

NOTICE

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

N JO 7900.12

Air Traffic Organization Policy

Effective Date:
September 1, 2019

Cancellation Date:
December 31, 2019

SUBJ: METAR/SPECI Reporting Changes for Snow Pellets (GS) and Hail (GR)

1. Purpose of this Notice. This Notice coincides with a revision to the Federal Meteorological Handbook (FMH-1) that was effective on November 30, 2017. The Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM) approved the changes to the reporting requirements of small hail and snow pellets in weather observations (METAR/SPECI) to assist commercial operators in deicing operations.

2. Audience. This order applies to all FAA and FAA-contract weather observers, Limited Aviation Weather Reporting Stations (LAWRS) personnel, and Non-Federal Observation (NF-OBS) Program personnel.

3. Where can I Find This Notice? This order is available on the FAA Web site at http://faa.gov/air_traffic/publications and http://employees.faa.gov/tools_resources/orders_notices/.

4. Cancellation. This notice will be cancelled with the publication of the next available change to FAA Order 7900.5D.

5. Procedures/Responsibilities/Action. This Notice amends the following paragraphs and tables in FAA Order 7900.5.

Table 3-2: Remarks Section of Observation

Remarks Section of Observation				
Element	Paragraph	Brief Description	METAR	SPECI
Volcanic Eruptions	14.20	Volcanic eruptions must be reported whenever first noted. Pre-eruption activity must not be reported. (Use PIREPs to report pre-eruption activity.) Encode volcanic eruptions as described in Chapter 14.	X	X

Remarks Section of Observation				
Element	Paragraph	Brief Description	METAR	SPECI
Tornadic Activity (Manual and Augmented Auto) (Tornadic activity_B/E(hh)mm LOC/DIR_(MOV))	14.21	Whenever tornadoes, funnel clouds, or waterspouts begin, are in progress, end, or disappear from sight, the event should be described directly after the "RMK" element. This remark must give, insofar as known, the phenomena, time, location and direction from the station, and direction of movement. The time the tornadic activity began must be reported and prefixed with a "B," the time the tornadic activity ended or disappeared from sight must be reported and prefixed with an "E," for example, TORNADO B13 DSNT NE.	X	X
Type of Automated Station (AO1, AO2)	14.22	This remark identifies the type of automated station. It must be included in all reports from automated stations. AO1 identifies an automated station without a precipitation discriminator; AO2 identifies an automated station with a precipitation discriminator. The absence of the remark indicates a manual station.	X	X
Peak Wind (PK WND dddff(f)/(hh)mm) (NA LAWRS)	14.23	When the peak wind exceeds 25 knots, the remark must be included in the next METAR report. ddd is the direction of the peak wind, ff(f) is the peak wind speed since the last METAR report, and (hh)mm is the time of occurrence (with only the minutes reported if the hour can be inferred from the report time), for example, PK WND 28045/15.	X	
Wind Shift (WSHFT_(hh)mm)	14.24	At stations with automated systems with SPECI capability and manual stations, when a wind shift occurs, WSHFT followed by a space and the time the wind shift began must be reported (with only the minutes reported if the hour can be inferred from the report time). The contraction FROPA may be entered following the time if it is reasonably certain that the wind shift was the result of frontal passage, for example, WSHFT 30 FROPA.	X	X
Tower or Surface Visibility (TWR VIS) (SFC VIS)	14.25	If tower visibility or surface visibility is carried in the remarks, use the appropriate set of values and precede the visibility with the appropriate identifier, TWR VIS or SFC VIS, for example, TWR VIS 1.	A/B/C	A/B/C

Remarks Section of Observation				
Element	Paragraph	Brief Description	METAR	SPECI
Variable Prevailing Visibility (VIS minVmax)	14.26	Whenever the prevailing visibility is less than 3 statute miles and is variable, this remark must be entered where min is the lowest visibility evaluated and max is the highest visibility evaluated, for example, VIS 1/2V2.	X	X
Sector Visibility (VIS_dd_vv)	14.27	Sector visibility must be reported when it differs from the prevailing visibility by one or more reportable values and either the prevailing or sector visibility is less than 3 miles or considered to be operationally significant. In the remark, dd defines the sector to 8 points of the compass and vv is the sector visibility in SM, for example, VIS N 2.	X	X
Visibility at Second Location (VIS vv location) (NA LAWRS)	14.28	When an automated station uses meteorological discontinuity sensors, remarks must be added to identify site specific visibilities which differ from conditions reported in the body of the report. vv is the visibility value measured at the secondary location. This remark must only be generated when the condition is lower than that contained in the body of the report.	X ³	X ³
Lightning (Frequency_LTG(type) [LOC])	14.29	When lightning is manually observed, the frequency and location must be reported, along with the type of lightning, if known. For example, OCNL LTG OHD, FRQ LTGCCG VC NE. When lightning is detected by an automated sensor (i.e. ALDARS) within 5NM of the ARP, it is reported as "TS" in the body of the report with no remark; within 5-10NM of the ARP, it is reported as "VCTS" in the body of the report with no remark. Beyond 10NM from the ARP lightning is reported in remarks as "LTG DSNT" followed by direction from the ARP, for example, OCNL LTG DSNT NE.	X	X

Remarks Section of Observation				
Element	Paragraph	Brief Description	METAR	SPECI
Beginning/Ending Time of Precipitation (WX)B(mm)E(mm) (NA LAWRS)	14.30	At stations with automated systems with SPECI capability and Manual Stations, when precipitation begins or ends, the next METAR report must include the type of phenomena, the beginning and/or ending time (prefixed with a B and/or E). If the beginning or ending of the precipitation type (hail, freezing precipitation, or ice pellets) initiated the SPECI report, then that SPECI report must include the type of phenomena, the beginning and/or ending time, and should also be reported in the next METAR report.	X	X ²
Beginning/Ending Time of Thunderstorms (TS)B(mm)E(mm)	14.31	When thunderstorms begin or end, the SPECI report must include the type of phenomena, the beginning and/or ending time (prefixed with a B and/or E), and should also be reported in the next METAR report, for example, TSB05E45	X	X
Thunderstorm Location (TS_LOC_(MOV_DIR))	14.32	Thunderstorm location and movement, if known, must be encoded. For example, TS SE MOV NE.	X	X
Hailstone Size (GR_{INCHES})	14.33	At augmented automated stations and at manual stations, the size of the largest hailstone is coded in 1/4 inch increments, identified with the contraction GR. When small hail less than 1/4 inch in size is occurring the hailstone size is reported in remarks as "GR LESS THAN 1/4".	X	X
Virga (VIRGA_{Direction})	14.34	When precipitation is observed to be falling from clouds, but is not reaching the ground because of evaporation, report VIRGA; the direction from the station is optional, for example, VIRGA or VIRGA SW.	X	X
Variable Ceiling Height (CIG minVmax)	14.35	Whenever the ceiling is below 3,000 feet and is variable, enter min as the lowest ceiling height evaluated and max as the highest ceiling height evaluated, for example, CIG 005V010.	X	X
Obscurements (w'w'_(NsNsNs) hshs)	14.36	When the sky condition contains an obscuration, either at the surface or aloft (other than clouds), the type of phenomena in the layer, plus the sky cover at the layer and the height must be reported in remarks, for example, FG SCT000 or FU BKN015.	X	X

Remarks Section of Observation				
Element	Paragraph	Brief Description	METAR	SPECI
Variable Sky Condition (N _s N _s N _s (h _s h _s h _s)_V_N _s N _s N _s)	14.37	This remark must identify the layer that is varying and indicate the range of variability. If there are several layers of the same coverage, the variable layer must be identified by including the layer height.	X	X
Significant Cloud Types	14.38	When observed, the following clouds are reported in remarks: 1.) Cumulonimbus (CB) or Cumulonimbus Mammatus (CBMAM), distance, direction from the station, direction of movement, for example, CB W MOV E, CB DSNT W. 2.) Towering Cumulus (TCU), distance, and direction from the station, for example, TCU W. 3.) Altocumulus Castellanus (ACC), direction from station, for example, ACC NW. 4.) Standing Lenticular (stratocumulus SCSL; altocumulus ACSL, or cirrocumulus CCSL) or rotor clouds, direction from the station, for example, ACSL SW-W, APRNT ROTOR CLD NE, CCSL S. Cumulonimbus of any kind and towering cumulus are also identified in the body of the report.	A	A
Ceiling Height at Second Location (CIG_{height}_{LOC}) (NA LAWRS)	14.39	When an automated station uses meteorological discontinuity sensors, remarks must be added to identify site specific sky conditions which differ from conditions reported in the body of the report. This remark must only be generated when the ceiling is lower than that contained in the body of the report, for example, CIG_002_RY11.	X ³	X ³
Pressure Rising or Falling Rapidly (PRESRR) (PRESFR) (NA LAWRS)	14.40	When the pressure is rising or falling rapidly at the time of the observation, the remark Pressure Rising Rapidly (PRESRR) or Pressure Falling Rapidly (PRESFR) must be included.	X	X
Sea-Level Pressure (SLPppp) (SLPNO) (NA LAWRS)	14.41	At stations with automated systems with SPECI capability and manual stations, this remark begins with SLP and is coded using the tens, units, and tenths of sea-level pressure in hectopascals, for example, SLP982. If sea-level pressure would normally be reported, but is not available, the remark is coded SLPNO.	X	

Remarks Section of Observation				
Element	Paragraph	Brief Description	METAR	SPECI
Aircraft Mishap (ACFT_MSHP)	14.42	If a report was taken to document weather conditions when notified of an aircraft mishap, the remark ACFT MSHP is included in the report, but is not transmitted. This is indicated by putting the remark in parenthesis in the record.	X	X
No SPECI Reports Taken (NOSPECI)	14.43	At staffed stations where SPECI reports are not taken, the remark NOSPECI must indicate that no changes in weather conditions will be reported until the next METAR report.	X ²	
Snow Increasing Rapidly (SNINCR_(ii)/(ii)) (NA LAWRS or sites not listed in Appendix F)	14.44	Report SNINCR if snow depth increases by 0.5 inch to the nearest whole inch or more in the past hour, followed by amounts. The remark SNINCR is followed by the depth of increase in the last hour, a solidus, and the total depth of snow on the ground at the time of the report. For example, a snow depth increase of 2 inches in the past hour with a total depth on the ground of 10 inches would be coded "SNINCR 2/10".	X	
Other Significant Information (Plain Language)	14.45	Other significant information important to operations, such as information on fog dispersal operations, runway conditions, or "Last" report from location, etc.	X	X
Group 2-Additive and Automated Maintenance Data				
Hourly Precipitation Amount (Prrrr) (NA LAWRS)	14.48	At automated stations this remark is included in METAR reports for the water equivalent of all precipitation that has occurred since the last METAR coded in hundredths of an inch, for example, P0009 indicates 9/100 ^{ths} of an inch of precipitation in the past hour.	X	
1-, 3- and 6-Hourly Ice Accretion Amount, I1nnn, I3nnn, I6nnn (NA LAWRS)	14.49	At automated stations with a freezing rain sensor, this remark is included in METAR/SPECI reports for the ice accretion amount that has occurred in hundredths of an inch during the last 1-hour (I1nnn), 3-hour (I3nnn), and 6-hour (I6nnn) period. No manual backup is required.	X	X
3- and 6-Hourly Precipitation Amount, 6RRRR/ (NA LAWRS)	14.50	At stations equipped with automated systems with SPECI capability and Manual stations, this remark is included in 3 and 6-hourly observations; encoded in inches, using tenths, and hundredths, of the amt.	X	

Remarks Section of Observation				
Element	Paragraph	Brief Description	METAR	SPECI
		2.17 inches of precipitation would be encoded as 60217. When an indeterminable amount of precipitation has occurred, the 6RRRR group is coded 6////. Note: Automated systems with SPECI capability automatically report this data.		
24-Hour Precipitation, 7R ₂₄ R ₂₄ R ₂₄ R ₂₄ (NA LAWRS)	14.51	Included in the 1200 UTC observation if more than a trace of precipitation has fallen in past 24 hours. It is coded using the tens, units, tenths, and hundredths of inches, for example, 1.25 inches would be coded 70125.	X	
Depth of Snow on the Ground, 4/sss (NA LAWRS)	14.52	At stations listed in Appendix F, the total snow depth on ground group is coded in the 0000, 0600, 1200, and 1800 UTC observations whenever there is more than a trace of snow on the ground, for example, a snow depth of 21 inches would be coded as "4/021".	X	
Water Equivalent of Snow on Ground (933RRR) (NA LAWRS)	14.53	At manual stations, this group is reported in the 1800UTC report if average snow depth is 2 inches or more. 933 is the code indicator for the water equivalent of snow on the ground. RRR represents the water equivalent of snow on the ground reported in tens, units and tenths of inches using 3 digits, for example, water equivalent of 3.6 inches would be 933036.	X	
Hourly Temperature and Dew Point T _s T'T'T's _n T'dT'dT'd (NA LAWRS)	14.54	At automated stations except AWOS-A, this element is used to report temperature and dew point to the tenth of a degree Celsius. T identifies the group, the s _n the sign of the temperature - coded as 1 if the value is below 0 degrees Celsius and 0 if the value is 0 degrees Celsius or higher. T' T' T' is the temperature in tens, units, and tenths of degrees and T'dT'dT'd is the dew point in tens, units and tenths of degrees, for example, a temperature of 2.6 and dew point of -1.5 would be coded in the body as 03/M01 and in remarks as T00261015. If the dew point is missing, report the temperature, if the temperature is missing, do not report either.	X	

Remarks Section of Observation				
Element	Paragraph	Brief Description	METAR	SPECI
6-Hour Maximum Temperature, 1s _n T _x T _x T _x (NA LAWRS)	14.55	Report the maximum temperature in the past 6-hours in tenths of degrees Celsius using 3 digits, where the 1 identifies the maximum temperature group, the s _n the sign of the temperature - coded as 1 if the value is below 0 degrees Celsius and 0 if the value is 0 degrees Celsius or higher. The T _x T _x T _x must be the maximum temperature during the last 6 hours, for example, a temperature of 1.0 degrees Celsius is coded as 10010, a maximum temperature of -2.1 degrees Celsius is coded 11021.	X	
6 Hour Minimum Temperature, 2s _n T _n T _n T _n (NA LAWRS)	14.56	Report the minimum temperature in the past 6-hours in tenths of degrees Celsius using 3 digits where the 2 identifies the minimum temperature group, the s _n the sign of the temperature - coded as 1 if the value is below 0 degrees Celsius and 0 if the value is 0 degrees Celsius or higher. The T _n T _n T _n must be the minimum temperature during the last 6 hours, for example, a temperature of -2.1 degrees Celsius is coded as 21021, a minimum temperature of 1.2 degrees Celsius is coded 20012.	X	
24-Hour Maximum and Minimum Temperature, 4s _n T _x T _x T _x s _n T _n T _n T _n (NA LAWRS)	14.57	Reported at midnight (LST); the maximum and minimum temperatures for the day coded in tenths of degrees Celsius using 3 digits where the 4 identifies the maximum/minimum temperature group, the s _n the sign of the temperature - coded as 1 if the value is below 0 degrees Celsius and 0 if the value is 0 degrees Celsius or higher. For example, a 24-hour maximum temperature of 10.0 degrees Celsius and a 24-hour minimum temperature of -1.5 degrees Celsius is coded 401001015.	X	

Remarks Section of Observation				
Element	Paragraph	Brief Description	METAR	SPECI
Pressure Tendency, 5appp (NA LAWRS)	14.58	At equipped automated stations, include in 3 and 6-hourly observations where the 5 identifies the pressure tendency group, the a represents the character of pressure change over the past 3 hours, and ppp is the change in pressure in the past 3 hours. The ppp is coded based on the absolute value of the change of either the station pressure or the altimeter in the past 3 hours coded in tenths of hectopascals and using the tens, units, and tenths digits, for example, a steady increase of 3.2 hectopascals in the past 3 hours would be coded 52032.	X	
Sensor Status Indicators	14.59	At equipped automated stations: When automated stations are equipped with a precipitation identifier and that sensor is not working, the remark PWINO is included. When the tipping bucket rain gauge is not operating at an automated station equipped with the device, PNO is included in remarks. When automated stations are equipped with a Freezing Rain Sensor and it is not working, the remark FZRANO is included. When automated stations are equipped with a lightning detection system and that sensor is not working, the remark TSNO is included. At an automated station, when the secondary visibility sensor is not working, VISNO_(LOC) is included, and when the cloud height indicator is not working CHINO_(LOC) is included.	X	
Maintenance Indicator	14.60	A maintenance indicator sign, \$, is included when an ASOS/AWSS detects that maintenance is needed on the system.	X	X
X – Indicates elements included at all stations A – Indicates elements that are at service level A (where so equipped) B – Indicates elements that are at service level B (where so equipped) ² Report if precipitation caused the SPECI. ³ At stations equipped with meteorological discontinuity sensors.				

3.11 Criteria for SPECI Observations.

f. Precipitation.

- (1) Hail (including small hail) begins or ends.

Table 6-6: Backup and Augmentation Weather and Obscurations

PHENOMENON OBSERVED	REPORT (NOTATION)	PHENOMENON OBSERVED	REPORT (NOTATION)
Tornado	+FC (in body); TORNADO (in remarks)	Snow Pellets	GS
Funnel Cloud	FC (in body); FUNNEL CLOUD (in remarks)	Volcanic Ash	VA
Waterspout	+FC (in body); WATER- SPOUT (in remarks)	Fog (Vsby <5/8)	FG
Thunderstorm	TS	Mist (Vsby ≥ 5/8)	BR
Rain	RA	Shallow (ground) Fog	MIFG
Rain Shower	Report RA for automated systems with SPECI capability	Patchy Fog	BCFG
Drizzle	DZ	Freezing Fog	FZFG
Freezing Rain	FZRA	Blowing Snow	BLSN
Freezing Drizzle	FZDZ	Haze	HZ
Ice Crystals	Report SN for automated systems with SPECI capability	Smoke	FU
Ice Pellets	PL	Squalls	SQ
Ice Pellet Showers	Report PL for automated systems with SPECI capability	Dust	DU
Hail	GR		
Snow	SN		
Snow Showers	Report SN for automated systems with capability		
Snow Grains	Report SN for automated systems with SPECI capability		

10.2 Precipitation.

c. Frozen Precipitation. Frozen precipitation is any form of precipitation that reaches the ground in solid form. Types of frozen precipitation are:

(2) Snow Pellets (GS). Snow pellets are defined as white, opaque grains of ice. The pellets are round or sometimes conical. Diameters range from about 0.08 to 0.2 inch (2 to 5 mm). Snow pellets are brittle and easily crushed. When they fall on hard ground, they bounce and often break up.

(4) Hail (GR). Hail is precipitation in the form of small balls or other pieces of ice falling separately or frozen together in irregular lumps. Hailstones consist of alternate opaque and clear layers of ice in most cases. When small hail less than 1/4 inch in size, is occurring GR is reported in the body of the report and the hailstone size is reported in Remarks as “GR LESS THAN 1/4”.

Table 10-1: Present Weather

Qualifier		Weather Phenomena		
Intensity or Proximity 1	Descriptor 2	Precipitation 3	Obscuration 4	Other 5
- Light	MI Shallow	DZ Drizzle	BR Mist	PO Well-Developed
Moderate ¹	PR Partial	RA Rain	FG Fog	Dust/Sand Whirls
+ Heavy	BC Patches	SN Snow	FU Smoke	SQ Squalls
VC In the Vicinity ²	DR Low Drifting	SG Snow Grains	VA Volcanic Ash	FC Funnel Cloud
	BL Blowing	IC Ice Crystals	DU Widespread	Tornado ³
	SH Showers	PL Ice Pellets	Dust	Waterspout ³
	TS Thunderstorm	GR Hail	SA Sand	SS Sandstorm
	FZ Freezing	GS Snow Pellets	HZ Haze	DS Duststorm
		UP Unknown	PY Spray	
		Precipitation ⁴		
General Note: The weather groups must be constructed by considering columns 1 to 5 in sequence, that is, intensity, followed by description, followed by weather phenomena, for example, heavy rain shower(s) is coded as +SHRA. ¹ To denote moderate intensity, no entry or symbol is used. ² See Paragraph 10.7 for vicinity definition and paragraph 14.14.a(2) for usage. ³ Tornadoes and waterspouts are coded as +FC. ⁴ "UP" is only used by automated weather observing systems.				

10.11. Determining the Character of Precipitation. The observer must use the definitions in this section to determine the character of precipitation.

c. Showery. Abrupt changes in precipitation intensity, or the precipitation starts and stops abruptly. The SH code must only be appended to rain (RA), snow (SN), ice pellets (PL), snow pellets (GS), or hail (GR), for example, SHRA, SHSN, SHPL, SHGS, SHGR.

10.13 Intensity of Snow, Snow Pellets, Snow Grains, Drizzle, and Freezing Drizzle. If any one of these phenomena occurs alone, Table 10 5: Intensity of Snow or Drizzle Based on Visibility, must be used to determine intensity on the basis of prevailing visibility. If occurring with other precipitation or obscurations, the intensity assigned must be no greater than that determined using visibility criteria if any of the above were occurring alone. With or without other obscuring phenomena, heavy snow (+SN) must not be reported if the visibility is greater than 1/4 mile and moderate snow (SN) must not be reported if the visibility is greater than 1/2 mile.

Note: Due to ASOS/AWOS-C software limitations, intensity for GS must be manually encoded into the RMK section as “GS LGT”, “GS MOD”, or “GS HVY”. Reporting of the intensity of GS will revert to the conventional method for precipitation intensity when ASOS upgrades are implemented (projected for October 2020).

10.30 Reporting Hail. Hail must be reported in an observation whenever it begins or ends, and in all observations taken while it is occurring. Times of beginnings and endings must be included in the remarks section (NA LAWRS). All observations concerning standard hail (GR) must report the diameter of the largest hailstones in the remarks section in 1/4 inch increments (NA LAWRS). No intensity must be assigned to hail. The format for reporting hail is given in Paragraph 0, 14. 33 Hailstone Size (GR_[size]). Hail less than 1/4 inch in size is coded in Remarks as "GR LESS THAN 1/4".

14.14 Present Weather Group (w'w')

b. Intensity or Proximity Qualifier.

(1) Intensity is coded with all precipitation types, except ice crystals (IC) and hail (GR), including those associated with a thunderstorm (TS) and those of a showery nature (SH). No intensity must be ascribed to the obscurations of blowing dust (BLDU), blowing sand (BLSA), blowing snow (BLSN), blowing spray (BLPY), well-developed dust/sand whirls (PO), or squalls (SQ). Tornadoes or waterspouts are coded using the indicator +, for example, "+FC", while a funnel cloud must always be coded "FC". Only moderate or heavy intensity must be ascribed to sandstorm (SS) and Dust storm (DS). Due to ASOS/AWOS-C software limitations, intensity for GS must be manually encoded into the RMK section as "GS LGT", "GS MOD", or "GS HVY". Reporting of the intensity of GS will revert to the conventional method for precipitation intensity when ASOS upgrades are implemented (projected for October 2020).

(2) The proximity qualifier for vicinity, VC (weather phenomena observed in the vicinity of but not at the point of observation), must only be coded in combination with thunderstorm (TS), fog (FG), shower(s) (SH), well-developed dust/sand whirls (PO), blowing dust (BLDU), blowing sand (BLSA), blowing snow (BLSN), sandstorm (SS), and dust storm (DS). VCTS is only used when lightning is detected by an automated sensor. Intensity qualifiers must not be coded with VC. VCFG is coded to report any type of fog in the vicinity of the point(s) of observation. Precipitation not occurring at the point of observation but within 10 statute miles is coded as showers in the vicinity (VCSH).

c. Descriptor Qualifier.

(3) The descriptor shower(s) (SH) is coded only with one or more of the precipitation types of rain (RA), snow (SN), ice pellets (PL), snow pellets (GS), or hail (GR). The SH descriptor indicates showery-type precipitation. When showery-type precipitation is coded with VC (VCSH), the intensity and type of precipitation must not be coded.

(4) The descriptor thunderstorm (TS) may be coded by itself, that is, a thunderstorm without associated precipitation, or it may be coded with the precipitation types of rain (RA), snow (SN), ice pellets (PL), snow pellets (GS), or hail (GR). For example, a thunderstorm with snow and snow pellets would be coded as "TSSNGS". TS must not be coded with SH.

d. Precipitation.

(2) Hail (including small hail) is coded as GR.

Table 14-4: Present Weather

Qualifier		Weather Phenomena		
Intensity or Proximity 1	Descriptor 2	Precipitation 3	Obscuration 4	Other 5
- Light	MI Shallow	DZ Drizzle	BR Mist	PO Well-Developed Dust/Sand Whirls
Moderate ¹	PR Partial	RA Rain	FG Fog	SQ Squalls
+ Heavy	BC Patches	SN Snow	FU Smoke	FC Funnel Cloud
VC In the Vicinity ²	DR Low Drifting	SG Snow Grains	VA Volcanic Ash	Tornado ³
	BL Blowing	IC Ice Crystals	DU Widespread Dust	Waterspout ³
	SH Shower(s)	PL Ice Pellets	SA Sand	SS Sandstorm
	TS Thunderstorm	GR Hail	HZ Haze	DS Duststorm
	FZ Freezing	GS Snow Pellets	PY Spray	
		UP Unknown Precipitation		
<p>The weather groups must be constructed by considering columns 1 to 5 in this table and in sequence, that is, intensity, followed by description, followed by weather phenomena; for example, heavy rain shower(s) is coded as +SHRA.</p> <p>¹ To denote moderate intensity, no entry or symbol is used.</p> <p>² See Paragraph 10.7 for vicinity definition and Paragraph 14.14.a(2) for usage.</p> <p>³ Tornadoes and waterspouts are coded as +FC.</p> <p>Note: The automated systems do not accept the SH entry.</p>				

14. 33 Hailstone Size (GR_[size]). At augmented automated stations and at manual stations the hailstone size is coded in the above format where GR is the remark identifier and [size] is the diameter of the largest hailstone, coded in 1/4 inch increments. When the largest hailstone observed is 1/4 inch or more in diameter, it is coded with the contraction GR. Hail less than 1/4 inch in size is coded in Remarks as “GR LESS THAN 1/4”.

EXAMPLE-

Largest hailstones 1 3/4 inches in diameter: GR 1 3/4 or GR Less than 1/4

Appendix A. ABBREVIATIONS AND ACRONYMS

GS	snow pellets
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E.2 Notations for Reporting Weather Phenomena

NOTATIONS FOR REPORTING WEATHER PHENOMENA					
QUALIFIER					
Intensity or Proximity					
-	Light	no sign	Moderate	+	Heavy

VC	In the Vicinity									
<u>Descriptor</u>										
MI	Shallow	PR	Partial	BC	Patches	DR	Low Drifting			
BL	Blowing	SH	Shower(s)	TS	Thunderstorm	FZ	Freezing			
WEATHER PHENOMENA										
<u>Precipitation</u>										
DZ	Drizzle	RA	Rain	SN	Snow	SG	Snow Grains			
IC	Ice Crystals	PL	Ice Pellets	GR	Hail	GS	Snow Pellets			
UP	Unknown Precipitation (auto; no intensity)									
<u>Obscuration</u>										
BR	Mist	FG	Fog	FU	Smoke	VA	Volcanic Ash			
DU	Widespread Dust	SA	Sand	HZ	Haze	PY	Spray			
<u>Other</u>										
PO	Well Developed Dust/Sand Whirls	SQ	Squalls	FC	Funnel Cloud(s) (Tornado, or Waterspout)	SS	Sandstorm			
DS	Duststorm									
REPORTABLE CONTRACTIONS FOR SKY COVER						REPORTING OF LAYERS AUTOMATED STATIONS				
Reportable Contraction	Meaning	Summation Amount of Layer	Priority	Layer Description						
VV	Vertical Visibility	8/8	1	lowest few layer						
SKC or CLR	Clear	0	2	lowest broken layer						
FEW	Few	less than 1/8 to 2/8	3	overcast layer						
SCT	Scattered	3/8 to 4/8	4	lowest scattered layer						
BKN	Broken	5/8 to less than 8/8	5	second lowest scattered layer						
OVC	Overcast	8/8	6	second lowest broken layer						
SKC is reported at manual stations when no clouds are observed.			7	highest broken layer						
CLR is reported at automated stations when no clouds are detected at or below 12000 feet.			8	highest scattered layer						
REPORTABLE VISIBILITY VALUES -- Automated			REPORTABLE VISIBILITY VALUES -- Manual							
M1/4, 1/4, 1/2, 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/2, 3, 4, 5, 6, 7, 8, 9, 10			0, 1/16, 1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 1 1/8, 1 1/4, 1 3/8, 1 1/2, 1 5/8, 1 3/4, 1 7/8, 2, 2 1/4, 2 1/2, 2 3/4, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 20, 25, 30, 35, 40, etc., in 5 mile increments.							
FORMAT AND ORDER OF CODED REMARKS -- Times of Transmission			00	03	06	09	12	15	18	21
Synoptic Cloud Types, 8/C _L C _M C _H (manual)			X	X	X	X	X	X	X	X
Snow Increasing Rapidly SNINCR [inches/hr]/[inches on ground] (manual)			Hourly							
Depth of Snow on the Ground, 4/sss (manual)			X ¹		X ¹		X ¹		X ¹	
Water Equivalent of Snow on the Ground, 933RRR (manual)									X	
Duration of Sunshine, 98mmm (manual)			0800 UTC							
Hourly Precipitation Amount, Prrrr (automated stations only)			Hourly							
6-Hour Precipitation Amount, 6RRRR			X ³	X ⁴	X ³	X ⁴	X ³	X ⁴	X ³	X ⁴
FORMAT AND ORDER OF CODED REMARKS -- Times of Transmission			00	03	06	09	12	15	18	21
24-Hour Precipitation Amount, 7R ₂₄ R ₂₄ R ₂₄ R ₂₄							X			
Hourly Temperature and Dew Point, Ts _n T _a T _a T _a S _n T _a T _a T _a			Hourly							
6-Hour Maximum Temperature, 1s _n T _x T _x T _x			X		X		X		X	
6-Hour Minimum Temperature, 2s _n T _n T _n T _n			X		X		X		X	
24-Hour Maximum/Minimum Temperature, 4s _n T _x T _x T _x S _n T _n T _n T _n			Midnight Local Standard Time (LST)							
Pressure Tendency, 5appp			X	X	X	X	X	X	X	X

¹ included whenever there is more than a trace of snow on the ground³ 6-hour precipitation amount⁴ 3-hour precipitation amount

E.3 Key to Decode METAR/SPECI Observations

KEY TO DECODE METAR/SPECI OBSERVATIONS		
METAR KABC 121755Z AUTO 21016G24KT 180V240 1SM R11/P6000FT -RA BR BKN015 OVC025 06/04 A2990 RMK AO2 PK WND 20032/25 WSHFT 1715 VIS 3/4V1 1/2 VIS 3/4 RWY11 RAB07 CIG 013V017 CIG 017 RWY11 PRESFR SLP125 P0003 60009 T00640036 10066 21012 58033 TSNO \$		
TYPE OF REPORT	METAR: hourly (scheduled) report; SPECI: special (unscheduled) report.	METAR
STATION IDENTIFIER	Four alphabetic characters; ICAO location identifier.	KABC
DATE/TIME	All dates and times in UTC using a 24-hour clock; two-digit date and four-digit time; always appended with <u>Z</u> to indicate UTC.	121755Z
REPORT MODIFIER	Fully automated report, no human intervention; removed when observer signed-on.	AUTO
WIND DIRECTION AND SPEED	Direction to nearest ten degrees from true north (first three digits); next two digits: speed in whole knots; as needed <u>G</u> usts (character) followed by maximum observed speed; always appended with <u>KT</u> to indicate knots; 00000KT for calm; if direction varies by 60° or more a <u>V</u> ariable wind direction group is reported.	21016G24KT 180V240
VISIBILITY	Prevailing visibility in statute miles and fractions (space between whole miles and fractions); always appended with <u>SM</u> to indicate statute miles; values <1/4 reported as M1/4.	1SM
RUNWAY VISUAL RANGE	10-minute RVR value in hundreds of feet; reported if prevailing visibility is ≤ one mile or RVR ≤ 6000 feet; always appended with <u>FT</u> to indicate feet; value prefixed with <u>M</u> or <u>P</u> to indicate value is lower or higher than the reportable RVR value.	R11/P6000FT
WEATHER PHENOMENA	RA: liquid precipitation that does not freeze; SN: frozen precipitation other than hail; UP: precipitation of unknown type; intensity prefixed to precipitation: light (-), moderate (no sign), heavy (+); FG: fog; FZFG: freezing fog (temperature below 0°C); BR: mist; HZ: haze; SQ: squall; maximum of three groups reported; augmented by observer: FC (funnel cloud/tornado/waterspout); TS (thunderstorm); PL (ice pellets); GR (hail); GS (snow pellets); FZRA (intensity; freezing rain); VA (volcanic ash).	-RA BR
SKY CONDITION	Cloud amount and height: CLR (no clouds detected below 12000 feet); FEW (few); SCT (scattered); BKN (broken); OVC (overcast); followed by 3-digit height in hundreds of feet; or vertical visibility (<u>VV</u>) followed by height for indefinite ceiling.	BKN015 OVC025
TEMPERATURE/DEW POINT	Each is reported in whole degrees Celsius using two digits; values are separated by a solidus; sub-zero values are prefixed with an <u>M</u> (minus).	06/04
ALTIMETER	Altimeter always prefixed with an <u>A</u> indicating inches of mercury; reported using four digits: tens, units, tenths, and hundredths.	A2990

E.4 Weather Phenomena Matrix

The shaded blocks indicate which qualifiers and weather phenomena are not accepted by the ASOS and AWOS C software for the present weather field.

WX PHENOMENA		QUALIFIER											
Precipitation		Intensity or Proximity				Descriptor ¹							
		Light -	Moderate	Heavy +	Vicinity VC ²	Shallow MI	Partial PR	Patches BC	Low Drifting DR ³	Blowing BL	Shower(s) SH	Thunder storm TS ⁴	Freezing FZ
Drizzle	DZ	-DZ	Drizzle	+DZ	-	-	-	-	-	-	-	-	FZDZ
Rain	RA	-RA	RA	+RA	-	-	-	-	-	-	SHRA	TSRA	FZRA
Snow	SN	-SN	SN	+SN	-	-	-	-	DRSN	BLSN	SHSN	TSSN	-
Snow Grains	SG	-SG	SG	+SG	-	-	-	-	-	-	-	-	-
Ice Crystals ⁵	IC	-	IC	-	-	-	-	-	-	-	-	-	-
Ice Pellets	PL	-PL	PL	+PL	-	-	-	-	-	-	SHPL	TSPL	-
Hail ^{5,6}	GR	-	GR	-	-	-	-	-	-	-	SHGR	TSGR	-
Snow pellets ⁷	GS	-	GS	-	-	-	-	-	-	-	SHGS	TSGS	-
Unknown Precipitation	UP	Automated Stations Only – No Intensity											
Thunderstorms, Showers, Freezing, and their Intensity or Proximity													
Indicator													
TS	-	-	TS	-	VCTS ⁸	-	-	-	-	-	-	-	-
TSRA	-	-TSRA	TSRA	+TSRA	-	-	-	-	-	-	-	-	-
TSSN	-	-TSSN	TSSN	+TSSN	-	-	-	-	-	-	-	-	-
TSPL	-	-TSPL	TSPL	+TSPL	-	-	-	-	-	-	-	-	-
TSGS	-	-	TSGA	-	-	-	-	-	-	-	-	-	-
SH	-	-	-	-	VCSH ⁹	-	-	-	-	-	-	-	-
SHRA	-	-SHRA	SHRA	+SHRA	-	-	-	-	-	-	-	-	-
SHSN	-	-SHSN	SHSN	+SHSN	-	-	-	-	-	-	-	-	-
SHPL	-	-SHPL	SHPL	+SHPL	-	-	-	-	-	-	-	-	-
SHGR	-	-	SHGR	-	-	-	-	-	-	-	-	-	-
SHGS	-	-	SHGS	-	-	-	-	-	-	-	-	-	-
FZDZ	-	-FZDZ	FZDZ	+FZDZ	-	-	-	-	-	-	-	-	-
FZRA	-	-FZRA	FZRA	+FZRA	-	-	-	-	-	-	-	-	-
FZFG													
Obscurements													
Mist ¹⁰	BR	-	BR10	-	-	-	-	-	-	-	-	-	-
Fog ¹¹	FG	-	FG ¹¹	-	VCFG ¹²	MIFG ¹³	PRFG ¹⁴	BCFG ¹⁵	-	-	-	FZFG ¹⁶	-
Smoke	FU	-	FU	-	-	-	-	-	-	-	-	-	-
Volcanic Ash ¹⁷	VA	-	VA ¹⁷	-	-	-	-	-	-	-	-	-	-
Widespread Dust	DU	-	DU	-	-	-	-	-	DRDU	BLDU	-	-	-
Sand	SA	-	SA	-	-	-	-	-	DRSA	BLSA	-	-	-
Haze	HZ	-	HZ	-	-	-	-	-	-	-	-	-	-
Spray	PY	-	-	-	-	-	-	-	-	BLPY	-	-	-
Blowing Phenomena													
BLSN ¹⁸	-	-	BLSN	-	VCBLSN	-	-	-	-	BLSN	-	-	-
BLSA	-	-	BLSA	-	VCBLSA	-	-	-	-	BLSA	-	-	-
BLDU	-	-	BLDI	-	VCBLDU	-	-	-	-	BLDU	-	-	-
Other													
Sand/ Dust Whirls	PO	-	PO	-	VCPO	-	-	-	-	-	-	-	-
Squalls ¹⁹	SQ	-	SQ	-	-	-	-	-	-	-	-	-	-
Funnel Cloud	FC	-	FC	-	-	-	-	-	-	-	-	-	-
Tunnel/ Waterspout	+FC	-	-	+FC	-	-	-	-	-	-	-	-	-
Sandstorm ²¹	SS	-	SS	+SS	VCSS	-	-	-	-	-	-	-	-

WX PHENOMENA		QUALIFIER											
Precipitation		Intensity or Proximity				Descriptor ¹							
		Light -	Moderate	Heavy +	Vicinity VC ²	Shallow MI	Partial PR	Patches BC	Low Drifting DR ³	Blowing BL	Shower(s) SH	Thunder storm TS ⁴	Freezing FZ
Duststorm ²²	DS	-	DS	+DS	VCDS	-	-	-	-	-	-	-	-

¹ Only 1 descriptor must be included for each weather phenomena group, for example, BCFG. Only 2 exceptions exist to this rule: VCSH and VCTS.

² Vicinity is defined as >0SM (not at point of observation) to 10SM of the point of observation for precipitation. Other than precipitation (VCFG, VCBLN, VCBLA, VCBLDU, VCPO, VCSS, VCDS), vicinity is 5SM to 10SM.

³ Raised by wind to less than 6 feet above the ground.

⁴ TS may be reported by itself if no precipitation is associated with the thunderstorm.

⁵ No intensity is ever given to hail (GR) or ice crystals (IC).

⁶ Hailstone size is coded in Remarks in 0.25 increments. Small Hail less than 0.25 inches is coded in Remarks as "Less than ¼"

⁷ - Snow Pellets Intensity is Reported in Remarks as "GS LGT, GS MOD or GS HVY" until software is upgraded.

⁸ - VCTS must only be used when lightning is detected by an automated sensor. Not a manual entry. If thunder is heard, TS must be reported.

⁹ - Showers (SH), when associated with the indicator VC, the type and intensity of the showery precipitation must not be specified, that is, +VCSHRA is not allowed; only VCSH would be reported. VCSH must be used to report any type of precipitation not at point of observation, but >0 to 10SM.

¹⁰ BR (mist) must only be used when the visibility is at least 5/8SM, but not more than 6SM.

¹¹ For FG (fog) to be reported without the qualifiers VC¹², MI¹³, PR¹⁴, or BC¹⁵ the visibility must be less than 5/8 SM.

¹² VC is used to report any type of fog observed in the vicinity (5-10SM) of the station.

¹³ MIFG (shallow fog) to be reported, the visibility at 6 feet above ground level must be 5/8SM or more and the apparent visibility in the fog layer must be less than 5/8SM.

¹⁴ PRFG (partial fog) indicates that a substantial part of the station is covered by fog while the remainder is clear of fog.

¹⁵ BCFG (patches fog) indicates that patches of fog randomly cover the station.

¹⁶ FZFG is any fog consisting predominately of water droplets at temperatures below 0°C and visibility less than 5/8 statute miles, whether it is depositing rime or not.

¹⁷ Volcanic Ash is always reported in the body of the METAR/SPECI when present. Visibility is not a factor.

¹⁸ SN BLSN indicates snow falling from clouds with blowing snow occurring. If the observer cannot determine whether or not snow is also falling from clouds, then only BLSN must be reported.

¹⁹ SQ (squall) is a sudden increase in wind speed of at least 16 knots, the speed rising to 22 knots or more and lasting for at least one minute.

²⁰ Tornadoes and Waterspouts must be reported using the indicator "+," that is, +FC.

²¹ SS (sandstorm) reported if the visibility is $\geq 5/16$ SM and $\leq 5/8$ SM. Report +SS if the visibility is $< 5/16$ SM.


²² DS (duststorm) reported if the visibility is $\geq 5/16$ SM and $\leq 5/8$ SM. Report +DS if the visibility is $< 5/16$ SM.

No more than three weather groups must be used to report weather phenomena at or near the station. If more than one significant weather phenomena is observed, separate weather phenomena groups must be included in the report. If more than one form of precipitation is observed, the appropriate abbreviations must be combined in a single group with the dominant type of precipitation being reported first. In such a single group, the intensity must refer to the first type of precipitation reported, for example, -RASN FG HZ.

Appendix G. GLOSSARY

ice pellets: Hard grains of ice consisting of frozen raindrops or largely melted and refrozen snowflakes. Precipitation of transparent or translucent pellets of ice, which are round or irregular, rarely conical, and which have a diameter of 0.2 inch (5 mm), or less.

Frozen Precipitation. Any form of precipitation that reaches the ground in solid form (snow, snow pellets, snow grains, hail, ice pellets, and ice crystals).

A handwritten signature in blue ink that reads "Jeffrey Vincent". The signature is fluid and cursive, with the first name "Jeffrey" and last name "Vincent" clearly legible.

Jeffrey Vincent
Vice President, Air Traffic Services
Air Traffic Organization