



**Agenda Item 3: Report of activities and deliverables of the INTEROP TF and Subgroups
b) Implantación CNS. Avances de los Subgrupos.**

**ATM/FPL ROADMAP UPDATE AND MODIFICATION
TO THE ACCEPTANCE MESSAGE FORMAT (ACK) AND
REJECTION (REJ) OF FLIGHT PLANS**

(Prepared by the Rapporteur of the ATM/FPL Subgroup)

SUMMARY	
This work paper presents the update of the ATM/FPL Roadmap to version 3.0 and the analysis to modify the ACK and REJ message template of flight plans, in order to have a standard with ATS movement and control messages.	
References	
<ul style="list-style-type: none">• Final Report Workshop/Meeting SAM/IG/27 (Virtual, 31 May to 3 June 2022);• Work paper presented at SAM Implementation Group Meeting (SAM/IG/28) for methodology for quantifying flight plan errors.• Workshop/Meeting of the ATM/FPL Subgroup (SG ATM/FPL/1) Lima, from Monday 26 to 31 March 2023.• ATM/FPL Subgroup Virtual Meeting on May 03, 2023.• ATM/FPL Roadmap Version 2.2	
ICAO Strategic Objectives:	<i>A – Safety B – Air Navigation Capacity and Efficiency</i>

1. Background

1.1 Within the framework of the SAM Region Implementation Group (SAM/IG), the ATM/FPL Subgroup of the Interoperability Task Group (GT INTEROP) was activated to address issues related to the mitigation of errors and duplication/multiplicity of flight plans, as well as issues related to the centralization of flight plan management and associated messages.

1.2 During the Twenty-Fifth Workshop/Meeting of the SAM/IG/25 Implementation Group, held from November 2 to 4, 2020, the ATM/FPL Roadmap and the format of acknowledgment of receipt (ACK) and rejection (REJ) messages of flight plans and associated messages were approved.

1.3 At the Twenty-Sixth Workshop/Meeting of the SAM Implementation Group (SAM/IG/26), the Inclusion of the Date of Flight (DOF) field for the Acceptance Message Format (ACK) is approved.

1.4 At the twenty-eighth SAM Implementation Group Workshop/Meeting (SAM/IG/28), a study note approved the methodology for data collection to quantify errors in flight plans and

associated messages, in order to obtain indicators and measure the level of mitigation achieved with the adoption of measures indicated in the ATM/FPL Roadmap.

1.5 During the Workshop/Meeting of the ATM/FPL Subgroup held in Lima, from Monday, March 26 to 31, 2023, the ATM/FPL Subgroup discussed the results regarding the data obtained to quantify errors and duplication of flight plans, centralization of the management of flight plans and associated messages and the proposal of a standard format for acceptance messages (ACK) or rejection (REJ).

2. Analysis

2.1 The acceptance message (ACK) is a means by which the originator of the flight plan is indicated that the message has complied with the established formats and the successful processing, this message can be given automatically by a flight plan validation system or manually by the respective operators of the ARO / AIS offices.

2.2 The rejection message (REJ), will be sent to the sender of the flight plan manually or automatically to indicate that the FPL message has not been accepted by the ARO/AIS office, since it does not comply with the ICAO format and / or contains errors in the different boxes, consequently the FPL could not be processed successfully.

2.3 To reduce errors and duplication/multiplicity of flight plans, it has been considered that the best practice of lessons learned by States is to delegate to air operators or their legal representative who have the capacity, the responsibility to correctly transmit flight plans and movement messages via AFTN/AMHS to ANSPs, in accordance with the provisions of Document 4444.

2.4 Flight plans and movement messages transmitted by air operators will be reviewed by ARO/AIS officers, who will proceed to respond to flight plan originators via AMHS/AFTN the acceptance (ACK), or rejection (REJ) message.

2.5 Chapter 11 "Air Traffic Services Messages", Doc 4444 Part 11.2.2.1, stipulates that ATS messages shall be prepared and transmitted in standard format and texts, and in accordance with conventional data representation in the cases and under the conditions prescribed in Appendix 3.

2.6 Appendix 3 of Doc 4444 "Content and format of messages" indicates the following:

"Note. — In order to facilitate the description of the content and format of air traffic services messages, intended both for exchange between units that do not have automatic data-processing equipment and for exchanges between air traffic control computers, the elements to be included in the messages are grouped by "fields". Each field contains a single element or a group of interrelated elements."

2.7 The acceptance messages (ACK) and rejection messages (REJ) are not defined in the standard categories of messages of Doc. 4444, so it does not allow regional or global standardization of this type of messages and in this sense the ATM / FPL roadmap has incorporated acceptance and rejection message formats to the FPL, This would allow receiving ATS/AIS units to respond to messages sent by air operators.

3. Proposed modification in ATM/FPL Roadmap – ACK message

3.1 Previous Message Structure (ACK).

ACK FPL SPIM CMP124 SPJC 1645 MPTO DOF/210907

Type of response = ACK

Type of message = FPL
 FIR issuing MSG = SPIM
 Flight Identification = CMP124
 DEP Aerodrome = SPJC
 EOBT = 1645
 ARR Aerodrome = MPTO
 Day of Flight = DOF/210907

3.2 New message structure (ACK).

(ACK FPL-CMP124-SPJC1645-MPTO-DOF/210907)

Type of response = (ACK
 Type of message = FPL-
 Flight Identification = CMP124-
 DEP Aerodrome and EOBT = SPJC1645
 ARR Aerodrome = MPTO-
 Day of Flight = DOF/210907)

Note 1:

- The beginning of the message with a parenthesis "(", which will constitute the signal of the beginning of the data.
- Composition of the separate message by means of a hyphen, "-", for the beginning of each field,
- DOF element that constitutes a field separated by a slash "/"; and
- The end of the ATS message shall be indicated by a closed parenthesis ")".

4. Proposed modification in ATM/FPL Roadmap – REJ message

4.1 Previous Message Structure (REJ)

REJ FPL SPIM JBU1824 INCORRECT FL RVSM

FPL-JBU1824-IS
 -A320/M-SWE3DFGHIM3RZ/SB1
 -SPJC0359
 -N464F350 BTE2F BTE UV1 TRU UL780 EVRED/N0456F360 UL780
 TBG/N0452F380 UL465 GCM UG448 IKBIX Y183 PEAKY DCT DVALL CORSO5
 -KFL534
 -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 = FPL
 FIR issuing message = SPIM
 Flight Identification = JBU1824
 Reason for rejection = INCORRECT FL RVSM (attach FPL below)

4.2 New Message Structure (REJ)

(REJ FPL-JBU1824-SEQM1645-KFLL-DOF/210907) INCORRECT FPL FIELD 15

Type of response = (REJ
Type of message = FPL-
Flight Identification = JBU1824-
DEP Aerodrome and EOBT = SEQM1645-
ARR Aerodrome = KFLL-
Day of Flight = DOF/210907)
Reason for rejection = INCORRECT FPL FIELD 15

Note1: The FPL boxes containing the error followed by a slash will be included because of the rejection. "/", example: 10/18.

Note 2:

- Start of the message with a parenthesis "(", which will be the signal of the beginning of the data;
- Composition of the message separated by a hyphen "-", for the beginning of each field;
- DOF element that constitutes a field, will be separated by a slash "/"; and
- The purpose of the ATS data shall be indicated by a closed parenthesis ")".

5. ATM/FPL Roadmap Update

5.1 Included in this study note is the ATM/FPL roadmap updated to version 3.0 (see **Appendix**), which has been agreed with the delegates of the ATM/FPL group and which is being considered by the meeting for approval.

6. Conclusions

6.1 The benefits included in the flight planning response message will be:

- Guarantee to the originators of the flight plan, the correct processing of the information sent.
- Feedback to help air operators correct errors.
- Harmonize the appropriate format in the region.
- Reduced workload on ATC controllers, AIS officers and air operators as there is a consistent and error-free flight plan.
- Responses can be sent to multiple addresses.

7. Recommended actions

7.1 The Meeting is invited to:

- a) Analyze the study note on the modification in the ACK and REJ messages;
- b) Solicitar a los Estados SAM que evalúen la inclusión de la misma en la hoja de ruta ATM/FPL y su aplicación regional; and
- c) Analyze and approve the ATM/FPL Roadmap version 3.0.

APPENDIX

International Civil Aviation Organization

ROAD MAP ATM/FPL Versión 3.0

SAM Region

Lima, May 2023
Version 3.0

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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 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.

2. 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.
- g) Creation of the flight plan processing unit in each State for the reception, review and transmission of standard ATS messages with the airlines.

3. 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.

4. 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.

5. 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:
 - YYYYYZAZX
 - YYYYYZRZX
 - 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.

6. FLIGHT PLAN PROCESSING UNIT (UTFPL)

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 ACK/REJ MESSAGES

ACKNOWLEDGMENT (ACK) AND REJECTION (REJ) message templates for flight plans

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-CMP124-SPJC1645-MPTO-DOF/210907)

Type of response = (ACK
Type of message = FPL-
Flight Identification = CMP124-
DEP Aerodrome and EOBT = SPJC1645
ARR Aerodrome = MPTO-
Day of Flight = DOF/210907)

Note 1:

- The beginning of the message with a parenthesis "(", which will constitute the signal of the beginning of the data.
- Composition of the separate message by means of a hyphen, "-", for the beginning of each field,
- DOF element that constitutes a field separated by a slash "/"; and
- The end of the ATS message shall be indicated by a closed parenthesis ")".

Rejected Message (ACK):

(REJ FPL-JBU1824-SEQM1645-KFLL-DOF/210907) INCORRECT FPL FIELD 15

Type of response = (REJ
Type of message = FPL-
Flight Identification = JBU1824-
DEP Aerodrome and EOBT = SEQM1645-
ARR Aerodrome = KFLL-
Day of Flight = DOF/210907)
Reason for rejection = INCORRECT FPL FIELD 15

Note1: The FPL boxes containing the error followed by a slash will be included because of the rejection. "/", example: 10/18.

Note 2:

- Start of the message with a parenthesis "(", which will be the signal of the beginning of the data;
 - Composition of the message separated by a hyphen "-", for the beginning of each field;
 - DOF element that constitutes a field, will be separated by a slash "/"; and
- The purpose of the ATS data shall be indicated by a closed parenthesis ")".