General Forecaster Competencies, Evaluation Criteria and Evaluation Methods for the Tropical Desk

COMPETENCY I

Analyze and continually monitor the evolving meteorological and/or hydrological situation.

Description: Observations and forecasts of weather parameters and significant weather phenomena are continuously monitored to determine the need for issuance, cancellation or amendment/update of forecasts and warnings according to documented thresholds and regulations. The forecaster must be able to

a) analyze and interpret data to identify weather features pertinent to the area of forecast responsibility; and

b) monitor weather parameters and evolving significant weather phenomena and validate current forecasts and warnings based on these parameters.

Evaluation Criteria and Method (PASS or FAIL)

Criteria	**Methods**	**PASS or FAIL**
1. Application of conceptual models: Understanding of the key elements of synoptic, mesoscale and dynamical meteorology and core analytical/diagnostic skills through the analysis of thermal/isodrosothermal gradients, areas of confluence/diffluence vs convergence/divergence, flow interactions with orography, scale interactions, and interactions between the upper and lower tropospheric systems.	•Participation in/occasional conduction of the daily weather discussion.	
2. Satellite imagery and sounding interpretation: Use of available channels to identify upper level circulations, jet streams, fronts, shear lines, squall lines, leeside perturbations-mountain waves/turbulence, cloud and topographic features.	•Participation in/ occasional conduction of the daily discussion.	
3. Trade wind wave analysis: Proper identification of waves in the trades using satellite data, model analyses and previous forecasts of wave positions, if available.	•Wave tracking forms.	
4. Stream line analysis: Analysis of 200, 500 and 850 hPa wind charts identifying areas of confluence/diffluence, troughs and ridges.	•Streamline analysis charts.	
5. Forecast verification: Validation of previous forecasts to determine necessary corrections to the future ones.	•Participation in/ occasional conduction of the daily discussion.	

COMPETENCY II

Forecast meteorological and hydrological phenomena and parameters.

Description: Forecasts of meteorological parameters and phenomena are prepared and issued in accordance with documented requirements, priorities and deadlines. The meteorologist must be able to

a) forecast weather phenomena and parameters as required, including forecast uncertainties and using appropriate tools;

b) ensure that forecasts are prepared and issued in accordance with national practices, relevant codes and technical regulations on content, accuracy and timeliness; and

c) make every effort to ensure that forecasts of weather parameters and phenomena are consistent spatially and temporally, extending across boundaries of the area of responsibility as far as practicable while maintaining meteorological integrity by monitoring forecasts/warnings issued for other regions when required.

2. Evaluation Criteria and Method (PASS or FAIL)

Criteria	Method	PASS or FAIL
1. Application of conceptual models: Understanding and application of the concepts of the forecast funnel into the development of forecast charts, deterministic vs. probabilistic forecasts and the interpretation of ensemble model guidance. Meteorologist must display core diagnostic and prognostic skills, including evaluation of stability and threat assessment techniques.	•Participation in/sporadic conduction of the daily discussion. •Forecast chart preparation in NAWIPS workstation.	
2. Forecast discussion: Active participation in the daily forecast discussion; performance of a critical comparison of variety of forecasts models, recognition of pattern variations from climatology, evaluation of upper, mid and low tropospheric dynamics, evaluation of stability indexes and preparation of quantitative precipitation estimates while determining confidence in the forecast. Sporadic conduction of daily forecast discussion during second half of the fellowship.	•Participation in/sporadic conduction of the daily discussion.	
3. Interpretation of deterministic vs ensemble models: Establishment of forecast confidence by recognizing uncorrected model bias and limitations of NWP guidance; forecast improvements using ensemble model forecasting.	•Participation in/sporadic conduction of the daily discussion.	
4. Synoptic forecast chart preparation: Preparation of weather forecast charts indicating frontal features, prefrontal squall lines, shear lines, low/high pressure centers, low-level troughs, low-level jets, regions of coastal convergence, the near equatorial trough (NET) and the inter tropical convergence zone (ITCZ). As applicable, indication of the potential for severe weather, solid precipitation (snow), echo training and/or formation of mesoscale convective systems. Appropriate management of time and ability to work under pressure for a timely issuance of all high-quality forecast products.	•Forecast chart preparation in NAWIPS workstation. •Model output analysis using the WINGRIDDS Software.	
5. Hazard chart preparation: When applicable, preparation of special weather chart identifying critical phenomena. This includes the identification of hazards for aviation such as the potential for icing and/or turbulence among others.	•Hazard chart preparation in NAWIPS workstation.	

COMPETENCY III

Become a weather forecasting instructor and mentor.

Description: The meteorologist must become an instructor and mentor to fellow forecasters, as well as demonstrate ability to think critically by conducting a thorough case study analysis where the methods learned during the training are applied.

Evaluation Criteria and Methods (PASS or FAIL)

Criteria	**Methods**	**PASS or FAIL**
1. Application of the forecast funnel: Application of the methodology that evaluates layer instability, mid/upper dynamics, surface features, moisture availability and convection triggers to generate a consistent quantitative precipitation forecast and also objectively analyze case studies of interest.	•Participation in/sporadic conduction of the daily discussion. •Forecast chart preparation in NAWIPS workstation. •Preparation of end-of-training case study. •Peer training.	
2. Application of techniques learned at the desks: Understanding and application of additional methodologies learned at the desk into weather analysis and forecasting, concentrating on the predictability of the event, special features of interest and indicators.	•Participation in/sporadic conduction of the daily discussion. •Forecast chart preparation in NAWIPS workstation. •Preparation of end-of-training case study. •Peer training.	
3. Scientific reasoning and knowledge: Demonstration of a general understanding of the physical processes and dynamics that lead to a weather event, and ability to think critically in the context of analysis and forecast of the atmosphere.	•Participation in/sporadic conduction of the daily discussion. •Preparation and presentation of the end-of-training case study. •Peer training.	
4. Documentation skills: Ability to extract the key ideas and convey them in a summarized document in a clear and organized manner.	•Preparation of the end-of-training case study.	
5. Communication skills: Ability to convey ideas in an orderly and concise manner to an audience of different backgrounds, and to their peers when assisting with the training.	•Presentation of the end-of-training case study. •Peer training.	

APPENDIX: Definitions

Daily discussion: Daily analysis of the current state of the atmosphere and its expected evolution. The analysis incorporates the application of conceptual models, interpretation of satellite imagery and verification of previous forecast using observations and satellite data. The forecast section of the discussion incorporates the evaluation of forecast confidence by the analysis of output from different global models and ensemble members. At the discretion of the instructor, meteorologists will be required to give a short presentation on conceptual models for frontal placement, jet analysis and other relevant processes discussed during the training. During the second half of the training, meteorologists will be periodically asked to lead the discussion.

NAWIPS Workstation: Linux system designed to overlay different fields and generate forecast charts. When applied to surface analysis, the meteorologist must utilize the workstation to demonstrate proficiency in the analysis of surface features, with emphasis in the proper placement of fronts with relation to pressure troughs and thermal gradients. Through satellite imagery animations, the meteorologist must be able to identify circulations, clouds, topography and other features. When queried, the meteorologist must describe the thought process that directed them to a particular solution. The meteorologist will be evaluated on the proper placement of the fronts, troughs, pressure centers, shear lines, squall lines, Inter Tropical Convergence Zone (ITCZ), the Near Equatorial Trough (NET) and the South Atlantic Convergence Zone (SACZ).

WINGRIDDS Software: Windows based software designed to perform objective analysis of global model guidance. The meteorologist will learn the basic commands required for the generation of the analysis charts through on-the-job training. The methods learn include the generation of constant pressure and isentropic surfaces charts when the analysis focuses on upper jets. The meteorologist will be evaluated on the proper identification of the different jets, corresponding jet maxima and thought process during the analysis.

Streamline Analysis Charts: Hand analysis of model-derived wind barbs on a constant pressure chart. The meteorologist will evaluated on the proper drawing of the streamlines with respect to the plotted wind barbs, areas of confluence/diffluence, proper identification of troughs and ridges, and proper identification of cross equatorial systems.