAER foresight, the evolution of severe weather in the airspace of interest defined in Appendix A;
- b) Define the SWAP implementation strategy, in coordination with the airlines, through the operational position located at CGNA, FMC, TWR involved (s) and CGNA / CIMAER forecast;
- c) Issue the SWAP messages, in coordination with the CGNA / CIMAER, FMC, TWR and the airline forecasts, through the operational position located at the CGNA;
- d) Keep SWAP routes updated on the AISWEB portal; and
- e) Provide facilities and furniture, with the following equipment and tools, in order to enable the Meteorologist Forecasting Officer service at the CGNA Operational Hall:
  - i. Technical-operational means of Informatics, such as Internet and INTRAER, with wide access to the most varied meteorological platforms and tools;
  - ii. Operational telephony terminal; and
  - iii. Other systems required for the routine assignments of the Meteorologist Forecasting Officer, as well as to meet the specific degradation plan inherent in the function.

#### **3.2 COMPETE TO FMC**

- a) Analyze severe weather conditions, in coordination with the CGNA / CIMAER forecaster, by means of videoconference and / or telephone;
- b) Request CGNA to implement ATFM measures related to SWAP;
- c) Enable and disable SWAP, in coordination with CGNA and other FMCs involved, including the SWAP routes to be applied;
- d) Conduct the modification of aircraft flight routes and the necessary actions related to the flight plan; and
- e) Take the necessary actions for the modification of envisaged routes in the FPL of aircraft on the ground, coordinating with the assistants of the control sectors, the PLN and TWR rooms involved.

NOTE: The actions envisaged for letter “e” can be attributed to the Supervisor, Coordinator or Air Traffic Controller enabled.

#### **3.3 COMPETE TO THE CCO**

- a) Inform the CGNA of any difficulties in complying with the SWAP routes, especially with regard to aircraft that are already in flight and that will have to proceed to the alternate aerodrome and may have their crew regulated;
- b) Analyze SWAP Warning messages and plan flights to comply with SWAP routes; and



- c) Inform crews about the possibility of applying SWAP routes.

### **3.4 COMPETE TO ACC/APP**

- a) Accept flights from aircraft that are rerouted to your area of jurisdiction, due to SWAP activation.

### **3.5 COMPETE TO TWR INVOLVED**

- a) Inform FMC of the responsibility area in cases where severe weather is impacting takeoff operations or missed approach; and
- b) Authorize flight plans according to the SWAP routes coordinated with the corresponding ACC.

### **3.6 COMPETE TO CIMAER**

- a) Have trained personnel to provide meteorological briefing about SWAP to CGNA, in the morning, afternoon and overnight shifts, with emphasis on forecasted severe weather conditions for the airspace of interest defined in Appendix A;
- b) The provision of forecasts personnel at CGNA, maintenance of the meteorological surveillance over the area of interest and immediately inform CGNA of any situation that indicates the beginning, intensification, displacement tendency, decrease or end of severe convective weather formations; and
- c) Establish a monitoring and control mechanism, through performance and process indicators, to make an adjustment decision on the product related to the SWAP forecast, when this action is deemed appropriate. The SWAP meteorological briefing will contain specific coding in order to differentiate between frontal and local systems.



## **4 SWAP PROCESS**

**4.1** Based upon a more detailed assessment of severe weather by FMC in the airspace operations under its responsibility, CGNA should, in coordination with the airlines, via the operational position located at the CGNA, and the FMCs involved, issue the WARNING message SWAP, with the greatest anticipation possible, depending on the possibilities of an adequate meteorological forecast and the characteristics of the predominant convective system (local or frontal).

**4.2** The SWAP Notice will be issued, preferably, at least 2 hours in advance of the estimated activation time, through the CGNA Operational Portal and the IATA ITOP message. For severe convective weather situations associated with local convective build ups (known in Meteorology as “Air Mass Thunderstorms”), SWAP notices are expected no more than 3 hours in advance, given that the variability in the temporal and spatial evolution of such systems hinder an earlier assertive weather forecast.

**4.3** The SWAP will be activated by the FMC and CGNA, in coordination with the airlines, through the operational position located at the CGNA, as soon as the severe weather is confirmed, by observing aircraft deviations in the affected control sectors.

NOTE 1: In cases where the time necessary to coordinate with CGNA and the airlines, through the operational position located at CGNA, may cause operational losses, the initial SWAP actions will be applied immediately by the FMC involved, as previously coordinated. in operational briefings and specific conference calls. In this case, FMCs must inform CGNA as soon as possible, coordinating the necessary actions to continue the execution of the plan.

NOTE 2: The meteorological tools that can be used by meteorological centers and FMCs to support decision making regarding the activation of SWAP are listed in Appendix B.

**4.4** These are requirements for the preparation and sending of Warning messages, Warning Cancellation, SWAP Activation and Deactivation:

4.4.1 SWAP warning:

- a) Severe weather conditions forecast in a SWAP regulated element, with a probability equal to or greater than a value to be determined in the appropriate CIMAER operational documentation.
- b) Forecast of significant air traffic demand in the regulated SWAP element, at the scheduled time for occurrences of severe weather conditions, which represents a percentage value of the available capacity envisaged in the operational documentation of the CGNA/ FMC/ATC body.

4.4.2 SWAP Warning Cancellation:

- a) Significant modification of the forecast of severe weather conditions in the vicinity or impacting the regulated SWAP element, with a probability equal to or greater than a value to be determined in the appropriate CIMAER operational documentation, that SWAP activation will not be necessary, whose warning has already been issued, but not enabled.

4.4.3 SWAP activation:

- c) Confirmation of severe weather conditions nearby or impacting the SWAP regulated element.

NOTE: Information from aircraft evolving in the vicinity of the impacted SWAP regulated element may be used to confirm the characteristics of severe weather conditions, if the meteorological tools are not sufficient.

- d) The application of ATFM measures other than rerouting is not sufficient to order the flow of air traffic in the affected element.
- e) A more efficient tactical diversion scheme in the vicinity of the impacted SWAP regulated element cannot be used, due to the magnitude of adverse weather conditions.

#### 4.4.4 SWAP deactivation:

- a) Confirmation of the dissipation of severe weather conditions nearby or impacting the SWAP regulated element.

NOTE: Information from aircraft evolving in the vicinity of the regulated SWAP element may be used to confirm the dissipation of severe weather conditions, if the meteorological tools are not enough.

- a) The application of ATFM measures other than rerouting is sufficient to order the flow of air traffic in the affected element.
- b) A more efficient tactical diversion scheme in the vicinity of the regulated SWAP element can be used, due to the reduction in the magnitude of the adverse weather conditions.
- c) FMC will deactivate SWAP as soon as possible, in coordination with CGNA, CIMAER and with the airlines, through the operational position located at CGNA.

#### 4.5 SWAP Message Validity Period

- a) Warning Message: Period when the weather forecast indicates that the SWAP Regulated Element may be impacted;
- b) Activation Message: Period between SWAP activation and the forecast of dissipation of adverse weather conditions.
- c) Cancellation Message: Immediate Application;
- d) Deactivation Message: Immediate Application;

#### 4.6 The modification of the FPL of the affected aircraft will be carried out as follows:

##### 4.6.1 Outbound SWAP activation

- a) The ATCO assistant of the FIR sector (s) impacted by the outbound SWAP activation must modify the aircraft routes on the ground, with a pre-active flight plan (20 minutes for EOBT), except for flights that have already started Push Back;
- b) The flow manager of the FMC involved must identify, via SIGMA - FIR Sector, the INACTIVE flight plans (over 20 minutes from EOBT) that should have their



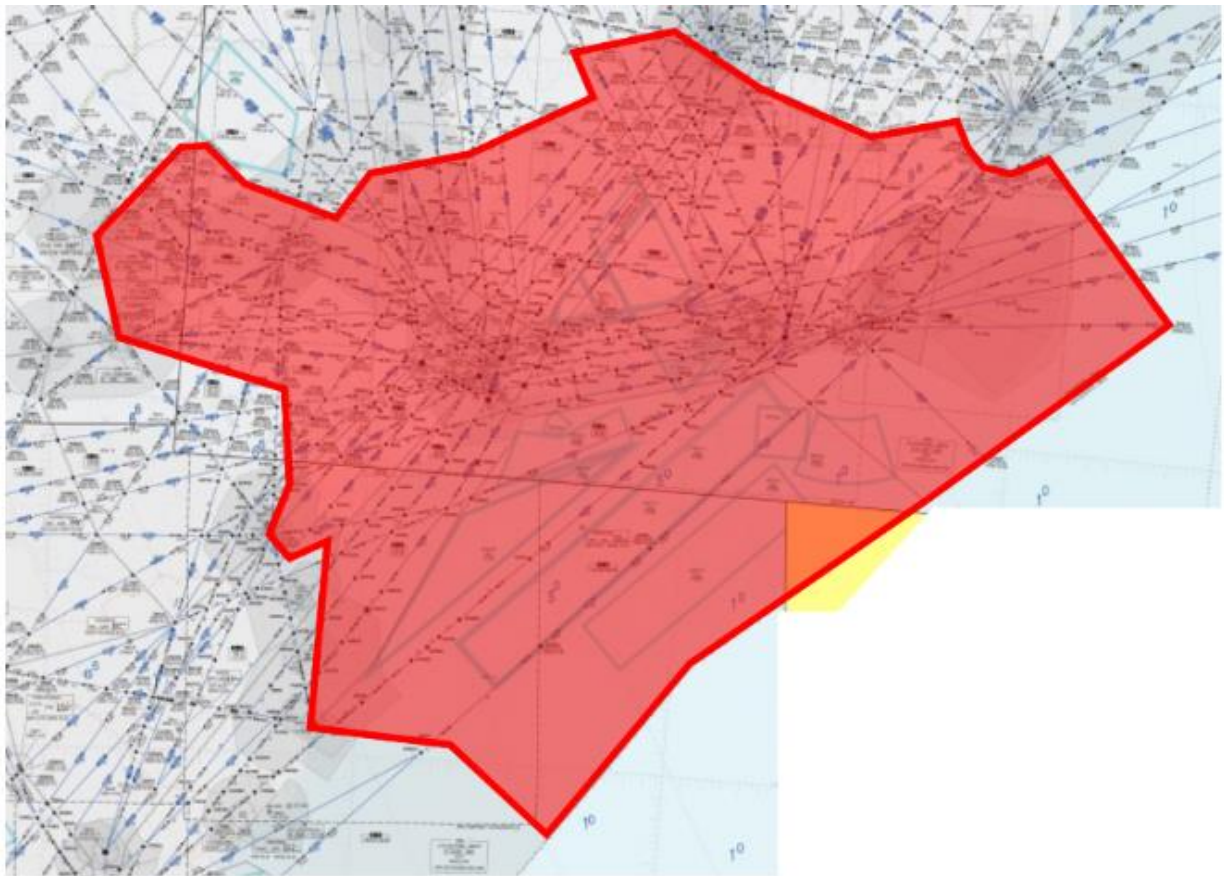
routes changed. This list must be forwarded to the PLN room to modify the routes according to the planned re-routing; and

- c) The operator of the PLN room must modify the flight plans (PLN INACTIVE) of the aircraft that take off from SBGR according to the rerouting determined by FMC.

#### 4.6.2 Arrival SWAP Activation

- a) ATCO (control position) shall guide aircraft in flight, maintaining the necessary separation, for the feeding points determined by FMC;
- b) Assistants must coordinate, by telephone, with the adjacent agencies and pass on the necessary flight plan data before the ACFT enters other FIRs;
- c) ATCO assistants, from the FIR-BS sector(s) responsible for ACFT takeoffs whose routes contain impacted SWAP regulated elements, must modify the aircraft routes on the ground, with a pre-active flight plan (20 minutes for the EOBT);
- d) The operators of the PLN room must modify the flight plans (PLN INACTIVE) of the aircraft departing from FIR-BS aerodromes (SBBR, SBGO, SBUL, SBCF etc.) according to the rerouting determined by the FMC; and
- e) Flowchart on the SWAP activation process is shown in Appendix C.

**APPENDIX A – AREA OF INTEREST FOR SEVERE WEATHER FORECAST**



Detailing:

TMA-SP and adjacent sectors of Brasília FIR (sectors 1, 2, 3 and 16), Curitiba FIR (sectors 5, 6, 7, 8, 9, 10 and 11), TMA-RJ and TMA-YS.



## **APPENDIX B – METEOROLOGY TOOLS**

The following tools to support severe weather forecasting will be used in the region covered by the SWAP:

- 1) Forecast up to 48h in advance:
  - Numerical time modeling products; and
  - Aviation Predictions.
  
- For Surveillance and Nowcasting (forecast up to 4 hours in advance)
  - Products derived from weather radars;
  - Products derived from lightning detection systems;
  - Products derived from the Severe Convective Weather System - STSC;
  - Atmospheric Analysis;
  - SIGMET/AIRMET/AD WRNG; and
  - METAR/SPECL.

### APPENDIX C - SWAP ACTIVATION PROCESS

