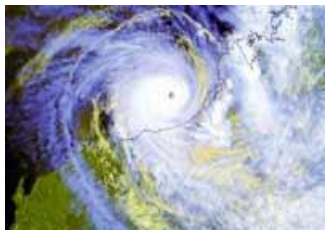




Australian Government
Bureau of Meteorology



Airport Weather Matrix (AWM)

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Introduction

- The Bureau is investigating developing an Aviation Weather Matrix (AWM).
- AWM will provide a method to automatically generating multiple aviation forecast products which have many common properties, such as TAF, TTF (Australian Trend Forecast), Airport Weather Briefing (AWB) and/or Low Probability Forecasts.

Motivation

- Currently Aviation forecasters are required to generate multiple forecasts with many common properties (wind, temp, weather...)
 - TAF
 - TTF
 - Airport Weather Briefing
 - Tabular probabilistic forecasts
 - Code Grey
 - Aerodrome Warnings
- Aerodrome forecasts need to be consistent
- Different users require different level of details in forecasting products

Samples of Products

Here is a range of forecasting products for can be generated an Australian aerodrome

- TAF AMD YSSY 262302Z 2700/2806
16020KT 9999 -SHRA SCT010 BKN025
FM270300 16018KT 9999 SCT035
FM270900 13010KT 9999 SCT030
FM280000 10015KT 9999 FEW035
RMK
T 20 21 20 19 Q 1022 1022 1022 1023
- TTF METAR YSSY 260000Z 16016KT 9999 -DZ FEW015 BKN027
19/15 Q1022
RMK RF00.0/000.0
NOSIG

Samples of Products

- **Sydney Airport Weather Briefing**
- Issued at 0450Z on 01/01/04
- **Sydney TAF**
- TAF YSSY 010436Z 0106/0212 03015KT CAVOK
- FM011800 01010KT CAVOK
- FM020200 03015KT CAVOK
- RMK T 27 25 23 21 Q 1009 1009 1009 1010
- **TAF Summary**
- A high in the Tasman is directing a northerly flow over Sydney. The fresh northeast winds will ease this evening and tend northerly overnight. The northeast sea breeze will return again tomorrow around mid-morning.
- **Thunderstorm Potential within the TMA**
- There is a 10% chance of some thunderstorm activity about the ranges west of Sydney tomorrow.
- **Other Possibilities**
- 20% chance there will be more than 20 knots crosswind gusts on runway 16/34-tomorrow afternoon. 10% chance thunderstorms will develop overnight. A Code Grey has been issued (see below).
- **Sydney Outlook**
- Saturday: City min 22, max 30. Fine, mostly sunny. N/NE winds, freshening near the coast in the afternoon.
- Sunday: City min 21, max 32. Fine. N/NE winds.
- **CODE GREY**
- PROB10 INTER 0114/0124 TS

Samples of Products

- Code Grey

PROB10 1919/1923 0500 FG

- Aerodrome Warning

YMES AD WRNG 1 VALID 280700/281200Z

AERODROME WARNING NUMBER 1 FOR EAST SALE VALID 281700/282200
LOCAL

ISSUED 280400Z (281400 LOCAL)

SURFACE WINDS WESTERLY 45KT MAX 55KT

- Sample PROB Forecast

TS probability

Time UTC	00Z	01Z	02Z	03Z	04Z	05Z	06Z	07Z	08Z	09Z	10Z	11Z	12Z
Prob %	00	00	10	10	20	20	30	30	40	50	40	30	30

Proposed AWM Parameters

- Wind Direction, Speed & Gust
- Cloud amount & base (up to 3)
- TCU/CB amount & base
- Visibility (Current, FM/BCMG, TEMP/INTER/PROB)
- QNH
- TEMP
- PROB Cloud Base <1500 & <2500FT
- PROB Visibility <4000m & <8000FT
- PROB Wx (5 User selectable groups)
- PROB TS WI 10NM & 40NM
- PROB X-Wind > XX KT
- PROB D-Wind > XX KT

Other Parameters

- Temporal
 - 15min steps for first 3 hrs
 - Hourly steps for 3-30 hrs
- Probabilities (0,10, 20....90, 100)
- INTER, TEMPO, FM, BCMG

AWM Inputs

- Previous Forecast
- ACCESS (NWP) Models
- International NWP
- GFE Grids
- NTFGS Grids

- For each forecast cell of the AWM, a forecaster could:
 - use forecasting guidance/tools;
 - re-use previous forecast; or
 - Enter/edit a value/probability

Features

- System Administrator would be able to define:
 - Visibility for each Wx group
 - Default guidance to use for each parameter
 - Products to be created for each AD
 - Parameters to be included in non-ICAO products, eg parameters in Met CDM matrix, Low Probability Forecasts,etc
 - Thresholds for products (e.g. Code Grey 10-30%)
 - Runway configurations

Other Features

- Forecaster should be able to
 - Select alternate guidance for each parameter
 - Configure active runway
 - Graph guidance, previous forecast, current forecast and observations (configure fields, start/end times)
 - Define which weather groups are being forecast
 - Preview each product (TAF, ..) prior to issue

Sample PROBs

	01	02	03	04	05	06
DZ						
SHRA	10	10	20	20	20	20
RA	50	50	70	80	70	50
TSRA	10	10	30	40	30	20
Fog						

Complexities

- When to issue/amend specific products
 - Forecaster defines when to issue/amend each product
 - Semi-auto
 - Auto
- Some sites have local amendment criteria
- Non-ICAO compliance
- Probabilistic guidance not yet available for most weather elements
- Use of INTER/TEMPO
- Use of FM/BCMG



Benefits

- Forecasters focus on meteorology instead of formatting/typing multiple products;
- Enhance consistency between products;
- Products created easily with different resolutions for different users;
- Allow creation of new products efficiently;
- Improvement to products in terms of accuracy and quality.

Proposal

- Review use and requirements for AWB & Code Grey
- Review non-ICAO compliance
- Bureau, in consultation with industry, develop requirements for system
- Bureau needs to develop first operational candidate (Prototype OC) of this capability within our new software platform (Visual Weather) and assess at its operational concept.
- Proposed to be used at major airports initially.

Questions or comments –

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