



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

January 24, 2020

Attachment 10 – Flight Operations Manual [Excerpts]

OPERATIONAL FACTORS

DCA19CA081



FOM

**Flight
Operations
Manual**

Revision 30

Manual Owner: Director of Operations

FAA Accepted

3. Crewmembers at layover points
 - a. If severe weather conditions are anticipated, you will be contacted by a Crew Scheduling representative (time permitting) the night before or in the morning of any irregularity in your schedule.
 - b. If you are aware that severe weather delays may be in effect for the hub you are scheduled to fly to, or if your equipment is/was routed through the affected hub, the PIC will contact Crew Scheduling by phone before leaving the hotel on the day of your departure to the hub.
 - c. The PIC is the representative for the entire crew (again, PICs are required to keep the crew together and coordinate with Crew Scheduling on behalf of entire crew).

8-9.2 **Policy**

- A. It is Compass policy not to operate flights in the proximity of severe or dangerous weather phenomena.
- B. Pilots and dispatchers will keep fully informed on the location and intensity of such phenomena, including ice, hail, thunderstorms, turbulence, volcanic ash, smoke and other similar occurrences, and take appropriate action.
- C. Flight deck crewmembers shall check the aircraft radar (as specified in AOM I) to ensure proper operation prior to flight in conditions requiring its use.

8-9.4 Turbulence Avoidance

- A. Compass policy is to avoid flight in moderate turbulence during cruise phase of flight and avoid occasional severe turbulence and greater in all phases of flight.
- B. There are four (4) levels of turbulence:
 - 1. Light: Small, erratic changes in altitude and/or attitude. Passengers and crew can feel a small strain against the seat belt.
 - 2. Moderate: Changes in altitude and/or attitude occur, but the aircraft stays in positive control at all times. It usually causes variation in the indicated airspeed. Passengers and crew feel a strain against seat belts.
 - 3. Severe: Large, abrupt changes in altitude and/or attitude. It usually causes large variation in the indicated airspeed. Aircraft can be momentarily out of control. Passengers and crew are violently force against the seat belts.
 - 4. Extreme: The aircraft is violently tossed about and it is practically impossible to control it. This can cause structural damage.
- B. Crewmember actions for unexpected turbulence encounters are listed on Table 8.9.1 Unexpected Turbulence Guidelines:

Table 8.9.1 Unexpected Turbulence Guidelines

Turbulence			
Type	Conditions	Flight Crew Response	FA Response
Light	- Coffee shakes but does not splash out of cup. - Carts still maneuverable	- Ensure seat belt sign is "ON." - Via the interphone, advise FA-A of type of turbulence and expected duration of turbulence. - Make PA emphasizing the need for passengers to be seated. (examples below)	- Service may need to be modified or discontinued depending on intensity and duration of turbulence. - Monitor compliance with seat belt sign by visually checking passengers are seated with belts fastened. - FAs may need to secure themselves in jumpseat.
Light or Occasional	- Coffee occasionally splashes out of cup. - Carts are occasionally difficult to maneuver.	- Ensure seat belt sign is "ON." - Via the interphone, advise FA-A of type of turbulence and expected duration of turbulence. - Make PA emphasizing the need for passengers and FAs to be seated and service to be discontinued. (examples below)	- Stop all service. - Stow all carts and galley equipment, time and conditions permitting. - FAs secure themselves in jumpseat as soon as possible using seat belt and shoulder harness (take nearest passenger seat if necessary).
Moderate	- Coffee consistently splashes out of cup. - Carts are difficult to maneuver.	Communicate with FA-A as required.	- FA-A: - Calls other FA to ensure FA-B and the passengers are seated. - Communicates with flight deck on cabin conditions as required.

Table 8.9.1 Unexpected Turbulence Guidelines (continued)

Turbulence			
Type	Conditions	Flight Crew Response	FA Response
Moderate or Occasional Severe	- Items occasionally fall over or lift off surfaces. - Standing is sometimes difficult or impossible without holding on to a part of the aircraft.	- Ensure seat belt sign "ON." - When Operationally Safe to Do So: - Make PA per the examples below. - After conditions subside, make PA to inform FAs and passengers. - Communicate with FA-A as required.	- Stop all service and leave carts with brakes engaged until turbulence is reduced. - FAs secure themselves in nearest available seats. If in jumpseat, use seat belt and shoulder harness. - When safe to do so: - Stow all carts and galley equipment. - FA-A calls other FA to ensure FA-B and the passengers are seated. - Check for injuries or damage. - FA-A will notify flight deck when all secure. - FA-A communicates with flight deck on cabin conditions as required.
Severe or Extreme	- Items fall over or lift from surfaces with consistency. - Standing is impossible without holding on to a part of the aircraft.		

Example PAs:

- 1) Predicted Turbulence: "Ladies and Gentleman, this is your Captain/FO speaking. It looks like we may be experiencing some light/moderate/severe turbulence up ahead [if possible insert timeframe in minutes] so I'm going to turn on the fasten seatbelt sign. [if necessary for light, and always for moderate/severe:] I'm going to ask that our flight attendants discontinue service and take a seat until it is safe to get up. Thank you."
- 2) Experiencing Turbulence: [seatbelt sign off] "Ladies and Gentleman, this is your Captain/FO speaking. We are experiencing Light/Moderate/Severe turbulence so I'm going to turn on the fasten seatbelt sign. Please return to your seats and ensure your seatbelt is fastened. [if necessary for light,

and always for moderate/severe]: I'm also going to ask the flight attendants to discontinue services and take as seat until it is safe to be up. Thank you."

- 3) Experiencing Turbulence [seatbelt sign already on]: "Ladies and Gentleman, this is your Captain/FO speaking, we are experiencing light/moderate/severe turbulence. [if necessary for light, and always for moderate/severe]: I'm also going to ask the flight attendants to discontinue service and take as seat until it is safe to be up. Please take a moment to double check that your seatbelt is fastened."
- 4) Turbulence Remainder of Flight: "Ladies and Gentleman, this is your Captain/FO speaking, it looks like we will be experiencing turbulence for the remainder of the flight. Please remain seated with your seatbelts fastened. For your safety and the safety of our cabin crew, I'm going to ask that our flight attendants discontinue service and prepare the cabin for arrival."

8-9.5 Avoidance of Known Severe Weather

A. Pilot Responsibilities

1. Recent research has proven that all thunderstorms are potentially dangerous and should be avoided. Compass flights will pass at least 20 miles (preferably upwind) from known thunderstorms and reported or sighted volcanic ash or dense smoke from volcanic action or forest fires. In the case of thunderstorms, the pilot-in-command may be able to determine from radar indications and/or his observations that passage at a closer distance is safe.
2. No Compass flight will take off or land if a thunderstorm is occurring within the airport boundary (within 5 SM of the airport center).
3. Forward reports to ATC and System Control of any severe weather encountered, giving nature, location, route, altitude and intensity.
4. Initiate requests to avoid severe weather activity as soon as possible, being specific concerning route and altitude desired. Pilots are reminded to review the Compass policy

and procedures in this manual and AOM I pertaining to thunderstorm avoidance and use of SIGMETs.

5. Adjust speed as necessary to maintain adequate control of aircraft in turbulent air and advise ATC as soon as possible. Comply with the AOM procedures for flight in turbulence.
6. Do not rely completely on air traffic controllers to provide information or to initiate radar vectors to aircraft for avoidance of severe weather, particularly when arriving and departing terminals or in holding patterns.
7. Proper and timely use of weather radar controls in accordance with the AOM (tilt, range, contour, gain) and interpretation of returns will facilitate identification and avoidance of severe weather.

B. Dispatcher Responsibilities

1. Suggest use of alternate routes whenever possible to avoid known areas of severe weather along normal or requested routes.
2. Expedite action on requests for route/altitude deviation to avoid known areas of severe weather. Such requests are time critical.
3. Relay PIREPs of severe weather to other flights as appropriate and, if necessary, initiate requests for additional reports to aid in anticipating requests for detours. Plan ahead when known areas of severe weather conditions exist and provide pilots with maximum information, rendering assistance in avoiding such areas when requested.

8-13 WEATHER REPORTS AND FORECASTS

14 CFR 121.101, 121.613, 121.619, 121.651, 121.652,
121.655, OPSS A010

8-13.1 Policy

- A. Adequate weather reporting services as approved in OPSS A010 must be available for all Compass domestic flight operations. [121.101(a)]
- B. For surface weather observations to be considered "current," one of the following two (2) conditions must be met:
 - 1. A specifically approved automated weather observation system must be fully operational while terminal area flight operations are conducted.
 - 2. An observer station must maintain a basic weather watch available to pilots and dispatchers at least 30 minutes before the estimated time of arrival or departure.

8-13.2 Approved Sources of Weather

- A. Compass OPSS A010 provides all approved sources of weather; all sources providing Compass weather must be approved by the U.S. National Weather Service (NWS). [121.101(b)(1)]
- B. The Weather Company (TWC) meets these requirements and is the primary source of weather forecasts, reports, altimeter settings and NOTAMs. Delta Meteorology is an approved source of weather, but will only be used to supplement NWS/TWC weather information in the event neither source is available.
- C. Each of the sources listed in OPSS A010 also provides adverse weather phenomena. Adverse weather phenomena are meteorological conditions that, if encountered in flight or during ground operations could directly diminish the safety of an operation. Compass weather reporting and forecasting systems as listed here and in OPSS A010 provide adequate information on the following conditions: [121.101(d)]
 - 1. Strong surface winds (exceeding 30 knots);
 - 2. Widespread low ceilings and/or visibilities that affect selection of destination and alternate airports;

-
3. Active thunderstorms;
 4. Moderate or severe in-flight icing;
 5. Icing that affects ground operations;
 6. Severe or extreme turbulence;
 7. Low altitude windshear (below 2000' AGL);
 8. Occurrence of unforecast weather conditions below takeoff or landing weather minimums;
 9. Volcanic ash;
 10. Sandstorms and dust storms; and/or
 11. Meteorological conditions that contaminate a runway surface and adversely affect aircraft performance or prohibit use of a runway.
- D. Flight crews can obtain approved weather information through the aircraft ACARS (NWS), the crewmember work stations in domicile (NWS/TWC), hard copy through the dispatch release or an operations printer or FAX (NWS/TWC), or by telephone communication with Compass Dispatch (NWS/TWC). In addition to NWS and/or TWC, Delta Meteorology may be used by Dispatch to supplement weather information in the event the primary approved sources are not available.
1. The use of ACARS to retrieve weather information shall only be used for operational purposes.
- E. If the above sources of weather are unavailable to the flight crew, approved alternate sources for crews to obtain weather are:
1. FAA FSS
 2. FAA or privately-operated air traffic control tower or other ATC facility
 3. Approved NWS-trained weather observation personnel, ASOS, or AWOS
 4. Any combination of information from the NWS or TWC, as supplemented by Delta Meteorology in accordance with this section, may be used to determine if the weather conditions will be adequate for the planned flight
 5. Limited Aviation Weather Reporting Stations (LAWRS)
- F. Any other sources of weather that the company provides (i.e. weather applications on company iPad/EFBs) are approved for use as a secondary weather source only, and act only as a supplement to the sources described above.
-

8-13.3 **Dispatch Release and Landing Minimums**

- A. Compass Airlines may not release an aircraft for operations under IFR unless appropriate weather reports or forecasts, or any combination thereof, indicate that the weather conditions will be at or above the authorized landing minimums at the estimated time of arrival at the airport or airports to which dispatched. [121.613]
- B. Destination landing minimums are determined by the visibility requirement of any available instrument approach at the destination airport. The selection of an available instrument approach is governed by the following:
 - 1. The selection of straight-in instrument approach minimums at the destination is not limited to the runway expected to be used at the time of arrival.
 - 2. The selection of an approach for determining destination landing minimums is not determined by wind conditions.
 - 3. The instrument approach used to determine airport landing minimums must be operational.
- C. "Appropriate weather reports or forecasts" implies that METARs must be considered if a flight's ETA falls within the valid time of such METAR when the flight is dispatched.
- D. The reports or forecasts for the time of arrival at an alternate must indicate visibility to be at or above that prescribed for the approach expected to be flown.
- E. On arrival, the PIC may begin the approach if, prior to reaching the final approach fix, the flight visibility is at or above the prescribed visibility for the standard instrument approach being flown. [121.651(b)(2)]
- F. If a pilot has begun the final approach segment of an instrument approach procedure and after that receives a later weather report indicating below minimum conditions, the pilot may continue the approach to the DA(H) or the MDA (or as modified for a high-minimum Captain). [121.651(c)]

8-15 SIGMETS AND NOTAMS

8-15.1 Sigmets: General

- A. SIGMETS and CONVECTIVE SIGMETS are advisory in nature and are to be taken into consideration when flying into an area, but they are not restrictive.
- B. For example, a SIGMET for severe turbulence in a specified area would not prevent flying into that area unless there was a legitimate PIREP validating the presence of severe turbulence, then flight into that area would cease. To determine whether a PIREP is legitimate, factors such as aircraft size, distance from destination or route of flight, and time of PIREP must be considered.

Note: All available weather data must be considered by dispatchers and pilots prior to and when operating in areas where a SIGMET is active.
--

8-15.2 Notams: General

- A. En route NOTAMS are provided to flight crews.
- B. Data is received from FAA 604 WX wire.
- C. If this system fails, the Dispatcher or PIC may use FSS, ARTC, ATIS, airport managers or any other means available to gather current NOTAM information.
- D. Should the Dispatcher become aware of a change in the navigational and/or communication status of a facility, he will notify the affected flight of this status change as soon as practicable.
- E. Conversely, if the PIC becomes aware of a change in the navigational and/or communication status of a facility, he will discuss available options with Dispatch.

8-18.4 **Supplementary Sources of Weather Information**

- A. Other company-provided sources of weather data may provide the same or similar information as the aircraft's weather radar (i.e. precipitation, convective activity, or turbulence), but are approved for use as a secondary weather source only. These secondary sources act only as a supplement to the aircraft's weather radar.

**8-19 REPORTING UNFORECAST WEATHER & NAVAID
IRREGULARITIES**
14 CFR 121.561

8-19.1 General

- A. Whenever meteorological conditions are encountered which are substantially different from that forecast or which may have a potentially adverse impact on the safe operation of other flights, the PIC will ensure Dispatch is provided a PIREP as soon as practical. [121.561(a)]
- B. Whenever irregularities in ground or navigation facilities are encountered that may have a potentially adverse impact on the safe operation of other flights, the PIC will ensure Dispatch is provided a PIREP as soon as possible. [121.561(a)]
- C. Dispatch will be responsible for disseminating PIREPs and other pertinent reports to the FSS nearest to the location of the report. [121.561(b)]

8-19.2 Conditions Requiring Weather Reports

- A. These conditions include but are not limited to:
 - 1. Moderate or worse icing
 - 2. Moderate or worse turbulence (See Table 8-18-1)
 - 3. Flight level (or surface) winds not consistent with the flight plan or forecast
 - 4. Windshear encountered during any phase of flight
 - 5. Volcanic ash or dense smoke observed or reported in your flight path
- B. Pilots shall provide in-flight weather information for Dispatch as conditions permit.

-
- C. Selected flights may be requested to provided en route weather to Dispatch, including:
1. Sky cover (clear, scattered, broken, overcast)
 2. Obstructions to visibility (rain, snow, etc.)
 3. Icing
 4. Turbulence
 5. Windshear
 6. En route winds
 7. OAT
 8. A general overview of other data that may be pertinent
 9. Notify Dispatch as soon as practical of any significant changes to the route of flight as assigned by ATC or any en route delays (e.g., holding) caused by adverse/hazardous weather.

8-19.3 **Turbulence - Industry Definitions**

The following definitions, regarding intensity and duration of turbulence, have been developed by international agreement. These definitions are to be used by Compass flight crews when estimating turbulence intensity/duration.

Table 8-18-1 Turbulence Definitions

Intensity	
Light	Turbulence that momentarily causes slight, erratic changes in altitude and/or attitude (pitch, roll, yaw) OR causes slight rapid and somewhat rhythmic bumpiness without appreciable changes in altitude or attitude (also called "Light Chop")
Moderate	Turbulence similar to light turbulence but of greater intensity. Changes in altitude and/or attitude occur but the aircraft remains in positive control at all times. It usually causes variations in indicated airspeed OR is similar to Light Chop but of greater intensity, causing rapid bumps or jolts without appreciable changes in aircraft altitude or attitude (also called "Moderate Chop")
Severe	Turbulence that causes large, abrupt changes in altitude and/or attitude. It usually causes large variations in indicated airspeed. Aircraft may be momentarily out of control.
Extreme	Turbulence in which the aircraft is violently tossed about and is practically impossible to control. It may cause structural damage.
Duration	
Occasional	Occurring less than 1/3 of the time.
Intermittent	Occurring 1/3 to 2/3 of the time.
Continuous	Occurring greater than 2/3 of the time.

9-9.7 **RVSM — Irregular Operations**

- A. General: In the event aircraft system failures or weather conditions prevent the aircraft from maintaining CFL or if the flight crew is unsure of the aircraft's altitude-keeping capability:
- B. Notify ATC and request assistance;
- C. Maintain cleared flight level, to the extent possible, while evaluating the situation;
- D. Watch for conflicting traffic both visually and by reference to TCAS, if equipped; and
- E. Alert nearby aircraft by illuminating exterior lights IAW with aircraft limitations.
- F. Merging Target Procedures: ATC will use “merging target procedures” to mitigate the effects of both severe turbulence and mountain wave activity (MWA). En route controllers will advise flight crews of potential traffic that they perceive may fly directly above or below their aircraft at minimum vertical separation.
- G. In response, pilots are given the option of requesting a radar vector to ensure their radar target will not merge or overlap with the traffic’s radar target; or

- H. The controller will vector aircraft to avoid merging targets with traffic at adjacent flight levels, traffic permitting.
 - 1. In situations where the pilot is experiencing altitude deviations of 200 feet or greater, the pilot will request a vector to avoid traffic. Until the pilot reports clear of MWA, the controller will apply merging target vectors to one or both passing aircraft to prevent their targets from merging.
- I. Wake Turbulence: Pilots should be alert for wake turbulence when operating:
- J. In the vicinity of aircraft climbing or descending through their altitude;
- K. Approximately 12-15 miles after passing 1,000 feet below opposite direction traffic; and
- L. Approximately 12-15 miles behind and 1,000 below same-direction traffic.
 - 1. Pilots encountering or anticipating wake turbulence in DRVSM airspace have the option of requesting a vector, FL change or if capable, a lateral offset.
- M. In domestic U.S. airspace, pilots must request clearance to fly a lateral offset.
- N. Offsets of approximately one wingspan upwind generally move the aircraft out of the immediate vicinity of another aircraft's wake vortex.

- O. Severe Turbulence: Report severe turbulence encounters to ATC. Until the flight crew reports clear of severe turbulence, the controller will apply merging target vectors to one or both passing aircraft to prevent their targets from merging.
- P. Mountain Wave Activity (MWA)
 - 1. Significant MWA occurs both below and above the floor of RVSM airspace and can produce altitude excursions, airspeed fluctuations and light turbulence. With sufficient amplitude, however, wave action can induce altitude and airspeed fluctuations accompanied by severe turbulence. MWA is difficult to forecast and can be highly localized and short lived.
 - 2. In-flight MWA Indicators include:
 - a) Altitude excursions and/or airspeed fluctuations with or without associated turbulence;
 - b) Pitch and trim changes required to maintain altitude with accompanying airspeed fluctuations; and
 - 1) Light to severe turbulence depending on the magnitude of the MWA.
 - 3. Report the magnitude and location of MWA to ATC in accordance with FOM Figures 9.8.1 and 9.8.2.

9-9.10 **Pilot/Controller Actions - RVSM Irregular Operations**

Figure 9.8.2

Pilot Actions	Controller Actions
GENERAL GUIDANCE	
• Notify ATC and request assistance. • Maintain cleared flight level, to the extent possible, while evaluating the situation. • Watch for conflicting traffic both visually and by reference to TCAS, if equipped. • Alert nearby aircraft by illuminating exterior lights (IAW with aircraft limitations).	
WAKE TURBULENCE	
• Contact ATC and request vector, FL change or, if capable, a lateral offset.	• Issue vector, FL change or lateral offset clearance, traffic permitting.
SEVERE TURBULENCE AND/OR MOUNTAIN WAVE ACTIVITY (MWA)	
• Advise ATC if experiencing MWA/Severe Turbulence induced altitude fluctuations greater than +/-200 ft. • Request vector clear of traffic at adjacent FLs. • If so desired, pilot may request a FL change or re-route. • Report location and magnitude of MWA to ATC.	• Advise pilot of conflicting traffic at adjacent FL. • If pilot requests, vector aircraft to avoid merging target with traffic at adjacent RVSM flight levels, traffic permitting. • Issue FL change or re-route, traffic permitting. • Issue PIREP to other aircraft.

14-1.4 Required Reports to Maintenance

- A. The list below outlines situations, in addition to other discrepancies or irregularities, which require mechanical discrepancy entries made in the Aircraft Maintenance Logbook (AML) and notification to MXC.
1. RSV thrust is activated and/or the thrust levers are advanced to the "MAX" position
 2. An in-air engine restart is conducted
 3. Overweight/hard landing
 4. Aircraft limitation exceedance
 - a. Overspeed
 - b. Flap/slat extend speed exceedance
 - c. Landing gear extended airspeed exceedance
 - d. Engine limit exceedance
 5. Landing with temperature less than -40°C
 6. Cabin depressurization
 7. Aircraft on ground which departs approved and/or paved airport surface
 8. High speed aborted takeoff (Greater than 80 knots)
 9. Landing gear extension malfunction
 10. Lightning strike
 11. Hail encounter
 12. Bird Strike
 13. Tow bar shear pin failure
 14. Severe turbulence encounter