Agenda
Item 3: Report of activities and deliverables of the Interop TF and Subgroups

ACTIVITIES EXECUTED BY SUBGROUPS OF THE INTEROP TF

(Presented by the Secretariat)

SUMMARY

This working paper presents the activities carried out by the Subgroups of the Interoperability Task Force (Interop TF) to date.

References:

- Final Report of SAM/IG/24 Meeting (Lima-Peru, 4 to 8 November 2019); and
- Final Report of SAM/IG/25 Meeting (Virtual, 2 to 4 November 2020).

ICAO Strategic Objectives:	*A – Safety* *B – Air Navigation Capacity y Efficiency* *ASBU: AMET-B0/4 (IWXXM), ASUR-B0/1 (ADS-B), ASUR-B1/1 (SB ADS-B), COMI-B0/7 (AMHS) y FICE-B0/1 (AIDC)*

1. INTRODUCTION

1.1 The SAM Region Implementation Group (SAM/IG) has formed the Interoperability Task Force (Interop TF) to support and promote air navigation services modernization initiatives and ensure 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 problems of interconnection 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 the interconnection works of the systems implemented in the South American Region.

1.2 Currently, 5 Interop TF Subgroups are enabled:

- Subgrupo ATM/AIDC;
- Subgrupo ATM/FPL;

- Subgrupo CNS/AMHS;
- Subgrupo CNS/SUR; y
- Subgrupo MET/IWXXM.

2. ANALYSIS

2.1 ATM/AIDC SUBGROUP

AIDC tests between States of the CAR/SAM Regions

2.1.1 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.

2.1.2 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.

2.1.3 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.

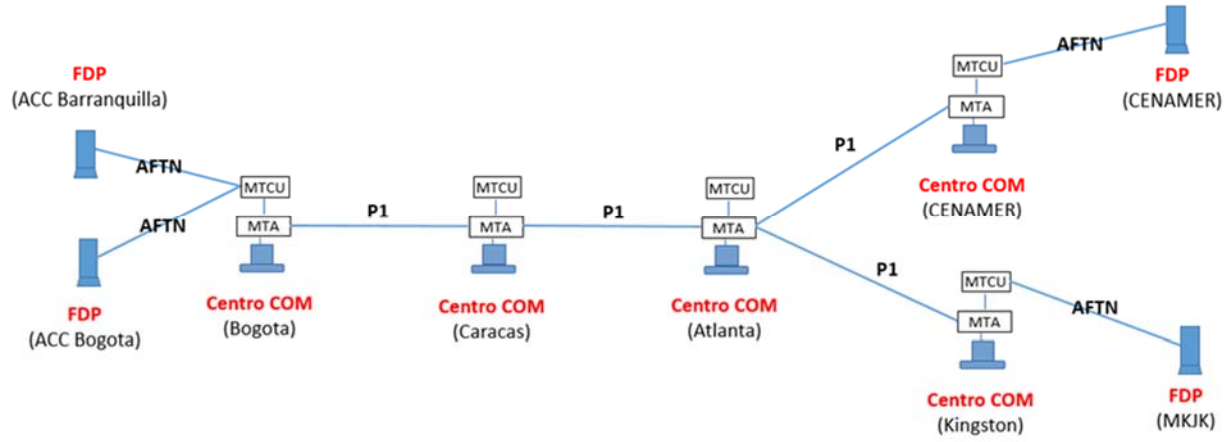

Figure 1 - AIDC test performed on 26 February, 2021

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

2.1.4 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 - Maiquetia ACC, Bogotá ACC - Maiquetia ACC, and Amazonic ACC- Maiquetia ACC.

2.1.5 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 Maiquetia 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.

2.1.6 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.

2.1.7 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.

2.1.8 During the Second Workshop/Meeting of the GT Interop Subgroups (GT INTEROP/2 – Virtual, from 09 to 13 August 2021) the representatives of the present States updated the information on the progress of the AIDC implementation. **Appendix A** to this work paper provides a summary of the information provided.

2.2 ATM/FPL SUBGROUP

Seminar on the Centralization of Flight Plan Management

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

2.2.2 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).

2.2.3 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)

2.2.4 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)

2.2.5 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

Webinar on the functions of the European Network Manager

2.2.8 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.

2.2.9 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.

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

Network Manager Function webinar | eu-lac-app

2.2.11 During the Workshop/Meeting INTEROP TF/2, the rapporteur of the ATM/FPL Subgroup encouraged States to initiate the processes outlined in the ATM/FPL Roadmap, taking advantage of the low traffic caused by the pandemic.

2.2.12 He also indicated the need to hold a seminar with the Airlines, to better disseminate information and refine procedures.

2.2.13 The rapporteur also stressed the importance of standardizing publications in the AIP of the States.

2.2.14 Ecuador has expressed interest in including one element (DOF) in the ACK message. The Secretary indicated that Ecuador would prepare a work paper with a proposal for the inclusion of the DOF information, to be discussed at this Meeting.

2.3 CNS/AMHS SUBGROUP

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

2.3.1 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.

2.3.2 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.

Advanced Course on AMHS

2.3.3 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).

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

2.3.4 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.

2.3.5 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.

2.3.6 The information on 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

2.3.7 During the Workshop/Meeting INTEROP TF/2, participants from the CNS/AMHS Subgroup present took note of the progress of AMHS implementation. So far, 26 out of 28 intraregional interconnections have already been implemented, remaining only the two interconnections of the COM Center in Montevideo with the COM Centers of Brasilia and Ezeiza.

2.3.8 The following interconnections are expected to be established this year:

- Caracas – Madrid;
- Ezeiza – Johannesburg; y
- Georgetown – Piarco.

2.3.9 Brazil has reported that it has already conducted successful trials between the COM Centers of Brasilia and Lisbon, but operational activation was affected by the pandemic. It was highlighted that the establishment of this interconnection provides a second route for the European continent, which currently has only the Brasilia - Madrid interconnection, via the CAFSAT network.

2.4 CNS/SUR SUBGROUP

2.4.1 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.

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

2.4.2 In the period from 26 to 29 January, 2021, in coordination with the NACC Office, the FAA 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.

2.4.3 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; and
4. Future ADS-B applications.

2.4.4 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.

2.4.5 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

2.4.6 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.

2.4.7 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

2.4.8 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

Space-based ADS-B Implementation through a Regional Project

2.4.9 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: 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.	**Expected impact:** ☐ 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: Immediately	**Situation:** Adopted in SAM/IG/25
Who: ☐ Coordinators ☒ States ☒ ICAO SAM Secretariat ☒ TCB ☒ Other: Industry/Users	

2.4.10 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).

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

2.4.12 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.

2.4.13 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.

2.4.14 During the Workshop/Meeting INTEROP TF/2, the company Aireon presented a new specific proposal for an implementation through an ICAO Technical Cooperation Project. A summary of the proposal is as follows:

1) El costo anterior de USD 275,000.00 por cada Service Delivery Point, sería rebajado para USD 125,000.00 con 2 a 3 Estados participando en el Proyecto Regional. Caso más de 3 Estados participen del Proyecto, el costo bajaría para USD 50,000.00 por cada SDP implantado.
2) El costo de la información de vigilancia para un contrato de 5 años, sería conforme la tabla abajo:

Service Volume	ICAO Prices (2021)	Prices 2022
High Density/Sole Source	$42	$44
Low Density/Sole Source	$21	$22
Low Density/ Augmenting existing surveillance/ Contingency	$8.5	$9
Medium Density/ Augmenting existing surveillance/ Contingency	$5.25	$5.50
High Density/ Augmenting existing surveillance/ Contingency	$3.15	$3.30
Ultra High Density/ Augmenting existing surveillance/ Contingency	$1.05	$1.10

3) The company would provide free of charge 2 users of Aireon's situational awareness display in each Participating State of the Project and one user for the SAM Regional Office.

4) One year (free) of SAM Region information for ATFM purposes.
5) The company provides (free of charge) 50 NM of adjacent airspaces for ATS planning purposes. This facility would resolve the issues of surveillance data exchange, once the ANSP that hires the services would have the information of the adjacent centers near its area of responsibility, increasing situational awareness.

2.5 MET/IWXXM SUBGROUP

Workshop on the OPMET International Bank of Brasilia

2.5.1 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.

2.5.2 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

Seminar/Workshop on adapting Aeronautical Meteorology Systems to the new IWXXM format

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

2.5.4 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.

2.5.5 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

2.5.6 During the INTEROP TF/2 Wokshop/Meeting, the Rapporteur of the Subgroup reported that tests were conducted between the OPMET Regional Banks of Brasilia and Brussels, with satisfactory results so far. Testing will continue during the second half of 2021.

2.5.7 Representatives of States present at the Workshop/Meeting reported on the status of implementation of the IWXXM in their countries, with most noting that the Covid-19 Pandemic had affected development progress.

2.5.8 Brazil reported that it is in the process of preparing a letter to send to ICAO SAM Office, about the system implemented in Brasilia (Regional OPMET Bank). He also highlighted that the feasibility of testing for the use of the webservice facility by only 1 meteorological center of the States is being analyzed.

3. SUGGESTED ACTION

3.1 The Meeting is invited to:

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

b) analyze other considerations that the Meeting deems pertinent.

- END -

APPENDIX

REGIONAL IMPLEMENTATION OF AIDC

ARGENTINA
As a result of the errors detected, the implementation of the AIDC is temporarily suspended by disabling the AIDC fields in the ACCs, until the problems can be solved to achieve the interconnections with the adjacent ACC. Work is under way on a process of updating automated ATM systems and AMHS systems.

BOLIVIA
The implementation of the AIDC in the Thales system is planned for 2022. A new AMHS system will also be purchased. From that moment on, it will be possible to start tests with the adjacent ACC.

BRAZIL
AIDC interconnection with Lima ACC in pre-operational phase. Pending solution by Atech of the problem of the LRM/62, as well as verify the format of the ABI message that is sent to Lima ACC regarding the information of fields 10 and 18 referring to equipment of the aircraft.
AIDC interconnections at the domestic level 100% implemented.

CHILE
AIDC interconnection between Iquique ACC and Cordoba ACC in test. AIDC interconnection at the domestic level is 100% implemented, except with the Santiago ACC and Oceanic airspace. Pending update of the Thales system of Santiago ACC to interconnect it with the adjacent ACC at the national level, and with Lima ACC at the international level.

COLOMBIA
AIDC interconnections implemented with Guayaquil ACC and Lima ACC.
AIDC interconnections at the domestic level between Bogota ACC and Barranquilla ACC and domestic APPs with independent ATM system.
Locally there are some LRM/57 problems (possibly because the adjacent ACC or APP has assumed the tracks in advance, or the coordination was done manually before the AIDC performed it automatically). Pending completion of local training.
Interconnection with Panama ACC operational, but no Letter of Agreement was signed due to ATM problems outside the AIDC.
Interconnection with CENAMER ACC pending CDN solution.
Successful tests with Kingston simulator. Kingston's operational ATM system (Thales) is being updated.
Pre-operational tests with Maiquetia's system (SAGITARIO) in process, awaiting update of Maiquetia's system by ATECH.
The interconnection with Amazon ACC is pending completion.
Colombia has organized several documents and other information concerning the implementation of AIDC in a *share point* and makes it available to other States.

ECUADOR
AIDC interconnections implemented with Lima ACC, Bogota ACC and CENAMER ACC.

PANAMA
AIDC interconnection with Barranquilla ACC operational. Letter of Agreement needs to be signed.

PARAGUAY
The implementation of the SARGITARIO system in Asunción was impacted by the pandemic. Once the implementation of the system is completed, the AIDC tests with the adjacent centers will be started.

PERU
AIDC interconnections implemented with Guayaquil ACC, Bogota ACC and Iquique ACC.
The interconnection with the Amazon ACC continues in the pre-operational phase. Successful tests in the SPIM-SBAZ direction. In the SBAZ-SPIM direction, there is an apparent incompatibility between the ABI message sent by the SAGITARIO system to the Indra system of Lima ACC, referring to Field 10 (Equipment). It is in the process of being analyzed. SAGITARIO LRM message processing pending (continues to send LRM/62 for any errors). The representative of ATECH stated that a new version will be provided in the second half of 2021, with the solution of these points.
Interconnection with Santiago ACC (Oceanic) continues suspended waiting the modernization of the Thales system of Santiago.

VENEZUELA
It is in pre-operational tests with the Barranquilla FIR. Fixed problem with the receipt of the ABI message and another error has been detected indicated by both INDRA and SAGITARIO systems, such as LRM/62. Another test is planned and it is also pending that ATECH update the SAGITARIO software, scheduled for this second half of 2021, which would facilitate the determination and solution of this error.