CHAPTER 5

WIND

5.1 General

Wind shall be measured in terms of velocity, a vector that includes direction and speed.

5.2 Scope

This chapter prescribes the standards for observing and reporting wind data.

5.3 Wind Parameters

As used in this chapter, wind is the horizontal motion of the air past a given point and includes:

a. **Direction.** The direction, in tens of degrees, from which the wind is blowing.

b. **Speed.** The rate, in knots, at which the wind passes a given point.

c. **Gusts.** The description of the variability of the wind speed.

d. **Peak wind speed.** The maximum instantaneous wind speed measured.

e. **Wind Shift.** A change in wind direction.

5.4 Wind Observing Standards

Wind direction, speed, and gusts shall be determined at all stations. All other wind related parameters shall be determined at designated stations.

5.4.1 Wind Direction. The wind direction shall be determined by averaging the direction over a 2-minute period. When the wind direction sensor(s) is out of service, at designated stations, the direction may be estimated by observing the wind cone or tee, movement of twigs, leaves, smoke, etc., or by facing into the wind in an unsheltered area.

5.4.2 Variable Wind Direction. The wind direction may be considered variable if, during the 2-minute evaluation period, the wind speed is 6 knots or less. Also, the wind direction shall be considered variable if, during the 2-minute evaluation period, it varies by 60 degrees or more when the average wind speed is greater than 6 knots.

5.4.3 Wind Speed. The wind speed shall be determined by averaging the speed over a 2-minute period. At designated stations, Table 5-1 shall be used to estimate wind speeds when instruments are out of service or the wind speed is below the starting speed of the anemometer in use.

5.4.4 Wind Gust. The wind speed data for the most recent 10 minutes shall be examined to evaluate the occurrence of gusts. Gusts are indicated by rapid fluctuations in wind speed with a variation of 10 knots or more between peaks and lulls. The speed of a gust shall be the maximum instantaneous wind speed.

5.4.5 Peak Wind Speed. Peak wind data shall be determined with wind speed recorders. The peak wind speed shall be the maximum instantaneous speed measured since the last routine METAR.

Table 5-1. Estimating Wind Speed

Knots	Specification	Knots	Specification
<1	Calm; smoke rises vertically.	22-27	Large branches in motion; whistling heard in overhead wires; umbrellas used with difficulty.
1-3	Direction of wind shown by smoke drift not by wind vanes.	28-33	Whole trees in motion; inconvenience felt walking against wind.
4-6	Wind felt on face; leaves rustle; vanes moved by wind.	34-40	Breaks twigs off trees; impedes progress.
7-10	Leaves and small twigs in constant motion; wind extends light flag.	41-47	Slight structural damage occurs.
11-16	Raises dust, loose paper; small branches moved.	48-55	Trees uprooted; considerable damage occurs.
17-21	Small trees in leaf begin to sway; crested wavelets form on inland waters.	56-71	Widespread damage.

5.4.6 Wind Shifts. Wind data shall be examined to determine the occurrence of a wind shift. A wind shift is indicated by a change in wind direction of 45 degrees or more in less than 15 minutes with sustained winds of 10 knots or more throughout the wind shift.

5.4.7 Wind Sensor Range, Accuracy, and Resolution. The required range, accuracy, and resolution for wind sensors are listed in Appendix C.

5.5 Wind Reporting Standards

5.5.1 Units of Measure and Resolution for Wind. Wind direction and speed shall be reported in the body of all observations. Direction shall be reported in tens of degrees with reference to true north and speed shall be reported in knots (see paragraph 12.6.5).

5.5.2 Calm Winds. When no motion of air is detected, the wind shall be reported as calm (see paragraph 12.6.5.d).

5.5.3 Variable Wind Direction. When the wind direction is variable, a variable wind entry shall be reported as part of the wind group in the body of the report (see paragraphs 12.6.5.b and 12.6.5.c).

5.5.4 Wind Gust. When a gust is detected within 10 minutes of the actual time of the observation, the maximum instantaneous speed shall be reported (see paragraph 12.6.5.a).

5.5.5 Peak Wind Data. The peak wind shall be reported in the remarks section whenever the maximum instantaneous speed in knots (since the last METAR) is greater than 25 knots (see paragraph 12.7.1.d).

5.5.6 Wind Shifts. The wind shift and the time of occurrence shall be reported in the remarks section (see paragraph 12.7.1.e).

5.6 Summary of Wind Observing and Reporting Standards

Table 5-2 summarizes the wind observing and reporting standards.

Table 5-2. Summary of Wind Observing and Reporting Standards

Parameter	Observing and Reporting Standard
Wind direction	2-minute average in 10 degree increments with respect to true north is reported.
Wind speed	2-minute average speed in knots is reported.
Wind gust	The maximum instantaneous speed in knots in the past 10 minutes is reported.
Peak wind	The maximum instantaneous speed in knots (since the last scheduled report) shall be reported whenever the speed is greater than 25 knots.
Wind shifts	Wind shift and the time the shift occurred is reported.