Australian Government
Bureau of Meteorology

2013 SAMU Survey

By ████████, Team Leader SAMU
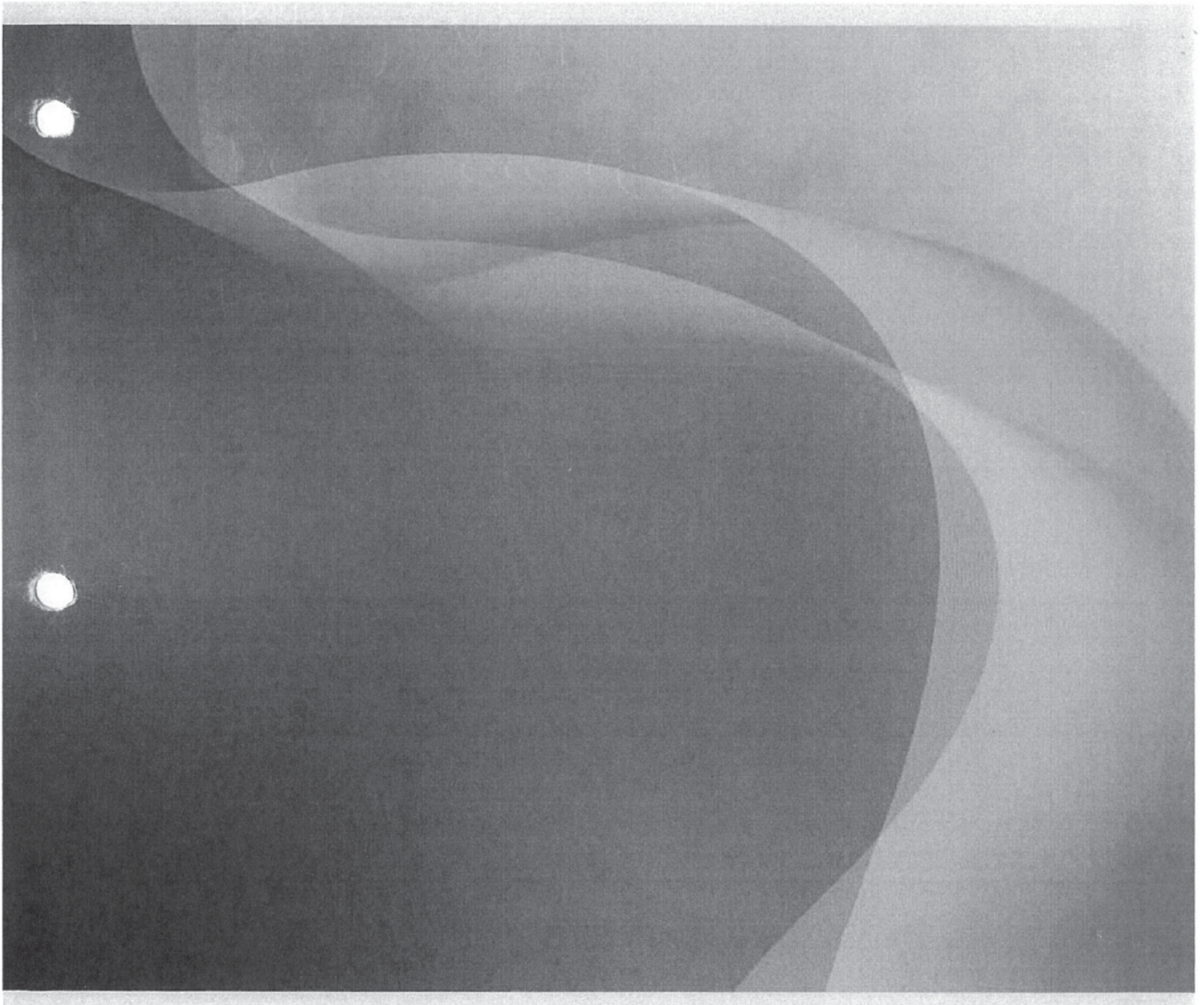
Report on the 2013 SAMU Survey

Published by the Bureau of Meteorology

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1 Introduction

Annually the Bureau of Meteorology conducts a survey of its services to the aviation industry. The focus of these surveys is to ensure continuous improvement of its products and services within the limits of the ISO 9001 Quality Management System. Under ISO 9001, the Sydney Airport Meteorological Unit (SAMU) is certified to provide forecasting services to aviation.

2.1.3   Accuracy

Figure 3 below illustrates that 74% of respondents perceive that the products and services from SAMU are mostly accurate with the remaining 26% believing they are accurate half of the time. Always accurate, occasionally accurate and always inaccurate scored nil for this section.

Overall Accuracy of Products and Services

■ Always accurate
■ Mostly accurate
■ Half the time
■ Occasionally Accurate
■ Always inaccurate

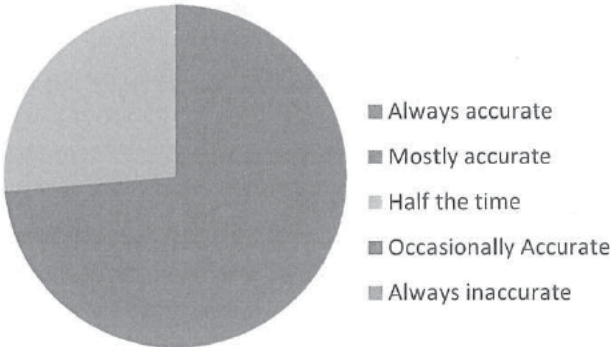**Figure 3: Chart of SAMU Aviation Product Accuracy from Survey Statistics**

It was encouraging to note that Airservices personnel perceived SAMU products to be mostly accurate 74% of the time. This figure was statistically similar to the 78% perceived accuracy in the Major Airport Survey conducted a year prior between the Bureau of Meteorology and the aviation industry. Moreover, no below average responses were communicated.
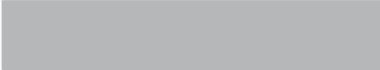
2.3 Weather Phenomena

2.3.2   Forecast Phenomena and Performance

Air Traffic Controllers were asked which weather phenomena they perceived could be better forecast by SAMU staff. Figure 7 below illustrates that the majority of controllers (58.8%) believe that SAMU could better forecast the wind at Sydney Airport. Thunderstorms had a response of 17.6% and both fog and low cloud were 11.8%.

Forecast Improvement
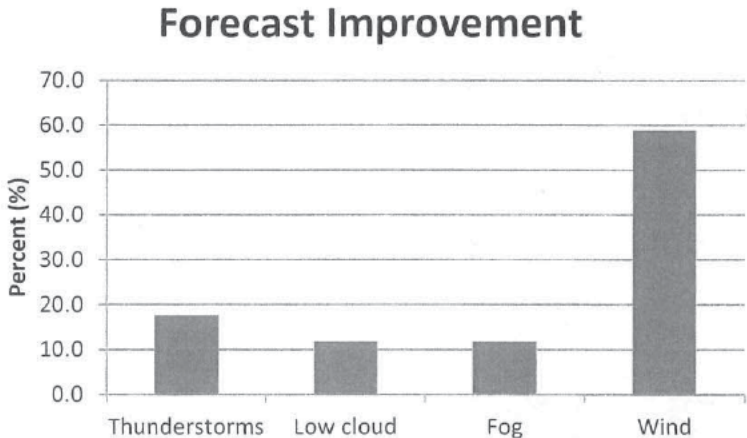
Figure 7: Bar Graph of Phenomena for Forecast Improvement

2.3.3 Response to Thunderstorms in the TMA

Thunderstorms often occur in the Terminal Area (TMA) surrounding Sydney Airport but outside of the 5nm boundary for Aerodrome Forecasts (TAF). Although outside of the TAF area thunderstorms can have major impacts to arriving and departing aircraft. Thunderstorms within 45nm of Sydney Airport are tracked by the SAMU forecaster and information is provided to Airservices.

The survey asked whether the SAMU staff recognise and respond appropriately to Thunderstorms within 45nm of Sydney Airport. It was noted that 16% of replies answered always, 63% mostly and 21% half of the time. (Refer to Figure 8). Note that responses for occasionally and never scored nil for this section.

Response to Thunderstorms in Sydney TMA

- Always
- Mostly
- Half the time
- Occasionally
- Never

Figure 8: Graph of Response to Thunderstorms in Sydney TMA

2.3.4 Thunderstorm Tracking Accuracy

A question was asked regarding the accuracy of the direction and speed of forecast thunderstorms. Air Traffic Controllers perceive that forecasts are mostly accurate 84% of the time with 16% of responses stating half of the time. Refer to Figure 9. Note that responses for always, occasionally and never scored nil for this section.

Thunderstorm Tracking Accuracy

- Always
- Mostly
- Half the time
- Occasionally
- Never
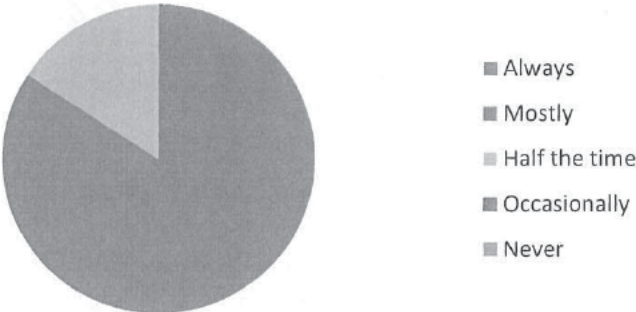
Figure 9: Graph of Thunderstorms Tracking Accuracy of SAMU Forecasts

The results suggest that the response and accuracy of SAMU staff in forecasting and tracking thunderstorms within the TMA at Sydney Airport is perceived as very good.

TAF Verification

for Major Airports

October 2013 to March 2014

Australian Bureau of Meteorology

Manager

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Bureau of Meteorology

Major Airport Services

These statistics are compiled using the Bureau's AVS(1) verification system. They are compared with statistics for the 10 year average 2002-2012 for the airport. Positive results are highlighted in green in the tables. Anomalies are highlighted in orange and some comments have been made for each aerodrome. The graphs and parameters on each page are calculated as follows:

Forecast Safety Index

This index is designed to represent the actual risk the aircraft has of encountering un-forecast weather, which they are unable to land in (Conditions below the landing minima or thunderstorms observed). This figure is calculated for the first 4 hours of the TAF. The lower the percentage, the less the risk to pilots using the TAF for flight planning that month. Figures near or above 1% require some scrutiny.

Thunderstorms

POD is the probability of detection % of a TS by the TAF in the first 6 hours of the forecast.

FAR is the false alarm ratio% and is the number of TS hourly misses divided by the total forecast TS hours in the first 6 hours of every TAF for the month. A FAR of 80% means 5 hours of forecast TS for every hour of TS reported. 80% is a very good result. A result of 95% means 20 hours of forecast TS for every reported TS within the TAF. High values often occur if there are very low numbers of TS in a month. This figure does not include missed TS by the first 6 hours of the TAF.

TS Hours is the total number of observed TS hours in the month.

Forecast TS Hours is the number of TS hours forecast in the first 6 hours of the TAF over the month.

Fog

These fog statistics are based on a reported visibility of <1000m as extracted from AVS(1). They could be distorted by observations of heavy precipitation and smoke. Heavy precipitation that reduces visibility below 1000m in fog seasons across Australia is extremely unlikely. These metrics should be treated with caution October to March.

POD is the probability of detection % of fog by the TAF in the first 6 hours of the forecast.

FAR is the false alarm ratio% and is the number of Fog hourly misses divided by the total forecast Fog hours. A FAR of 80% means 5 hours of forecast Fog for every hour of hit. 80% is a very good result. A result of 95% means 20 hours of forecast Fog for every hour of hit. This figure does not include outright misses by the TAF.

Fog Hours is the total number of observed Fog hours in the month.

Forecast FG Hours is the number of FG hours forecast in the first 6 hours of the TAF over the month.

Alternate Minima

Operationally Correct is the % of time for the month that the first 6 hours of every TAF were forecast above minima and observed above minima plus forecast below minima and observed below minima.

Failed detections are the % of time below the alternate minimum when the TAF forecast above minimum in the first 6 hours of every TAF.

False Alarms are the % of time that the TAF forecast below the alternate minimum in the first 6 hours when the observed conditions were above.

Hours Below are the number of hours observed below the alternate minimum.

Summary of Results

Forecast Safety Index

% of Unsafe forecasts

	October	November	December	January	February	March
Sydney	0.7	1.57	0.1	0.04	0	1.14
Melbourne	0	0.1	0	0	0	0
Brisbane	0.26	0.55	0.65	0.35	0	0.17
Perth	0	0	0	0	0	0.32
Adelaide	0.04	0	0	0.6	0	0.55
Gold Coast	0	0	0.15	0.07	0	0.49
Cairns	0.37	0.29	0.5	0.18	0.1	0.08
Canberra	0	0.21	1.12	0	0.57	1.28
Darwin	1.72	0.74	0.75	0.9	0.14	0.99
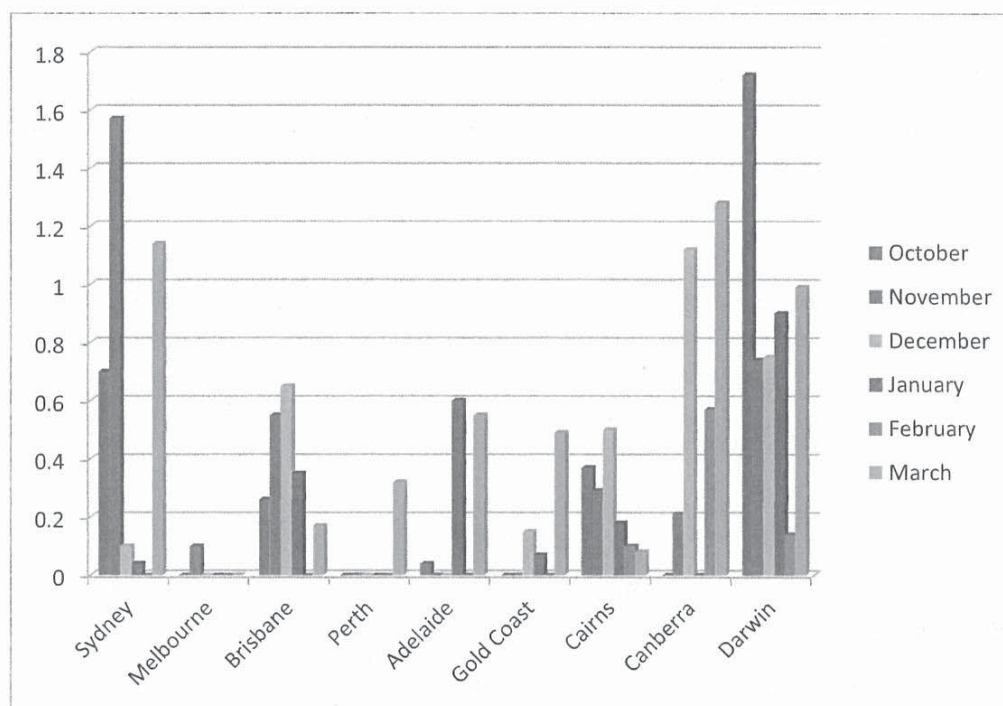
Forecast Safety Index by Major Airport. The following spikes above 1% are shown:

Sydney (November): Late forecast TS on two occasions.

Sydney (March): Late forecast TS. High number of TS events. SAMU to further develop TS forecasting processes and case study events.

Canberra (December): Late forecast TS event.

Canberra (March): High number of TS events. One late forecast fog event.

Darwin (October) late forecast TS.

SYDNEY

Alternate Minimum	2500m	700ft
Landing Minimum	2000m	250ft

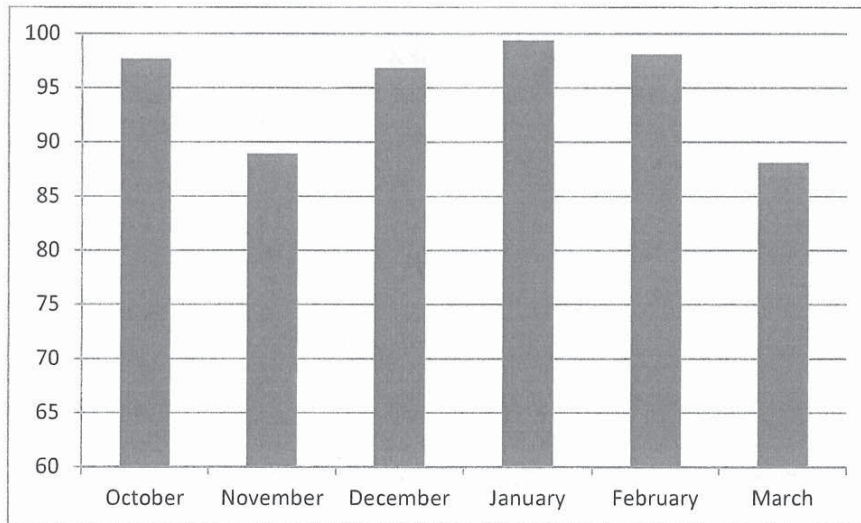| Month	October	November	December	January	February	March	10 Year Avg
FSI (1-4hrs) %	0.7	1.57	0.1	0.04	0	1.14	
Vis <1000 POD (1-6hrs)%	0	0	0	0	0	0	71.5
Vis <1000 FAR (1-6hrs)%	0	0	0	0	0	0	89.7
Vis <1000 HRS (1-6hrs)	0	0	0	0	0	0	123.6
Forecast FG Hours (1-6hrs)	0	0	0	0	0	0	855
TS POD (1-6hrs)%	0	51.1	50	0	66.7	43.7	61.6
TS FAR (1-6hrs)%	100	82.5	98.1	100	92.9	92	93
TS HRS (1-6hrs)	0.73	26.4	1	0.18	1.5	18.3	425.4
Forecast TS Hours (1-6hrs)	12	77	26	3	14	100	3765
Operationally correct (1-6hrs only) %	97.68	88.9	96.83	99.36	98.08	88.12	94.76
Failed detections (1-6hrs) %	0.2	1.98	0.19	0.25	0.28	1.37	0.57
False Alarms (1-6hrs) %	2.12	9.12	2.98	0.39	1.63	10.51	4.67
Hours Below (1-6hrs)	12	30.1	2.5	1.95	4.63	19.5	1095.7

Thunderstorm forecasts in November were subject to AMIR investigation and lessons learned will be incorporated into forecaster notes. There was a prolonged TS event on 15 November. Thunderstorm forecasts in March will be reviewed and forecast processes to be refined in coming months.

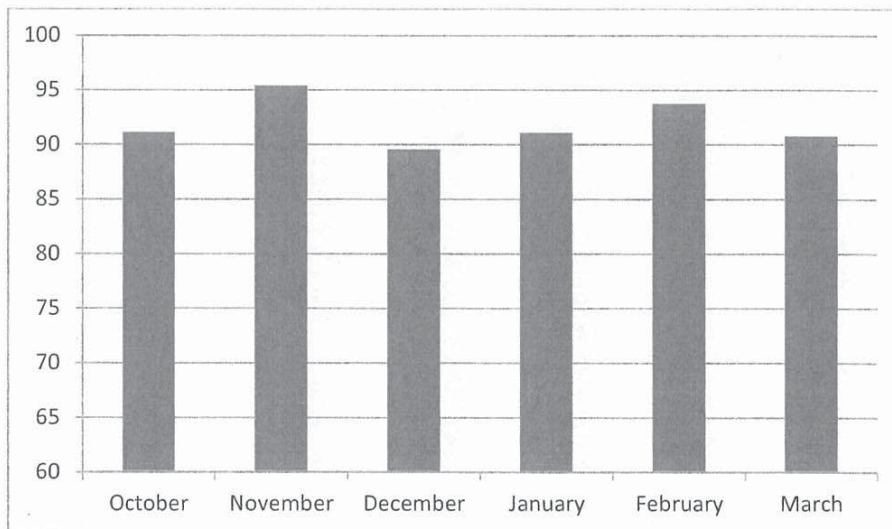**Operationally Correct % - Long term average 94.76%**

Melbourne

Alternate Minimum	2500m	700ft
Landing Minimum	800m	210ft

Month	October	November	December	January	February	March	10 Year Avg
FSI (1-4hrs)%	0	0.1	0	0	0	0	
Vis <1000 POD (1-6hrs) %	0	0	0	100	0	0	**78.1**
Vis <1000 FAR (1-6hrs) %	0	100	0	98.2	100	100	**88.1**
Vis <1000 HRS (1-6hrs)	0	0.52	0	0.25	0	0	**300.6**
Forecast FG Hours (1-6hrs)	0	7	0	14	4	9	**1966**
TS POD (1-6hrs) %	0	100	100	100	100	100	**77.04**
TS FAR (1-6hrs) %	100	95	99.2	99.1	97.3	97	**95.9**
TS HRS (1-6hrs)	0	0.33	0.47	0.38	0.32	0.97	**205.9**
Forecast TS Hours (1-6hrs)	26	6	57	46	12	32	**3868**
Operationally correct (1-6hrs only) %	91.13	95.39	89.59	91.11	93.77	90.77	**90.05**
Failed detections (1-6hrs) %	0.32	0.12	0.47	0	0.08	0.22	**0.49**
False Alarms (1-6hrs) %	8.56	4.49	9.93	8.89	6.15	9.02	**9.46**
Hours Below (1-6hrs)	3.63	10.7	8.43	5.38	3.73	15.5	**2636.2**

Comment: Near or above long term operationally correct throughout. Slightly high false alarms experienced in December.

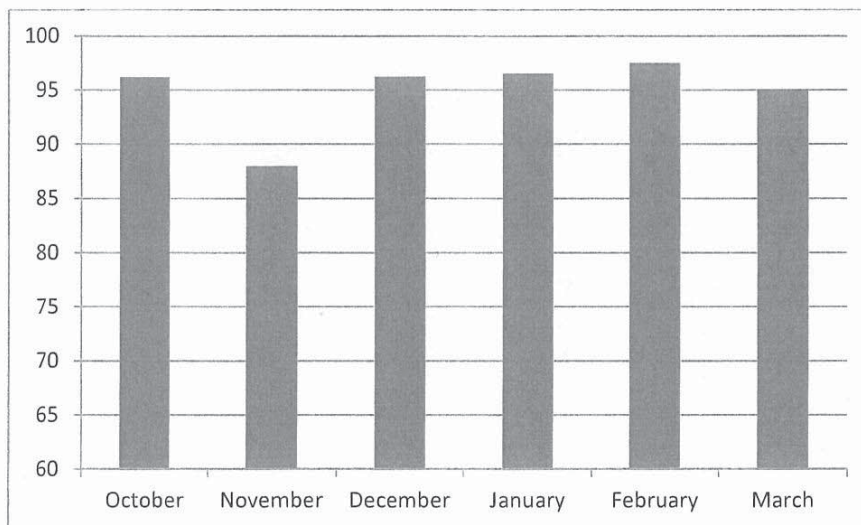**Operationally Correct% - Long term average 90.05%**

Brisbane

Alternate Minimum	2500m	700ft
Landing Minimum	800m	220ft

Month	October	November	December	January	February	March	10 Year Avg
FSI (1-4hrs)%	0.26	0.55	0.65	0.35	0	0.17	
Vis <1000 POD (1-6hrs) %	0	0	0	0	0	0	**67**
Vis <1000 FAR (1-6hrs) %	0	0	0	0	0	100	**86.6**
Vis <1000 HRS (1-6hrs)	0	0	0	0	0	0	**142.8**
Forecast FG Hours (1-6hrs)	0	0	0	0	0	9	**714**
TS POD (1-6hrs) %	56.2	91.2	55.1	88.6	100	55.9	**67.77**
TS FAR (1-6hrs) %	87.1	77.9	81.2	68.4	91.7	94	**90.6**
TS HRS (1-6hrs)	8	38.8	13.3	17.5	2	2.27	**455.8**
Forecast TS Hours (1-6hrs)	35	160	39	49	24	21	**3272**
Operationally correct (1-6hrs only) %	96.17	87.97	96.23	96.53	97.49	95.04	**94.68**
Failed detections (1-6hrs) %	0.41	0.36	0.65	0.23	0	0.67	**0.53**
False Alarms (1-6hrs) %	3.42	11.67	3.12	3.23	2.51	4.3	**4.79**
Hours Below (1-6hrs)	8	38.8	13.3	19.6	2.87	9.8	**1310.8**

Comment: Thunderstorm metrics exceeded long term averages for a significant number of TS events in November and January.

**Operationally Correct% - Long term average 94.68%**

Perth

Alternate Minimum	2500m	700ft
Landing Minimum	1500m	250ft

Month	October	November	December	January	February	March	10 Year Avg
FSI (1-4hrs)%	0	0	0	0	0	0.32	
Vis <1000 POD (1-6hrs)%	100	0	0	0	0	0	82.3
Vis <1000 FAR (1-6hrs)%	98.8	0	0	0	0	100	95.3
Vis <1000 HRS (1-6hrs)	0.93	0	0	0	0	0	216.7
Forecast FG Hours (1-6hrs)	73	0	0	0	0	25	3760
TS POD (1-6hrs)%	0	0	100	0	0	0	79.8
TS FAR (1-6hrs)%	100	100	95.2	100	100	100	96.4
TS HRS (1-6hrs)	0	0	0.63	0	0	2	255.4
Forecast TS Hours (1-6hrs)	21	33	13	14	27	82	5658
Operationally correct (1-6hrs only)%	89.54	94.81	98.73	98.43	96.48	87.88	89.34
Failed detections (1-6hrs)%	0.3	0	0	0	0	0.25	0.26
False Alarms (1-6hrs)%	10.16	5.19	1.27	1.57	3.52	11.87	10.4
Hours Below (1-6hrs)	7	0	0.63	0	0	2.33	1051.9

Comment: Very few thunderstorms within 5nm of Perth airport over the last 6 months (Total=2.63hrs).

**Operationally Correct% - Long term average 89.34%**
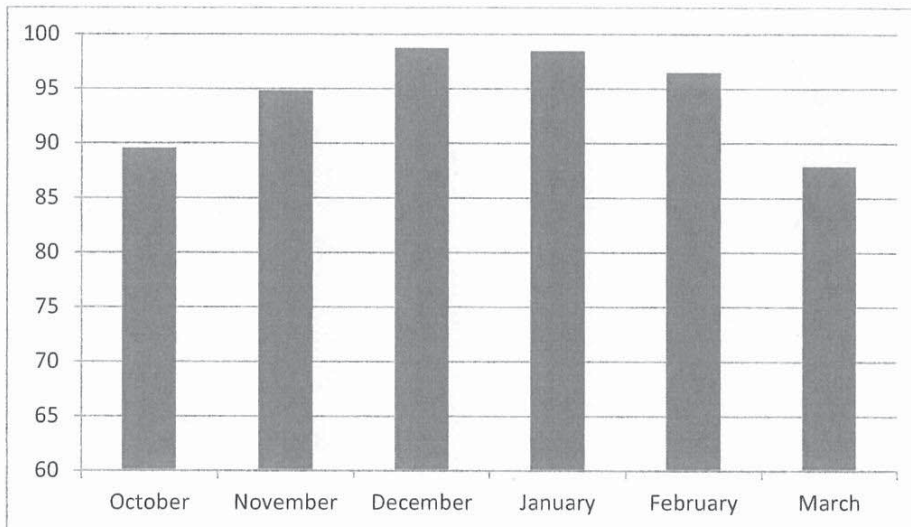
Adelaide

Alternate Minimum	4000m	850ft
Landing Minimum	1200m	270ft

Month	October	November	December	January	February	March	10 Year Avg
				2014			
FSI (1-4hrs)%	0.04	0	0	0.6	0	0.55	
Vis <1000 POD (1-6hrs)%	0	0	0	0	0	0	**79.4**
Vis <1000 FAR (1-6hrs)%	0	0	0	0	0	0	**87.2**
Vis <1000 HRS (1-6hrs)	0	0	0	0	0	0	**134.9**
Forecast FG Hours (1-6hrs)	0	0	0	0	0	0	**839**
TS POD (1-6hrs)%	52.4	0	100	19.6	0	31.8	**66.8**
TS FAR (1-6hrs)%	98.4	0	94.9	83.5	100	96.6	**93.6**
TS HRS (1-6hrs)	1.4	0	2.1	6.73	0	4.35	**220.7**
Forecast TS Hours (1-6hrs)	45	0	41	8	11	41	**2295**
Operationally correct (1-6hrs only)%	93.26	99.54	95.16	98.25	95.1	92.23	**93.29**
Failed detections (1-6hrs)%	0.14	0.13	0.12	0.9	0.94	0.53	**0.4**
False Alarms (1-6hrs)%	6.6	0.33	4.72	0.85	3.96	7.24	**6.31**
Hours Below (1-6hrs)	2.08	1.5	4.1	8.27	11.4	7.83	**1236.9**

Comment: NSTR

Operationally Correct% - Long term average 93.29%
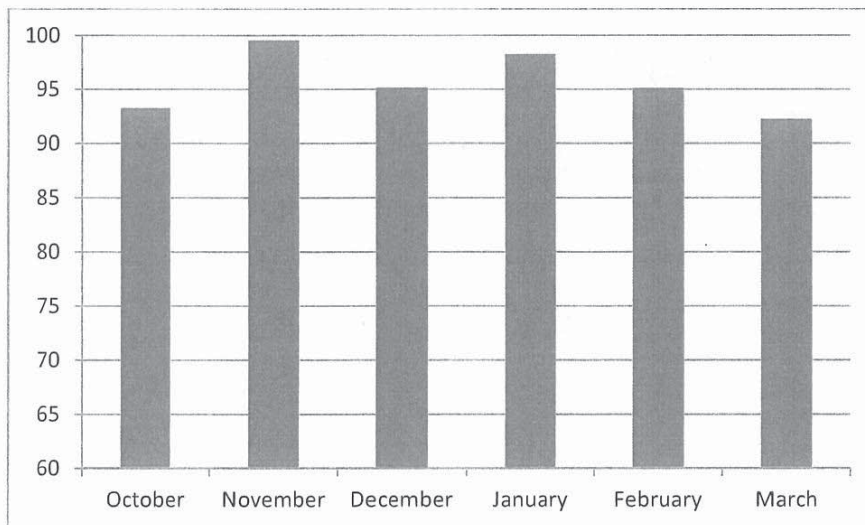
Gold Coast

Alternate Minimum	6000m	1439ft
Landing Minimum	4100m	750ft

Month	October	November	December	January	February	March	10 Year Avg
				2014			
FSI (1-4hrs)%	0	0	0.15	0.07	0	0.49	
Vis <1000 POD (1-6hrs)%	0	0	0	0	0	0	**21.3**
Vis <1000 FAR (1-6hrs)%	0	0	0	0	0	0	**86.2**
Vis <1000 HRS (1-6hrs)	0	0	0	0	0	0	**93.1**
Forecast FG Hours (1-6hrs)	0	0	0	0	0	0	**144**
Operationally correct (1-6hrs only)%	86.47	74.01	88.72	75.7	83.63	69.53	**77.91**
Failed detections (1-6hrs)%	0.72	0.26	0.17	0.4	0.41	0.63	**0.94**
False Alarms (1-6hrs)%	12.81	25.72	11.11	23.9	15.96	29.84	**21.14**
Hours Below (1-6hrs)	13.4	28.4	10.7	15.2	11.4	42.7	**4670**

Slightly high false alarms experienced in November, January and March.

No present weather capability.

Unable to verify thunderstorms, false alarms may be distorted (too high) and operationally correct too low.

<u>Operationally Correct – 77.91%</u>
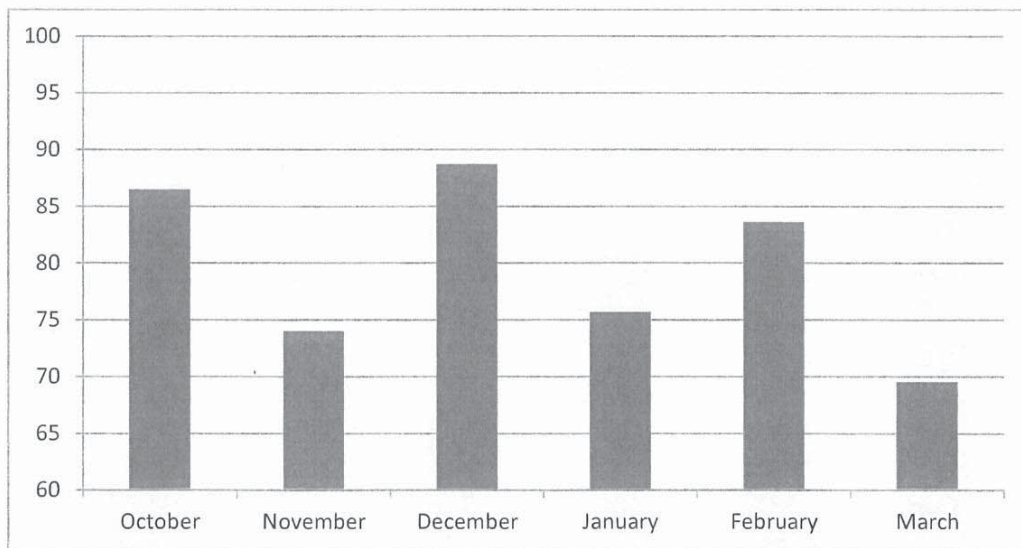
Cairns

Alternate Minimum	6000m	1400ft
Landing Minimum	4100m	720ft

Month	October	November	December	January	February	March	10 Year Avg
				2014			
FSI (1-4hrs)%	0.37	0.29	0.5	0.18	0.1	0.08	
Vis <1000 POD (1-6hrs)%	0	0	0	0	0	0	**0**
Vis <1000 FAR (1-6hrs)%	0	0	0	0	0	0	**100**
Vis <1000 HRS (1-6hrs)	0	0	0	0	0	0	**0.2**
Forecast FG Hours (1-6hrs)	0	0	0	0	0	0	**14**
TS POD (1-6hrs)%	0	67.1	0	63.6	100	100	**60.7**
TS FAR (1-6hrs)%	0	97	100	84.5	94.9	96.6	**93.6**
TS HRS (1-6hrs)	2	4	0	3.67	4	1	**435.9**
Forecast TS Hours (1-6hrs)	0	87	6	15	78	29	**4152**
%Operationally correct (1-6hrs only)	92.49	70.04	87.84	71.97	53.66	67.6	**71.71**
% Failed detections (1-6hrs)	0.66	0.18	0.16	0.1	0.26	0.19	**0.35**
% False Alarms (1-6hrs)	6.86	29.78	12	27.93	46.08	32.21	**27.94**
Hours Below (1-6hrs)	8.53	11.1	3.67	27.9	57.1	34.8	**4002.6**

Comment: Active monsoon trough in Cairns area for much of February and March triggering high false alarms.

### Operationally Correct% - Long term average 71.71%
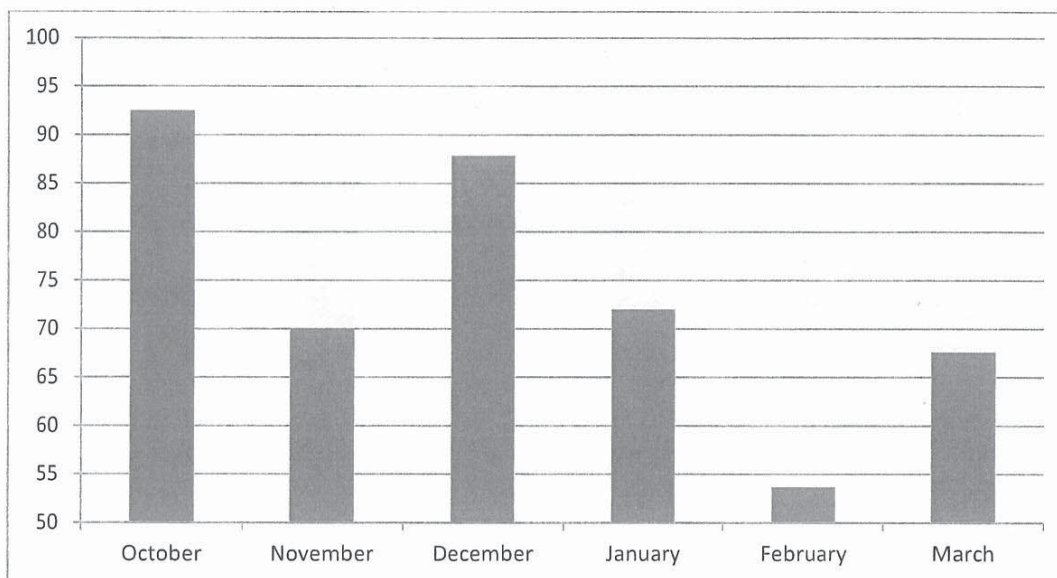
Canberra

Alternate Minimum	6000m	2194ft
Landing Minimum	1700m	570ft

	October	November	December	January	February	March	10 Year Avg
				2014			
Month							
FSI (1-4hrs)%	0	0.21	1.12	0	0.57	1.28	
Vis <1000 POD (1-6hrs)%	100	0	0	0	0	70.7	**84**
Vis <1000 FAR (1-6hrs)%	90	0	0	0	0	69.2	**80.2**
Vis <1000 HRS (1-6hrs)	1.57	0.4	0	0	0	16.1	**1279.8**
Forecast FG Hours (1-6hrs)	16	7	0	0	0	37	**5441**
TS POD (1-6hrs)%	0	76.5	89.6	82	87.7	95.1	**76**
TS FAR (1-6hrs)%	100	95.9	89.8	89.6	93.6	88	**92.8**
TS HRS (1-6hrs)	0	5.47	7.22	3.05	2.57	16.7	**506.5**
Forecast TS Hours (1-6hrs)	61	103	71	24	35	132	**5347**
Operationally correct (1-6hrs only)%	86.65	75.3	80.25	85.23	76.32	61.6	**75.72**
Failed detections (1-6hrs)%	0.67	0.56	0.76	0.51	3.32	1.92	**1.93**
False Alarms (1-6hrs)%	12.67	23.15	18.98	14.26	20.35	36.48	**22.35**
Hours Below (1-6hrs)	24.5	29.2	84.4	24.4	129.9	175.3	**13076.5**

Comment: Thunderstorm (TS) metrics in December and March exceeded the 10 year average. Fog event POD metric is slightly low in March. Combination of fog and thunderstorm metrics contributed to the low operationally correct in March.

**Operationally Correct % - Long term average 79.7%**
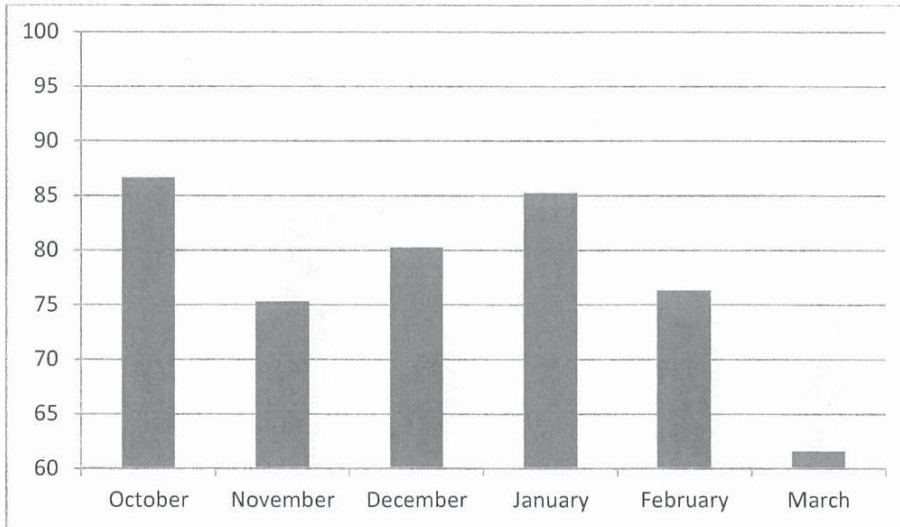
Darwin

Alternate Minimum	4000m	800ft
Landing Minimum	2000m	250ft

				2014			
Month	October	November	December	January	February	March	10 Year Avg
FSI (1-4hrs)%	1.72	0.74	0.75	0.9	0.14	0.99	
Vis <1000 POD (1-6hrs)%	0	0	0	0	0	0	**40.9**
Vis <1000 FAR (1-6hrs)%	0	0	0	0	0	0	**95.2**
Vis <1000 HRS (1-6hrs)	0	0	0	0	0	0	**62.2**
Forecast FG Hours (1-6hrs)	0	0	0	0	0	0	**526**
TS POD (1-6hrs)%	52.5	77.5	65.4	61.6	63.2	57.6	**74**
TS FAR (1-6hrs)%	87.5	93.5	93.8	97.4	96.9	89.4	**95.5**
TS HRS (1-6hrs)	32.6	27.6	24.7	13.4	12.1	27.3	**1201.5**
Forecast TS Hours (1-6hrs)	137	338	258	312	245	148	**19801**
Operationally correct (1-6hrs only)%	86.46	66.8	67.23	51.49	63.29	82.59	**79.7**
Failed detections (1-6hrs)%	1.68	0.49	0.8	1.21	0.24	1.32	**0.48**
False Alarms (1-6hrs)%	11.86	32.71	31.97	47.29	36.46	16.09	**19.81**
Hours Below (1-6hrs)	33.2	31.9	30.9	55.9	22.7	28.6	**2203.1**

Comment: Wet season thunderstorm stats discussed with Darwin RFC. The complexity of thunderstorm development at this time of year creates a high degree of variability in the accuracy of the TAF in the first 6 hours.

Operationally Correct % - Long term average 79.7%
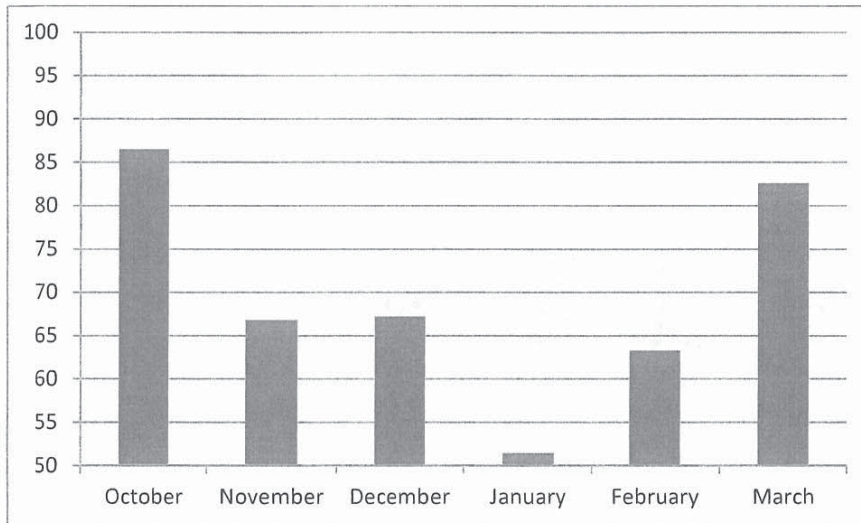
Australian Government
Bureau of Meteorology

TAF Verification

for Major Airports

November 2013 to February 2014

Australian Bureau of Meteorology

Manager

Major Airport Weather Services

Weather and Ocean Services Branch

PO BOX 211 Mascot NSW 1460

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TAF Verification Report for February 2014

These statistics are compiled using the Bureau's AVS(1) verification system. They are compared with statistics for the 10 year average 2002-2012 for the airport. Positive results are highlighted in green in the tables. Anomalies are highlighted in orange and some comments have been made for each aerodrome. The graphs and parameters on each page are calculated as follows:

Forecast Safety Index

This index is designed to represent the actual risk the aircraft has of encountering un-forecast weather, which they are unable to land in (Conditions below the landing minima or thunderstorms observed). This figure is calculated for the first 4 hours of the TAF. The lower the percentage, the less the risk there was for pilots using the TAF for flight planning that month. Figures near or above 1% require some scrutiny though a high index does not necessarily correlate with a decline in forecast performance. The detail is revealed through the fog and thunderstorm figures.

Thunderstorms

POD is the probability of detection % of a TS by the TAF in the first 6 hours of the forecast.

FAR is the false alarm ratio% and is the number of TS hourly misses divided by the total forecast TS hours in the first 6 hours of every TAF for the month. A FAR of 80% means 5 hours of forecast TS for every hour of TS reported. 80% is a very good result. A result of 95% means 20 hours of forecast TS for every reported TS within the TAF range (5nm). High values often occur if there are very low numbers of TS in a month. This figure does not include missed TS by the first 6 hours of the TAF. These results do not include thunderstorms that passed between 5-10nm (VCTS) or TS in the Terminal Area (TMA) beyond. Given the nature of TS it is quite possible to have numerous near misses and score a high FAR even though it was prudent to have TS on the TAF.

TS Hours is the total number of observed TS hours in the month.

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Fog

These fog statistics are based on a reported visibility of <1000m as extracted from AVS(1). They could be distorted by observations of heavy precipitation and smoke. Heavy precipitation that reduces visibility below 1000m in fog seasons across Australia is extremely unlikely. These metrics should be treated with caution October to March.

POD is the probability of detection % of fog by the TAF in the first 6 hours of the forecast.

FAR is the false alarm ratio% and is the number of Fog hourly misses divided by the total forecast Fog hours. A FAR of 80% means 5 hours of forecast Fog for every hour of hit. 80% is a very good result. A result of 95% means 20 hours of forecast Fog for every hour of hit. This figure does not include outright misses by the TAF.

Fog Hours is the total number of observed Fog hours in the month.

Forecast FG Hours is the number of FG hours forecast in the first 6 hours of the TAF over the month.

Alternate Minima

Operationally Correct is the % of time for the month that the first 6 hours of every TAF were forecast above minima and observed above minima plus forecast below minima and observed below minima.

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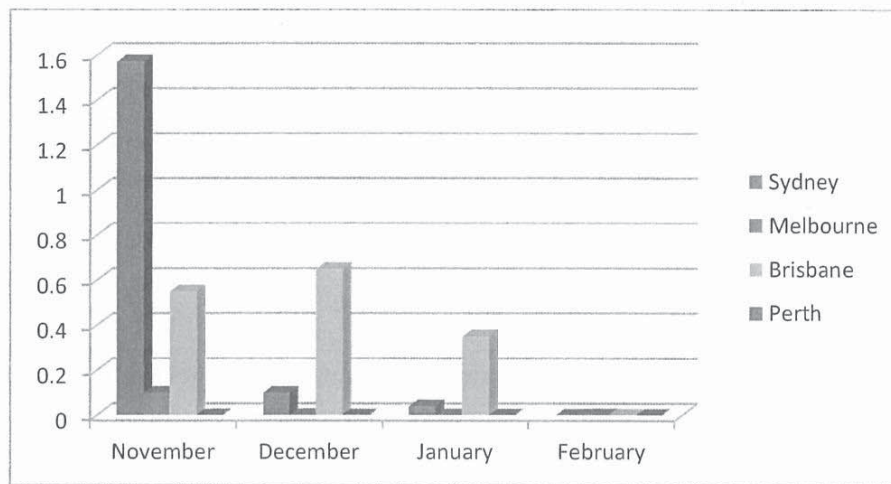
Hours Below are the number of hours observed below the alternate minimum.

Summary of Results

Forecast Safety Index

% of Unsafe forecasts

November	December	January	February
1.57	0.1	0.04	0
0.1	0	0	0
0.55	0.65	0.35	0
0	0	0	0

There was an exceptionally benign February at all major airports. All below landing minima events were covered by the TAF at all airports.

Forecast Safety Index by Major Airport

The following spikes above 1% are shown:

Sydney (November) late forecast TS on two occasions. Responses to industry concerns addressed through AMIRs.
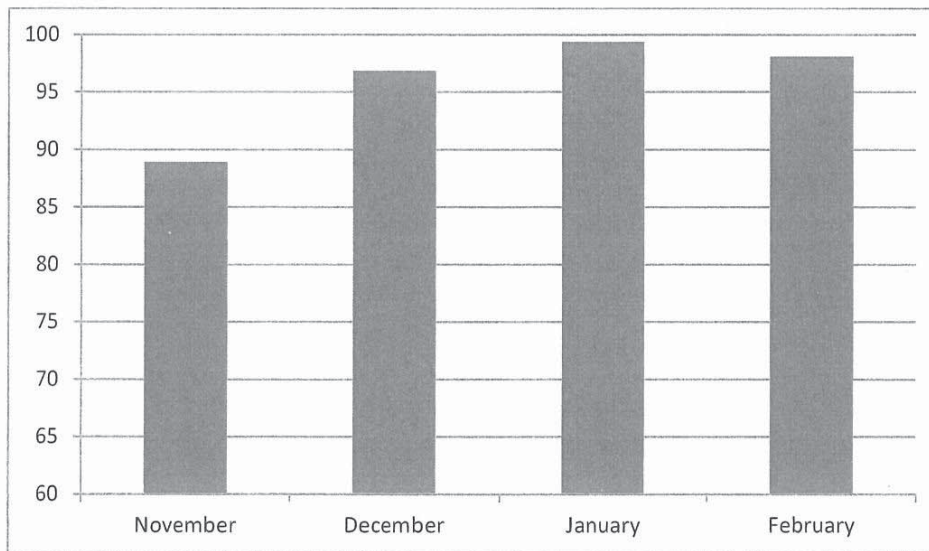
SYDNEY

Alternate Minimum	2500m	700ft
Landing Minimum	2000m	250ft

Month	November	December	January	February	2014 10 Year Avg
FSI (1-4hrs) %	1.57	0.1	0.04	0	
Vis <1000 POD (1-6hrs)%	0	0	0	0	**71.5**
Vis <1000 FAR (1-6hrs)%	0	0	0	0	**89.7**
Vis <1000 HRS (1-6hrs)	0	0	0	0	**123.6**
Forecast FG Hours (1-6hrs)	0	0	0	0	**855**
TS POD (1-6hrs)%	51.1	50	0	66.7	**61.6**
TS FAR (1-6hrs)%	82.5	98.1	100	92.9	**93**
TS HRS (1-6hrs)	19.9	1	0.18	1.5	**425.4**
Forecast TS Hours (1-6hrs)	77	26	3	14	**3765**
Operationally correct (1-6hrs only) %	88.9	96.83	99.36	98.08	**94.76**
Failed detections (1-6hrs) %	1.98	0.19	0.25	0.28	**0.57**
False Alarms (1-6hrs) %	9.12	2.98	0.39	1.63	**4.67**
Hours Below (1-6hrs)	30.1	2.5	1.95	4.63	**1095.7**

Comment: Thunderstorm forecasts in November were subject to AMIR investigations and lessons learned will be incorporated into forecaster notes. There was a prolonged TS event on 15 November.
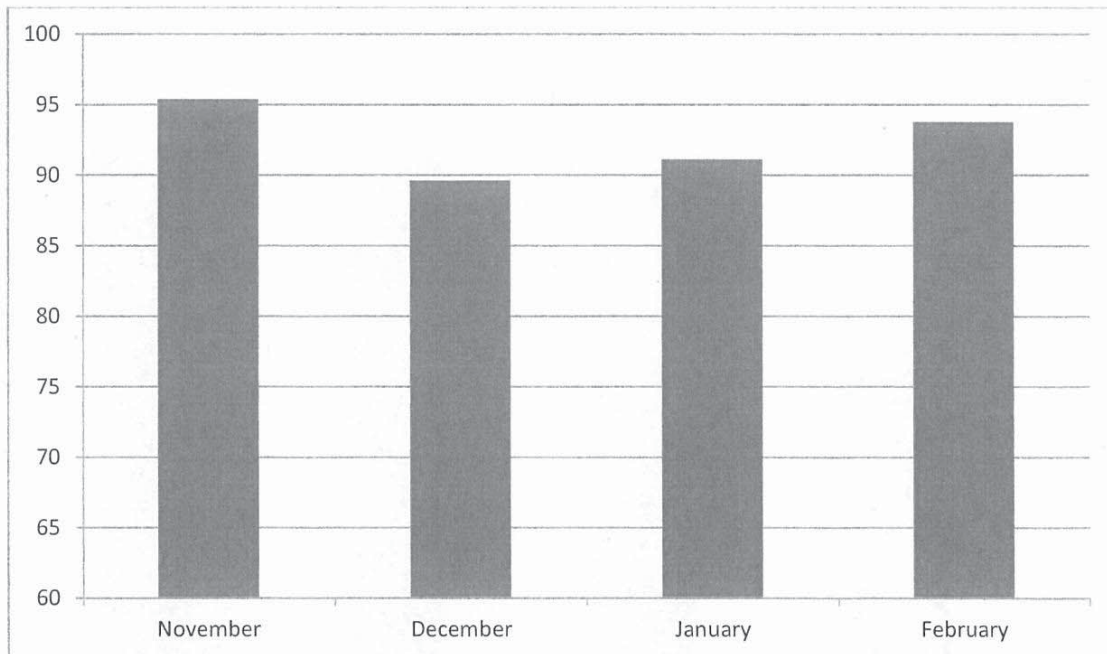
Operationally Correct %

Melbourne

Alternate Minimum	2500m	700ft
Landing Minimum	800m	210ft

Month	November	December	January	February	10 Year Avg
FSI (1-4hrs)%	0.1	0	0	0	
Vis <1000 POD (1-6hrs) %	0	0	100	0	**78.1**
Vis <1000 FAR (1-6hrs) %	100	0	98.2	100	**88.1**
Vis <1000 HRS (1-6hrs)	0.52	0	0.25	0	**300.6**
Forecast FG Hours (1-6hrs)	7	0	14	4	**1966**
TS POD (1-6hrs) %	100	100	100	100	**77.04**
TS FAR (1-6hrs) %	95	99.2	99.1	97.3	**95.9**
TS HRS (1-6hrs)	0.33	0.47	0.38	0.32	**205.9**
Forecast TS Hours (1-6hrs)	6	57	46	12	**3868**
Operationally correct (1-6hrs only) %	95.39	89.59	91.11	93.77	**90.05**
Failed detections (1-6hrs) %	0.12	0.47	0	0.08	**0.49**
False Alarms (1-6hrs) %	4.49	9.93	8.89	6.15	**9.46**
Hours Below (1-6hrs)	10.7	8.43	5.38	3.73	**2636.2**

Comment: TS false alarms slightly high in December though not significantly so.
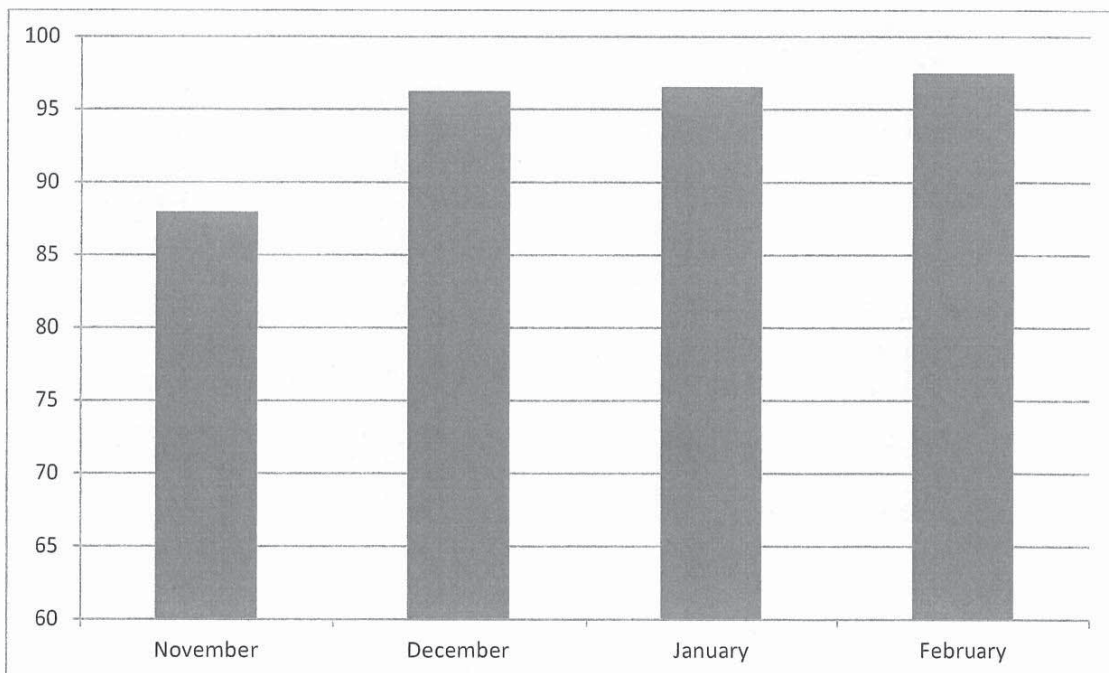
Operationally Correct%

Brisbane

Alternate Minimum	2500m	700ft
Landing Minimum	800m	220ft

Month	November	December	January	2014 February	10 Year Avg
FSI (1-4hrs)%	0.55	0.65	0.35	0	
Vis <1000 POD (1-6hrs) %	0	0	0	0	**67**
Vis <1000 FAR (1-6hrs) %	0	0	0	0	**86.6**
Vis <1000 HRS (1-6hrs)	0	0	0	0	**142.8**
Forecast FG Hours (1-6hrs)	0	0	0	0	**714**
TS POD (1-6hrs) %	91.2	55.1	88.6	100	**67.77**
TS FAR (1-6hrs) %	77.9	81.2	68.4	91.7	**90.6**
TS HRS (1-6hrs)	38.8	13.3	17.5	2	**455.8**
Forecast TS Hours (1-6hrs)	160	39	49	24	**3272**
Operationally correct (1-6hrs only) %	87.97	96.23	96.53	97.49	**94.68**
Failed detections (1-6hrs) %	0.36	0.65	0.23	0	**0.53**
False Alarms (1-6hrs) %	11.67	3.12	3.23	2.51	**4.79**
Hours Below (1-6hrs)	38.8	13.3	19.6	2.87	**1310.8**

Comment: Whilst below the operationally correct long term average in November, Brisbane forecasters handled a very high number of thunderstorm events extremely well scoring well above the long term POD and well below the long term FAR.

Operationally Correct%

Perth

Alternate Minimum	2500m	700ft
Landing Minimum	1500m	250ft

Month	November	December	January	February 2014	10 Year Avg
FSI (1-4hrs)%	0	0	0	0	
Vis <1000 POD (1-6hrs)%	0	0	0	0	**82.3**
Vis <1000 FAR (1-6hrs)%	0	0	0	0	**95.3**
Vis <1000 HRS (1-6hrs)	0	0	0	0	**216.7**
Forecast FG Hours (1-6hrs)	0	0	0	0	**3760**
TS POD (1-6hrs)%	0	100	0	0	**79.8**
TS FAR (1-6hrs)%	100	95.2	100	100	**96.4**
TS HRS (1-6hrs)	0	0.63	0	0	**255.4**
Forecast TS Hours (1-6hrs)	33	13	14	27	**5658**
Operationally correct (1-6hrs only)%	94.81	98.73	98.43	96.48	**89.34**
Failed detections (1-6hrs)%	0	0	0	0	**0.26**
False Alarms (1-6hrs)%	5.19	1.27	1.57	3.52	**10.4**
Hours Below (1-6hrs)	0	0.63	0	0	**1051.9**

Operationally Correct%
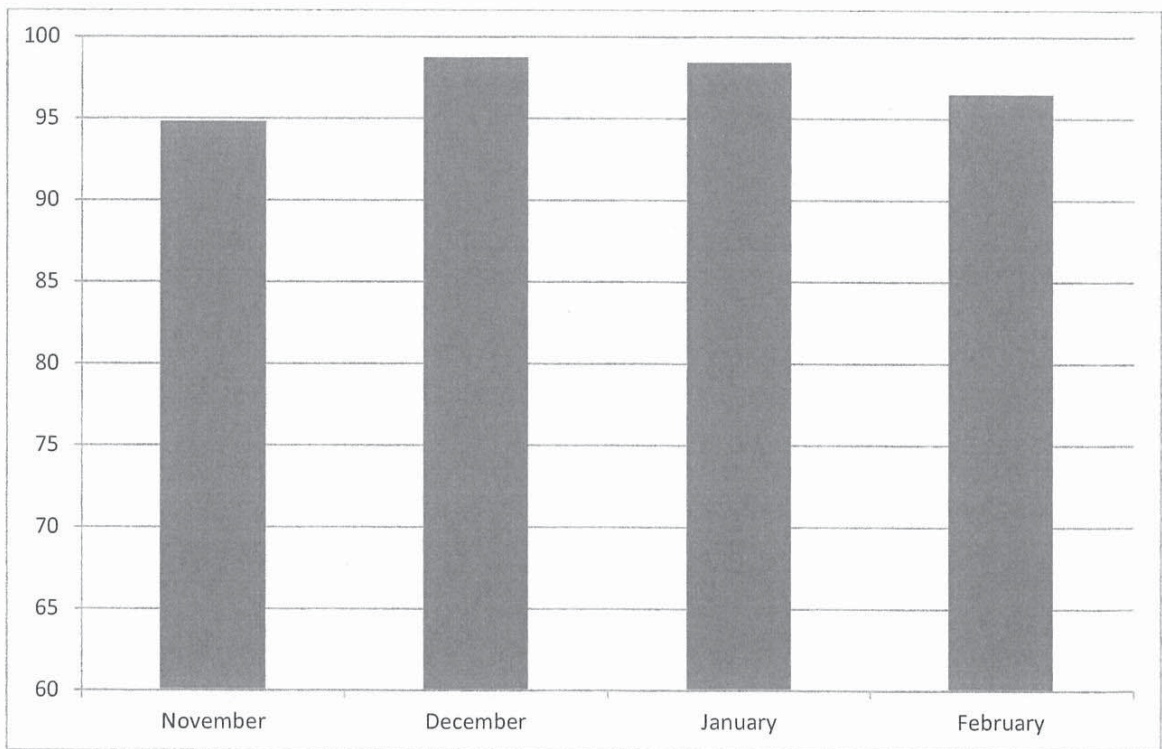
Australian Government
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TAF Verification

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December 2013 to March 2014

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Forecast Safety Index

This index is designed to represent the actual risk the aircraft has of encountering un-forecast weather, which they are unable to land in (Conditions below the landing minima or thunderstorms observed). This figure is calculated for the first 4 hours of the TAF. The lower the percentage, the less the risk there was for pilots using the TAF for flight planning that month. Figures near or above 1% require some scrutiny though a high index does not necessarily correlate with a decline in forecast performance. The detail is revealed through the fog and thunderstorm figures.

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Operationally Correct is the % of time for the month that the first 6 hours of every TAF were forecast above minima and observed above minima plus forecast below minima and observed below minima.

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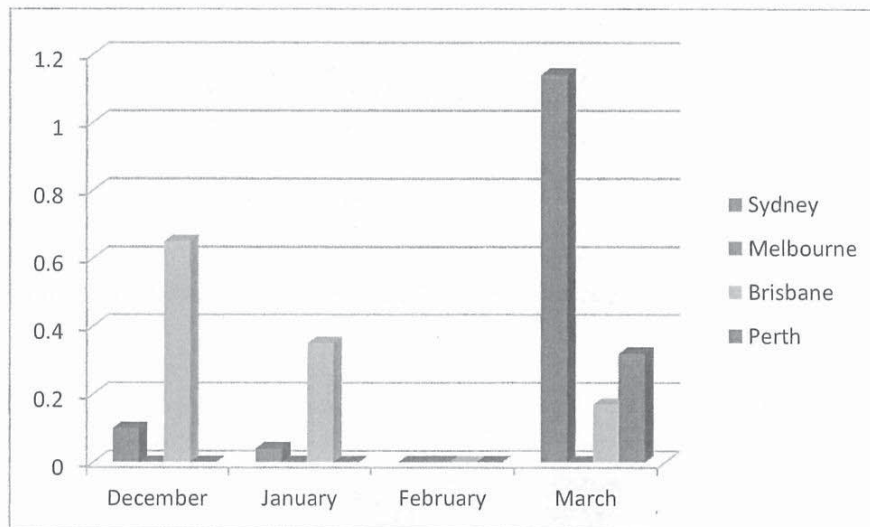
Hours Below are the number of hours observed below the alternate minimum.

Summary of Results

Forecast Safety Index

% of Unsafe forecasts

	December	January	February	March
Sydney	0.1	0.04	0	1.14
Melbourne	0	0	0	0
Brisbane	0.65	0.35	0	0.17
Perth	0	0	0	0.32

There was increased thunderstorm activity (18.3hrs) in Sydney in March. Relatively benign weather at the other airports.

Forecast Safety Index by Major Airport

The following spikes above 1% are shown:

Sydney (March) late forecast TS. No AMIRs raised and TAF AMDS issued appropriately. The Sydney Airport Met Unit will be discussing the late forecast events at an internal workshop. Further examination of TS forecasting processes will be conducted over the next 6 months.
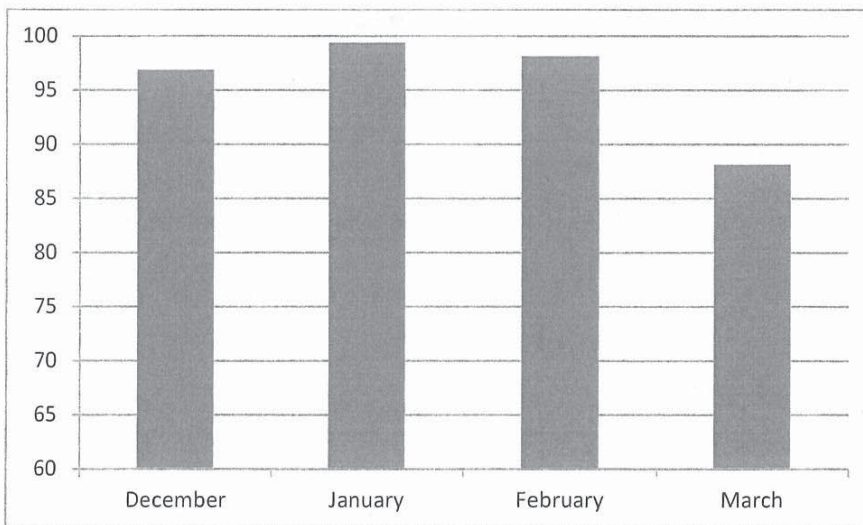
SYDNEY

Alternate Minimum	2500m	700ft
Landing Minimum	2000m	250ft

Month	December	January	February	March	10 Year Avg
FSI (1-4hrs) %	0.1	0.04	0	1.14	
Vis <1000 POD (1-6hrs)%	0	0	0	0	**71.5**
Vis <1000 FAR (1-6hrs)%	0	0	0	0	**89.7**
Vis <1000 HRS (1-6hrs)	0	0	0	0	**123.6**
Forecast FG Hours (1-6hrs)	0	0	0	0	**855**
TS POD (1-6hrs)%	50	0	66.7	43.7	**61.6**
TS FAR (1-6hrs)%	98.1	100	92.9	92	**93**
TS HRS (1-6hrs)	1	0.18	1.5	18.3	**425.4**
Forecast TS Hours (1-6hrs)	26	3	14	100	**3765**
Operationally correct (1-6hrs only) %	96.83	99.36	98.08	88.12	**94.76**
Failed detections (1-6hrs) %	0.19	0.25	0.28	1.37	**0.57**
False Alarms (1-6hrs) %	2.98	0.39	1.63	10.51	**4.67**
Hours Below (1-6hrs)	2.5	1.95	4.63	19.5	**1095.7**

Comment: Thunderstorm forecasts in March will be reviewed at a workshop with the Sydney Airport Met Unit.
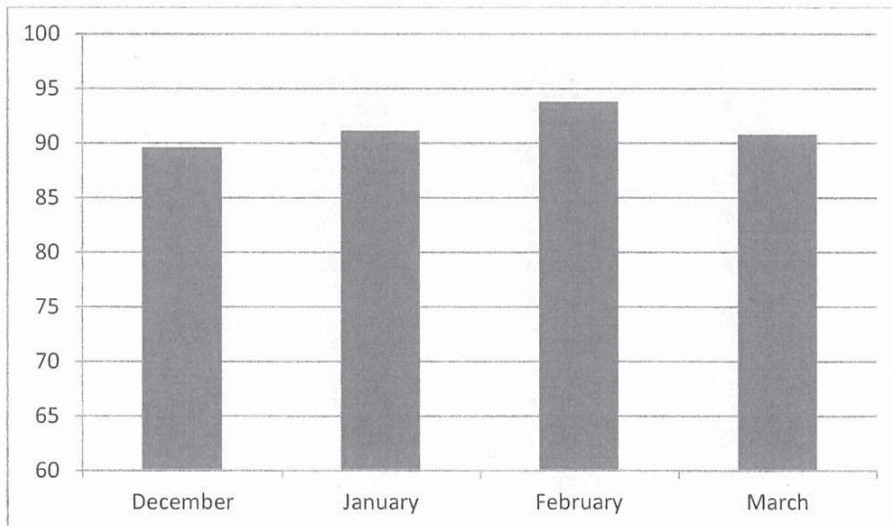
Operationally Correct %

Melbourne

Alternate Minimum	2500m	700ft
Landing Minimum	800m	210ft

Month	December	January	February	March	10 Year Avg
FSI (1-4hrs)%	0	0	0	0	
Vis <1000 POD (1-6hrs) %	0	100	0	0	**78.1**
Vis <1000 FAR (1-6hrs) %	0	98.2	100	100	**88.1**
Vis <1000 HRS (1-6hrs)	0	0.25	0	0	**300.6**
Forecast FG Hours (1-6hrs)	0	14	4	9	**1966**
TS POD (1-6hrs) %	100	100	100	100	**77.04**
TS FAR (1-6hrs) %	99.2	99.1	97.3	97	**95.9**
TS HRS (1-6hrs)	0.47	0.38	0.32	0.97	**205.9**
Forecast TS Hours (1-6hrs)	57	46	12	32	**3868**
Operationally correct (1-6hrs only) %	89.59	91.11	93.77	90.77	**90.05**
Failed detections (1-6hrs) %	0.47	0	0.08	0.22	**0.49**
False Alarms (1-6hrs) %	9.93	8.89	6.15	9.02	**9.46**
Hours Below (1-6hrs)	8.43	5.38	3.73	15.5	**2636.2**

Comment: TS false alarms slightly high in December though not significantly so.

Operationally Correct%

Brisbane

Alternate Minimum	2500m	700ft
Landing Minimum	800m	220ft

Month	December	January	February	March	10 Year Avg
FSI (1-4hrs)%	0.65	0.35	0	0.17	
Vis <1000 POD (1-6hrs) %	0	0	0	0	**67**
Vis <1000 FAR (1-6hrs) %	0	0	0	100	**86.6**
Vis <1000 HRS (1-6hrs)	0	0	0	0	**142.8**
Forecast FG Hours (1-6hrs)	0	0	0	9	**714**
TS POD (1-6hrs) %	55.1	88.6	100	55.9	**67.77**
TS FAR (1-6hrs) %	81.2	68.4	91.7	94	**90.6**
TS HRS (1-6hrs)	13.3	17.5	2	2.27	**455.8**
Forecast TS Hours (1-6hrs)	39	49	24	21	**3272**
Operationally correct (1-6hrs only) %	96.23	96.53	97.49	95.04	**94.68**
Failed detections (1-6hrs) %	0.65	0.23	0	0.67	**0.53**
False Alarms (1-6hrs) %	3.12	3.23	2.51	4.3	**4.79**
Hours Below (1-6hrs)	13.3	19.6	2.87	9.8	**1310.8**

Comment: Exceeded long term operationally correct throughout. Good TS Forecast performance in January.

Operationally Correct%
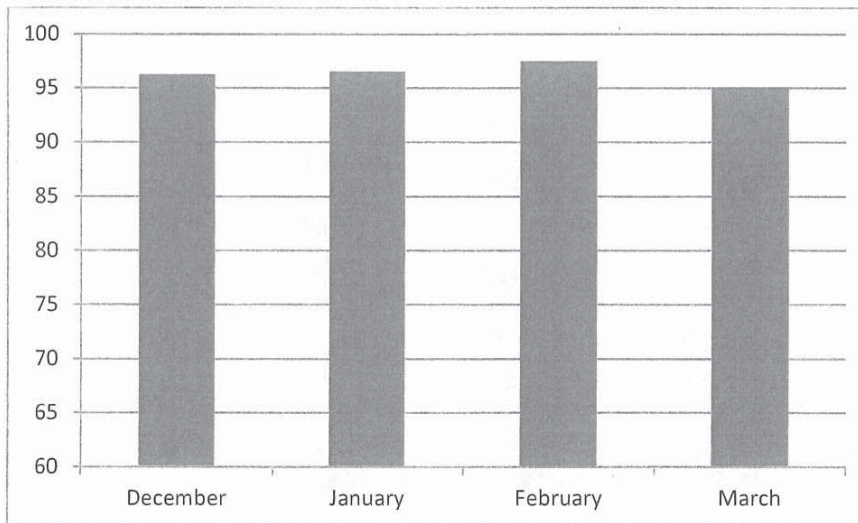
Perth

Alternate Minimum   2500m   700ft
Landing Minimum   1500m   250ft

Month	December	January	February	March	10 Year Avg
FSI (1-4hrs)%	0	0	0	0.32	
Vis <1000 POD (1-6hrs)%	0	0	0	0	**82.3**
Vis <1000 FAR (1-6hrs)%	0	0	0	100	**95.3**
Vis <1000 HRS (1-6hrs)	0	0	0	0	**216.7**
Forecast FG Hours (1-6hrs)	0	0	0	25	**3760**
TS POD (1-6hrs)%	100	0	0	0	**79.8**
TS FAR (1-6hrs)%	95.2	100	100	100	**96.4**
TS HRS (1-6hrs)	0.63	0	0	2	**255.4**
Forecast TS Hours (1-6hrs)	13	14	27	82	**5658**
Operationally correct (1-6hrs only)%	98.73	98.43	96.48	87.88	**89.34**
Failed detections (1-6hrs)%	0	0	0	0.25	**0.26**
False Alarms (1-6hrs)%	1.27	1.57	3.52	11.87	**10.4**
Hours Below (1-6hrs)	0.63	0	0	2.33	**1051.9**

Comment: Slightly high false alarms in March though not statistically significant.

Operationally Correct%
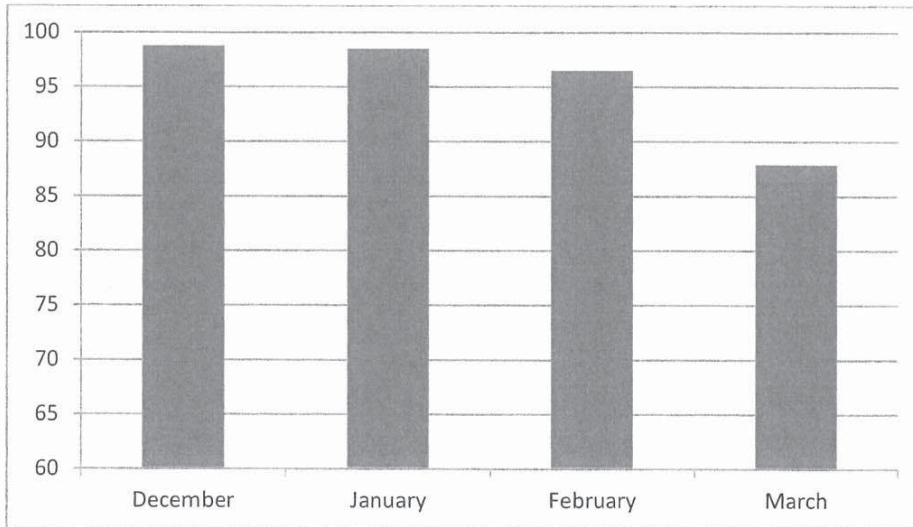
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Operationally Correct is the % of time for the month that the first 6 hours of every TAF were forecast above minima and observed above minima plus forecast below minima and observed below minima.

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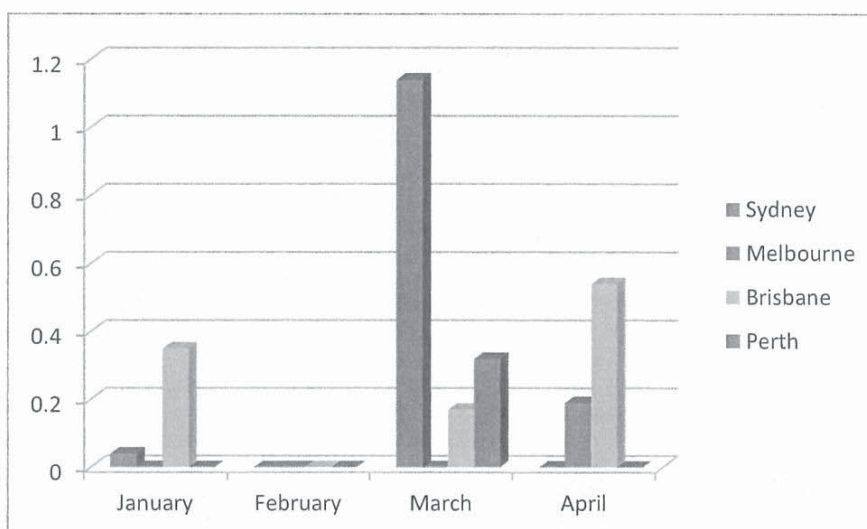
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Summary of Results

Forecast Safety Index

% of Unsafe forecasts

	January	February	March	April
Sydney	0.04	0	1.14	0
Melbourne	0	0	0	0.19
Brisbane	0.35	0	0.17	0.54
Perth	0	0	0.32	0

There was increased thunderstorm activity (18.3hrs) in Sydney in March.

Forecast Safety Index by Major Airport

The following spikes above 1% are shown:

Sydney (March) late forecast TS. No AMIRs raised and TAF AMDS issued appropriately. The Sydney Airport Met Unit have discussed the late forecast events at an internal workshop. Further examination of TS forecasting processes will be conducted over the next 6 months.
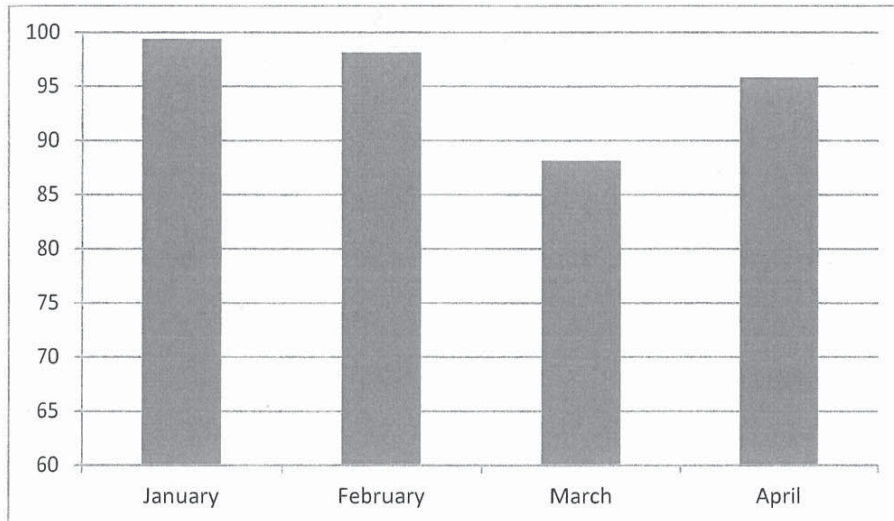
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Month	January	February	March	April	10 Year Avg
FSI (1-4hrs) %	0.04	0	1.14	0	
Vis <1000 POD (1-6hrs)%	0	0	0	0	**71.5**
Vis <1000 FAR (1-6hrs)%	0	0	0	100	**89.7**
Vis <1000 HRS (1-6hrs)	0	0	0	0	**123.6**
Forecast FG Hours (1-6hrs)	0	0	0	14	**855**
TS POD (1-6hrs)%	0	66.7	43.7	0	**61.6**
TS FAR (1-6hrs)%	100	92.9	92	100	**93**
TS HRS (1-6hrs)	0.18	1.5	18.3	0.65	**425.4**
Forecast TS Hours (1-6hrs)	3	14	100	17	**3765**
Operationally correct (1-6hrs only) %	99.36	98.08	88.12	95.81	**94.76**
Failed detections (1-6hrs) %	0.25	0.28	1.37	0.09	**0.57**
False Alarms (1-6hrs) %	0.39	1.63	10.51	4.11	**4.67**
Hours Below (1-6hrs)	1.95	4.63	19.5	0.65	**1095.7**

Comment: Thunderstorm forecasts in March reviewed at a workshop with the Sydney Airport Met Unit.
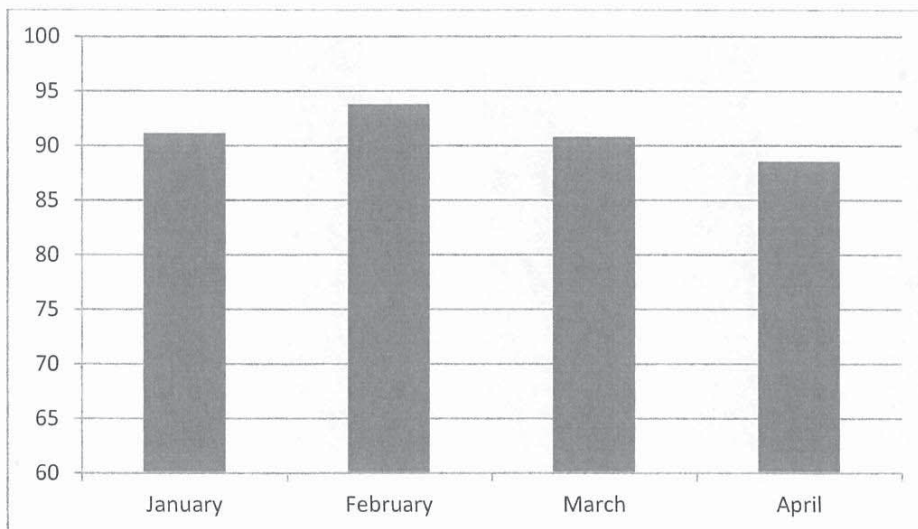
Operationally Correct %

Melbourne

Alternate Minimum	2500m	700ft
Landing Minimum	800m	210ft

Month	January	February	March	April	10 Year Avg
FSI (1-4hrs)%	0	0	0	0.19	
Vis <1000 POD (1-6hrs) %	100	0	0	0	**78.1**
Vis <1000 FAR (1-6hrs) %	98.2	100	100	100	**88.1**
Vis <1000 HRS (1-6hrs)	0.25	0	0	0	**300.6**
Forecast FG Hours (1-6hrs)	14	4	9	39	**1966**
TS POD (1-6hrs) %	100	100	100	0	**77.04**
TS FAR (1-6hrs) %	99.1	97.3	97	0	**95.9**
TS HRS (1-6hrs)	0.38	0.32	0.97	0	**205.9**
Forecast TS Hours (1-6hrs)	46	12	32	0	**3868**
Operationally correct (1-6hrs only) %	91.11	93.77	90.77	88.55	**90.05**
Failed detections (1-6hrs) %	0	0.08	0.22	1.75	**0.49**
False Alarms (1-6hrs) %	8.89	6.15	9.02	9.7	**9.46**
Hours Below (1-6hrs)	5.38	3.73	15.5	52.3	**2636.2**

Comment: High number of hours below alternate minimum in April.
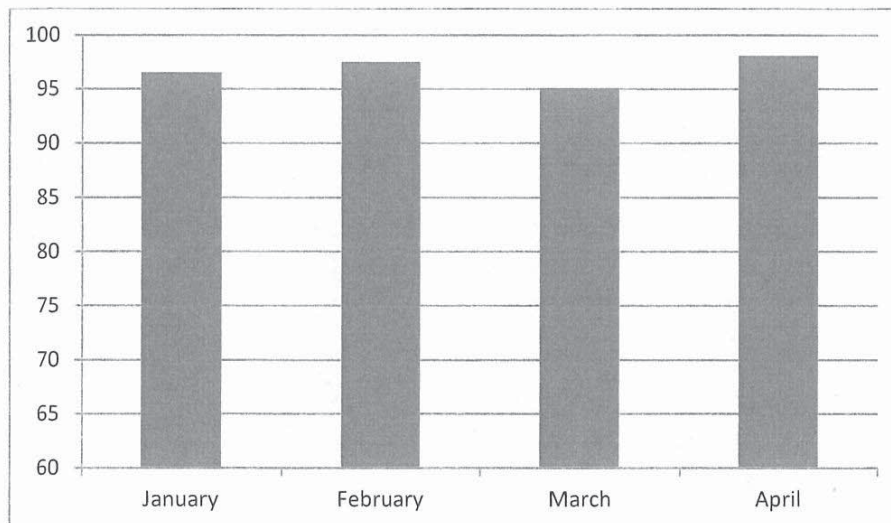
Operationally Correct%

Brisbane

Alternate Minimum	2500m	700ft
Landing Minimum	800m	220ft

Month	January	February	March	April	10 Year Avg
FSI (1-4hrs)%	0.35	0	0.17	0.54	
Vis <1000 POD (1-6hrs) %	0	0	0	0	67
Vis <1000 FAR (1-6hrs) %	0	0	100	0	86.6
Vis <1000 HRS (1-6hrs)	0	0	0	0	142.8
Forecast FG Hours (1-6hrs)	0	0	9	0	714
TS POD (1-6hrs) %	88.6	100	55.9	0	67.77
TS FAR (1-6hrs) %	68.4	91.7	94	100	90.6
TS HRS (1-6hrs)	17.5	2	2.27	2.9	455.8
Forecast TS Hours (1-6hrs)	49	24	21	12	3272
Operationally correct (1-6hrs only) %	96.53	97.49	95.04	98.06	94.68
Failed detections (1-6hrs) %	0.23	0	0.67	0.38	0.53
False Alarms (1-6hrs) %	3.23	2.51	4.3	1.56	4.79
Hours Below (1-6hrs)	19.6	2.87	9.8	2.9	1310.8

Comment: Exceeded long term operationally correct throughout. Good TS Forecast performance in January.

Operationally Correct%

Perth

Alternate Minimum	2500m	700ft
Landing Minimum	1500m	250ft

Month	January	February	March	April	10 Year Avg
FSI (1-4hrs)%	0	0	0.32	0	
Vis <1000 POD (1-6hrs)%	0	0	0	0	82.3
Vis <1000 FAR (1-6hrs)%	0	0	100	100	95.3
Vis <1000 HRS (1-6hrs)	0	0	0	0	216.7
Forecast FG Hours (1-6hrs)	0	0	25	31	3760
TS POD (1-6hrs)%	0	0	0	0	79.8
TS FAR (1-6hrs)%	100	100	100	100	96.4
TS HRS (1-6hrs)	0	0	2	0	255.4
Forecast TS Hours (1-6hrs)	14	27	82	8	5658
Operationally correct (1-6hrs only)%	98.43	96.48	87.88	94.4	89.34
Failed detections (1-6hrs)%	0	0	0.25	0.41	0.26
False Alarms (1-6hrs)%	1.57	3.52	11.87	5.19	10.4
Hours Below (1-6hrs)	0	0	2.33	7.33	1051.9

Comment: Slightly high false alarms in March though not statistically significant.

Operationally Correct%
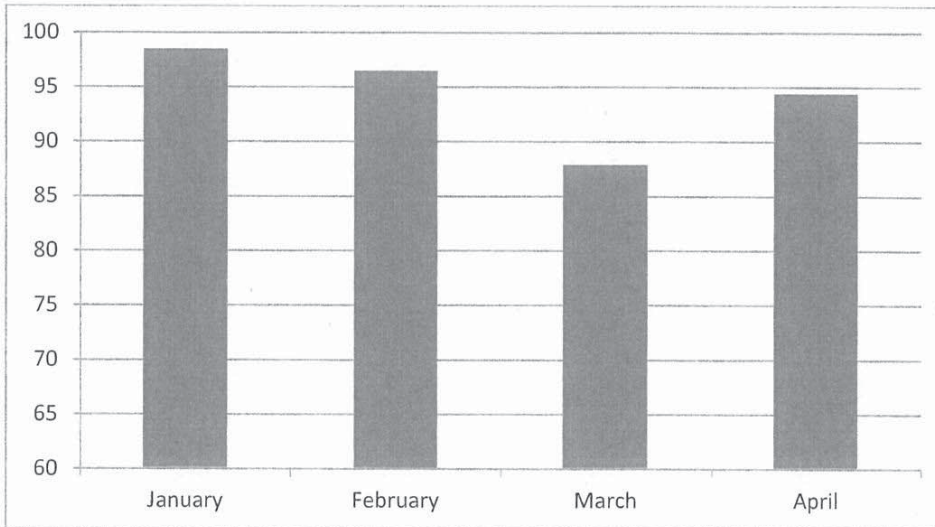
Australian Government
Bureau of Meteorology

TAF Verification

for Major Airports

February to May 2014

Australian Bureau of Meteorology

Manager

Major Airport Weather Services

Weather and Ocean Services Branch

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TAF Verification Report for May 2014

These statistics are compiled using the Bureau's AVS(1) verification system. They are compared with statistics for the 10 year average 2002-2012 for the airport. Positive results are highlighted in green in the tables. Anomalies are highlighted in orange and some comments have been made for each aerodrome. The graphs and parameters on each page are calculated from all TAFs as follows:

Forecast Prediction Accuracy Index

This index is designed to represent the actual risk the aircraft has of encountering un-forecast weather, which they are unable to land in (Conditions below the landing minima or thunderstorms observed). This figure is calculated for the first 4 hours of the TAF. The lower the percentage, the less the risk there was for pilots using the TAF for flight planning that month. Figures near or above 1% require some scrutiny though a high index does not necessarily correlate with a decline in forecast performance. The detail is revealed through the fog and thunderstorm figures.

Thunderstorms

POD is the probability of detection % of a TS by the TAF in the first 6 hours of the forecast.

FAR is the false alarm ratio% and is the number of TS hourly misses divided by the total forecast TS hours in the first 6 hours of every TAF for the month. A FAR of 80% means 5 hours of forecast TS for every hour of TS reported. 80% is a very good result. A result of 95% means 20 hours of forecast TS for every reported TS within the TAF range (5nm). High values often occur if there are very low numbers of TS in a month. This figure does not include missed TS by the first 6 hours of the TAF. These results do not include thunderstorms that passed between 5-10nm (VCTS) or TS in the Terminal Area (TMA) beyond. Given the nature of TS it is quite possible to have numerous near misses and score a high FAR even though it was prudent to have TS on the TAF.

TS Hours is the total number of observed TS hours in the month.

Forecast TS Hours is the number of TS hours forecast in the first 6 hours of the TAF over the month.

Fog

These fog statistics are based on a reported visibility of <1000m as extracted from AVS(1). They could be distorted by observations of heavy precipitation and smoke. Heavy precipitation that reduces visibility below 1000m in fog seasons across Australia is extremely unlikely. These metrics should be treated with caution October to March.

POD is the probability of detection % of fog by the TAF in the first 6 hours of the forecast.

FAR is the false alarm ratio% and is the number of Fog hourly misses divided by the total forecast Fog hours. A FAR of 80% means 5 hours of forecast Fog for every hour of hit. 80% is a very good result. A result of 95% means 20 hours of forecast Fog for every hour of hit. This figure does not include outright misses by the TAF.

Fog Hours is the total number of observed Fog hours in the month.

Forecast FG Hours is the number of FG hours forecast in the first 6 hours of the TAF over the month.

Alternate Minima

Operationally Correct is the % of time for the month that the first 6 hours of every TAF were forecast above minima and observed above minima plus forecast below minima and observed below minima.

Failed detections are the % of time below the alternate minimum when the TAF forecast above minimum in the first 6 hours of every TAF.

False Alarms are the % of time that the TAF forecast below the alternate minimum in the first 6 hours when the observed conditions were above.
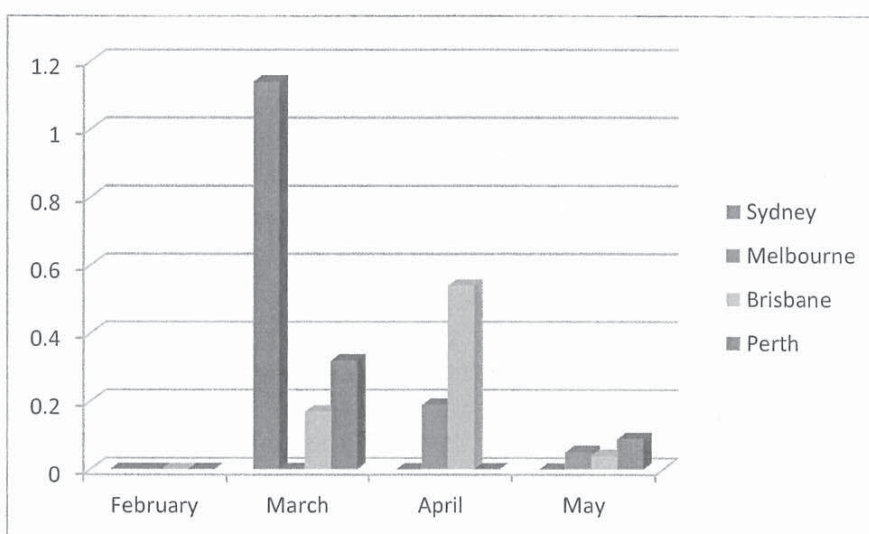
Hours Below are the number of hours observed below the alternate minimum.

Summary of Results

Forecast Prediction Accuracy Index

% of forecasts not meeting this strict criterion

	February	March	April	May
Sydney	0	1.14	0	0
Melbourne	0	0	0.19	0.05
Brisbane	0	0.17	0.54	0.04
Perth	0	0.32	0	0.09

There was increased thunderstorm activity (18.3hrs) in Sydney in March.

Forecast Prediction Accuracy Index by Major Airport

The following spikes above 1% are shown:

Sydney (March) late forecast TS. No AMIRs raised and TAF AMDS issued appropriately. The Sydney Airport Met Unit has discussed the late forecast events at an internal workshop. Further examination of TS forecasting processes will be conducted over the next 6 months.
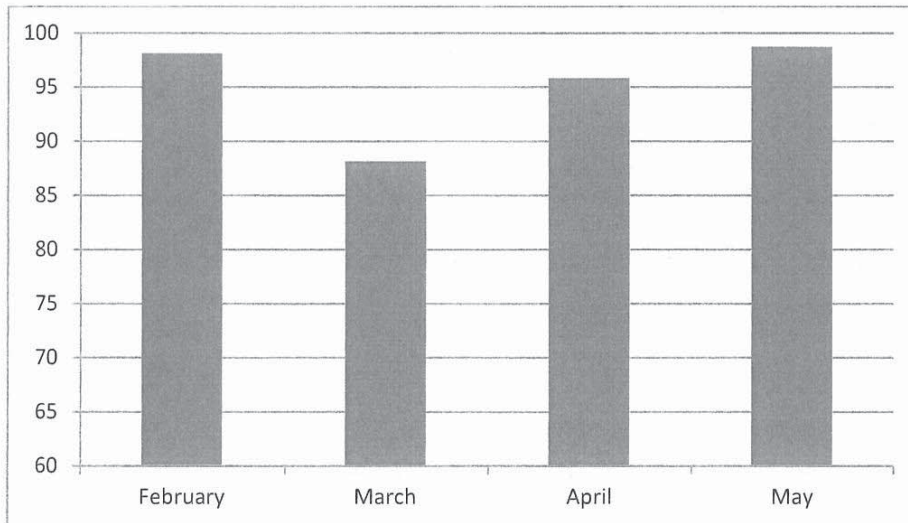
SYDNEY

Alternate Minimum	2500m	700ft
Landing Minimum	2000m	250ft

Month	February	March	April	May	10 Year Avg
FPAI (1-4hrs) %	0	1.14	0	0	
Vis <1000 POD (1-6hrs)%	0	0	0	0	71.5
Vis <1000 FAR (1-6hrs)%	0	0	100	100	89.7
Vis <1000 HRS (1-6hrs)	0	0	0	0	123.6
Forecast FG Hours (1-6hrs)	0	0	14	9	855
TS POD (1-6hrs)%	66.7	43.7	0	0	61.6
TS FAR (1-6hrs)%	92.9	92	100	0	93
TS HRS (1-6hrs)	1.5	18.3	0.65	0	425.4
Forecast TS Hours (1-6hrs)	14	100	17	0	3765
Operationally correct (1-6hrs only) %	98.08	88.12	95.81	98.71	94.76
Failed detections (1-6hrs) %	0.28	1.37	0.09	0.12	0.57
False Alarms (1-6hrs) %	1.63	10.51	4.11	1.17	4.67
Hours Below (1-6hrs)	4.63	19.5	0.65	0.93	1095.7

Comment: Thunderstorm forecasts in March reviewed at a workshop with the Sydney Airport Met Unit.
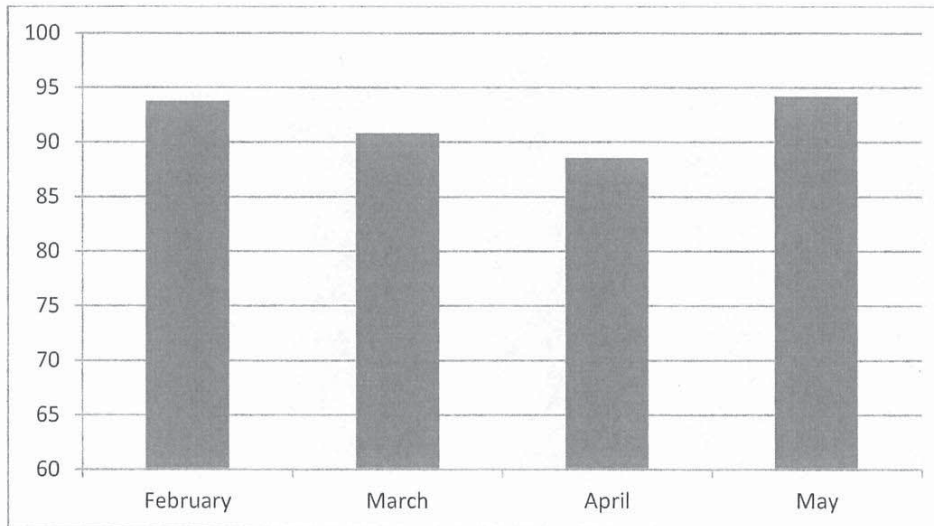
Operationally Correct %

Melbourne

Alternate Minimum	2500m	700ft
Landing Minimum	800m	210ft

Month	February	March	April	May	10 Year Avg
FPAI (1-4hrs)%	0	0	0.19	0.05	
Vis <1000 POD (1-6hrs) %	0	0	0	68.2	**78.1**
Vis <1000 FAR (1-6hrs) %	100	100	100	66.5	**88.1**
Vis <1000 HRS (1-6hrs)	0	0	0	15.7	**300.6**
Forecast FG Hours (1-6hrs)	4	9	39	32	**1966**
TS POD (1-6hrs) %	100	100	0	0	**77.04**
TS FAR (1-6hrs) %	97.3	97	0	100	**95.9**
TS HRS (1-6hrs)	0.32	0.97	0	0	**205.9**
Forecast TS Hours (1-6hrs)	12	32	0	18	**3868**
Operationally correct (1-6hrs only) %	93.77	90.77	88.55	94.18	**90.05**
Failed detections (1-6hrs) %	0.08	0.22	1.75	0.28	**0.49**
False Alarms (1-6hrs) %	6.15	9.02	9.7	5.54	**9.46**
Hours Below (1-6hrs)	3.73	15.5	52.3	18	**2636.2**

Comment: High number of hours below alternate minimum in April. POD for fog slightly low for May.

Operationally Correct%

Brisbane

Alternate Minimum	2500m	700ft
Landing Minimum	800m	220ft

Month	February	March	April	May	2014 10 Year Avg
FPAI (1-4hrs)%	0	0.17	0.54	0.04	
Vis <1000 POD (1-6hrs) %	0	0	0	0	67
Vis <1000 FAR (1-6hrs) %	0	100	0	100	86.6
Vis <1000 HRS (1-6hrs)	0	0	0	0	142.8
Forecast FG Hours (1-6hrs)	0	9	0	1	714
TS POD (1-6hrs) %	100	55.9	0	100	67.77
TS FAR (1-6hrs) %	91.7	94	100	95.5	90.6
TS HRS (1-6hrs)	2	2.27	2.9	1.13	455.8
Forecast TS Hours (1-6hrs)	24	21	12	25	3272
Operationally correct (1-6hrs only) %	97.49	95.04	98.06	96.19	94.68
Failed detections (1-6hrs) %	0	0.67	0.38	0.21	0.53
False Alarms (1-6hrs) %	2.51	4.3	1.56	3.6	4.79
Hours Below (1-6hrs)	2.87	9.8	2.9	3.9	1310.8

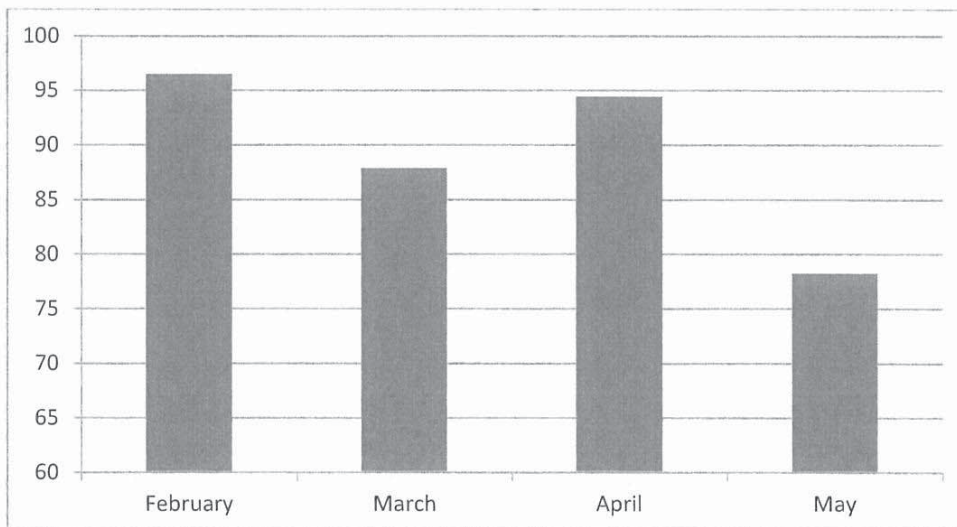Comment: Exceeded long term operationally correct throughout.

Operationally Correct%
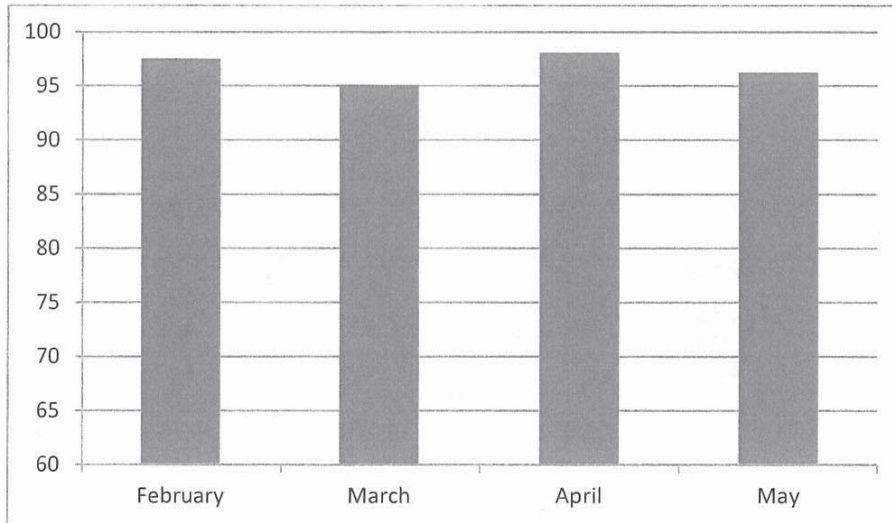
Perth

Alternate Minimum	2500m	700ft
Landing Minimum	1500m	250ft

Month	February	March	April	May	2014 10 Year Avg
FPAI (1-4hrs)%	0	0.32	0	0.09	
Vis <1000 POD (1-6hrs)%	0	0	0	79	**82.3**
Vis <1000 FAR (1-6hrs)%	0	100	100	99	**95.3**
Vis <1000 HRS (1-6hrs)	0	0	0	2.07	**216.7**
Forecast FG Hours (1-6hrs)	0	25	31	161	**3760**
TS POD (1-6hrs)%	0	0	0	0	**79.8**
TS FAR (1-6hrs)%	100	100	100	100	**96.4**
TS HRS (1-6hrs)	0	2	0	0	**255.4**
Forecast TS Hours (1-6hrs)	27	82	8	62	**5658**
Operationally correct (1-6hrs only)%	96.48	87.88	94.4	78.23	**89.34**
Failed detections (1-6hrs)%	0	0.25	0.41	0.63	**0.26**
False Alarms (1-6hrs)%	3.52	11.87	5.19	21.14	**10.4**
Hours Below (1-6hrs)	0	2.33	7.33	11.9	**1051.9**

Comment: Slightly high false alarms in March though not statistically significant. Very high false alarms for both fog and thunderstorms in May.

Operationally Correct%

SUMMARY

Sydney:
- Above Operationally correct long term average in May.
- Forecast Precision Accuracy Index (FPAI) exceeded 1% in March due to late forecast thunderstorms.
- Thunderstorm forecasts in March reviewed at a workshop with the Sydney Airport Met Unit.

Melbourne:
- Above Operationally correct long term average in May.
- POD for fog slightly low in May.
- High number of hours below alternate minimum in April.

Brisbane:
- Above Operationally correct long term average in May.
- Exceeded long term average operationally correct over last 4 months.

Perth:
- Below Operationally correct long term average in May.
- Very high false alarm rates for both fog and thunderstorms in May.