

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 8: Regional Implementation of the World Area Forecast System (WAFS)

2) Current status of WAFS implementation

**SURVEY ON OPERATIONAL USE OF SERVICES AND PRODUCTS FROM SERVICE
PROVIDERS OF WORLD AREA FORECAST SYSTEM (WAFS) IN ASIA/PACIFIC
REGIONS AND WAFS TRAINING NEEDS OF ASIA/PACIFIC STATES**

(Presented by Chairman, WAFS Implementation Task Force)

SUMMARY

This paper presents the results of a survey in the Asia/Pacific Regions during December 2011 to January 2012 on the operational use of services and products from service providers of the World Area Forecast System (WAFS) in Asia/Pacific Regions and the WAFS training needs of Asia/Pacific States.

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 Initiatives:

GPI-19 Meteorological Systems

1. Introduction

1.1 The Asia/Pacific World Area Forecast System Implementation Task Force (WAFS/TF) of the Communications, Navigation and Surveillance/Meteorological Sub-group (CNS/MET SG) of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) conducted a survey from December 2011 to January 2012. This was the second annual survey to solicit information on:

- (a) the operational user of services and products from service providers of the World Area Forecast System (WAFS) in the Asia/Pacific Regions; and
- (b) the training needs of Contracting States/Territories in the Asia / Pacific Regions on WAFS.

2. The questionnaire

2.1 The questionnaire for the survey (Appendix A) covers the following areas:

- (a) Access to WAFS services;
- (b) Transition of GRIB1 to GRIB2 WAFS data;
- (c) Utilization of trial gridded forecast of icing, turbulence and CB;
- (d) Secure SADIS FTP download speed
- (e) Training needs.

2.2 At APANPIRG/22, there was discussion on the download rate of the current Secure SADIS FTP. It was noted that the Secure SADIS FTP download rate was lower than that of the WAFS Internet File Service (WIFS). There was also a view that the bandwidth of Secure SADIS FTP service might have to increase in light of the fact that more users were expected to transition from SADIS FTP to Secure SADIS FTP due to 1) the transition of service is obligatory by November 2012 for SADIS FTP users, 2) a likely increase in Internet users versus satellite retrieval, 3) States selecting passive mode versus active mode for security reasons, and 4) the need for assuring Secure SADIS FTP can manage a large volume of users in the rare event WIFS service were to fail. To assist in determining the users' needs for the SADISOPSG/17 Meeting, it was decided to conduct a survey on bandwidth needs for Secure SADIS FTP. Given the above, APANPIRG/22 adopted the following Conclusion:

Conclusion 22/40 – Secure SADIS FTP download speed

That,

- a) The WAFS/I TF survey Asia/Pacific States to determine if an upgrade to Secure SADIS FTP download speed is considered beneficial; and
- b) SADISOPSG Member State, on behalf of WAFS/I IT, submit a paper on the regional survey results to the SADISOPSG/17 meeting.

2.3 In connection with Conclusion 22/40 a), the latest survey included a new question (re. para. 2.1 d)) to seek the views of States/Territories in the Asia/Pacific Regions.

3. Discussion

3.1 The questionnaire was sent to 28 Contracting States/Territories in the Asia/Pacific Regions by email on 30 November 2011. A total of 18 (64%) returns were received: Australia; Brunei Darussalam; China; Fiji Islands; Hong Kong, China; Macao, China; India; Japan; Republic of Korea; Malaysia; Republic of Maldives; New Caledonia; New Zealand; Pakistan; the Philippines; Singapore; Thailand; and Vietnam. The percentage of return is higher than that of the previous survey (41%). Appendix B contains the detailed results of the survey. Highlights of the results are given below.

3.1.1 Among the 18 responding States/Territories, 5 (28%) have access to UK WAFS products, 7 (39%) US WAFS products and 6 (33%) both.

3.1.2 8 States/Territories adopt UK WAFS as the primary source for producing flight documentation, while 9 States/Territories use US WAFS. The remaining one State does not regulate the use of any set as the primary source.

3.1.3 Of the 11 States/Territories having access to UK WAFS products, 8 States/Territories (73%) use SADIS 2G, 10 States/Territories (91%) use SADIS FTP Service / Secure SADIS FTP Service, and 2 States/Territories (18%) via other channel (the Global Telecommunications System (GTS)). It was evident that more States/Territories were using SADIS FTP Service / Secure SADIS FTP Service as compared with the last survey.

3.1.4 Of the 13 States/Territories having access to US WAFS products, 11 States/Territories (85%) use ISCS-G2, 7 States/Territories (54%) use WIFS, and 3 others (23%) via other channel (GTS).

3.1.5 In respect of migration from SADIS FTP Service to Secure SADIS FTP Service, 10 States/Territories said that they planned to do so by 30 November 2012. 4 States/Territories have no such plan for the following reasons: (a) already receiving UK WAFS product via SADIS 2G satellite (4), (b) not enough time to prepare for switching (1) and (c) have no technical expertise in switching.

3.1.6 In respect of migration from ISCS satellite service to WIFS, 6 States/Territories said they plan to do so in 2012. 4 other States/Territories indicated no such plan for the following reasons: (a) already receiving UK WAFS products (3), and have no technical expertise in switching (1).

3.1.7 11 States/Territories (61%) said they were receiving GRIB2 WAFS data already while the remaining 7 (39%) were not. Of the former 11 States/Territories, 4 States/Territories (36%) were using GRIB2 data operationally while 7 others were not.

3.1.8 8 States/Territories indicated that they planned to use GRIB2 WAFS data operationally in 2012 (5; 62.5%) and in 2013 (3; 37.5%). 2 other States/Territories said that they have no plan to use GRIB2 WAFS data operationally because (a) not able to decode GRIB2 data (1; 50%) and (b) limited computing facilities and processing software to process GRIB2 data to generate products for flight documentation (2; 100%).

3.1.9 Concerning the planned cessation of GRIB1 data in November 2013, 6 States/Territories indicated difficulty in migration to GRIB2 data due to (a) not yet receiving WAFS Aviation GRIB2 data (3); (b) no technical expertise in processing WAFS Aviation GRIB2 data (3) and (c) no access to finances to procure the necessary GRIB2 visualization software (3).

3.1.10 On utilization of trial gridded forecasts of icing, turbulence and CB, 2 States/Territories (11%) said that they have evaluated the performance of these products while the remaining 16 States/Territories (89%) have not attempted to do so.

3.1.11 With regard to the question on Secure SADIS FTP download speed (see Question 23 in Appendix A and result in paragraph 15 in Appendix B), 8 States/Territories provided feedback. 6 of them (75%) considered an upgrade to Secure SADIS FTP download speed beneficial, while the remaining 2 (25%) considered otherwise. In comparison, more States/Territories considered an upgrade to Secure SADIS FTP download speed beneficial. One State/Territory remarked that the Secure SADIS FTP download speed should be increased to at least comparable with that of WIFS without significant increase in charge.

3.1.12 In view of the results in the previous paragraph, a working paper summarizing the results was submitted to the SADISOPSG/17 meeting, which was held during 29-31 May 2012. The SADISOPSG/17 meeting recognized that the number of users of Secure SADIS FTP had been steadily growing since it became operational in November 2010 and considered that over the coming years more users might seek Internet-based rather than satellite-based retrieval of WAFS products. The SADISOPSG considered it beneficial that a feasibility study be conducted by the SADIS Provider State into increasing the allocated bandwidth of the Secure SADIS FTP Service. The SADISOPSG formulated the following conclusion:

Conclusion 17/23 – Feasibility study into increasing the allocated bandwidth of the Secure SADIS FTP service

That the SADIS Provider State, in coordination with the SADISOPSG Technical Developments Team, be invited to:

- a) explore the feasibility of increasing the Secure SADIS FTP allocated bandwidth for users;
- b) study the increase in costs attributable to providing the Secure SADIS FTP service at various higher allocated bandwidths; and
- c) prepare a report on the results thereof, in time for the SADISOPSG/18 Meeting.

Note 1. – The SADISOPSG/18 will be expected to determine whether or not to upgrade the allocated bandwidth of the Secure SADIS FTP service based on the results of the study.

Note 2. – In the context of allocated bandwidth, this refers to the SADIS Provider's internet service provider (ISP) bandwidth available for Secure SADIS FTP service provision; and does not refer to a State/user's local internet connection/bandwidth through a local ISP.

3.1.13 The most-need topic for training is ‘Interpretation of WAFS products’, followed by ‘Generation of products for flight documentation’.

3.2 Based on the Work Plan of WAFS/I TF, regular surveys would be conducted to monitor the implementation of WAFS in ASIA/PACIFIC Regions and to solicit views on WAFS training needs.

4. Action by the meeting

4.1 The meeting is invited to note the results of the survey and discussions in this paper.

Appendix A The Questionnaire

**Questionnaire on
Operational Use of Services and Products from Service Providers of
World Area Forecast System (WAFS) in Asia / Pacific Regions and
WAFS Training Needs of Asia / Pacific States**

INTRODUCTORY NOTE

This questionnaire is developed by the WAFS Implementation Task Force (WAFS/TF) of the Communications, Navigation, Surveillance and Meteorology Sub-group (CNS/MET SG) of the Asia / Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG). It is distributed to Contracting States / Territories in the Asia / Pacific Regions to solicit information on:

- (a) Operational use of services and products from the service providers of the World Area Forecast System (WAFS) in the Asia / Pacific Regions; and
- (b) training needs of Contracting States / Territories in the Asia / Pacific Regions on WAFS.

The results will be presented to the CNS/MET SG and will be reported to the World Area Forecast System Operations Group (WAFSOPSG) as necessary.

The questionnaire is divided into 7 sections covering the following subjects:

- Section 1 General
- Section 2 Access to WAFS services
- Section 3 Transition from GRIB1 to GRIB2 WAFS data
- Section 4 Utilization of trial gridded forecasts of icing, turbulence and CB
- Section 5 Secure SADIS FTP download speed
- Section 6 Training needs
- Section 7 Additional information

All questions should be answered if applicable. It is particularly important that you provide your answers as detail as possible. You can provide such details and any other comments in Section 7.

Please return the completed questionnaire by email to cmcheng@hko.gov.hk on or before 27 January 2012. Your valuable inputs are very important to help promoting the use of WAFS services and utilization of WAFS products in the Asia / Pacific Regions.

Abbreviation

APANPIRG	Asia Pacific Air Navigation Planning and Implementation Regional Group
CB	Cumulonimbus
CNS/MET SG	Communications, Navigation and Surveillance/Meteorology Sub-Group
FTP	File Transfer Protocol
GRIB	GRIdded Binary
GRIB1	GRIB Edition 1
GRIB2	GRIB Edition 2
ISCS	International Satellite Communications System
SADIS	Satellite Distribution System for information relating to air navigation
WAFS	World Area Forecast System
WAFS/I TF	WAFS Implementation Task Force
WIFS	WAFS Internet File Service

SECTION 1 – GENERAL

1. Name of State/Territory:
2. Name of Your Organization¹:
3. Details of Focal Point for SADIS, if applicable:
 - (a) Name (surname in capital letters):
 - (b) Title/Post:
 - (c) Affiliation:
 - (d) Tel. No.: ()-
 - (e) Fax.No.: ()-
 - (f) Email:
4. Details of Focal Point for WIFS, if applicable:
 - (g) Name (surname in capital letters):
 - (h) Title/Post:
 - (i) Affiliation:
 - (j) Tel. No.: ()-
 - (k) Fax.No.: ()-
 - (l) Email:

¹ The word “Organization” is used in the questionnaire to mean the entity in your State / Territory, who responds to this questionnaire. If there are more than one entity in your State / Territory that receive WAFS products, please consolidate the inputs from these entities into one single reply for your State / Territory.

SECTION 2 – ACCESS TO WAFS SERVICES

5. Does your State/Territory currently have access to WAFS products?

- (a) Yes (b) No (go to Q.15)

[Answer:](#) Click and select ...

6. Which sets of WAFS products does your State/Territory have access to?

- (a) UK WAFS (go to Q.8)
(b) US WAFS (go to Q.9)
(c) Both US and UK WAFS (go to Q.7)

[Answer:](#) Click and select ...

7. Which sets of WAFS products does your State/Territory use as the primary source for producing flight documentation?

- (a) UK WAFS
(b) US WAFS

[Answer:](#) Click and select ...

8. What is/are the channels through which your State/Territory gains access to UK WAFS products? *(Can select more than one item. Click on checkbox to select. Same in following questions)*

- SADIS 2G satellite communications
 SADIS FTP Service / Secure SADIS FTP Service
 Others (please specify below):

9. What is/are the channels through which your State/Territory gains access to US WAFS products?

- ISCS-G2 satellite communications
 WAFS Internet File Service (WIFS)
 Others (please specify below):

10. (Answer this question only if you DO NOT select 'SADIS 2G satellite communications' in Question 8)

If your State/Territory is under the footprint of SADIS 2G satellite and your State/Territory has not yet access to UK WAFS products via SADIS 2G satellite, does your State/Territory have any plan to receive UK WAFS products via SADIS 2G satellite?

(a) Yes

(b) No

Answer: Click and select ...

If 'yes', then when to start reception:

(i) 2011

(ii) 2012

(iii) 2013

(iv) 2014

(v) 2015

(vi) beyond 2015

Answer: Click and select ...

If 'no', then why:

Already receiving US WAFS products

Already receiving UK WAFS products via SADIS FTP Service / Secure SADIS FTP Service

Already receiving UK WAFS products via other channel(s) (please specify below):

Have no technical expertise in implementation

High implementation cost

High operating cost

Other reason(s) (please specify below):

11. (Answer this question only if you do NOT select 'SADIS FTP Service / Secure SADIS FTP Service' in Question 8)

If your State/Territory has not yet gained access to UK WAFS products via SADIS FTP Service / Secure SADIS FTP Service, does your State/Territory have any plan to do so?

- (a) Yes (b) No

Answer: Click and select ...

If 'yes', then when do you plan to access Secure SADIS FTP Service:

- (i) 2011
- (ii) 2012
- (iii) 2013
- (iv) 2014
- (v) 2015
- (vi) beyond 2015

Answer: Click and select ...

If 'no', then why:

- Already receiving US WAFS products
- Already receiving UK WAFS products via SADIS 2G satellite
- Already receiving UK WAFS products via other channel(s) (please specify below):

- Have no technical expertise to gain access to the service
- High implementation cost
- High operating cost
- Other reason(s) (please specify below):

12. If your State/Territory is using the SADIS FTP Service, does your State/Territory have any plan to switch to use Secure SADIS FTP Service by 30 November 2012?

- (a) Yes (b) No

Answer: Click and select ...

13. If your answer to Q.12 is 'no', then why:

- Already receiving US WAFS products
- Already receiving UK WAFS products via SADIS 2G satellite
- Not enough time to prepare for switching
- Have no technical expertise in switching
- Other reasons (please specify below):

14. *(answer this question only if you do NOT select 'WAFS Internet File Service (WIFS) in Question 9)*

WAFS Washington will terminate the ISCS satellite broadcast on 30 June 2012. The WAFS data and products currently provided by ISCS satellite service are currently available via WIFS. The US has requested ISCS users to transition to WIFS no later than 1 March 2012. If your State/Territory has not yet gained access to US WAFS products via WIFS, does your State/Territory has any plan to do so?

(a) Yes (b) No

[Answer:](#) Click and select ...

If **'yes'**, then when:

- (i) 2011
- (ii) 2012
- (iii) 2013
- (iv) 2014
- (v) 2015
- (vi) beyond 2015

[Answer:](#) Click and select ...

If **'no'**, then why:

- Already receiving UK WAFS products
- Already receiving US WAFS products via other channel(s) (please specify below):

- Have no technical expertise to implement the change
- High implementation cost
- High operating cost
- Other reasons (please specify below):

15. If the answer to Q.5 is 'no', does your State/Territory have any plan to gain access to either UK WAFS products or US WAFS products or both?

(a) Yes (b) No

Answer: Click and select ...

If 'yes', then when:

- (i) 2011
- (ii) 2012
- (iii) 2013
- (iv) 2014
- (v) 2015
- (vi) beyond 2015

Answer: Click and select ...

and via which channel(s):

- SADIS 2G satellite communications
- SADIS FTP Service
- Secure SADIS FTP Service
- WAFS Internet File Service (WIFS)
- Others (please specify below):

If 'no', then why:

- Have no technical expertise on implementation
- High implementation cost
- High operating cost
- Other reason(s) (please specify below):

SECTION 3 – TRANSITION FROM GRIB1 TO GRIB2 WAFS DATA

16. Both WAFS London and WAFS Washington commenced the provision of WAFS Aviation GRIB2 data via their respective server based systems (SADIS FTP for WAFS London; WIFS for WAFS Washington) on 2 March 2010. WAFS Aviation GRIB2 data are also made operationally available via SADIS and ISCS on 18 November 2010. Re-prioritization of GRIB2 data over GRIB1 data will be made on 5 July 2012. Is your State/Territory currently receiving/retrieving WAFS Aviation GRIB2 data?

- (a) Yes (go to Q.17) (b) No (go to Q.18)

[Answer:](#) Click and select ...

17. If your answer to Q.16 is **'yes'**, is your State/Territory utilizing WAFS Aviation GRIB2 data operationally for preparing flight documentation?

- (a) Yes (b) No

[Answer:](#) Click and select ...

18. If your answer to Q.16 is **'no'** and/or your answer to Q.17 is **'no'**, does your State/Territory have any plan to utilize WAFS Aviation GRIB2 data operationally for preparing flight documentation?

- (a) Yes (b) No

[Answer:](#) Click and select ...

If **'yes'**, then when:

- (i) 2011
- (ii) 2012
- (iii) 2013
- (iv) 2014
- (v) 2015
- (vi) beyond 2015

[Answer:](#) Click and select ...

If **'no'**, then why:

- Not yet able to decode WAFS Aviation GRIB2 data
- Not yet using WAFS Aviation GRIB2 data operational but currently evaluating the data
- Limited computing facilities and processing software to process WAFS Aviation GRIB2 data to generate products for flight documentation
- Other reason(s) (please specify below):

19. It is planned that broadcast of WAFS forecasts in GRIB1 would cease in November 2013. Does your State/Territory envisage any difficulty in preparing for the migration from GRIB1 to GRIB2 WAFS data?

(a) Yes

(b) No

[Answer:](#) Click and select ...

If **'yes'**, then why:

- Not yet receiving WAFS Aviation GRIB2 data
- No technical expertise in processing WAFS Aviation GRIB2 data
- Not enough time to prepare for the migration
- No access to finances to procure the necessary GRIB2 visualization software
- Other reason(s) (please specify below):

SECTION 4 – UTILIZATION OF TRIAL GRIDDED FORECASTS OF ICING, TURBULENCE AND CB

20. WAFC London and WAFC Washington are currently providing gridded forecasts of icing, turbulence and CB in GRIB2 format via their respective server based systems (SADIS FTP for WAFC London; WIFS for WAFC Washington) for trial and evaluation only. Have your State/Territory evaluated the performance of the trial gridded forecasts of icing, turbulence and CB?

(a) Yes

(b) No

[Answer:](#) Click and select ...

21. If your answer to Q.20 is '**yes**', please provide your comments on the performance of the trial gridded forecasts of icing, turbulence and CB.

Source of trial gridded forecasts:

US WAFS

UK WAFS

Both US and UK WAFS (go to Q.22)

Comments:

22. If your answer to Q.20 is '**yes**' and your State/Territory can gain access to gridded forecasts of icing, turbulence and CB from both WAFC London and WAFC Washington, please provide comments in respect of comparison of performance of the two sets of trial gridded forecasts. (*You can provide any other views on trial gridded forecasts of icing, turbulence and CB in Section 7*)

Comments:

SECTION 5 – SECURE SADIS FTP DOWNLOAD SPEED

23. *(Answer this question only if have access to Secure SADIS FTP service)*

A regional survey on Secure SADIS FTP download speed in mid-2011 revealed that the Secure SADIS FTP download rate was significantly lower than that of WIFS, yet modestly higher than SADIS FTP, and reflected the low number of Secure SADIS FTP users. The bandwidth may have to increase in light of the fact that more users are expected to transition from SADIS FTP to Secure SADIS FTP due to 1) the transition of service is obligatory by November 2012 for SADIS FTP users, 2) a likely increase in Internet users versus satellite retrieval, 3) States selecting passive mode versus active mode for security reasons, and 4) the need for assuring Secure SADIS FTP can manage a large volume of users in the rare event WIFS service were to fail. In addition, an increase in bandwidth will provide a quicker return to service following any planned or unplanned outage. It is noted that an increase in the bandwidth of Secure SADIS FTP would entail an increase in the charge for gaining access to Secure SADIS FTP service. Given the above, does your State/Territory consider whether an upgrade to Secure SADIS FTP download speed is considered beneficial?

(a) Yes (b) No

[Answer:](#) Click and select ...

SECTION 6 – TRAINING NEEDS

24. Have your State/Territory gained access to training via the following resources?

- Seminar(s)/Workshop(s) organized by ICAO
- Seminar(s)/Workshop(s) organized by other organization(s) (please specify organization(s)):
- On-line training (please specify source(s)):
- Self-study of training materials on Internet (please specify source(s), if available):
- Others (please specify):

25. What is/are the area(s) of training on WAFS that your State/Territory consider most needed. Please specify the priority of your selected item(s) by inserting '1', '2', '3', etc. to the respective text box in the last column (*can select multiple items*).

Area(s) of training need	Priority (<i>'1' most needed</i>)
(a) Channels for reception of WAFS products (please provide details of topics of interest:)	<input type="text"/>
(b) WAFS processing software (please provide details of topics of interest:)	<input type="text"/>
(c) Decoding of WAFS data (please provide details of topics of interest:)	<input type="text"/>
(d) Generation of products for flight documentation (please provide details of topics of interest:)	<input type="text"/>
(e) Interpretation of WAFS products (please provide details of topics of interest:)	<input type="text"/>
(f) Other (please specify):	<input type="text"/>
(g) Other (please specify):	<input type="text"/>
(h) Other (please specify):	<input type="text"/>

(i) Other (please specify):

(j) Other (please specify):

(k) Other (please specify):

(l) Other (please specify):

(m) Other (please specify):

(n) Other (please specify):

(o) Other (please specify):

(p) Other (please specify):

Section 7 – ADDITIONAL INFORMATION

Please use this section to describe any further details in your answers in the previous sections and to provide any further comments that you may have. Please specify the section and question numbers when you supplement further details in your previous answers.

===== END OF QUESTIONNAIRE =====

Thank you very much for your valuable inputs !!!

Appendix B Results of Survey of Operational Use of Services and Products from Service Providers of WAFS in Asia/Pacific Regions and WAFS Training Needs of Asia/Pacific States (December 2011 – January 2012)

Access to WAFS services

- 1. *Does your State/Territory currently have access to WAFS products?*

All States/Territories (18; 100%) said that they have access to WAFS products.

- 2. *Which sets of WAFS products does your State/Territory have access to?*

5 States/Territories (28%) said that they have access to UK WAFS products, 7 (39%) US WAFS products and 6 (33%) both (Figure 1).

- 3. *Which sets of WAFS products does your State/Territory use as the primary source for producing flight documentation?*

17 States/Territories responded to this question. 8 States/Territories (47%) said they use UK WAFS as primary source and 9 States/Territories (53%) said they use US WAFS as primary source (Figure 2).

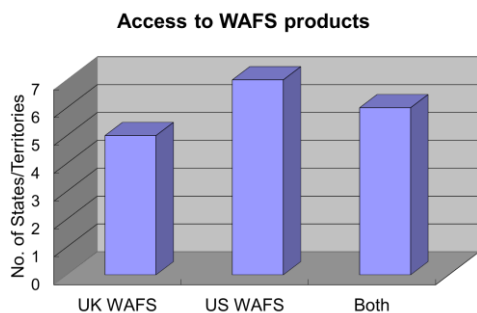


Figure 1

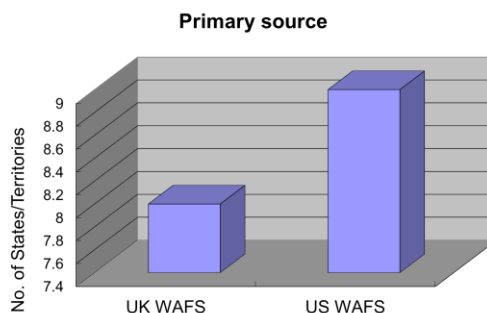


Figure 2

- 4. *What is/are the channels through which your State/Territory gains access to UK WAFS products?*

There are 11 States/Territories responding to this question. 8 States/Territories (73%) said that the channel they use is SADIS 2G, 10 States/Territories (91%) via SADIS FTP Service / Secure FTP Service, and 2 State/Territory (18%) via other channel (the Global Telecommunications System (GTS)) (Figure 3).

- 5. *What is/are the channels through which your State/Territory gains access to US WAFS products?*

There are 13 States/Territories responding to this question. 11 States/Territories said that the channel they use is ISCS-G2 (85%), 7 States/Territories (54%) via WAFS Internet File Service (WIFS), and 3 States/Territories (23%) via other channel (GTS) (Figure 4).

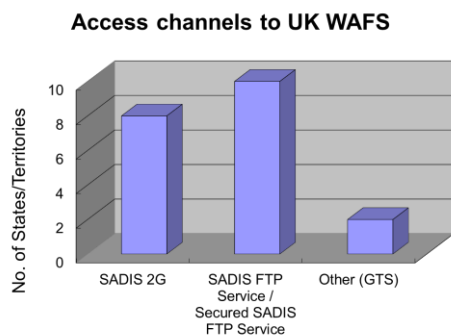


Figure 3

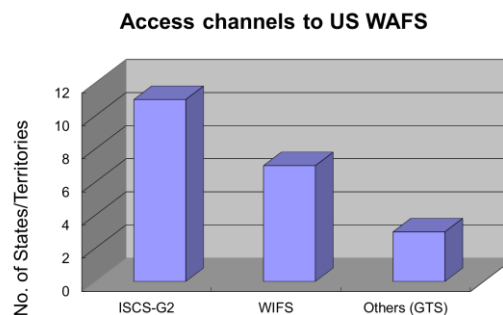


Figure 4

6. *If your State/Territory is under the footprint of SADIS 2G satellite and your State/Territory has not yet access to UK WAFS products via SADIS 2G satellite, does your State/Territory have any plan to receive UK WAFS products via SADIS 2G satellite?*

7 States/Territories responded to this question and said that they have no plan to use SADIS 2G for the following reasons:

- (a) already receiving US WAFS products (7; 100%);
- (b) already receiving UK WAFS products via SADIS FTP Service / Secure SADIS FTP Service (1; 14%);
- (c) already receiving UK WAFS products via other channels (GTS) (1; 14%);
- (d) have no technical expertise in implementation (1; 14%);
- (e) high operating cost (2; 28%).

7. *If your State/Territory has not yet gained access to UK WAFS products via SADIS FTP Service / Secure SADIS FTP Service, does your State/Territory have any plan to do so?*

7 States/Territories responded to this question. 2 State/Territory said that they planned to gain access to UK WAFS products via SADIS FTP Service / Secure SADIS FTP Service in 2012 and 2013 respectively. 5 States/Territories said that they have no plan to do so for the following reasons:

- (a) already receiving US WAFS products (5; 100%)
- (b) have no technical expertise to gain access to the service (1; 20%).

8. *If your State/Territory is using the SADIS FTP Service, does your State/Territory have any plan to switch to use Secure SADIS FTP Service by 30 November 2012?*

Of the 14 States/Territories responding to this question, 10 of them (71%) said that they planned to migrate to Secure SADIS FTP Service by 30 November 2012. 4 States/Territories (29%) have no plan to do so for the following reasons:

- (a) Already receiving UK WAFS products via SADIS 2G satellite (4; 100%)
- (b) Not enough time to prepare for switching (1; 25%)
- (c) have no technical expertise in switching (2; 50%).

9. WAFS Washington will terminate the ISCS satellite broadcast on 30 June 2012. The WAFS data and products currently provided by ISCS satellite service are currently available via WIFS. The US has requested ISCS users to transition to WIFS no later than 1 March 2012. If your State/Territory has not yet gained access to US WAFS products via WIFS, does your State/Territory has any plan to do so?

10 States/Territories responded to this question. 6 States/Territories (60%) said ‘yes’ and 4 State/Territory (40%) said ‘no’. All those 6 States/Territories planned to gain access to WIFS in 2012. The 4 States/Territories have no plan to gain access to WIFS for the following reason:

- (a) already receiving UK WAFS products (3; 75%)
- (b) have no technical expertise in switching (1; 25%).

Transition from GRIB1 to GRIB2 WAFS data

10. Both WAFS London and WAFS Washington commenced the provision of WAFS Aviation GRIB2 data via their respective server based systems (SADIS FTP for WAFS London; WIFS for WAFS Washington) on 2 March 2010. WAFS Aviation GRIB2 data are also made operationally available via SADIS and ISCS on 18 November 2010. Re-prioritization of GRIB2 data over GRIB1 data will be made on 5 July 2012. Is your State/Territory currently receiving/retrieving WAFS Aviation GRIB2 data?

11 States/Territories (61%) said that they are receiving WAFS Aviation GRIB2 data and 7 States/Territories (39%) said no (Figure 5).

11. If your State/Territory is currently receiving/retrieving WAFS Aviation GRIB2 data, is your State/Territory utilizing them operationally for preparing flight documentation?

11 States/Territories responded to this question. 4 of them (36%) are using GRIB2 data operationally for preparing flight documentation and 7 of them (64%) are not (Figure 6).

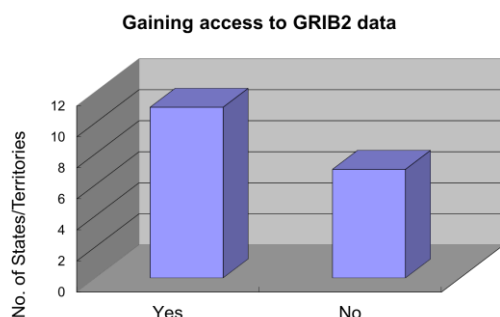


Figure 5

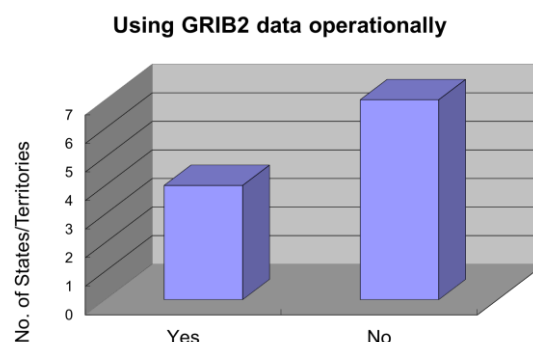


Figure 6

12. If your State/Territory is not currently receiving/retrieving WAFS Aviation GRIB2 data and/or is not yet utilizing GRIB2 data operation, does your State/Territory have any plan to utilize GRIB2 data operationally for preparing flight documentation?

10 States/Territories responded to this question. 8 of them (80%) said that they planned to use GRIB2 data operationally and 2 State/Territory (20%) said that they have no plan (Figure 7). 8 States/Territories indicated their plan to use GRIB2 data operationally: 5 (62.5%) in 2012 and 3 (37.5%) in 2013. The two States/Territories have no plan to use GRIB2 operationally because:

- (a) not able to decode WAFS Aviation GRIB2 data (1; 50%)
- (b) limited computing facilities and processing software to process WAFS Aviation GRIB2 data to generate products for flight documentation (2; 100%).

13. *It is planned that broadcast of WAFS forecasts in GRIB1 would cease in November 2013. Does your State/Territory envisage any difficulty in preparing for the migration from GRIB1 to GRIB2 WAFS data?*

15 States/Territories responded to this question. 6 (40%) States/Territories said that they have difficulty in migrating from GRIB1 to GRIB2 data and 9 States/Territories (60%) said no (Figure 8). The areas of difficulty are:

- (a) not yet receiving WAFS Aviation GRIB2 data (3 quotes)
- (b) no technical expertise in processing WAFS Aviation GRIB2 data (3 quotes)
- (c) no access to finances to procure the necessary GRIB2 visualization software (3 quotes).

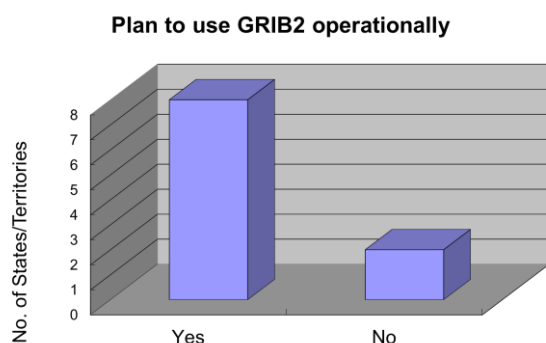


Figure 7

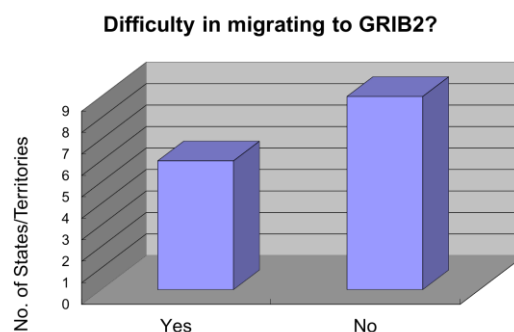


Figure 8

Utilization of trial gridded forecasts of icing, turbulence and CB

14. *WAFS London and WAFS Washington are currently providing gridded forecasts of icing, turbulence and CB in GRIB2 format via their respective server based systems (SADIS FTP for WAFS London; WIFS for WAFS Washington) for trial and evaluation only. Have your State/Territory evaluated the performance of the trial gridded forecasts of icing, turbulence and CB?*

2 States/Territories (11%) said that they have evaluated trial gridded forecasts of icing, turbulence and CB, and 16 States/Territories (89%) said that they have not done so. Of the above 2 States/Territories, both of them evaluated those of both US and UK WAFS. Comments provided by the States/Territories are as follows:

- (a) Limited analysis has been performed on data. The greatest problem has been developing a product from the data that can be used by operators. Operators are used to receiving severity and they now receive a potential field. i.e. translating potential fields into severity as required by operators. Users have indicated that high probability of low severity is not of much interest, moderate probability of high severity is of interest and high probability of high severity is of great interest, but how do we obtain severity?

The consistency between the two WAFCs of gridded icing, turbulence and CB fields has historically been relative poor. However the previous ability to compare the fields from the two WAFCs was very useful to obtain confidence in the likelihood of the event

occurring, however since the two WAFCs datasets have been blended/harmonized, it is now difficult to obtain a confidence that that a scenario will eventuate. This independence is a detriment to the WAFS.

- (b) Our earlier observations on difference between gridded forecasts of icing from WAFS London and WAFS Washington presented in Section 4, WP/42 (Revised) of CNS/MET SG/15 of APANPIRG held in Bangkok, Thailand, 25-29 July 2011 (http://www.bangkok.icao.int/cns/meeting.do?method=download&year_id=13&meeting_id=78&doc_id=956) seemed to be addressed after the harmonization on 29 Nov 2011. However, longer term comparison should be conducted by the WAFCs to ascertain this.

As harmonization might impact on the performance of the product, it is not clear whether the focused study, as contained in the "Guidance on the Harmonized WAFS Forecasts for CB clouds, Icing and Turbulence forecasts", is still valid. Further evaluation on the harmonized product by the WAFCs should be conducted.

So far only one study on icing has been made available. Before the new gridded forecast are to be used operationally, evaluation of the performance should be conducted by the WAFCs in accordance with Conclusion 6/15 of WAFSOPSG/6.

Secure SADIS FTP download speed

15. *A regional survey on Secure SADIS FTP download speed in mid-2011 revealed that the Secure SADIS FTP download rate was significantly lower than that of WIFS, yet modestly higher than SADIS FTP, and reflected the low number of Secure SADIS FTP users. The bandwidth may have to increase in light of the fact that more users are expected to transition from SADIS FTP to Secure SADIS FTP due to 1) the transition of service is obligatory by November 2012 for SADIS FTP users, 2) a likely increase in Internet users versus satellite retrieval, 3) States selecting passive mode versus active mode for security reasons, and 4) the need for assuring Secure SADIS FTP can manage a large volume of users in the rare event WIFS service were to fail. In addition, an increase in bandwidth will provide a quicker return to service following any planned or unplanned outage. It is noted that an increase in the bandwidth of Secure SADIS FTP would entail an increase in the charge for gaining access to Secure SADIS FTP service. Given the above, does your State/Territory consider whether an upgrade to Secure SADIS FTP download speed is considered beneficial??*

Recall in para. 4 above, 10 States/Territories are getting access to SADIS FTP / Secure SADIS FTP services. Among them, 8 responded to this question. 6 of them (75%) considered an upgrade to Secure SADIS FTP download speed beneficial, while 2 of them (25%) considered otherwise. In other words, a majority of States/Territories considered an upgrade to Secure SADIS FTP download speed beneficial.

Training needs

16. *Have your State/Territory gained access to training via the following resources?*

15 States/Territories responded to this question and indicated that they have gained access to training in WAFS via the following sources:

- (a) seminar(s)/Workshop(s) organized by ICAO (8 responses)
- (b) seminar(s)/Workshop(s) organized by other organization(s) (4 responses : 2 by WMO; 1 by MeteoFrance; and 1 by IBL Software Engineering)
- (c) on-line training (1 response : by ENM MeteoFrance)
- (d) self-study of training materials on Internet (7 responses)

(e) Others: (3 responses : documentation or training by vendors)

17. *What is/are the area(s) of training on WAFS that your State/Territory consider most needed?*

The table below summarizes the priority of areas of training on WAFS as indicated by the States/Territories:

Areas	No. of States/ Territories quoting this area as priority '1'	No. of States/ Territories quoting this area as priority '2'	No. of States/ Territories quoting this area as priority '3'	No. of States/ Territories quoting this area as priority '4'	No. of States/ Territories quoting this area as priority '5' or lower
Interpretation of WAFS products (see Note (1))	9	1	4	2	0
Generation of products for flight documentation (see Note (2))	5	5	4	0	0
WAFS processing software (see Note (3))	2	4	3	4	1
Channels for reception of WAFS products (see Note (4))	2	1	4	2	3
Decoding of WAFS data (see Note (5))	0	5	6	1	4
Other (see Note (6))	3	0	0	0	1

Note :

(1) States/Territories remarked that the topic on 'Interpretation of WAFS products' should:

- cover how to interpret/use gridded experimental fields
- cover potential vs severity - how should potential be applied
- cover use of max vs mean datasets - when to use each
- be relevant to southern hemisphere
- cover practical examples on the application of gridded forecast of CB cloud, icing and turbulence;
- cover how to establish the threshold for specific application given the performance of these gridded products; and
- cover how to use the gridded forecast (which are probabilistic in nature) together with the SIGWX charts (which are deterministic in nature)

- cover verification of CB Forecast, gridded icing product
 - cover gridded forecasts of icing, turbulence and CB
- (2) States/Territories remarked that the topic on ‘Generation of products for flight documentation’ should:
- be relevant to southern hemisphere
- (3) States/Territories remarked that the topic on ‘WAFS processing software’ should:
- be relevant to southern hemisphere
 - cover software training to improve product
 - cover automatic plotting of synoptic data in any given time
- (4) States/Territories remarked that the topic on ‘Channel for reception of WAFS products’ should:
- be relevant to southern hemisphere
 - cover FTP automation.
- (5) States/Territories remarked that the topic on ‘Decoding of WAFS data’ should:
- be relevant to southern hemisphere
 - cover decoding data and their use.
- (6) Other topics include:
- What is the intended usage of the max vs mean datasets? - when to use each.
 - What potential values should be used for icing, turbulence and CB products
 - technical aspects of transmission and reception
 - Overlaying of different products, e.g., satellite imageries and radar imageries