International Civil Aviation Organization

SIXTEENTH MEETING OF THE COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND METEOROLOGY SUB-GROUP (CNS/MET SG/16) OF APANPIRG

Bangkok, Thailand, 23 – 27 July 2012

Agenda Item 19: Any other business

SIGNIFICANT OUTCOME OF AERONAUTICAL COMMUNICATION PANEL WORKING GROUP – I (IPS) AND M (MAINTENANCE) MEETINGS

(Presented by Secretariat)

SUMMARY

Aeronautical Communication Panel Working Group – I (IPS) meeting was held in Montreal from 28 to 30 May and Working Group – M (Maintenance) meeting was held also in Montreal from 30 May to 1 June 2012. This paper discusses significant outcome of the two meetings.

This paper relates to –

Strategic Objectives:
A: Safety – *Enhance global civil aviation safety*
C: Environmental Protection and Sustainable Development of Air Transport – *Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

Global Plan Initiative:
GPI-22 Communication infrastructure

1. Introduction

1.1 Fifteenth Working Group – I (IPS) meeting of ICAO Aeronautical Communication Panel (ACP WG-I/15) was held in Bucharest, Romania from 28 to 30 May, 2012. The meeting was hosted by Romanian Air Traffic Services Administration (RMOATSA).

1.2 Aeronautical Communication Panel Working Group – M (Maintenance) Nineteenth meeting (ACP-M WG/19) was held from 30 May to 1 June, 2012 in also in Bucharest, Romania. This meeting was also hosted by Romanian Air Traffic Services Administration (RMOATSA). This paper discusses the issues relevant for the region. This paper discusses significant outcome of both the meetings.

2. Discussions

ACP Working Group – I (IPS)

Action Items

2.1 ACP WG-I/15 was informed that Action Item that ICAO Secretariat will work to obtain IPv6 address block for the Regions remained open. It was also informed that Action WG-I/14-05 about ICAO to develop a justification for a /16 address block and make an application to ARIN or IANA based on expediency also remained open. Another action item Action WG-I/14-08 that required ICAO to apply for new Top Level Domain (TLD) and draft appropriate guidance material on the allocation of lower level domain names remained open also.

System Wide Information Management (SWIM)

Regional IP Implementations

2.2 With reference to the use of IP for ATM communication following points was presented to the meeting:

- use of COTS equipment with required capabilities is recommended to continuously inspect and monitor traffic through Inspection and Firewall modules;
- determining and then monitoring traffic pattern baselines is necessary to ensure that the network is functioning correctly and that no traffic anomalies have occurred;
- applying most effective routing protocols is key for ensuring high performance convergence time of the whole network;
- strict management of multicast is needed to prevent “storms” and “flooding”; and
- Satellite backup (VSAT) is implemented for business continuity of critical applications.

2.3 Meeting was informed about the informal group Joint Coordination Group (JCG) to deal with cyber-security and its involvement with ICAO Aviation Security (AVSEC) Group. It was proposed that ACP could exploit JCG interest in Network Security to lobby States to recommend at 12th Air Navigation Conference that ICAO provide the resources needed by the ACP to complete its work on IPS guidance and implementation. It was generally felt that establishment of a task force to coordinate cyber-security would:

- duplicate the work ACP WG/M group is already dealing with; and
- invalidate the work of the ACP thus far by selecting different standards.

2.3.1 An action item was developed inviting Secretary to develop a short explanation of the approach to be used with JCG to obtain additional resources to assist the ACP with the development of IPS guidance material.

Surveillance Data Distribution System (SDDS)

2.4 Meeting was informed about the IP platform developed independent of PENS and used to support distribution of surveillance data by EUROCONTROL. The presentation was more focused on the security arrangements. Some of the salient issues covered by the presentation are as follows:

- the system also covers data-link distribution;
- it also supports SOA services such as Publish/Subscribe and Request/Reply;
- it provides stateless and stateful security as needed; and
- acts as a gateway between different national systems: i.e. IPv6 vs IPv4, multicast vs unicast.

2.4.1 It was pointed that the surveillance data itself is not protected as it has such a short lifetime. The security provides protection for the system management software and hardens the system against intrusions through spoofing and other techniques. The platform architecture chosen for the transport of surveillance data can support any IP based message communication system. The domain specific applications are integrated in the form of plug-ins. The layered structure of the platform allows re-use of components with or without very limited adaptations to reduce development, validation and certification cost and improve harmonization. In addition, the use of open protocols at the infrastructure side (Simple Network Management Protocol (SNMP) for monitoring and control and XML (for configuration) ensures easy integration in the center infrastructure. The platform is fully Service Oriented (supporting publish/subscribe and request/reply mechanism), which ensures SWIM compatibility. The software and documents are at present available free of charge only to EUROCONTROL member States. Participants were invited to provide ideas and were requested to support development of new plug-ins. It was clarified that any message based IP communication can be handled by the SDDS by developing a domain specific plug-in with suitable Application Programming Interface (API). The plug-ins can be run on a single server or can be run on different servers also, if performance is important.

System Wide Information Management (SWIM)

2.5 Discussing the role of ACP's potential role in SWIM standardization, a number of key points (including the following) were raised:

- How do we migrate to SWIM?
- How to ensure upward compatibility with existing ACP developments?; and
- implementation guidance development for current deployed systems migration (e.g.)

AMHS, EUROCONTROL Surveillance Data Distribution System) in the context of SWIM

- SWIM is a global effort, consequently it is essential to maintain the appropriate standardization in ICAO;
- there are various System Oriented Architecture (SOA) standards and it should be ICAO's role to determine which should be adopted for global use; and
- management of Security in SWIM.

2.6 At ACP WG-I/14 meeting it was argued that a task force should be established to evaluate SWIM and determine ACP's role. This resulted in Action Item 14-9, which remains open. It was suggested that airline and airports personnel should also participate in this task force. It was agreed to develop an action item detailing FAA to look into FAA intentions to deal with SWIM at the 12th Air Navigation Conference. Meeting also decided to be proactive with regard to adoption of SWIM and adopted an action item inviting ICAO to write to the States seeking their support for SWIM activities and proposed conduction of a workshop on SWIM.

2.7 Meeting noted that an initial SWIM Concept of Operation (ConOps) was produced by SESAR which provides a clear definition of the building blocks. The transition to SWIM will be an evolutionary process likely to be started by implementing AIXM and WXXM and being made Service Oriented Architecture compliant. It was clarified that standardization of SWIM will be required to provide global interoperability and harmonization.

Security

2.8 Secure Dialogue Service (SDS), which will be proposed as the security solution for the ATN using OSI will be expected to have following key advantages:

- the solution will facilitate implementation of Security over OSI and is consistent with IPS security requirements;
- it resides between the upper layers and the application thus eliminating the need for security provisions in the application or layers of communication stack; and
- its implementation is optional thus providing backward compatibility with existing implementations (e.g. Link 2000+)

This approach was well regarded by the meeting.

It was also informed that the changes to Doc 9880 were expected to be completed by the end of this year and validation is likely to be completed by mid 2013.

12th Air Navigation Conference

2.9 Following is the summary of presentation on the preparation for 12th Air Navigation Conference made to the ACP Working Group – I (IPS):

1) Block upgrades and roadmaps were developed by a group which included participants from NextGen, SESAR, airlines, airframe manufacturers, industry-standards bodies and other industry groups;

2) Block upgrades and the modules have gone through three stage review by the global civil aviation community;

3) Modules represent operational improvements which will be available for implementation at milestones separated by five years;

4) Many modules provide a phased implementation of an operational capability;

5) Block milestone dates represent the time that all provisions (technology, procedures, regulatory approvals, business case etc.) will be in place to allow implementation to take place;

6) Implementation of modules is not mandatory but shall be determined based on a needed performance improvement basis;

7) The roadmap includes technologies which support block upgrade modules as well as legacy technologies;

8) Next edition of Global Air Navigation Plan (GANP) will be based on ASBU and will support roadmaps. The GANP will have guidelines to allow the PIRGs to maintain and update their regional air navigation plans;

9) The FASID will be updated through a Performance Framework Form which has been updated to accommodate the ASBU modules; and

10) Implementation by Regions will be monitored and published each year in a Global Air Navigation Report.

ACP Working Group – M (Maintenance) meeting

Action Items

2.10 Action Item WG-M/15-01 requiring Secretary to explore the possibility of improving the collection of data related to implementation issues by allowing Regional Offices to convey information to ICAO HQ remained open. Also Action Item WG-M/15-04 requiring Secretary to provide guidance material on the use of the AMC in Part 2(b) of Doc 9880 remained open. Action Item WG-M/16-02 requiring Secretary to take action to allow ICAO GIS portal to be used as a means to the timely capture of information on bilateral AMHS connections and other CNS developments remained open. Status of a number of other Action Items concerning implementation of air-ground and ground-ground communication was also reviewed.

ATN Security Standards

2.11 Updates to ICAO Doc 9880 were proposed based on the information provided regarding Secure Dialogue Service (SDS). It is an alternative for implementing security in the Upper Layer Communication Services (ULCS). In addition to reducing complexity, SDS permits security to be achieved in one sub-layer rather than involving CM for key exchange. The SDS facilitates i) interworking with current implementations and ii) the optional implementation of security and iii) is consistent with ATN/IPS security requirements for legacy applications. Meeting was reminded about the details of the original addition of security to the ATN/OSI stack in Doc 9705 Edition 3, which addressed the standards for securing air-ground communications. Security requirements in ATN/IPS

environment have been defined in ICAO Doc 9896, which uses the mobile IP as the mobility solution over TCP/IP or UDP/IP protocol. Doc 9896 includes an IP Dialogue Service which allows legacy (ATN/OSI) applications such as CPDLC and CM to operate in the ATN/IPS environment. The information provided to the meeting can be summarized as below:

a) the proposed Secure Dialogue Service approach would simplify the implementation of ATN security;

b) security is performed in only one place, i.e. in the Secure Dialogue Service sub-layer;

c) Doc 9880 ULCS can be updated to remove the security features. The document then becomes an equivalent to Doc 9705 Edition 2 with PDRs incorporated;

d) Secure Dialogue Service provides implementation options: It can be implemented or not implemented and if implemented used or not depending on the operational domain; and

e) in any case the applications and ULCS would be the same.

Some issues like crypto, SDS primitives etc. were raised in the meeting. The meeting decided to form an SDS sub-group under WG-M to develop detailed technical material for ULCS and SDS.

2.12 With reference to the data-link security, some recommendations were made by the airframe manufacturers recommending coordination and cooperation in reviewing the integrated security requirements. It was agreed that the anticipated security approach was not clear and hence a delay may be caused because of this to the equipage. Proposed amendments for Doc 9880 to accommodate FIS and ADS-C were also discussed

2.13 Amendment proposal for ICAO Annex 10, Volume II to accommodate enhanced operational requirements for AFTN resulting from Amendment 1 of PANS ATM (Doc 4444) (known as FPL 2012) to become applicable on 15 November 2012 was presented. The proposal, to a lesser extent addresses aeronautical applications supporting AIS/AIM (Annex 15) and MET (Annex 3) also. The proposal highlighted that introduction of FPL 2012 and other new/amended applications could affect AFTN messages in three areas where AFTN format was constrained:

1) the maximum line length set to 69 characters;

2) the used character set, limited to a smaller number of authorized characters (capital letters only, digits and some punctuation marks) listed in Annex 10, Volume II, 4.1.2; and

3) the maximum text length set to 1800 characters, and the correlated overall maximum message length (2100 characters).

2.13.1 Some of these constraints, particularly the 69 character line length limitation were due to the historical specifications of AFTN using telegraphic ITA-2 message format. Regarding items 2 (character set) and 3 (text length), it was informed that States were already allowed by Notes included in Annex 10, Volume II to relax compliance with these constraints (if the AFTN Comm. Centres were able to handle messages exceeding these limits). This would apply on a local basis or be based on bilateral agreements. However no such statement existed in Annex 10, Volume II authorizing States to relax the line length requirement. The amendment proposal was aimed at

inserting a similar note for the purpose of accommodating line length in excess of 69 characters, if it could be accommodated in their message switch. Similar note covering messages with maximum length over 2100 characters was also placed before the meeting. The meeting approved the Amendment Proposal. This amendment will require changes to the provision of AFTN/AMHS Gateway, as specified in Doc 9880, Part II also. Considering that AMHS does not constrain the contents of messages as strictly as AFTN does, one of the functions of AFTN/AMHS Gateway is to protect AFTN from AMHS messages exceeding AFTN capabilities, particularly in respect of line length, character set and the message length. So if the AFTN constrains are removed or relaxed, the protection clause applicable for the Gateway specification will also need to be modified to avoid Gateway from becoming the bottleneck.

AMHS Directory and other services

2.14 Issues related to the use of File Transfer Body Parts (FTBP), particularly the registration of Object Identifiers (OID) were taken up for discussion by the meeting. Since these OIDs are required to be unique on a world-wide basis, it was decided to register already declared OID values in Europe in the ICAO EUR AMHS Manual. Meeting developed an Action Item requiring Secretary to coordinate the organization of the OID registration. The meeting also discussed implementation of "European Directory Service" (EDS). EDS takes into account the existing infrastructure for management and distribution of AMHS address information by the AMC.

SwiftBroadband Services

2.15 Efforts taken to make the SwiftBroadband (SBB) services suitable for safety services were presented to the meeting and it was informed that each message sent by SBB avionics will carry GPS derived location data. Meeting was also informed about NEXUS, a group formed under the EUROCONTROL NEXSAT SG aiming at developing material for an update of the ICAO documents (AMS(R)S SARPs and Technical Manual) to introduce more stringent performance requirements to support future ATM concept in 2020+ timeframe. NEXUS is proposing to establish following classes of service:

a) Class C – capable of supporting current levels of performance

b) Class B – capable of supporting initial 4D operations

c) Class A – capable of supporting full 4D operations (such as Block 3 of ASBU)

2.15.1 It was noted that current (commercial) satellite systems such as INMARSAT SBB and Iridium Next should support Class B performance but a new system may be needed for Class A services. It was agreed that a sub-group will be formed to deal with the work on SwiftBroadband. The first task would be to add guidance material on the provision of Class C services through SBB. This would be followed by work on generic SARPs to support Class B services (from SBB and other satellite services) once input had been received from NEXUS group.

SELCAL Code Pool Shortage

2.16 Issue of shortage of SELCAL codes (because of issuance of more than 30,000 codes against possible 10,920 unique codes) was raised in the CNS/MET SG/15 and in APANPIRG/22. The same issue was raised in the ACP WG – M (Maintenance) meeting also. It was informed that Aviation Spectrum Resources Inc. (ASRI), the organization responsible for administering Selective Calling (SELCAL) codes had a meeting with the SELCAL avionics vendors and other interested organizations to review possible alternatives to expanding SELCAL code pool. As a result of the

meeting, a solution was agreed upon for adding 16 new tones (frequencies) to the current system with frequencies being interspersed between the existing 16 tones. The solution provides a large set of possible SELCAL codes (215,760) and also meets the goal of not impacting the existing avionics. A nomenclature to identify the 16 new tones was identified by using the upper case alpha characters T through Z and numbers 1 through 9 inclusive. ACP Working Group – M agreed in principle with the ASRI proposal for SELCAL code pool extension but considered the proposed date of implementation 1 September 2014 too optimistic. An Action Item was developed for ASRI to conduct a survey to assess the suitability of SELCAL Code Extension date and also consider linking it with the FPL 2012.

Status of ICAO Doc 9880

2.17 Regarding the status of publication of ICAO Doc 9880, the meeting was informed that:

i) Edition 1 Containing Parts 1 to 4 was published in 2010;

ii) Amendment to provide material for Part 3 was approved in 2011; and

iii) Edition 2 will be published when material for the following has been incorporated into the document.

a) Security Provisions;

b) Registration Provisions (previously in Doc 9705 Sub-Vol. 9);

c) Directory Service;

d) FIS and ADS-C; and

e) Changes needed for consistency with other ICAO and industry documents

2.17.1 Meeting was advised that once the next edition has been prepared, publication would take approximately twelve months. During this period the draft edition would be posted on ICAO Net as an un-edited advance copy.

2.18 It was decided to hold the next meeting in Montreal from 23 to 30 January, 2013 in conjunction with the next meeting of Working Group I.

3. Action Required

3.1 Meeting is invited to note the significant outcome of ACP Working Group I and M meetings, particularly information provided in respect of shortage of SECAL Code pool and the solution worked out to mitigate that problem.

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