***Marine Weather Forecaster Performance Criteria 2.2: Direct Observation***

***C2.2 Prepare forecast for weather phenomena, parameters and variables including spatial extent, onset and cessation, duration, intensity and temporal variations, where applicable***

***Performance criterion comments:***

The forecaster must apply meteorological knowledge to forecast weather phenomena, parameters and variables that are relevant to marine weather customers, including for high seas and coasts.

**Scenario**:

During an assessment period, for example, one or more forecast shifts, the forecaster is asked to analyse and diagnose the weather situation, considering synoptic, mesoscale and local features. In particular, the forecaster analyses weather parameters and features significant to marine meteorology and marine services users.

For direct observation C2.2, the forecaster can be asked to apply a “think-aloud” protocol to describe decisions about data products viewed and judgements of the situation and its likely evolution that can be made based on the data.

**Evidence of competency checklist**:

The forecaster utilizes available data such as

* surface data
* in-situ ocean observations
* NWP analyses and forecasts
* remote sensed data
* radar imagery
* tide charts
* other available data
* advisories issued by other meteorological services and regional centers

to construct a comprehensive analysis of

* precipitation
* convection potential
* restrictions to visibility
* surface winds, including areas of strong winds
* areas of significant weather
* synoptic features, including large-scale motion
* boundary layer processes and evolution
* sea state
* interactions with tide and river run-off, especially near the coast
* other pertinent features

The forecaster uses meteorological knowledge to

* determine the most plausible meteorological processes at work that would produce the observed weather conditions
* consider the limitations of model fields and statistical guidance
* explain the meteorological processes at work
* explain how the observed weather phenomena, parameters and variables support the diagnosis of features impactful to marine weather information users

The forecaster accurately forecasts or warns for

* wind: speed, direction, gustiness, distribution and variability, as well as associated sea state
* pressure: surface pressure variations across an area or at a location, including a deepening low pressure system or blocking high pressure system, and the movement of pressure systems
* precipitation and associated visibility: precipitation type, amount, rate, phase, impacts to visibility (including heavy precipitation and blowing snow), freezing spray
* visibility: surface visibility, fog formation and cessation, mist, smoke, volcanic ash, dust, haze, sandstorms, climatology (seasonal and diurnal variations), impacts of low visibility to marine customers, obstructions to visibility near the coast
* thunderstorms: convective potential, development and motion of convective cells and systems, severity of convection and convective precipitation, risk of microbursts, hail, lightening, waterspouts, convective winds or other convective hazards
* sea state: wave height/direction for particular time frame (particularly damaging large waves or swell), wave height/direction for a critical location of marine activities, wave period, impacts to wave development and motion due to coastal layout and bathymetry, wave impacts on locations, activities and infrastructures
* tropical cyclones: predicted path, changing intensity, predicted impacts on coasts, impacts of associated severe weather (winds, large waves, storm surge, precipitation, etc.)
* icing on vessels or structures
* sea ice state and movement
* other international and national foreast requirements, as listed under Regional Variations

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| Required background knowledge and skills as presented in WMO-No. 1209 for additional consideration in the assessment:   * Knowledge of methods for predicting meteorological and oceanographic conditions, and their applications, including those required by the application regional variations; * Knowledge of forecasting models (deterministic models and EPS) including wave models; * Knowledge of remote-sensing applications; * Knowledge of forecast preparation systems (including use of software); * Knowledge of local and regional areas of responsibility, in particular forecast boundaries and associated observation sites; * Knowledge of forecast issue times and work priorities; * Knowledge of types and characteristics of wave and swell; generation and decay of wave and swell; and shallow water wave characteristics; * Knowledge of tropical cyclones, hurricanes and typhoons and their impact on marine   activities;   * Knowledge of sea and tidal currents, sea level (including storm surges and tsunami) and drifting of objects or pollutants; * The ability to forecast sea-ice extent, thickness, concentration, stage of development, drift, deformation, growth and melting; * The ability to forecast icebergs and their movement, as required |