ePPRC/03 — WP/10
16/07/21

GREPECAS Programmes and Projects Committee (PPRC) Third Virtual Meeting (ePPRC/03)
Online, 22 – 23 July 2021

Agenda Item 2: **Follow-up on the updated GREPECAS Programmes and Projects**
  2.1 Reviewed GREPECAS Programmes and Projects

CNS IMPLEMENTATION IN THE CAR/SAM REGIONS

(Presented by the Secretariat)

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<tr><td colspan="2" align="center">EXECUTIVE SUMMARY</td></tr>
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<tr><td><i>References:</i></td><td>• Second Virtual Meeting of the GREPECAS Programmes and Projects Review Committee (PPRC) (ePPRC/02), October 2020
• Twenty-fifth Workshop/Meeting of the SAM Implementation Group - SAM/IG/25 (Virtual, 2 to 4 November, 2020)</td></tr>
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1. Introduction

1.1. Within the framework of Projects C - Automation and Situational Compression and D - Ground-Ground and Ground-Air Communications Infrastructure of GREPECAS, the main initiatives/activities developed in the CAR/SAM Regions are presented in this working paper, related with the implementation of Air Navigation Services (ANS) in the Communications, Navigation and Surveillance (CNS) area.

2. ANALYSIS

2.1. INITIATIVES/JOINT ACTIVITIES OF THE CAR/SAM REGIONS

2.1.1. Since the last PPRC Meeting, the following activities were carried out with States of both CAR and SAM Regions, developed by the NACC and SAM Regional Offices:

On-line Workshop on Automatic Dependent Surveillance - Broadcast for the NAM/CAR/SAM Regions (ADS-B/OUT/ W)

2.1.2.   From 26 to 29 January, 2021, in coordination with the NACC Office, the FAA has provided a workshop on ADS-B, which was attended by 250 delegates of the NAM/CAR and 10 delegates of the SAM Regions. Other participants connected from Europe and Africa

2.1.3.   The Workshop had four different sessions:

1. Detailed overview of ADS-B avionics systems.
2. Detailed overview of ground-based surveillance systems for ADS-B
3. Detailed overview of the surveillance integration chain and Space-based ADS-B
4. Future ADS-B applications

2.1.4.   As a final recommendation, the event identified opportunities for improvement that States can implement in their current and future surveillance projects, optimizing the use of ADS-B data to support the implementation of the different elements of ASBU and taking into account the future technology.

2.1.5.   The documents, presentations and the recording of all the sessions of the event are available at the following link:

https://www.icao.int/NACC/Pages/meetings-2021-adsb.aspx

ICAO/THALES Workshop: ADS-B and WAM/MLAT Technologies and ICAO/INDRA Workshop: Surveillance Technologies

2.1.6.   Also coordinated by the NACC Office, two virtual workshops were held on surveillance technologies (ADS-B and WAM/MLAT), on 10 February, 2021 with the Thales company and on 17 February, 2021 with the Indra company.

2.1.7.   In the workshop with Thales, 150 delegates from the States of the NAM/CAR/SAM Regions participated, as well as participants from Africa, Asia and Europe Regions,
and the documents and presentations used are available at the link below:

https://www.icao.int/NACC/Pages/meetings-2021-adsb1.aspx

2.1.8.   In the workshop with Indra, 148 States of the NAM/CAR/SAM Regions participated, as well as of other regions, and the documents and presentations used are available at the link below:

https://www.icao.int/NACC/Pages/meetings-2021-adsb2.aspx

AIDC tests between States of the CAR/SAM Regions

CRC errors

2.1.9.   On 26 February, AIDC tests were carried out between Barranquilla ACC-Kingston ACC, and Bogotá ACC-CENAMER ACC, to verify whether there was still the occurrence of CRC errors, verified in tests previously carried out.

2.1.10.	With the establishment of the P1 AMHS interconnection between the COM AMHS Centers in Atlanta and Caracas, all COM centers involved in the processing of messages already have P1 connections (MTA to MTA), without the need to use gateways AFTN/AMHS. Figure 1 presents the schematic for conducting the tests.

2.1.11.	During the tests, it was found that the CRC errors no longer occurred, even when the routing of the messages was changed via the COM Centers in Lima and Panama. ACCs personnel involved recognized that other adjustments in the automated systems (database) are necessary for the perfect functioning of the AIDC communication.
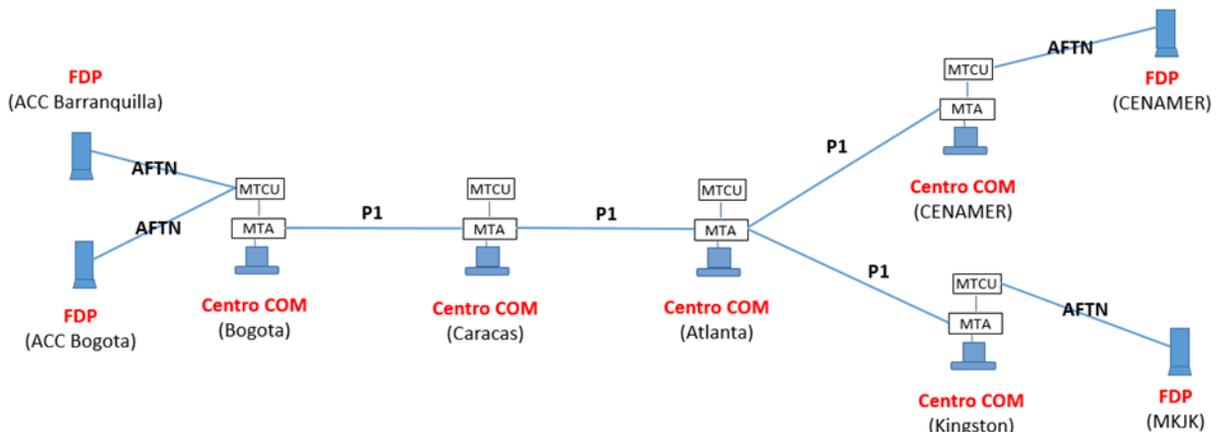
Figure 1 - AIDC test performed on 26 February, 2021

Workshop on the OPMET International Bank of Brasilia

2.1.12.	Under the coordination of MET Officers of the NACC and SAM Regions, the Workshop on the OPMET International Bank of Brasilia was organized, virtually held, from 13 to 14 April, 2021, with the aim of familiarizing the MET and CNS staff with the facilities and functionalities of the Brasilia OPMET Data Bank, and as a final result, the training of -at least- 2 MET technicians and 2 CNS technicians from the AMHS area of each State with knowledge of the IWXXM formats of the OPMET messages, in support of their implementation, as well as the data quality control procedures of the referred Bank.

2.1.13.	Presentations used in the event are available at the link below:

https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2021-RLA06901-OPMET

Establishment of the AMHS P1 Interconnection between the COM Centers of Caracas and Piarco

2.1.14.	On 26 April, 2021, the pre-operational tests (POT) were concluded and the interconnection of the COM AMHS Centers of Caracas (Venezuela) and Piarco (Trinidad & Tobago) was established, through REDDIG II.

2.1.15.	It is estimated to establish the AMHS interconnection between the Georgetown COM Center (Guyana) and Piarco (Trinidad & Tobago), via REDDIG II, in the second half of 2021, after the interconnection between Atlanta (United States) and Piarco is established. (Trinidad & Tobago), also via REDDIG II.

Webinar on the functions of the European Network Manager

2.1.16.   Within the framework of the EU-LAC APP Project (America and Caribbean Aviation Partnership Project), the SAM Regional Office has coordinated with EASA the presentation of initiatives for the centralized management of flight plans. In this sense, EASA organized an event with EUROCONTROL and COCESNA, which was held from 1 to 3 June, 2021. More than 100 people from States of the CAR and SAM Regions participated in the event.

2.1.17.   The workshop provided insights on the benefits and potential of centralized approaches for services with a strong regional character, such as flight plan management and ATFM, as well as best practices and lessons learned from the European experience. Likewise, COCESNA has presented its initiative to centralize the management of flight plans that will be implemented this year.

2.1.18.   Information on the webinar and presentations are available at the link below:

Network Manager Function webinar | eu-lac-app

Webinar on Unmanned Aircraft Aystems (UAS) for the NAM/CAR and SAM regions

2.1.19.   The first Unmanned Aircraft Systems (UAS) event for the NAM/CAR and SAM Regions was held in November 2020, with 274 participants from the NAM/CAR and SAM Regions, as well as participants from Africa and Europe.

2.1.20.   The event provided information on the documentation developed by ICAO to support the States in the development of appropriate legislation for the operation of these aircraft, as well as with the experience of the States of Brazil, Canada, the United States and Honduras.

2.2.   INITIATIVES/ACTIVITIES SPECIFIC OF THE CAR REGION

Initiative on Cybersecurity for Air Navigation Services

2.2.1.   During the meeting of the AIDC Task Group of the NACC region, the need to address the issue of cybersecurity in air navigation aspects was identified, due to the increasing implementation of state-of-the-art air navigation systems in the region and that are more vulnerable to cyberattacks.

2.2.2.   Through a project in collaboration with the Industry in which the NACC Office, CANSO and Airbus participate, which aims to support the CAR States in the evaluation of their vulnerabilities, carry out analysis and the development of the cybersecurity policy manual, which will be the beginning of the development of the States in this matter

2.2.3.   As part of the project, the following activities have been carried out:

2.2.4.   Webinar on the implementation of aviation cybersecurity ICAO/CANSO/AIRBUS in December 2020, which was attended by 253 people from the NAM/CAR/ SAM States, as well as Africa, Asia and Europe.

2.2.5.   Information, documentation and recording of the event is under the following link:
           https://www.icao.int/NACC/Pages/meetings-2020-aci.aspx

2.2.6   The second event can be found under the following link:
           https://www.icao.int/NACC/Pages/meetings-2021-canso02.aspx

2.2.7   Currently, we are working directly with each of the CAR States in the development of their cybersecurity policy manual applicable to their operations.

Activities in the Communications area

2.2.8   The process of exploration of technologies and services of the industry was carried out as part of the development of the fourth phase of the MEVA regional communications network. This new phase will be called CANSNET (Caribbean Communications Network).

2.2.9   The project has been rescheduled to run between 2021 and 2024, in response to the interconnection requirements of the region and taking into account the effects on the entire region due to COVID-19.

2.2.10   Regarding the AMHS interconnections through MEVA/REDDIG for both NAM/CAR/SAM regions, the United States established connectivity with Brazil, Peru and Venezuela.

AIDC/TF Task Group Activities

2.2.11   An event was coordinated with the support of the Central American Corporation for Air Navigation Services (COCESNA) to minimize flight plan errors for the NAM/CAR region. Event information is available under the following link:

https://www.icao.int/NACC/Pages/meetings-2021-aidc4.aspx

2.2.12   The Fourth NAM/CAR Air Traffic Services Inter-facility Data Communication (AIDC) and North American Interface Control Document (NAM/IDC) Implementation Follow-up Meeting (AIDC/NAM/ICD/4), where the Group's work plan was updated.

2.2.13   All the States in our region will have access to Eurocontrol's BADA aircraft database, which will serve to continuously update the control center databases and boost the level of automated coordination of automated connections. States will also receive training in this area from Eurocontrol.

2.2.14   The NAM/CAR Region has 70% implementation of the automated connections and the operational tests that were scheduled for 2020, will restart in the second half of 2021.

IWXXM Weather Messaging Tests

2.2.15   The tests of meteorological messages between Cuba and the United States were completed and will begin between Cuba and COCESNA in the second half of 2021. These second tests have a strategic objective to test the platform of a specific AMHS system in the region, that many CAR States have.

2.3   INITIATIVES/SPECIFIC ACTIVITIES OF THE SAM REGION

2.3.1   The SAM Region Implementation Group (SAM/IG) has formed the Interoperability Task Group (GT Interop) to support and promote modernization initiatives of air navigation services and guarantee interoperability between automated systems used by AIM, ATM, ATFM, CNS and MET users, with a view to:

a)   facilitate the exchange of information between the systems implemented by the States, reducing the time and interconnection problems between the systems;

b) promote a coordinated and homogeneous transition to the new services and elements indicated in the GANP; and

c) Encourage the multidisciplinary participation of air navigation services professionals in support of the SAM Region Implementation Group (SAM/IG) for the planning and execution of interconnection work of the systems implemented in the South American Region.

2.3.2   Currently, 5 Subgroups of the GT Interop are activated:

- ATM/AIDC Subgroup;
- ATM/FPL Subgroup;
- CNS/AMHS Subgroup;
- CNS/SUR Subgroup; and
- MET/IWXXM Subgroup.

ATM/AIDC Subgroup Activities

AIDC connections between Brazil's ACCs - Venezuela and Colombia - Venezuela

2.3.3   On 4 May, 2021, a teleconference was held with the participation of representatives of Brazil, Colombia, Venezuela, the Subgroup Rapporteur, an EASA representative, and the manufacturers of the automated centers (Atech and Indra), to discuss of the establishment of the AIDC connections of the Barranquilla ACC - Maiquetía ACC, Bogotá ACC - Maiquetía ACC, and Amazónico ACC- Maiquetía ACC.

2.3.4   Regarding the AIDC connections of the ACCs in Colombia and Venezuela, it was reported that the problems presented in the ABI Message (fields 13 and 16) were resolved, through an adaptation carried out by Atech in the Maiquetía ACC system, in order to accept one or two line breaks for the information in these fields. However, other adjustments related to the systems database were detected and would be implemented.

2.3.5   Regarding the connection between the Amazon ACC and the Maiquetía ACC, the proposal was made to implement the connection through an IP circuit, since the implanted systems are from the same manufacturer (Atech) and this functionality is available.

2.3.6   The representatives of Venezuela expressed their intention to conclude the coordination with Colombia first, and then work on the connection with the Brazil ACC. Likewise, Atech representatives indicated that they are updating the systems implemented in the Brazil's ACCs and would also update the ACC Maiquetía system with the same version.

2.3.7   For the period from 9 to 13 August, 2021, the Second Workshop/Meeting of the Interop GT Subgroups will be carried out, where the actions for the implementation of the planned AIDC connections will be monitored, in the specific session for the ATM/AIDC Subgroup.

Activities of the ATM/FPL Subgroup

Seminar on the Centralization of Flight Plan Management

2.3.8   From 29 to 31 March 29, 2021, the Seminar on Centralization of Flight Plan Management was virtually held, with the attendance of 64 participants.

2.3.9   First, in accordance with the proposed agenda, the ATM/FPL Roadmap document was presented by the ATM/FPL Subgroup Rapporteur. It is recommended that the implementation of management centralization be carried out in phases:

- **Initiation phase**:

1) Formation of a multidisciplinary group for each State, involved in processing the flight plan data. It is suggested that the group be made up of representatives of the Aeronautical Authority, the Airlines and other aircraft operators and Air Navigation Service Provider (ANSP) with AIM, ATM, CNS and Information Technology professionals;
2) Designation of a collective address (Distribution List) to receive flight plans (_____ZPZX). The collective address must have the following addresses: ZAZX and ZRZX. Apart from the collective addresses, the flight plans must be transmitted to the Departure, Arrival and Alternate Aerodromes;
3) Publication of the regulations in the AIP, regarding the procedure for receiving flight plans via Message Service (AFTN/AMHS). It is recommended to start publication 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 Message Service (AFTN/AMHS), must be prepared for all operational personnel involved in each State:
   - Type of standard messages (FPL, DLA, CHG and CNL);
   - Syntax and use of ACK and REJ messages; and
   - Procedures established by the State and ANSP.
2) Workshops and Meetings with airline personnel interested in the new procedures; and
3) Carry out test protocols with users:
   - Report sheet by the ANSP; and
   - Performance report and report for each airline.

- **Implementation Phase:**

1) Establish communication with each airline describing the contact points with the ANSP;
2) Prepare and publish a contingency plan in case of inoperative Message System (AFTN/AMHS).

2.3.10   On the second day of the seminar, before the presentation of EUROCONTROL's Centralized Flight Plan Management Service, EASA representatives indicated the support they can provide on ATM/ANS issues, through the EU-LAC APP Project (America and Caribbean Aviation Partnership Project). EASA's presentation is available at the link below:

EU-LAC APP_FPL Webinar SRVSOP_EASA Intro.pdf (icao.int)

2.3.11   Next, EUROCONTROL representatives presented the functions of the Network Manager, its operation and support services, ending with possible cooperation of the Latin American States on the issue of centralizing the management of flight plans. EUROCONTROL presentation is available at:

NM Central FP Management_final_v1.pdf (icao.int)

2.3.12   Then, a representative from DECEA presented the Brazilian Flight Plan Centralization Project. The presentation is available at:

Microsoft PowerPoint - APRESENTAÇÃO CPV ICAO_eng ICAO LIMA Cap DAVI

2.3.13   The contextualization and information regarding the initiative to centralize the flight plans management in Brazil, within the framework of the Sirius Brazil Program, was presented.

2.3.14   The system being implemented in Brazil is automated and will use its own address (SBRJZPZX) to receive flight plans. The implementation will be in phases, starting with the Recife FIR.

CNS/AMHS Subgroup Activities

Advanced Course on AMHS

2.3.15   In the period from 17 to 21 May, 2021, the Advanced Course on AMHS was virtually held, with the attendance of delegates from 11 member states of the Regional Project RLA/06/901 (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Panama, Paraguay, Peru, Uruguay and Venezuela).

2.3.16   Mr. Manuel Garcia from the Meridean company acted as the course instructor. **Appendix** of this working paper presents the agenda of this course.

Second Workshop/Meeting of Supervisors/Operators of COM AMHS Centers of the SAM Region

2.3.17   In the period from 25 to 27 May, 2021, the Second Workshop/Meeting of Supervisors/Operators of COM AMHS Centers of the SAM Region was held, with the participation of 54 representatives of 13 States of the SAM Region (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Panama, Paraguay, Peru, Suriname, Uruguay and Venezuela), 3 representatives from EASA and 2 officers from the SAM Region.

2.3.18   During the event, the States presented the progress in the preparation and approval of their contingency plans for the COM AMHS Centers; they discussed the standardization of the information to be entered in the AMC database (AMHS Address Management Center of EUROCONTROL); They dealt with updating the AMHS routing tables; and received information on issues related to the COM AMHS Centers, such as the implementation of the new OPMET Regional Bank in Brasilia, the increasingly frequent use of direct aeronautical information exchange (database based on data), using new formats for this exchange (AIXM, FIXM and IWXXM) and the basic fundamentals of the SWIM Concept.

2.3.19   The information on the the Second Workshop/Meeting of Supervisors/Operators of COM AMHS Centers of the SAM Region is available at the link below:

https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2021-RLA06901-IICOMAMHS

CNS/SUR Subgroup Activities

2.3.20   The CNS/SUR Subgroup was activated to deal with interoperability issues of surveillance systems and was also in charge of carrying out an analysis on a potential regional implementation of Space-based ADS-B, using the regional IP network (REDDIG II) as a platform for the distribution of surveillance

data. Figure 1 presents the concept of Space-based ADS-B implementation, using REDDIG II as one of the communication links for the distribution of surveillance information.
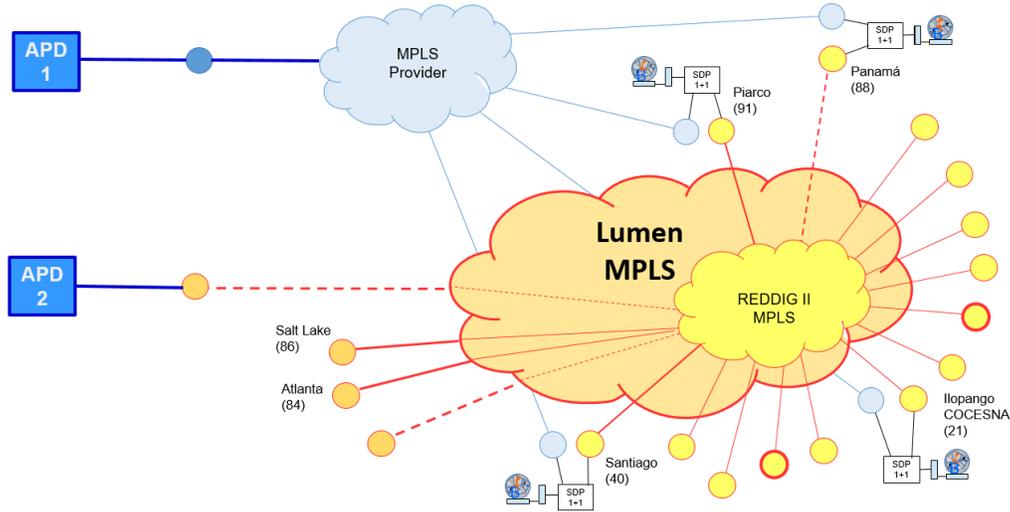
Figure 1 - Regional IP network (REDDIG II) as a space-based ADS-B distribution link

2.3.21   During the SAM/IG/25 Meeting (Virtual, from 2 to 4 November, 2020), the following conclusion was approved:

Conclusion SAM/IG/25-07 Space-based ADS-B Implementation through a Regional Technical Cooperation Project	
That the Secretariat:	**Expected impact:**
a) Consult Trinidad & Tobago about the interest of participating in the potential regional implementation of space-based ADS-B together with Chile and Panama, initially; b) Start 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 the potential contracting of the service.	☐ Political / Global ☒ Inter-regional ☒ Economic ☒ Environmental ☒ Technical / Operational
Why: Provide the States that expressed interest in the implementation of Space-based ADS-B with the necessary support for contracting the service.	

When:	Situation:
Immediately	Adopted in SAM/IG/25
Who:	
☐ Coordinators ☒ States ☒ ICAO SAM Secretariat ☒ TCB ☒ Other: Industry/Users	

2.3.22   Trinidad & Tobago has expressed interest in participating in a potential implementation of Space-based ADS-B, through a Regional Technical Cooperation Project (RLA/03/901).

2.3.23   TCB (Technical Cooperation Bureau) has provided the information and costs that an implementation would involve through the Regional Technical Cooperation Project RLA/03/901 (REDDIG).

2.3.24   Within the framework of the Regional Technical Cooperation Project RLA/03/901, an Ad-hoc Group was created, made up of Chile, Panama and Trinidad & Tobago, to carry out the analysis and elaboration of the necessary documents for the implementation.

2.3.25   To date, a draft of technical specifications has been prepared and circulated for review by the 3 States interested in the implementation of Space-based ADS-B. The interested States are evaluating the costs and the draft of technical specifications, a definition being awaited to give continuity to the process.

MET/IWXXM Subgroup Activities

2.3.26   After holding the Workshop on the International OPMET Bank of Brasilia (see item 2.1.12), the SAM Office organized the Seminar/Workshop on adapting Aeronautical Meteorology Systems to the new IWXXM format, virtually, from 18 to 19 May, 2021.

2.3.27   At this event, the following topics were presented:

-    General Purpose of OPMET Messages in IWXXM format;
-    IWXXM Implementation Guide for the MET Panel;
-    Necessary infrastructure for the exchange of OPMET Messages in IWXXM format; and
-    Progress of the States of the SAM Region in the implementation of the IWXXM format.

2.3.28   The documents and presentations used in this event are available at the link below:

https://www.icao.int/SAM/Pages/ES/MeetingsDocumentation_ES.aspx?m=2021-RLA06901-SISTMETNUEVOFORMATO

3.   **Suggested actions**

3.1   States are invited to:

a)   take note of the information presented in this working paper;

b)   consider the adoption of regional approaches for the implementation of new systems; and

c) Analyze any other issue related to the matter that the Meeting deems necessary.

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Advanced on-line AMHS course (SAM countries)

Course Manager: Manuel Garcia
Instructors: Manuel Garcia
Location: Virtual classroom

DAY/TIME	1	2	3	4	5	6
Monday	Course introduction	AMHS: Theory for the User Messaging, X.400, AMHS, Strategy		AMHS System Design Criteria ENAIRE's AMHS Solution		
Tuesday	AMHS User Types		Practical Exercises	AMHS System Management Tools		
Wednesday	AMHS Common Facilities AMHS Security			AMHS Operational Issues		
Thursday	AMC Management Center (Part I)					
Friday	AMC Management Center (Part II)			EDS (Directory Services)		

Advanced on-line AMHS course

17 -21 March 2021