International Civil Aviation Organization

EIGHTH MEETING OF THE ASIA/PACIFIC OPMET MANAGEMENT TASK FORCE (OPMET/M TF/8)

Bangkok, Thailand, 23 – 25 March 2010

Agenda 5: Future exchange and reception of OPMET information

b) ISCS-G2 cessation plans and WIFS development

ISCS-G2 CONTRACT EXTENSION STATUS AND WIFS OPERATIONAL STATUS

(Presented by USA)

SUMMARY

This Working Paper conveys the updated information on contract extension to the existing International Satellite Communication System-2nd Generation (ISCS-G2) contract and the status of the World Area Forecast System (WAFS) Internet File Service or (WIFS) operational readiness. The WIFS related implementation documents have been developed and ready for review. The current ISCS-G2 user States are requested to coordinate the transition to WIFS no later than June 2012 when the extended ISCS-G2 contract will expire.

1. INTRODUCTION

1.1 BACKGROUND

1.1.1 At the International Civil Aviation Organization (ICAO) Communications/Meteorology (COM/MET) Divisional Meeting in April 1982, it was unanimously agreed that two States/Members would accept responsibility for operation of a World Area Forecast System (WAFS) that provides global products in support of flight planning. The United States (U.S.) and the United Kingdom established World Area Forecast Centres (WAFC) to provide this capability and agreed to provide a satellite broadcast to disseminate these products. Establishment of two centres allowed for the needed redundancy to ensure continuity of service in the event of a failure or disruption of service at one of the centres.

1.1.2 The report of the 1982 COM/MET Divisional meeting outlined a clear division of responsibility between the provider State and user State for the broadcast and reception of WAFS products via satellite. Paragraphs 1.1.2.1 and 1.1.2.2 below (in italics) are excerpts from the 1982 meeting report.

1.1.2.1 The provider State be responsible for the generation of area forecast products, and making them available in a uniform manner to user States, with no products being uniquely generated on behalf of a particular State or region. The demarcation point at which these products were thus made available was effectively the satellite concerned.

1.1.2.2 It is incumbent on the user State to arrange for access to that satellite for the reception of these products, and to arrange nationally for selecting, processing, distributing and making available products in keeping with national requirements and international commitments unique to that State.

1.1.3 The U.S., in accepting the responsibility of being a WAFS provider State, currently operates a satellite broadcast for the distribution of WAFS products. The U.S. Federal Aviation Administration (FAA) funds the communication costs for the satellite broadcast. The U.S. National Weather Service (NWS) collects and makes available WAFS data, in addition to managing the contract for leasing the satellite broadcast service from a telecommunications vendor. The NWS contract for leasing the satellite broadcast capability for the distribution of WAFS products is called the International Satellite Communications System (ISCS) 2nd Generation (G2) contract. The ISCS-G2 contract expired at the end of December 2009. In accordance with U.S. procurement law, the U.S. government had to re-compete the service to continue the satellite broadcast or identify an alternative method for providing the WAFS service to meet the US government obligations to ICAO.

1.1.4 As noted above the ISCS-G2 fullfilled the US government obligations for a satellite broadcasat to provide Operational Meteorological Data (OPMET) and WAFS products to authorized users. The US government also provides backup service for the satellite broadcast. The file server is managed by the US National Weather Service (NWS) via the File Transfer Protocol (FTP).. However, this server was not explicity intended for WAFS users, and as currently configured, is not user friendly. The FAA in colloboration with the NWS has recently deployed a more user friendly Internet File Server accessible via the Secure Hypertext Transfer Protocol (HTTPS) for WAFS users. This Server is referred to as the WAFS Internet File Server (WIFS).

1.2 WIFS Coordination in ASIA/PAC and CAR/SAM Regions

1.2.1 The US presented a working paper at the APANPIRG CNS/MET SG-13 in July 2009 outlining options under consideration at that time:

a. Replace the ISCS-G2 satellite broadcast to internet based WIFS
b. Replace the ISCS-G2 with a 3rd generation broadcast satellite (ISCS-G3)

ICAO Asia/Pacific Regional office issued a State letter to survey the States for their readiness to support either options (ISCS-G3 or WIFS).

1.2.2 The results from the State letter are as follows:

a. The following States indicated support for WIFS
Australia
Singapore
New Caledonia
New Zealand
Thailand (support either options)

b. The following States indicated support for ISCS-G3 (with stated reasons)
Hong Kong, China (reliability of internet for WAFS products and QOS)
China (internet security would have potential risk to metorological service)
Fiji (reliability of ISP and QOS)
Japan (internet security and QOS)

1.2.3 The US presented a working paper on the use of WIFS as a replacement for ISCS-G2 at the Tenth Meeting of the GREPECAS Aeronautical Meteorology Subgroup (AERMETSG/10) held in Buenos Aires, Argentina, 19 to 23 October 2009. States in CAR/SAM agreed to support the transition to WIFS. To transition to WIFS in an orderly manner, the AERMET SG establsihed a

Task Force to provide oversight to the transition and to assist the FAA in coordinating with States on the actions required by States to fully transition to WIFS. The schedule and actions identified for the task force can be found in Appendix C, Task Force on WAFS in the Final Report of the Tenth Meeting of the GREPECAS Aeronautical Meteorology Subgroup (AERMETSG/10).

1.2.4 The Washington WAFC Provider State presented a working paper on the devlelopment of WIFS as a replacement to ISCS-G2 at the Fifth World Area Forecast System Operations Group (WAFSOPSG/5) Meeting in September 2009 at Paris, France. The final report for WAFSOPSG/5 notes the following: *The group noted that the WIFS, which was being developed to support the distribution of all WAFS forecasts, would allow States, through the use of the Public Internet, to have access to all WAFS forecasts and OPMET data currently available through the ISCS. In view of the cost effectiveness of Internet-based distribution systems both for the service provider and users, the WIFS was being implemented by the ISCS Provider State as soon as possible and no later than March 2010.*

2. DISCUSSION

2.1 ISCS-G2 Contract extension

2.1.1 To avoid a disruption in the WAFS services via satellite broadcaast, the FAA has succesfully extend the exiting ISCS-G2 contract, which was scheduled to be expired in December 2009 to June 2012. After careful review and assessment of the need to continue to provide a satellite broadcast two principal factors surfaced to conclude that the WAFS service can be provided via the Public Internet. Firstly, States in CAR/SAM have agreed that the Public Internet was acceptable means to access WAFS products in support of fligh planning. Secondly, States in ASIA/PAC had a mixed response with some agreeing to support WIFS with some States concerned about security and QOS. However the issues raised by security and QOS are addressed by ICAO Doc 9855 and FAA AC 00-62. These documents address issues of security and QOS in order to use the Public Internet to access meteorological data for flight planning. Thirdly, the costs to continue a satellite broadcast and the costs for States to upgrade ground stations are significant and that the benefits to be derived for maintaining a satellite broadcast vs the use of Public Internet to access data in support of flight planning were not justified. Thus,he FAA would like to emphasize the need to convert from ISCS-G2 to internet based WIFS before March 2012, three months before the expiration of ISCS-G2 extended contract.

2.2.1 ISCS-G2 Replacement Options Comparison

1. Replace the ISCS-G2 with a 3rd generation broadcast satellite (ISCS-G3)
2. Replace the ISCS-G2 satellite broadcast to internet based WIFS

1. Replaced ISCS

Bandwidth:	128 Kbps
Provider Availability:	0.999
Diversity:	Using SADIS if available
New equipment:	Very Likely. No guarantee that existing end user equipment under ISCS-G2 could be used
Selective Data Capability:	No. Every user receives an identical broadcasted data and WAFS Work Station customized to specific user requirements.
Data on Demand Capability:	None
Future Expansion:	None

Cost:	High (Provider cost is estimated $US 2M for annual recurring cost and $US 3M for Non-recurring cost-User cost for equipment is estimated $US 26K depending on selection of vendors)

2. WIFS

Bandwidth:	64 Kbps with burst rate of 512 Kbps is required. High speed internet could provide up to1.544 Mbps
Provider Availability:	0.9993
Diversity:	Virtually connected to 3 separated geographically web farms. Can use SADIS FTP as backup
New Equipment:	User might need to upgrade software and/or work station
Selective Data Capability:	Yes. User can download specific data.
Data on Demand Capability:	Yes. User can download data as needed 24 hours/day 7 days/week.
Future Expansion:	Yes. Higher bandwidth can support more data
Cost:	Low (Cost of user's equipment is varied depend on vendors and contract arrangement. No satellite ground station equipment is required)

2.3 Recommended WIFS to replace ISCS-G2 service

Based on the service availability, network diversity, data on demand capability, and future expansion to support graphic based data, is the FAA plans on replacing ISCS-G2 with WIFS. The use of the Public Internet will be the principal means to access WAFS products in support of flight planning.

2.4 Transition to WIFS

2.4.1 After June 2012, when the extended contract of ISCS-G2 is to expire, the WIFS file server will be the primary means for users to obtain WAFS data products from the Washington WAFC. WIFS is expected to be available for operational use by March 2010 for initial testing. Users are responsible for arranging access to the Public Internet, and also for any required modifications to WAFS workstation software necessary to download WAFS products off of the WIFS.

2.4.2 The FAA will provide a WIFS users guide. The guide will provide information on user access, customer login process, file formats, and directory structures.

2.4.3 The Interface Control Document (ICD) has been developed and will define the interface parameters between the WIFS server and WAFS Work Stattions.

2.4.4 The FAA has been coordinating with the current WAFS terminal vendors for the purpose of allowing vendors to not only test the system but to also to develop WIFS compatible application software.

2.4.5 In support of the U.S. proposal, the CNS/MET SG/13 of APANPIRG held 20-24 July 2009 in Bangkok, Thailand, the meeting developed the following decision based on the discussion above:

Draft Decision 13/30 – Use of the public Internet to access OPMET data and WAFS forecasts

That, OPMET data and WAFS forecasts currently distributed through the ISCS, if only used for flight planning, can be considered non-time critical and therefore, can be accessed through the public internet. Note: Relevant ICAO guidance will be updated accordingly, subject to consideration of a similar decision by the WAFSOPSG/5 Meeting and subsequent endorsement by ANC.

The FAA reviewed all options and concerns from States as well as the prociurement process and has decided to pursue the use of WIFS as the only mean to provide WAFS products.

2.5 Access to WIFS options

The concerns provided by States for not supporting WIFS are mostly Quality of Service (QOS) and the internet security.

2.5.1 Quality of Service (QOS): The WIFS shall comply as a Qualified Internet Communication Provider (QICP) in accordance with Federal Aviation Administration's (FAA) Advisory Circular (AC) 00-62 which is similar to the ICAO Doc 9855, Guidelines on the Use of the Public Internet for Aeronautical Applications, using the Hypertext Transfer Protocol Secure (HTTPS) protocol to deliver WAFS data products. WIFS will provide access to WAFS products which are stored in directories, grouped by type. This data is accessed by the WAFS workstation vendors using the GNU "wget" a free software package for retrieving files using HTTPS a widely-used secure Internet protocol. This open source package is available for Windows or Linux Operating Systems. For more information please refer to Working Paper title "Development of WIFS" to be presented next.

2.5.2 For those State's because of national practices are not allowed to use the Public Internet an alternatives to Internet connection to WIFS is proposed:

a. Use of Virtual Private Network (VPN) connection: stringent security but require VPN capability at WIFS server and Work Station (cost is estimated to be low)
b. Dedicated circuit: stringent security using dedicated circuit but result in reduced availability and diversity. The monthly cost for the circuit is estimated approximately $2,000.00 per circuit
c. Dedicated circuit to Local Internet Service Provider (ISP) in USA or in any State: Reduced availability and diversity. Not improved security and the monthly cost is estimated approximately $2,000.00
d. WAFS Work Stations establish connection to SADIS-2G if the VSAT is under the SADIS footprint. However, State would be required to procure a ground station that is compatible with SADIS 2G.

The FAA is willing to work with interested States to support the appropriate connection to WIFS and proposes that a Task Force similar to AERMET be established.

2.6 WIFS Implementation Schedule

QICP Approval	Frebuary 2010
Interface Control Document (ICD)	March 2010
User Guide	March 2010
WIFS Operational Readiness	March 2010
Letter issue to WAFS Work Station vendors for testing	March 2010
Beginning testing with WAFS Work Station	April 2010

2.7 WIFS Coordination Point of Contact in USA

For all ISCS-G2 transition to WIFS environment, please direct all your corespondence to:

Steven Albersheim
Federal Aviation Administration
Mail Stop: AJB-68
800 Independence Avenue, SW
Washington, DC 20591
Phone: 1-202-385-7185
Email: steven.albersheim@faa.gov

3. RECOMMENDATION

The meeting is invited to review the WIFS operation and prepare for WIFS transition as required. The FAA would request the conclusion to recommend the WIFS to replace ISCS-G2 to APANPIRG/21 for adoption after reviewing by CNS/MET SG/14 scheduled for 19-23 July 2010. Furthermore, an ICAO State Letter is requested to be issued after the adoption of WIFS in the APANPIRG/21 meeting scheduled for 6-10 Septemeber 2010 to allow current WAFS user States enough time for completting its transition before March 2012.

3.1 In light of the above discussion, the group is requested to consider adoption of the following conclusion;

Conclusion 8.xx Transition by the Washington WAFC to a WAFS File Server

a. That Washington WAFC is invited to keep the APANPIRG OPMET/M Task Force members apprised of the transition to the WAFS File Server and the operation of the WIFS via provision of appropriate User and ICD guidance documents,

b. WIFS is to be recognized as the primary means to access WAFS products from the Washington WAFC and

c.That ISCS-G2 is scheduled to terminate effective June 2012

4. ACTION

The group is invited to consider the proposed recommendation for adoption.

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