



**INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE**

**REPORT OF
THE FOURTH MEETING OF THE ASIA/PAC OPMET
MANAGEMENT TASK FORCE (OPMET /M TF/4)**

13-16 February 2006

Bangkok, Thailand

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1. Introduction

1.1 The Fourth Meeting of the ASIA/PAC OPMET Management Task Force (OPMET/M TF/4) of the CNS/MET Sub-group of APANPIRG was held in Bangkok, Thailand from 13 to 16 February 2006.

2. Attendance

2.1 The meeting was attended by 27 experts from Australia, China, Hong Kong, China, Fiji, India, Indonesia, Japan, Malaysia, New Zealand, Russian Federation, Singapore, Thailand and IATA. The List of Participants is provided in **Appendix A** to the report.

3. Opening of the meeting

3.1 On behalf of Mr. Lalit B. Shah, Regional Director, ICAO Asia and Pacific Office, Mr. Dimitar Ivanov welcomed all participants to the ICAO Regional Office, Bangkok and provided a brief overview of the objectives and the working arrangements for the meeting.

3.2 Mr. Rick Houghton from Bureau of Meteorology, Australia, opened the meeting and welcomed the new participants from Malaysia, New Zealand and the Russian Federation.

4. Officers and Secretariat

4.1 Mr. Rick Houghton, Rapporteur of the OPMET/M Task Force presided over the meeting.

4.2 Mr. Dimitar H. Ivanov, Regional Officer, Aeronautical Meteorology acted as Secretary of the meeting. He was assisted by Mr. Li Peng, Regional Officer CNS.

5. Agenda of the Meeting

5.1 The agenda adopted by the meeting was as follows:

- Agenda Item 1:**
- a) Adoption of provisional agenda and working arrangements for the meeting
 - b) Review of the TORs and follow-up action on the TF/3 meeting

- Agenda Item 2:** Review:
- a) Current status of OPMET exchange in the Region
 - b) Status report of Regional OPMET Data Banks
 - c) Inter-Regional exchange and new requirements for OPMET information

- Agenda Item 3:** Review of regional guidance material on OPMET exchange:
- a) ROBEX Handbook
 - b) ASIA/PAC ICD
 - c) OPMET related FASID tables

Agenda Item 4: Development of procedures for monitoring and management of OPMET exchange:

- a) OPMET monitoring and quality control procedures
- b) OPMET bulletins update procedures
- c) SIGMET tests

Agenda Item 5: Regional planning for transition to BUFR coded OPMET information (together with the WG of the ATN/IC Task Force):

- a) MET issues
- b) COM issues

Agenda Item 6: Future Work Programme

Agenda Item 7: Any other business

Agenda Item 1 b): Review of the TORs and work programme of the group

1.1 The meeting recalled that the 13th Meeting of APANPIRG, Bangkok, 9 to 13 September 2002, established with its Decision 13/28 the ASIA/PAC OPMET Exchange Task Force (OPMET/E TF). The 7th Meeting of the CNS/MET Sub-group of APANPIRG, July 2003, adopted Decision 7-10/26, by which the OPMET Exchange Task Force was renamed to ASIA/PAC OPMET Management Task Force (OPMET/M TF).

1.2 The terms of reference (TOR) of the group have been reviewed and amended by its second and third meeting. APANPIRG/16 meeting held in Bangkok from 22 to 26 August 2005, agreed on the proposed amendments and adopted Decision 16/45, *Terms of reference and work programme of OPMET/M Task Force*.

1.3 The group reviewed the current TORs and Work Programme of the OPMET/M TF endorsed by APANPIRG/16 and proposed some changes as indicated in **Appendix B** to the report. The meeting welcomed the proposal by India to become a permanent member of the Task Force.

1.4 The group further reviewed the follow up activities on the Action Items formulated by its third meeting. It was identified that a good progress has been achieved and the action on the majority of the Action Items completed, while the follow up action on a few items was on-going since these were tasks of permanent nature. Detailed information on the status of the tasks adopted by the previous meetings of the group, together with the new tasks agreed by the meeting, is provided in **Appendix C**, *List of Action Items of OPMET/M TF (revision 4)*.

1.5 The group appreciated in particular some important achievements, such as:

- Preparation of draft quality control (QC) and monitoring procedures for inclusion in the ROBEX Handbook;
- Conduction of operational trials of the back-up procedures between IROG Singapore and IROG Bangkok;
- Advancement of the ROBEX database;
- Conducting new series of SIGMET tests for WV, WC and WS SIGMET;
- Development of special procedures for OPMET exchange in the South Pacific.

Agenda Item 2: Review:

- a) **Current status of OPMET exchange in the Region**
- b) **Status report of Regional OPMET Data Banks**
- c) **Inter-Regional exchange and new requirements for OPMET information**

2.1 Current status of OPMET exchange in the Region

Review outcomes from CNS/MET SG/9 and APANPIRG/16 meetings on OPMET issues.

2.1.1 A summary of the activities after the OPMET/M TF/3 was presented by the Secretariat. The following activities were outlined:

- The Rapporteur of the Task Force attended the 9th meeting and presented the OPMET/M TF/3 report. The CNS/MET SG expressed appreciation at the work of the group and acknowledged the improvement of the availability of ASIA/PAC OPMET data achieved based on the streamlining of the OPMET exchange procedures done by the Task Force.
- The OPMET issues discussed by the 9th meeting of the Sub-group and reflected in the report were:
 - Review of the report of OPMET/M TF/3 meeting
 - AIREP Survey
 - Operations of the RODBs and Inter-regional exchange
 - Regional guidance material on OPMET exchange
 - OPMET monitoring and related quality control (QC) procedures
 - FASID Tables related to OPMET exchange
 - Issues related to TAF with extended period of validity
 - Migration to BUFR-coded aeronautical meteorological messages
 - TOR and work programme of the OPMET Management Task Force

2.1.2 APANPIRG reviewed the report of CNS/MET SG/9 and adopted one decision and two conclusions on OPMET issues. Decision 16/45 was on the revised TORs and work programme of the task force.

2.1.3 Conclusion 16/43 is aimed at improving the issuance and exchange of special air-reports. Follow-up action is to be taken by the Secretariat, IATA and the States concerned.

2.1.4 Conclusion 16/44 calls for amendment of ASIA/PAC FASID tables related to OPMET exchange and their harmonization with the ROBEX tables. Revised FASID Tables MET 4A and MET 4B have been included in a FASID amendment proposal circulated to States in December 2005. The status of FASID tables related to OPMET exchange is discussed further under agenda item 3c).

2.1.5 The CNS/MET SG/9 meeting addressed concerns related to the introduction of new TAF with extended period of validity. This will be of concern to the OPMET TF as it would have significant impact on OPMET exchange. The issue has been passed to AMOS Study Group for further consideration.

2.1.6 APANPIRG/16 meeting discussed issues related to the regional planning for transition to BUFR-coded OPMET information, and emphasized the need for the OPMET/M TF and the ATN Transition TF to address these issues jointly from MET and COM perspective.

OPMET information from the Pacific

2.1.7 The group recalled that the OPMET monitoring results during the last 2-3 years indicated shortfalls of OPMET data from the South Pacific Region. The lack of METAR and TAF has been included in the APANPIRG List of deficiencies. In order to assist the South Pacific States to resolve the deficiencies, ICAO conducted a Special Implementation Project (SIP) in September 2005. One of the tasks of the SIP was to identify the causes for the OPMET data shortfalls and to assist the States' authorities concerned to develop appropriate action plans.

2.1.8 The main goal was to ensure availability of METAR and TAF as required by the ASIA/PAC ANP (FASID Tables 1A refers). It was identified that a variety of communication procedures had been used by the small Pacific island States to promulgate their METAR and TAF to the international exchange. For most of the aviation meteorological offices in these States, the use of AFTN was not feasible. Therefore, alternative methods were being used, such as, Internet and the WMO GTS.

2.1.9 Following the general principles of the ROBEX scheme and the relevant Annex 3 SARPs, it was proposed that the bulletin exchange should be organized via RODB Nadi.

2.1.10 The most efficient way for RODB Nadi to collect the national METAR and TAF bulletins from the South Pacific States was by e-mail. Nadi AFTN centre had the capability to switch automatically AFTN formatted messages received via e-mail to the AFTN. Therefore, a procedure was proposed, in which, the originating centres in the small PAC States should e-mail their METAR and TAF (if any) to a specified e-mail address at RODB Nadi. Nadi will then relay the messages to the AFTN and will compile multinational PAC bulletins. Trials have been conducted with the participation of Tonga, RODB Nadi and RODB Singapore, to check the procedures and resolve any technical issues.

2.1.11 The procedure for using e-mail for collection of METAR and TAF in the South Pacific, as described in **Appendix D** to the report, was reviewed and agreed by the meeting. The Secretariat will inform all participating States and a full scale trial will be conducted before officially launching the new South Pacific bulletins. (**Action Item**)

2.1.12 The Australian member informed the meeting of work undertaken with the Papua New Guinea National Weather Service to establish new ROBEX bulletins for METAR and TAF issued by Port Moresby. Bulletins are being prepared and issued by Brisbane RODB as FTNG31, FCNG31, FCNG32 and SANG31. The bulletin data is still irregular due to communications problems, with the PNG NWS striving to provide data on a regular basis. The new bulletins have been included in the relevant ROBEX tables.

Availability of TAF for Siem Reap

2.1.13 Bangkok RODB advised the meeting that following monitoring of incoming OPMET messages, they had continuously received 24-hour TAF for VDSR Siem Reap International Airport, Cambodia for 3 months. The meeting agreed that VDSR aerodrome be added to FTAS31 VTBB bulletin. (**Action Item**)

Availability of OPMET information for AOP and non-AOP aerodromes

2.1.14 RODB Bangkok presented results of a OPMET data monitoring undertaken as a follow up of the IATA monitoring findings presented at the OPMET/M TF/3 meeting, March 2005. The aim of the monitoring was to verify the missing OPMET data on SADIS within the area of responsibility of the Bangkok ROBEX centre. The monitoring encompassed all aerodromes in Thailand and Cambodia included in SADIS User Guide Annex 1.

2.1.15 The results of the monitoring showed that almost all METAR and TAF required in SUG Annex 1 have been issued and distributed to Singapore IROG. Singapore confirmed that the bulletins received from Bangkok are relayed to London. Therefore, the reason for non-availability of some of this OPMET information should be investigated with the SADIS Gateway. It was identified that VTSN airport should be removed from SUG Annex 1 and only METAR requirement should be left for VTPH.

2.1.16 Another finding of the monitoring was that the OPMET information for a number of domestic aerodromes in Thailand was highly irregular and issued only on request, e.g., when flights were conducted. This created difficulties in providing representative results on the availability of the OPMET data from these aerodromes. The meeting agreed that the monitoring results were very useful to identify those irregularities and that in the future monitoring exercises such aerodromes for which METAR and/or TAF is issued only on request should be appropriately flagged. (**Action Item**)

2.1.17 The IATA expert appreciated the effort undertaken by RODB Bangkok to identify the reasons for the OPMET data shortfalls reported in 2005 and noted that there had been a significant improvement in the availability from the region, especially from Thailand. He also noted that where an aerodrome did not operate 24 hours, information on the hours of operation could be added to the tables in SUG Annex 1. Aerodromes where TAF is issued only on request should be flagged and they could be excluded from the scope of the monitoring.

2.1.18 The representative of RODB Bangkok thanked for the proposals aimed at improving the monitoring procedures and assured that they would be taken into consideration in the future monitoring exercises.

2.2 Content and Operation of the Regional OPMET Data Banks

2.2.1 Under this agenda item the representatives of the RODBs Bangkok, Brisbane, Singapore Nadi and Tokyo presented to the meeting information on the current status of the operation of their respective centres.

2.2.2 RODB Brisbane advised the meeting of recent software changes to ensure that bulletins issued by Brisbane complied with ICAO and WMO formats. Also advised were details of new bulletins being generated for Papua New Guinea. The RQM message format had been standardized. Statistical data, over three months, on the frequency of "RQM" AFTN requests received by Brisbane RODB were presented, with a disproportional high number being received from OPMET data bank Brasilia. It was identified that most of these requests were for information for which RODB Brisbane had no responsibility. The meeting requested the secretariat to advise SAM region of the problem and to direct Brasilia to either arrange permanent reception of the bulletins or request the bulletins from the correct RODB. (**Action item**)

2.2.3 Singapore RODB advised the meeting of the new request format for FK and FV bulletins and corresponding reply message issued by the RODB.

2.2.4 Details of a new ftp/http backup system being developed by Singapore RODB in support of Internet operations were provided to the meeting. The ftp access was organized in a similar manner to the SADIS ftp service. Authorized users could download hourly or 15-minute data files organized by OPMET type. Details about the new ftp service by RODB Singapore are provided in **Appendix E** to the report.

2.2.5 The meeting expressed appreciation to RODB Singapore for providing a new type of access to the data bank which will be very useful for users who do not have AFTN capabilities. Singapore advised that the ftp service is available on trial basis until the end of March and the OPMET/M TF members could login with user name and password to be advised. A query based interrogation to this new service is envisaged by the end of 2006 and Singapore was still working on some security issues and access policies. Users from airlines were also encouraged by Singapore to apply for access to the new service.

2.2.6 Tokyo RODB advised the meeting of some ICD changes. Statistical data based on a ten-day analysis of the requests to the RODB have been presented. There was an average of 1176 reports per day in the request messages for TAF and METAR. Analysis of the RQM messages with wrong format was also present. It was noted that the largest number of requests was received from users in the Russian Federation.

2.2.7 India informed the meeting of the operation of four national OPMET data banks in India at Delhi, Mumbai, Chennai and Kolkata Airports. The four data banks were recently equipped with latest state of the art Automatic Message Switching Systems (AMSS). The systems allow retrieval of any type of aviation message from any location through AFTN. The meeting thanked India for the information and noted that, in view of the fact that there was no RODB located in the western part of the region, Indian national data banks could serve as a useful supplement to the existing RODBs. It was agreed in principle that information on the procedures and OPMET content of these data banks could be appended to the ASIA/PAC ICD; however, this should not be regarded as establishing of a new RODB, rather, it would have the status of national data bank open for international users.

2.2.8 The meeting also noted that some of the data held by the Indian data banks were in GTS format and would be rejected by other RODB's. India assured that action would be taken to remedy the situation.

2.2.9 After presenting the information from the five RODBs in the region, the meeting concluded that all RODBs have been operating satisfactorily during the period since the OPEMT/M TF/3 in March 2005. It was appreciated that the tendency towards standardizing the procedures and improving the availability of the OPMET information from the region, which started in 2004, has continued in all RODB's, with harmonization in several areas progressing well. The meeting requested the Secretariat to introduce all reported changes in the ROBEX handbook and the ICD document and update the ICAO web site accordingly. (**Action Item**)

2.3 Inter-Regional Exchange

2.3.1 It was recalled that at the TF/3 meeting IROG Singapore and IROG Bangkok informed of the establishment of a back-up procedure for the OPMET exchange between ASIA/PAC and EUR through hand-over the transmission of the bulletins to IROG London (respectively, to SADIS Gateway) in the event of Singapore IROG having a failure in their telecommunication network/system. The procedure involved five steps to be undertaken by the two IROGs and the actions and responsibilities of the centres were very well described in a joint document. The TF/3 meeting proposed that, in order to check the operability of the back-up procedures, real-time test of the hand-over should be carried out in coordination with the Secretariat and IROG London.

2.3.2 The representative of Bangkok RODB informed the meeting of the results of such a test carried out during January 2006. The test covered an activation of the backup procedure initiated by Singapore, monitoring of data traffic with Bangkok taking over the switching and a recovery phase where Bangkok stopped transmission of data. The trial proved successful with no missing data or disruption to London IROG.

2.3.3 The meeting appreciated the work done by the two centres which ensures seamless OPMET traffic to and from EUR region in case of technical problems in IROG Singapore. It was agreed that similar trials should be held regularly (once per year) and recommended that, as the trial was undertaken during a quiet traffic period, the next trial should be undertaken during a more active period now that procedures had been tested and were successful. **(Action Item)**

2.3.4 The secretariat informed of the coordination of the exchanges with other ICAO regions. The responsibilities for ASIA/PAC IROGs were recalled as outlined in the ROBEX handbook.

2.3.5 The exchange between ASIA/PAC and EUR region has continued to improve and some problems have been resolved. The exchange with MID region has also been carried out regularly; currently RODB Vienna, Austria was serving the MID region. The exchange with NAM region by Tokyo IROG should be further coordinated in view of the need to transmit all ASIA/PAC OPMET information available to Washington and thus facilitate harmonization of the OPMET data sets transmitted via SADIS and ISCS. The meeting expressed concern of the fact that currently SADIS and ISCS OPMET content differed significantly and requested the secretary of the group to discuss the problem with the secretary of the SADISOPS group. It was clarified in this regard that, in accordance with Annex 3, all OPMET bulletins should be sent to SADIS and ISCS so that the OPMET content of the satellite broadcasts should be identical.

2.3.6 It was noted by the meeting that the inter-regional exchange between ASIA/PAC and AFI and ASIA/PAC and SAM had not changed, i.e. there was no direct exchange via the designated IROGs. It should be further studied whether this situation had any operational implications. **(Action item)**

2.3.7 A draft of the new EUR OPMET Handbook was received by the Secretariat and the final version was expected to be available soon on the ICAO Paris web site. The meeting noted the very positive tendency that the EUR OPMET Handbook and the ROBEX Handbook were being increasingly harmonized which would facilitate seamless exchanges between ASIA/PAC and EUR regions.

2.3.8 The current version of the AMBEX Handbook has also been received and reviewed by the secretariat. It was noted that there was no designated RODB in the AFI region. Therefore, it should be further coordinated with the ICAO offices concerned which AMBEX centre should be assigned the IROG function to carry out exchange with Bangkok and Brisbane IROGs. **(Action Item)**

2.4 New requirements for OPMET information

2.4.1 Under this agenda item the secretariat presented excerpts from the 10th meeting of the SADISOPSG pertinent to the work of the Task Force, which included conclusions 10/8, 10/9 and 10/10 of the meeting. Also presented were the specifications for a new database format of the SUG Annex 1, the observed shortfalls of OPMET data for AOP aerodromes in the ASIA/PAC region, and the amendments to SUG Annex 1 for review by the meeting.

2.4.2 The secretariat emphasised the need for State to notify ICAO of any changes to the status of AOP and non-AOP aerodromes so that the SUG Annex 1 could be amended, as this was the document containing the recognised requirements for OPMET information. The inclusion of non-AOP aerodromes

was entirely at the discretion of the State concerned. However, it should be realized that once the State agrees for the inclusion of some non-AOP aerodromes in SUG Annex 1, the information from these aerodromes should be provided on a regular basis. The expert from IATA requested in this regard that information for non-availability of OPMET information for aerodromes included in SUG Annex 1 should be forwarded by the States to IATA and the SADISOPSG in order to update the table by deletion or suitable remark.

2.4.3 The proposal for a data based oriented format for Annex 1 to the SUG was reviewed and discussed. Though the development of the SUG Annex 1 database was in an initial phase, it was felt that information should be exchanged to ensure that the similar development of the ROBEX database is harmonized. The meeting recognized the need for the ASIA/PAC region database, as developed by Brisbane RODB, to continue to meet ROBEX requirements, which would also be beneficial in keeping the regional content of the SUG database up to date.

2.4.4 Appendix G of the SADISOPSG/10 report for AOP aerodromes with no available data during the monitoring period indicated that one of the major areas of deficiency within the region were the Indonesian data. The expert from Indonesia advised that a large part of the required METAR and TAF was actually issued, however, there were communication problems related to the lack of AFTN lines available at the meteorological offices at some aerodromes. As an alternative, the data could be made available the RODB Singapore via GTS. It was agreed that Indonesia and Singapore RODB should pursue development of suitable procedure for switching Indonesian OPMET bulletins received via GTS to the AFTN. **(Action Item)**

Agenda Item 3: Review of regional guidance material on OPMET exchange

- a) **ROBEX Handbook**
- b) **ASIA/PAC ICD**
- c) **OPMET related FASID Tables**

3.1 ROBEX Handbook

3.1.1 The meeting recalled that the 12th edition of ROBEX Handbook was published by the ICAO Office, Bangkok in November 2004 and made available on the ICAO web site in pdf format.

3.1.2 The meeting reviewed and updated the ROBEX Tables for METAR, TAF and SIGMET exchange. The updated tables are in **Appendices F** (for METAR), **G** (for TAF) and **H** (for SIGMET). Changes to the ROBEX Tables, whose implementation would require additional coordination are as follows:

3.1.2.1 Introduction of new METAR and TAF bulletins for South Pacific, to be compiled by Nadi ROBEX centre was noted as a measure for improving the availability of OPMET data from the sub-region. The new bulletins will become operational after consultation with Nadi ROBEX centre and necessary notification to the ROBEX centres and States concerned (**Action Item**).

3.1.2.2 All AOP aerodromes in Indonesia, Malaysia and Japan have been included in the ROBEX Table for METAR bulletins. Further coordination between these States and the Secretariat will take place before implementing the proposed changes. (**Action Item**)

3.1.2.3 AOP aerodromes in Indonesia required to provide TAF have been added to ROBEX Table for TAF bulletins.

3.1.3 Changes to WMO headings of some bulletins have been proposed in order to align the heading with the bulletin content in regard to the WMO geographical designators (AA). It was agreed that RODB Bangkok should use “AE” (Southeast Asia) in the WMO heading, while India should change SAAE bulletin to SAIN. The agreed changes are as follows: (**Action Item**)

- SAAE31 VECC to SAIN33 VECC
- SAAS31 VTBB to SAAE31 VTBB
- FTAS31 VTBB to FTAE31 VTBB
- FTAS32 VTBB to FTAE32 VTBB
- FCAS31 VTBB to FCAE31 VTBB

The above changes will be further coordinated between India, Thailand and the Secretariat. Notification through METNO messages will be carried out as necessary.

3.1.4 The meeting noted the draft material developed for Chapter 12 of the ROBEX Handbook, *Management of OPMET exchange under the ROBEX scheme*, which is further discussed under agenda item 4.

3.1.5 A “Record of amendments and corrigenda” page has been added in the beginning of the ROBEX Handbook. The revision date has also been included in the web version of the documents in order to facilitate tracking of the changes.

3.1.6 Japan informed that, in accordance with the change of AFTN address of Tokyo COM center from RJAAIFYX to RJJYFYX due to the relocation of Tokyo AFTN COM center from Narita to Fukuoka from 15UTC on February 15 2006, the AFTN address of Tokyo ROBEX centre will also be changed from RJAAYPYX to RJTDYPYX. This change will not affect the current address RJTDZYX of RODB Tokyo. Corresponding changes to the ROBEX Tables will be introduced by the secretariat. **(Action Item)**

3.2 ASIA/PAC ICD

3.2.1 The meeting noted that RODB Singapore and RODB Japan introduced new request format for FK and FV bulletins with a dummy CCCC location indicator in the form "RQM/FKXXXX" and "RQM/FVXXXX". These and some other changes to the respective ICD Appendices have been provided to the Secretariat for incorporation in the updated version of the ICD to be published on the ICAO web site shortly after the meeting. **(Action Item)**

3.2.2 RODB Brisbane raised the question of the implementation by all RODBs of the standard format of the reply message, as specified in the ICD, using dummy geographical designator "XX" and ii=99. The format has already been implemented by RODB Bangkok and Tokyo, and partly by RODB Singapore. RODB Brisbane has planned to introduce this format, while RODB Nadi was studying this possibility. The representative of RODB Singapore emphasized that the proposed standard format may not be the best option, in particular, when replying to a request for more than one type information. The IATA expert stated that the standardization of the format of the request and reply messages is highly desirable, including the harmonization of these format between the ICAO regions. It was agreed that the ASIA/PAC RODBs will continue consultation on this subject and prepare a common position for the next meeting. **(Action Item)**

3.2.3 The meeting noted that the ASIA/PAC OPMET Catalogue, which should become Appendix F of the ICD has not been developed yet. However, significant progress has been made in the development of the *ROBEX Database* by the expert from RODB Brisbane. It is expected that by means of this Database a full list of the available OPMET information from ASIA/PAC Region could be developed and maintained. This matter should be pursued by all RODBs and the first draft of the catalogue should be prepared for consideration by the next meeting. **(Action Item)**

3.3 OPMET related FASID tables

3.3.1 The Secretariat informed the meeting that a FASID amendment proposal containing changes to the MET Tables related to the ROBEX scheme, agreed by the third meeting of the group, was circulated to the States concerned in December 2005 with deadline for comments 31 January 2006. Some corrections to FASID Tables MET 4A and 4B have been received and it was expected that the amendment proposal will be finalized in the near future.

3.3.2 As regards FASID Tables MET 2A, *Exchange of operational meteorological information not catered by the ROBEX scheme*, and MET 2B, *Exchange of SIGMET messages*, the Secretariat informed that coordination was undergoing with the other ICAO regional offices to find a harmonized solution. These two tables, which had been introduced in the regional ANPs long time ago, were difficult to maintain up-to-date and their replacement with other tables (e.g., SUG Annex 1 table) had been discussed. It was expected that the decision about FASID Tables MET 2A and 2B should be taken by the end of 2006.

3.3.3 In view of the above, the expert from Hong Kong, China requested guidance in regard to the exchange of SIGMET with the adjacent FIRs, in particular, how to determine which SIGMET bulletins should be received by the ROBEX centres. It was clarified that guidance on SIGMET exchange

provided in the *ASIA/PAC SIGMET Guide* and the *ROBEX Handbook* ensured the dissemination of SIGMET to the international OPMET data banks and the satellite broadcast providers (SADIS and ISCS). Therefore, if these exchanges were fully implemented, all centres using SADIS or ISCS receivers would receive all SIGMETs issued globally. However, there was still a requirement for bilateral exchange of SIGMET via direct AFTN addressing between the MWOs and ACCs in the adjacent FIRs within a radius of 1800 km (1000 NM). It was expected that this exchange was intended for providing the ACCs with the valid SIGMETs necessary for transmission to aircraft in flight via voice communication or VOLMET (or D-VOLMET), should be arranged bilaterally. The meeting discussed an option of introducing AFTN distribution lists for SIGMET in a similar manner as for METAR and TAF, however, the prevailing opinion was that this would create additional workload related to coordinating and updating a new ROBEX table.

Agenda Item 4: Development of procedures for monitoring and management of OPMET exchange

- a) **OPMET monitoring and quality control procedures**
- b) **OPMET bulletins update procedure**
- c) **SIGMET tests**

4.1 OPMET monitoring and quality control procedures

4.1.1 The meeting recalled that the third OPMET/M TF meeting identified that management of OPMET exchange under the ROBEX scheme was yet to be developed. It was recognized that the quality control (QC) of the OPMET bulletin to be performed by the ROBEX centres and the RODBs was one of the most important parts of Chapter 12 of the ROBEX Handbook. It was proposed to form an OPMET QC Team to collect information of the existing quality control procedures and prepare a draft text for Chapter 12 to be ready for OPMET/M TF/4 meeting

4.1.2 The coordinator of the OPMET QC Team from Singapore RODB presented a report to the meeting, which contained draft QC material for inclusion in Chapter 12 of the ROBEX Handbook. The draft had been developed in coordination with RODB Tokyo and was based on ISO 9000 QC principles.

4.1.3 The meeting reviewed the draft material and commended the QC Team for the excellent job done. It was agreed that this material would be included in the ROBEX Handbook as shown in **Appendix I** to the report. (**Action item**)

4.1.4 Bangkok RODB presented the results of a monitoring exercise carried out for a period of 31 days (August 2005) over the ASIA and MID OPMET bulletins for which the RODB was responsible. The exercise included computing the availability, compliance and regularity indices as defined in the draft guidance material prepared by the QC Team. The computed indices for METAR and TAF reports have been presented in tabulated and graphical form. The meeting expressed appreciation to the effort by RODB Bangkok which came to confirm that regular monitoring by all RODBs and ROBEX centres using standardized methodology would be achievable.

4.1.5 The meeting discussed some outstanding tasks related to the implementation of the quality control and monitoring by the RODBs and ROBEX centres. It was necessary to determine the frequency of the monitoring exercises, to agree on acceptable levels of the performance indicators and to automate the QC and monitoring processes. Singapore will provide advice to other centres on the methodology to be used.

4.1.6 A demonstration of an advanced version of the ROBEX database developed by Brisbane RODB was presented, which showed new functionalities allowing to perform monitoring of the OPMET data stored in the database. The need for implementing common checking procedure was emphasized. The current version of the ROBEX database could be used for by the RODB's to analyze the OPMET information received provided that the data are stored in text file format. To enable quality control "checks" to be carried out, the bulletins should be extracted from the text file, segmented and loaded into a Microsoft Access Database.

4.1.7 The meeting agreed that the QC Team should continue working on refining the QC and monitoring procedures to be provided to the ROBEX centres. Coordination with the EUR BMG should take place in order to ensure that the monitoring results are comparable with similar monitoring activities carried out by BMG and SADISOPSG.

4.2 OPMET bulletins update procedure

4.2.1 A draft procedure for ROBEX bulletin updates developed by the Secretariat was presented to the meeting. The procedure was developed with due consideration of the need for advanced notification to the communication centres and users concerned so that they could adjust their systems prior to the implementation of the bulletin changes. As agreed by the OPMET/M TF/3 meeting, the procedure included notification of the AFTN users by means of a standard METNO message. The overall coordination of the bulletin changes would be carried out by the Regional Office and the designated ROBEX Focal Points.

4.2.2 The meeting agreed that the draft procedure was applicable and should be included in the next version of the ROBEX Handbook, to be published shortly after the meeting. **(Action Item)**

4.3 SIGMET Tests

4.3.1 The meeting reviewed the results of the recent SIGMET tests carried out in the ASIA/PAC Region presented by the expert from Japan. It was noted that the regional guidance for the SIGMET tests had been slightly revised, but the main objective of the tests remained to be checking of the compliance of the communication procedures and dissemination schemes used by the MWOs. The tests were conducted according to a schedule, coordinated with the Rapporteur of the ASIA/PAC VA/TC Implementation Task Force, as follows:

- Test for SIGMET for volcanic ash (WV SIGMET) – 19 January 2006, start time (time of issuance of the triggering volcanic ash advisory by the VAACs concerned) 0200 UTC;
- Test for SIGMET for tropical cyclones (WC SIGMET) – 26 January 2006, start time (time of issuance of the triggering tropical cyclone advisory by the TCACs concerned) 0200 UTC;
- Test for SIGMET for other weather phenomena (WS SIGMET) – 9 February 2006, start time 0200 UTC.

4.3.2 The results presented to the meeting, were only preliminary since the tests were conducted shortly before the meeting. However, there were enough data to allow to outline some tendencies in regard to the SIGMET issuance and dissemination.

4.3.3 The participation of the ASIA/PAC States in the SIGMET tests was estimated as satisfactory. Some of the deficiencies identified during the previous tests conducted in 2005 were observed again, namely:

- The number of the test SIGMETs received was lower than expected according to the SIGMET tables in the ROBEX Handbook and the ASIA/PAC SIGMET Guide;
- There were a few bulletins with wrongly formatted WMO heading, e.g., WS instead of WV;
- Not all the issued test SIGMETs reached all RODBs.

4.3.4 On a positive note, the meeting appreciated the participation of most of the 14 Russian MWOs, which were in the VAAC Tokyo area of responsibility, in the VA SIGMET test. The observer from the Russian Federation informed the meeting that the VA SIGMET test procedure used in the EUR region was different to the one used in the ASIA/PAC. It was highly desirable to harmonize these procedures in order to facilitate the participation of the Russian MWOs, which were to participate in the tests conducted in the two regions. The secretariat took note of this suggestion and would investigate with the ICAO Office, Paris the possibility for harmonizing the procedures. **(Action item)**

4.3.5 The meeting requested the Rapporteurs of the OPMET/M TF and VA/TC/I TF to finalize the analysis of the SIGMET tests results and provide some quantitative figures on the degree of compliance with the requirements spelled out in the relevant regional guidance documents throughout the region. Special analysis should be carried out of the AFTN addressing of SIGMETs and advisories and of the use of non-AFS channels for SIGMET transmission like GTS. **(Action Item)**

4.3.6 The meeting noted with interest some observations by Hong Kong, China based on the SIGMET tests and additional surveys conducted by Hong Kong Observatory (HKO) on the SIGMET dissemination. Monitoring results of SIGMETs received via the SADIS satellite broadcast, SADIS FTP and ISCS satellite broadcast for one day (20 Jan 2006) in Hong Kong, China indicated that :

- the number of SIGMETs received via these three sources (SADIS satellite broadcast, SADIS FTP and ISCS satellite broadcast) were different;
- certain SIGMETs were only available via AFTN, but not available from the two satellite broadcasts or SADIS FTP;
- certain SIGMETs were only available from SADIS FTP but not available from SADIS satellite broadcast.

4.3.7 In addition, SIGMETs for FIRs in the ASIA/PAC Region were searched from the Hong Kong Observatory's OPMET database which contained data received via SADIS and AFTN. It was noticed that no SIGMET have been received for certain FIRs by Hong Kong, China throughout the whole year of 2005. Based on these observations, the expert from Hong Kong, China suggested some actions to be taken in order to resolve the observed discrepancies on the SIGMET availability from the different communication sources, in particular, those related to SADIS, SADIS FTP, and ISCS. It was agreed in this regard that the secretariat will provide the data from Hong Kong, China to the secretary of the SADISOPSG for further consideration. **(Action Item)**

4.3.8 The expert from the HKO demonstrated an experimental web application developed by the HKO for graphical depiction of the locations where a valid SIGMET is currently available. The depiction is done by different symbols for WC, WS and WV SIGMET. The text of the SIGMET could also be retrieved and shown on the screen. The meeting agreed that this new product could be very useful for real time monitoring of the SIGMET in the ASIA/PAC Region. It was recommended that the VA and TC advisories should also be displayed to show the correspondence between the advisories and the SIGMETs.

4.3.9 The meeting requested Hong Kong China to check the feasibility of providing access to the SIGMET web page to ROBEX Centres, MWOs and other aviation users in ASIA/PAC Region. In order to ensure that the web application will cover the whole ASIA/PAC Region, Singapore RODB was requested to relay all ASIA/PAC SIGMETs and advisories to HKO. Subject to confirmation by Hong Kong China, the meeting formulated the following draft conclusion for consideration by CNS/Met SG/10 meeting.

Draft Conclusion 4/1 Development of ASIA/PAC SIGMET web page by Hong Kong, China

That,

ICAO invite Hong Kong China to develop, in coordination with Singapore, a web page on the Hong Kong Observatory web site, providing real-time information on the valid SIGMETs and advisories issued by the MWOs and advisory centres in the ASIA/PAC Region.

Note: Authorized access to the web application to be provided to the RODBs, ROBEX centres, MWOs and the ICAO Regional Office with possible future expansion to other aviation users.

4.3.10 The meeting expressed full support to the continuous efforts for improving the availability of SIGMET by the ASIA/PAC States and thanked all those involved in the organization of the SIGMET tests. The final results of the tests together with appropriate recommendations should be forwarded to all participating States for information and action as necessary. **(Action Item)**

Agenda Item 5: Transition to BUFR coded OPMET information

5.1 Under this agenda item, the meeting reviewed the background information and discussed two working papers presented by the Secretariat and Japan.

5.2 The meeting recalled the APANPIRG Decision 15/40 *Planning for migration to BUFR-coded aeronautical meteorological messages*, which called the OPMET/M Task Force and the ATN Transition Task Force to pursue matters related to the BUFR transition and develop a Regional Plan for the Transition to BUFR coded OPMET Information.

5.3 The meeting was informed that the outcome of OPMET/M TF/3 was presented to the seventh meeting of ATNT TF held in Shanghai in April 2005. The related issue for AMHS to support the BUFR code was briefly discussed at the ATNT TF meeting. It was confirmed that the basic ATS MHS (AMHS) being implemented by States would not be able to support exchange of BUFR coded OPMET information without modification. Therefore, the ATNT TF/7 meeting in its Decision 7/15 tasked an ad-hoc Working Group to study the capability of AMHS to handle BUFR-coded meteorological information and to address the detailed requirements of the BUFR code to be introduced in the Asia/Pacific region.

5.4 A meeting of the ATNT TF Ad-hoc Working Group was held during the ATN Seminar, on 26 January 2006 with 9 participants from China, Hong Kong China, Fiji, Japan, Singapore, Thailand and USA. The outcome of the meeting was provided by the Rapporteur from USA and presented to the meeting by the Secretariat.

5.5. It was informed that the binary-based AMHS would be able to support transmission of the binary-based BUFR coded files. However, modifications to some existing AMHS systems may be necessary. The BUFR coded information would be an attached file to a AMHS message to be distributed to respective users and/or application processing systems.

5.6 The ATN Ad-hock Working Group identified the following two approaches for the MET service to use BUFR code:

- a) support BUFR code directly by updating data generating systems and end users systems and/or;
- b) by insulating these systems from BUFR by use of converters (TAC/BUFR and BUFR/TAC converters).

5.7 In order for ATN Implementation Coordination Group to further study the issue, the OPMET Management Task Force was requested to provide detail information on the following items:

- a) BUFR Coded maximum memory requirement for each transmission;
- b) Interface characteristics required between AMHS and MET; generating/receiving MET data (Interface Control Document)
- c) Distribution and display requirements;
- d) Tracking and storage requirements;
- e) Transition of OPMET system from AFTN to AMHS

5.8 The meeting was informed that a survey was conducted by the ATN Ad Hoc working group. The responses received from the working group member States on their readiness to support BUFR coded OPMET messages are as follows:

China: The future operational AMHS would have the capability to support the extended service for BUFR coded OPMET message by year 2007. However, regarding the detailed implementation plan for BUFR coded OPMET message, the Meteorology Division of CAAC will further study and analyze to determine certain timeframe of the implementation.

Japan: The AMHS currently in operation between Japan and the United States cannot support the BUFR-coded data. In order to handle BUFR coded OPMET messages, it will be necessary to modify part of the gateway software in their AMHS.

Hong Kong, China: According to Decision 7/15 of the ATN/T TF, Hong Kong will procure a new AMHS System in early 2007 to support BUFR code operation.

Fiji: Fiji plans to implement ATN in 2007 and can also support BUFR-coded OPMET messages by 2007.

Thailand: Bangkok OPMET Data Bank/ROBEX centre automation cannot support the BUFR code at the moment. Thailand plans to develop a BUFR application in 2007-2009. AEROTHAI AMSS (Automatic Message Switching Service) presently cannot support binary attachments such as BUFR code but it will be enhanced in order to support binary attachments by 2009.

United States: The operational FAA AMHS is based on Basic Service as defined in ICAO Doc. 9705, Edition 2. At present it is not capable to support binary attachments such as BUFR code. With the implementation of Extended Service or modification of existing AMHS Basic Service, the FAA system would support BUFR code when it becomes operational.

5.9 The meeting noted that, according to the regional air navigation plan, most States in the ASIA/PAC Region will implement AMHS in about four years time frame i.e. 2006-2009(FASID Table CNS 1C approved in July 2005 refers). These new AMHS systems would be able to support BUFR coded messages subject to the detailed MET requirements to be specified.

5.10 Japan informed the meeting of the necessity of phased introduction of BUFR coded OPMET information in line with the implementation of AMHS. It was suggested to set target date of implementation for each stage.

5.11 It was advised that during the transition period to BUFR code the exchange of both binary-coded and character-based data in parallel would be necessary. It would also be necessary, before the entire AFS network was able to handle BUFR-coded data, to convert between BUFR-coded and character-based data or to take measures for the simultaneous transmission of the same data in both BUFR and character formats.

5.12 It was noted that a method for AMHS to support transmission of binary files is through a chunk of binary data which is transmitted in an "envelope". It is required for AMHS to check only the address of the envelope and it is not necessary to process the message content. This method would be generally applicable to a variety of binary data and only minor software modification would be required to existing MTAs and gateways. It will be necessary to consider the use of the File Transfer Body Part (FTBP) defined in the draft Edition 4 of ICAO Doc. 9705 which will be finally reviewed by ACP in May 2006 and likely to be available by September 2006.

5.13 The meeting noted that the suggested time frame of the transition to BUFR code along with amendments to Annex 3:

- End of 2007 – amendment 74 to Annex 3: will allow the use of BUFR coded OPMET in addition to TAC between States under bilateral agreement.
- 2010 – Amendment 75 to Annex 3: provisions for exchange/distribution of BUFR between OPMET databanks in the form of a recommended practice (RP);
- 2013 – Amendment 76 to Annex 3: the above RP become Standards and provisions allowing all States to issue OPMET data in BUFR to OPMET databanks as recommended practice;
- 2016 – Amendment 77 to Annex 3: above becomes Standard leading to full implementation of BUFR coded OPMET data.

5.14 It was recognized that if the communication infrastructure, end processing systems, as well as the associated procedure were available, a shorter transition period would be more cost effective.

5.15 It was agreed that domestic use of BUFR coded meteorological information is a local matter. It will be for the States to decide when and how to use BUFR code in their domestic environment for distribution and process of meteorological information.

5.16 It was further clarified that the transition to BUFR coded meteorological information only refers to those OPMET data types, i.e., METAR, SPECI, TAF, SIGMET, etc., which are currently exchanged via AFTN.

5.17 The meeting further discussed some MET aspects of the transition to BUFR coded OPMET information. It was emphasized that the BUFR coding will require highly standardized meteorological input. That means that all currently observed discrepancies and deficiencies in the implementation of the ICAO and WMO prescribed formats should be resolved.

5.18 It was also the common understanding that all OPMET data types, including those which are not in the WMO Manual on Codes, such as the VA and TC advisories, would be BUFR-coded in the future.

5.19 The meeting sought more information on the type of the future end-user products based on the BUFR coded OPMET information. The secretariat advised that there are no new products envisaged at this stage, thus it is expected that the end-users, e.g., pilots, would continue receiving the METAR and TAF as before. There were some opinions that the introduction of the BUFR code for OPMET would be a good opportunity to revise these traditional products, which had been imposing certain limitations to the meteorological information provided to the users. However, it was expected that any change to the traditional data types (METAR, TAF, etc.) would lead to significant cost for the users in training and other adaptations. The meeting agreed that the above considerations were interesting and the group should keep abreast of the developments that may accompany the transition to the BUFR coded OPMET data.

5.20 Issues related to the necessary new equipment, software and procedure for the NOCs, ROBEX centres and RODBs in order to enable the transition to BUFR code were of primary importance for the States. At this stage, these questions had no definite answer which made it impossible to estimate the cost of the transition for all centres involved. More technical guidance including prototyping was considered necessary in order to facilitate the regional planning.

5.21 The meeting took note of the information provided by the observer from the Russian Federation on the discussion in the EUR Region of the potential negative effects of the transition to BUFR code including some safety implications. These concerns had been addressed by EANPG in its Conclusion 47/27.

5.22 In order to provide answers to the questions raised by the ATN Ad Hoc Working Group by May 2006 and identify detailed MET requirements for using BUFR code, the meeting agreed to establish a Project Team on the BUFR Transition for OPMET information (PT/BUFR Transition). Participants from Australia, China, Fiji, India, Japan and Thailand expressed their wish to be members of the Team and some other would inform the secretariat after coordination with their administrations. **(Action Item)**

Agenda Item 6: Future Work Programme

6.1 The group reviewed the status of the action items from its previous meetings and established schedule for the new tasks as appropriate. The updated list of action items is in **Appendix C** to the report.

6.2 The group agreed that its fifth meeting would be held in February 2007 in the ICAO Regional Office, Bangkok. The exact dates for the meeting will be advised after further coordination.

6.3 In order to advance the development of a regional plan for migration to BUFR-coded OPMET information, the meeting also agreed that during the tenth meeting of CNS/MET Sub-group of APANPIRG, scheduled for July 2006, a joint side meeting with experts from both the ATN Implementation Coordination Group and the OPMET/M Task Force should be conducted. The members of the BUFR Transition Project Team of the OPMET/M Task Force were strongly encouraged to participate in this meeting. (**Action Item**)

Agenda Item 7: Any other business

7.1 The group expressed its appreciation and gratitude to the Rapporteur, Rick Houghton, who was going to retire later this year. Rick has chaired all four meetings of the task force since its establishment and contributed greatly to its success. The group wished him long and happy retirement.

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**Fourth Meeting of the ASIA/PAC
OPMET Management Task Force (OPMET/M TF/4)
Bangkok, Thailand (13-16 February 2006)**

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**TERMS OF REFERENCE OF ASIA/PAC OPMET MANAGEMENT TASK FORCE
(OPMET/M TF)**

1. Terms of Reference

- Review the OPMET exchange schemes in the ASIA/PAC and MID Region and develop proposals for their optimization taking into account the requirements by the aviation users and the current trends for global OPMET exchange;
- Develop **standardized quality control**, monitoring and management procedures related to ROBEX exchange and other exchanges of OPMET information;
- Regularly update the regional guidance material related to OPMET exchange;
- Liaise with other groups dealing with communication and/or management aspects of the OPMET exchange in ASIA/PAC and other ICAO Regions (ASIA/PAC ATN ~~Transition~~ **Implementation Coordination** TF, BMG EUR Region, CNS/MET SG MID Region, etc.).

2. Work Programme

The work to be addressed by the ASIA/PAC OPMET Management Task Force includes:

- (a) to examine the existing and any new requirements for OPMET exchange in ASIA/PAC and MID regions and assess the feasibility of satisfying these requirements, taking into account the availability of the data;
- (b) to keep under review the ROBEX scheme and other OPMET exchange schemes and prepare proposal for updating and optimizing of the schemes;
- (c) to review and update the procedures for interregional OPMET exchange and ensure the availability of the required ASIA/PAC and MID OPMET data for the AFS satellite broadcasts (ISCS and SADIS);
- (d) to keep under review and provide timely amendments ~~of~~ **to** the regional guidance materials ~~on the~~ OPMET exchange; to ensure that guidance material ~~covers~~ **contains** procedures for the exchange of all required OPMET data types: SA, SP, FC, FT, WS, WC, WV, FK, FV, UA;
- (e) to conduct trials and develop procedures for **quality control**, monitoring and management of the OPMET exchange; to foster implementation of quality management of OPMET data by the ROBEX centres and the RODBs;
- (f) to prepare regional plan for the transition to BUFR coded OPMET information in coordination with the relevant APANPIRG contributing bodies.

3. Composition

- (a) The Task Force is composed by experts from:

Australia (Rapporteur); China; Fiji; Japan; Hong Kong, China; [India](#); Indonesia; Singapore; Thailand; United Kingdom; United States; and Viet Nam.

- (b) Representatives of IATA, EUR BMG and MID OPMET Bulletin Board are invited to participate in the work of the Task Force

ASIA/PAC OPMET/M TF/4
Appendix C-I to the Report

List of Action Items of OPMET/M TF (revision 4)
(as reviewed by OPMET/M TF/4 Meeting, 13 – 16 February 2006)

PART I – Status of Action Items adopted by OPMET/M TF/1 and 2

Action Item ID	Paragraph from the Report	Action	Status	Target Date	TF Member(s)
TF1-2.1	2.1.6	Consultation with ATN Transition TF on the possible impact on OPMET Data exchange; report to OPMET/E TF/2	<i>Closed</i> <i>(superseded by action item by OPMET/M TF/3)</i>	Permanent task	Secretariat (RO/CNS)
TF1-3.1	3.2	Provide the Secretariat with updated information on the AIREP exchange in ASIA/PAC	<i>Completed</i>	July 2004	AIREP Team
TF1-3.2	3.3	Preparation of a draft proposal for the re-composition of the ROBEX scheme based on the current MCC and TCC centres	<i>Completed</i>	15 April 2003 to be reported to CNS/MET SG/7 July 2003	Secretariat
TF1-3.3	3.4	Introduction of the new terminology to the ROBEX Handbook and other relevant documents	<i>Completed</i>	April 2003 to be reported to CNS/MET SG/7 July 2003	Secretariat
TF1-3.4	3.5	Coordination of the ROBEX Tables with the ROBEX centres	<i>Completed</i>	Tables sent to States before 30 April 2003 Replies from States before 15 June 2003	Secretariat All Members
TF1-3.5	3.6 (1)	Australian METAR and TAF bulletins to be rearranged to include all required international aerodromes	<i>Completed</i>	March 2004	Australia
TF1-3.6	3.6 (2), 4.12	Survey of the availability of METAR and TAF from the Pacific States (based on FASID Table MET 1A and SUG Annex 1)	<i>Completed</i>	July 2004	Fiji Australia United States

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Action Item ID	Paragraph from the Report	Action	Status	Target Date	TF Member(s)
TF1-3.7	3.9	Harmonization of the format and content of OPMET related Tables in different documents; change of format of FASID Tables MET 4A and 4B	<i>Completed</i>	Dec 2005	Secretariat
TF1-3.10	3.14	Deletion of obsolete EUR AFTN addresses from the distribution lists of ROBEX centres	<i>Completed</i>	July 2004	Singapore ROBEX Centre
TF1-3.11	3.14, 3.15, 3.16	Designation of inter-regional OPMET Gateways as single contact points for other regions	<i>Completed</i>	Continuous implementation	Singapore Bangkok Tokyo Secretariat
TF1-3.12	3.17	RODB Bangkok to provide back-up to RODB Singapore as IROG for EUR	<i>Completed</i>	April 2004	Bangkok Singapore Secretariat
TF1-3.13	3.19	ASIA/PAC RODBs to handle all OPMET data types	<i>Completed</i>	31 May 2003	All RODBs
TF1-3.16	3.23	Study of the possibilities of the RODBs to provide ftp and Internet access to OPMET related information.	<i>Completed</i>	Feb 2006 <i>RODB Singapore has developed a ftp/http backup system in support of Internet - OPMET Operations</i>	Australia Other RODBs
TF1-4.1	4.2	Proposal for transforming the Task Force into a "Management Group"	<i>Completed</i>	CNS.MET SG/7 Meeting July 2003.	Secretariat
TF1-4.1/1	4.2	Preparation of a modified OPMET update procedure for ASIA/PAC based on the EUR procedure	<i>Completed</i>	February 2006	Secretariat
TF1-4.2	4.3	NO messages generated in EUR to be distributed to ASIA/PAC	<i>Completed</i>	2005	Rapporteur of BMG

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Action Item ID	Paragraph from the Report	Action	Status	Target Date	TF Member(s)
TF1-4.3	4.7	Introduction of the EUR monitoring procedure by RODB Bangkok on a trial basis; provision of relevant software by UK	<i>Completed</i>	First 24-hour trial – AIRAC date 2 May 2003	Bangkok UK Secretariat
TF1-5.1	5.1	Preparation of the new edition of the ROBEX Handbook	<i>Completed</i>	Submission of the first draft to the ROBEX centres for review, comments and proposals – 30 April 2003 - Responses by the ROBEX centres – 15 June 2003 - Final draft to be presented at the CNS/MET SG/8 Meeting, July 2004	Secretariat ROBEX centres Secretariat
TF1-5.2	5.3	Singapore RODB to provide Secretariat with information on the current availability of EUR OPMET data	<i>Completed</i>	30 April	Singapore
TF1-5.3	5.4	Preparation of the new edition of the Asia/Pacific Regional ICD for OPMET Data Bank Access Procedures	<i>Completed</i>	July 2004	Secretariat RODBs

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Item No.	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
1. Operational Issues						
TF2-2	<u>1.2 Procedures</u>		1.			
		Inclusion all RODB addresses in distribution lists for all bulletins	2. List to be provided after verification 3. All ROBEX centres informed on RODBs addresses	<i>Completed</i>	May 2004	1. Australian member 2. All RODBs, Secretariat
		Deletion of obsolete EUR AFTN addresses (avoid duplication)	1. Letter to ROBEX Centres 2. Checking and removing duplications	To be checked with ROBEX centres	May 2004	1. Secretariat 2. RODBs/ ROBEX centres Singapore Australia
TF2-3	<u>1.3 Standardize formats</u>	Use of BBB group	Detailed explanation in ROBEX Handbook	<i>Completed</i>	April 2004	Secretariat
		Changes METAR & TAF Amd 73	1. Coordinate with the HQ and inform TF members 2. Conclusion for APANPIRG/15 3. State letter	<i>Completed</i>	1. March 2004 2. July 2004 3. August 2004	Secretariat; TF
		SIGMET Headers	Prepare a new ROBEX Table	<i>Completed</i>	April 2004	Secretariat
		AFTN Address Brisbane RODB	Provide one address for use by all centres concerned	<i>Completed</i>	May 2004	TF member from Australia
2. Studies necessary for improvement/optimization						

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Item No.	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
TF2-4	<u>2.1 AIREP</u>	Study: - current situation with collection/dissemination; - current use of AIREP by Met Offices; - proposals from States for improvement.	1. Prepare a questionnaire and send to all States concerned 2. Prepare proposal for amendment of ROBEX scheme as necessary	<i>Completed</i> <i>(Report TF3)</i>	July 2004	AIREP Team: Singapore & Australia – chair, assisted by RODBs & ROBEX
TF2-5	<u>2.2 SIGMET and advisories</u>	- Continue survey on the SIGMET headings; - Survey advisories headings; - Survey dissemination schemes used by MWO	- Finalize SIGMET table for ROBEX - Prepare proposal for optimization of dissemination schemes - Proposal for SIGMET tests	<i>Completed</i>	April 2004 2005	SIGMET Team: Rapporteur – Chair, assisted by all RODBs
3. Regional Guidance documents						
TF2-6	<u>3.1 ROBEX handbook</u>	Editorial changes proposed at the meeting	All changes agreed to be introduced by Secretariat	<i>Completed</i>	May 2004	Secretariat
		Add information on procedures for splitting the long bulletins	Include information in Appendix F	<i>Completed</i>	May 2004	Secretariat
		Clarify provision about filing times, obs. times & DTG SPECI	Consult with the HQ	<i>Completed</i>	May 2004	Secretariat
		New table short TAF	Prepare table	<i>Completed</i>	May 2004	Secretariat
		New table SIGMET	Prepare table	<i>Completed</i>	May 2004	Secretariat
		Update MID Region ROBEX tables	Information to be provided by the MID Region	<i>Completed</i>	May 2004	Secretariat
		Final draft – all ROBEX centres (incl MID)	Send to TF members for coordination; Present at CNS/MET SG/8	<i>Completed</i>	June 2004	Secretariat
TF2-7	<u>3.2 ICD</u>					

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Item No.	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
		Standardize the ICD with a “common” part and appendices	Remove ‘common’ part from current Appendices – describe differences for RODB’s only	<i>Completed</i>	May 2004	Secretariat in coordination with RODBs
		Final draft	Send to TF members for coordination; Present at CNS/MET SG/8	<i>Completed</i>	July 2004	Secretariat, RODBs
TF2-8	<u>3.3 DB & Catalogue</u>	Distribute DB from Brisbane to RODBs and ICAO	Finalize DB distribute to RODBs	<i>Completed</i>	April 2004	Australia
4. Quality Management Procedures						
TF2-9	<u>4.1 Monitoring exercises</u>	Present monitoring results at CNS/MET SG/8	Bangkok to prepare a paper for CNS/MET SG/8 showing result of monitoring	<i>Completed</i>	July 2004	Bangkok RODB
		Decide performance indices & presentation styles		<i>Completed</i>	2005	RODBs to coordinate and decide
		Standardize monitoring procedures	Exchange information via e-mail and prepare proposal for TF/3 meeting	<i>Completed</i>	Feb 2006	RODBs; TF members
TF2-10	<u>4.2 ROBEX update procedures</u>	Revise APANPIRG conclusion regarding the use of EUR OPMET procedure	Revisit the EUR procedure and amend it according to the regional practice	<i>Completed</i>	Feb 2006	Secretariat
TF2-11	<u>4.3 SIGMET monitoring procedures</u>	Develop procedure for SIGMET monitoring	To be developed based on the SIGMET study by the SIGMET Team	<i>Completed (SIGMET test procedures)</i>	2005	SIGMET Team
6. Administrative						

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Item No.	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
TF2-13	6.1 Improving efficiency of the TF	Focal point ROBEX centres	Rapporteur to write State letter requesting nomination of focal person	<i>Completed</i>	April 2004	Rapporteur, Secretariat
		Use of WEB site - Report TF - Discussion Group	Investigate possibility of discussion email/web group	<i>Completed (discussion via e-mail)</i>		Rapporteur
		Reporting CNS/MET SG/8	Report to be prepared and presented	<i>Completed</i>	July 2004	Rapporteur
	6.2 Composition of the TF	Include Indonesia as a member of the group	Present proposal to CNS/MET SG/8	<i>Completed</i>	July 2004	Secretariat
		Invite India to join the group	Send invitation letter	<i>Completed</i>	December 2004	Secretariat
Outstanding Action Items						
TF1-3.8	3.10	Change of OPMET bulletin structure from multinational to national		<i>Ongoing</i>	Permanent task (Tokyo Changed Feb 05)	Secretariat, Rapporteur, ROBEX centres
TF1-3.14	3.20	Introduction of mirroring of Databank's content (first phase)		<i>Ongoing</i>	Permanent task (In May 05, RODB SIN reviewed SIN and Tokyo DB content in the same period. The content is 80% aligned, except some domestic RJTD OPMET and EU FTXX90 not received in WSSS.)	Bangkok Brisbane Singapore Tokyo
TF1-3.15	3.21	Further standardization of access procedure to the ASIA/PAC RODBs		<i>Ongoing</i>	Permanent task	All RODBs Secretariat Rapporteur

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List of Action Items of OPMET/M TF (revision 4)
(as reviewed by OPMET/M TF/4 Meeting, 13 – 16 February 2006)

PART II – Status of Action Items adopted by OPMET/M TF/3

Item No.	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
1. Operational Issues						
TF3-1 (p. 2.4.5)	<u>1.1 Data Management</u>	OPMET DATA Availability - ASIA/PAC OPMET Data Shortfalls - PAC Data shortfalls	Follow-up the reported shortfalls by IATA	<i>On-going</i> <i>(RODB SIN switched METAR WSAP to London IROG as of 29 Apr 05. New Pacific SIP & PNG bulletins)</i>	Permanent task	TF members and ROBEX centres; Secretariat to coordinate
TF3-2 (p. 2.4.6)		Check if the content of OPMET information on SADIS and ISCS is identical	Coordinate with SADISOPSG and Provider States	<i>Closed</i> <i>(To be followed by SADISOPSG)</i>	June 2005	Secretariat
TF3-3 (p.2.4.7)		OPMET data from Viet Nam	Advise of availability	<i>Completed</i> <i>(Viet Nam advised on availability)</i>	July 2005	Viet Nam

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Item No.	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
TF3-4 (p.2.3.2, 2.3.3)		Improve the inter-regional exchange	Coordinate with ICAO Paris the exchange between ASIA/PAC and MID; Coordinate with ICAO Dakar and Nairobi the exchange between ASIA/PAC and AFI; Coordinate with ICAO Lima the exchange between ASIA/PAC and SAM	Closed <i>(Coordination with ICAO Regional Offices in progress)</i>	<i>(Overtaken by new action item by TF4 meeting)</i>	Rapporteur, Secretariat
TF3-5 (p.3.2.3.3)	1.2 Procedures	Request format for FK and FV bulletins	RODBs to introduce request format with dummy CCCC identifier	Completed <i>(RODB SIN, BKK and Tokyo; BBN and Nadi to advise)</i>	End of 2005	RODBs
TF3-6 (p.4.2.4)		Bulletin changes notification via AFTN	Introduce METNO bulletin	Completed	TF/4 meeting	All ROBEX centres in coordination with Secretariat
TF3-7 (p. 2.1.2)	1.3 Standardize formats	METAR and TAF format	TF Members to provide examples of wrongly formatted messages	Completed <i>(New task to be formulated by TF/4)</i>	1 May 2005	All members
TF3-8 (p.2.2.6)		Format of request message to RODBs	Users to be informed of the format; IATA to provide web link to the ICD ICAO RO to send letter to IATA	On-going	May 2006	IATA Secretariat
2. Studies necessary for improvement/optimization						

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Item No.	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
TF3-9 (p.2.1.14)	<u>2.1 AIREP</u>	Follow-up the AIREP survey	<ul style="list-style-type: none"> - Send AIREP report to all ROBEX Centres – receive feed-back - Present the survey report at CNS/MET SG/9 - Decide on AIREP exchange in ROBEX 	<i>Completed</i>	1 May 2005 July 2005 TF/4	AIREP Team and Secretariat
TF3-10 (p.4.3.1.5)	<u>2.2 SIGMET and advisories</u>	Follow-up SIGMET tests	Present results of the VA and TC tests at CNS/MET SG/9; Advise States with identified deficiencies	<i>Completed</i>	July 2005	SIGMET Team, Secretariat
TF3-11 (p.4.3.1.8)		Conduct tests for WS SIGMET	Present the draft procedures at CNS/MET SG/9 and coordinate date	<i>Completed</i>	July 2005	SIGMET Team
3. Regional Guidance documents						
TF3-12 (p. 2.2.9)	<u>3.1 ROBEX Handbook</u>	Update ROBEX Handbook	Update with the information received during the meeting	<i>On-going</i>	March 2006	Secretariat
TF3-13 (p. 3.1.2.2, 4.1.6, 4.4.4)		Finalize the chapter on OPMET Management	Develop QC procedures; Develop monitoring procedures	<i>Completed</i>	TF/4	QC Team (all RODBs, Rapporteur – Singapore)
TF3-14 (p.3.1.2.3)		Review and update Appendix G	Coordinate with the Regions concerned	<i>On-going</i>	2006	Secretariat
TF3-15 (p. 3.1.3)		Introduce “Record of Amendments” page	Develop page and include in the updated version on web	<i>Completed</i>	TF/4	Secretariat
TF3-16 (p.2.2.9)	<u>3.2 ICD</u>	Update ICD	Update with the information received during the meeting	<i>Completed</i>	TF/4	Secretariat

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Item No.	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
TF3-17 (p.3.2.3.3)		Format of RODB's OPMET catalogues	Standardize all OPMET catalogues	<i>Completed</i> (Nadi to advise)	TF/4	RODBs
TF3-18 (p.2.3.7)		Introduce Back-up procedures	Add an appendix in the ICD with the back-up arrangements between SIN and BKK	<i>Completed</i>	TF/4	Secretariat, RODB Bangkok and Singapore
TF3-19 (p.3.2.6)	<u>3.3 ROBEX DB & Catalogue</u>	Development of the ROBEX Database (MS Access application)	<ul style="list-style-type: none"> - Members to test the beta-version and provide feedback to Brisbane; - Database to be presented at CNS/MET SG/9 	<i>On-going</i> <i>Completed</i>	1 June 2006 July 2005	All Members
TF3-20 (p.3.2.6)	<u>3.4 FASID</u>	Harmonize OPMET information in different documents	Prepare amendment proposals for OPMET related FASID Tables for consideration by CNS/MET SG/9	<i>Completed</i>	July 2005	Secretariat in coordination with all Members
5. Liaison with other groups						
TF3-21 (p.5.4)	<u>5.1 Groups</u>	ATN/T Task Force	Coordinate with the ATN/T TF (or its successor) a joint meeting in 2006 to discuss BUFR transition issues	<i>Completed</i>	April 2005	Rapporteur, Secretariat
		Other ICAO Regions	Send report	<i>Completed</i>	April 2005	Secretariat
6. Administrative						
	<u>6.2 Composition of the TF</u>	New members	Advice CNS/MET SG/9 on the participation of India and Viet Nam in the work of the TF	<i>Completed</i>	February 2006	Secretariat

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List of Action Items of OPMET/M TF (revision 4)
(as reviewed by OPMET/M TF/4 Meeting, 13 – 16 February 2006)

PART III –Action Items adopted by OPMET/M TF/4

Item No. & Report paragraph	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
1. Operational Issues						
TF4-1 2.1.11 2.1.13 2.4.4 3.1.2.2	<u>1.1 Data Management</u>	Improve OPMET availability	<ol style="list-style-type: none"> 1. Implement new South PAC bulletins 2. Add VDSR to FTAS31 VTBB 3. Update SA and FT bulletins from Thailand 4. Implement new bulletins from Indonesia 5. Coordinate changes to bulletins for Malaysia and Japan 		<ol style="list-style-type: none"> 1. May 2006 2. ASAP 3. ASAP 4. Dec 2006 5. June 2006 	TF members and ROBEX centres; Secretariat to coordinate
TF4-2 2.2.2 2.3.6 2.3.8		Improve the inter-regional exchange	<ol style="list-style-type: none"> 1. Coordinate with ICAO SAM and AFI regions in regard to the operation of data banks; 2. Advise SAM region of frequent RQMs sent to RODB YBBN 3. Continue operational trials of back-up procedures between IROGs BKK and SIN 		<ol style="list-style-type: none"> 1. April 2006 2. April 2006 3. End of 2006 	Secretariat; IROGs

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Item No. & Report paragraph	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
TF4-3 3.2.2	<u>1.2 Procedures</u>	Standard format of RODB's reply message	Conduct consultation between the RODBs on the implementation of reply messages with "XX" geographical designator and advise TF/5		TF/5 2007	RODBs
TF4-4 3.1.3	<u>1.3 Standardize formats</u>	Align WMO headings of the OPMET bulletins issued by Thailand and India with the standard geographical designators	Change designators of SA, FT and FC bulletins		August 2006	India and Thailand TF members; Secretariat to coordinate
2. Studies necessary for improvement/optimization						
TF4-5 4.3.4 4.3.5 4.3.7 4.3.10	<u>2.1 SIGMET and advisories</u>	Follow-up SIGMET tests	<ol style="list-style-type: none"> 1. Finalize the analysis of the WV, WC and WS test held in Jan/Feb 2006 and advise States 2. Inform SADISOPSG of the findings by HK China 3. Coordinate with EUR region harmonization of WV test procedures 		<ol style="list-style-type: none"> 1. April 2006 2. March 2006 3. July 2006 	SIGMET Team, Secretariat
3. Regional Guidance on OPMET exchange						

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Item No. & Report paragraph	Field	Description	Action	Status	Target Date	To be done by
1	2	3	4	5	6	7
TF4-6 3.1.6 4.1.3 4.2.2	<u>3.1 ROBEX Handbook</u>	Update ROBEX Handbook	<ol style="list-style-type: none"> 1. Update ROBEX Tables with the information received during the meeting 2. Change AFTN address of Tokyo ROBEX centre 3. Add QC procedures, Chapter 12.2 4. Add OPMET bulletin update procedure 		March 2006	Secretariat
TF4-7 3.2.1	<u>3.2 ICD</u>	Update ICD	Update with the information received during the meeting		April 2006	Secretariat
TF4-8 3.2.3	<u>3.3 ROBEX DB & Catalogue</u>	ASIA/PAC Catalogue and further test the ROBEX Database (MS Access application)	-Coordinate with RODBs and use the Database for preparing OPMET Catalogue		TF/5 2007	RODBs Secretariat Australia
5. Transition to BUFR code for OPMET information – regional planning						
TF4-9 5.23 6.3	<u>5.1 PT BUFR Transition</u>	-Establish Project Team on BUFR Transition together with ASIA/PAC ATN IC Group	<ol style="list-style-type: none"> 1. Coordinate the membership to PT BUFR/T 2. Inform ATN ICG meeting 3. Prepare a side meeting of the PT during CNS/MET SG/10 		<ol style="list-style-type: none"> 1. April 2006 2. May 2006 3. July 2006 	Rapporteur, Secretariat

PROPOSAL FOR NEW PROCEDURE FOR SOUTH PACIFIC OPMET BULLETINS

1. METAR/SPECI and TAF bulletins for aerodromes in the South Pacific should be compiled by the Nadi ROBEX Centre.
2. Participating States and territories: Cook Islands, Fiji, Kiribati, Niue, Samoa, Tonga, Tuvalu, Vanuatu.
3. To ensure that Nadi ROBEX Centre is able to compile the bulletins, a uniform procedure should be applied for transmitting the national bulletins or individual messages to Nadi AFTN centre. Since most originating meteorological offices (NOCs) in the South Pacific States do not have direct access to AFTN. Therefore, alternative communication means should be used.
4. The use of e-mail for sending national messages/bulletins is considered the most efficient method of communication between the originating meteorological offices (NOCs) in South Pacific and Nadi ROBEX Centre. Nadi AFTN Centre message switch has the functionality to automatically relay AFTN-formatted messages received via e-mail to AFTN. It can also provide a request/reply service to users sending their request by e-mail.
5. In order to establish reliable and secure exchange of OPMET data via e-mail, all participating meteorological offices (NOCs) in South Pacific States shall designate official e-mail address to be used for this exchange and inform Nadi ROBEX Centre, accordingly. The e-mail address of Nadi ROBEX Centre to be used in this exchange is: umsv4@afl.com.fj .
6. The format of the e-mail messages containing OPMET messages from originating offices is as follows:
 - a. Subject line: TBD
 - b. Content:

Example:

GG NFFNYZYX

200658 NFTFYMYX

SATO31 NTF 200700
METAR NFTL 200700Z 09008KT 9999 FEW020 29/26 Q1011=
METAR NFTF 200700Z 13004KT 9999 BKN020 29/24 Q1012=
METAR NFTV 200700Z NIL=
7. The following South Pacific OPMET bulletins will be compiled by Nadi ROBEX Centre:

METAR

SAPS31 NFFN
NCRG, NFFN, NFSU, PLCH, NGTA, NGFU, NIUE

SAPS32 NFFN

NSAP, NFTF, NFTV, NVVV, NVSS, NLWW, *NSMA*, *NFTL*

TAF

FTPS31 NFFN

NCRG, NFFN, PLCH, NGTA, NIUE, NSAP, NFTF, NFTV, NVVV, NVSS

8. Nadi ROBEX Centre should send the above bulletins to the following AFTN addresses:

Bangkok
Brisbane
Singapore
Tokyo
Wellington

9. Singapore IROG will forward the bulletins to SADID Gateway, London for uplink to SADIS. Tokyo IROG will forward the bulletins to Washington for uplink to ISCS.
10. Other OPMET bulletins currently generated by South Pacific States that should also be sent to Nadi RODB:

Compiled by French Polynesia

SAPF31 NTAA

NTTG, NTAA

FTPF31 NTAA

NTAA

Compiled by New Caledonia

SANC31 NWWW

NWWW

FTNC31 NWWW

NWWW

Bulletins for Papua New Guinea, Solomon Islands and Nauru, compiled by Brisbane
RODB

	Designator	Location	TAF issue times
FTNG31	AYPY	Port Moresby	0024 0606 1212 1818
	ANYN	Nauru	0024 0606 1212 1818
	AGGH	Honiara	0024 0606 1212 1818

Issue times 0445, 1045, 1645 and 2245

FCNG31

	AYNZ	Nadzab	0214 0820 1808
	AYMD	Madang	0214 ----- 1808
	AYWK	Wewak	0214 ----- 2008
	AYVN	Vanimo	0211 2008

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AYGA	Goroka	0211	2008
AYMH	Mount Hagen	0211	2008
AYMO	Momote	0214 0820	2008
AYDU	Daru	0211	2008
AYGN	Gurney	0211	2008
AYHK	Hoskins	0211	2008
AYKV	Kavieng	0211	2008
AYMS	Misima	0211	2008
AYTK	Tokua (Rabaul)	0211	2008
AYKI	Kiunga	0211	2008

Issue times 0045, 0645, 1645, 1745 and 1845 (this will cover variable issue times)

FCNG32

AGGM	Munda	0517 1402 1910
AGGK	Kirakira	0517 1402 1910
AGGL	Santa Cruz	0517 1402 1910

Issue times 0345, 1245 and 1745

SANG31

AYPY	Port Moresby	Hourly METAR – SPECI as required
AYWK	Wewak	Hourly 1900-0930 – SPECI as required
AYVN	Vanimo	Hourly 1900-0930 – SPECI as required
AYNZ	Nadzab	Hourly 1900-0930 – SPECI as required
AYMH	MtHagen	Hourly 2000-0800 – SPECI as required
AYGN	Gurney	Hourly 1900-0930 – SPECI as required
AYMO	Momote	Hourly 2000-0900
AGGH	Honiara	Hourly 2000-0900

FTP AND INTERNET ACCESS TO OPMET INFORMATION PROVIDED BY RODB SINGAPORE

1. INTRODUCTION

1.1 OPMET/M TF/3 meeting in March 2005 discussed the future development of RODBs providing internet-based backup facilities for retrieval of OPMET information through File Transfer Protocol (ftp) or Hypertext Transfer Protocol (http) via the Internet. To support this provision, Singapore RODB established such website in line with the overall initiatives to promote the use of the Internet.

2. GENERAL SERVICE INFORMATION

2.1 The OPMET data is placed on a UNIX-Based FTP server, which is linked to the Message Switch. The data is available in near real time and is placed on the server at 10 minutes interval.

2.2 Internet OPMET Backup System is a simple data library and data format is the same type of alphanumeric information (e.g. SA, SP, FC, FT etc) obtained via the AFTN, namely:

OPMET_hourly	Each hourly file contains OPMET bulletins received between TT:00 and TT:59Z
OPMET_last_15mins	This file is updated every 15 minutes (TT:15Z) and contains a concatenation of the last 15 minutes of OPMET bulletins
OPMET_last_hour	This file is updated every hour - on the hour and contains the last hour of OPMET bulletins received between TT:00 and TT:59Z)
SIGMET WS WC WV	These file folders store SIGMET messages for the current day.
Tropical_Cyclones_Advisories	FK messages are stored at least for 24 hours.
Volcanic_Ash_Advisories	FV messages are stored at least for 24 hours.

2.3 File format

All files on Internet OPMET Backup System follow the WMO FTP standard:

^CMessage Length
Bulletin Number
Bulletin Header
Actual Data

ASIA/PAC OPMET/M TF/4
Appendix E to the Report

Examples:

```
^C0000014300
689
SASR31 WSSL 180900
METAR WSSL 180900Z 19004KT 9999 FEW016 FEW018CB SCT200 27/24 Q1008 RETS
RMK 0830Z Q1008 =
```

```
^C0000021100
690
FTPF21 NTAA 180859
NTAA 180855Z 181212 VRB05KT 9999 FEW023
BECMG 1820 07015G25KT
PROB40 TEMPO 2006 22012KT
BECMG 0406 VRB05KT=
```

```
^C0000014500
691
FTAE32 WIMM 180848
TAF WIMM 180848Z 181212 00000KT 6000 HZ FEW017CB SCT017
BECMG 0103 32008KT 7000 SCT017=
```

3. USER LOGIN PROCESS

3.1 Individual user account will be established on the server. It will be accessed via a unique set of login information: a username, and a password. Singapore RODB will provide this login information to each user.

3.2 User workstation needs to establish FTP session and store the user login details.
General login information for the service:

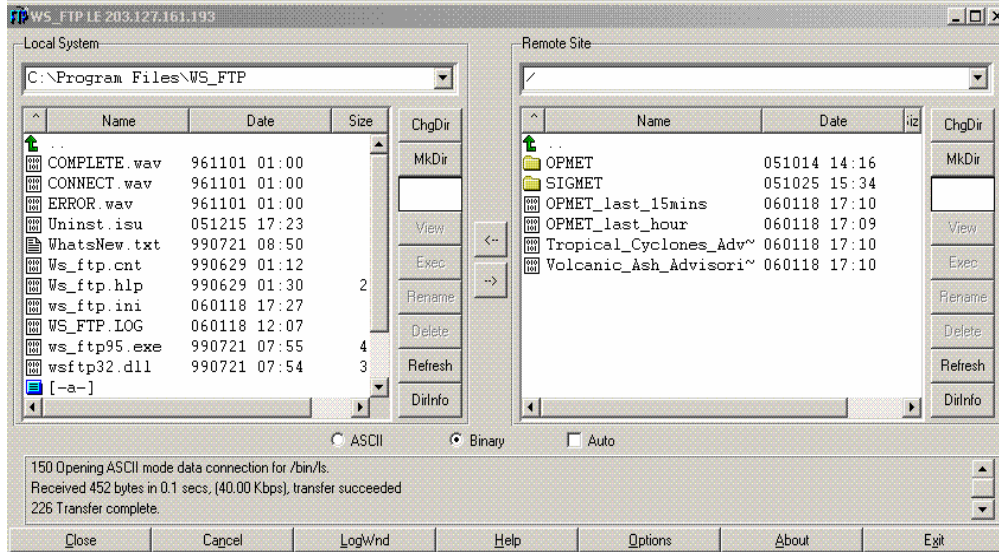
IP Address	203.127.161.193
Server Name	ftp.mssinet.gov.sg
FTP Address	203.127.161.193

3.3 Contact Information

For user requests access the Internet-based OPMET System, please contact the following officer through email: chua_guat_mui@nea.gov.sg

4. EXAMPLES

4.1 Appendix A - Establish a FTP Session



ASIA/PAC OPMET/M TF/4
Appendix E to the Report

4.2 Layout of the File Folders

	Name	Date
	OPMET	051014 14:16
	SIGMET	051025 15:34
	OPMET_last_15mins	060118 16:55
	OPMET_last_hour	060118 16:35
	Tropical_Cyclones_Advisories	060118 16:55
	Volcanic_Ash_Advisories	060118 16:55

/SIGMET		
	Name	Date
	..	
	WC	060118 17:10
	WS	060118 17:10
	WV	060118 17:10

/OPMET		
	Name	Date
	..	
	OPMET_hourly_data_btwn_00Z_and_01Z	060118 09:36
	OPMET_hourly_data_btwn_01Z_and_02Z	060118 10:35
	OPMET_hourly_data_btwn_02Z_and_03Z	060118 11:36
	OPMET_hourly_data_btwn_03Z_and_04Z	060118 12:37
	OPMET_hourly_data_btwn_04Z_and_05Z	060118 13:39
	OPMET_hourly_data_btwn_05Z_and_06Z	060118 14:39
	OPMET_hourly_data_btwn_06Z_and_07Z	060118 15:36
	OPMET_hourly_data_btwn_07Z_and_08Z	060118 16:35
	OPMET_hourly_data_btwn_08Z_and_09Z	060117 17:36
	OPMET_hourly_data_btwn_09Z_and_10Z	060117 18:37
	OPMET_hourly_data_btwn_10Z_and_11Z	060117 19:37
	OPMET_hourly_data_btwn_11Z_and_12Z	060117 20:36
	OPMET_hourly_data_btwn_12Z_and_13Z	060117 21:34
	OPMET_hourly_data_btwn_13Z_and_14Z	060117 22:32
	OPMET_hourly_data_btwn_14Z_and_15Z	060117 23:36
	OPMET_hourly_data_btwn_15Z_and_16Z	060118 00:34
	OPMET_hourly_data_btwn_16Z_and_17Z	060118 01:37
	OPMET_hourly_data_btwn_17Z_and_18Z	060118 02:36
	OPMET_hourly_data_btwn_18Z_and_19Z	060118 03:29
	OPMET_hourly_data_btwn_19Z_and_20Z	060118 04:32
	OPMET_hourly_data_btwn_20Z_and_21Z	060118 05:34
	OPMET_hourly_data_btwn_21Z_and_22Z	060118 06:34
	OPMET_hourly_data_btwn_22Z_and_23Z	060118 07:36
	OPMET_hourly_data_btwn_23Z_and_00Z	060118 08:35

APPENDIX A

ROBEX COLLECTION AND DISSEMINATION OF METAR BULLETINS

Table A : METAR (SA)

Explanation of Table

- Col. 1: Name and ICAO location indicator of the ROBEX Centre compiling the bulletin.
- Col. 2: Description of the METAR Bulletin
- Col. 3: Official observation time of the bulletin
- Col. 4: Distribution of the bulletin to other ROBEX centres and RODBs
*Note: The RODB responsible for storing the bulletin is in **bold***

Aerodromes with shaded text are included in the HF VOLMET Broadcast

Table A : ROBEX Collection and Dissemination of METAR Bulletins									
1		2			3	4			
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO			
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address		
ASIA/PAC REGION									
Bangkok	VTBB	SAAS31	VTBD	BANGKOK/Bangkok Intl	HH + 00	BANGKOK	VTBBYPYX		
			VTCC	CHIANG MAI/Chiang Mai Intl	HH + 30		BRISBANE	YBBBYPYX	
			VTBU	RAYONG/U-Tapao Intl			SINGAPORE	WSZZYPYM	
			VTSS	SONGKHLA/Hat Yai Intl			TOKYO	RJTDYPYX	
			VTSP	PHUKET/Phuket Intl			Kolkata	VECCYPYX	
			VLVT	VIENTIANE/Wattay			Colombo	VCCCYPYX	
			VYMD	MANDALAY/Mandalay			Delhi	VIDPYPYX	
			VYYY	YANGON/ Yangon Intl			Hong Kong	VHZZYPYX	
			VVTS	HO-CHI-MINH/Tan-Son Nhat			Jakarta	WIZZMCMC	
			VVNB	HANOI/Noibai			Kuala Lumpur	WMZZYPYR	
			VVDN	DANANG/Danang			Mumbai	VABBYPYX	
			VDPP	PHNOM PENH/Pochentong			Incheon	RKSIYPYX	
			VDSR	SIEM REAP/Siem Reap					
			SATH31	VTCH	Mae Hongson		HH + 00	SINGAPORE	WSZZYPYM
				VTCL	Lampang				
		VTCL		Lampang					
		VTCL		Lampang					
		VTCL		Lampang					
		VTCL		Lampang					
		VTCL		Lampang					
		VTCL		Lampang					
		SATH32	VTSE	Chumphon					
			VTSE	Chumphon					
VTSE	Chumphon								
VTSE	Chumphon								

1		2			3	4		
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO		
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address	
			VTSG VTSK VTSM VTSR VTST	Krabi Pattani Samui Ranong Trang				
		SATH33	VTBO VTUD VTUI VTUJ VTUK VTUL VTUO VTUQ VTUU VTUV VTUW	Trad Udon Sakhon Nakkon Surin Khon Kaen Loei Burirum Nakhon Ratchasima Ubon Ratchatani Roi-et Nakhon Phanom	HH + 00			
Beijing	ZBBB	SACI31	ZBAA	BEIJING/Capital	HH + 00	BANGKOK	VTBBYPYX	
			ZBTJ	TIANJING/Binhai	HH + 30	BRISBANE	YBBBYPYX	
			ZBYN	TAIYUAN/Wusu		SINGAPORE	WSZZPYM	
			ZGGG	GUANGZHOU/Baiyun		TOKYO	RJTDYPYX	
			ZSHC	HANGZHOU/Xiaoshan		Hong Kong	VHZZYPYX	
			ZSPD	SHANGHAI/Pudong		Jakarta	WIZZMZBB	
			ZSSS	SHANGHAI/Hongqiao		Karachi	OPZZYPYX	
			ZWWW	URUMQI/Diwopu		Mumbai	VABBYPYX	
			ZYTL	DALIAN/Zhoushuizi		Incheon	RKSIYPYX	
			ZYTX	SHENYANG/Taoxian		Ulan Bator	ZMUBMYX	
			ZBSJ	SHIJIAZHUANG/Zhengding				
			SACI32	ZGKL	GUILIN/Liangjiang	HH + 00	BANGKOK	VTBBYPYX
				ZGNN	NANNING/Wuxu		BRISBANE	YBBBYPYX
			ZGOW	SHANTOU/Shantou		SINGAPORE	WSZZPYM	
	ZGSZ	SHENZHEN/Baoan		TOKYO	RJTDYPYX			

1		2			3	4	
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO	
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address
			ZLXY	XIAN/Xiayang		Hong Kong Jakarta Kuala Lumpur Incheon Wellington	VHZZYPYX WIZZMZBB WMZZYPYX RKSIYPYX NZZZYPYX
			ZMUB	ULAANBAATOR/Bryant-Ukhaa			
			ZPPP	KUNMING/Wujiaba			
			ZSAM	XIAMEN/Gaoqi			
			ZSQD	QINGDAO/Liuting			
			ZUUU	CHENGDU/Shuangliu			
			SACI41	ZBHH			
		ZGHA		CHANGSHA/Huanghua			
		ZHHH		WUHAN/Tianhe			
		ZJHK		HAIKOU/Meilan			
		ZJSY		SANYA/Fenghuang			
		ZLLL		LANZHOU/Zhongchuan			
		ZSNJ		NANJING/Lukou			
		ZSOF		HEFEI/Luogang			
		ZUCK		CHONGQING/Jiangbei			
		ZWSH		KASHI/Kashi			
		ZYCC		CHANGCHUN/Dafangshen			
		ZYHB		HARBIN/Taiping			
		ZHCC		ZHENGZHOU/Xinzheng			
		Brisbane	YBBN	SAAU31	YSSY	SYDNEY/Kingsford Smith Intl	HH + 00
YMML	MELBOURNE/Melbourne Intl				HH + 30		
YBBN	BRISBANE/Brisbane						
YPAD	ADELAIDE/Adelaide						
YPDN	DARWIN/Darwin						
YPPH	PERTH/Perth int						
YBCS	CAIRNS/Cairns						
YBAS	ALICE SPRINGS/Alice Springs						
YPLM	LEARMONTH/Learmonth						
YBTL	TOWNSVILLE/Townsville						
YPVV	COCOS ISLD/Cocos Isld						
YPXM	CHRISTMAS ISL/Cristms Isl						

1		2			3	4	
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO	
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address
			YPTN YPKU	TINDAL /Tindal RAAF KUNUNURRA/Kununurra			
		SAAU32	YSCB	CANBERRA/Canberra	HH + 00 HH + 30	BANGKOK	VTBBYPYX
			YBCG	COOLANGATTA/Coolangatta		BRISBANE	YBBBYPYX
			YMAV	AVALON/Avalon	SINGAPORE	WSZZYPYM	
			YBRK	ROCKHAMPTON/Rockhampton	TOKYO	RJTDYPYX	
			YPKG	KALGOORLIE/Kalgoorlie	Hong Kong	VHZZYPYX	
			YPPD	PORT HEDLAND/Port Hedland	Jakarta	WIZZMIMI	
			YBRM	BROOME/Broome	Nadi	NFFNYPYX	
			YSNF	NORFOLK ILS/Norfolk Isl	Port Moresby	AYPYYMYX	
			YSDU	DUBBO/Dubbo	Seoul	RKSSYPYX	
			YSRI	RICHMOND/Richmond RAAF	Wellington	NZZZYPYX	
			YWLM	WILLIAMTOWN/Williamtown RAAF			
			YMLT	LAUNCESTON/Launceston			
			YMHB	HOBART/Hobart			
			YPEA	PEARCE/Pearce RAAF			
			YCIN	CURTIN-DERBY/Curtin-Derby			
			YFRT	FORREST/Forrest			
			YPGV	GOVE/Gove			
		YAMB	AMBERLEY/Amberley RAAF				
		YBHM	HAMILTON ISLD/Hamilton Isld				
		YBMA	MOUNT ISA/Mount Isa				

1		2			3	4	
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO	
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address
		SANG31	AYPY AYWK AYVN AYNZ AYMH AYGN AYMO AGGH	PORT MORESBY WEWAK* VANIMO* NADZAB* MOUNT HAGEN** GURNEY* MOMOTE*** HONIARA*** * From 1900-0930;**From 2000-0800;***From2000-0900	HH+00	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing Hong Kong Jakarta Port Moresby Wellington	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYM RJTDYPYX ZBBBYPYX VHZZYPYX WIZZMIMI AYPYMYX NZZZYPYX
Colombo	VCCC	SASB31	VCBI VRMM	COLOMBO/Katunayake MALE/Male Intl	HH + 20	BANGKOK BRISBANE SINGAPORE TOKYO	VTBBYPYX YBBBYPYX WSZZYPYM RJTDYPYX
					HH + 50		Hong Kong Kuala Lumpur Mumbai
Delhi	VIDP	SAIN32	VIDP VILK VIAR VIBN VIJP	DELHI/Indira Gandhi Intl LUCKNOW AMRITSAR VARANASI JAIPUR	HH + 00	BANGKOK BRISBANE SINGAPORE TOKYO	VTBBYPYX YBBBYPYX WSZZYPYM RJTDYPYX
					HH + 30		Kolkata Hong Kong Karachi Mumbai

1		2			3	4	
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO	
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address
Hong Kong	VHHH	SAHK31	VHHH	HONG KONG/Hong Kong Intl	HH + 00 HH + 30***	BANGKOK	VTBBYPYX
			RCTP	TAIBEI/Taipei Intl		BRISBANE	YBBBYPYX
			RCKH	GAOXIONG/Gaoxiong		SINGAPORE	WSZZYPYM
			RCSS	TABEI/Sungshan		TOKYO	RJTDYPYX
			VMMC	MACAU/Macau Intl		Beijing	ZBBBYPYX
			RPLL	MANILA/Ninoy Aquino Intl*		Guangshou	ZGGGYPYX
			RPVM	LAPU LAPU/Mactan Cebu Intl*		Kuala Lumpur	WMZZYPYR
			RPMD*	DAVAO/Francisco Bangoy Intl		Incheon	RKSIYPYX
			RPLB	SUBIC BAY/Subic Bay Intl		Wellington	NZZZYPYX
			RPLI**	LAOAG/Laoag Intl			
			RPMZ**	ZAMBOANGA/Zamboanga Intl			
Note: * Available 0000-0900 and 2200-2300; ** Available 0000-0900; *** Only for: VHHH, RCTP, RCKH, RCSS, VMMC							
Incheon	RKSI	SAKO31	RKSI	SEOUL/Incheon Intl	HH + 00 HH + 30	BANGKOK	VTBBYPYX
			RKSS	SEOUL/Gimpo Intl		BRISBANE	YBBBYPYX
			RKPC	JEJU/Jeju Intl		SINGAPORE	WSZZYPYM
			RKPK	BUSAN/Gimhae Intl		TOKYO	RJTDYPYX
			RKTU	CHEONGJU/Cheongju Intl		Beijing	ZBBBYPYX
			RKNY	YANGYANG/Yangyang Intl		Hong Kong	WSZZYPYM
			RKTN	DAEGU/Daegu Intl		Singapore	WSZZYPYM
						Tokyo	RJTDYPYX
		Wellington	NZZZYPYX				
		Mumbai	VABBYPYX				
Jakarta	WIII	SAID31*	WAAA	UJUNG PANDANG/Hasanuddin	HH + 00 HH + 30	BANGKOK	VTBBYPYX
			WABB	BIAK/Frans Kaisiepo		BRISBANE	YBBBYPYX
			WIHH	JAKARTA/Halimperdana Kusuma		SINGAPORE	WSZZYPYM
			WIII	JAKARTA/Soekarno-Hatta		TOKYO	RJTDYPYX
			WIDD	BATAM/Hang Nadim		Hong Kong	VHZZYPYX
			WIMM	MEDAN/Polonia		Kuala Lumpur	WMZZYPYR
			WADD	BALI/Ngurah Rai		Wellington	NZZZYPYX
			WARR	SURABAYA/Juanda			

1		2			3	4		
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO		
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address	
		SAID32*	WAMM	MANADO/Sam Ratulangi	HH + 00			
			WIBB	PEKANBARU/Sultan Syarif Kasim II				
			WIDN	TANJUNG PINANG/Kijang				
			WIPT	PADANG PARIAMAN/Minangkabau				
			WIOO	PONTIANAK/Supadio				
			WIPP	PALEMBANG/Sultan Mahmud Badaruddin II				
			WAOO	BANJARMASIN/Syamsuddin Noor				
			WALL	BALIK PAPAN/Sepinggan				
			WADA	MATARAM/Selaparang				
		SAID33*	WABP	TIMIKA/Tembegapura	HH + 00			
			WAJJ	JAYAPURA/Sentani				
			WAKK	MERAUKE/Mopah				
			WAPP	AMBON/Pattimura				
			WARS	SEMARANG/Achmad Yani				
			WICT	BANDAR LAMPUNG/Radin Inten				
			WATT	KUPANG/Ei Tari				
			WALR	TARAKAN/Juwata				
			* Content of the bulletins to be confirmed by Jakarta					
Kolkata	VECC	SAAE31	VECC	KOLKATA/Netaji Subhash Chandra Bose Intl	HH + 50	BANGKOK	VTBBYPYX	
			VEPT	PATNA/Patna			BRISBANE	YBBBYPYX
			VGZR	DHAKA/Zia Intl			SINGAPORE	WSZZYPYM
			VGEG	CHITTAGONG/M. A. Hannan Intl			TOKYO	RJTDYPYX
			VNKT	KATHMANDU/Tribhuvan Intl			Colombo	VCCCPYX
							Delhi	VIDPYPYX
		Hong Kong	VHZZYPYX					
		Karachi	OPZZYPYX					
		Mumbai	VABBYPYX					

1		2			3	4	
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO	
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address
Karachi	OPKC	SAPK31	OPKC	KARACHI/Jinnah International	HH + 20 HH + 50	BANGKOK BRISBANE SINGAPORE TOKYO Abu Dhabi Bahrain Beijing Kolkata Delhi Hong Kong Mumbai Tehran	VTBBYPYX
			OPRN	ISLAMABAD/Chaklala			YBBBYPYX
			OPLA	LAHORE/Allama Iqbal International			WSZZYPYM
			OPNH	NAWABSHAH			RJTDYPYX
			OPGD	GAWADAR			OMZZYPYX
			OPPS	PESHAWAR			OBZZYPYX
Kuala Lumpur	WMKK	SAMS31	WMKK	KUALA LUMPUR/Kuala Lumpur Intl	HH + 00 HH + 30	BANGKOK BRISBANE SINGAPORE TOKYO Colombo Hong Kong Jakarta Manila Mumbai Incheon Wellington	VTBBYPYX
			WSSS	SINGAPORE/Changi			YBBBYPYX
			WSSL	SINGAPORE/Seletar			WSZZYPYM
			WMKP	PENANG/Bayan Lepas			RJTDYPYX
			WBKK	KOTA KINABALU/Kota Kinabalu Intl			VCCCYPYX
			WBGG	KUCHING/Kuching			VHZZYPYX
			WBSB	BANDAR SERI BEGAWAN /Brunei Intl			WIZZMBMB
			(TBC)	WMSA			KUALA LUMPUR/Subang
		WBKL	LABUAN/Labuan	VABBYPYX			
		WBGR	MIRI/Miri	RKSIYPYX			
		WBGS	SIBU/Sibu	NZZZYPYX			
		WMKJ	JOHOR BAHRU/Sultan Ismail				
		WMKD	KUANTAN/Kuantan				
		WMKM	MALACCA/Malacca				
		WMKL	PULAU LANGKAWI/Pulau Langkawi				
		WBKW	TAWAU/Tawau				

1		2			3	4	
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO	
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address
Mumbai	VABB	SAIN31	VAAH	AHMADABAD/Ahmadabad	HH + 10 HH + 40	BANGKOK BRISBANE SINGAPORE TOKYO	VTBBYPYX
			VABB	MUMBAI/CSI Airport			YBBBYPYX
			VANP	NAGPUR			WSZZYPYM
			VOHY	HYDERABAD			RJTDYPYX
			VOMM	CHENNAI/Chennai		Abu Dhabi Bahrain Colombo Delhi Hong Kong Karachi Kolkata Tehran	OMZZYPYX
			VOTR	TIRUCHCHIRAPPALLI			OBZZYPYX
			VOTV	TRIVANDRUM/Trivandrum Intl			VCCCYPYX
Nadi	NFFN	SAPS31*	NCRG	AVARUA/Rarotonga Intl	HH+00	BANGKOK BRISBANE SINGAPORE TOKYO	VTBBYPYX
			NFFN	NADI/Nadi Intl			YBBBYPYX
			NFNA	SUVA/Nausori Intl			WSZZYPYM
			PLCH	KIRITIMATI/Christmas I.			RJTDYPYX
			NGTA	TARAWA/Bonriki Intl		Nadi Port Moresby Wellington	NFFNYPYX
			NGFU	FUNAFUTI/Funafuti Intl			AYPYMYX
			NIUE	ALOFI/Niue Intl			NZZZYPYX
		SAPS32*	NSFA	APIA/Faleolo Intl	*Hours of availability of the aerodromes included in the bulletins to be advised		
			NFTF	TONGATAPU/Fua'amotu Intl			
			NFTV	VAVA'U/Lupepau'u			
			NVVV	PORT-VILA/Bauerfield			
			NVSS	SANTO/Pekoa			
			NLWW	WALLIS/Hififo			
			NSMA	MAOTA			
			NFTL	HA'APAI LIFUKA			

1		2			3	4		
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO		
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address	
Tokyo	RJTD	SAJP31	RJAA	TOKYO/Narita Intl	HH + 00 HH + 30	BANGKOK	VTBBYPYX	
			RJTT	TOKYO/Tokyo Intl		BRISBANE	YBBBYPYX	
			ROAH	NAHA/Naha		SINGAPORE	WSZZYPYM	
			RJOO	OSAKA/Osaka Intl		TOKYO	RJTDYPYX	
			RJBB	OSAKA/Kansai Intl		Beijing	ZBBBYPYX	
			RJGG	NAGOYA/Chubu Centrair Intl		Guam	PGUMCOAX	
		(TBC)	SAJP32	RJCC	SAPPORO/New Chitose	HH + 00 HH + 30	BANGKOK	VTBBYPYX
				RJFF	FUKUOKA/Fukuoka		BRISBANE	YBBBYPYX
				RJFK	KAGOSHIMA/Kagoshima		SINGAPORE	WSZZYPYM
				RJCH	HAKODATE/Hakodate		TOKYO	RJTDYPYX
				RJFU	NAGASAKI/Nagasaki		Beijing	ZBBBYPYX
				RJOA	HIROSHIMA		Guam	PGUMCOAX
				RJFT	KUMAMOTO		Hong Kong	VHZZYPYX
				RJSN	NIIGATA		Incheon	RKSIYPYX
RJFO	OITA	London	EGZZMASI					
RJOB	OKAYAMA	Nadi	NFZZRCXX					
RJSS	SENDAI	Wellington	NZZZYPYX					
RJOT	TAKAMATSU							
Wellington	NZKL	SANZ31	NZWN	WELLINGTON/Wellington Intl	HH + 00	BANGKOK	VTBBYPYX	
			NZAA	AUCKLAND/Auckland Intl		BRISBANE	YBBBYPYX	
			NZCH	CHRISTCHURCH/Christchurch Intl		SINGAPORE	WSZZYPYM	
						TOKYO	RJTDYPYX	
					NADI	NFFNYPYX		
					Beijing	ZBBBYPYX		
					Hong Kong	VHZZYPYX		
					Incheon	RKSIYPYX		

1		2			3	4	
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO	
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address
						Jakarta Port Moresby	WIZZYPYX AYPYMYX

1		2			3	4	
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO	
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address
MID REGION							
Baghdad	ORBS	SAAW31	ORBS	BAGHDAD/Saddam Intl	HH + 20 HH + 50	BANGKOK	VTBBYPYX
			ORMM	BASRAH/Basrah Intl		BRISBANE	YBBBYPYX
						SINGAPORE	WSZZYPYX
						TOKYO	RJTDYPYX
						Bahrain	OBZZYPYX
						Beirut	OLLYPYX
						Jeddah	OEJDYPYX
						Tehran	OIZZYPYX
Bahrain	OBBI	SABN31	OBBI	BAHRAIN/Intl	HH +50	BANGKOK	VTBBYPYX
			OEDF	DAMMAM/King Fahd Intl		BRISBANE	YBBBYPYX
			OEDR	DHAHRAN/King Abdul Aziz Air base		SINGAPORE	WSZZYPYX
			OTBD	DOHA/Intl		TOKYO	RJTDYPYX
			OKBK	KUWAIT/Intl		Abu Dhabi	OMAMMYX
			OOSA	SALALAH		Baghdad	ORBSYPYX
						Beirut	OLLYPYX
						Hong Kong	VHZZYPYX
						Jeddah	OEZZYPYX
						Karachi	OPZZYPYX
		Mumbai	VABYPYX				
		Tehran	OIZZYPYX				
		Wellington	NZZZYPYX				
		SABN32	OMAA	ABU DHABI/Abu Dabi Intl	HH + 00	BANGKOK	VTBBYPYX
			OMAL	AL AIN		BRISBANE	YBBBYPYX
			OMDB	DUBAI/Dubai Intl		SINGAPORE	WSZZYPYX
			OMFJ	FUJEIRAH/Fujeirah Intl		TOKYO	RJTDYPYX
			OMRK	RAS AL KHAIMAH/Ras Al Kahimah		Abu Dhabi	OMAMMYX
			OMSJ	SHARJAH/Intl		Baghdad	ORBSYPYX
		OOMS	MUSCAT/Seeb Intl	Beirut	OLLYPYX		
						Hong Kong	VHZZYPYX

1		2			3	4	
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO	
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address
						Jeddah Karachi Mumbai Tehran Wellington	OEZZYPYX OPZZYPYX VABBYPYX OIZZYPYX NZZZYPYX
Beirut	OLBA	SALB31	OLBA	BEIRUT/Beirut Intl	HH + 00 HH + 30	BANGKOK	VTBBYPYX
			OSDI	DAMASCUS/Damascus Intl		BRISBANE	YBBBYPYX
			OJAM	AMMAN/Marka Intl		SINGAPORE	WSZZYPYM
			OJAI	AMMAN/Queen Alia Intl		TOKYO	RJTDYPYX
						Abu Dhabi	OMZZYPYX
						Baghdad	ORBSYMYX
						Bahrain	OBZZYPYX
						Jeddah	OEJDYPYX
Jeddah	OEJD	SADS31	OEDF	DAMMAM/King Fahd Intl	HH + 50	BANGKOK	VTBBYPYX
			OEDR	DHAHRAN/King Abdul Aziz Air Base		BRISBANE	YBBBYPYX
			OEJN	JEDDAH/King Abdul Aziz Intl		SINGAPORE	WSZZYPYM
			OEMA	MADINAH/Prince Mohammad Bin Abdul Aziz		TOKYO	RJTDYPYX
			OERK	RIYADH/King Khaled Intl		Abu Dhabi	OMZZYPYX
			OERY	RIYADH		Baghdad	ORBBYMYX
			OYSN	SANA'A/Sana'a Intl		Bahrain	OBZZYPYX
						Beirut	OLLLYPYX
						Hong Kong	VHZZYPYX

1		2			3	4	
ROBEX Centre		METAR Bulletin			Bul. Time	DISSEMINATION TO	
Name	CCCC	BUL No.	CCCC	Aerodrome		RODB/ROBEX C.	AFTN Address
Tehran	OIII	SAIR31	OIII	THERAN/Mehrabad Intl	HH + 00 HH + 30	BANGKOK	VTBBYPYX
			OIFM	ESFAHAN/Shahid Behesti		BRISBANE	YBBBYPYX
			OISS	SHIRAZ/Shahid Dastghaib Intl		SINGAPORE	WSZZYPYM
			OIZH	ZAHEDAN/Zahedan Intl		TOKYO	RJTDYPYX
			OIKB	BANDAR ABBAS/Bandar Abbas Intl		Abu Dhabi	OMZZYPYX
			OIMM	MASHHAD/Shahid Hashemi Nejad Intl		Baghdad	ORBSYMYX
			OIAW	AHWAZ		Bahrain	OBZZYPYX
			OIKK	KERMAN		Beirut	OLLLYPYX
			OITT	TABRIZ/Tabriz Intl		Delhi	VIDPYPYX
				Mumbai	VABBYPYX		
				Hong Kong	VHZZYPYX		
		SAIR32	OAKB	KABUL/Kabul	HH + 00	BANGKOK	VTBBYPYX
			OAKN	KANDAHAR/Kandahar		BRISBANE	YBBBYPYX
						SINGAPORE	WSZZYPYM
						TOKYO	RJTDYPYX
						Abu Dhabi	OMZZYPYX
						Baghdad	ORBSYMYX
						Bahrain	OBZZYPYX
						Beirut	OLLLYPYX
						Delhi	VIDPYPYX
						Karachi	OPZZYPYX
					Mumbai	VABBYPYX	

APPENDIX B

ROBEX COLLECTION AND DISSEMINATION OF TAF BULLETINS

(Table B – 1: FT TAF (18- and 24-hour))

Explanation of the Table

Col. 1: Name and ICAO location indication of the ROBEX Centre compiling the bulletin

Col. 2: Description of the TAF Bulletin

Col 3: Distribution of the bulletin to other ROBEX Centres and RODBs

Note: The RODB responsible for storing the bulletin is in bold

Table B 1 : ROBEX Collection and Dissemination of TAF (FT) Bulletins

1		2					3	
ROBEX Centre		TAF Bulletin					Dissemination	
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address
Bangkok	VTBB	FTAS31	VTBD	BANGKOK/Bangkok Intl	0400	0600	BANGKOK	VTBBYPYX
			VYYY	YANGON/ Yangon Intl	1000	1200	BRISBANE	YBBBYPYX
			VGZR	DHAKA/Zia Intl	1600	1800	SINGAPORE	WSZZPYM
			VLVT	VIENTIANE/Wattay	2200	0000	TOKYO	RJTDYPYX
			VVTS	HO-CHI-MINH/Tan-Son Nhat			Abu Dhabi	OMZZYPYX
			VDPP	PHNOM PENH/Pochentong			Bahrain	OBZZYPYX
			VDSR	SIEM REAP			Beijing	ZBBBYPYX
						Beirut	OLLLYPYX	
						Hong Kong	VHZZYPYX	
						Jeddah	OEJDYPYX	
						Karachi	OPZZYPYX	
						Kuala Lumpur	WMZZYPYR	
						Mumbai	VABBYPYX	
						Incheon	RKSIYPYX	
				Tehran	OIIYPYX			
				Wellington	NZZZYPYA			
		FTAS32	VTBU	RAYONG/U-Tapao Intl	0400	0600	BANGKOK	VTBBYPYX
			VTCC	CHIANG MAI/Chiang Mai Intl	1000	1200	BRISBANE	YBBBYPYX
			VTSS	SONGKHLA/Hat Yai Intl	1600	1800	SINGAPORE	WSZZPYM
			VTSP	PHUKET/Phuket Intl	2200	0000	TOKYO	RJTDYPYX
			VVNB	HANOI/Noibai			Bahrain	OBZZYPYX
			VVDN	DANANG/Danang			Beijing	ZBBBYPYX
							Beirut	OLLLYPYX
						Hong Kong	VHZZYPYX	
						Jeddah	OEJDYPYX	
						Karachi	OPZZYPYX	
						Kuala Lumpur	WMZZYPYR	
						Mumbai	VABBYPYX	
						Incheon	RKSIYPYX	
						Tehran	OIIYPYX	
						Wellington	NZZZYPYA	

1		2					3	
ROBEX Centre		TAF Bulletin					Dissemination	
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address
		FTTH31	VTCT	Chiangrai	0400	0600	SINGAPORE	WSZZYPYM
			VTCL	Lampang	1600	1800		
			VTCH	Nan	<i>Note: issued twice per day</i>			
			VTCP	Phae				
			VTCH	Mae Hongson				
			VTPM	Mae Sot				
			VTPP	Phitsanulok				
			VTPT	Tak				
			VTPO	Sukhothai				
			VTPB	Petchaboon				
		FTTH32	VTST	Surat Thani	0400	0600	SINGAPORE	WSZZYPYM
			VTSM	Samui	1600	1800		
			VTSC	Narathivat	<i>Note: issued twice per day</i>			
			VTSK	Pattani				
			VTST	Trang				
			VTSR	Ranong				
			VTSF	Nakhon Si Thamarat				
			VTSH	Songkhla				
			VTSE	Chumphon				
			VTSG	Krabi				
		FTTH33	VTUD	Udon Thani	0400	0600	SINGAPORE	WSZZYPYM
			VTUI	Sakhon Nakkon	1600	1800		
			VTUK	Khon Kaen				
			VTUU	Ubon Ratchatani				
			VTUL	Loei				
			VTUO	Buriram				
			VTUW	Nakhon Phanom				
			VTUQ	Nakhon Ratchasima				
			VTUV	Roi-et				
			VTUJ	Surin				

1		2					3		
ROBEX Centre		TAF Bulletin					Dissemination		
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address	
Beijing	ZBBB	FTCI31	ZBAA	BEIJING/Capital	0500	0600	BANGKOK	VTBBYPYX	
			ZBTJ	TIANJING/Binhai	1100	1200	BRISBANE	YBBBYPYX	
			ZBYN	TAIYUAN/Wusu	1700	1800	SINGAPORE	WSZZYPYM	
			ZGGG	GUANGZHOU/Baiyun	2300	0000	TOKYO	RJTDYPYX	
			ZSSS	SHANGHAI/Hongqiao			Hong Kong	VHZZYPYX	
			ZSHC	HANGZHOU/Xiaoshan			Karachi	OPZZYPYX	
			ZYTX	SHENYANG/Taoxian			Mumbai	VABBYPYX	
			ZYTL	DALIAN/Zhoushuzi			Incheon	RKSIYPYX	
			ZWWW	URUMQI/Diwopu			Ulan Bator	XMUBMYX	
			ZSPD	SHANGHAI/Pudong			Wellington	NZZZYPYA	
			FTCI32	ZPPP	KUNMING/Wujiaba	0500	0600	BANGKOK	VTBBYPYX
		ZGNN		NANNING/Wuxu	1100	1200	BRISBANE	YBBBYPYX	
		ZGOW		SHANTOU/Shantou	1700	1800	SINGAPORE	WSZZYPYM	
		ZGSZ		SHENZHEN/Baoan	2300	0000	TOKYO	RJTDYPYX	
		ZSAM		XIAMEN/Gaoqi			Hong Kong	VHZZYPYX	
		ZSQD		QINGDAO/Liuting			Jakarta	WIZZYPYX	
		ZUUU		CHENGDU/Shuangliu			Karachi	OPZZYPYX	
		ZLXY		XIAN/Xianyang			Kuala Lumpur	WMZZYPYR	
		ZMUB		ULAANBAATOR/Bryant-Ukhaa			Mumbai	VABBYPYX	
		ZGKL		GUILIN/Liangjiang			Wellington	NZZZYPYA	
			FTCI41	ZBHH	HOHHOT/Baita	0500	0600	BANGKOK	VTBBYPYX
		ZGHA		CHANGSHA/Huanghua	1100	1200	BRISBANE	YBBBYPYX	
		ZJHK		HAIKOU/Meilan	1700	1800	SINGAPORE	WSZZYPYM	
		ZHHH		WUHAN/Tianhe	2300	0000	TOKYO	RJTDYPYX	
		ZSOF		HEFEI/Luogang			Hong Kong	VHZZYPYX	
		ZSNJ		NANJING/Lukou			Jakarta	WIZZYPYX	
		ZUCK		CHONGQING/Jiangbei			Karachi	OPZZYPYX	
		ZLLL		LANZHOU/Zhongchuan			Mumbai	VABBYPYX	
		ZYHB		HARBIN/Yanjiangang			Incheon	RKSIYPYX	
		ZYCC		CHANGCHUN/Dafangshen			Ulan Bator	ZMUBMYX	
ZWSH	KASHI			Wellington	NZZZYPYX				

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ROBEX Centre		TAF Bulletin					Dissemination			
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address		
Brisbane	YBBN	FTAU31	YSSY	SYDNEY/Kingsford Smith Intl	0500	0600	BANGKOK	VTBBYPYX		
			YPAD	ADELAIDE/Adelaide	1100	1200	BRISBANE	YBBBYPYX		
			YBBN	BRISBANE/Brisbane	1700	1800	SINGAPORE	WSZZYPYM		
			YMML	MELBOURNE/Melbourne Intl	2300	0000	TOKYO	RJTDYPYX		
			YBCS	CAIRNS/Cairns			Beijing	ZBBBYPYX		
			YPPH	PERTH/Perth			Hong Kong	VHZZYPYX		
			YPDN	DARWIN/Darwin			Jakarta	WIZZYPYX		
			YBAS	ALICE SPRINGS/Alice Springs			Manila	RPLLYPYX		
			YPTN	TINDAL/Tindal RAAF			Mumbai	VABBYPYX		
		YPMX	CHRISTMAS ISLAND/Christmas Island			Nadi	NFZZRFXX			
						Port Moresby	AYPYMYX			
						Wellington	NZZZYPYX			
				FTAU32	YSCB	CANBERRA/Canberra	0500	0600	BANGKOK	VTBBYPYX
					YBCG	COOLANGATTA/Gold Coast	1100	1200	BRISBANE	YBBBYPYX
					YMAV	AVALON/Avalon	1700	1800	SINGAPORE	WSZZYPYM
					YBTL	TOWNSVILLE/Townsville	2300	0000	TOKYO	RJTDYPYX
					YBRK	ROCKHAMPTON/Rockhampton			Hong Kong	VHZZYPYX
					YPLM	LEARMONTH/Learmonth			Jakarta	WIZZYPYX
					YPKG	KALGOORLIE/Kalgoorlie			Manila	RPLLYPYX
					YPPD	PORT HEDLAND/Port Hedland			Mumbai	VABBYPYX
					YPEA	PEARCE/Pearce RAAF			Nadi	NFZZRFXX
				YPCC	COCOS ISLAND/Cocos Island			Wellington	NZZZYPYX	
				YWLM	WILLIAMTOWN/Williamtown RAAF					
				YSRI	RICHMOND/Richmond RAAF					
				FTNG31	AYPY	PORT MORESBY				
					ANYN	NAURU				
					AGGH	HONIARA				
Hong Kong	VHHH	FTHK31	VHHH	HONG KONG/Hong Kong Intl	0400	0600	BANGKOK	VTBBYPYX		
			RCTP	TAIBEI/Taibei Intl	1000	1200	BRISBANE	YBBBYPYX		
			RCKH	GAOXIONG/Gaoxiong	1600	1800	SINGAPORE	WSZZYPYM		
			RCSS	TABEI/Sungshan	2200	0000	TOKYO	RJTDYPYX		
			VMMC	MACAU/Macau Intl			Abu Dhabi	OMZZYPYX		
			RPLL	MANILA/Ninoy Aquino Intl			Bahrain	OBZZYPYX		
			RPVM	LAPU LAPU/Mactan Cebu Intl			Beijing	ZBBYPYX		

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ROBEX Centre		TAF Bulletin					Dissemination	
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address
			RPM RPLB RPMZ RPLI	DAVAO/Francisco Bangoy Intl SUBIC BAY/Subic Bay Intl ZAMBOANGA/Zamboanga Intl LAOAG/Laoag Intl			Beirut Karachi Mumbai Incheon Tehran Wellington	OLLLYPYX OPZZYPYX VABBYPYX RKSIPYX OIIYPYX NZZZYPYA
Incheon	RKSI	FTKO31	RKSI	SEOUL/Incheon Intl	0500	0600	BANGKOK	VTBBYPYX
			RKSS	SEOUL/Gimpo Intl	1100	1200	BRISBANE	YBBBYPYX
			RKPC	JEJU/Jeju Intl	1700	1800	SINGAPORE	WSZZPYM
			RKPK	BUSAN/Gimhae Intl	2300	0000	TOKYO	RJTDYPYX
			RKTU	CHEONGJU/Cheongju Intl			Hong Kong	VHZZYPYX
			RKNY	YANGYANG/Yangyang Intl			Karachi	OPZZYPYX
			RKTN	DAEGU/Daegu Intl			Wellington	NZZZYPYX
Karachi	OPKC	FTPK31	OPKC	KARACHI/Jinnah International	0400	0600	BANGKOK	VTBBYPYX
			OPRN	ISLAMABAD/Chaklala	1000	1200	BRISBANE	YBBBYPYX
			OPLA	LAHORE/Allama Iqbal International	1600	1800	SINGAPORE	WSZZPYM
			OPNH	NAWABSHAH/Nawabshah	2200	0000	TOKYO	RJTDYPYX
			OPPS	PESHAWAR			Abu Dhabi	OMZZYPYX
			OPGD	GAWADAR			Bahrain	OBZZYPYX
							Beijing	ZBBYPYX
							Beirut	OLLLYPYX
				Hong Kong	VHZZYPYX			
				Jeddah	OEJDYPYX			
				Karachi	OPZZYPYX			
				Tehran	OIIYPYX			
Mumbai	VABB	FTIN31	VAAH	AHMADABAD/Ahmadabad	0400	0600	BANGKOK	VTBBYPYX
			VABB	MUMBAI/CSI Airport	1000	1200	BRISBANE	YBBBYPYX
			VANP	NAGPUR/Nagpur	1600	1800	SINGAPORE	WSZZPYM
			VECC	KOLKATA/NSCBI Airport	2200	0000	TOKYO	RJTDYPYX
			VEPT	PATNA/Patna			Abu Dhabi	OMZZYPYX
			VIAR	AMRITSAR/Amritsar			Bahrain	OBZZYPYX
			VIBN	VARANASI/Varanasi			Beijing	ZBBYPYX
			VIDP	DELHI/Indira Gandhi Intl			Beirut	OLLLYPYX
			VIJP	JAIPUR/Jaipur			Hong Kong	VHZZYPYX

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ROBEX Centre		TAF Bulletin					Dissemination	
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address
			VILK	LUCKNOW/Lucknow			Jeddah Karachi Tehran	OEJDYPYX OPZZYPYX OIIYPYX
		FTIN32 (FTAS32)	VCBI VNKT VOCI VOCL VOHY VOMM VOTR VOTV	COLOMBO/Katunayake KATHMANDU/Tribhuvan Intl COCHIN/Cochin Intl CALICUT/Calicut HYDERABAD/Hyderabad CHENNAI/Chennai TIRUCHCHIRAPALLI/Tiruchchirapalli TRIVANDRUM/Trivandrum				
Nadi	NFFN	FTPS31*	NFFN NWWW NSTU NCRG PLCH NGTA NIUE NSFA NFTF NFTV NVVV NVSS	NADI/Intl NOUMEA/La Tontouta PAGO PAGO/Intl, Tutuila I. AVARUA/Rarotonga Intl KIRITIMATI/Christmas I. TARAWA/Bonriki Intl ALOFI/Niue Intl APIA/Faleolo Intl TONGATAPU/Fua'amotu Intl VAVA'U/Lupepau'u PORT-VILA/Bauerfield SANTO/Pekoa	0400 1000 1600 2200	0600 1200 1800 0000	BANGKOK BRISBANE SINGAPORE NADI TOKYO Hong Kong Wellington	VTBBYPYX YBBBYPYX WSZZPYM NFZZRFXX RJTDYPYX VHZZYPYX NZZZYPYA
*Hours of availability of TAF for individual aerodromes to be advised								

1		2					3	
ROBEX Centre		TAF Bulletin					Dissemination	
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address
Singapore	WSSS	FTSR31	WSSS	SINGAPORE/Changi	0430	0600	BANGKOK	VTBBYPYX
			WSAP	SINGAPORE/Paya Lebar	1030	1200	BRISBANE	YBBBYPYX
			WMKK	KUALA LUMPUR/Kuala Lumpur Intl	1630	1800	SINGAPORE	WSZZPYM
			WADD	Bali/Ngurah Rai (Bali Intl)	2230	0000	TOKYO	RJTDYPYX
			WMKJ	JOHOR BAHRU/Sultan Ismail			NADI	NFZZRFXX
			WMKP	PENANG/Bayan Lepas			Abu Dhabi	OMZZYPYX
			WARR	SURABAYA/Juanda			Bahrain	OBZZYPYX
			WIHH	JAKARTA/Halim			Beijing	ZBBBYPYX
			WIII	JAKARTA/Soekarno-Hatta			Beirut	OLLLYPYX
			WMSA	SUBANG/Sultan Abdul Aziz Shah			Colombo	VCCCYPYX
							Hong Kong	VHZZYPYX
							Karachi	OPZZYPYX
							Manila	RPLLYPYX
							Mumbai	VABBYPYX
				Incheon	RKSIYPYX			
				Tehran	OIIYPYX			
				Wellington	NZZZYPYA			
		FTSR32	WBSB	BANDAR SERI BEGAWAN /Brunei Intl	0430	0600	BANGKOK	VTBBYPYX
			WBKK	KOTA KINABALU/Kota Kinabalu Intl	1030	1200	BRISBANE	YBBBYPYX
			WBGG	KUCHING/Kuching	1630	1800	SINGAPORE	WSZZPYM
			WIMM	MEDAN/Polonia	2230	0000	TOKYO	RJTDYPYX
			WABB	BIAK/Frans Kaisieppo			Beirut	OLLLYPYX
			WAAA	UJUNG PANDANG/Hasanuddin			Hong Kong	VHZZYPYX
							Manila	RPLLYMYX
				Mumbai	VABBYPYX			
				Wellington	NZZZYPYX			

1		2					3			
ROBEX Centre		TAF Bulletin					Dissemination			
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address		
Tokyo	RJTD	FTJP31	RJAA	TOKYO/Narita Intl	0300	1200	BANGKOK	VTBBYPYX		
			RJTT	TOKYO/Tokyo Intl	0900	1800	BRISBANE	YBBBYPYX		
			ROAH	NAHA/Naha	1500	0000	SINGAPORE	WSZZYPYM		
			RJOO	OSAKA/Osaka Intl	2100	0600	TOKYO	RJTDYPYX		
			RJCH	HAKODATE/Hakodate			Beijing	ZBBBYPYX		
			RJBB	OSAKA/Kansai Intl			Beirut	OLLLYPYX		
			RJSS	SENDAI/Sendai			Brasilia	SBBRYZYX		
							Colombo	VCBIYMYX		
							Guam	PGUMCOAX		
							Hong Kong	VHZZYPYX		
							Mumbai	VABBYPYX		
							Nadi	NFZZRAXX		
							Saipan	PGSNYMYX		
							Seoul	RKSIYPYX		
						Washington	KWBCYMYX			
						Wellington	NZZZYPYA			
				FTJP32	RJFF	FUKUOKA/Fukuoka	0300	1200	BANGKOK	VTBBYPYX
					RJGG	NAGOYA/Nagoya Chubu Cenrair Intl	0900	1800	BRISBANE	YBBBYPYX
					RJCC	SAPPORO/New Chitose	1500	0000	NADI	NFFNYPYX
					RJFK	KAGOSHIMA/Kagoshima	2100	0600	SINGAPORE	WSZZYPYM
					RJSN	NIIGATA/Niigata			TOKYO	RJTDYPYX
					RJFU	NAGASAKI/Nagasaki			Beijing	ZBBBYPYX
					RJFT	KUMAMOTO/Kumamoto			Beirut	OLLLYPYX
					RJOA	HIROSHIMA/Hiroshima			Hong Kong	VHZZYPXX
					RJOB	OKAYAMA/Okayama			Mumbai	VABBYPYX
					RJOT	TAKAMATSU/Takamatsu			Incheon	RKSIYPYX
					RJFO	OITA/Oita			Wellington	NZZZYPYA
					RJNT	TOYAMA/Toyama			Colombo	VCBIYMYX
		RJNK	KANAZAWA/Komatsu				Nadi	NFZZRAXX		
							Saipan	PGSNYMYX		
						Guam	PGUMCOAX			
						Brasilia	SBBRYZYX			

1		2					3			
ROBEX Centre		TAF Bulletin					Dissemination			
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address		
Wellington	NZKL	FTNZ31	NZWN	WELLINGTON/Wellington Intl		1200	BANGKOK	VTBBYPYX		
			NZAA	AUCKLAND/Auckland Intl		1800	BRISBANE	YBBBYPYX		
			NZCH	CHRISTCHURCH/Christchurch Intl		0000	SINGAPORE	WSZZYPYM		
						0600	TOKYO	RJTDYPYX		
							Beijing	ZBBBYPYX		
							Nadi	NFZZRFYX		
							Port Moresby	AYPPYMYX		
							Hong Kong	VHZZYPYX		
MID REGION										
Bahrain	OBBI	FTBN31	OBBI	BAHRAIN/Intl	0300	0600	BANGKOK	VTBBYPYX		
			OEDR	DHAHRAN/King AbdulAziz Air base	0900	1200	BRISBANE	YBBBYPYX		
			OTBD	DOHA/Intl	1500	1800	SINGAPORE	WSZZYPYM		
			OKBK	KUWAIT/Intl	2100	0000	TOKYO	RJTDYPYX		
							Baghdad	ORBSYMYX		
							Beijing	ZBBBYPYX		
							Beirut	OLLLYPYX		
							Hong Kong	VHZZYPYX		
							Jeddah	OEJDYPYX		
						Karachi	OPZZYPYX			
						Mumbai	VABBYPYX			
						Seoul	RKSSYPYX			
						Tehran	OIIYPYX			
						Wellington	NZZZYPYX			
				FTBN32	OMAA	ABU DHABI/Abu Dabi Intl	0300	0600	BANGKOK	VTBBYPYX
					OMDB	DUBAI/Dubai Intl	0900	1200	BRISBANE	YBBBYPYX
					OMSJ	SHARJAH/Intl	1500	1800	SINGAPORE	WSZZYPYM
					OOMS	MUSCAT/Seeb Intl	2100	0000	TOKYO	RJTDYPYX
		OMRK	RAS AL KHAIMAH/Ras Al Kahimah				Baghdad	ORBSYMYX		
		OMFJ	FUJEIRAH/Fujeirah Intl				Beijing	ZBBBYPYX		
		OOSA	SALALAH				Beirut	OLLLYPYX		
		OMAL	AL AIN				Hong Kong	VHZZYPYX		
							Jeddah	OEJDYPYX		
						Karachi	OPZZYPYX			
						Mumbai	VABBYPYX			

1		2					3		
ROBEX Centre		TAF Bulletin					Dissemination		
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address	
							Seoul Tehran Wellington	RKSSYPYX OIIYPYX NZZZYPYX	
Beirut	OLBA	FTME31	OLBA	BEIRUT/Beirut Intl	0400	0600	BANGKOK	VTBBYPYX	
			OJAM	AMMAN/Marka Intl	1000	1200		BRISBANE	YBBBYPYX
			OJAI	AMMAN/Qeen Alia Intl	1600	1800		SINGAPORE	WSZZPYM
			ORBS	BAGHDAD/Saddam Intl	2200	0000		TOKYO	RJTDYPYX
			ORMM	BASRAH/Basrah Intl			Abu Dhabi	OMZZYPYX	
			OSDI	DAMASCUS/Damascus Intl			Bahrain	OBZZYPYX	
							Jeddah	OEJDYPYX	
				Karachi	OPZZYPYX				
				Mumbai	VABBYPYX				
				Tehran	OIIYPYX				
Jeddah	OEJD	FTSD31	OEJN	JEDDAH/King Abdul Aziz Intl	0400	0600	BANGKOK	VTBBYPYX	
			OEMA	MADINAH/Pr. Mohammad Bin Abdul Aziz	1000	1200		BRISBANE	YBBBYPYX
			OERK	RIYADH/King Khaled Intl	1600	1800		SINGAPORE	WSZZPYM
			OEDR	DHAHRAN/King Abdul Aziz Air Base	2200	0000		TOKYO	RJTDYPYX
			OYSN	SANA'A/Sana'a Intl			Abu Dhabi	OMZZYPYX	
			OYAA	ADEN/Aden Intl			Bahrain	OBZZYPYX	
							Beirut	OLLLYPYX	
				Hong Kong	VHZZYPYX				
				Karachi	OPZZYPYX				
				Mumbai	VABBYPYX				
				Tehran	OIIYPYX				

1		2					3	
ROBEX Centre		TAF Bulletin					Dissemination	
Name	CCCC	Bul No.	CCCC	Aerodrome	Filing time	Start of validity	RODB/ROBEX Centre	AFTN address
Tehran	OIII	FTIR31	OIII	THERAN/Mehrabad Intl	0400	0600	BANGKOK	VTBBYPYX
			OIFM	ESFAHAN/Shahid Behesti	1000	1200	BRISBANE	YBBBYPYX
			OISS	SHIRAZ/Shahid Dastghaib Intl	1600	1800	SINGAPORE	WSZZYPYM
			OIZH	ZAHEDAN/Zahedan Intl	2200	0000	TOKYO	RJTDYPYX
			OIKB	BANDAR ABBAS/Bandar Abbas Intl			Abu Dhabi	OMZZYPYX
			OIMM	MASHHAD/Shahid Hashemi Nejad Intl			Bahrain	OBZZYPYX
			OIAW	AHWAZ			Beijing	ZBBBYPYX
			OIKK	KERMAN			Beirut	OLLLYPYX
			OITT	TABRIZ/Tabriz Intl			Jeddah	OEJDYPYX
							Karachi	OPZZYPYX
				Mumbai	VABBYPYX			

APPENDIX E

**WMO HEADING FOR SIGMET BULLETINS
USED BY ASIA/PAC METEOROLOGICAL WATCH OFFICES**

(TABLE E : SIGMET)

Explanation of Table

Col. 1:	State and name of the MWO
Col 2:	ICAO location indicator of MWO
Col 3:	TTAAii group of the WMO heading for the WS SIGMET bulletin
Col 4:	TTAAii group of the WMO heading for the WC SIGMET bulletin (tropical cyclone)
Col 5:	TTAAii group of the WMO heading for the WV SIGMET bulletin (volcanic ash)
Col 6:	ICAO location indicator of the FIR/CTA served by the MWO
Col 7:	Remarks

**Table E: WMO HEADINGS FOR SIGMET BULLETINS
USED BY ASIA/PAC METEOROLOGICAL WATCH OFFICES**

MWO location	ICAO location indicator	WMO SIGMET Headings			FIR/ACC served	Remarks
		WS	WC	WV	ICAO location indicator	
1	2	3	4	5	6	7
AUSTRALIA						
ADELAIDE/Adelaide	YPRM	WSAU21			YMMM	
BRISBANE/Brisbane	YBRF	WSAU21	WCAU01		YBBB	
DARWIN/Darwin	YDRM	WSAU31	WCAU01	WVAU01	YMMM	
HOBART/Hobart	YMHF	WSAU31			YBBB	
MELBOURNE/Melbourne	YMRF	WSAU31			YMMM	
PERTH/Perth	YPRF	WSAU31	WCAU01		YBBB	
SYDNEY/Sydney	YSRF	WSAU31			YMMM	
TOWNSVILLE	YBTL	WSAU31			YBBB	
BANGLADESH						
DHAKA/Zia Intl	VGZR	WSBW20	WCBW20		VGFR	
CAMBODIA						
PHNOM-PENH/Pochentong	VDPP				VDPP	MWO not established
CHINA						
BEIJING/Capital	ZBAA	WSCI33			ZBPE	
CHENGDU/Shuangliu	ZUUU	WSCI36				
GUANGZHOU/Baiyun	ZGGG	WSCI35			ZGZU	
KUNMING/Wujiaba	ZPPP	WSCI36			ZPKM	
LANZHOU/Zhongchuan	ZLLL	WSCI37			ZLHW	
SANYA/Phoenix	ZJSY	TBD	TBD		ZJSA	
SHANGHAI/Hongqiao	ZSSS	WSCI34			ZSHA	
SHENYANG/Taoxian	ZYTX	WSCI38			ZYSH	
TAIBEI/Taibei Intl	RCTP	WSCI31	WCCI31	WVCI31	RCAA	
URUMQI/Diwopu	ZWWW	WSCI39			ZWUQ	
WUHAN/Tianhe	ZHHH	WSCI35			ZHWH	
HONG KONG/Hong Kong Intl	VHHH	WSSS20	WCSS20	WVSS01	VHHK	
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA						
PYONGYANG/Sunan	ZKPY				ZKKK	No SIGMET issued
FIJI						
NADI/Nadi Intl	NFFN	WSFJ01,02,...	WCFJ01,02,...	WVFJ01,02,...	NFFF	

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MWO location	ICAO location indicator	WMO SIGMET Headings			FIR/ACC served	Remarks
		WS	WC	WV	ICAO location indicator	
1	2	3	4	5	6	7
FRENCH POLYNESIA TAHITI/Faaa	NTAA	WSPF21,22	WCPF21	WVPF21	NTTT	
INDIA KOLKATA/Kolkata CHENNAI/Chennai DELHI/Indira Gandhi Intl MUMBAI/CSI Airport	VECC VOMM VIDP VABB	WSIN31 WSIN31 WSIN31 WSIN31	WCIN31 WCIN31 WCIN31 WCIN31	WVIN31	VECF VOMF VIDF VABF	
INDONESIA JAKARTA/Soekarno-Hatta Intl UJUNG PANDANG/Hasanuddin	WIII WAAA	WSID20 WSID21	WCID20 WCID21	WVID20 WVID21	WIIZ WAAZ	
JAPAN (TOKYO/JMA)	RJTD	WSJP31	WCJP31	WVJP31	RJJJ	
LAO PEOPLE'S DEMOCRATIC REPUBLIC VIENTIANE/Wattay	VLVT	WSLA31		WVLA31	VLVT	Not confirmed
MALAYSIA KOTA KINABALU/Kota Kinabalu Intl KUALA LUMPUR/Kuala Lumpur Intl	WBKK WMKK	WSMS31 WSMS31	WCMS31 WCMS31	WVMS31 WVMS31	WBFC WMFC	
MALDIVES MALE/Hulule	VRMM	WSMV31	WCMV31		VRMM	
MONGOLIA ULAN BATOR/Ulan Bator	ZMUB	WSMO31			ZMUB	Not confirmed
MYANMAR YANGON/Yangon Intl	VYYY	WSBM31	WCBM31		VYYY	Not confirmed
NAURU NAURU I./Nauru	ANAU				ANAU	No Information
NEPAL KATHMANDU/Tribhuvan Intl	VNKT	WSNP31			VNSM	Not confirmed

MWO location	ICAO location indicator	WMO SIGMET Headings			FIR/ACC served	Remarks
		WS	WC	WV	ICAO location indicator	
1	2	3	4	5	6	7
NEW ZEALAND (WELLINGTON/Kelburn Intl)	NZKL	WSNZ21 WSPS21	WCNZ21 WCPS21	WVNZ21 WVPS21	NZZC NZZO	Operational monitoring coverage south of 60°S is limited due to the lack of information

PAKISTAN KARACHI/Quaid-E-Azam Intl LAHORE/Lahore	OPKC OPLA	WSPK31 WSPK31	WCPK31		OPKR OPLR	
PAPUA NEW GUINEA PORT MORESBY/Jacksons	AYPY	WSNG20	WCNG20	WVNG20 WVNG01	AYPY	
PHILIPPINES MANILA/Ninoy Aquino Intl	RPLL	WSPH31	WCPH31	WVPH31	RPHI	
REPUBLIC OF KOREA INCHEON/Incheon Intl	RKSI	WSKO31	WCKO31	WVKO31	RKRR	
SINGAPORE SINGAPORE/Singapore Changi	WSSS	WSSR20	WCSR20	WVSR20	WSJC	
SOLOMON ISLANDS HONIARA/Henderson	AGGH				AGGG	No Information (issued by AYPY)
SRI LANKA COLOMBO/Katunayake	VCBI	WSSB31	WCSB31		VCBI	
THAILAND BANGKOK/Bangkok Intl	VTBD	WSTH31	WCTH31	WVTH31	VTBB	
UNITED STATES ANCHORAGE/Anchorage Intl HONOLULU/Honolulu Intl (KANSAS CITY/Missouri) (National Aviation Weather Advisory Unit)	PAWU PHFO KMKC	WSPN01 WSPN31 WSPN41 WSPN01-15	 WCPA31-35 WCPS31	WVAK20-24	PAZA KZOA KZOA	
VIET NAM Gialam MWO	VVGL	WSVS31	WCVS31	WVVS31	VVNB VVTS	

Material for inclusion in Chapter 12 of ROBEX Handbook

12.2 QUALITY MANAGEMENT OF OPMET EXCHANGE UNDER THE ROBEX SCHEME

12.2.1 Objectives and Scope

12.2.1.1 **Objectives:** Develop a management system that provides general guidance on procedures applied to OPMET exchange, which includes quality control aspects and introduces a non-real-time monitoring for OPMET exchange.

12.2.1.2 **Scope:** Management of OPMET data exchange will be organized in the following sections:

Quality Control	Data quality control applies to OPMET validation and correction during data processing and during preparation of messages.
OPMET Monitoring	Monitor and evaluate the performance indicators for the scheduled OPMET.

12.2.2 Quality Control

12.2.2.1 Quality control (QC) consists of examination of OPMET data at MWOs, ROBEX Centres and RODBs to check for message format, coding errors and time and space consistency.

12.2.2.2 OPMET should be checked in real time or as close to it as possible, at the first point, i.e., the originator, which may be: meteorological station, aerodrome meteorological office or meteorological watch office. Errors may occur during coding or transcription of meteorological messages by the observer or forecaster. The originating office should apply quality control procedures during data processing and preparation of messages, in order to eliminate the main sources errors.

12.2.2.3 The national OPMET centre (NOC) should apply QC procedures on the incoming messages from national sources and on the compiled national bulletins.

12.2.2.4 It is also advisable to apply QC checks at the ROBEX Centre, where the ROBEX bulletins are received or compiled. If automation is available it should be used, or partly assisted by computing facilities. The principle is that every message should be checked, preferably at the various points along the data chain.

12.2.2.5 The checks that have already been performed by originating offices and ROBEX Centres are usually repeated at the OPMET data banks. Erroneous messages found by the RODB should be either rejected or corrected by reference back to the source or by the data bank itself. Data corrected by the data banks should be flagged in the database for record purpose.

12.2.2.6 As a result of the quality control process described above, OPMET data of established quality will be used in the exchange and stored in the data banks. The RODBs should compile information with regard to errors that were found and compile records, such

as the numbers and types of errors detected during quality control. Such non-conformities should be reported to ICAO Regional Office, Bangkok for follow-up action.

12.2.3 Quality Control Procedures

12.2.3.1 General guidance on the quality control procedures for each type of OPMET is outlined as follows:

12.2.3.2 OPMET Data Validation

12.2.3.2.1 The ROBEX Centres and RODBs should not modify the content of the meteorological data, e.g. visibility, QNH etc., but only items contained in the WMO bulletin headings, such as, location indicators or observation times.

12.2.3.2.2 WMO Abbreviated Heading (TTAAii CCCC YYGGgg BBB) Validation:

TT	Message Type, shall comprise two alphabetical characters
AA	Location Indicator, shall comprise two alphabetical characters
ii	comprise two digits, from 01 to 99
CCCC	A 4-letter ICAO location indicator shall comprise 4 alphabetical characters.
YYGGgg	The date time group of the bulletin, shall be configured to validate it with the current time
BBB	BBB is an optional group. The use of BBB group shall comply with the rules in the WMO abbreviated heading, in regard to delayed, corrected and amended bulletins.

Examples:	After QC check
METAR with incorrect YYGGgg: SABM31 VYMD 100830 UTC VYMD 100830Z 18005KT 8000 FEW025 31/18 Q1000 =	SABM31 VYMD 100830 VYMD 100830Z 18005KT 8000 FEW025 31/18 Q1000 =
TAF without AHL: 112324 WIDDYMYX TAF WIDD 112324Z 120024 00000KT 4000 RA BKNT017 BECMG 0305 20010KT 9000 SCT017=	FTID31 WIDD 112300 TAF WIDD 112324Z 120024 00000KT 4000 RA BKNT017 BECMG 0305 20010KT 9000 SCT017=
TAF with invalid BBB: FTBN31 OBBI 030525 AMD OBBI 030606 16010KT CAVOAK BECMG 0812 33017KT 5000 PROB30 TEMPO 0814 0800 DU=	FTBN31 OBBI 030525 AAA OBBI 030606 16010KT CAVOAK BECMG 0812 33017KT 5000 PROB30 TEMPO 0814 0800 DU=

12.2.3.2.3 METAR/SPECI Validation

For each individual METAR or SPECI within a bulletin the following additional fields shall be validated:

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Prefix checks	METAR METAR COR SPECI SPECI COR	SA SA SP SP
Observation Time YYGGggZ	The report shall have a valid date and time of observation, including the character 'Z'. In a SPECI bulletin, this group will be as same as the YYGGgg, part of the Abbreviated Bulletin Heading.	
End-of-Message format “=”	Each METAR or SPECI report shall be terminated by the "=" character.	

Examples:	After QC check
METAR with Observation Time error: SAPK31 OPKC 030159 RRA OPKC 030200 26004 8000 BKN020 27/23 Q1007 NOSIG=	SAPK31 OPKC 030200 RRA OPKC 030200 26004 8000 BKN020 27/23 Q1007 NOSIG=
METAR with mistyped Observation Time: SAID31 WADD 120100 METAR WADD 121000Z 17004KT 9999 FEW018CB SCT120 BKN300 28/26 Q1005 CB SE-E RERA=	SAXX31 WADD 120100 METAR WADD 120100Z 17004KT 9999 FEW018CB SCT120 BKN300 28/26 Q1005 CB SE-E RERA=
SPECI with incorrect Message Type, TT: SANZ31 NZKL 040000 AAA SPECI NZWP 040000Z 17005KT 010V240 25KM FEW020 FEW020CB SCT035 BKN050 18/15 Q1018 NOSIG RMK SPECI CEASES AAA=	SPNZ31 NZKL 040000 AAA SPECI NZWP 040000Z 17005KT 010V240 25KM FEW020 FEW020CB SCT035 BKN050 18/15 Q1018 NOSIG RMK SPECI CEASES AAA=

12.2.3.2.4 TAF Validation

For each individual TAF within a bulletin, the following additional items shall be validated:

Prefix checks	TAF TAF COR TAF AMD	FT or FC FT or FC FT or FC
Issue Time YYGGggZ	If the field is included, it shall have a valid date and time of origin of forecast including 'Z'.	
Validity Y ₁ Y ₁ G ₁ G ₁ G ₂ G ₂	Some TAFs are still produced with a 4-digit validity period. These shall be corrected by inserting a date consistent with the current date and the date time group of the bulletin header. If a TAF is received without a validity period it shall be discarded.	
End-of-Message format “=”	Each forecast shall be terminated by the "=" character.	

Examples:	After QC check
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TAF with issue time error (wrong date): FCID31 WIII 181630 TAF WIII 041630Z 041803 00000KT 9000 FEW025 BECMG 2224 16005KT=	FCID31 WIII 181630 TAF WIII 181630Z 041803 00000KT 9000 FEW025 BECMG 2224 16005KT=
TAF with mistyped Validity Period: FTPH31 RPLL 132200 TAF RPLC 132200Z 140028 04006KT 9999 SCT036 BKN300 TEMPO 0006 02010KT 5000 -SHRA FEW020 BKN270 TX32.05Z TN22/21Z=	FTPH31 RPLL 132200 TAF RPLC 132200Z 140024 04006KT 9999 SCT036 BKN300 TEMPO 0006 02010KT 5000 -SHRA FEW020 BKN270 TX32.05Z TN22/21Z=
TAF with Validity error (wrong date): FCMS33 WMKK 170748 TAF WMKK 170700Z 300918 30005KT 9999 FEW017CB SCT140 BKN270=	FCMS33 WMKK 170748 TAF WMKK 170700Z 170918 30005KT 9999 FEW017CB SCT140 BKN270=
TAF with 4-digit Validity period: FTXX31 WIDD 170121 TAF WIDD 0618 06010G20KT 9999 SCT018 BECMG 1214 00000KT 7000=	FTXX31 WIDD 170121 TAF WIDD 170618 06010G20KT 9999 SCT018 BECMG 1214 00000KT 7000=

12.2.3.2.5

SIGMET Validation

CCCC on the AHL	A valid 4-letter ICAO location indicator indicating the FIR for which the SIGMET was.	
Prefix checks	SIGMET for TS, CB, TURB, ICE, MTW, DS and SS SIGMET for VA SIGMET for TC	WS WV WC
Validity Period DDHHMM/DDHHMM	Shall have a valid period of validity. Validity periods may be corrected if <ul style="list-style-type: none"> • Missing VALID string • Incorrect SIGMET Number format • Incorrect formatted Validity Period 	
Note: For SIGMET validation, please refer to the format described in the ASIA/PAC Regional SIGMET Guide.		

Examples:	After QC check
SIGMET without TTAAii: SIGMET OYSN 121525Z OYSC SIGMET 1 VALID 121530/122130 OYSN- SANAA FIR EMBD TS OBS/FCST OVER WESTERN AND SOUTHWESTERN MOUNTAINS AND COASTAL AREAS CB TOPS FL36 NC=	WSXX31 OYSN 121525Z OYSC SIGMET 1 VALID 121530/122130 OYSN- SANAA FIR EMBD TS OBS/FCST OVER WESTERN AND SOUTHWESTERN MOUNTAINS AND COASTAL AREAS CB TOPS FL36 NC=

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<p>SIGMET with incorrect number format</p> <p>WCPH30 RPLL 210445 SIGMET NO 01 VALID 210000/210600 RPLL TD OBS N0830 E12900 AT 0000Z FL470 WI250 MOV WNW 19KMH TD TYP CENTER N0930 E12718 OTLK 211200Z TD N1018 E12730 211800Z 1042N 12636E=</p>	<p>WCPH30 RPLL 210445 SIGMET 01 VALID 210000/210600 RPLL TD OBS N0830 E12900 AT 0000Z FL470 WI250 MOV WNW 19KMH TD TYP CENTER N0930 E12718 OTLK 211200Z TD N1018 E12730 211800Z 1042N 12636E=</p>
<p>SIGMET with incorrect formatted validity period:</p> <p>WSIN90 VIDP 181800 VIDP SIGMET 06 VALID 18/1600 TO 18/2000 UTC VIDP DELHI FIR ISOL TS EMBEDDED C.B. FCST NORTH OF 30 DEG. NORTH=</p> <p>WSSD20 OEJD 220503 OEJD SIGMET 01 VALID 220500 TO 220900 OEJN-JEDDAH FIR DU/BLDU OBS/FCST N OF 24.0N E OF 40.0E=</p>	<p>WSIN90 VIDP 181800 VIDP SIGMET 06 VALID 181600/182000 VIDP DELHI FIR ISOL TS EMBEDDED C.B. FCST NORTH OF 30 DEG. NORTH=</p> <p>WSSD20 OEJD 220503 OEJD SIGMET 01 VALID 220500/220900 OEJN- JEDDAH FIR DU/BLDU OBS/FCST N OF 24.0N E OF 40.0E=</p>

12.2.4

Quality Control Methods

OPMET Data	Elements Defining	Control Methods
METAR METAR COR SPECI (SA,SP)	<ul style="list-style-type: none"> • AHL • Code name • Observation date/time 	Software verification Manual validate Periodic Quality Control & PI Monitoring
TAF TAF AMD TAF COR (FT,FC)	<ul style="list-style-type: none"> • AHL • Code name • Originating station ICAO location indicator • Date/time of issue • Date, time of starting, time of end of the period the forecast refers to 	Software verification Manual validate Periodic Quality Control & PI Monitoring
SIGMET (WS, WC, WV)	<ul style="list-style-type: none"> • AHL • SIGMET Sequence No • Date/time groups indicating the period of validity <p>Additional Checks (recommended):</p> <ul style="list-style-type: none"> • Name of the FIR or the CTA the message is issued for • Location indicator of the MWO originating the 	Software verification Manual validate Periodic SIGMET Quality Control Monitoring

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	message	
Volcanic Ash Advisory FV	<ul style="list-style-type: none"> • Type of message • Issue date and time <p>Additional Checks (recommended):</p> <ul style="list-style-type: none"> • Location indicator or name of the VAAC centre originating the message 	<p>Software verification</p> <p>Manual validate</p> <p>Periodic VA Quality Control Monitoring</p>
Tropical Cyclone Advisory FK	<ul style="list-style-type: none"> • Type of message • Issue date and time <p>Additional Checks (recommended):</p> <ul style="list-style-type: none"> • Location indicator or name of the TCAC centre originating the message 	<p>Software verification</p> <p>Manual validate</p> <p>Periodic TC Quality Control Monitoring</p>

12.2.5 **OPMET Monitoring**

12.2.5.1 **Monitoring of Scheduled OPMET data**

12.2.5.1.1 The monitoring shall focus on the measurement of three performance indicators (PIs), viz., Compliance, Availability and Regularity indices of the scheduled, routine OPMET data (SA, FT, FC) exchanged in the region.

12.2.5.1.2 **Monitoring Reference**

The monitoring shall involve the recording and analysis of data provided by the AFTN circuit. The three PIs should be monitored against ROBEX Tables.

12.2.5.1.3 **Methodology**

Data is monitored with reference to the procedures defined in the EUR OPMET Data Monitoring Procedures as produced by EANPG METG BMG (Bulletin Management Group).

12.2.5.1.4 **Performance Indicators (PIs)**

(i) *Compliance Index*

The ROBEX Compliance index can be calculated from:

$$V_{\text{bulletin compliance}} = \frac{\text{No of reports received for a bulletin}}{\text{No of reports required for the bulletin}}$$

The Compliance Index is to assess the level of compliance to the ROBEX scheme. The determination of the compliance index is performed as follows:

- Total number of reports received for ROBEX bulletin during the monitoring period, include reports in the retard bulletins.
- Weed out correction and amendment bulletins, as these are re-transmitted messages, can be disregarded.

(ii) *Availability Index*

The availability index measures the current coverage of the OPMET distribution against the ROBEX exchange requirements. The determination of the availability index is performed on a daily basis from the data captured during the monitoring period. At least one non-NIL report is received from the aerodrome during the 24-hour period, that aerodrome is considered to have been available. The daily availability index of a particular bulletin can be calculated as:

$$V_{\text{bulletin availability}} = \frac{\text{No of aerodromes for which 1 or more non-NIL data type are received}}{\text{No of aerodromes required in the bulletins}}$$

(iii) *Regularity Index*

The regularity index measures the consistency in number of reports provided by an aerodrome. The computation of Regularity Index assumes that the number of report follows a normal distribution and attempts to ascertain the distribution characteristics (mean and standard deviation) from a set of data. These characteristics are used to determine if subsequent number of reports from an aerodrome is “regular”

Denoting mean and standard deviation by μ and σ , a threshold report numbers (τ) can be established as:

$$\tau = \mu - \sigma$$

The threshold is a reporting characteristic of an aerodrome. If the subsequent daily number of reports meets or exceeds the threshold, it is considered “regular”. The daily regularity index for a bulletin can be expressed as:

$$V_{\text{bulletin regularity}} = \frac{\text{No of aerodromes for which the no of reports equals or exceeds the threshold}}{\text{No of aerodromes required in the bulletin}}$$

12.2.5.2 **Monitoring of Non-Scheduled OPMET data**

12.2.5.2.1 Monitoring of non-routine OPMET data shall be executed for FK, FV, WC, WS, and WV.

12.2.5.2.2 The monitoring results shall be presented in bulletin-oriented format, one line per bulletin indicating the abbreviated header (TTAAii CCCC YGGgg), the FIR/UIR where applicable, receipt time and originator.

ASIA/PAC OPMET/M TF/4
Appendix I to the Report

Example Non-routine OPMET monitoring result file formats:

TT	AAii	CCCC	YYGGgg	FIR/UIR	Rx Time	Origin
WS	PF21	NTAA	271004	NTTT	271004	NTAAYMYX
WS	IN90	VIDP	271000	VIDP	271007	VECCYMYX
WS	BW20	VGZR	271100	VGZR	271030	VGZRYMYX
WS	CI31	RCTP	271150	RCTP	271150	RCTPYMYX
WS	MS31	WMKK	272013	WBFC	272013	WMKKYMYX
WS	CI35	ZGGG	272225	ZGZU	272228	ZGGGYZYX
FV	AU01	ADRM	270323		270330	YMMCYMYX
FK	PQ30	RJTD	270500		270504	RJTDYMYX

File format:

- TT: Type of bulletin FK, FV, WC, WS, WV
- AAii: Bulletin
- CCCC: Compiling Station
- YYGGgg: Standard time of report
- FIR/UIR: ICAO Location indicator of the FIR/UIR or blank (4 spaces) as applicable
- RxTime: Time of receipt
- Origin: Originator address.

12.2.5.3 Analysis of Monitoring Results

12.2.5.3.1 Each RODB collects and analyses the relevant result in order to determine the effectiveness and suitability of the quality management system and to highlight any possible improvement to ICAO Regional Office, Bangkok.

12.2.5.4 Examples of Monitoring Results – PI Measurements

The following tables show values of Compliance, Availability and Regularity Index for ASIA/PAC OPMET bulletins compiled by Singapore RODB in March 05:

TABLE A	ROBEX Compliance Index		
	SA	FT	FC
AE31 VECC	0.81	--	
AS31 VABB	---	0.99	
AS31 VTBB	0.96	0.99	
SA32 VABB	--	0.98	
AS32 VTBB	--	0.85	
AU31 YBBN	1.00	0.99	0.97
AU32 YBBN	0.98	0.94	
BN31 OBBI	0.96	0.92	
BN32 OBBI	0.94	0.95	
CI31 ZBBB	0.99	0.99	
CI32 ZBBB	0.99	0.99	
CI41 ZBBB	0.93	0.99	
EG31 HECA	--	0.85	
HK31 VHHH	0.99	0.99	1.00
ID31 WIII	0.74	--	
IN31 VIDP	--	0.97	
IN31 VABB	0.74	--	0.97
IN32 VIDP	0.73	--	
IR31 OIII	0.84	0.93	
JP31 RJTD	1.00	1.00	1.00
JP32 RJTD	1.00	1.00	1.00
KO31 RKSI	1.00	0.96	
ME31 OLBA	--	0.86	
MS31 WMKK	1.00	--	
NZ31 NZKL	0.95	1.00	
PK31 OPKC	0.91	0.80	
SB31 VCCC	0.97	--	
SD31 OEJD	0.95	--	
SR31 WSSS	--	0.98	0.99
SR32 WSSS	--	1.00	
TH31 VTBB	0.67	1.00	
TH32 VTBB	0.76	0.91	
TH33 VTBB	0.75	0.94	

Note: Entry dashed out (--) means no reports of this type (SA or FT) are required

TABLE B	Availability Index		
	SA	FT	FC
AE31 VECC	0.98	--	
AS31 VABB	--	1.00	
AS31 VTBB	0.99	1.00	
SA32 VABB	--	0.99	
AS32 VTBB	--	0.96	
AU31 YBBN	1.00	1.00	1.00
AU32 YBBN	1.00	1.00	
BN31 OBBI	1.00	1.00	
BN32 OBBI	1.00	0.99	
CI31 ZBBB	1.00	1.00	
CI32 ZBBB	1.00	1.00	
CI41 ZBBB	1.00	1.00	
EG31 HECA	--	1.00	
HK31 VHHH	1.00	1.00	1.00
ID31 WIII	0.98	--	
IN31 VIDP	--	1.00	
IN31 VABB	1.00	--	1.00
IN32 VIDP	0.98	--	
IR31 OIII	1.00	1.00	
JP31 RJTD	1.00	1.00	1.00
JP32 RJTD	1.00	1.00	1.00
KO31 RKSI	1.00	1.00	
ME31 OLBA	--	0.99	
MS31 WMKK	1.00	--	
NZ31 NZKL	--	1.00	
PK31 OPKC	1.00	0.99	
SB31 VCCC	1.00	--	
SD31 OEJD	1.00	--	
SR31 WSSS	--	1.00	1.00
SR32 WSSS	--	1.00	
TH31 VTBB	0.97	1.00	
TH32 VTBB	0.88	1.00	
TH33 VTBB	0.83	1.00	

TABLE C	Regularity Index		
	SA	FT	FC
AE31 VECC	0.86	--	
AS31 VABB	--	0.96	
AS31 VTBB	0.93	0.96	
AS32 VABB	--	0.96	
AS32 VTBB	--	0.96	
AU31 YBBN	0.90	0.90	0.96
AU32 YBBN	0.93	0.91	
BN31 OBBI	0.93	0.94	
BN32 OBBI	0.82	0.89	
CI31 ZBBB	0.96	0.94	
CI32 ZBBB	0.93	0.91	
CI41 ZBBB	0.94	0.97	
EG31 HECA	--	0.77	
HK31 VHHH	0.93	0.97	0.85
ID31 WIII	0.92	--	
IN31 VIDP	--	0.84	
IN31 VABB	0.84	--	0.97
IN32 VIDP	0.88	--	
IR31 OIII	0.71	1.00	
JP31 RJTD	1.00	1.00	1.00
JP32 RJTD	1.00	1.00	1.00
KO31 RKSI	0.84	1.00	
ME31 OLBA	--	0.97	
MS31 WMKK	0.98	--	
NZ31 NZKL	0.82	1.00	
PK31 OPKC	0.84	0.97	
SB31 VCCC	0.96	--	
SD31 OEJD	0.89	--	
SR31 WSSS	--	0.99	0.95
SR32 WSSS	--	0.99	
TH31 VTBB	0.92	1.00	
TH32 VTBB	0.85	0.96	
TH33 VTBB	0.89	0.94	
