VERIFICATION OF ATMet CATEGORY FORECAST

Office of Aviation Weather Forecasting
Japan Meteorological Agency

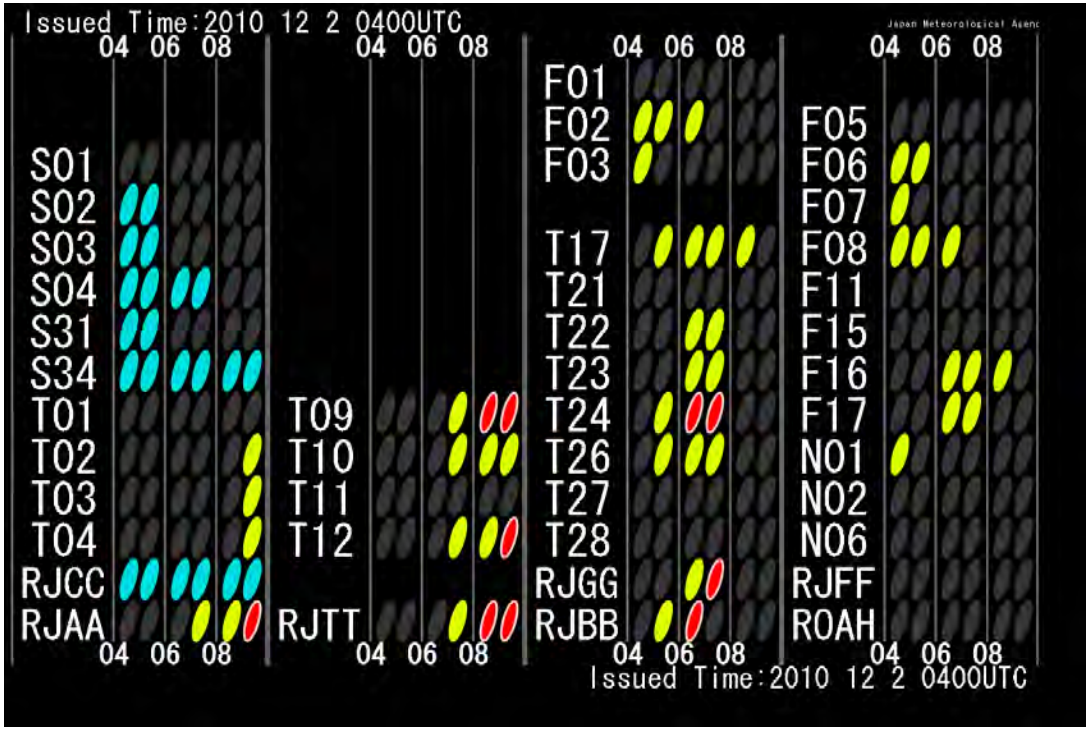
ICAO ASIA/PAC METEOROLOGY/AIR TRAFFIC MANAGEMENT(MET/ATM)SEMINAR
26-28 November 2013, Bangkok, Thailand

CONTENTS

1. What is ATMet category forecast
2. Verification of ATMet category forecast criteria
3. Summary

1.What is ATMet category forecast

・Product for the purpose of supporting ATM
・The trigger for ATM officers to consider when and where to control air traffic flow



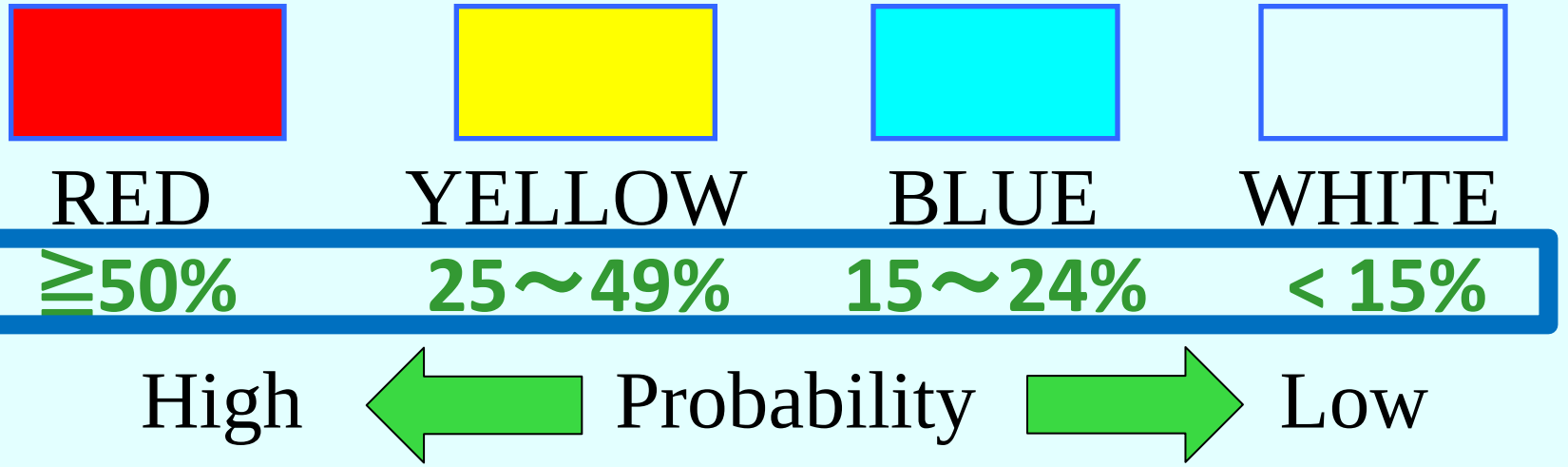
1.What is ATMet category forecast

Specification

Contents :

Probability that weather conditions impact on air traffic flow

The Probability is shown in four ranks

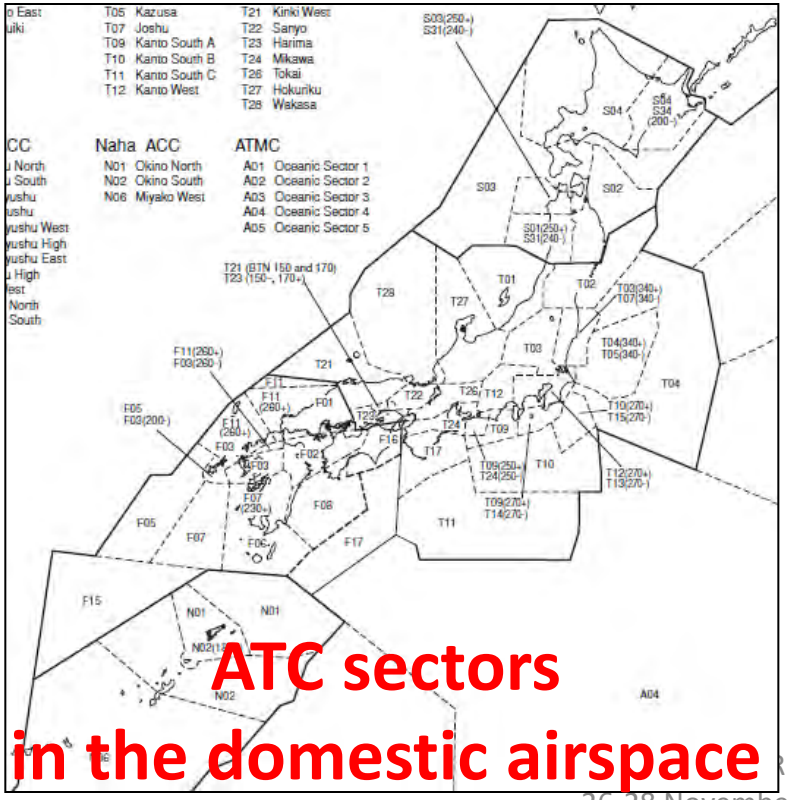


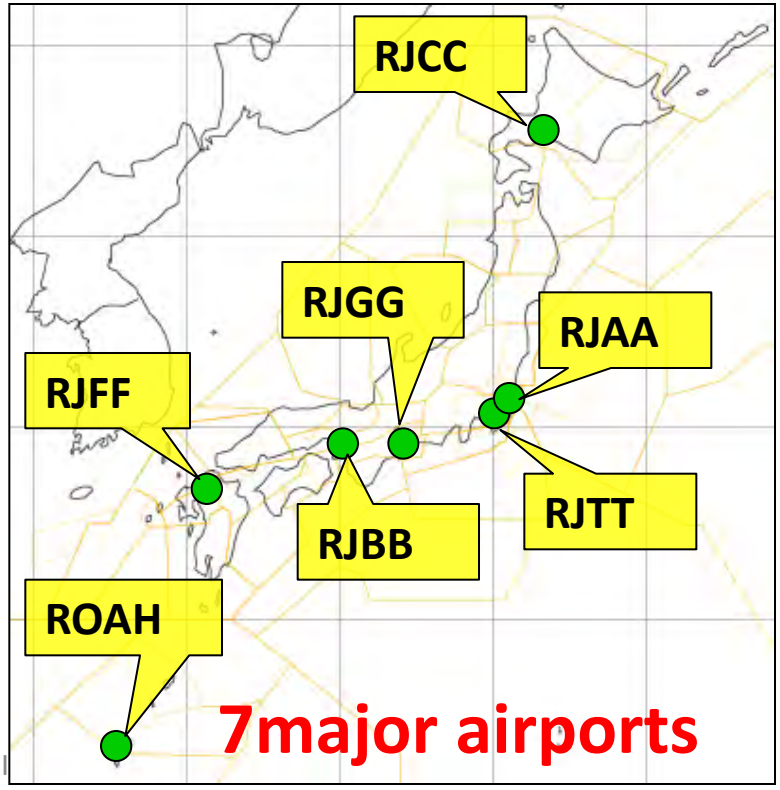
1.What is ATMet category forecast

Specification

Period of validity : 6 hours (hourly)

Target areas : ATC sectors in the domestic airspace and 7 major airports

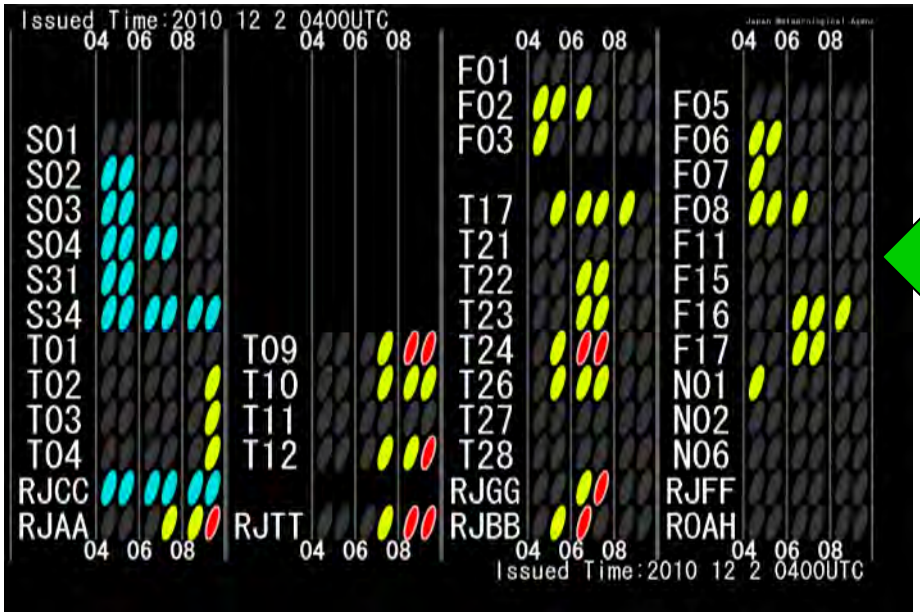




1.What is ATMet category forecast

Specification

FORM : (Table format)



Air Traffic Demand Chart

Similar format to Air Traffic Demand Chart

ATMC officers can understand easily

1.What is ATMet category forecast

Specification

Share information by using one of the large monitors in front of the operations room

ATMet category forecast

1.What is ATMet category forecast

Specification

Set criteria through coordination process between MET and ATM based on

a) investigations on past significant weather cases,

b) aircraft operating manuals and flight operations manuals,

c) information regarding ATM on main airways, important air navigation facilities, the sensitive altitude, etc..

1.What is ATMet category forecast

ATMet category forecast criteria

color code \ target area	RJTT	RJAA	RJGG	RJBB	RJFF	ROAH	RJCC	ATC SECTOR
RED	wind speed ≧ 40kt							the proportion occupied with CB (top ≧ FL300) in the sector ≧ 50
	cross wind component to runway ≧ 30kt							
	cross wind component to runway ≧ 25kt with moderate or heavy precipitaion							
		wind direction 030～060° or 210～240° and gust ≧ 30kt					visibility < 800m with snow	
	visibility < 600m	visibility < 400m					ceiling < 400ft with snow	
	ceiling < 300ft						visibility < 1000 with blowing snow	
	TS OHD							
	snow fall rate ≧ 1cm/1h						snow fall rate ≧ 5cm/3h	
	wind speed at surface ≧ 30kt and wind speed below 5000ft ≧ 60kt	wind speed below 3000ft ≧ 60kt					snow fall rate ≧ 2cm/3h when wind direction 120～240°	
YELLOW	wind speed ≧ 34kt with gust ≧ 50kt							CB exists on selected airway or on selected area
	cross wind component to runway ≧ 25kt							
	cross wind component to runway ≧ 20kt with moderate or heavy precipitation							the proportion occupied with CB (top ≧ FL300) in the sector ≧ 20
		wind direction 030～060° or 210～240° and gust ≧ 25kt						
	TS							
	CB in HANEDA sector	CB in NARITA sector					visibility < 400m	
							visibility < 1600m with snow	
		ceiling < 200ft					ceiling < 600ft with snow	
	moderate or heavy snow							
	wind speed at surface ≧ 30kt and wind speed below 5000ft ≧ 50kt	wind speed below 3000ft ≧ 50kt					snow fall rate ≧ 3cm/3h when wind direction 250～110°	
BLUE	TS in TAF but CB doesn't exist in the aerodrome							the proportion occupied with CB (top ≧ FL300) in the sector ≧ 10
							wind speed ≧ 20kt with snow ceiling < 200ft	

1.What is ATMet category forecast

ATMet category forecast criteria

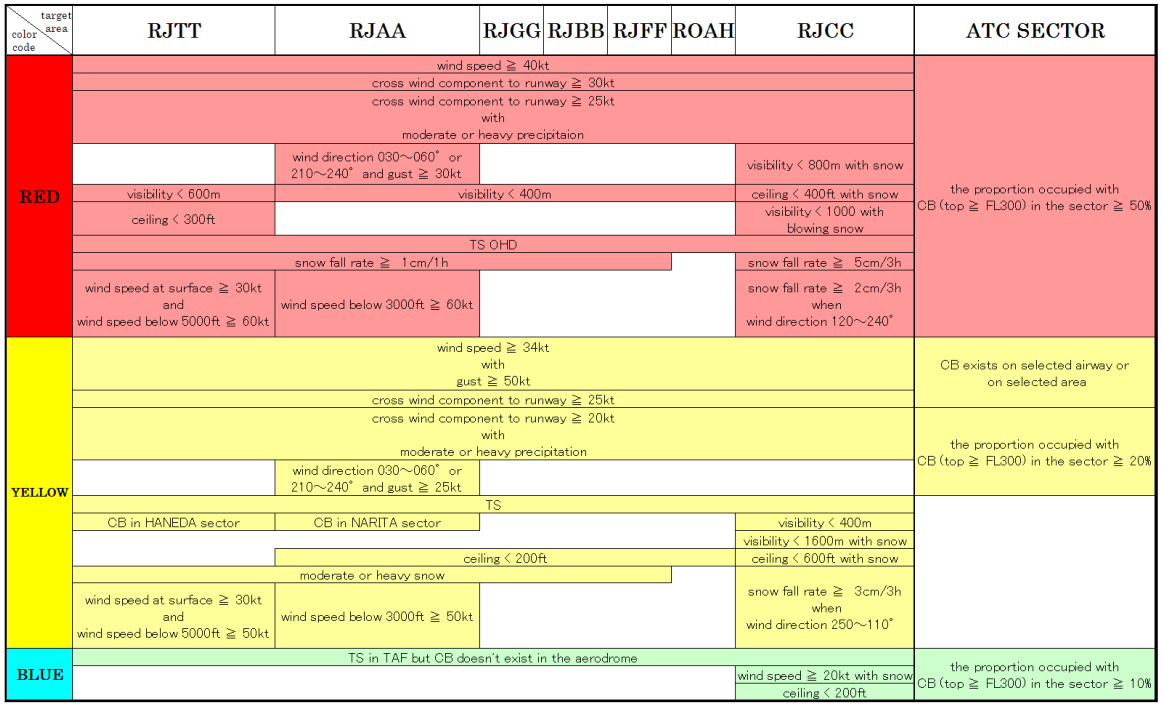
color code \ target area	RJTT	RJAA	RJGG	RJBB	RJFF	ROAH	RJCC	ATC SECTOR
RED	wind speed ≧ 40kt							
	cross wind component to runway ≧ 30kt							
	cross wind component to runway ≧ 25kt with moderate or heavy precipitaion							
		wind direction 030～060° or 210～240° and gust ≧ 30kt					visibility < 800m with snow	
	visibility < 600m	visibility < 400m					ceiling < 400ft with snow	the proportion occupied with CB (top ≧ FL300) in the sector ≧ 50%
	ceiling < 300ft						visibility < 1000 with blowing snow	
	TS OHD							
	snow fall rate ≧ 1cm/1h						snow fall rate ≧ 5cm/3h	
	wind speed at surface ≧ 30kt and wind speed below 5000ft ≧ 60kt	wind speed ≧ 60kt					snow fall rate ≧ 2cm/3h when wind direction 120～240°	
YELLOW	wind speed ≧ 34kt with gust ≧ 50kt							CB exists on selected airway or on selected area
	cross wind component to runway ≧ 25kt							
	cross wind component to runway ≧ 20kt							the proportion occupied with CB (top ≧ FL300) in the sector ≧ 20%
	wind speed at surface ≧ 25kt and wind speed below 5000ft ≧ 50kt						snow fall rate ≧ 1cm/3h when wind direction 250～110°	

TS OHD

The Possibility of go-around or holding rises extremely

RJTT・・Probability of air traffic flow control is 67%

2. Verification of ATMet category forecast criteria



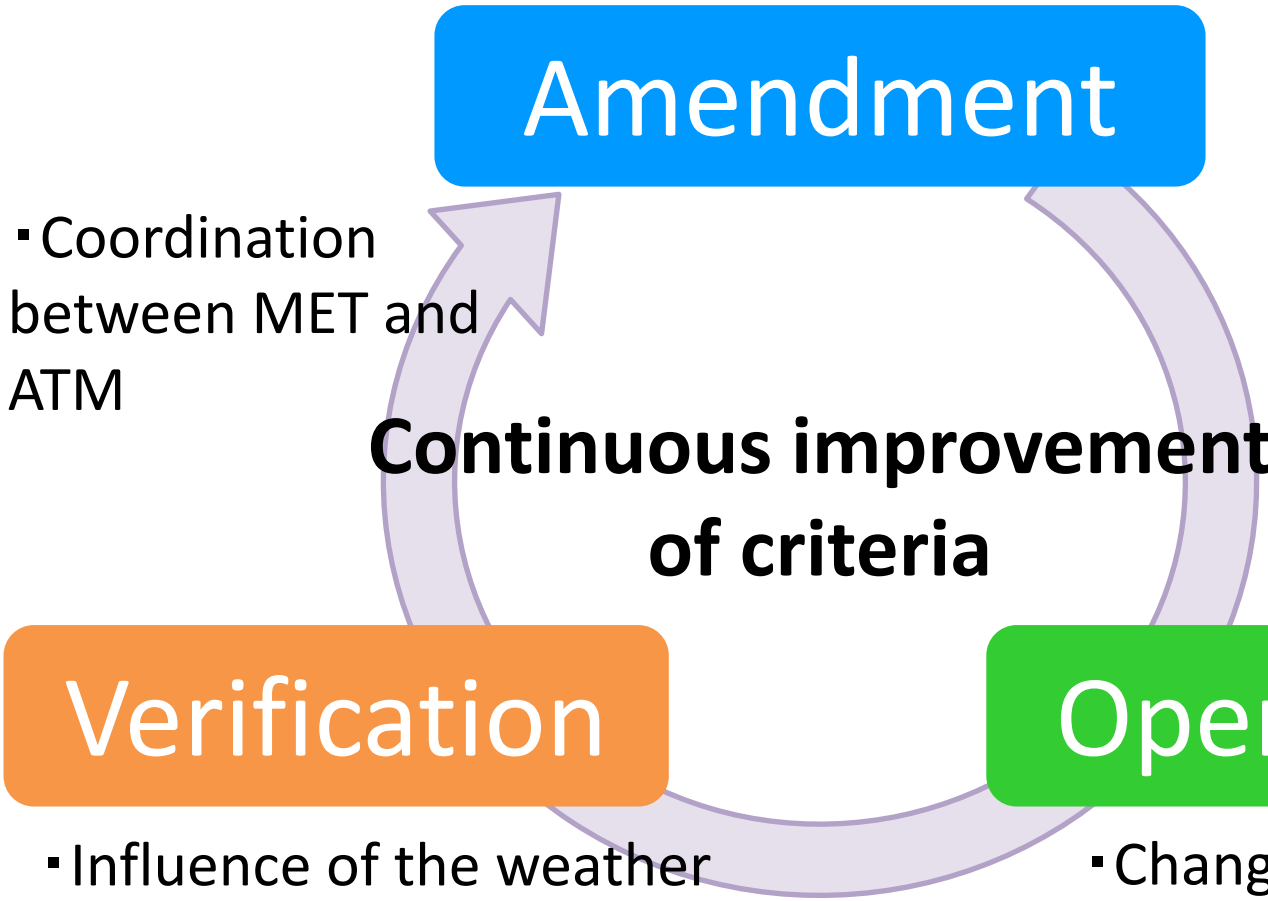
target area / color code	RJTT	RJAA	RJGG	RJBB	RJFF	ROAH	RJCC	ATC SECTOR
RED	wind speed ≧ 40kt							the proportion occupied with CB (top ≧ FL300) in the sector ≧ 50%
	cross wind component to runway ≧ 30kt							
	cross wind component to runway ≧ 25kt with moderate or heavy precipitaion							
		wind direction 030～060° or 210～240° and gust ≧ 30kt					visibility < 800m with snow	
	visibility < 600m	visibility < 400m					ceiling < 400ft with snow	
	ceiling < 300ft						visibility < 1000 with blowing snow	
	TS OHD							
	snow fall rate ≧ 1cm/1h						snow fall rate ≧ 5cm/3h	
	wind speed at surface ≧ 30kt and wind speed below 5000ft ≧ 60kt	wind speed below 3000ft ≧ 60kt					snow fall rate ≧ 2cm/3h when wind direction 120～240°	
YELLOW	wind speed ≧ 34kt with gust ≧ 50kt							CB exists on selected airway or on selected area
	cross wind component to runway ≧ 25kt							
	cross wind component to runway ≧ 20kt with moderate or heavy precipitation							the proportion occupied with CB (top ≧ FL300) in the sector ≧ 20%
		wind direction 030～060° or 210～240° and gust ≧ 25kt						
	TS							
	CB in HANEDA sector	CB in NARITA sector					visibility < 400m	
							visibility < 1600m with snow	
		ceiling < 200ft					ceiling < 600ft with snow	
	moderate or heavy snow							
	wind speed at surface ≧ 30kt and wind speed below 5000ft ≧ 50kt	wind speed below 3000ft ≧ 50kt					snow fall rate ≧ 3cm/3h when wind direction 250～110°	
BLUE	TS in TAF but CB doesn't exist in the aerodrome							the proportion occupied with CB (top ≧ FL300) in the sector ≧ 10%
							wind speed ≧ 20kt with snow	
							ceiling < 200ft	

Revision history

Version	Date
Ver.0.1	01/06/2005
Ver.1.0	09/09/2005
Ver.1.1	07/10/2005
Ver.1.2	24/01/2006
Ver.1.3	10/04/2006
Ver.1.4	09/06/2006
Ver.15/08/2006	15/08/2006
Ver.07/11/2006	07/11/2006
Ver.06/12/2006	06/12/2006
Ver.08/11/2007	08/11/2007
Ver.11/08/2008	11/08/2008
Ver.29/01/2009	29/01/2009
Ver.01/03/2010	01/03/2010
Ver.21/10/2010	21/10/2010
Ver.08/03/2012	08/03/2012
Ver.04/02/2013	04/02/2013

2. Verification of ATMet category forecast criteria

Outline of validation method



2. Verification of ATMet category forecast criteria

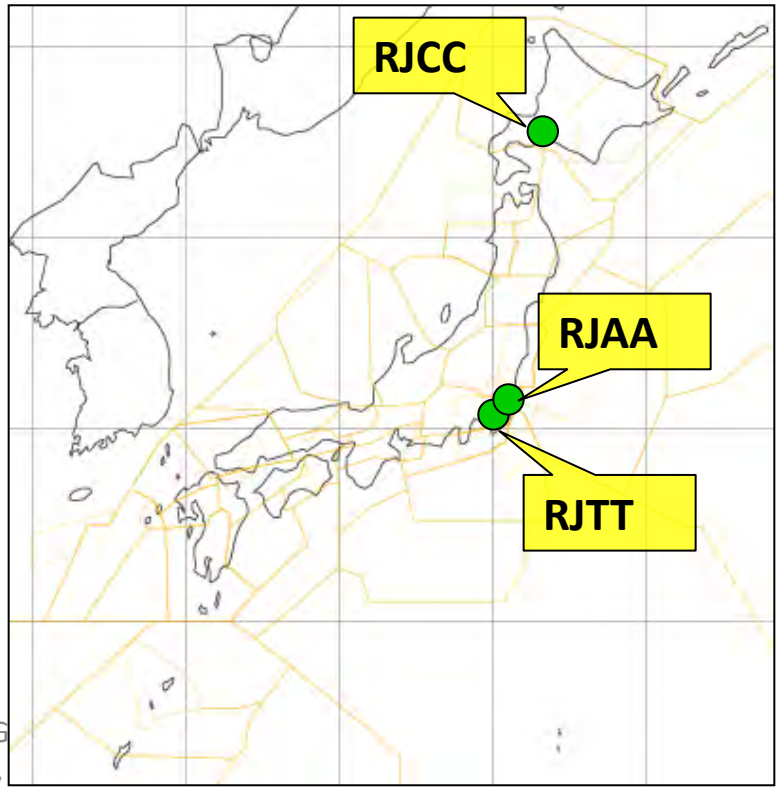
Examples of verifications

The criteria are verified based on past significant weather cases

- Tokyo International Airport(RJTT)
- Narita International Airport(RJAA)
- New Chitose Airport(RJCC)

✓Traffic is busy (RJTT,RJAA)

✓Air traffic is frequently influenced by show(RJCC)



2. Verification of ATMet category forecast criteria

Validation method

$$\frac{\textit{Number of Traffic controls}}{\textit{Number of Wx conditions}} = \textit{WXIR(\%)}$$

*WXIR : Weather Impact Ratio

Number of Traffic controls

Operational data of Air traffic flow controls (such as EDCT) provided by ATMC.

Number of Wx conditions

Meteorological observations collected by ATMetC.

2. Verification of ATMet category forecast criteria

Verification result of color codes criteria

RJTT

Upper : From 01/01/2008 To 01/12/2008
Lower : From Jan. 2004 To Oct. 2006

Color code criterion	Wx conditions	Traffic controls	WXIR(%)
Wind speed at surface ≧30kt and Wind speed below 5000ft ≧ 60kt	8	6	**75**
Wind speed at surface ≧30kt and Wind speed below 5000ft ≧ 50kt	13	7	**53***

*When WXIR exceeds 50%, it should be colored red. However in this case, since it was near the class boundary, yellow was used temporarily according to coordination with ATM.

$$\frac{\textit{Number of Traffic controls}}{\textit{Number of Wx conditions}} = \textit{WXIR(\%)}$$

2. Verification of ATMet category forecast criteria

Verification result of color codes criteria

RJAA

From Oct. 2010 To Apr. 2012

Color code criterion	Wx conditions	Traffic controls	WXIR(%)
wind direction 030～060° or 210～240° and gust ≧ 30kt	44	25	**57**
wind direction 030～060° or 210～240° and gust ≧ 25kt	58	28	**48**

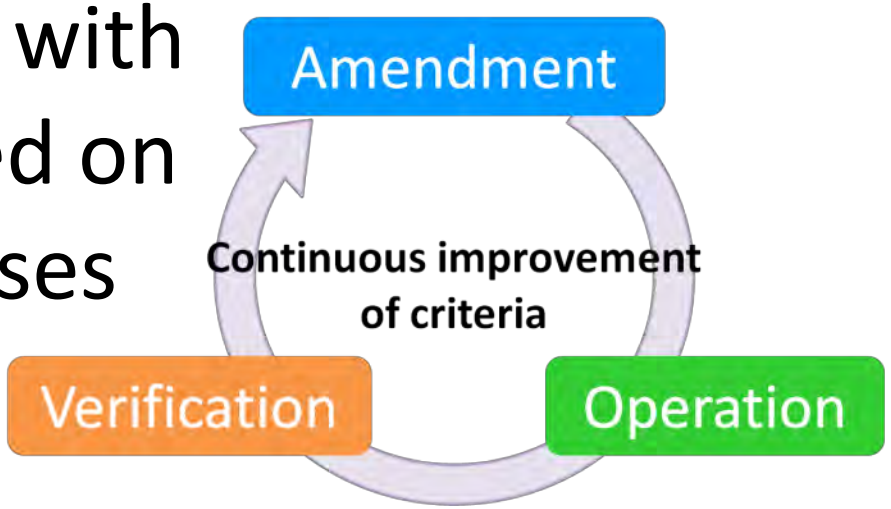
RJCC

From Jan. 2006 To Dec. 2011(23-12UTC)

Color code criterion	Wx conditions	Traffic controls	WXIR(%)
less than 1000m VIS with BLSN	37	33	**89**

3. Summary

1. Make criteria considering ATM operations and procedures
2. Continuous improvement is key to success
3. Verify and coordinate with users the criteria based on past significant WX cases



Thank you for your attention