



International Civil Aviation Organization

**THIRD MEETING OF THE METEOROLOGICAL REQUIREMENTS
TASK FORCE (MET/R TF/3)**

28 – 29 November 2013, Bangkok, Thailand

Agenda Item 3: MET and ATM Requirements and Information Exchange

b) Integration of MET information in ATM, airspace user systems and decision support tools

COLLABORATIVE DECISION MAKING

(Presented by Australia)

SUMMARY

This paper presents an overview of a Trial of Collaborative Decision Making in Australia.

1. Introduction

1.1 As stated in ICAO Doc 9971 the Manual on Collaborative Air Traffic Flow Management: *“2.1.1 Collaborative Decision Making (CDM) is a process applied to support other activities such as demand/capacity balancing. CDM can be applied across the timeline of activities from strategic planning (e.g. infrastructure investments) to real time operations. CDM is not an objective but a way to reach the performance objectives of the processes it supports. These performance objectives are expected to be agreed upon collaboratively. Since implementing CDM likely will require investments, these will need to be justified in accordance with the performance-based approach.”*

2. Background

2.1 In Australia traffic movements at the major airports have been increasing at about 4% per annum. At peak times and during periods of marginal or poor weather there are more aircraft scheduled to land than there are slots available and in some circumstances the limitations on landing and take-off slots results in significant delays and flight cancellations. This is particularly evident at Sydney, Brisbane and Perth. This congestion is primarily being managed by Airservices utilising the airlines schedules to produce a ground delay program (GDP) using Metron Traffic Flow (MTF), a software tool that enables an Air Navigation Service Provider (ANSP) to monitor demand and capacity across the network, and to implement Traffic Management Initiatives (TMI) when demand exceeds capacity in any component of the network, particularly at a network airport.

3. Australian CDM Trial

3.1 Landing rates for each airport are decided the previous day by a collaborative process taking into account weather and other factors that are likely to influence traffic flow. In this pre-tactical phase of air traffic flow management (ATFM), planning occurs the day prior to the day of a flight's operation until two hours prior to the flight's departure. This planning phase includes a review of airline schedules, an assessment of forecast wind and weather, and any other capacity constraints. The Air Traffic Control ATC Shift Managers will consult with other relevant stakeholders and implement a TMI to manage any forecast capacity/demand imbalance. Subsequently, prior to or after its implementation, a change in forecast wind or weather may necessitate a revision of the original TMI or implementation of another TMI.

3.2 In terms of weather, the landing rates are currently determined principally from the current Aerodrome Forecast (TAF) which is a significant limitation as the TAF does not effectively convey all of the information on weather phenomena likely to affect traffic flow into the airport. An example of this is thunderstorms in the Terminal Movement Area (TMA), for Sydney this is out to a range of 45nm. These thunderstorms may not appear on the TAF, which effectively covers an area of only 5nm around the airport but may have a significant effect on traffic flow for Sydney.

3.3 It is therefore highly desirable that a process be developed whereby information on meteorological conditions that cannot be disseminated via the standard OPMET product set is shared amongst aviation industry users at these airports. This additional information can then be used in a suitable risk assessment process to predict landing rates in a more effective way. To produce and use this new information effectively will require a significant culture change amongst both users and the producers of the information as well undertaking a targeted education program so that everyone involved in the CDM process is working towards a common goal.

4. The Bureau of Meteorology's (Bureau) involvement in CDM

4.1 As part of the CDM trials recently undertaken in Australia the Bureau's National Operations Centre Meteorological Unit (NOCMET), located within Airservices Australia's National Operations Centre (NOC) in Canberra, provide a coordination role with Meteorological Offices (MOs) and Meteorological Watch Offices (MWOs). As part of the CDM process NOCMET obtain information from Bureau forecasters (MOs and MWOs) on the meteorological thinking behind the TAF, including the forecasters assessment of the likelihood of alternative outcomes as well as the forecasters level of confidence in order to populate the probability and confidence matrix, see figure 1.

4.2 Airservices NOC manage the routine daily teleconferences between major CDM stakeholders, including NOCMET Bureau forecasting staff, as well as the Qantas Meteorological Unit (QMET) and the Virgin Australia Meteorological Unit (VAMET). The purpose of the early morning teleconference is to provide a forum for CDM processes relating to network operations, weather, infrastructure constraints, as well as TMIs and their impacts.

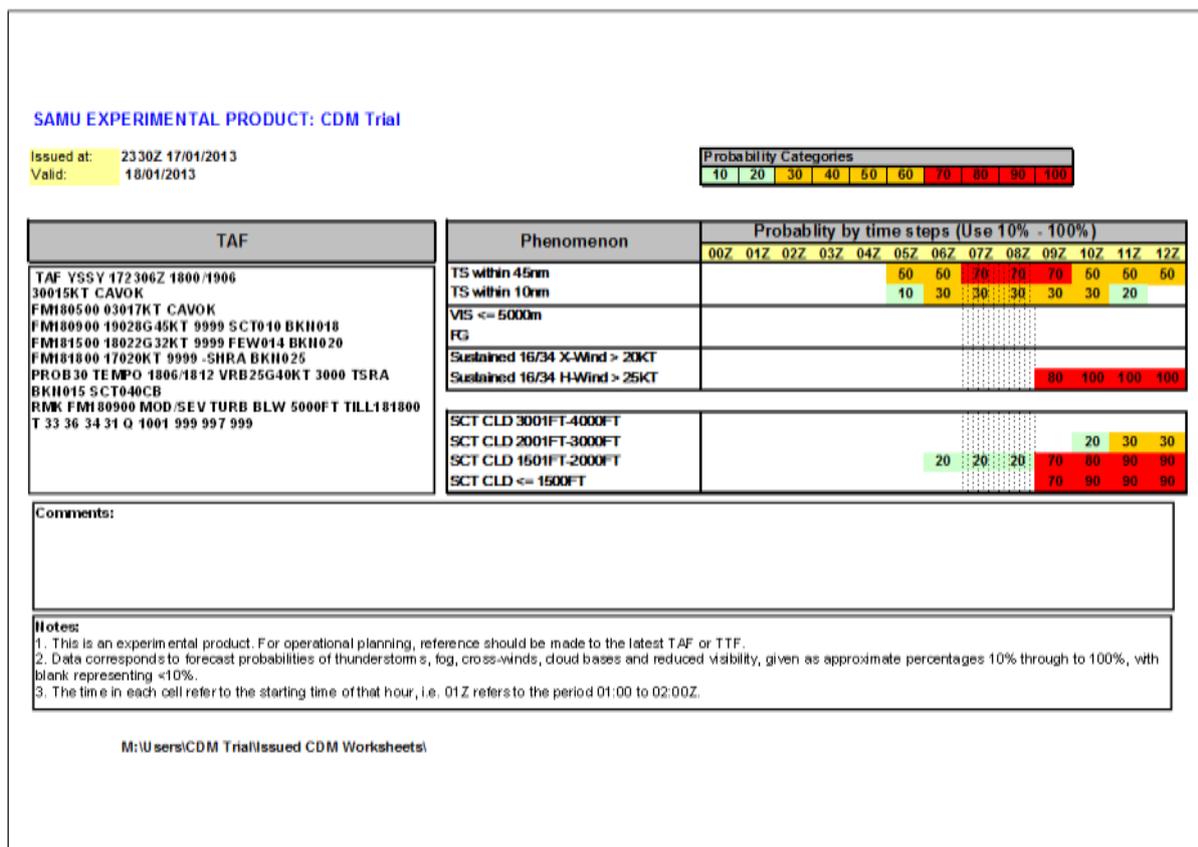


Fig. 1 – Sample probability matrix for Sydney

5. Lessons learnt

5.1 For the first trial at Sydney (three month period) the trial demonstrated that the process was valuable for information sharing to support intelligent decisions. One of the benefits from the trial has been the development of the probability matrix which contains significantly more information than is available in the standard TAF.

5.2 Before CDM can progress any further in Australia the Bureau’s Aviation Weather Services program sees that there are number of issues that need to be addressed before CDM can be implemented in Australia. The current issues include:

- Together with Airservice and other stakeholders the Bureau would need to development better defined user requirements in order to provide the specialised products and services.
- As well as location specific products, such as TAF and Trend Forecast (TTF), what other products can be used in the CDM process that can add value to MTF, such as the use of SIGMET and forecasts at key alternate aerodromes.
- In order for CDM to be fully effective, key areas in the Bureau will require additional resources.

- In order to monitor CDM and the associated products the Bureau, together with stakeholders, will need to develop the methodology of verification for improved Meteorological CDM products.
- The development of an education program for both producers and users in order to develop better defined roles and responsibilities within the CDM process.
- There are existing problems associated with users not properly understanding the probability matrix. The current version of the matrix includes the use of probabilities as well as a forecaster confidence interval. Without an appropriate mathematical background these terms may be somewhat confusing; and
- There could be a perception that CDM meteorological products are in conflict with official OPMET product. Users may be confused over differences between the probability matrix and the official TAF/TTF.

6. Action by the Meeting

- 6.1 The meeting is invited to note the information contained in this paper.
