



Agenda

Item 3:

Report of activities and deliverables of the GT - Interop and Subgroups

**ACTIVITIES EXECUTED BY ATM/AIDC, ATM/FPL,
 CNS/AMHS AND MET/IWXXM SUBGROUPS**

(Presented by the Secretariat)

SUMMARY	
This working paper presents the activities carried out by the ATM/AIDC, ATM/FPL, CNS/AMHS and MET/IWXXM Subgroups to date.	
References:	
<ul style="list-style-type: none"> - Final Report of SAM/IG/23 Meeting (Lima-Peru, 20 to 24 May 2019); and - Final Report of SAM/IG/24 Meeting (Lima-Peru, 4 to 8 November 2019). 	
ICAO Strategic Objectives:	<i>A – Safety</i> <i>B – Air Navigation Capacity y Efficiency</i> <i>ASBU: AMET-B0/4 (IWXXM), COMI-B0/7 (AMHS) y FICE-B0/1 (AIDC)</i>

1. INTRODUCTION

1.1 The SAM Region Interoperability Task Force (GT Interop) was established at the Twenty Second Workshop/Meeting of the ICAO SAM Implementation Group (SAM/IG/22) carried out in Lima-Peru from 19 to 23 November 2018, to support and promote initiatives to modernize air navigation services and ensure interoperability between automated systems used by AIM, ATM, ATFM, CNS, MET and SAR users.

1.2 At the SAM/IG/24 Meeting (Lima-Peru, 4 to 8 November 2019), several subgroups were activated, with the task of studying and proposing the activities necessary to address the interoperability issues of air navigation systems implemented by the States of the SAM Region.

1.3 Of the five subgroups currently activated, four will have the activities presented in this working paper (ATM/AIDC, ATM/FPL, CNS/AMHS and MET/IWXXM subgroups), and the CNS/SUR subgroup activities being described in another working paper (NE/02).

2. ANALYSIS

2.1 ATM/AIDC SUBGROUP

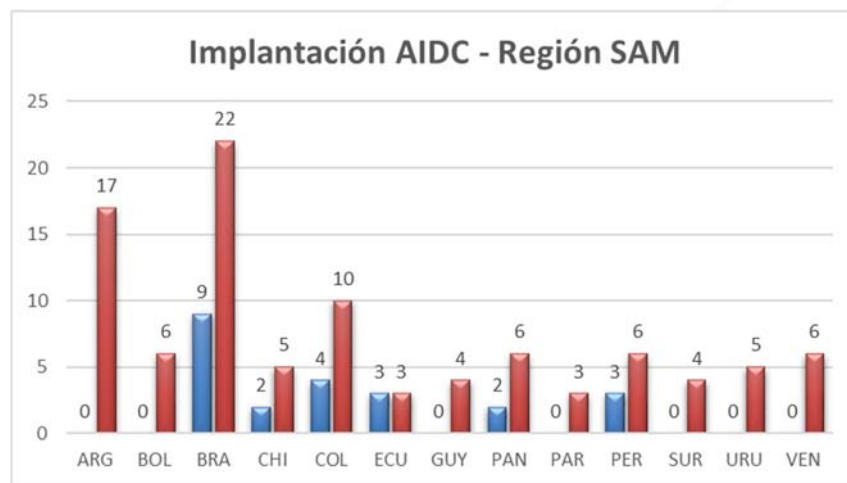
2.1.1 Five teleconferences were held to address the implementation of AIDC communication between adjacent automated centers. Although all difficulties caused by the pandemic, a great deal of effort was made by Colombia, Ecuador, Panama and Peru to establish three AIDC communications in 2020:

- **Guayaquil ACC – CENAMER ACC** (16 March 2020);
- **Bogotá ACC – Lima ACC** (12 October 2020); and
- **Barranquilla ACC – Panamá ACC** (15 October 2020).

2.1.2 Two other AIDC communications are in the pre-operational phase and must be operational until the end of 2020:

- **Barraquilla ACC – Maiquetía ACC**; and
- **Bogotá ACC – Panama ACC**.

2.1.3 Graph 1 presents the current status of the AIDC implementation in the SAM Region.



Graph 1 – AIDC implementation in the SAM Region

2.1.4 One situation that has been found is the CRC error in some messages, such as:

30-07-20 10:39:22 lat. RX
BQX0430 301039
FF SKBQFDBA
301039 MKJKZQZX 2.000439-3.SKBQ003536-4.200730103914-5.CA81-
(LRM-RMK/61/HEADER/INVALID CRC)

2.1.5 The message above is related to the following ABI message:

30-07-20 10:39:07 lat. TX
QBX0265 301039
FF MKJKZQZX
301039 SKBQFDBA 2.003536-4.200730103907-5.8B74-
(ABI-AAL9708/A0530
-SAEZ-OTAMO/1118F380
-KMIA-8/IN
-9/B772/H-10/SWYDE1E2E3FGHIJ3J5M1RX/B1D1L

**-15/N0483F360 DCT DILAR UQ108 OTAMO UA301 MLY UL417
 LENAX UL795 ALTIB
 UM347 ZEUSS Y325 FOWEE FLIPR7
 -18/STS/HAZMAT PBN/A1B1C1D1L1O1S2T1 NAV/RNVD1E2A1
 DAT/1FAN SUR/260B
 RSP180 DOF/200730 REG/N779AN SEL/KLMS CODE/AA8A83
 PER/D RMK/CARGO
 ONLY AROAIS EZE 54801555)**

2.1.6 It is likely that some format change in the text is introduced by moving the message in different contexts (AFTN/AMHS or vice versa), causing error in checking the message integrity. In this sense, it is very important migrate the users (human and automated) to the AMHS messaging environment and to establish more direct AMHS P1 connections.

2.2 ATM/FPL SUBGROUP

2.2.1 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 error mitigation and duplication/multiplicity of flight plans, as well as issues related to the centralization of flight plan management and associated messages.

SID/STAR codification

2.2.2 The SAM/IG/24 Report indicates that there is an inconvenience with respect to the way FPL is transmitted directly from airlines servers to ANSPs FDP systems. Although Annex 11 states that, the encoding of SIDs and STAR must be abbreviated with 7 alphanumeric characters, some FMS systems on board aircraft work with only 6 characters. This causes incompatibility between the received FPL and the information that is in the FDP database of ANSPs automated systems. The importance of the industry to be in line with Annex 11 is highlighted to avoid incompatibilities between aircraft systems and ATS automated systems.

2.2.3 IATA's cooperation has been requested to contact airlines and their system providers, that generate flight plans, to meet the number of characters indicated in the current rules.

ACK/REJ messages standard format

2.2.4 By means of teleconferences, the ATM/FPL Subgroup has discussed the centralization of flight plan management (and associated messages) and a proposal for acceptance (ACK) and rejection (REJ) messages format, in order to provide feedback to flight plan originators.

2.2.5 This proposal will be submitted, for approval, at the next SAM Region Implementation Group (SAM/IG/25) Meeting, to be held from 2 to 4 November 2020, by teleconference.

(ACK) acceptance message:

If the flight plan or other standardized message correctly enters the system via AMHS/AFTN; an ACK message will be transmitted to the originator of the flight plan.

ACK message description: **ACK FPL SPIM CMP124 SPJC 1645 MPTO**
 Type of feedback = **ACK**
 Message type = **FPL**
 FIR = **SPIM**

Flight identification = CMP124
 DEP airport = SPJC
 EOBT = 1645
 ARR airport = MPTO

(REJ) rejection message:

If the flight plan or other standardized message enters incorrectly into the system via AMHS/AFTN; an REJ message will be transmitted to the originator of the flight plan. The original flight plan message is copied below the rejection message for reference.

REJ message description: 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 CURS05
 -KFL0534
 -PBN/A1B1C1D1O1S2T1 NAV/RNVD1E2A1 SUR/260B DOF/190315
 REG/N282JB EET/SEFG0110 SKED0156 MPZL0225 MKJK0345 MUFH0427
 KZMA0501 SEL/AJKS CODE/AB4F5D

Type of feedback = REJ
 Message type = FPL
 FIR = SPIM
 Flight identification = JBU1824
 Reason for rejection = INCORRECT FL RVSM
 Original FPL for reference

2.3 CNS/AMHS SUBGROUP

AMHS Implementation

2.3.1 With regard to AMHS interconnection, despite the impact caused by the pandemic, important AMHS P1 interconnections were established in 2020. Currently, 26 regional interconnections have already been established and only 2 operational AFTN circuits must be replaced by an AMHS (P1) interconnection: **SAEZ – SUMU** and **SBBR – SUMU**.

2.3.2 In addition to regional interconnections, two interregional AMHS interconnections were established in 2020: **SPIM (Lima) – KATL (Atlanta)** and **SBBR (Brasilia) – GOOO (Dakar)**. By the end of 2020, two interconnections already in interoperability tests will probably be completely operational: **SVCA (Caracas) – KATL (Atlanta)** and **SVCA (Caracas) – TTPP (Piarco)**. Figure 1 and the Graph 2 depicts the status of AMHS deployment in the SAM Region.

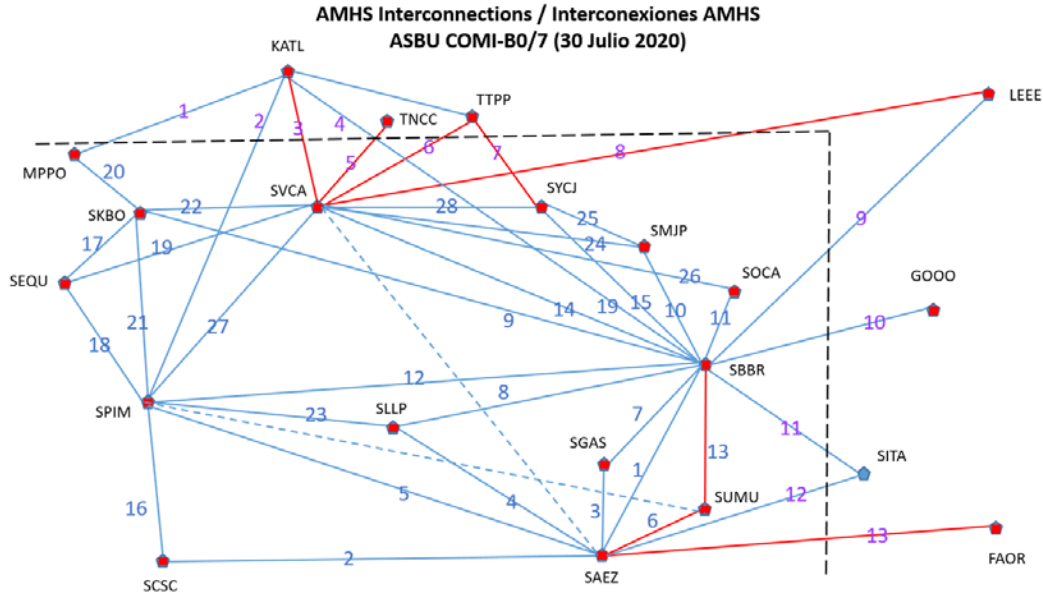
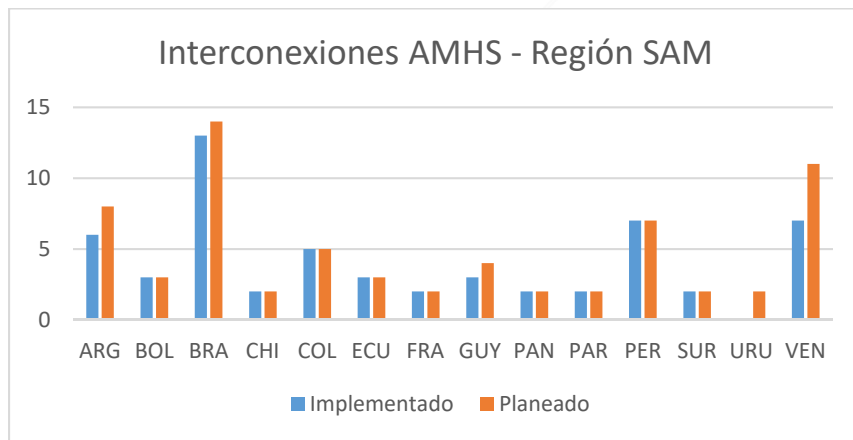


Figure 1 – AMHS P1 interconnection and remaining AFTN circuits



Graph 2 – SAM AMHS Region Implementation

AFTN users' migration

2.3.3 The Secretariat indicates the importance of planning the migration of remaining AFTN users for the AMHS environment. The AFTN message limits the possibility of automating systems that support air navigation services. New message formats are being implemented for the exchange of flight plans (FIXM), aeronautical information (AIXM), and weather information (IWXXM). AFTN users will not be able to handle messages in the new formats.

2.3.4 Special attention should be given to AFTN users hosted in automated systems, such as automatic MET systems, flight plan processors and aeronautical information data banks, which involve relatively high costs to update these systems, in order to exchange messages in the AMHS environment.

SITA Type X Gateway

2.3.5 In 2019, the connection of SITA's Type X Gateway to the two planned COM centers in the SAM Region (Brasilia and Ezeiza), was concluded. This interconnection allows users of the aircraft operators messaging context (SITA) to exchange messages with users of AMHS context (ANSPs). Figure 2 illustrates SITA Type X Gateway connections to the AMHS context of all ICAO regions.

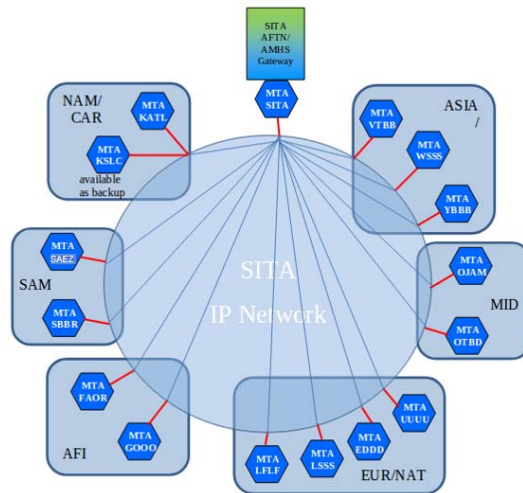


Figure 2 – SITA Type X Gateway Interconnections

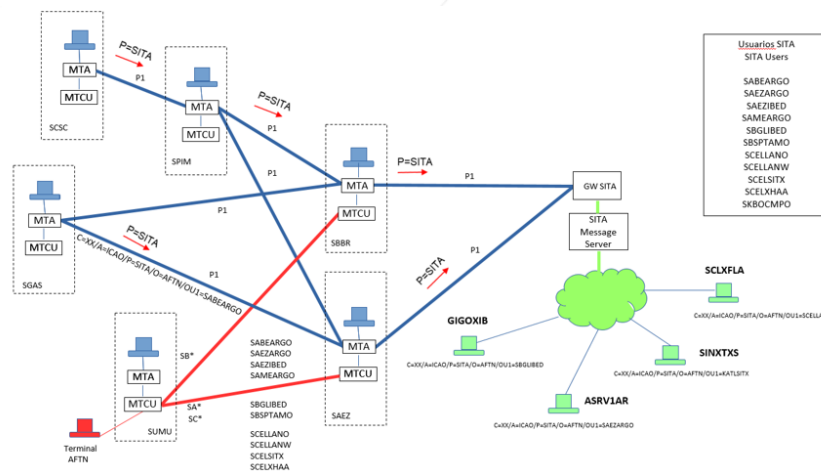


Figure 3 – Message contexts (AMHS/SITA) interconnection

2.3.6 Figure 3 illustrates how the SITA Type X Gateway acts, providing that messages from the aircraft operators' messaging context (SITA) can reach the AMHS messaging context of Air Navigation Service Providers (ANSPs) and vice versa.

2.4 MET/IWXXM SUBGROUP

2.4.1 Also within the framework of the SAM/IG Group, the Interop TF MET/IWXXM Subgroup was activated, to address the adequacy of aeronautical meteorology user systems to the new format of weather messages (IWXXM).

2.4.2 Two main initiatives were discussed by the MET/IWXXM Subgroup: a converter from the TAC format to the IWXXM format, called METAX, developed by Venezuelan staff and the adequacy made by the Brazilian administration at the Regional Data Bank OPMET in Brasilia.

METAX converter

2.4.3 The METAX system was developed by Venezuelan personnel and converts the weather information from the TAC format to the IWXXM format. METAX is an application that can be installed on a network or as a web service. Users accessing METAX can enter the respective message (METAR, TAF, SIGMET, etc.) in the TAC format and the system will generate an XML file with the weather information encoded in the IWXXM format. Weather bulletins can also be processed by the METAX system.

2.4.4 The .xml extension file must be sent as an attachment to an AMHS message addressed to a weather user, such as the OPMET Regional Bank of Brasilia (C=XX/A=ICAO/P=SB/O=SBBR/OU1=SBBR/CN=SBBRYZYX).

2.4.5 The Administration of Venezuela gently yields, at no cost, the system for installation in other aeronautical administrations, also providing the source codes under the commitment of not being used for commercial purposes.

2.4.6 A presentation made during the SAM/IG/24 Meeting is available at the following link: <https://www.icao.int/SAM/Documents/2019-06901-SAMIG24/metax-iwxxm-ven.pdf>.

Current Regional OPMET Data Bank of Brasilia

2.4.7 The current Regional OPMET Data Bank of Brasilia was adapted in 2017 to receive and transmit weather information in version 2.1 of the new IWXXM format.

- AMHS address of the Regional OPMET Data Bank of Brasilia:
/CN=SBBRYZYX/OU=SBBR/O=SBBR/PRMD=SB/ADMD=ICAO/C=XX/
- AFTN address: **SBBRYZYX**

2.4.8 In accordance with the recommendations contained in **Doc 10003 – Manual on the ICAO Meteorological Information Exchange Model and EUR Doc 033 – Operational Concept for the Transition of OPMET Data Exchange using IWXXM**, the weather information in the new IWXXM format is sent as a file (XML extension) attached to an AMHS message.

2.4.9 A MET user who sends an AMHS message with the weather information correctly encoded in version 2.1 of the IWXXM format, this information will be accepted by the Regional OPMET Data Bank of Brasilia and stored in the database. The system will convert the same weather information into the traditional format (TAC) and also store it in the database.

2.4.10 If the weather information presents any coding error (or inconsistency in the data), the message will not enter the database and an AMHS message will be sent to the originator indicating rejection.

2.4.11 In order to consult the weather information stored in the Regional OPMET Data Bank of Brasilia, the MET user with the capacity to receive the information in the new format, must send an AMHS message of requisition **RQX**. Example: **RQX/LASBBR, SBRJ=**.

2.4.12 MET users who do not yet have the ability to send messages in the new format, can enter weather information by sending AMHS (or AFTN) messages in the traditional format (TAC). The system will receive the information, convert for the IWXXM format and store it in the database in both formats (IWXXM and TAC).

2.4.13 To consult weather information, a MET user without the ability to handle the data in the new format, must send an **RQM** requisition via an AMHS (or AFTN) message. Example: **RQM/SASBBR, SBRJ=**.

Note: Observe the difference between the two requisitions (RQX/LA and RQM/SA)

Future system (estimated for March 2021)

2.4.14 Brazil's main ANSP (DECEA) is in the process of implementing a new Regional OPMET Data Bank in Brasilia, adapted for **version 3.0** of the new IWXXM format (and earlier versions), with the same reception and transmission characteristics by the aeronautical messaging service (AMHS or AFTN) described above for the current system in operation. Figure 4 presents the interconnection context of the Regional OPMET Data Bank of Brasilia.

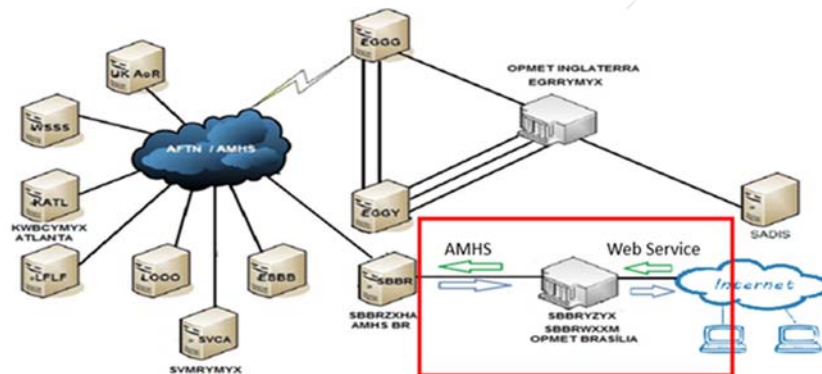


Figure 4 – Context of the future Regional OPMET Data Bank of Brasilia

2.4.15 In addition to the functionalities present in the current system, the new system will provide that registered MET users can access a web service that will allow the insertion and consultation of weather information through IP networks (Intranet or Internet). Figure 5 presents the possibilities of connecting MET users to the system of the Regional OPMET Data Bank of Brasilia.

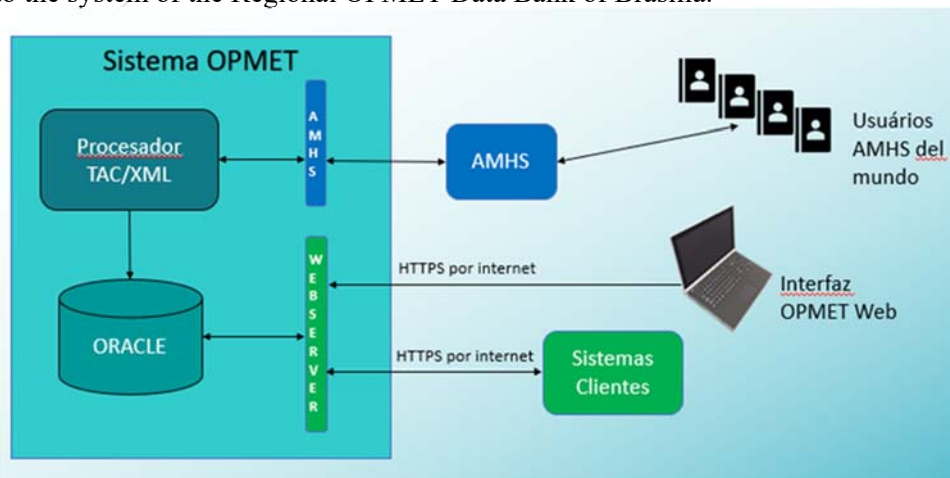


Figure 5 – Possibilities of connection with the new Regional OPMET Data Bank of Brasilia

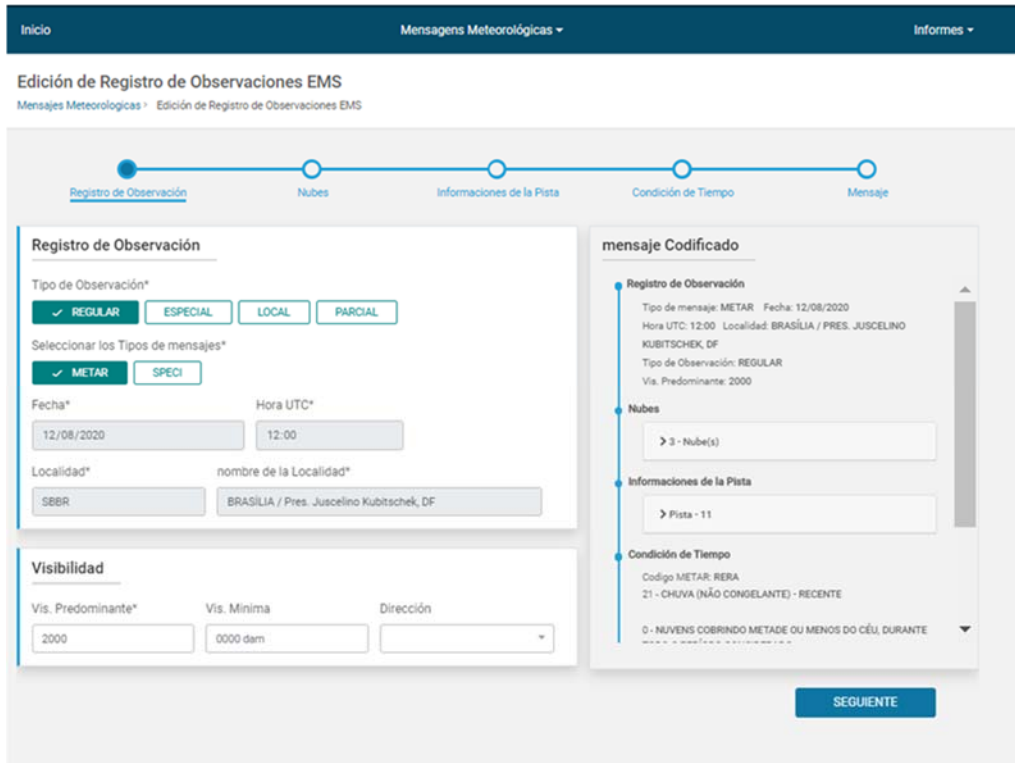


Figure 6 – Weather Information Processing Screen (METAR)

2.4.16 The web service will provide screens with its own boxes to fill in the desired weather information (METAR, SIGMET, TAF, SPECI, AIRMET, AVA, TCA and SWX). These boxes will be criticized (by the system), in case the user enters inconsistent information. The message will only be accepted when all necessary boxes are filled with consistent information.

2.4.17 Figure 6 presents an example of the METAR composition screen with its proper boxes.

2.4.18 The system will store the weather information in the database (of the Regional OPMET Data Bank of Brasilia) in both formats (TAC and IWXXM). Users will also be able to use the web service to consult the information stored in both formats.

2.4.19 The future system will also allow other database systems to exchange information directly (database to database). To do this, systems need to meet the interoperability requirements of the Interface Control Document (ICD) for data exchange. The document (ICD) will be addressed to the SAM ICAO Lima Regional Office, which will make available to States/Organizations interested in establishing interoperability with the system of the Regional OPMET Data Bank of Brasilia.

3. SUGGESTED ACTION

3.1 The Meeting is invited to:

- a) Take note of the activities carried out in the Subgroups;

- b) approve the format of the ACK and REJ messages; and
- c) analyze other considerations that the Meeting deems pertinent.

- END -