CONSIDERATION OF REPORTS OF CAeM STRUCTURES

Reports of CAeM Regional Rapporteurs

Report on Two Pilot Projects

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Summary and Purpose of Document

This document provides an update on the implementation of two AeM related pilot projects in RA II and RA V.

ACTION PROPOSED

The Management Group (MG) is invited to take note of the progress made in implementing the two pilot projects and to provide guidance on their further development.

Appendix: Project outline for CAeM pilot project on Disaster Prevention and Mitigation (DPM).
1. EXECUTIVE SUMMARY

1.1 The MG reviewed the report by the Vice-president of CAeM on two pilot projects related to the AeMP. They are the Pilot Project to Develop Support for Developing Countries in AeMP established by Regional Association II in December 2004 and the CAeM Pilot Project on Aviation-weather Disaster Risk Reduction (ADRR) established by the Commission in November 2006.

RA II Pilot Project to Develop Support for Developing Countries in AeMP

1.2 The Group was pleased to note the good progress of the RA II Pilot Project to Develop Support for Developing Countries in AeMP since the 13th session of CAeM, which included:

(a) The pilot project website (http://www.aamets.org/) providing a suite of guidance products of numerical model output intended to support NMHSs in the provision of aviation weather service, especially those in the least developed countries (LDCs), was declared semi-operational in March 2007;

(b) A VCP training seminar was organized by the China Meteorological Administration (CMA) during 6-8 March 2007 on the use of the guidance products on the pilot project website. Financial assistance was provided by China and WMO for participants in need. 14 participants from 11 RA II Members (Cambodia, Kazakhstan, Laos, Maldives, Myanmar, Nepal, Pakistan, Russian Federation, Sri Lanka, Thailand, Yemen) attended the seminar;

(c) The progress of the pilot project was presented at the ICAO Asia/Pacific SIGMET Seminar held in Bangkok during 11-13 July 2007. At the same time, it was agreed that further technical support would be provided to Laos on the preparation of TAF for three airports.

1.3 The Group also noted that the pilot project would be further enhanced as follows:

(a) Provide relevant SIGWX forecast charts from the World Area Forecast Centres (WAFCs). Coordination has been made with UK, ICAO and WMO to include the forecasts from WAFC London in the website;

(b) Provide more meteorological satellite products as guidance for SIGMET preparation;

(c) Extend the technical support being provided to Laos to other Least Developed Countries (LDCs) in TAF provision, and at a later stage, in SIGMET provision.

1.4 The MG agreed that the pilot project should be further developed to provide more assistance and support to developing countries in the region, especially in the preparation of SIGMET and TAF. Noting the serious deficiencies of a number of Meteorological Watch Offices (MWOs) in the provision of SIGMET and the imminent consideration by the ICAO Meteorological Warnings Study Group (METWSG) in the re-structuring of the provision of SIGMET to overcome these deficiencies, the Group emphasized that more efforts by capable Members and collaboration among neighbouring Members would be urgently needed to help the NMHSes concerned. The offer by China to provide specific technical support to Laos was an excellent model to build on.

CAeM Pilot Project on Aviation-weather Disaster Risk Reduction (ADRR)

1.5 The Group was pleased to note the good progress of the pilot project under the leadership of the Hong Kong Observatory (HKO) in coordination with aviation stakeholders, interested Members, ICAO and WMO Secretariat, since its establishment in November 2006, which included:

(a) Interaction with aviation stakeholders to gather user’s requirements and feedback on the pilot project;
(b) Development of a project outline and liaison with Members in RA II and RA V on their participation;

(c) Development of a dedicated website on “Aviation-weather Disaster Risk Reduction (ADRR) (http://adrr.weather.gov.hk) for the pilot project by HKO which included tropical cyclone warnings issued by China; Japan; Hong Kong, China; and the Philippines; as well as advisories and numerical forecasts issued by the Tropical Cyclone Advisory Centre (TCAC) Tokyo of Japan, Joint Typhoon Warning Centre (JTWC) of the USA, and European Centre for Medium-Range Weather Forecasts (ECMWF);

(d) Launch of a beta version of the dedicated website in September 2007 for access by aviation stakeholders and Members for evaluation and decision-making.

1.6 The MG agreed that the pilot project should be further developed to assist NMHSs in disaster risk reduction and to facilitate aviation stakeholders in their operational planning and decision-making.

2. PROGRESS/ACTIVITY REPORT

2.1 PILOT PROJECT TO DEVELOP SUPPORT FOR DEVELOPING COUNTRIES IN AERONAUTICAL METEOROLOGY PROGRAMME

2.1.1 The Pilot Project to Develop Support for Developing Countries in Aeronautical Meteorology Programme was established by Regional Association II (Asia) in its 13th Session held in Hong Kong, China during 7-15 December 2004. The pilot project has been coordinated by a Coordination Group comprising experts from Cambodia; China (Coordinator); Hong Kong, China; Iran; Japan; Lao; Mongolia; Myanmar; Nepal; and Yemen, with Observers from ICAO and the two World Area Forecast Centres (WAFCs).

2.1.2 The pilot project was reported at the 13th Session of the Commission (para. 8.18-8.22 of CAeM-XIII report). Progress so far since CAeM-XIII includes:

(a) The pilot project website (http://www.aamets.org/) providing a suite of guidance products of numerical model output intended to support NMHSes in the provision of aviation weather service, especially those in the least developed countries (LDCs), was declared semi-operational in March 2007;

(b) A VCP training seminar was organized by the China Meteorological Administration (CMA) during 6-8 March 2007 on the use of the guidance products on the pilot project website. Financial assistance was provided by China and WMO for participants in need. 14 participants from 11 RA II Members (Cambodia, Kazakhstan, Laos, Maldives, Myanmar, Nepal, Pakistan, Russian Federation, Sri Lanka, Thailand, Yemen) attended the seminar;

(c) The progress of the pilot project was presented at the ICAO Asia/Pacific SIGMET Seminar held in Bangkok during 11-13 July 2007. At the same time, it was agreed that further technical support would be provided to Laos on the preparation of TAF for three airports. Historical meteorological data were being requested by CMA from the Department of Meteorology and Hydrology of Laos for the derivation of TAF guidance products based on model output statistics (MOS).

2.1.3 Discussions are being made with CMA to further enhance the pilot project website in the following ways:
(a) Provide relevant SIGWX forecast charts from the World Area Forecast Centres (WAFCs). Coordination has been made with UK, ICAO and WMO to include the forecasts from WAFC London in the website;

(b) Provide more meteorological satellite products as guidance for SIGMET preparation;

(c) Extend the technical support being provided to Laos to other Least Developed Countries (LDCs) in TAF provision, and at a later stage, in SIGMET provision.

2.2 PILOT PROJECT ON AVIATION-WEATHER DISASTER RISK REDUCTION (ADRR)

2.2.1 In its 13th Session in 2006, CAeM endorsed a plan (see para. 8.12-8.15 of CAeM-XIII report) for a pilot project in RA II in cooperation with the Hong Kong Observatory (HKO), other interested Members in the Region, airlines, ICAO and the WMO secretariat to study:

(a) The feasibility of providing on an operational basis aviation weather forecasts and warnings in particular for severe convection, floods and tropical cyclones in close cooperation with all aviation stakeholders;

(b) The skill of such forecasts and warnings for 24-48 hours ahead;

(c) The benefits to aviation in particular and in general to the population in the regions affected by natural disasters.

2.2.2 After interacting with local users and reviewing previous weather hazards affecting the Hong Kong International Airport (HKIA), tropical cyclone is found to be the dominating weather bringing economic loss to flight operations at the airport. The pilot project will initially be focused on tropical cyclones.

2.2.3 HKO took lead in the pilot project to develop a project outline (see Appendix) and liaise with Members in the region on their participation. To demonstrate the benefits of the project to developing countries, and considering the significant impact of tropical cyclones to countries over the western North Pacific, the Philippines was also invited to participate. A number of Members and centres have also agreed to provide tropical cyclone forecast products for the pilot project.

2.2.4 HKO has developed a dedicated website on “Aviation-weather Disaster Risk Reduction” (ADRR) for this pilot project (http://adrr.weather.gov.hk). The website contains tropical cyclone warnings issued by China; Japan; Hong Kong, China; and the Philippines; advisories issued by the Tropical Cyclone Advisory Centre (TCAC) Tokyo of Japan and Joint Typhoon Warning Centre (JTWC) of the USA, as well as numerical forecasts of the European Centre for Medium-Range Weather Forecasts (ECMWF) (see Figures 1 and 2 for sample forecasts).

2.2.5 Using HKIA as an example, forecasts of weather conditions, e.g. crosswind and turbulence, which might bring airport disruption, are also provided on the pilot project webpage (see Figures 3 and 4 for sample forecasts). These aviation-specific forecasts are intended to demonstrate the benefits of such information to aviation stakeholders in the planning of airport operations and large-scale diversions due to tropical cyclones.

2.2.6 The project outline (Appendix) and the prototype website have been presented by HKO to representatives of local aviation users (including airlines, pilots, air traffic management, airport authority, and search and rescue units) in Hong Kong, China with very positive feedback. The website has been developed incorporating the users’ suggestions and a beta version has been provided to the local aviation users for evaluation and decision-making.
2.2.7 The website is also available for access via the Internet by all WMO Members in RA II and RA V. Through the WMO secretariat, Members are advised to contact HKO to obtain the password for access of the website. Coordination will also be made with ICAO to promulgate the pilot project webpage to the designated Meteorological Authorities in the regions.

2.2.8 Evaluation of the benefits to aviation in particular, and in general to the population in the regions affected by natural disasters will be conducted with the help of questionnaires to be sent to the participating users and WMO Members after the typhoon season this year.
Figure 1. Tropical cyclone forecasts based on official warnings issued by Members as well as advisories and numerical forecasts issued by the Tropical Cyclone Advisory Centre (TCAC) Tokyo of Japan, Joint Typhoon Warning Centre (JTWC) of the USA, and European Centre for Medium-Range Weather Forecasts (ECMWF).

Figure 2. Strike probability objective forecast issued by ECMWF.
Figure 3. Weather summary for HKIA.

Figure 4. Extended take-off forecast for HKIA.
Project Outline for
CAeM Pilot Project on Disaster Prevention and Mitigation (DPM)

Early Warning of Tropical Cyclone Activity for
All Aviation Stakeholders – Demonstration Project RA II

1. Introduction

1.1 In its 13th Session in 2006, CAeM endorsed a plan for a Pilot Project in RA II in cooperation with the Hong Kong Observatory (HKO), other interested Members in the Region, airlines, ICAO and the WMO secretariat to study:

(a) The feasibility of providing on an operational basis aviation weather forecasts and warnings in particular for severe convection, floods and tropical cyclones in close cooperation with all aviation stakeholders;
(b) The skill of such forecasts and warnings for 24-48 hours ahead;
(c) The benefits to aviation in particular and in general to the population in the regions affected by naturals disasters.

1.2 A draft project outline taking into consideration of feedback from users of aviation weather services in Hong Kong, China is summarized below.

2. Project Scope and Methodology

2.1 Interaction with local users and previous weather disasters affecting the airport reveal that tropical cyclone is the dominating weather bringing economic loss to flight operations at the Hong Kong International Airport (HKIA). Therefore the Pilot Project will be focused on tropical cyclones.

2.2 At HKIA, tropical cyclones could bring high crosswinds and severe turbulence, making aircraft landing and take-off difficult or even prohibitive. In the most significant events, the disruption took a few days to recover, bringing significant economic loss in flight operations. Forecast products on the occurrence of high impact weather conditions such as high crosswinds and severe turbulence under tropical cyclone situation could be developed making use of tropical cyclone forecast track and intensity generated by numerical weather prediction (NWP) models.

2.3 Tropical cyclone forecast track and intensity information up to 48 hours and beyond is already available from national and regional centres as well as on the Severe Weather Information Centre (SWIC) website of WMO (http://severe.worldweather.wmo.int/). Apart from deterministic forecasts, ensemble tropical cyclone track forecasts based on NWP models are also becoming available (see example in Figure 1). Provision of these tropical cyclone forecasts by participating RSMCs and Members will be key to the success of the Pilot Project. Based on these forecasts, the probability of occurrence of the high impact weather conditions could then be generated and made available to users. The track and intensity forecasts up to 48 hours and beyond will also be useful in planning of large-scale diversions due to tropical cyclones by ATM authorities and airlines.

2.4 Participating aviation users and Members will be provided access to the above-mentioned forecast products via the Internet-based Aviation Meteorological Information System (AMIDS) of the HKO for evaluation and decision making.
3. User’s Feedback

3.1 The above project scope and methodology were presented to representatives of local airlines, the Airport Authority Hong Kong, and Hong Kong Civil Aviation Department in January 2007. Users in general welcome the initiative of the Pilot Project and look forward to participating. The above-mentioned forecast products are also considered useful for search and rescue operations of the Hong Kong Government Flying Service.

3.2 Evaluation of the benefits to aviation and the population in the Region will be conducted with the help of questionnaires to be sent to the participating aviation users and Members.

4. Timeline

4.1 The suggested timeline for the Pilot Project is as follow:

(a) 2007 Q1 - finalize project outline and invite RSMCs and Members from the Region to participate;
(b) 2007 Q3 – launch tropical cyclone track and intensity forecasts and associated airport-specific high impact weather forecasts on AMIDS for evaluation by participating aviation users and Members;
(c) 2007 Q4 – obtain user’s feedback and evaluate benefits;
(d) 2008 Q1-Q2 – enhance Pilot Project website taking into account feedback from aviation users and Members;
(e) 2008 Q3-Q4 – conduct second round of evaluation;
(f) 2008 Q3-Q4 – prepare documentation and organize training to share best practices with Members, including an evaluation of the benefits to users;
(g) 2009 Q1 and beyond - consider extending the Pilot Project to other airports in the Region and declare the Pilot Project website operational.