Unit 8 Aviation Weather Services

8.1 Weather Briefings

- When requesting a weather briefing, you should identify:
  - Yourself as a pilot
  - Intended route
  - Intended dest
  - VFR or IFR
  - Type of a/c
  - Proposed departure time and time enroute
- Standard briefing should be obtained before every flight; contains all info necessary for a safe flight
- Outlook briefing is provided when it is 6 or more hours b4 scheduled departure
- Abbreviated briefing will be provided when the user requests info to
  - Supplement mass disseminated data, update a previous briefing, or be limited to specific information

8.2 Aviation Routine Weather Report (METAR)

- METARs are actual weather observations at the time indicated. 2 types of reports: METAR - routine; SPECI - nonroutine
- Ex: METAR KAUS 301651Z 12008KT 4SM -RA HZ BKN010 OVC023 21/17 A3005 RMK RAB25
- METAR - type of report
- KAUS - 4 letter ICAO identifier
- 301651Z - date and UTC time
- (modifier if req'd)
- 12008KT - wind (from 120 true @ 8kt)
- 4SM - visibility in statute miles
- (runway visual range)
- Weather phenomena: -RA HZ means light rain and haze
- Sky conditions: broken at 1,000, overcast at 2300
- temperature/dewpoint
- Altimeter
- Remarks (RAB25 means rain began at 25 minutes past the hour)

8.3 Aircraft Observations and Reports

- No observation is more timely or needed than the one you make from the flight deck.
- PIREPs are transmitted in the format listed later.
- All heights given in MSL. To determine AGL, subtract field height from current height.
- Turbulence reported as LGT, MDT, or SVR
- Icing reported as CLR or RIME
- Cloud layers reported with heights for bases, tops, and layer type if available. "No entry" means that information was not given.

    - Ex: SK 024 BKN 032/042 BKN-OVC means a broken layer at 2400 MSL to 3200 MSL. A second layer is broken to overcast starting at 4200 MSL
- Wind direction and velocity are given as a five or six digit code (/WV 27045 - 270 @45kt)
- Air temp in degrees celsius
- AIREPs are reported as routine or special. Either reported by the pilot or generated automatically and delivered to a ground station.

UUA/UA	Urgent - UUA - any PIREP containing tornadoes, funnel clouds, waterspouts; svr or extreme turbulence including clear air turbulence (CAT), severe icing; hail; low-level windshear (LLWS) [airspeed fluctuations of 10 kt or more within 2000 ft of sfc]; any other weather phenomena reported that are considered by the controller to be hazardous, or potentially hazardous, to flight ops Routine - UA - any PIREP that contains weather phenomena not listed above, incl LLWS with as fluctuations less than 10 kt
/OV	Location ("over") - use VHF NAVAID(s) or an airport using the 3 or 4 letter location identifier. Can be over a site, at some location relative to a site, or along a route. Ex /OV KABC; =OV KABC090025; /OV KABC045020-DEF; /OV KABC-DEF
/TM	UTC time, 4 digits
/FL	Altitude or flight level; 3 digits indicating hundreds of feet. /FL095; /FLUNKN (unknown)
/TP	Aircraft type, 4 digits max
/SK	Sky cover - cloud amount, height of bases, height of cloud tops. /SK SCT040-TOP080; /SK BKNUNKN-TOP075
/WX	Flight visibility (FV) reported first; use standard METAR weather symbols. /WX FV05SM -RA; /WX FV01 SN BR
/TA	Temp in degrees celsius /TA 01, /TA M05
/WV	Wind; direction from which the wind is blowing in tens of degrees in 3 digits, plus the speed in 2 or 3 digits. /WV 27045KT; /WV 150110KT
/TB	Turbulence - use standard contractions for intensity and type (CAT or CHOP when appropriate). Incl altitude only if different from FL. ex /TB EXTRM; /TB OCNL LGT-MDT BLO 090
/IC	Icing - using standard intensity and type contractions. /IC LGT-MDT RIME; /IC SEV CLR 028-045

/RM	Remarks - use free form to clarify report, put hazardous elements first

8.4 Terminal Aerodrome Forecast (TAF)

- TAFs - weather forecasts for selected airports throughout the country
- Elements of a TAF:
    - Type - TAF - routine; TAF AMD - amended
    - ICAO stn identifier
    - Date and time the forecast is prepared
    - Valid period of the TAF
    - Forecast meteorological conditions, incl wind, visibilit, weather, sky condition. Cumulonimbus clouds (CB) are the only cloud type forecasted in TAFs
- Ex:
  TAF
  KBRO 300545Z 300606 VRB04KT 3SM SCT040 OVC150 TEMPO 2124 SHRA
  FM 0200 10010KT P6SM OVC020 BECMG0306 NSW BKN020=
- TAF at Brownsville, TX. Valid from the 30th day at 0600 to the next day at 0600. Forecast from 0600 to 0200 is the first line (variable winds at 4kt, visibility 3SM, scattered clouds at 4000, ceiling at 15000 overcast, occasional rain showers between 2100 and 2400 UTC [TEMPO 2124 SHRA]
- Next line is from 0200 until 0300, winds 10010kt, visibility greater than 6 SM, overcast at 2000. Becoming no significant weather, bkn at 2000 from 0300 to 0600Z.
    - BECMG group is no longer part of civilian TAFs and is no longer tested.

8.5 Radar Weather Reports

- Radar weather reports - textual reports of weather radar observations. Include type, intensity, location, and cell movement of precip
- It is important to remember that the intensity trend (increasing or weakening) is no longer coded on the radar weather report (SD/ROB)

8.6 In-Flight Weather

- Flight Service Stations (FSS) provide weather advisories on 122.2 MHz. Provides info regarding actual weather and thunderstorm activity along a proposed route
- Designed to be a continual exchange of info on winds, turbulence, visibility, icing, etc. between pilots and briefers
- Flight information services-broadcast (FIS-B) is a ground based broadcast system provided through ADS-B via the 978 MHz datalink that can display inflight weather data
    - FIS-B info is intended for advisory use in assisting long and near term planning and decision making. The system lacks the updating capability necessary for tactical aerial maneuver around localized weather phenomena
    - Many products are available through FIS-B, including AIRMETs, SIGMETs, convective SIGMETs, NEXRAD, D-NOTAMs, FDC-NOTAMs, METARs, TAFs, winds aloft, PIREPs, and special use airspace status updates.

        - Be aware that NEXRAD uplink may be 20 mins old upon receipt and should not be used for navigation through severe weather.

8.7 Wind and Temperature Aloft Forecasts (FB)

- Forecast winds and temps are provided at specified altitudes for specific locations in the US
- 4 digit group (when temps are not forecast) shows wind direction with reference to TRUE north and the wind speed in kts. First two digits - wind direction after a 0 is added. Next two digits are wind speed. No temp is forecast for the 3000 ft level or for a level within 2500 AGL of the station
- Six digit group includes the forecast temp aloft in degrees celsius (last 2 digits). + or - sign is indicated before the temps except above 2400 MSL when temps are always negative
- When wind is less than 5 kt, the forecast is 9900 (light and variable)
- When wind is >100kt, 50 is added to the direction and 100 is subtracted from the speed. Ex 730649 (at 34000 ft) means direction 230 @ 106 kt, temp -49C

8.8 Significant Weather Prognostic Charts

- Significant weather prognostic charts - contain two panels. Forecast significant weather from the sfc to 24000; one panel for 12 hr and one for 24 hr. Some providers also incl two lower panels depicting forecast surface conditions; one 12 and one 24.
- Low-level significant weather prognostic chart depicts ceilings less than 1000 ft and/or visibility less than 3 SM (IFR) by a solid line around the area. Ceilings 1000 to 3000 and/or visibility 3 to 5 SM (MVFR) by a scalloped line around the area
- Moderate or greater turbulence by a broken line around the area (a peaked hat indicates moderate turbulence. Altitudes are indicated on the chart in hundreds of feet). Freezing levels are given by a dashed line corresponding to the height of the freezing level.
- Charts are used to determine areas to avoid (freezing levels and turbulence)

8.9 AIRMETs and SIGMETs

- Issued to notify pilots en route of the possibility of encountering hazardous flying conditions.
- SIGMETs include weather phenomena that are potentially hazardous to all a/c
    - Convective: tornadoes, lines of thunderstorms, embedded thunderstorms, thunderstorm areas greater or equal to thunderstorm intensity level 4 with an area coverage of 40% or more; hail greater than or equal to ¾ in diameter
    - SIGMETs: svr or extreme turbulence or CAT not associated with thunderstorms, severe icing not associated with thunderstorms, dust storms, sandstorms, volcanic ash lowering vis to less than 3 SM; volcanic eruption
- AIRMETs apply to light a/c to notify of: moderate icing, moderate turbulence, vis less than 3SM or ceilings less than 1000, sustained winds of 30 kt or more at the surface, extensive mountain obscurement.

- Refer to Inflight Aviation Weather Advisories to get a complete weather picture (AIRMETs Zulu, Tango, and Sierra)

Unit 8 Quiz 54/56
Missed Questions 2
10. When calling FSS, provide the aircraft identification or the pilot's name.
49. SIGWX prognostic charts are used to determine areas to avoid (freezing levels and turbulence)