



India

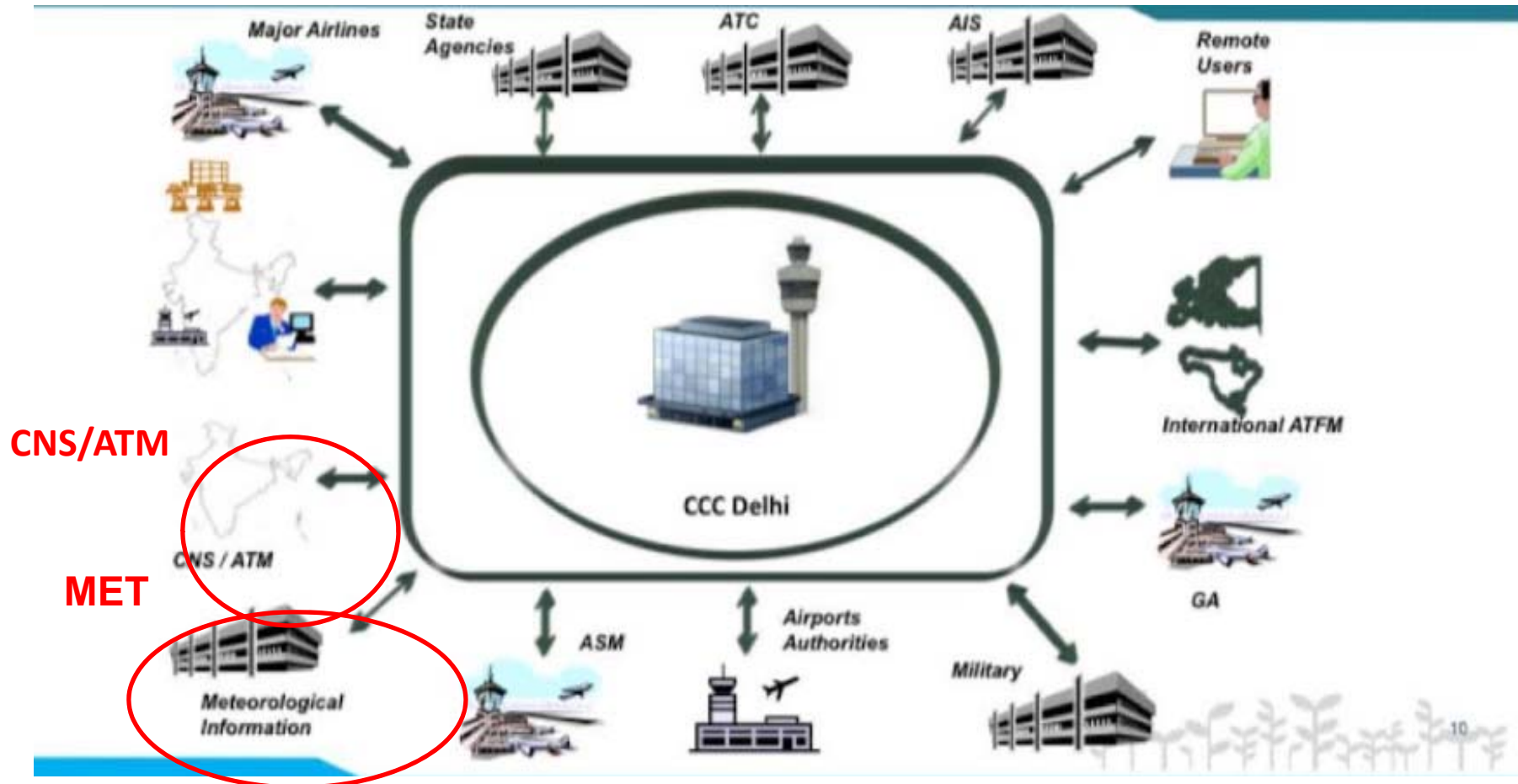


# DISSEMINATION OF TAF FORECASTS

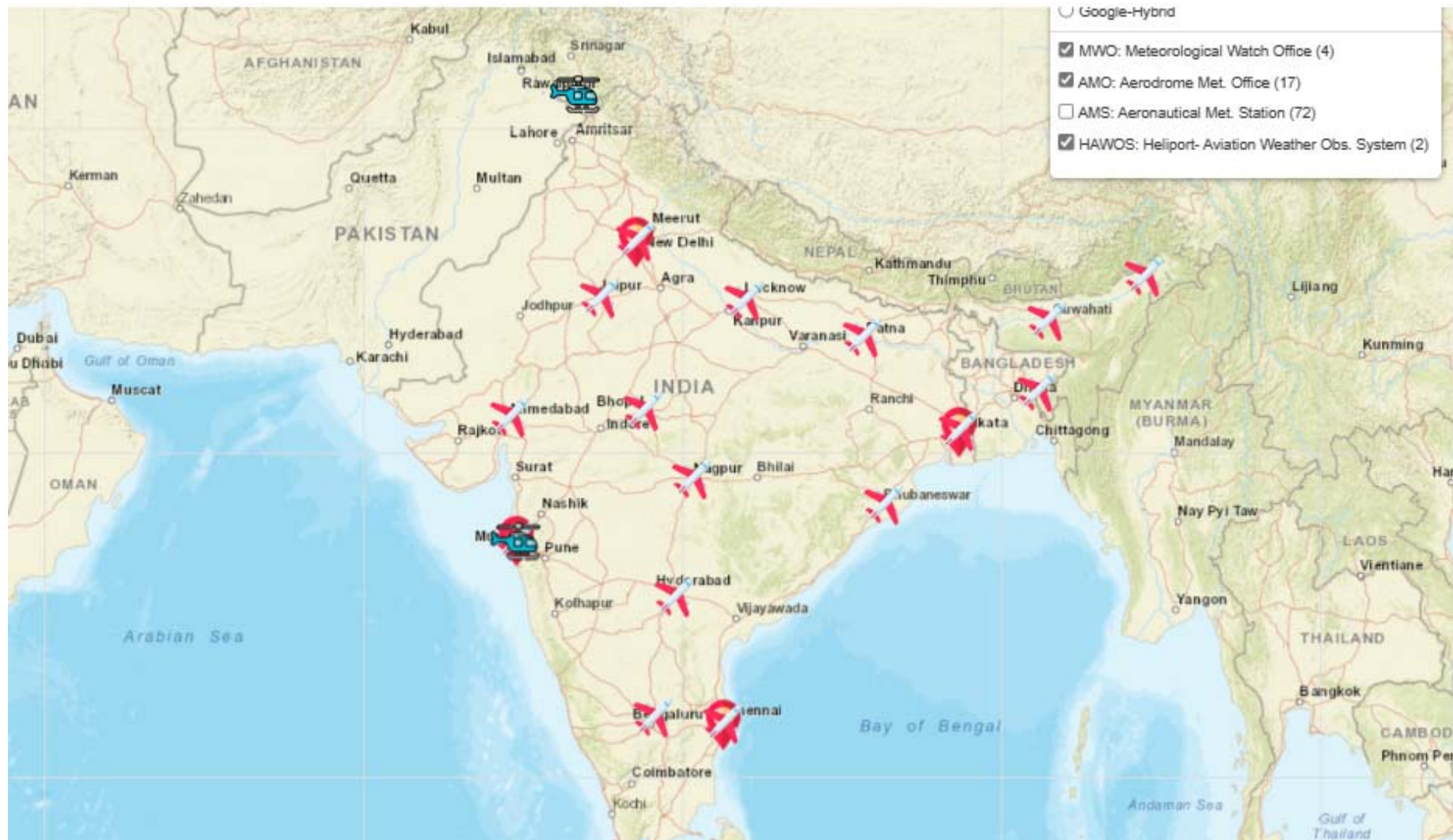
**Working Paper Asia and Pacific (APAC) Thirteenth Meeting  
of the Meteorological Requirements Working Group (MET/R  
WG/13) Bangkok, Thailand, 22 to 26 April 2024**

**Presented by Dr. Neeti Singh, Charan Singh, and  
Gajendra Kumar, INDIA**

# Functional Chart



# Aviation MET Network map

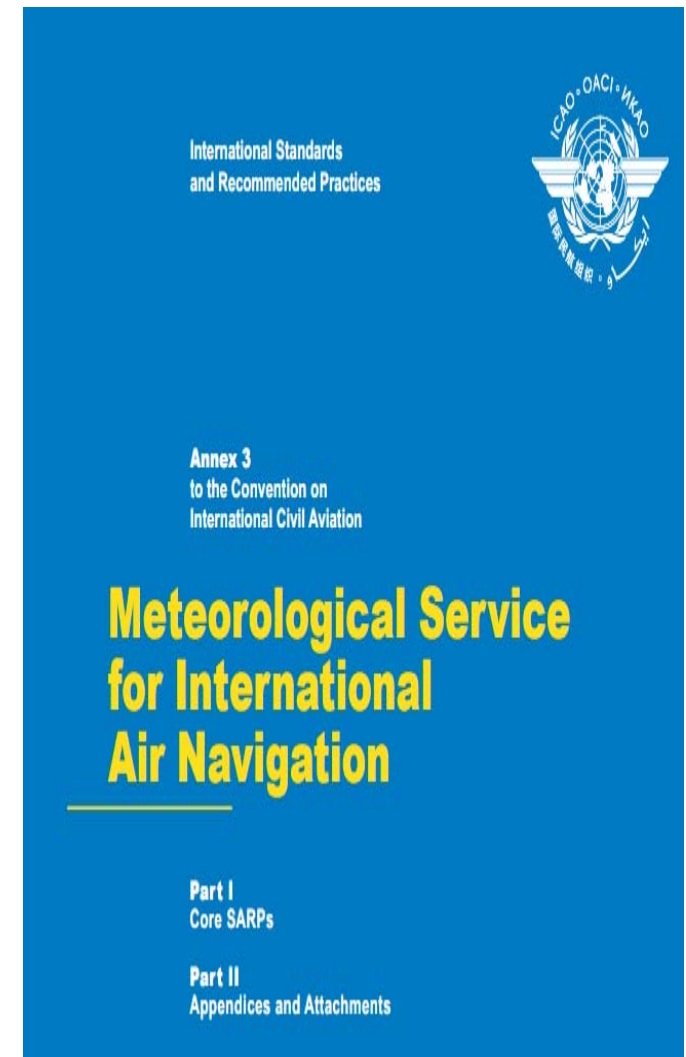


# Introduction

This paper refers to proposals for the amendment of

ICAO Annex 3, Meteorological Service for International Air Navigation, Part I — Core SARPs Part II — Appendices and Attachments Twentieth Edition, July 2018

APPENDIX 5. TECHNICAL SPECIFICATIONS RELATED TO FORECASTS, The MET/R WG/13 Meeting is also reminded that States and appropriate international organizations should provide ICAO with any comments they wish to make on the amendment proposals.



## ICAO Criteria For TAF Forecast

**Use of change group Appendix 5, of Annexure 3**

Provisions requiring the dissemination of

TAF forecasts and replacing the limitation of the Wind direction +/- 60° TEMPO and BECMG in values contained in

TAF;

Satellite +  
Radar+ AWS

Answer ====Evaluation criteria

**ICAO criteria for TAF verification wind direction +/-20 with an accuracy of 80%.**

These criteria of Wind Direction are not met in verification accuracy in satisfactory figures, which means the verification observed quite below 80% criteria of ICAO in most of the situations

# Wind Variation In Indian Region

Over the north Indian region airports observed variable winds during morning hours in Dec, Jan till mid Feb.

Hence the accuracy variable forecast of wind direction does not fulfill the criteria of wind direction verification and the result goes down in verification.



# ICAO Desirable Accuracy

## Annex 3 — Meteorological Service for International Air Navigation Attachment B

Element to be forecast	Operationally desirable accuracy of forecasts	Minimum percentage of cases within range
Wind Direction	$\pm 20^\circ$	80% of cases
Wind speed	$\pm 10$ km/h (5kt)	80% of cases
Visibility	$\pm 200$ m up to 800m $\pm 30\%$ between 800 m and 10 km	80% of cases
Precipitation	Occurrence or non-occurrence	80% of cases
Cloud amount	One category below 450m (1500 ft) Occurrence or non-occurrence of BKN or OVC between 450 m (1500 ft) and 3000 m (10000 ft)	70% of cases
Cloud height	$\pm 30$ m (100 ft) up to 300m (1000 ft) $\pm 30\%$ between 300m (1000 ft) and 3000m (10000 ft)	70% of cases



# VERIFICATION OF TAFOR



- TAF is considered a forecast for time periods rather than for points of time.
- Changes within the TAF period are indicated mostly using BECMG, and TEMPO.
- ‘PROB’ is not used.

There seems to be a potential challenge between the forecasts provided by forecasters and ICAO criteria, to address this issue TAF forecast verification done and find out verification accuracy not achieving due to the limitation.



# TAF FORECAST VERIFICATION

- In case of TAF, only the **current weather observations** from the aerodrome during the validity period of the TAF are used for verification purpose.
- In TAF, **the change group is verified** as a separated forecast.
- **Amended forecast** is also verified separately.
- **Syntax errors are** also checked, but not as a part of the verification scheme.

# EXAMPLE- PROBLEM STATEMENT

➤ Wind direction **current 220**

➤ When f/c can give forecast when variation

Will be  $\pm 60$

➤ 200---220---240(  $\pm 20$  within this range will be correct)

➤ 250...in case of 250 WD it will go wrong

➤ Tempo 260-----160/280-----300

Forecaster can  
give TEPO  
280KT

# Percentage Calculations

- **Change groups**: Assumed that the forecast value takes effect at the time specified after the change indicator 'BECMG' or 'TEMPO'
- Hence, the values which are applicable outside the change group are not considered to be applicable within the change group.
- If forecast value falls within the specified range, it is considered as a correct occurrence.
- The ratio of total number of correct occurrences against the total number of forecast (**basic+ change group or amendments**) is considered for calculating percentage occurrence.

# Yearly TAF Verification Result

STATION	TAF VERIFICATION REPORT 2022 FOR AIRPORTS IN NORTH EAST REGION																	
BARAPANI(VEBI)	Month	JAN	FEB	MAR	Q1	APR	MAY	JUN	Q2	JUL	AUG	SEP	Q3	OCT	NOV	DEC	Q4	Whole Year
	Wind Direction	98.30%	76.70%	61.70%	79.80%	43.30%	42.40%	46.30%	43.70%	41.60%	37.70%	42.80%	40.30%	42.20%	62.00%	83.20%	64.00%	54.70%
	Wind Speed	100%	100%	96.70%	99.10%	94.80%	98.90%	98.50%	97.10%	99.50%	100%	99.10%	99.60%	99.40%	100%	100%	99.80%	98.90%
	Visibility	63.90%	66.30%	67.80%	65.80%	64.30%	53.60%	50.70%	57.10%	70.40%	66.30%	57.70%	65.00%	65.20%	74.50%	59.30%	64.90%	63.10%
	Precipitation	96.40%	97.90%	99.20%	97.60%	89.80%	80.60%	79.80%	84.10%	88.30%	86.40%	83.30%	86.00%	88.40%	99.80%	100%	96.30%	91.00%
	Cloud Amount	97.70%	98.70%	98.10%	98.20%	98.00%	100%	100%	99.20%	100%	100%	96.60%	99.00%	99.40%	99.60%	92.00%	96.30%	98.10%
	Cloud Height	97.70%	98.70%	98.10%	98.20%	98.00%	100%	100%	99.20%	100%	99.60%	91.40%	97.30%	96.20%	100%	89.60%	94.30%	97.20%
	Temperature																	
	Weighted Average	91.40%	91.50%	90.00%	91.00%	84.20%	83.90%	83.50%	83.90%	87.30%	85.30%	82.00%	84.90%	85.10%	92.10%	87.70%	88.00%	86.90%

# Recommendation

- The criteria used for the inclusion of change groups in TAF particularly in case of **wind direction should be reduced from exiting 60°.**

## Discuss and consider

- Appropriate actions to support: Provisions requiring the dissemination of TAF forecasts and replacing the limitation of the

**Wind direction +/- 60° to less than +/- 60° TEMPO and BECMG in values contained in TAF.**

**Thank You**