



International Civil Aviation Organization

**Eight Meeting of the Communications/Navigation/Surveillance and
Meteorology Sub-Group (CNS/MET SG/8) of APANPIRG**

Bangkok, Thailand, 12-16 July 2004

**Agenda Item 8: Review of the implementation of WAFS
1) Implementation of ISCS and SADIS**

**EXPERIENCE OF RECEIVING WAFS PRODUCTS AND DATA
FROM ISCS WITH TCP/IP PROTOCOL IN JAPAN**

(Presented by Japan)

SUMMARY

This information paper describes several problems that JCAB and JMA encountered during the transition of ISCS protocol from X.25 to TCP/IP and actions taken by them to ensure the dissemination of WAFS products and data for aviation users in Japan.

1. INTRODUCTION

1.1 In Japan, the Japan Civil Aviation Bureau (JCAB) is in charge of development and operations of the system for receiving WAFS products and data via ISCS satellite broadcast and switching them to the Japan Meteorological Agency (JMA), which has the responsibility of distribution of WAFS products and data to aviation users.

1.2 During the transition period, although both organizations undertook appropriate preparations for applying to the new TCP/IP protocol, several problems occurred. History of the implementation and actions taken by the organizations are explained in the following paragraphs.

2. HISTORY OF ISCS TRANSITION TO THE NEW PROTOCOL

2.1 The State letter AP-MET0014, dated 28 February 2003, with the subject "Upgrade of the ISCS and replacement of workstations", was distributed from ICAO Asia and Pacific Office to the contracting States concerned. It stated in the second paragraph:

"... It is envisaged that the transition from the current to the new system will last about one year. Furthermore, approximately a **nine-month dual operation** (X.25 and TCP/IP) is planned to ensure a smooth transition to the new ISCS in early 2004."

2.2 JCAB and JMA started preparations for the transition to the new TCP/IP protocol. Since the reception system is not a stand-alone one, but connected to the telecommunication network for distribution (shown as Figure), installation of a Protocol Converter was planned to minimize the implementation cost. Although detailed technical information was necessary for the implementation, information given by the ISCS program office and MCI was not oriented to the situation in Japan.

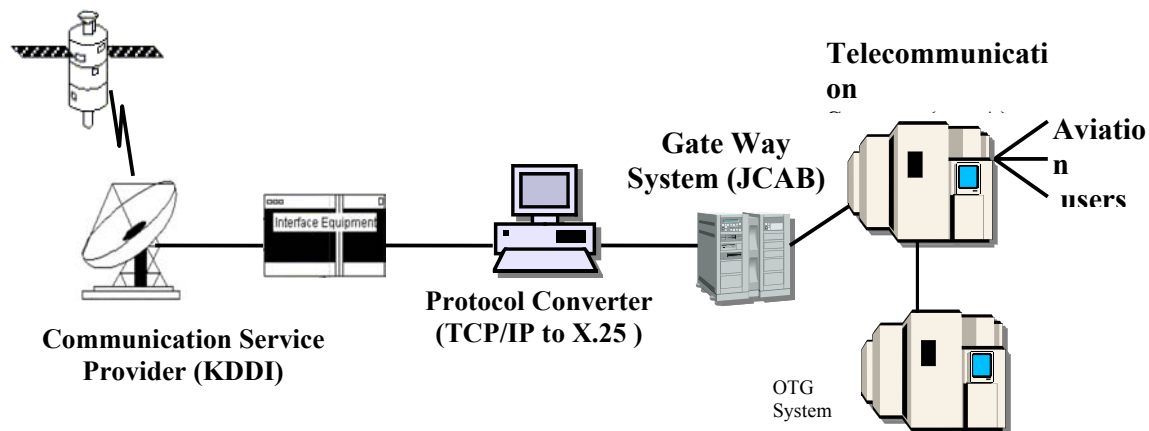


Figure: Configuration of Reception System for WAFS broadcast

Note:

- ISCS data are transmitted with TCP/IP protocol to Protocol Converter
- TCP/IP stream is converted into X.25 at Protocol Converter
- PD Receiver software is installed in Protocol Converter

Note: OTG (Oceanic Track Generator)

2.3 APANPIRG CNS/MET SG/7, held from 15 to 21 July 2003, was provided with a revised schedule for implementation of the new ISCS, as follows:

- The TCP/IP protocol will be introduced in mid September 2003; the X.25 protocol will be also available until 1st January 2004.

2.4 After waiting for the start of the broadcast with the new protocol for several month, JMA received a letter dated December 17, 2003 from International Activities Office of the National Weather Service (NWS) of the United States, which announced that the NWS had issued a contract modification to MCI extending the X.25 broadcast over the ISCS through March 31, 2004.

2.5 The broadcast with TCP/IP commenced on 19 February 2004, which enabled JCAB to start testing the upgraded software with real data. Several unexpected problems arose as described in Section 3.

2.6 JMA received a formal letter W/NA/T.3-ISCS, dated 1 April 2004, from World Meteorological Organization (WMO) with the subject "Upgrade of the ISCS user sites". It notified that the dual operation (X.25 and TCP/IP) had been started and that the definite switchover to TCP/IP would take place on 30 April 2004.

2.7 E-mail with the subject "Extension of X.25 ISCS Broadcast to 31 May 2004" was sent from the Program Leader for ISCS on 29 April 2004. This was followed by another with the announcement of further extension of the dual operation to 30 Jun 2004 sent on 29 May 2004.

3. ISSUES ENCOUNTERED DURING THE IMPLEMENTATION

3.1 Change of format

3.1.1 At first, there was information concerning the change of the protocol only, and therefore assumption was made that there would be no change of data format. However, after the commencement of reception of real data on 19 February 2004, several changes of the format were found.

3.1.2 The files received and stored with the PD-Receive interface software were archived. It required an additional procedure in the data handling software

3.1.3 The FAX data file in X.25 stream was divided into several segments with data size not exceeding 15KB. In contrast, that in TCP/IP is not segmented. It causes a serious problem, since the current message switching system does not allow large data files.

3.1.4 The sequential number contained in a file was changed to five digits, instead of previously used three digits.

3.2 Change of stream

3.2.1 In the previous ISCS broadcast, the data streams were separated into six Permanent Virtual Circuits (PVCs) as follows:

- PVC-1 WAFS GRIB Products
- PVC-2 WAFS Alphanumeric Data Bulletins
- PVC-3 WAFS T4 Graphics Products
- PVC-4 RMTN-IV GRIB Products
- PVC-5 GTS Alphanumeric Data Bulletins
- PVC-6 RMTN-IV T4 Graphics Products

3.2.2 With the new ISCS broadcast, the PD-Receive interface software produces archived files which contain data with all types mixed. Since the current message switching system requires the separation of A/N, FAX and binary input, a data type selection process had to be added.

4. CONCLUSION

4.1 JCAB and JMA encountered several problems associated with the transition of ISCS protocol from X.25 to TCP/IP. Both of the organizations consider that one reason is the delay of the commencement of the broadcast with the new protocol and the consequent shorter dual operation period for real-time testing of the upgraded software.

4.2 WAFS data utilization in Japan is different from most of the other States in that its own system was developed for distribution of WAFS data to the systems of the users, who use them as indispensable information to their operations. In particular, JCAB's daily operations of generating oceanic flexible track routes, which aim at safe and efficient international air navigation, depend largely on the data.

4.3 In the future, all the WAFS user States should be given complete technical information on any change in the WAFS broadcast well in advance.

4.4 During the transition to the new protocol, efforts of NWS of the United States for arrangement of backup means of obtaining the WAFS products were of great help to JMA and aviation users.

5. ACTION BY THE MEETING

5.1 The meeting is invited to note the information described in this information paper.

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