



Agenda Item 5: Operational implementation of new ATM automated systems and integration of the existing systems

FOLLOW-UP TO THE IMPLEMENTATION OF AUTOMATED SYSTEMS FOR FPL 2012 AND ANALYSIS OF ERRORS AND DUPLICATION OF FLIGHT PLANS IN THE SAM REGION

(Presented by the Secretariat)

SUMMARY

This working paper presents information on the status of implementation of AMHS/AFTN terminals and FDP automation for the generation and processing of flight plans in accordance with Amendment 1 to Edition 15 of ICAO Doc 4444. It also follows up on the analysis of flight plan errors and duplication and how these have affected AIDC performance in the SAM Region since the SAM/IG/18 meeting.

REFERENCES

- Report of the Third AIDC Implementation Meeting (Lima, Peru, 24-26 April 2017).
- Report of the Second AIDC Implementation Meeting (Lima, Peru, 21-23 September 2016).
- Eighteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/18) Lima, Peru, 17-21 October 2016.

1 Introduction

1.1 The SAM/IG/18 meeting discussed activities related to the implementation of automation for FPL 2012, and actions to mitigate flight plan errors, particularly the review and approval of the guide to avoid errors in FPLs and ATS messages, as presented in the report of the Second AIDC Implementation Meeting, in Appendix B to agenda item 1.

1.2 The SAM/IG/18 meeting also reviewed the errors identified in flight plans, and formulated and approved recommendations to mitigate such errors. The list of errors and the recommendations for their mitigation are shown in Appendix D to Item 1 of the AIDC/2 final report.

2 Analysis

2.1 This section describes some aspects related to the follow-up of the implementation of automated systems for FPL 2012 and the analysis of flight plan errors and duplication in the SAM Region:

- Status of implementation of automated systems for FPL/2012
- Procedures for flight plan filing by SAM States
- Procedures to mitigate duplication/multiplicity of flight plans

Status of implementation of automated systems for FPL 2012

2.2 Regarding progress made in the implementation of automated systems for FPL 2012, Bolivia has started the implementation of an ATM automation project at the ATS units of La Paz, Cochabamba, Santa Cruz, and Trinidad, called CIDACTA. The automated system to be installed at those ATS units is TopSky, from Thales, and will be completed in 2019. By the end of 2017, the FDPs of the ACCs of Brazil would be in a position to process FPL 2012, thus eliminating the converters currently installed. Chile has installed AFTN rather than AMHS terminals at national level, and does not have templates compatible with FPL 2012. Peru has started the modernisation of the Lima ACC (INDRA AIRCON 2100), which, *inter alia*, will correct existing limitations in the number of characters in box 10 of FPL 2012. The modernisation process is to be completed by the end of the third quarter of 2017. Finally, Paraguay and Venezuela expect to have an automated system in their ACCs that accepts FPL 2012 by the end of 2017.

2.3 The analysis of the status of implementation of automated systems in the SAM Region in compliance with Amendment 1 to Edition 15 of Doc 4444 (FPL2012) revealed that out of a total of 27 ACCs in the SAM Region, 67% had implemented the update in flight plan processors (FDP), 22% continued using converters, and the remainder still applied the manual solution, since the automated systems installed in the ACCs did not comply with FPL 2012 or they lacked automated systems. Regarding the implementation of AMHS/AFTN terminals with FPL 2012 templates capable of detecting completion errors, 67% of the States were in compliance.

2.4 In this regard, almost no progress has been made in the implementation of automation for FPL 2012 since the SAM/IG/18 meeting. **Appendix A** contains an updated table of the status of implementation of automation in compliance with amendment 1 to Edition 75 of Doc 4444.

Procedures for flight plan filing by SAM States

2.5 The AIDC/3 meeting updated the procedures used by the States of the Region for flight plan filing, as shown in **Appendix B**, which includes the procedures in Bolivia, Chile, and Uruguay.

Procedures for mitigating flight plan duplication/multiplicity

2.6 The AIDC/3 meeting noted that, according to the analysis of flight plan filing procedures used by the States of the Region, many States had duplication of international flight plans of commercial airlines, since most of them are filed using two means: directly by the flight planning systems contracted by airlines (Lido, Jeppesen) through the AFTN network, and addressed to the FDP of the ACC of the airport of departure; and in a printed format to the ARO/AIS offices as a regulatory requirement. These offices relay the information through the AFTN/AMHS network to the FDPs of the ACCs of the airport of departure. This results in duplication at the level of the FDPs, causing rejection or flight plan processing conflicts.

2.7 In this regard, the AIDC/3 meeting considered that, in order to reduce flight plan duplication at the level of the FDPs of the ACCs at the airport of departure, the international flight plans sent through the AFTN network by flight planning systems contracted by airlines should be addressed to the corresponding ARO/AIS offices at the airport of departure so that they can relay them via AFTN/AMHS to the FDPs of the corresponding ACCs of the airport of departure. This process would be applied during a period of transition established by the States. Once effective reception of flight plans directly through the AFTN/AMHS by flight planning systems contracted by the airlines has been shown, these could be directly relayed to the FDP, with copy sent to the corresponding ARO/AIS offices. In this sense, the meeting formulated *Conclusion AIDC/3-1 – Procedure for reducing duplication/multiplicity of international flight plans*.

2.8 On 10 May 2017 a teleconference was held among AIDC focal points and AIS personnel to analyse the mitigation procedures, with a total of 25 participants (AIDC focal points and AIS/ARO staff) from 9 SAM States (Argentina, Bolivia, Brazil, Chile, Ecuador, Paraguay, Peru, Uruguay, and Venezuela).

2.9 As a result of the teleconference, it was agreed that the States would review and establish arrangements with the operators in order to follow the procedure indicated in paragraph 2.6 of this working paper. Another solution that was proposed involved informing the aviation community about the procedure through an aeronautical information circular (AIC).

2.10 The AIDC/3 agreed that, in order to ensure an efficient flight plan management, the States of the Region should study the possibility of implementing a national centre for receiving, processing, and distributing flight plans and associated messages. The flight plans received by this centre would be validated, corrected where possible, and redistributed to the final recipients through the AFTN/AMHS network. In this regard, the AIDC/3 meeting formulated *Conclusion AIDC/3-2 – National centre for flight plan reception, processing, and distribution*.

3 Suggested action

3.1 The Meeting is invited to:

- a) take note of the information provided herein;
- b) review the information contained in section 2 and in Appendices A and B; and
- c) discuss any other related matters it may deem appropriate.

APPENDIX A / APENDICE A

STATUS OF THE AUTOMATION IMPLEMENTATION TO GIVE EFFECT TO THE
AMENDMENT TO THE FLIGHT PLAN FORMAT/ESTADO DE IMPLANTACION DE LA AUTOMATIZACION PARA DAR CUMPLIMIENTO
DE LA ENMIENDA EN EL FORMATO DEL PLAN DE VUELO

STATE/ ESTADO	ACC	AFTN/AMHS (Template FPL 2012)	FDP /FPL2012
Argentina	Comodoro Rivadavia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated/Automatización Implemented June 2016/Implementado Junio 2016
	Cordoba	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated / Automatizado
	Ezeiza	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated / Automatizado
	Mendoza	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated/Automatización Implemented June 2016/Implementado Junio 2016
	Resistencia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated/Automatización Implemented June 2016/Implementado Junio 2016
Bolivia	Cochabamba /La Paz	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Manual It is foreseen by the end of 2019 an ATM automated system compatible with FPL/12 in the new Cochabamba ACC and La Paz ACC (back up) / Se tiene previsto para finales del 2019 un sistema automatizado ATM compatible con el FPL/12 en el nuevo ACC de Cochabamba y La Paz. ACC (respaldo)

STATE/ ESTADO	ACC	AFTN/AMHS (Template FPL 2012)	FDP /FPL2012
Brazil / Brasil	Amazónico	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatizado (use of converter) / (uso de convertidor centralizado)
	Atlántico	Implemented (AMHS terminal) / Implantado (terminal AMHS)	An update in Sagitario ATM automated system (from ATECH Brazil) which includes the new FPL/12 flight plan format to deactivate the centralized inverter is scheduled for the end of 2017 in the ACC
	Brasilia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Amazonico, Atlantico, Brasilia, Curitiba and Recife./ Para finales del 2017 está prevista una actualización en Sagitario (sistema automatizado ATM de Brasil de la empresa ATECH) que incluye el nuevo formato de plan de vuelo FPL/12 y desactivar el convertidor centralizado.
	Curitiba	Implemented (AMHS terminal) / Implantado (terminal AMHS)	
	Recife	Implemented (AMHS terminal) / Implantado (terminal AMHS)	
Chile	Iquique	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated /Automatizado
	Punta Arenas	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automatizado /
	Puerto Montt	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated /Automatizado
	Santiago	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated/Automatizado
	Santiago Oceanico	Not implemented (AFTN terminal) / No Implantado (terminal AFTN)	Automated/Automatizado
Colombia	Barranquilla	Not implemented (AMHS terminal) No implantado (terminal AMHS)	Automated /Automatizado
	Bogotá	Not implemented (AMHS terminal) No implantado (terminal AMHS)	Automated /Automatizado

STATE/ ESTADO	ACC	AFTN/AMHS (Template FPL 2012)	FDP /FPL2012
Ecuador	Guayaquil	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatizado
French Guiana (France) Guyana Francesa (Francia)	Rochambeau	No Implemented (AMHS terminal) / No Implantado (terminal AMHS)	Automated / Automatizado
Guyana	Timehri	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated / Automatizado
Panama	Panama	Implemented / implantado (AMHS terminal))	Automated /Automatizado
Paraguay	Asunción	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Manual Automated at the end of 2017 /Automatizado a final del 2017
Peru	Lima	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Update automation system by the end of third quarter 2017/ Actualización Sistema automatizado finales del tercer trimester del 2017
Suriname/Surinam	Paramaribo	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated (out of service, working manually) / Automatizado (fuera de servicio, trabajando manualmente)
Uruguay	Montevideo	Implemented (AMHS terminal) / Implantado(terminal AMHS)	Automated / Automatizado
Venezuela	Maiquetia	Implemented (AMHS terminal) / Implantado (terminal AMHS)	Automated /Automatizado (use of converter) / (uso de convertidor) By the end of 2017 it is foreseen a new automation system in Maiquetía ACC/ Para finales del 2017 se estima operación del nuevo sistema automatizado del ACC de Maiquetía

APPENDIX B

FLIGHT PLAN FILING PROCEDURES IN THE SAM REGION

ARGENTINA

Regarding the processing of FPLs in accordance with national regulations, paper forms can be initially filed at an ARO-AIS office and transmitted *via* AMHS to the units involved, or by phone or in flight through the A/G frequency.

The filing of RPLs is also regulated, as published in the AIP of Argentina. It should be noted that the filing of RPLs is not being used.

Additionally, the ACCs of Argentina have a flight data position, where an air traffic controller receives and controls FPLs through an AMHS channel.

In 2015, coordination started between the service provider and the operators LATAM Argentina and Aerolíneas Argentinas to study the possibility of using the information digitally produced by the flight planning systems hired by said operators, in the communication systems of the service provider, which produced the FPLs of all planned flights, which were then submitted by the operators in hard copy to the ARO/AIS offices involved.

To this end, coordination meetings were held between the aeronautical authority, ANAC, and the aforementioned actors. Personnel of the service provider and the operator conducted tests in early 2016 using the AMHS channel, with the inclusion of the ARO/AIS units of Aeroparque, Ezeiza and the INDRA automated centre at the EZE ACC.

These tests were successful, and use was extended to all ARO/AIS units in charge of planning the flights of the aforementioned companies.

This procedure permits reception of flight plans by the LIDO or JEPPESEN systems up to 4 hours before, with the advantage that they contain the data of the flight that will be actually conducted, significantly reducing errors in the data contained therein.

It should be noted that the aforementioned provision on FPL processing continues to be applied, and the control function of the ARO/AIS operator is not replaced by the systems hired by the operators.

BRAZIL

Brazil has as goal, to implement the centralized treatment of flight plans, as part of the implementation of SIGMA system (Air Movement Integrated System in use by CGNA – Air Navigation Management Centre). Under this concept, SIGMA validates the syntax, based on the analysis of the content of each field of the flight plan form (FPL) and in accordance with MCA 100-11- “*Preenchimento dos Formulários de Plano de Voo*”.

It also validates the semantics, which refers to the consistency among FPL boxes, based on the specifications of each flight, such as preferred routes, restricted aerodromes, enabled and activated airspaces, and others. All this automated process starts with the completion of the flight plan and

ends when clicking on the VALIDATE button. If there is any inconsistency, the user will be informed in order to make corrections as needed.

At present Brazil accepts domestic flight plans through internet in its whole territory, as set by AIC-9N dated 15 May 2016 – “Sending flight plans by internet”. Additionally 6 AIS – CAIS regional centres were implemented in Brasilia, Curitiba, Recife, Rio de Janeiro and Sao Paulo, as well as AIS offices in airdromes of Belo Horizonte, Campinas, Confins and Guarulhos that use SIGMA system in filling flight plans and making the semantic validation. Likewise, flight plans can also be received by phone, fax, or in person at the AIS offices or in CAIS.

In this framework, the FLP filling in AMHS terminals is made only as alternative in case of communication failure between the application and SIGMA system. In this process, the FLP validated will be analysed by SIGMA from a flow management perspective (demand vs. capacity) and, if approved, are directly transmitted to the ACCs, which relay them to the TWRs and APPs involved.

Another on-going project is the integration of automated systems of TWR and ACC/APP, using OLDI protocol and ADEXP messages, which allows more integrity of flight plan data used by centers involved.

Regarding the repetitive flight plan (RPL), Brazil applies this type of procedure for scheduled, charter, and postal flights authorised by ANAC, and is reproduced with the same basic characteristics for at least 10 (ten) flights, for a minimum period of 2 (two) months. RPLs are standardised through ICA 100-11 – Plano de Voo. A basic requirement for using RPLs is that data must be highly stable, so any changes can be easily made.

The RPL is filed using electronic media, the Internet, and, alternatively, by fax, or in person at the repetitive flight plan centre. Non-repetitive flight data, such as an alternate, range, and number of people on board, shall be sent prior to take-off, by radiotelephone, to the control tower, aerodrome of departure, or aeronautical telecommunication station.

Airlines must request the repetitive flight plan at least ten (10) days before the beginning of each of the periods described below:

- a) from the first to the tenth day of the month;
- b) from the eleventh to the twentieth day of the month; and
- c) from the twenty-first to the last day of each month.

Changes, delays, and temporary cancellations can be made to a flight in a planned RPL series. Permanent modifications that involve the addition of new flights, the deletion or modification of flights, in the RPL lists will be presented in the form of a new flight plan with the same advance notice.

CHILE

All flight plans have to be sent to ARO offices via AFTN, e-mail or presenting ATC-1 (FPL) form on ARO fronting desk.

The regulation allows sending a flight plan by any written means. There is also the possibility to present a flight plan at ATC through radio frequency (AFIL).

The process is as follows:

- Flight plan presented by the user (pilot, dispatcher, airline, etc.)
- Flight plan accepted. Review and advisory by ARO office in this part of the process.
- Flight plan transmitted to all ATS dependencies involved in the route.

IFIS system (flight plan presentation through internet) is only available for domestic users of general aviation (small aircrafts). Air operators are not allowed to send FPL via IFIS. Flight plans filled by IFIS are validated by the system and directly registered in FDP of automated systems.

Flight plans send by operators of flight plan service are registered in FDP pf automated system.

ECUADOR

Based on the implementation of Amendment 1 to the Procedures for air navigation services – Air traffic management (PANS ATM - Doc 4444, 15th edition) of the International Civil Aviation Organization (ICAO), the implementation of new procedures and the content of the flight plan and its associated messages in Ecuador are defined as follows:

Procedures for filing a flight plan

- Flight plans will be physically filed at the AIS-AD room of the air navigation services at the aerodrome of departure.
- Filing of flight plans within Ecuadorian territory through the Internet flight information system (IFIS), whether by the pilot-in-command or his/her authorised representative, based on national technical aeronautical regulations on the filing of flight plans within Ecuadorian territory.
- When the operations office of the aircraft operator at the aerodrome of departure uses e-mail as the means to communicate with the AIS-AD room, the filing of the referential flight plan using this medium will be permitted, after which the original forms shall be filed on the same day, no later than 2300 UTC.
- The filing of the flight plan by telephone will not be accepted, nor its submission by individuals other than the pilot-in-command or his/her duly accredited and authorised representative.

PANAMA

Panama has the THALES ANAIS system for flight plan processing.

In accordance with the AIP of Panama (ENR1.10-1), all users must file a flight plan in accordance with the flight plan format contained in Doc 4444, at least one hour before departure.

The user must notify ATM units of any changes (amendments) to the FPL, on a timely basis.

Users that have dispatch offices with a service capable of linking to the AMHS network shall transmit the FPL to the appropriate ATM units once approved by the authority.

Every AIS-AD unit that receives an FPL will immediately transmit it to the ATM services, addressed to MPZLZQZX and the airports and ACCs involved.

PARAGUAY

The operator files the flight plan in writing to the AIS unit.

The AIS unit transcribes the flight plan, which is addressed and transmitted *via* AMHS.

The flight plan is entered in the AMHS and, in turn, addressed to the automated system through a point-to-point connection to the FDP.

The FDP does the processing and sends the flight plan to the flight plan generation and correction position.

Obs: All flight plans entered in the automated system are sent *via* the AMHS.

An IFPL application (flight plan presentation *via* INTERNET) developed by company Radio COM is available for domestic flights.

PERU

The AIS expert in charge receives the FPL, whether in hard copy, *via* AMHS, mail, fax, or telephone, and analyses and verifies its content.

The AIS expert determines if it is authorised (permit from the DGAC).

The authorisation number is recorded in the FPL.

He/she verifies if aeronautical services have been paid for.

He/she stamps the original and the copies to indicate the office, day, and time when the FPL was received.

He/she transmits the FPL to the ATS units involved, using an FDP station. A user agent (AMHS) will send the FPLs in case of failure of the FDP.

The FDP workstation is part of the INDRA AIRCON 2100 system.

URUGUAY

The presentation of FPL is based on AIP Uruguay ENR 1.10-1.

International FPL

The presentation of the flight plan must be made without exception, before departure in the Operations Office (Flight Plan) at the departure airdrome which is responsible of filling the FPL in the system.

FPL reception

The Operations Department of DINACIA of Carrasco International Airport receives flight plans through the following means: 1) in person at the department' office, 2) by Fax # (598) 26040311, 3) by E-mail: plandevuelo@dinacia.gub.uy. All those FPLs are registered in the automated system.

National FPL

For domestic flights and/or when the operations office does not exist/functioning at the departing airdrome, FPL can be routed through the Aeronautical Telecommunications Station (CXK), through telephone 0800 PLAN (0800-7536 or 2604 0251 Ext. 5123).

RPL presentation is based on AIP Uruguay ENR 1.11-4.

The operator first will present by means and addresses indicated in ENR 1.11-5, the list of RPL and/or its corresponding amendments and them will be registered in the system.

FPL forms and RLP Doc 4444

Error types:

- Aircraft not entering FIR and not being alternated
- Duplicated plans
- Plan origin (no route, PBN)
- FPL missing (DEP, EST.)
- Data base (solution in progress)
- FLP form (free text)

VENEZUELA

Every aircraft that files a domestic or international flight plan, whether civilian, commercial, or military, must complete the physical flight plan format established to that end.

This flight plan must be presented to the appropriate AIS authority or unit, which will validate and authorise the flight plan.

Once the flight plan is authorised, the communications office will arrange for the entry of the flight plan into the AMHS or AFTN system so that it will reach the FDP.

Repetitive flight plans also exist in the automated system of the ACC. These flight plans are the commercial itineraries. However, these flight plans are also received by the AIS office (although not obligatory) and, when processed, generate duplication in the FDP system. Venezuela has incorporated Amendment 1 to Edition 15 of Doc 4444 into its flight plan.