

Section 6. Weather Information

2-6-1. FAMILIARIZATION

Become familiar with pertinent weather information when coming on duty, and stay aware of current weather information needed to perform ATC duties.

2-6-2. HAZARDOUS INFLIGHT WEATHER ADVISORY SERVICE (HIWAS)

Controllers must advise pilots of hazardous weather that may impact operations within 150 NM of their sector or area of jurisdiction. Hazardous weather information contained in HIWAS broadcasts includes Airmen's Meteorological Information (AIRMET), Significant Meteorological Information (SIGMET), Convective SIGMET (WST), Urgent Pilot Weather Reports (UUA), and Center Weather Advisories (CWA). Facilities must review alert messages to determine the geographical area and operational impact for hazardous weather information broadcasts. The broadcast is not required if aircraft on your frequency(s) will not be affected.

a. Controllers within commissioned HIWAS areas must broadcast a HIWAS alert on all frequencies, except emergency frequency, upon receipt of hazardous weather information. Controllers are required to disseminate data based on the operational impact on the sector or area of control jurisdiction.

NOTE-

The inclusion of the type and number of weather advisory responsible for the HIWAS advisory is optional.

PHRASEOLOGY-

ATTENTION ALL AIRCRAFT. HAZARDOUS WEATHER INFORMATION (SIGMET, Convective SIGMET, AIRMET, Urgent Pilot Weather Report (UUA), or Center Weather Advisory (CWA), Number or Numbers) FOR (geographical area) AVAILABLE ON HIWAS, FLIGHT WATCH, OR FLIGHT SERVICE FREQUENCIES.

b. Controllers outside of commissioned HIWAS areas must:

1. Advise pilots of the availability of hazardous weather advisories. Pilots requesting additional information should be directed to contact the nearest Flight Watch or Flight Service.

2. Apply the same procedure when HIWAS outlets, or outlets with radio coverage extending into

your sector or airspace under your jurisdiction, are out of service.

PHRASEOLOGY-

ATTENTION ALL AIRCRAFT. HAZARDOUS WEATHER INFORMATION FOR (geographical area) AVAILABLE FROM FLIGHT WATCH OR FLIGHT SERVICE.

c. Terminal facilities have the option to limit hazardous weather information broadcasts as follows: Tower cab and approach control facilities may opt to broadcast hazardous weather information alerts only when any part of the area described is within 50 NM of the airspace under their jurisdiction.

REFERENCE-

AIM, Chapter 7, Section 1, Meteorology, Para 7-1-5 through Para 7-1-9.

2-6-3. PIREP INFORMATION

Significant PIREP information includes reports of strong frontal activity, squall lines, thunderstorms, light to severe icing, wind shear and turbulence (including clear air turbulence) of moderate or greater intensity, volcanic eruptions and volcanic ash clouds, detection of sulfur gases (SO₂ or H₂S) in the cabin, and other conditions pertinent to flight safety.

REFERENCE-

FAAO JO 7110.65, Para 3-1-8 Low Level Wind Shear/Microburst Advisories.

FAAO JO 7210.3, Para 6-3-1, Handling of SIGMETs, CWAs, and PIREPs.

AIM, Para 7-5-9, Flight Operations in Volcanic Ash.

FAAO JO 7210.3, Para 10-3-1, SIGMET and PIREP Handling.

a. Solicit PIREPs when requested or when one of the following conditions exists or is forecast for your area of jurisdiction:

1. Ceilings at or below 5,000 feet. These PIREPs must include cloud base/top reports when feasible.

TERMINAL. Ensure that at least one descent/climb-out PIREP, including cloud base/s, top/s, and other related phenomena, is obtained each hour.

EN ROUTE. When providing approach control services, the requirements stated in TERMINAL above apply.

2. Visibility (surface or aloft) at or less than 5 miles.

3. Thunderstorms and related phenomena.

4. Turbulence of moderate degree or greater.
5. Icing of light degree or greater.
6. Wind shear.
7. Volcanic ash clouds.

NOTE—

Pilots may forward PIREPs regarding volcanic activity using the format described in the Volcanic Activity Reporting Form (VAR) as depicted in the AIM, Appendix 2.

8. Detection of sulfur gases (SO₂ or H₂S), associated with volcanic activity, in the cabin.

NOTE—

The smell of sulfur gases in the cockpit may indicate volcanic activity that has not yet been detected or reported and/or possible entry into an ash-bearing cloud. SO₂ is identifiable as the sharp, acrid odor of a freshly struck match. H₂S has the odor of rotten eggs.

9. **TERMINAL.** Braking Action Advisories are in effect.

REFERENCE—

FAAO JO 7110.65, Para 3–3–5 Braking Action Advisories.
P/CG Term— Braking Action Advisories.

b. Record with the PIREPs:

1. Time.
2. Aircraft position.
3. Type aircraft.
4. Altitude.
5. When the PIREP involves icing include:

(a) Icing type and intensity.

(b) Air temperature in which icing is occurring.

c. Obtain PIREPs directly from the pilot, or if the PIREP has been requested by another facility, you may instruct the pilot to deliver it directly to that facility.

PHRASEOLOGY—

REQUEST/SAY FLIGHT CONDITIONS.

Or if appropriate,

REQUEST/SAY (specific conditions; i.e., ride, cloud, visibility, etc.) CONDITIONS.

If necessary,

OVER (fix),

or

ALONG PRESENT ROUTE,

or

BETWEEN (fix) AND (fix).

d. Handle PIREPs as follows:

1. Relay pertinent PIREP information to concerned aircraft in a timely manner.

2. **EN ROUTE.** Relay all operationally significant PIREPs to the facility weather coordinator.

3. **TERMINAL.** Relay all operationally significant PIREPs to:

(a) The appropriate intrafacility positions.

(b) The FSS serving the area in which the report was obtained.

NOTE—

The FSS is responsible for long line dissemination.

(c) Other concerned terminal or en route ATC facilities, including non-FAA facilities.

(d) Use the word *gain* and/or *loss* when describing to pilots the effects of wind shear on airspeed.

EXAMPLE—

“Delta Seven Twenty-one, a Boeing Seven Twenty-seven, previously reported wind shear, loss of Two Five knots at Four Hundred feet.”

“U.S. Air Seventy-six, a D-C Niner, previously reported wind shear, gain of Twenty-Five knots between Niner Hundred and Six Hundred feet, followed by a loss of Five Zero knots between Five Hundred feet and the surface.”

REFERENCE—

AIM, Para 7–1–24, Wind Shear PIREPs.

2–6–4. WEATHER AND CHAFF SERVICES

a. Issue pertinent information on observed/reported weather and chaff areas by defining the area of coverage in terms of azimuth (by referring to the 12-hour clock) and distance from the aircraft or by indicating the general width of the area and the area of coverage in terms of fixes or distance and direction from fixes.

NOTE—

Weather significant to the safety of aircraft includes such conditions as funnel cloud activity, lines of thunderstorms, embedded thunderstorms, large hail, wind shear,

microbursts, moderate to extreme turbulence (including CAT), and light to severe icing.

REFERENCE-

AIM, Paragraph 7-1-14, ATC Inflight Weather Avoidance Assistance.

PHRASEOLOGY-

WEATHER/CHAFF AREA BETWEEN
(number) O’CLOCK AND (number) O’CLOCK
(number) MILES,

or

(number) MILE BAND OF WEATHER/CHAFF FROM
(fix or number of miles and direction from fix) TO (fix or
number of miles and direction from fix).

b. Inform any tower for which you provide approach control services of observed precipitation on radar which is likely to affect their operations.

c. Use the term “precipitation” when describing radar-derived weather. Issue the precipitation intensity from the lowest descriptor (LIGHT) to the highest descriptor (EXTREME) when that information is available. Do not use the word “turbulence” in describing radar-derived weather.

1. LIGHT.
2. MODERATE.
3. HEAVY.
4. EXTREME.

NOTE-

Weather and Radar Processor (WARP) does not display light intensity.

PHRASEOLOGY-

AREA OF (Intensity) PRECIPITATION BETWEEN
(number) O’CLOCK AND (number) O’CLOCK, (number)
MILES, MOVING (direction) AT (number) KNOTS, TOPS
(altitude). AREA IS (number) MILES IN DIAMETER.

EXAMPLE-

1. “Area of extreme precipitation between eleven o’clock and one o’clock, one zero miles moving east at two zero knots, tops flight level three niner zero.”
2. “Area of heavy precipitation between ten o’clock and two o’clock, one five miles. Area is two five miles in diameter.”
3. “Area of heavy to extreme precipitation between ten o’clock and two o’clock, one five miles. Area is two five miles in diameter.”

REFERENCE-

P/CG Term- Precipitation Radar Weather Descriptions.

d. When precipitation intensity information is not available.

PHRASEOLOGY-

AREA OF PRECIPITATION BETWEEN (number)
O’CLOCK AND (number) O’CLOCK, (number) MILES.
MOVING (direction) AT (number) KNOTS, TOPS
(altitude). AREA IS (number) MILES IN DIAMETER,
INTENSITY UNKNOWN.

EXAMPLE-

“Area of precipitation between one o’clock and three o’clock, three five miles moving south at one five knots, tops flight level three three zero. Area is three zero miles in diameter, intensity unknown.”

NOTE-

Phraseology using precipitation intensity descriptions is only applicable when the radar precipitation intensity information is determined by NWS radar equipment or NAS ground based digitized radar equipment with weather capabilities. This precipitation may not reach the surface.

e. EN ROUTE. When issuing Air Route Surveillance Radar (ARSR) precipitation intensity use the following:

1. Describe the lowest displayable precipitation intensity as MODERATE.
2. Describe the highest displayable precipitation intensity as HEAVY to EXTREME.

PHRASEOLOGY-

AREA OF (Intensity) PRECIPITATION BETWEEN
(number) O’CLOCK AND (number) O’CLOCK, (number)
MILES, MOVING (direction) AT (number) KNOTS, TOPS
(altitude). AREA IS (number) MILES IN DIAMETER.

EXAMPLE-

1. “Area of moderate precipitation between ten o’clock and one o’clock, three zero miles moving east at two zero knots, tops flight level three seven zero.”
2. “Area of moderate precipitation between ten o’clock and three o’clock, two zero miles. Area is two five miles in diameter.”

f. When operational/equipment limitations exist, controllers must ensure that the highest available level of precipitation intensity within their area of jurisdiction is displayed.

g. When requested by the pilot, provide radar navigational guidance and/or approve deviations around weather or chaff areas. In areas of significant weather, plan ahead and be prepared to suggest, upon pilot request, the use of alternative routes/altitudes.

1. An approval for lateral deviation authorizes the pilot to maneuver left or right within the limits of the lateral deviation area.

REFERENCE-

AIM, Paragraph 7-1-14b, 1. (a) ATC Inflight Weather Avoidance Assistance

2. If a pilot enters your area of jurisdiction already deviating for weather, advise the pilot of any additional pertinent weather which may affect his route.

3. If traffic and airspace (i.e., special use airspace boundaries, LOA constraints) permit, combine the approval for weather deviation with a clearance on course.

PHRASEOLOGY-

DEVIATION (restrictions if necessary) APPROVED, WHEN ABLE, PROCEED DIRECT (name of NAVAID/WAYPOINT/FIX)

or

DEVIATION (restrictions if necessary) APPROVED, WHEN ABLE, FLY HEADING (degrees), VECTOR TO JOIN (airway) AND ADVISE.

EXAMPLE-

1. "Deviation twenty degrees right approved, when able proceed direct O'Neill VORTAC and advise."

En Route: The corresponding fourth line entry is "D20R/ONL" or "D20R/F."

2. "Deviation 30 degrees left approved, when able fly heading zero niner zero, vector join J324 and advise."

En Route: In this case the free text character limitation prevents use of fourth line coordination and verbal coordination is required.

4. If traffic or airspace prevent you from clearing the aircraft on course at the time of the approval for a weather deviation, instruct the pilot to advise when clear of weather.

PHRASEOLOGY-

DEVIATION (restrictions if necessary) APPROVED, ADVISE CLEAR OF WEATHER.

EXAMPLE-

"Deviation North of course approved, advise clear of weather."

En Route: In this case the corresponding fourth line entry is "DN," and the receiving controller must provide a clearance to rejoin the route in accordance with paragraph 2-1-15 c.

h. When a deviation cannot be approved as requested because of traffic, take an alternate course of action that provides positive control for traffic resolution and satisfies the pilot's need to avoid weather.

PHRASEOLOGY-

UNABLE DEVIATION, FLY HEADING (heading), ADVISE CLEAR OF WEATHER

or

UNABLE DEVIATION, TURN (number of degrees) DEGREES (left or right) FOR TRAFFIC, ADVISE CLEAR OF WEATHER,

EXAMPLE-

"Unable deviation, turn thirty degrees right vector for traffic, advise clear of weather."

i. When forwarding weather deviation information, the transferring controller must clearly coordinate the nature of the route guidance service being provided. This coordination should include, but is not limited to: assigned headings, suggested headings, pilot-initiated deviations. Coordination can be accomplished by: verbal, automated, or pre-arranged procedures. Emphasis should be made between: controller assigned headings, suggested headings, or pilot initiated deviations.

EXAMPLE-

"(call sign) assigned heading 330 for weather avoidance"

"(call sign) deviating west, pilot requested..."

REFERENCE-

*FAA Order JO 7110.65 2-1-14 Coordinate Use Of Airspace
FAA Order JO 7110.65 5-4-5 Transferring Controller Handoff
FAA Order JO 7110.65 5-4-6 Receiving Controller Handoff
FAA Order JO 7110.65 5-4-10 Prearranged Coordination
FAA Order JO 7110.65 5-4-11 En Route Fourth Line Data Block Usage*

j. En Route Fourth Line Data Transfer

1. The inclusion of a NAVAID, waypoint, or /F in the fourth line data indicates that the pilot has been authorized to deviate for weather and must rejoin the route at the next NAVAID or waypoint in the route of flight.

REFERENCE-

FAA Order JO 7110.65 5-4-11 En Route Fourth Line Data Block Usage

EXAMPLE-

"Deviation twenty degrees right approved, when able proceed direct O'Neill VORTAC and advise." In this case, the corresponding fourth line entry is "D20R/ONL" or "D20R/F."

2. The absence of a NAVAID, waypoint, or /F in the fourth line indicates that:

(a) The pilot has been authorized to deviate for weather only, and the receiving controller must provide a clearance to rejoin the route in accordance with paragraph 2-1-15c.

EXAMPLE-

"Deviation twenty degrees right approved, advise clear of weather."

(b) The free text character limitation prevents the use of fourth line coordination. Verbal coordination is required.

EXAMPLE-

“Deviation 30 degrees left approved, when able fly heading zero niner zero, vector join J324 and advise.”

k. The supervisory traffic management coordinator-in-charge/operations supervisor/controller-in-charge shall verify the digitized radar weather information by the best means available (e.g., pilot reports, local tower personnel, etc.) if the weather data displayed by digitized radar is reported as questionable or erroneous. Errors in weather radar presentation shall be reported to the technical operations technician and the air traffic supervisor shall determine if the digitized radar derived weather data is to be displayed and a NOTAM distributed.

NOTE-

Anomalous propagation (AP) is a natural occurrence affecting radar and does not in itself constitute a weather circuit failure.

2-6-5. CALM WIND CONDITIONS

TERMINAL. Describe the wind as calm when the wind velocity is less than three knots.

REFERENCE-

FAAO JO 7110.65, Para 3-5-3 Tailwind Components.
FAAO JO 7110.65, Para 3-10-4 Intersecting Runway/Intersecting Flight Path Separation.

2-6-6. REPORTING WEATHER CONDITIONS

a. When the prevailing visibility at the usual point of observation, or at the tower level, is less than 4 miles, tower personnel must take prevailing visibility observations and apply the observations as follows:

1. Use the lower of the two observations (tower or surface) for aircraft operations.
2. Forward tower visibility observations to the weather observer.
3. Notify the weather observer when the tower observes the prevailing visibility decrease to less than 4 miles or increase to 4 miles or more.

b. Forward current weather changes to the appropriate control facility as follows:

1. When the official weather changes to a condition which is below 1,000-foot ceiling or below the highest circling minimum, whichever is greater, or less than 3 miles visibility, and when it improves to a condition which is better than those above.

2. Changes which are classified as special weather observations during the time that weather conditions are below 1,000-foot ceiling or the highest circling minimum, whichever is greater, or less than 3 miles visibility.

c. Towers at airports where military turbo-jet en route descents are routinely conducted must also report the conditions to the ARTCC even if it is not the controlling facility.

d. If the receiving facility informs you that weather reports are not required for a specific time period, discontinue the reports. The time period specified should not exceed the duration of the receiving controller’s tour of duty.

e. **EN ROUTE.** When you determine that weather reports for an airport will not be required for a specific time period, inform the FSS or tower of this determination. The time period specified should not exceed the duration of receiving controller’s tour of duty.

REFERENCE-

FAAO JO 7110.65, Para 3-10-2 Forwarding Approach Information by Nonapproach Control Facilities.

2-6-7. DISSEMINATING WEATHER INFORMATION

TERMINAL. Observed elements of weather information must be disseminated as follows:

a. General weather information, such as “large breaks in the overcast,” “visibility lowering to the south,” or similar statements which do not include specific values, and any elements derived directly from instruments, pilots, or radar may be transmitted to pilots or other ATC facilities without consulting the weather reporting station.

b. Specific values, such as ceiling and visibility, may be transmitted if obtained by one of the following means:

1. You are properly certificated and acting as official weather observer for the elements being reported.

NOTE-

USAF controllers do not serve as official weather observers.

2. You have obtained the information from the official observer for the elements being reported.

3. The weather report was composed or verified by the weather station.

4. The information is obtained from an official

Automated Weather Observation System (AWOS) or an Automated Surface Observation System (ASOS).

c. Differences between weather elements observed from the tower and those reported by the weather station must be reported to the official observer for the element concerned.