International Civil Aviation Organization
South American Regional Office
Twenty Fifth Workshop/Meeting of the SAM Implementation Group (SAM/IG/25) – Regional Project RLA/06/901
(Virtual, 2 to 4 November 2020)

SAM/IG/25-WP/4.3
03/11/2020

Agenda Item 4: Analysis of the TG Interop and formulation of conclusions

DELIVERABLES OF THE INTEROP TG AND PROPOSALS FOR CONCLUSIONS

(Presented by the Secretary)

SUMMARY

This working paper presents the deliverables provided by the activated subgroups of the Interoperability Task Group (GT Interop) and proposes Conclusions to be adopted at the SAM/IG/25 Meeting.

References:

- Final Report of the SAM/IG/22 Meeting (Lima-Peru, 19 to 23 November, 2018);
- Final Report of the SAM/IG/23 Meeting (Lima-Peru, 20 to 24 May, 2019);
- Final Report of the SAM / IG / 24 Meeting (Lima - Peru, 4 to 8 November, 2019); and
- First Workshop/Meeting of the Interop TG Subgroups (Virtual, 27 to 30 September, 2020).

ICAO Strategic Objetives:	*A –Safety* *B – Air Navigation Capacity and Efficiency* *ASBU: AMET-B0/4 (IWXXM), COMI-B0/7 (AMHS), FICE-B0/1 (AIDC), ASUR-B0/1 (ADS-B), ASUR-B0/3 (Space-based ADS-B)*

1. INTRODUCTION

1.1 The SAM Region Interoperability Task Group (Interop TG) was created at the SAM/IG/22 Meeting (Lima-Peru, 19 to 23 November, 2018) to support and promote initiatives to modernize the air navigation services and guarantee interoperability among automated systems used by AIM, ATM, ATFM, CNS and MET users.

1.2 At the SAM/IG/23 Meetings (Lima-Peru, 20 to 24 May, 2019) and SAM/IG/24 (Lima-Peru, 4 to 8 November, 2019) the following subgroups were activated: ATM/AIDC , ATM/FPL, CNS/AMHS, CNS/SUR and MET/IWXXM.

2. DISCUSSION

MAIN DELIVERABLES OF THE ACTIVATED SUBGROUPS OF THE INTEROP TG

ATM/AIDC Subgroup

2.1 The main objective of the ATM/AIDC Subgroup is to establish 76 links for Data Link Communication between ATS Units (AIDC) by the States of the SAM Region.

2.2 To date, 16 intraregional AIDC communications and 02 interregional AIDC communications have been established.

2.3 The first deliverable of the ATM/AIDC Subgroup was the completion of a training held in Santiago in the first semester of 2019, with the support of EASA, which gave the ATM Automation Course for 14 participants (all from Chile).

2.4 The second deliverable of the ATM/AIDC Sub Group was the preparation of a report, after visits, in August 2019, by an EASA specialist, accompanied by Indra representatives, to the area control centers of Cordoba and Iquique. The report with recommendations for the establishment of AIDC communication between ACC Córdoba and ACC Iquique was sent to the focal points of Argentina and Chile.

2.5 The AIDC communications established in 2019 and 2020 are also considered as deliverables of the ATM/AIDC Subgroup. In 2019, the following AIDC communications entered the operational phase:

- **ACC Bogota – ACC Barranquilla;**
- **ACC Bogota – ACC Guayaquil; and**
- **ACC Panama – CENAMER**.

2.6 In 2020, five teleconferences were carried out to discuss the implementation of AIDC communication between the adjacent automated centers. Despite the difficulties caused by the pandemic, a great effort was made by Colombia, Ecuador, Panama and Peru to establish three AIDC communications:

- **ACC Guayaquil – ACC CENAMER (16 March, 2020);**
- **ACC Bogota– ACC Lima (12 October, 2020); and**
- **ACC Barranquilla – ACC Panama (15 October 2020).**

2.7 Two other AIDC communications are in the pre-operational phase and should become operational by the end of 2020:

- ACC Barranquilla – ACC Maiquetia; and
- ACC Bogota – ACC Panama.

ATM/FPL Subgroup

2.8 The ATM/FPL Subgroup was activated to deal with issues related to the mitigation of errors and duplication/multiplicity of flight plans, as well as issues related to the centralization of the flight plans management and associated messages.

2.9 Two deliverables were produced: the preparation of an ATM/FPL roadmap for the SAM Region and the proposal to adopt a format for the acceptance (ACK) and rejection (REJ) messages of flight plans and associated messages. **Appendix A** to this working paper presents the ATM/FPL Roadmap.

2.10 In this sense, the following Conclusion proposal is formulated:

SAM/IG/25-X **Conclusion:**	**Approval of the ATM/FPL Roadmap and of the acknowledgment of receipt (ACK) and rejection (REJ) messages format of flight plans and associated messages**
That the States: a) Approve the ATM/FPL Roadmap and the acknowledgment of receipt (ACK) and rejection (REJ) format of flight plans and associated messages; and b) Adopt the guidelines and procedures of the ATM/FPL Roadmap.	**Expected impact:** ☐ Political/Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Technical/Operational
Why: To mitigate the occurrence of errors and duplication/multiplicity of flight plans, also providing feedback to the FPL and associated messages originators.	
When: Immediately	**Status:** Adopted in SAM/IG/25
Who: ☐ Coordinators ☒ States ☒ ICAO Secretariat ☒ TCB ☐ Others:	

CNS/AMHS Subgroup

2.11 The CNS/AMHS Subgroup has the objective of resolving interoperability issues in the implementation of the COM AMHS Centers systems, as well as supporting the other groups in matters related to aeronautical messaging.

2.12 The main deliverables were: the completion of the Advanced Course on AMHS (Virtual, 14 to 18 September, 2020) and the First Workshop/ Meeting of the Supervisors/Operators of COM AMHS Centers of the SAM Region (Virtual, 23 to 25 September, 2020), the development of the Contingency Plans of the COM AMHS Centers and the establishment of the AMHS interconnections (P1).

2.13 In relation to AMHS interconnections (P1), despite the impact caused by the pandemic, important interconnections were established in 2020. Currently, 26 regional interconnections have already been executed, there are only 2 AFTN circuits that must be replaced by an AMHS interconnection (P1): SAEZ - SUMU and SBBR - SUMU.

2.14 In addition to the regional interconnections, 2 interregional AMHS interconnections were established in 2020: SPIM (Lima) - KATL (Atlanta) and SBBR (Brasilia) - GOOO (Dakar). Until the end

of 2020, two additional interconnections that are already in interoperability tests, must be completed: SVCA (Caracas) - KATL (Atlanta) and SVCA (Caracas) - TTPP (Piarco).

2.15 **Appendix B** to this working paper presents the status of AMHS implementation in the SAM Region.

CNS/SUR Subgroup

2.16 The CNS/SUR Subgroup was activated to deal with the interoperability issues of the surveillance systems and, specifically, to carry out an analysis on the regional implementation of Space-based ADS-B, using the regional IP network (REDDIG II), as a distribution platform of surveillance data.

2.17 Five teleconferences were held to discuss regional implementation and a summarized analysis carried out is shown to the Meeting in Appendix of SAM/IG/25-WP/3.2 for consideration of the recommendations of the referred document.

2.18 In response to a consultation sent by the SAM Regional Office to all the States of the SAM Region, Chile and Panama expressed interest in participating in a regional implementation of Space-based ADS-B, using the regional IP network as a platform for the distribution of aeronautical surveillance data.

2.19 Since Trinidad and Tobago is a participant in the Regional Project RLA/03/901 (REDDIG II), it is considered convenient that said State be consulted, if there is interest in participating in the regional implementation of ADS-B, by contracting the service within the Regional Project RLA/03/901.

2.20 For the above, the following Conclusion proposal is formulated:

SAM/IG/25-Y **Conclusion** **Implantación Regional de ADS-B Satelital** **Regional Implementation of Satellite ADS-B** Space-based ADS-B	
That the Secretariat: a) Consult Trinidad & Tobago about the interest of participating in the regional implementation of Space-based ADS-B together with Chile and Panama, initially; b) Initiate the procedures, together with the Technical Cooperation Bureau (TCB), to enable the contracting of the service through the Regional Project RLA/03/901; and c) Organize an Ad-hoc group of the Regional Project RLA/03/901, with the States interested in participating in the regional implementation of Space-based ADS-B for the preparation of the necessary documents for contracting the service.	**Expected impact:** ☐ Political/Global ☒ Inter-regional ☒ Economic ☐ Environmental ☒ Technical/Operational

Why: Provide the States that expressed interest in the regional implementation of Space-based ADS-B with the necessary support for contracting the service.	
When: Immediately	**Status:** Adopted in SAM/IG/25
Who: ☐ Coordinators ☒ States ☒ ICAO Secretariat ☒ TCB ☐ Others:	

2.21 In addition to the analysis carried out, it is considered as deliverable the making of presentations by COCESNA and Nav Canada of the implementations of Space-based ADS-B by these air navigation service providers; as well as a presentation of an avionics company and its products for the installation of ADS-B equipment on board of small aircrafts (uAvionix), during the First Workshop/Meeting of the TG Interop Subgroups (Virtual, 27 to 30 September, 2020).

MET/IWXXM Subgroup

2.22 The MET/IWXXM Subgroup was activated to deal with matters related to the adaptation of meteorological systems to the new format of meteorological messages (IWXXM).

2.23 Two main initiatives were addressed by the MET/IWXXM Subgroup: a converter from the TAC format to the IWXXM format, called METAX, developed by personnel from Venezuela, and the adaptation carried out by the Brazilian Administration in the OPMET Regional Data Bank of Brasilia.

2.24 Three MET/IWXXM Subgroup meetings were held and presentations were made on the two initiatives mentioned in the previous item. Likewise, the participants received information on the adopted documents such **as Doc 10003 -** ***Manual of the ICAO model for the exchange of meteorological information*** and **EUR Doc 033 -** ***Operational conception for the transition of the OPMET data exchange using IWXXM.***

3. SUGGESTED ACTION

3.1 The Meeting was invited to:

a) Take note of the deliverables provided by the activated subgroups of the Interop TG; and

b) Discuss and approve the conclusions formulated, as deemed pertinent.

- END -

APPENDIX A

International Civil Aviation Organization

ROAD MAP ATM/FPL

SAM Region

Lima, October 2020
Version 1.1

Introduction

The ATFM/FPL Subgroup Roadmap was developed by the ATM/FPL Subgroup. The purpose of this roadmap is to provide guidance to the main stakeholders of the aeronautical community, to plan the development of the presentation of standardized messages using the AFTN/AMHS, resulting in minimizing duplication/multiplicity and errors in flight plans.

The main stakeholders in the aeronautical community that benefit from this roadmap are:

- The operators and users of the airspace.
- Air navigation service providers.
- International organizations.

The effective and homogeneous flow of air traffic through the FIR boundaries IR is achieved, in part, by securing flight plans and transmitting, processing and transferring associated messages among the FIRs in a homogeneous, efficient and consistent manner.

The methods and procedures used to present and/or originate flight plans have a residual effect on the quality of the air traffic services provided. Introducing duplicate or multiple flight plans, or flight plans that contain erroneous information, has a direct impact on the safety and efficiency of flights within the aeronautical system of the global airspace.

The AMHS is an aeronautical message handling system, designed for the exchange of information between providers of air traffic services and users. This achieves the significant reduction of errors and the duplication/multiplicity of flight plans in ATS systems.

In its initial applications, the user presented flight plans physically in the ARO offices, with the ARO Specialist being in charge of receiving, reviewing, approving and transmitting the flight plans to the automated systems and the respective aeronautical community. For airlines that comprise a greater number of flights with itineraries, the facility was provided to present Repetitive Flight Plans (RPL), but as a result of large amounts of modifications in flight data due to the complexities of operations, there were observed a greater number of errors and duplication/multiplicity of flight plans, and as a consequence, there were problems in the implementation of AIDC in the CAR/SAM Region and delays of flights on the ground.

To reduce errors and duplication/multiplicity of flight plans, it has been considered to follow the best practices of the industry (procedures homologated with the agreements in the ICAO NACC office) when delegating the reception of flight plans via AFTN/AMHS between ANSPs and users, in accordance with the provisions of ICAO Document 4444 *Air Traffic Management Appendix 2, page A2-3, part 2.1*, which delegates to the airlines that have the capacity, the responsibility to correctly transmit the initial FPL, as well as the related messages, to all the ATS units involved, in accordance with Doc. 4444, 11.2.1.1.3.

OBJECTIVE OF THE ATM/FPL ROADMAP

The following strategic objectives apply to the ATM/FPL roadmap for the SAM Region:

a) That the States, organizations and airlines of the SAM Region work together in the development of the new automated procedures for the transmission and reception of flight plans and standard messages.
b) Optimize the interoperability of automated systems among ANSPs and airlines.

c) Formation of a multi-operational group in each State where ATM, AIM, CNS personnel and collaborators from the aeronautical community participate.
d) Official use of new acknowledgment and rejection messages for standard ATS messages.
e) Preparation of common regulations and procedures in the SAM Region for the reception and transmission of flight plans in the AIP of each State.
f) Provide instruction to all aeronautical personnel involved in the treatment of flight plans (Pilots, Aircraft dispatchers, ATM, AIM and CNS personnel).
g) Creation of the flight plan processing unit in each State for the reception, review and transmission of standard ATS messages with the airlines.

Principles of ATM/FPL implementation

The implementation of ATM/FPL procedures in the CAR/SAM Region will be based on the following principles:

a) Development of a collaborative decision-making process (CDM), based on the concepts of teamwork, transparency, trust and communication in a pragmatic way.
b) Taking full advantage and use of the existing automated systems of each State and collaboration of aeronautical operators to meet the objectives sought by ICAO in the BBB (Basic Building Block).
c) Necessary coordination to make all possible efforts to make the best use of the systems and facilitate the system interconnection with the aeronautical operators.
d) Updating of the regulations by each State on the presentation of flight plans via AMHS/AFTN for publication purposes in the AIP.

ANSPs are encouraged to collaborate with state regulators to review and align existing regulations with emerging technologies. In cases where state regulations require the FPL to be hand-delivered along with the electronic FPL, modifications to these regulations can reduce inadvertent human-induced discrepancies in the filing process.

During this process, ANSPs should initiate appropriate quality control measures to reduce the possibility of disparity between electronic and hand-delivered FPLs. This manual procedure should remain as one of the contingencies available to users or to those users who do not have the acquired capacity.

Supplementary flight plan information (FPL box 19)

The supplementary flight plan information should not be considered to be transmitted by each FPL. When for SAR reasons, this information is required by any ANSP (according to Annex 11, part 5.2.2.1), the following sequence to acquire the information would be:

a) Via VHF, requested to the flight crew, if the event is considered by ATC, as an appropriate action, or

b) By telephone, by contacting the operation/flight dispatch unit of the designated airline 24/7 (in accordance with coordination with each user for delegation of the FPL) or
c) Via AMHS/AFTN to the operation/flight dispatch unit of the designated airline 24/7 through an SPL.

ATM/FPL development strategy by each State

The reception and transmission of flight plans via AFTN/AMHS will consist of three phases:

Initiation phase:

a) Formation of a multi-operational group for each State, involved in the processing of flight plan data.

   1) Authorities, company representatives and ANSP.
   2) ATM, CNS and AIM staff

b) Designation of a collective address (Distribution List - DL) for receiving flight plans via AFTN/AMHS (XXXXZPZX).

   1) The collective address (DL) must have the following addresses:

      - YYYYZAZX
      - YYYYZRZX

   2) The transmission of flight plans must be directed by the airline besides the collective address to the following addresses:

      - Departure aerodrome (ZTZX, YOYX)
      - Arrival aerodrome (ZTZX, YOYX)
      - Alternate aerodrome (ZTZX)

      To reduce FPL presentation discrepancies that result in aeronautical message addressing errors, ANSPs should designate their AMHS/AFTN addressing requirements in their Aeronautical Information Publication (AIP). Guidance related to the addressing of AMHS/AFTN messages is also available in ICAO Annex 10, Volume II, Chapter 4 and in ICAO Doc. 7910 and 8585, and in the regional AMHS/AFTN routing directories of ICAO.

      Some automated systems may reject flight plans that do not have an alternate aerodrome as a destination. Consequently, some operators present alternate aerodromes when an alternate one is not required in order to avoid the flight plan from being rejected, resulting in the economic burden of having to carry additional and unnecessary fuel. Under no circumstances for legal safety and liability, should FPL treatment unit personnel add this or no parameters to the FPL on behalf of the operator without prior agreement and consent.

      ICAO Annex 6 *Aircraft Operations, Part 2* establishes exceptions to the requirements to present an alternative destination aerodrome. ANSPs should ensure that such alternative field is not a mandatory field for automated flight plan processing, especially for flights in transit to a destination in another FIR.

   3) Publication of the AIP regulation, referring to the FPL reception procedure via AMHS, it is recommended to start through an AIC, temporarily until changes are made in the general regulations for publication in ENR/AIP.

Instruction and testing phase:

1) An instruction plan for the FPL reception procedures via AFTN/AMHS must be carried out to all the operational personnel involved in each State.

- Standard message types (FPL, DLA, CHG and CNL)

ANSPs must specify in local agreements or in the AIP, the timeframes required to complete the sending of movement messages (DLA and CHG) for individual flights, for example, by means of a time parameter before the expected time of out of chocks (EOBT)

It is preferable to use a CNL and resubmit the FPL as an alternative to sending multiple change messages to the same FPL or multiple changes within it. The use of the type of message that best meets the operational need based on the limitations of its automated dispatch system, should be left to the decision of the airline.

To avoid multiple FPLs, airlines will only originate and transmit the FPL, if the ANSP has delegated this responsibility to the user in the AIP or AIC. ANSPs should take into account that not all airline FPL/ dispatch systems have the ability to modify AMHS addresses by flight phase, so during the publication phase, the user is asked to remove the ATS addresses described in the AIP (ARO, ACC, TWR, etc.). This could generate a total loss of airline FPLs for that FIR, therefore, this procedure is not recommended.

- Syntax and use of ACK and REJ messages. (see appendix)

- Procedures established by the State and ANSPs

ANSPs should ensure that the names of any published Standard Instrument Departure (SID) or Standard Instrument Arrival (STAR) procedure meet the naming requirements of ICAO Annex 11, *Air Traffic Service, Appendix 3* (especially with the maximum of 7 characters per procedure) in order to reduce the number of rejected flight plans.

ANSPs shall ensure that ATM systems are capable of correctly processing submitted flight plans that include SID and STAR as part of the route. To achieve this goal, the encoding used to identify SIDs or STARs in databases of ATM systems should be exactly the same as the official chart publications. In the CAR/SAM Region, they continue to have publications using TERPS criteria to identify “transitions” in procedures that are not compatible when naming a procedure in the ATM system database.

EXAMPLE:

- Problem: PELICAN LOBO transition (AIP letter publication) is not encodable in ATM system due to 7 character limit.
- Solution: 1: Limit nomenclatures to ICAO Annex 11 (regardless of the PANS or TERPS design criteria).

- Solution 2: Apply the technique described for FMS standard

- Solution 3: publish the same nomenclature/coding used in the database of the ATM system in aeronautical charts (ex: PELTLOB instead of PELICAN LOBO transition)

2) Workshops and meetings with airline personnel interested in the new procedures.

3) Carry out test protocols with users

   - Report sheet by ANSP
   - Performance report and report for each airline.

Implementation phase:

1) Establish communication with each airline through an AIC/NOTAM describing the focal points of the ANSP to reach an agreement on procedures until publishing the necessary information in the AIP of each State in the ENR part.
2) A contingency plan must be prepared and published in case the AMHS system does not respond.
3) Create the Flight Plans Treatment Unit, thus centralizing the information and creating adequate procedures.
4) Carry out a risk analysis of the flight plan reception procedures via AFTN/AMHS.

   ANSPs should consider establishing a reporting mechanism to provide regular feedback to IATA operators on the number and causes of flight plan rejection and errors.

   Additionally, ANSPs should consider holding periodic user/operator forums to discuss recurring discrepancies.

<u>Flight plan processing unit (UTFPL)</u>

ANSPs with one or multiple ATS centers may consider installing a central flight planning unit for the initial process and distribution of the FPLs. An example of central flight planning is provided by the EUROCONTROL initial flight plan specifications.

Studies carried out by EUROCONTROL and the European Commission determined that inconsistencies in the content of flight data held by different parties for the same flight process have a negative impact on the efficiency of operations within the European traffic management system.

According to the EUROCONTROL website, which defines the procedures and requirements for the provision, processing and distribution of flight plans in the pre-flight phase, the improvement in the consistency of flight planning data has contributed to making operations more homogeneous within the environment, improved operational safety and has also allowed new operational concepts to be defined by the ATM.

The Flight Plans Treatment Unit has the benefit for the ANSP and the operators, to have a single place for the treatment and correction of the FPLs in the FIR or territory, optimizing resources and facilitating communication between the operator and the personnel in charge of FPLs in the ANSP. There is the possibility of having alternatives (instead of AMHS) for the presentation of flight plans via the internet through a virtual flight plan platform. A validation process should be implemented to prevent the introduction of inaccurate data from movement messages.

These virtual platforms allow the direct presentation of the flight plan by pilots and/or companies operations centers, however, they are considered as the last alternative by airlines that have FP systems integrated to dispatch systems, due to operational safety policies, since the dispatcher could introduce inadvertent manual errors, such as occurs with the receipt of the FPLs physically when being transcribed by the ARO. In no case should this be arbitrarily considered by the ANSP as the main means for an operator with these characteristics; these virtual platforms should comply with minimum error-checking functions.

Appendix

ACKNOWLEDGMENT AND REJECTION message templates for flight plans ACK and REJ

All ARO Team personnel are informed that as of the date, the acknowledgment of receipt by means of ACK and REJ messages through the FDD - AIRCON2100 system, will be incorporated into the flight plan reception procedures. For this reason, this template has been developed that will serve as a guide for all ARO specialists at the Lima aerodrome.

Accepted Message (ACK):

In the event that the flight plan enters the FDD system directly via AMHS/AFTN, an ACK message will be transmitted from the ARO position.

Example:

Message Description: **ACK FPL SPIM CMP124 SPJC 1645 MPTO**

Response type	= ACK
Message type	= FPL
FIR emitting MSG	= SPIM
Flight ID	= CMP124
DEP Aerodrome	= SPJC
EOBT	= 1645
ARR Aerodrome	= MPTO

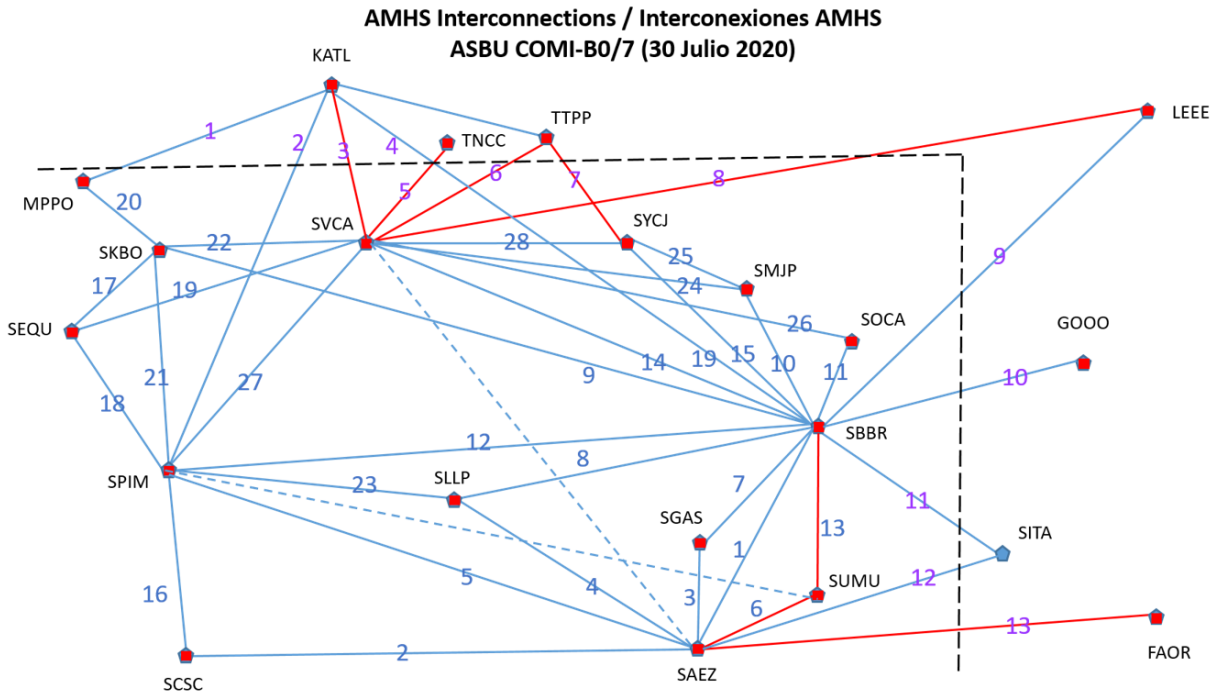
Description of the message:

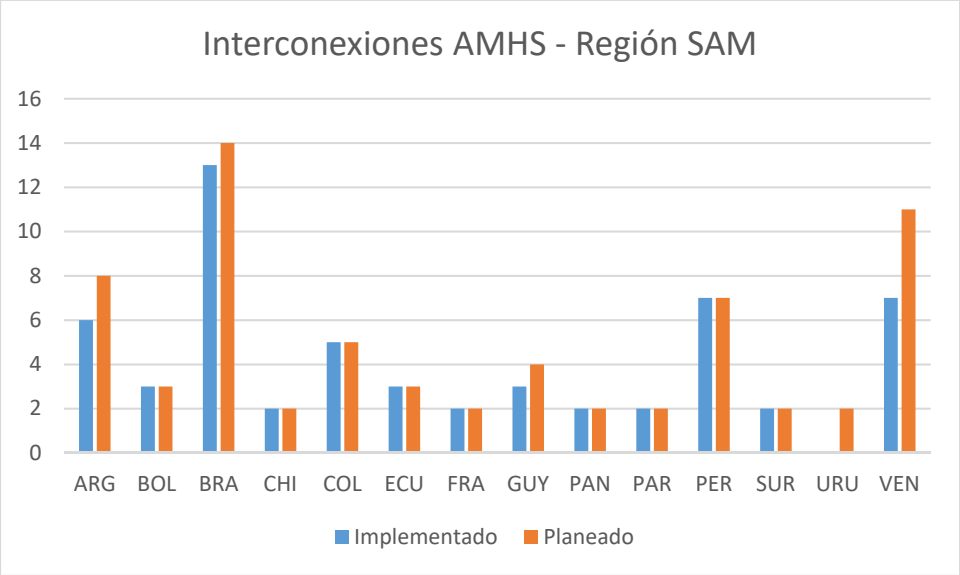
Rejected (REJ)

REJ FPL SPIM JBU1824 INCORRECT FL RVSM
FPL-JBU1824-IS
-A320/M-SWE3DFGHIM3RZ/SB1
-SPJC0359
-N464**F350** BTE2F BTE UV1 TRU UL780 EVRED/N0456F360 UL780
TBG/N0452F380 UL465 GCM UG448 IKBIX Y183 PEAKY DCT DVALL CURSO5
-KFLL534
-PBN/A1B1C1D1O1S2T1 NAV/RNVD1E2A1 SUR/260B DOF/190315
REG/N282JB EET/SEFG0110 SKED0156 MPZL0225 MKJK0345 MUFH0427
KZMA0501 SEL/AJKS CODE/AB4F5D

TYPE OF RESPONSE	= REJ
TYPE OF MESSAGE	= FPLFIR
FIR ISSUING MESSAGE	= SPIM
FLIGHT ID	= JBU1824
REJECTION REASON	= INCORRECT FL RVSM (PASTE FPL BELOW)

APPENDIX B


AMHS Interconnections / Interconexiones AMHS
ASBU COMI-B0/7 (30 Julio 2020)
KATL
TTPP
TNCC
LEEE
MPPO
SVCA
SYCJ
SKBO
SMJP
SEQU
SOCA
GOOO
SBBR
SPIM
SLLP
SGAS
SITA
SUMU
SCSC
SAEZ
FAOR


Interconexiones AMHS - Región SAM
16
14
12
10
8
6
4
2
0
ARG
BOL
BRA
CHI
COL
ECU
FRA
GUY
PAN
PAR
PER
SUR
URU
VEN
Implementado
Planeado