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Operations and Services

Aviation Weather Services, NWSPD 10-8

EN ROUTE FORECASTS AND ADVISORIES

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SUMMARY OF REVISIONS: This directive supersedes *NWSI 10-811*, “*En-route Forecasts and Advisories*,” dated August 27, 2013. Changes made to reflect NWS Headquarters reorganization effective April 1, 2015. Additional changes include:

- Change CCFP references to TCF and make the description consistent with the PDD.
- Section 5.1.1 Deletion of CONUS FA
- Section 5.1.4 Changes to the FA issuance in Alaska
- Section 6.1.1 to delete "an area of at least 3,000 square miles"
- Section 6.2.1 to change "affecting at least 3,000 square miles" to "judged to have a significant impact on the safety of aircraft operations"
- Section 6.3.1 to delete "greater than 3,000 square miles or", delete "an area", change "effect" to "impact", and delete "NOTE: Obscured, embedded, or squall line thunderstorms do not have to reach 3,000 square miles criteria."
- Section 6.3.9 Addition of IWXXM
- Section 7.1 to change "of at least 3,000 square miles" to "having a significant impact on the safety of aircraft operations"
- Section 7.2 Changes in Alaska Region for AIRMET Bulletins, Issuance Times, and Valid Period

signed

December 18, 2018

Andrew Stern

Date

Director, Analyze, Forecast, and Support Office

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1 Purpose

This instruction describes the content and preparation of aviation en route forecasts and advisories prepared and issued by National Weather Service (NWS) offices. En route forecasts and advisories include the Area Forecast (FA), Significant Meteorological Information (SIGMET), Airmen's Meteorological Information (AIRMET), Tropical Cyclone Advisory (TCA), Volcanic Ash Advisory (VAA), Route Forecast (ROFOR), and Traffic Flow Management Convective Forecast (TCF). TCAs and VAAs provide coverage for their respective areas of responsibility per international agreements; please refer to NWSI 10-601 Tropical Cyclone Products and 10-1501 Volcanic Ash Advisory Centers respectively for information about these products. En route forecasts and advisories issued by Center Weather Service Units (CWSU) may be found in NWSI 10-803 Support to Air Traffic Control Facilities. Information on the Aviation Watch Notification Message issued by the Storm Prediction Center may be found in NWSI 10-512 National Severe Weather Products Specification.

2 General

The FA, SIGMET, AIRMET, ROFOR, and TCF products provide forecast and advisory coverage for aviation forecast users operating within the U.S. domestic Flight Information Regions (FIRs). Some of these products also provide forecast and advisory service for Atlantic and Pacific oceanic FIRs and the Gulf of Mexico. General definitions of each product follow.

1. FA: An area forecast in abbreviated plain language concerning the occurrence or expected occurrence of specified en route weather phenomena.
2. AIRMET: An advisory in abbreviated plain language concerning the occurrence or expected occurrence of specified en route weather phenomena that may affect the safety of aircraft operations, but at intensities that do not meet SIGMET criteria.
3. SIGMET: A warning in abbreviated plain language concerning the occurrence or expected occurrence of hazardous en route weather phenomena that may affect the safety of aircraft operations. SIGMETs are of highest priority among all meteorological products provided to aviation users.
4. ROFOR: A route forecast in abbreviated plain language concerning the occurrence or expected occurrence of weather phenomena specific to a particular en route segment.
5. TCF: A collaboratively generated forecast graphic that outlines areas of high-topped convection for use in air traffic flow planning.

3 Responsibility for Issuance

The NWS operates three Meteorological Watch Offices (MWO), the Aviation Weather Center (AWC), the Alaska Aviation Weather Unit (AAWU), and the Weather Forecast Office (WFO) in Honolulu. All FAs, SIGMETs, and AIRMETs included in this instruction are produced and issued by these MWOs; their areas of responsibility are shown in Appendix C and described below.

1. AWC:
 - a. Twenty (20) domestic Air Route Traffic Control Center (ARTCC) Flight Information Regions (FIRs) covering the conterminous U.S. and adjacent coastal waters

- b. New York, Houston, Miami, and San Juan Oceanic FIRs
 - c. The portion of Oakland Oceanic FIR north of 30N latitude and east of 140W longitude
2. AAWU:
- a. Anchorage Continental FIR
 - b. Anchorage Oceanic FIR
 - c. Arctic Oceanic FIR
3. WFO Honolulu:
- a. The portion of Oakland Oceanic FIR south of 30N latitude and west of 140W longitude

4 Standardization

All forecasts and in-flight advisories use the following standards.

1. All referenced heights or altitudes will be referenced above mean sea level (MSL), unless otherwise noted, and annotated using the height in hundreds of feet, consisting of three digits (e.g., 040). For heights at or above 18,000 feet, the level will be preceded by FL (e.g., FL180).
2. References to latitude and longitude will be in degrees and minutes as follows: Nnn[nn] or Snn[nn], Wnnn[nn], or Ennn[nn]. Note: a space is placed between latitude and longitude values and a space-hyphen-space between successive points (e.g., N6030 W15030 - N5800 W15200 - N5930 W15100).
3. Messages will be prepared in abbreviated plain language using contractions from the current Federal Aviation Administration (FAA) Order 7340.1 for domestic products and International Civil Aviation Organization (ICAO) document 8400 for international products issued for Oceanic FIRs. A limited number of non-abbreviated words, geographical names and numerical values of a self-explanatory nature may also be used.
4. Weather and obstructions to visibility will be described using the weather abbreviations for surface airways observations (METAR or SPECI). See the Federal Meteorological Handbook (FMH) No. 1 - Surface Observations.
5. Heights will be identified as follows: (1) for heights below 3,000 feet, increments will be in 100s of feet; (2) for heights from 3,000 to 5,000 feet, increments will be in 500s of feet; and for heights greater than 5,000 feet, increments will be in 1,000s of feet.

5 Area Forecast (FA)

The FA describes specific forecast conditions expected to affect at least a portion of the designated area of responsibility. The four designated areas include Hawaii, Gulf of Mexico, Caribbean, and Alaska, as outlined below. See Appendix C for area of responsibility maps.

1. Hawaii: WFO Honolulu will issue an FA for the main Hawaiian Islands and adjacent coastal waters extending out 40 nautical miles from the coastlines.

2. Gulf of Mexico: The AWC will issue an FA for the northern Gulf of Mexico, to cover the Houston Oceanic FIR, the Gulf of Mexico portion of the Miami Oceanic FIR, and the coastal waters west of 85W longitude.
3. Caribbean FA: The AWC will issue an FA for portions of the Gulf of Mexico (south of the Houston Oceanic FIR to approximately 22N latitude), the Caribbean Sea and adjacent portions of the North Atlantic.
4. Alaska: The AAWU will issue seven (7) FAs covering separate geographical areas of Alaska and the adjacent coastal waters, including the Pribilof Islands and Southeast Bering Sea.

5.1 FA Descriptions

5.1.1 Hawaii FA

1. Vertical coverage: FA will cover the airspace between the surface and 45,000 feet MSL.
2. Horizontal coverage: The Hawaii FA (FAHW31 PHFO) will cover the main Hawaiian Islands and adjacent coastal waters extending out 40 nautical miles from the coastlines.
3. Dissemination: The Hawaii FA will be issued four (4) times daily at 0340, 0940, 1540, and 2140 UTC.
4. Content: Each FA will include the following elements.
 - a. Synopsis: This is a brief discussion of the significant synoptic weather affecting the FA area during the 18-hour valid period.
 - b. Clouds and Weather: This is a brief description of the clouds and weather for the first 12-hour period, including the following elements:
 - (1) Cloud amount (SCT, BKN, or OVC) with bases and tops
 - (2) Visibilities of 6 SM or less with obstruction(s) to visibility
 - (3) Precipitation and thunderstorms
 - (4) Sustained surface winds 20 knots or greater
 - c. 6-hour categorical outlook: IFR, MVFR, or VFR, including expected precipitation and/or obstructions to visibility

5.1.2 Gulf of Mexico FA (FAGX)

1. Vertical coverage: FAGX will cover the airspace between the surface and 45,000 feet MSL.
2. Horizontal coverage: FAGX coverage is shown in Appendix C.
3. Dissemination: FAGX will be issued three times daily at 0130, 1030 and 1830 UTC.
4. Content: FAGX will include the following elements. Each geographical section will contain an entry.
 - a. Synopsis: This is a brief discussion of the significant synoptic weather affecting the

- FAGX area during the entire 24-hour valid period.
- b. Significant Clouds and Weather: This is a description of the significant clouds and weather for the first 12-hours including the following elements:
 - (1) Cloud amount (SCT, BKN, or OVC) for clouds with bases below FL180, or SKC.
 - (2) Cloud bases and tops associated with cloud amount.
 - (3) Precipitation and thunderstorms.
 - (4) Visibility below 7 SM and obstruction(s) to visibility.
 - (5) Sustained surface winds greater than or equal to 20 knots.
 - c. 6-hour categorical outlook (LIFR, IFR, MVFR, or VFR).
 - d. Icing and Freezing Level: Moderate or severe icing and freezing level. For the coastal waters portion of the FAGX, users will be referred to the appropriate CONUS AIRMET.
 - e. Turbulence: Moderate or greater turbulence. For the coastal waters portion of the FAGX, users will be referred to the appropriate CONUS AIRMET.

5.1.3 Caribbean FA (FACA)

- 1. Vertical coverage: The FACA will cover the airspace between the surface and 24,000 feet MSL (approximately 400 millibars).
- 2. Horizontal coverage: FACA coverage is shown in Appendix C.
- 3. Dissemination: FACA will be issued four (4) times daily at 0330, 0930, 1530, and 2130 UTC.
- 4. Content: FACA will include the following elements. Each geographical section will contain an entry.
 - a. Synopsis: This is a brief discussion of the synoptic weather affecting the FACA area during the 24-hour valid period.
 - b. Significant Clouds and Weather: This is a brief description of the significant clouds and weather for the first 12 hours including the following elements:
 - (1) Cloud amount (SCT, BKN, or OVC) for clouds with bases below FL180, or SKC
 - (2) Cloud bases and tops associated with cloud amount
 - (3) Precipitation and thunderstorms
 - (4) Visibility below 7 SM and obstruction(s) to visibility
 - (5) Sustained surface winds greater than or equal to 20 knots
 - c. 6-hour categorical outlook (IFR, MVFR, or VFR)
 - d. Icing and Freezing Level: moderate or greater icing and freezing level
 - e. Turbulence: moderate or greater turbulence

5.1.4 Alaska FA

1. Vertical coverage: Each FA will cover the airspace between the surface and 45,000 feet MSL.
2. Horizontal coverage: Seven (7) FAs will be issued covering 25 geographical zones of Alaska and the adjacent coastal waters, including the Pribilof Islands and Southeast Bering Sea. See Appendix C.
3. Dissemination: Each FA will be issued three (3) times daily at 0415, 1215, and 2015 local Alaska Time or 0515, 1315, and 2115 UTC during standard time, and 0415, 1215, and 2015 UTC during daylight saving time.
4. Content: Each FA will include the following elements—Clouds and weather, turbulence, and icing information is included in each geographical zone.
 - a. Synopsis: This is a brief description of the significant synoptic weather affecting the FA area during the first 18 hours of the forecast period.
 - b. Clouds and Weather: a description of the clouds and weather for each geographical zone during the first 12 hours of the forecast period including the following elements:
 - (1) AIRMET information for IFR ceiling and visibility, mountain obscuration, and strong surface winds
 - (2) Cloud amount (FEW, SCT, BKN, or OVC) with bases and tops for BKN and OVC layers
 - (3) Visibilities of 6 SM or less with obstruction(s) to visibility
 - (4) Precipitation and thunderstorms
 - (5) Surface wind greater than 20 knots
 - (6) Mountain pass conditions using categorical terms (for selected zones only)
 - (7) 6-hour categorical outlook (VFR, MVFR, and IFR)
 - c. Turbulence: a description of expected turbulence conditions including the following elements:
 - (1) AIRMET information for turbulence or low level wind shear.
 - (2) Turbulence not meeting AIRMET criteria.
 - (3) If no significant turbulence is forecast, NIL SIG will be entered.
 - d. Icing and freezing level: a description of expected icing conditions including the following elements:
 - (1) AIRMET information for icing and freezing precipitation
 - (2) Icing not meeting AIRMET criteria
 - (3) Freezing level
 - (4) If no significant icing is forecast, NIL SIG will be entered followed by the freezing level.

5.2 FA Amendments

FAs will be under continuous review and amended at the discretion of the forecaster. An amended FA will contain “AAA” after the date/time group on the WMO heading line for the first amendment, “AAB” for the second, and continuing for all subsequent amendments. “AMD” will be included after the date/time group on the FAA product line. The date/time group on the WMO and FAA lines will be updated to indicate the time of the correction. The ending valid time will remain unchanged.

5.3 FA Corrections

FAs containing errors will be corrected. A corrected FA will contain “CCA” after the date/time group on the WMO heading line for the first correction, “CCB” for the second, and continuing for all subsequent corrections. “COR” will be included after the date/time group on the FAA product line. The date/time group on the WMO and FAA lines will be updated to indicate the time of the correction. The ending valid time will remain unchanged.

NOTE: The FAA uses a time matching system to determine the most recent products. Therefore, amendments and corrections will carry the current time of the FA correction or amendment to ensure that the FA is updated in the FAA system. This is accomplished by manually changing the date/time group on the amended or corrected FA being issued.

6 Significant Meteorological Information (SIGMET)

A SIGMET is a concise description of the occurrence or expected occurrence of specified en route weather phenomena which is expected to affect the safety of aircraft operations. SIGMETs are intended for dissemination to all pilots in flight to enhance safety. SIGMETs will be issued by the responsible MWO as soon as is practical to alert operators and aircrews of hazardous en route conditions.

6.1 Non-Convective SIGMET Description

6.1.1 Issuance Criteria

The AWC will issue a Non-Convective SIGMET when any of the following conditions are affecting or, in the judgment of the forecaster, are expected to affect an area judged to have a significant impact on the safety of aircraft operations.

- Severe (or greater) turbulence (SEV TURB)
- Severe icing (SEV ICE)
- Widespread dust storm (WDSPR DS)
- Widespread sandstorm (WDSPR SS)
- Volcanic ash cloud (VA)

6.1.2 Issuance Time and Valid Period

1. A SIGMET is an unscheduled product issued any time conditions reaching SIGMET criteria are occurring or expected to occur within a 4-hour period.
2. A SIGMET will have a valid period up to, but not exceeding, four (4) hours. SIGMETs for continuing phenomena will be reissued at least every 4 hours as long as SIGMET

conditions continue to occur in the area for responsibility.

6.1.3 SIGMET Format

SIGMETs will be concise and not contain unnecessary descriptive information. See examples in Appendix A. The content and order of elements in the SIGMET will be as follows:

1. Series name and number.
2. Valid beginning and ending time (UTC).
3. List of states affected by the phenomena.
4. Location of phenomena delineated by high-altitude VHF (Very High Frequency) Omnidirectional Radio Range (VOR) coordinates covering the affected area during the SIGMET valid time.
5. Phenomena description (e.g., SEV ICE).
6. Vertical extent (base, top), if appropriate.
7. Movement, if appropriate.
8. Intensity change (INTSF, WKN, or NC).
9. Indication of whether the condition will continue during the 4 hours beyond the valid time of the SIGMET.

6.1.4 SIGMET Cancellations

A Non-Convective SIGMET will be canceled when the phenomena is no longer occurring, no longer expected to occur or has moved out of the area of responsibility.

6.1.5 SIGMET Amendments

Amendments to Non-Convective SIGMETs will not be issued. Instead, a new SIGMET is issued using the next series number.

6.1.6 SIGMET Corrections

Corrections to Non-Convective SIGMETs will be issued as necessary.

NOTE: The FAA uses a time matching system to determine the most recent products. Therefore, corrections will carry the CURRENT time of the SIGMET to ensure the SIGMET is updated in the FAA system.

6.2 Convective SIGMET Description

6.2.1 Routine Issuance Criteria

AWC will issue a Convective SIGMET when the following conditions are occurring or, in the judgment of the forecaster, are expected to occur.

- A line of thunderstorms at least 60 miles long with thunderstorms affecting at least 40 percent of its length.
- An area of active thunderstorms judged to have a significant impact on the safety of aircraft operations covering at least 40 percent of the area concerned and exhibiting a

very strong radar reflectivity intensity or a significant satellite or lightning signature.

- Embedded or severe thunderstorm(s) expected to occur for more than 30 minutes during the valid period regardless of the size of the area.

6.2.2 Special Issuance Criteria

A special Convective SIGMET may be issued when any of the following criteria are occurring or, in the judgment of the forecaster, are expected to occur for more than 30 minutes of the valid period.

- Tornado, hail greater than or equal to 3/4 inch, or wind gusts greater than or equal to 50 knots are reported.
- Indications of rapidly changing conditions, if in the forecaster's judgment, they are not sufficiently described in existing Convective SIGMETs.
- Special issuance is not required for a valid Convective SIGMET.

6.2.3 Issuance Time and Valid Period

The Convective SIGMET issuance time and valid period are as follows:

- Three (3) Convective SIGMET bulletins for the eastern, central, and western regions of the CONUS will be issued hourly on a scheduled basis.
- Convective SIGMETs are valid for 2 hours or until superseded by the next hourly issuance.
- A SIGMET bulletin will be transmitted each hour for each region. When conditions do not meet or are not expected to meet Convective SIGMET criteria within a region at the scheduled time of issuance a "CONVECTIVE SIGMET . . . NONE" message is transmitted.

6.2.4 Convective SIGMET Format

Each Convective SIGMET bulletin will include one or more individually numbered Convective SIGMETs for the region. See examples in Appendix A. The content and order of each bulletin will be as follows:

1. CONVECTIVE SIGMET, series number, and region letter (E, W, or C)
2. Valid ending time (UTC)
3. List of states affected by the phenomena
4. Location of phenomena delineated by high-altitude VOR coordinates covering the affected area during the SIGMET valid time
5. Phenomena description (e.g., AREA SEV EMBD TS)
6. Movement (e.g., MOV FROM 26030KT)
7. Cloud top (e.g., TOPS ABV FL450)
8. Remarks (e.g., TORNADOES . . . HAIL TO 2.5 IN . . . WIND GUSTS TO 70KT POSS). Tropical Cyclone information will be added to remarks section when appropriate.

6.2.5 Convective SIGMET Outlook

Each region will include a 2- to 6-hour convective SIGMET outlook at the end of the bulletin. The content and order of each bulletin will be as follows. See examples in Appendix A.

1. Beginning and ending valid times
2. Location of expected Convective SIGMET issuances delineated by high-altitude VOR

used as a further description of the thunderstorm as necessary.

6.3.1.1 International SIGMET for Volcanic Ash Cloud

A SIGMET for volcanic ash cloud will be issued for volcanic eruptions. A volcanic eruption is any volcanic activity that produces volcanic ash emissions, regardless of eruption magnitude. Offices preparing SIGMETs for volcanic ash should use the forecast position information available from advisories provided by the pertinent Volcanic Ash Advisory Center (VAAC). Initial Volcanic Ash Eruption SIGMETs may be issued based on credible pilot reports in the absence of a Volcanic Ash Advisory (VAA), but should be updated once a VAA is issued.

Volcanic ash SIGMETs will continue to be issued until the ash cloud is no longer occurring or expected to occur over the area of responsibility.

SIGMETs for volcanic ash cloud will be valid up to six (6) hours and provide an observed or forecast location of the ash cloud at the beginning of the SIGMET. A forecast position for the ash cloud, valid at the end of the validity period of the SIGMET message, will also be included. SIGMETs will be reissued at least every six (6) hours while the volcanic ash cloud hazard exists or is expected to exist.

6.3.1.2 International SIGMET for Tropical Cyclone

A SIGMET for a tropical cyclone will be issued for non-frontal synoptic-scale cyclones meeting the following criteria.

1. Originates over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation.
2. Wind speeds reach 35 knots independent of the wind averaging time used by the Tropical Cyclone Advisory Center (TCAC).

MWOs preparing SIGMETs for tropical cyclones will use the Tropical Cyclone Advisory (FK bulletins) issued by the appropriate TCAC (Miami, Honolulu, or Tokyo) for forecast information.

SIGMETs for tropical cyclones will be valid up to six (6) hours. SIGMETs for tropical cyclones will include two positions. The first position included will be the TCAC advisory position. The second position will be the forecast position valid at the end of the SIGMET period.

In addition to the two storm positions, SIGMETs will include associated convection when applicable. SIGMETs will be reissued at least every six (6) hours while the tropical cyclone wind remains or are expected to remain above 34 knots.

6.3.2 Format

International SIGMETs will contain the following information, related to the specific phenomena and in the order indicated. See examples in Appendix A.

1. Phenomenon and its description from Section 6 (e.g., SEV TURB).
2. An indication whether the information is observed, using OBS and/or FCST. The time of observation will be given in UTC.
3. Location of the phenomenon described by using latitude and longitude, or VORs, and flight levels (altitude) covering the affected area during the SIGMET valid time.
SIGMETs for volcanic ash cloud and tropical cyclones will contain the positions of the

ash cloud, tropical cyclone center and radius of convection at the start of the validity time of the SIGMET.

4. Movement towards or expected movement using sixteen points of the compass, with speed in knots, or stationary, if appropriate.
5. Thunderstorm maximum height as FL.
6. Changes in intensity; using as appropriate, the abbreviations INTSF (Intensifying), WKN (Weakening), or NC (No Change).
7. Forecast position of volcanic ash cloud or the center of the tropical cyclone at the end of the valid period of the SIGMET message.

6.3.3 International SIGMET Cancellations

A SIGMET will be cancelled when the phenomena is no longer occurring or expected to occur in the area or responsibility.

6.3.4 International SIGMET Amendments

SIGMET amendments will NOT be issued. Instead, the next SIGMET in the series is issued to accomplish the update. The valid time of the new SIGMET is reset to reflect the new four-hour valid period (six-hour for VA and TC SIGMETs).

6.3.5 International SIGMET Corrections

Corrections to SIGMETs will be issued as necessary by issuing a new SIGMET in the series which advances the SIGMET number and supersedes the previous SIGMET.

NOTE: The FAA uses a time matching system to determine the most recent products. Therefore, corrections will carry the CURRENT time to ensure that the SIGMET is updated in the FAA system.

6.3.6 Interchange of SIGMETs between Adjacent U.S. Offices

The originating office will cancel an existing SIGMET when hazardous weather covered by the SIGMET moves from one office's area of responsibility to the adjacent office's area of responsibility. The adjacent MWO will issue a new SIGMET under a new SIGMET series identifier.

6.3.7 Continuous SIGMET Criteria across Adjacent Boundaries

When an area of continuous hazardous weather meeting SIGMET criteria extends from one area of responsibility into another, the two offices will determine whether to issue two separate SIGMETs or have one office issue a single SIGMET for the hazardous weather in both areas.

6.3.8 SIGMET Naming Convention across the Pacific Basin and the Anchorage FIR

To avoid duplication of valid SIGMET series names in the Pacific Basin, the MWOs have adopted a series naming convention where each uses a different portion of the [ICAO Phonetic Alphabet](#).

- AWC: ALFA, BRAVO, CHARLIE, DELTA, ECHO, FOXTROT, GOLF, and HOTEL
- AAWU: INDIA, JULIETT, KILO, LIMA, and MIKE

- WFO Honolulu: NOVEMBER, OSCAR, PAPA, QUEBEC, ROMEO, SIERRA, TANGO, UNIFORM, VICTOR, WHISKEY, XRAY, YANKEE, and ZULU

If the number of active SIGMETs exceeds the names assigned, the MWO will use the following SIGMET naming procedures:

- AWC: The AWC will cycle through the alpha names listed above. If all eight SIGMET alpha names are in use by the AWC, they will coordinate with the AAWU to temporarily use INDIA, JULIETT, KILO, LIMA, or MIKE. When the temporary need for the letter has ended, AWC will coordinate with AAWU to release the letter.
- AAWU: The AAWU will cycle through the alpha names listed above. If all five SIGMET alpha names are in use by the AAWU, they will coordinate with WFO Honolulu to temporarily use NOVEMBER, OSCAR, PAPA, or QUEBEC. If the AWC is using the ALFA name and the AAWU needs to issue another SIGMET, they will skip the ALFA name the AWC is using and issue the next available name in the series. When the temporary need for the letter has ended, AAWU will coordinate with WFO Honolulu to release the letter.
- WFO Honolulu: WFO Honolulu will cycle through the alpha names listed above. If the AAWU is using an alpha name and WFO Honolulu needs to issue another SIGMET, they will skip the alpha name the AAWU is using and issue the next available name in the series.

6.3.9 SIGMET Dissemination

SIGMET dissemination over NWS and international circuits uses a text (Traditional Alphanumeric Code, TAC) convention. In accordance with International Civil Aviation Organization (ICAO) Annex 3 requirements (as amended), NWS will simultaneously disseminate SIGMETs using the ICAO Weather Information Exchange Model (IWXXM) data standard. IWXXM is a machine-readable language that enables digital communications, such that SIGMETs (and other TAC products) can be ingested and used digitally for visualizations and in decision tools. SIGMET conversion from TAC to IWXXM is done automatically within NWS production and telecommunications systems.

7 Airmen's Meteorological Information (AIRMET) and Graphical AIRMET

An AIRMET is a concise description of the occurrence or expected occurrence of specified en route weather phenomena which may affect the safety of aircraft operations, but at intensities lower than those which require the issuance of a SIGMET. AIRMETs are intended to inform all pilots, but especially Visual Flight Rules pilots and operators of sensitive aircraft, of potentially hazardous weather phenomena. Freezing level information is included.

The Graphical-AIRMET (G-AIRMET), is a graphical forecast of en route weather hazards valid at discrete times no more than 3 hours apart for a period of up to 12 hours into the future (00, 03, 06, 09 and 12 hours). G-AIRMET is issued based on the same criteria as AIRMET.

7.1 AIRMET Criteria

An AIRMET will be issued when any of the following weather phenomena is affecting or, in the judgment of the forecaster, is expected to affect an area having a significant impact on the safety of aircraft operations.

1. Ceiling less than 1,000 feet and/or visibility less than 3 statute miles (IFR).
2. Weather phenomena restricting the visibility including, but not limited to, precipitation (PCPN), smoke (FU), haze (HZ), mist (BR), fog (FG), and blowing snow (BLSN).
3. Widespread mountain obscuration (MT OBSC).
4. Weather phenomena causing the obscuration can include, and are limited to, clouds (CLDS), precipitation (PCPN), smoke (FU), haze (HZ), mist (BR), and fog (FG).
5. Moderate turbulence (MOD TURB).
6. Top and bottom of MOD TURB layer are included.
7. Sustained surface wind greater than 30 knots (STG SFC WND).
8. Moderate icing (MOD ICE).
9. Top and bottom of MOD ICE are included.
10. Multiple freezing level (FRZLVL) altitudes may be given; the lowest level is the declared FRZLVL.
11. Areas with multiple freezing levels are included.
12. Range of freezing levels over the area is included.
13. Lowest freezing levels above ground level (AGL) at intervals of 500 feet AMSL (or SFC as appropriate) are included.
14. Non-convective low-level wind shear potential below 2,000 feet AGL (LLWS POTENTIAL).

7.2 AIRMET Bulletins, Issuance Times, and Valid Period

1. AIRMETs will be issued as bulletins containing one or more AIRMET messages on the following schedule. Unscheduled AIRMETs are issued when conditions are occurring or expected to occur, but were not forecast.
 - a. CONUS: AIRMET bulletins will be issued on a scheduled basis every 6 hours around 0245, 0845, 1445, and 2045 UTC.
 - b. Hawaii: AIRMET bulletins will be issued on a scheduled basis every 6 hours at 0400, 1000, 1600, and 2200 UTC.
 - c. Alaska: AIRMET bulletins will be issued on a scheduled basis every 8 hours at 0415, 1215, and 2015 local Alaska Time or 0515, 1315, and 2115 UTC during standard time, and 0415, 1215, and 2015 UTC during daylight saving time.
2. AIRMETs will be valid for no more than 6 hours in CONUS and Hawaii and no more than 8 hours in Alaska. The valid period of an AIRMET message will not exceed the valid time of the AIRMET bulletin.

7.3 AIRMET Format

An AIRMET message will include the following information as appropriate and in the order indicated. See examples in Appendix A.

1. Reference to appropriate active SIGMETs affecting the area of concern at the time of AIRMET issuance (e.g., SEE SIGMET BRAVO SERIES).
2. Beginning time of the AIRMET phenomenon if different from the AIRMET beginning valid time.
3. AIRMET name (SIERRA, TANGO, or ZULU), update number, weather phenomenon, and ending valid time. (Note: the AIRMET number is reset to zero (0) after 0000 UTC each day. The update numbering begins with any update, either regularly scheduled or amendment, after the issuance of the first regularly scheduled AIRMET of the UTC day. Corrections carry the same update number as the previous issuance being corrected.)
4. List of affected states (CONUS only).
5. Location of phenomenon using VORs or other well-known geographic features. The AAWU may also use VORs or geographic location.
6. Description of phenomenon for the AIRMET issuance.
7. Vertical extent (bases and tops), as appropriate.
8. Ending time of phenomenon if different from the AIRMET ending time.
9. Alaska AIRMETs. Intensity change remarks (INTSF, WKN, or NC) concerning the continuance of the phenomenon following the 6 hour valid period.
10. CONUS and Hawaii AIRMETs: A separate AIRMET outlook will be included in the AIRMET bulletin when conditions meeting criteria are expected to occur during the 6-hour period after the valid time of the AIRMET bulletin.
11. Alaska AIRMETs: Outlook information will be included in the appropriate FA zone during the 6-hour period after the valid time of the AIRMET bulletin.

7.4 AIRMET Updates and Amendments

If an AIRMET is amended and issued out of the normal schedule, it will contain AAA at the end of WMO heading line for the first amendment, AAB for the second, and continuing for all subsequent amendments. AMD will be added after the date/time group on the FAA product line. The update number will be incremented (see 7.3 Item 3). UPDT will be added to end of the line with the list of affected states (CONUS only). The issuance time of the AIRMET bulletin is updated to reflect the time of the amendment. The ending valid time remains unchanged.

7.5 AIRMET Corrections

AIRMETs containing errors will be corrected. CCA will be added after the date/time group on the WMO heading line for the first correction, CCB for the second, and continuing for all subsequent corrections. COR will be added after the date/time group on the FAA product line. The issuance time of the AIRMET bulletin is updated to reflect the time of the correction. The ending valid time remains unchanged.

NOTE: The FAA uses a time matching system to determine the most recent products. Therefore, amendments and corrections will carry the CURRENT time to ensure that the AIRMET is updated in the FAA system.

8 Route Forecast (ROFOR)

ROFORs predict conditions for specific flight routes several hours in advance to accommodate planning. The only NWS office that issues ROFORs is WFO Honolulu.

8.1 ROFOR Criteria

WFO Honolulu prepares and issues ROFORs for flight paths that begin, end, or have most of their path within the Pacific Region area of responsibility, which extends from the equator to 30N, between 140W and 130E.

8.2 ROFOR Issuance Time

ROFORs are issued for prescribed times, several hours in advance, for regularly scheduled flights. ROFOR requests for unscheduled flights will be prepared as soon as time allows.

8.3 ROFOR Amendments

ROFORs are not required to be amended.

8.4 ROFOR Corrections

ROFOR corrections will be issued as soon as possible when erroneous data has been transmitted.

8.5 ROFOR Content

ROFORs contain some or all of the following forecast parameters:

- Winds and temperatures aloft
- Significant en route weather
- Zone weather
- Weather Synopsis

At a minimum, ROFORs include winds and temperatures aloft and significant en route weather. ROFORs may contain data for multiple altitudes and include TAFs for destination points and/or alternates.

9 Traffic Flow Management (TFM) Convective Forecast (TCF)

The TCF is a high confidence (greater than 50%) graphical representation of forecasted convection meeting specific coverage, intensity, and echo top criteria. The TCF is designed for use in the coordinated planning and strategic management of en route air traffic flow. The TCF is used by airline industry and FAA participants of the Collaborative Decision Making (CDM) NAS planning process led by the Federal Aviation Administration's Air Traffic Control System Command Center. From approximately March 1 through October 31, the TCF is issued by AWC after collaboration with NWS offices, Meteorological Service of Canada, meteorological offices of airlines and service providers. Automated routines make the TCF available as a non-collaborated product from November through February. Lines of convection are not depicted when automated routines produce the TCF.

9.1 TCF Criteria

All of the following conditions will be met for an area of convection to be identified and included in the TCF.

1. The area will contain at least 25% coverage of:
 - a. 40 dBZ or higher composite radar reflectivity echoes, and
 - b. Echo tops at or above FL250
2. Forecaster confidence (of the above conditions occurring) of at least 50%.

9.2 TCF Format

1. Coverage
 - a. Sparse 25–39% (sparse fill)
 - b. Medium 40–74% (medium fill)
 - c. Lines of coverage: Solid purple lines, either alone or within a polygon. The length of a line will be at least 100 nm and coverage of 75–100%.
2. Maximum echo tops range:
 - a. 25,000–29,000 feet MSL (290)
 - b. 30,000–34,000 feet MSL (340)
 - c. 35,000–39,000 feet MSL (390)
 - d. At or above 40,000 feet MSL (400)
3. Forecaster confidence:
 - a. High: 50–100% (blue border and fill)

9.3 TCF Issuance Times and Valid Period

1. The TCF is issued daily from March 1 to October 31, every 2 hours, valid at 4-, 6-, and 8-hours after issuance time.
2. A portion of Canadian airspace is included April 1 to September 30.
3. The TCF ASCII coded text product is issued under these WMO headers:
 - a. 4-Hour: FAUS28 KKCI
 - b. 6-Hour: FAUS29 KKCI
 - c. 8-Hour: FAUS30 KKCI

9.4 TCF Updates, Amendments, and Corrections

The TCF is updated every 2 hours and is not required to be amended or corrected.

APPENDIX A - Examples

A1 SIGMET

A1.1 CONUS Non-Convective SIGMET

WSUS01 KPCI 050600
WS1R
BOSR WS 050600
SIGMET ROMEO 2 VALID UNTIL 051000 ME NH VT
FROM CAR TO YSJ TO CON TO MPV TO CAR
SEV TURB BLW 080. RPRTD BY ACFT. CONDS CONTG BYD 1000Z.

A1.2 CONUS Convective SIGMET

WSUS33 KPCI 091855
SIGW
MKCW WST 091855
CONVECTIVE SIGMET...NONE
.
OUTLOOK VALID 092055-100055
TS ARE NOT EXPD.

WSUS32 KPCI 091855
SIGC
MKCC WST 091855
CONVECTIVE SIGMET 21C
VALID UNTIL 2055Z
AR OK
FROM 20S RZC-40SSW FSM
DMSHG LINE TS 25 NM WIDE MOV FM 27025KT. TOPS TO FL320.

.
OUTLOOK VALID 092055-100055
FROM 40NE BUM-60SE SGF-50WSW LIT-40W GGG-60ENE ABI-ADM-50WNW BUM-40NE
BUM
WST ISSUANCES EXPD. REFER TO MOST RECENT ACUS01 KWNS FROM STORM
PREDICTION CENTER FOR SYNOPSIS AND METEOROLOGICAL DETAILS.

A1.3 Convective SIGMET with tropical cyclone remarks

WSUS31 KPCI 211355
SIGE
MKCE WST 211355
CONVECTIVE SIGMET 1E
VALID UNTIL 1555Z
NC SC FL GA AND CSTL WTRS
FROM 30SSE CLT-160SE ILM-140ENE OMN-60E TLH-ABY-30SSE CLT AREA SEV
EMBD TS MOV FROM 21015KT. TOPS ABV FL450.
TORNADOES...WIND GUSTS TO 60KT POSS.
TS ASSOC'D WITH TROPICAL STORM ALBERTO.
.
OUTLOOK VALID 211555-211955
FROM 30E RDU-180SE ECG-140SSE ILM-180E PBI-40SE PBI-40S EYW-90SW EYW-

70W SRQ-50N CTY-40N MCN-30NW SPA-30E RDU REF WW 475.
WST ISSUANCES EXPD. REFER TO MOST RECENT ACUS01 KWNS FROM STORM
PREDICTION CENTER FOR SYNOPSIS AND METEOROLOGICAL DETAILS. REFER TO
MOST RECENT WTNT21 KNHC FROM NATIONAL HURRICANE CENTER FOR DETAILS ON
TROPICAL STORM ALBERTO.

A1.4 International SIGMET

WSPA07 PHFO 010358
SIGPAT
KZAK SIGMET TANGO 1 VALID 010400/010800 PHFO-
OAKLAND OCEANIC FIR EMBD TS OBS WI N2055 W15000 - N1950 W14945 - N1922
W15130 - N2027 W15048 - N2055 W15000. CB TOP FL400. MOV W 10KT. WKN.

A1.5 International Tropical Cyclone SIGMET

WSNT03 KKCI 081451 SIGA0C
KZNY SIGMET CHARLIE 11 VALID 081500/082100 KKCI-
NEW YORK OCEANIC FIR TC KYLE OBS N3106 W07118 AT 1500Z CB TOP FL500 WI
120NM OF CENTER MOV WSW 5 KT NC FCST 2100Z TC CENTER N3142 W07012

A1.6 International Volcanic Ash Cloud SIGMET

WVAK01 PAWU 300600
PAZA SIGMET INDIA 1 VALID 300600/301200 PAWU-
ANCHORAGE FIR VA ERUPTION PAVLOF VOLCANO PSN N5542 W16153
VA CLDS OBS AT 0600Z WI N5734 W16036 - N5609 W16027 - N5612 W15838 -
N5530 W15838 - N5516 W16256 - N5719 W16406 - N5734 W16036 SFC/FL300.
MOV E 5KT. NC. FCST 1200Z VA CLD WI N5616 W15836 - N5624 W15322 -
N5519 W15332 - N5528 W15835 - N5616 W15836.

A2 AIRMETs

A2.1 CONUS AIRMET

WAUS43 KKCI 091445
CHIZ WA 091445
AIRMET ZULU UPDT 4 FOR ICE AND FRZLVL VALID UNTIL 092100
AIRMET ICE...KS IA MO IL
FROM 30WSW FOD TO DBQ TO 50NW DEC TO 50SW FAM TO OSW TO MKC TO 30WSW
FOD
MOD ICE BTN FRZLVL AND FL200. FRZLVL 060-100. CONDS ENDG BY 21Z.
.
OTLK VALID 2100-0300Z...ICE IA MO WI IL IN KY
BOUNDED BY BAE-BVT-PXV-50SW FAM-50NW DEC-DBQ-BAE
MOD ICE BTN FRZLVL AND FL200. FRZLVL 080-100. CONDS CONTG THRU 03Z.
.
FRZLVL...RANGING FROM SFC-120 ACRS AREA
MULT FRZLVL 015-085 BOUNDED BY 40W INL-YQT-SSM-70NNE ASP-YVV-DXO-40NE
FWA-40SSE BJI-40W INL
SFC ALG 50NNW ISN-70W FAR-GFK-40NE ODI-40SW DXO
040 ALG ISN-70S BIS-30W ABR-30E ABR-60S FAR-30SW BRD-30NE FWA
080 ALG GLD-SLN-30W BDF-50S JOT-40SE IND-30SW CVG-40SW LOZ

A2.2 Hawaii AIRMET

WAHW31 PHFO 090945
WA0HI
HNLT WA 091000
AIRMET TANGO UPDATE 1 FOR TURB VALID UNTIL 091600
AIRMET TURB...KAUAI OAHU MOLOKAI LANAI MAUI
OVR AND IMTS THRU W OF MT.
MOD TURB BLW 100. COND CONT BYD 1600Z.

A2.3 Alaska AIRMET

WAAK47 PAWU 011740
WA7O
JNUS WA 011745
AIRMET SIERRA FOR IFR AND MT OBSC VALID UNTIL 012100
.
LYNN CANAL AND GLACIER BAY JB
PAGS W SPRDG E MTS OCNL OBSC IN CLDS/PCPN. DTRT.
.
CNTRL SE AK JC
N PAGN OCNL CIGS BLW 010/VIS BLW 3SM -RA BR. IMPR.
.
CNTRL SE AK JC
MTS OCNL OBSC IN CLDS/PCPN. NC.
.
ERN GLF CST JE
MTS OCNL OBSC IN CLDS/PCPN. IMPR.
.
SE AK CSTL WTRS JF AAA
OCNL CIG BLW 010 VIS BLW 3SM BR. ST/FOG TOPS 015. NC.

A3 FA

A3.1 Gulf of Mexico FA

FAGX20 KKCI 091812
OFAGX
SYNOPSIS VALID TIL 101900Z FCST...091900Z-100700Z OTLK...100700Z-
101900Z

INTERNATIONAL OPERATIONS BRANCH
AVIATION WEATHER CENTER KANSAS CITY MISSOURI

.
CSTL WATERS FROM COASTLINE OUT TO HOUSTON OCEANIC FIR AND GLFMEX MIAMI
OCEANIC FIR AND W OF 85W. HOUSTON OCEANIC FIR AND GLFMEX MIAMI OCEANIC
FIR.

.
TS IMPLY SEV OR GTR TURB SEV ICE LLWS AND IFR CONDS.

.
01 SYNOPSIS...HIGH PRES OVR NRN GLFMEX.
.

02 SIGNIFICANT CLD/WX...

.
CSTL WATERS... SCT020. OTLK...VFR.

.
HOUSTON OCEANIC FIR...SCT020. OTLK...VFR.

.
GLFMEX MIAMI OCEANIC FIR...SCT020. OTLK...VFR.

.
03 ICE AND FRZLVL...

CSTL WATERS...SEE AIRMETS ZULU WAUS44 KKCI AND WAUS42 KKCI. HOUSTON OCEANIC FIR...NO SGFNT ICE EXP OUTSIDE CNVTV ACT. GLFMEX MIAMI OCEANIC FIR...NO SGFNT ICE EXP OUTSIDE CNVTV ACT. FRZLVL...140 THRUT.

04 TURB...

CSTL WATERS...SEE AIRMETS TANGO WAUS44 KKCI AND WAUS42 KKCI. HOUSTON OCEANIC FIR...NO SGFNT TURB EXP OUTSIDE CNVTV ACT. GLFMEX MIAMI OCEANIC FIR...NO SGFNT TURB EXP OUTSIDE CNVTV ACT.

A3.2 Caribbean FA

FACA20 KKCI 121530

OFAMKC

INTERNATIONAL OPERATIONS BRANCH

AVIATION WEATHER CENTER KANSAS CITY MISSOURI VALID 121600-130400

OUTLOOK...130400-131600

.
ATLANTIC S OF 32N W OF 57W...CARIBBEAN...GULF OF MEXICO BTN 22N AND 24N.

.
ALL WND SFC. TS IMPLY SEV OR GTR TURB SEV ICE LLWS AND IFR CONDS. SFC TO 400 MB.

.
SYNOPSIS...WK CDFNT EXTDS FM NR 28N60W TO 23N63W TO THE MONA PASSAGE. CDFNT WL MOV EWD AND WKN TODAY. EXP NARROW BAND OF CLDS WITH ISOL SHRA INVOF CDFNT.

.
SIGNIFICANT CLD/WX...

ERN MONTERREY FIR...NRN MERIDA FIR SCT025 SCT060. OTLK...VFR.

.
ATLC SWRN NEW YORK FIR...SAN JUAN FIR

NW OF CDFNT...SCT025 SCT060. Lyr OCNL BKN. TOP 120. ISOL SHRA. OTLK...VFR.

VCNTY CDFNT...SCT025 BKN060. OCNL BKN025. TOP 120. WDLY SCT SHRA. ISOL TSRA TIL 20Z. OTLK...VFR SHRA.

SE OF CDFNT...SCT025 SCT060. ISOL SHRA. OTLK...VFR.

.
ATLC MIAMI FIR

SCT025 SCT060. Lyr OCNL BKN. TOP 120. ISOL SHRA. OTLK...VFR.

.
WRN PIARCO FIR...NRN MAIQUETIA FIR...CURACAO FIR

BTN 61W-63W...SCT025 BKN060. OCNL BKN025. TOP 120. WDLY SCT SHRA. OTLK...VFR SHRA.

RMNDR...SCT025 SCT060. ISOL SHRA. OTLK...VFR.
.
SANTO DOMINGO FIR...PORT-AU-PRINCE FIR
SCT025 SCT060. LVR OCNL BKN. TOP 120. ISOL SHRA. OTLK...VFR.
.
NRN BARRANQUILLA FIR...NRN PANAMA FIR
SCT025 SCT060. ISOL SHRA. SFC WND NE 20-25KT. OTLK...VFR.
.
KINGSTON FIR...NERN CNTRL AMERICAN FIR...HABANA FIR
SCT025 SCT060. ISOL SHRA. OTLK...VFR.
.
ICE AND FRZLVL...
NO SGFNT ICE EXP OUTSIDE CNVTV ACT. FRZLVL... 145-170.
.
TURB...
NO SGFNT TURB EXP OUTSIDE CNVTV ACT.

A3.3 Hawaii FA

FAHW31 PHFO 080940
FA0HI
.
HNLC FA 080940
SYNOPSIS AND VFR CLD/WX SYNOPSIS VALID UNTIL 090400
CLD/WX VALID UNTIL 082200...OUTLOOK VALID 082200-090400
.
SEE AIRMET SIERRA FOR IFR CLD AND MT OBSC.
TS IMPLY SEV OR GREATER TURB SEV ICE LOW LEVEL WS AND IFR COND. NON
MSL HGT DENOTED BY AGL OR CIG.
.
SYNOPSIS...SFC HIGH FAR N PHNL NEARLY STNR.
.
BIG ISLAND ABOVE 060.
SKC. 20Z SCT090. OUTLOOK...VFR.
.
BIG ISLAND LOWER SLOPES...COAST AND ADJ WATERS FROM UPOLU POINT TO
CAPE KUMUKAHI TO APUA POINT.
SCT030 BKN050 TOPS 080 TEMPO BKN030 VIS 3-5SM -SHRA BR. 21Z SCT030
SCT- BKN050 TOPS 080 ISOL BKN030 5SM -SHRA. OUTLOOK...VFR.
.
BIG ISLAND LOWER SLOPES...COAST AND ADJ WATERS FROM APUA POINT TO SOUTH
CAPE TO UPOLU POINT. SKC. 21Z BKN-OVC060 TOPS 080 ISOL BKN030 -
SHRA.N AND E FACING SLOPES...COAST AND ADJ WATERS OF THE REMAINING
ISLANDS.
SCT020 BKN045 TOPS 070 TEMPO BKN020 VIS 3-5SM -SHRA. 22Z SCT025 SCT-
BKN050 TOPS 070 ISOL BKN025 3-5SM -SHRA. OUTLOOK...VFR.
.
REST OF AREA.
FEW-SCT050 ISOL BKN040 TOPS 070 -SHRA. OUTLOOK...VFR.

A3.4 Alaska FA

FAAK48 PAWU 291739
 FA8H
 ANCH FA 291315
 AK SRN HLF EXCP SE AK...

.
 AIRMETS VALID UNTIL 292115
 CB IMPLY POSSIBLE SEV OR GREATER TURB SEV ICE LLWS AND IFR CONDS.
 NON MSL HEIGHTS NOTED BY AGL OR CIG.

.
 SYNOPSIS VALID UNTIL 300700
 998MB LOW 140NM SE PAKH MOV SE THRU PD. ASSOC SFC TROF SERN KODIAK
 ISLAND-SEWD ALSO MOV SE THRU PD. OCFNT WRN/CNTRL BERING SEA-PAAK MOV
 E TO LIE NR A ST MATTHEW ISLAND-PAPB-SEGUAM LN BY 18Z AND A PASA-
 PACZ-PADU LN BY END OF PD.

.
 COOK INLET AND SUSITNA VLY AB...VALID UNTIL 300100
 ...CLOUDS/WX...
 AIRMET IFRTIL 19Z N PANC OCNL CIG BLW 010/VIS BLW 3SM -SHSN BR.
 IMPR...
 AIRMET MT OBSCN PANC MTS OBSC IN CLDS/PCPN. IMPR...
 N PANC SCT005 BKN025 OVC045 TOP 120 LYRD TO FL250 VIS 5SM -SN.
 AFT 21Z ISOL -SN.
 ELSW BKN050 BKN120 CI ABV.
 OTLK VALID 300100-300700...TALKEETNA MTS MVFR CIG. ELSW VFR.
 PASSES...LAKE CLARK...MERRILL...RAINY...VFR.
 WINDY...IFR CIG/VIS SHSN. AFT 21Z MVFR CIG.
 PORTAGE...MVFR CIG.
 ...TURB...
 NIL SIG.
 ...ICE AND FZLVL...
 AIRMET ICETIL 16Z N PAUO OCNL MOD ICEIC 020-120.
 FZLVL SFC. WKN...
 16Z TO 19Z N PATK ISOL MOD ICEIC 020-120.

.
 COPPER RIVER BASIN AC...VALID UNTIL 300100
 ...CLOUDS/WX...
 AIRMET IFRVLYS OCNL CIGS BLW 010/VIS BLW 3SM BR. IMPR...
 AIRMET MT OBSCMTS OCNL OBSC IN CLDS/PCPN. NC...
 FEW015 SCT045 BKN070 TOP 120. VCY MTS OCNL BKN045 ISOL -SHSN.
 OTLK VALID 300100-300700...VFR.
 PASS...TAHNETA...IFR VIS BR.
 ...TURB...
 NIL SIG.
 ...ICE AND FZLVL...
 AFT 19Z NE PAGK ISOL MOD ICEIC 020-120. FZLVL SFC.

.
 CNTRL GLF CST AD...VALID UNTIL 300100
 ...CLOUDS/WX...
 AIRMET MT OBSCMTS OCNL OBSC IN CLDS/PCPN. IMPR...
 FEW005 SCT025 BKN045 TOP 110. OCNL BKN025 VIS 5SM -SHSN/SHRASN BR.

CHUGACH MTS ISOL CIGS BLW 010/VIS BLW 3SM -SHSN BR.
 OTLK VALID 300100-300700...CHUGACH MTS MVFR CIG SHSN/SHRA. ELSW VFR.
 ...TURB...
 NIL SIG.
 ...ICE AND FZLVL...
 NIL SIG. FZLVL BLW 010.
 .
 KODIAK IS AE...VALID UNTIL 300100
 ...CLOUDS/WX...
 TIL 18Z OFSHR SE PAKH BKN-OVC025 LYRD TO FL200. OCNL -SHRA/-SHRASN BR.
 ELSW/OTRW SCT035 BKN050 TOPS 090 ISOL -SHSN.
 OTLK VALID 300100-300700...VFR.
 ...TURB...
 NIL SIG.
 ...ICE AND FZLVL...
 NIL SIG. FZLVL SFC N TO 020 S.

A4 ROFOR

Santa Barbara and San Francisco to Honolulu Route:

FRPN31 PHFO 061904
 RFRKSF

WINDS/TEMPERATURES AND WEATHER BY ZONE FOR
 ROUTE SFO/HNL VIA 31.3N/140W VALID AT 071200Z

		FLIGHT LEVELS					
ZONE	FL050	FL100	FL180	FL240	ZONE	WEATHER	
25	9904 P05	3308 P00	3124 M17	3131 M29	4-6	CI FL250/FL350	
26	2409 P06	2716 P03	2827 M16	2839 M29	2-4	SCCU 020-030	
					4-6	CI FL250/FL350	
27	2619 P07	2527 P02	2547 M15	2657 M28	3-5	SCCU 020-050	
					4-6	CI FL250/FL400	
28	2723 P09	2630 P00	2640 M14	2748 M27	5-7	LYRS 020/100	
						VIS 3-5SM SHRA	
					4-6	CI FL250/FL400	
29	2615 P10	2727 P02	2726 M13	2638 M26	DO		
30	3206 P10	2715 P03	2619 M12	2635 M25	DO		
31	0611 P11	2106 P05	2715 M11	2633 M23	3-5	SCCU 020/060	
						ISOL VIS 5SM -SHRA	
					4-6	CI FL250/FL350	
32	0817 P12	0908 P07	2618 M10	2730 M21	3-5	SCCU 020/080	
						ISOL VIS 5SM -SHRA	

OVERALL WIND FACTOR COMPONENTS
 M05 M14 M24 M34

ROUTE SFO/HNL VIA 31.3N/140W...OUTLOOK				VALID AT
OVERALL WIND FACTOR COMPONENTS				
M10	M12	M23	M31	08/1200Z
M04	M14	M21	M21	09/1200Z
P05	P01	M07	M13	10/1200Z

ROUTE SBA/HNL VIA 29.5N/140W VALID AT 071200Z

		FLIGHT LEVELS				
ZONE	FL050	FL100	FL180	FL240	ZONE	WEATHER
25	3408 P06	3417 P00	3432 M17	3450 M28	1-3	CU 030/050
26	3206 P07	3015 P04	2926 M14	2946 M26	3-5	SCCU 020/040
					4-6	CI FL300/FL400
27	2710 P09	2619 P05	2736 M13	2751 M25	DO	
28	3113 P10	2624 P05	2639 M12	2652 M25	DO	
29	3311 P10	2621 P04	2631 M12	2545 M25	DO	
30	0310 P11	2612 P04	2722 M12	2536 M25	DO	
31	0612 P11	9905 P05	2617 M11	2632 M23	3-5	SCCU 020/060
						ISOL VIS 5SM -SHRA
					4-6	CI FL250/FL350
32	0818 P13	1009 P07	2618 M10	2730 M20	3-5	SCCU 020/080
						ISOL VIS 5SM -SHRA

OVERALL WIND FACTOR COMPONENTS
P02 M10 M23 M36

ROUTE SBA/HNL VIA 29.5N/140W...OUTLOOK

OVERALL WIND FACTOR COMPONENTS				VALID AT
M02	M12	M20	M28	08/1200Z
M02	M09	M19	M20	09/1200Z
P04	M01	M13	M14	10/1200Z

SYNOPSIS...COLD FRONT APPROACHING ZONES 28-30 WILL BRING SHRA AND LOWERED VIS TO LEVELS BELOW 10000 FT MSL. OTHERWISE SCT HIGH CLOUDS AND SCT LOW STRATUS WILL DOMINATE THE FLIGHT PATH. -SHRA MAY AFFECT FLIGHTS INBOUND OR OUTBOUND TO THE ISLANDS.

A5 TCF

FAUS28 KKCI 301700

CFP02

CCFP 20130430_1700 20130430_2100

AREA 3 3 3 3 0 0 5 326 773 299 792 301 775 326 764 326 773 312 777

AREA 3 3 3 3 0 0 19 282 897 285 889 293 884 298 883 303 875 312 869

321 872 324 886 325 904 319 924 315 935 315 953 307 954 300 947 301

938 297 929 291 920 282 923 282 897 292

916

AREA 3 1 3 2 0 0 16 282 912 287 902 294 898 297 908 306 911 317 910

320 898 320 886 320 876 314 872 302 878 302 888 293 887 287 892 282

902 282 912 265 897

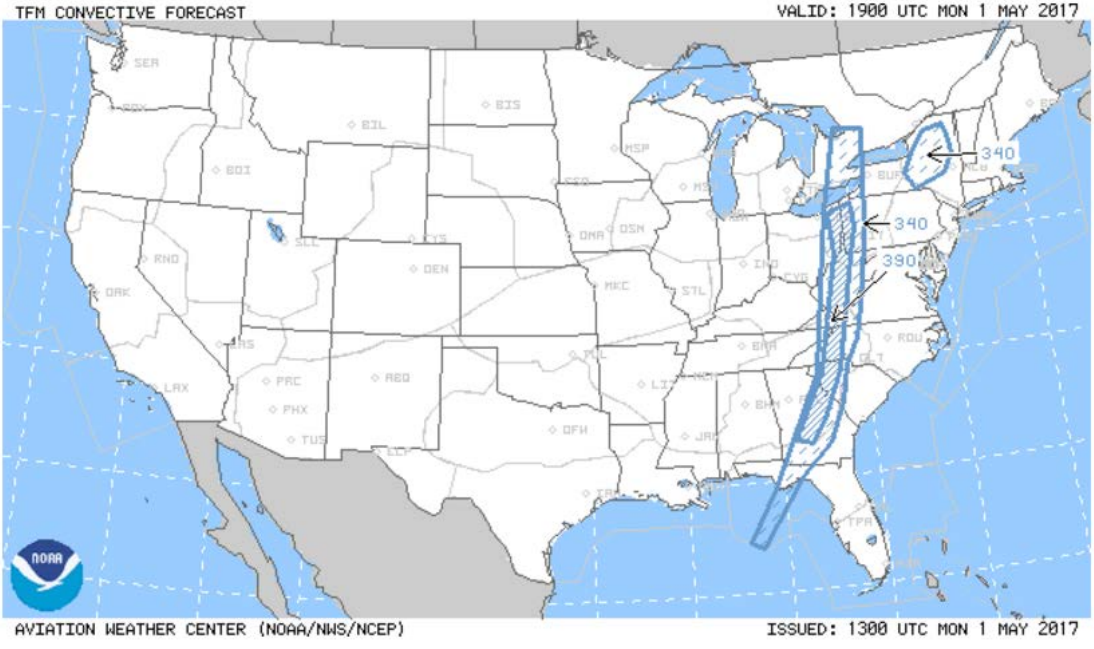
AREA 3 1 3 2 0 0 7 288 817 283 824 264 816 254 805 264 802 286 811 288

817 272 812

AREA 3 3 3 2 0 0 13 297 819 281 828 269 824 259 814 252 811 252 804

263 800 268 795 275 795 278 805 286 807 296 814 297 819 290 818

CANADA ON



APPENDIX B - WMO Headers

B1 Aviation Weather Center (AWC) Products

B1.1 SIGMET

B1.1.1 CONUS FIRs Non-Convective SIGMET

<u>WMO Header</u>	<u>AWIPS ID</u>
WCUS01 KKCI	MKCWC1 [N-Y] *
WSUS01 KKCI	MKCWS1 [N-Y] *
WVUS01 KKCI	MKCWV1 [N-Y] *
WCUS02 KKCI	MKCWC2 [N-Y] *
WSUS02 KKCI	MKCWS2 [N-Y] *
WVUS02 KKCI	MKCWV2 [N-Y] *
WCUS03 KKCI	MKCWC3 [N-Y] *
WSUS03 KKCI	MKCWS3 [N-Y] *
WVUS03 KKCI	MKCWV3 [N-Y] *
WCUS04 KKCI	MKCWC4 [N-Y] *
WSUS04 KKCI	MKCWS4 [N-Y] *
WVUS04 KKCI	MKCWV4 [N-Y] *
WCUS05 KKCI	MKCWC5 [N-Y] *
WSUS05 KKCI	MKCWS5 [N-Y] *
WVUS05 KKCI	MKCWV5 [N-Y] *
WCUS06 KKCI	MKCWC6 [N-Y] *
WSUS06 KKCI	MKCWS6 [N-Y] *
WVUS06 KKCI	MKCWV6 (N-Y) *

*Omit Sierra (S), Tango (T), and Zulu (Z)

B1.1.2 CONUS FIRs Convective SIGMET

<u>WMO Header</u>	<u>AWIPS ID</u>
WSUS31 KKCI	MKCSIGE
WSUS32 KKCI	MKCSIGC
WSUS33 KKCI	MKCSIGW

B1.1.3 New York, Miami, Houston, and San Juan Oceanic FIRs

<u>WMO Header</u>	<u>AWIPS ID</u>
WSNT01 KKCI	SIGA0A
WSNT02 KKCI	SIGA0B
WSNT03 KKCI	SIGA0C
WSNT04 KKCI	SIGA0D
WSNT05 KKCI	SIGA0E
WSNT06 KKCI	SIGA0F
WSNT07 KKCI	SIGA0G
WSNT08 KKCI	SIGA0H
WSNT09 KKCI	SIGA0I

WSNT10	KKCI	SIGA0J
WSNT11	KKCI	SIGA0K
WSNT12	KKCI	SIGA0L
WSNT13	KKCI	SIGA0M
WCNT01	KKCI	MKCWSTA0A
WCNT02	KKCI	MKCWSTA0B
WCNT03	KKCI	MKCWSTA0C
WCNT04	KKCI	MKCWSTA0D
WCNT05	KKCI	MKCWSTA0E
WCNT06	KKCI	MKCWSTA0F
WCNT07	KKCI	MKCWSTA0G
WCNT08	KKCI	MKCWSTA0H
WCNT09	KKCI	MKCWSTA0I
WCNT10	KKCI	MKCWSTA0J
WCNT11	KKCI	MKCWSTA0K
WCNT12	KKCI	MKCWSTA0L
WCNT13	KKCI	MKCWSTA0M
WVNT01	KKCI	MKCWSVA0A
WVNT02	KKCI	MKCWSVA0B
WVNT03	KKCI	MKCWSVA0C
WVNT04	KKCI	MKCWSVA0D
WVNT05	KKCI	MKCWSVA0E
WVNT06	KKCI	MKCWSVA0F
WVNT07	KKCI	MKCWSVA0G
WVNT08	KKCI	MKCWSVA0H
WVNT09	KKCI	MKCWSVA0I
WVNT10	KKCI	MKCWSVA0J
WVNT11	KKCI	MKCWSVA0K
WVNT12	KKCI	MKCWSVA0L
WVNT13	KKCI	MKCWSVA0M

B1.1.4 Oakland Oceanic FIR

<u>WMO Header</u>	<u>AWIPS ID</u>	
WSPN01	KKCI	MKCSIGP0A
WSPN02	KKCI	MKCSIGP0B
WSPN03	KKCI	MKCSIGP0C
WSPN04	KKCI	MKCSIGP0D
WSPN05	KKCI	MKCSIGP0E
WSPN06	KKCI	MKCSIGP0F
WSPN07	KKCI	MKCSIGP0G
WSPN08	KKCI	MKCSIGP0H
WSPN09	KKCI	MKCSIGP0I
WSPN10	KKCI	MKCSIGP0J
WSPN11	KKCI	MKCSIGP0K
WSPN12	KKCI	MKCSIGP0L
WSPN13	KKCI	MKCSIGP0M
WCPN01	KKCI	MKCWSTP0A
WCPN02	KKCI	MKCWSTP0B
WCPN03	KKCI	MKCWSTP0C

WCPN04	KKCI	MKCWSTP0D
WCPN05	KKCI	MKCWSTP0E
WCPN06	KKCI	MKCWSTP0F
WCPN07	KKCI	MKCWSTP0G
WCPN08	KKCI	MKCWSTP0H
WCPN09	KKCI	MKCWSTP0I
WCPN10	KKCI	MKCWSTP0J
WCPN11	KKCI	MKCWSTP0K
WCPN12	KKCI	MKCWSTP0L
WCPN13	KKCI	MKCWSTP0M

WVPN01	KKCI	MKCWSVP0A
WVPN02	KKCI	MKCWSVP0B
WVPN03	KKCI	MKCWSVP0C
WVPN04	KKCI	MKCWSVP0D
WVPN05	KKCI	MKCWSVP0E
WVPN06	KKCI	MKCWSVP0F
WVPN07	KKCI	MKCWSVP0G
WVPN08	KKCI	MKCWSVP0H
WVPN09	KKCI	MKCWSVP0I
WVPN10	KKCI	MKCWSVP0J
WVPN11	KKCI	MKCWSVP0K
WVPN12	KKCI	MKCWSVP0L
WVPN13	KKCI	MKCWSVP0M

B1.2 AIRMET

The AWC issues six sets of three AIRMETs (i.e., SIERRA, TANGO, and ZULU).

<u>WMO HEADER</u>	<u>AWIPS ID</u>
WAUS41 KKCI	MKCWA1 [STZ]
WAUS42 KKCI	MKCWA2 [STZ]
WAUS43 KKCI	MKCWA3 [STZ]
WAUS44 KKCI	MKCWA4 [STZ]
WAUS45 KKCI	MKCWA5 [STZ]
WAUS46 KKCI	MKCWA6 [STZ]

B1.3 TCF

<u>WMO HEADER</u>	<u>AWIPS ID</u>
FAUS28 KKCI	CFP02
FAUS29 KKCI	CFP03
FAUS30 KKCI	CFP04

B1.4 FA

B1.4.1 Gulf of Mexico FA

<u>WMO HEADER</u>	<u>AWIPS ID</u>
FAGX20 KKCI	MKCOFAGX

B1.4.2 Caribbean FA

<u>WMO HEADER</u>	<u>AWIPS ID</u>
FACA20 KKCI	MKCOFAMKC

B2 Alaska Aviation Weather Unit (AAWU) Products

B2.1 SIGMET

<u>WMO HEADER</u>	<u>AWIPS ID</u>
WSAK01 PAWU	ANCSIGAK1
WSAK02 PAWU	ANCSIGAK2
WSAK03 PAWU	ANCSIGAK3
WSAK04 PAWU	ANCSIGAK4
WSAK05 PAWU	ANCSIGAK5
WSAK06 PAWU	ANCSIGAK6
WSAK07 PAWU	ANCSIGAK7
WSAK08 PAWU	ANCSIGAK8
WSAK09 PAWU	ANCSIGAK9
WVAK01 PAWU	ANCWSVAK1
WVAK02 PAWU	ANCWSVAK2
WVAK03 PAWU	ANCWSVAK3
WVAK04 PAWU	ANCWSVAK4
WVAK05 PAWU	ANCWSVAK5
WVAK06 PAWU	ANCWSVAK6
WVAK07 PAWU	ANCWSVAK7
WVAK08 PAWU	ANCWSVAK8
WVAK09 PAWU	ANCWSVAK9

B2.2 AIRMET

The AAWU issues three sets of three AIRMETs (i.e., SIERRA, TANGO, and ZULU).

<u>WMO HEADER</u>	<u>AWIPS ID</u>
WAAK47 PAWU	ANCWA7O
WAAK48 PAWU	ANCWA8O
WAAK49 PAWU	ANCWA9O

B2.3 FA

<u>WMO HEADER</u>	<u>AWIPS ID</u>
FAAK47 PAWU	ANCFA7H
FAAK57 PAWU	ANCFA7W
FAAK48 PAWU	ANCFA8H
FAAK58 PAWU	ANCFA8W
FAAK68 PAWU	ANCFA8T
FAAK49 PAWU	ANCFA9H
FAAK59 PAWU	ANCFA9W

B2.4 VAA

<u>WMO HEADER</u>	<u>AWIPS ID</u>
FVAK21 PAWU	ANCVAAAK1
FVAK22 PAWU	ANCVAAAK2
FVAK23 PAWU	ANCVAAAK3
FVAK24 PAWU	ANCVAAAK4
FVAK25 PAWU	ANCVAAAK5

B2.5 VAG (VAA graphic)

<u>WMO HEADER</u>	<u>AWIPS ID</u>
PFXD21 PAWU	not required
PFXD22 PAWU	not required
PFXD23 PAWU	not required
PFXD24 PAWU	not required
PFXD25 PAWU	not required

B3 WFO Honolulu Products

B3.1 SIGMET

<u>WMO HEADER</u>	<u>AWIPS ID</u>
WSPA01 PHFO	HFOSIGPAN
WSPA02 PHFO	HFOSIGPAO
WSPA03 PHFO	HFOSIGPAP
WSPA04 PHFO	HFOSIGPAQ
WSPA05 PHFO	HFOSIGPAR
WSPA06 PHFO	HFOSIGPAS
WSPA07 PHFO	HFOSIGPAT
WSPA08 PHFO	HFOSIGPAU
WSPA09 PHFO	HFOSIGPAV
WSPA10 PHFO	HFOSIGPAW
WSPA11 PHFO	HFOSIGPAX
WSPA12 PHFO	HFOSIGPAY
WSPA13 PHFO	HFOSIGPAZ
WCPA01 PHFO	HFOWSTPAN
WCPA02 PHFO	HFOWSTPAO
WCPA03 PHFO	HFOWSTPAP
WCPA04 PHFO	HFOWSTPAQ
WCPA05 PHFO	HFOWSTPAR
WCPA06 PHFO	HFOWSTPAS
WCPA07 PHFO	HFOWSTPAT
WCPA08 PHFO	HFOWSTPAU
WCPA09 PHFO	HFOWSTPAV
WCPA10 PHFO	HFOWSTPAW
WCPA11 PHFO	HFOWSTPAX
WCPA12 PHFO	HFOWSTPAY
WCPA13 PHFO	HFOWSTPAZ

WVPA01	PHFO	HFOWSVPAN
WVPA02	PHFO	HFOWSVPAO
WVPA03	PHFO	HFOWSVPAP
WVPA04	PHFO	HFOWSVPAQ
WVPA05	PHFO	HFOWSVPAR
WVPA06	PHFO	HFOWSVPAS
WVPA07	PHFO	HFOWSVPAT
WVPA08	PHFO	HFOWSVPAU
WVPA09	PHFO	HFOWSVPAV
WVPA10	PHFO	HFOWSVPAW
WVPA11	PHFO	HFOWSVPAX
WVPA12	PHFO	HFOWSVPAY
WVPA13	PHFO	HFOWSVPAZ

B3.2 AIRMET

<u>WMO HEADER</u>	<u>AWIPS ID</u>
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WAHW31 PHFO	WA0HI
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NOTE: Parsing is for geographical areas.

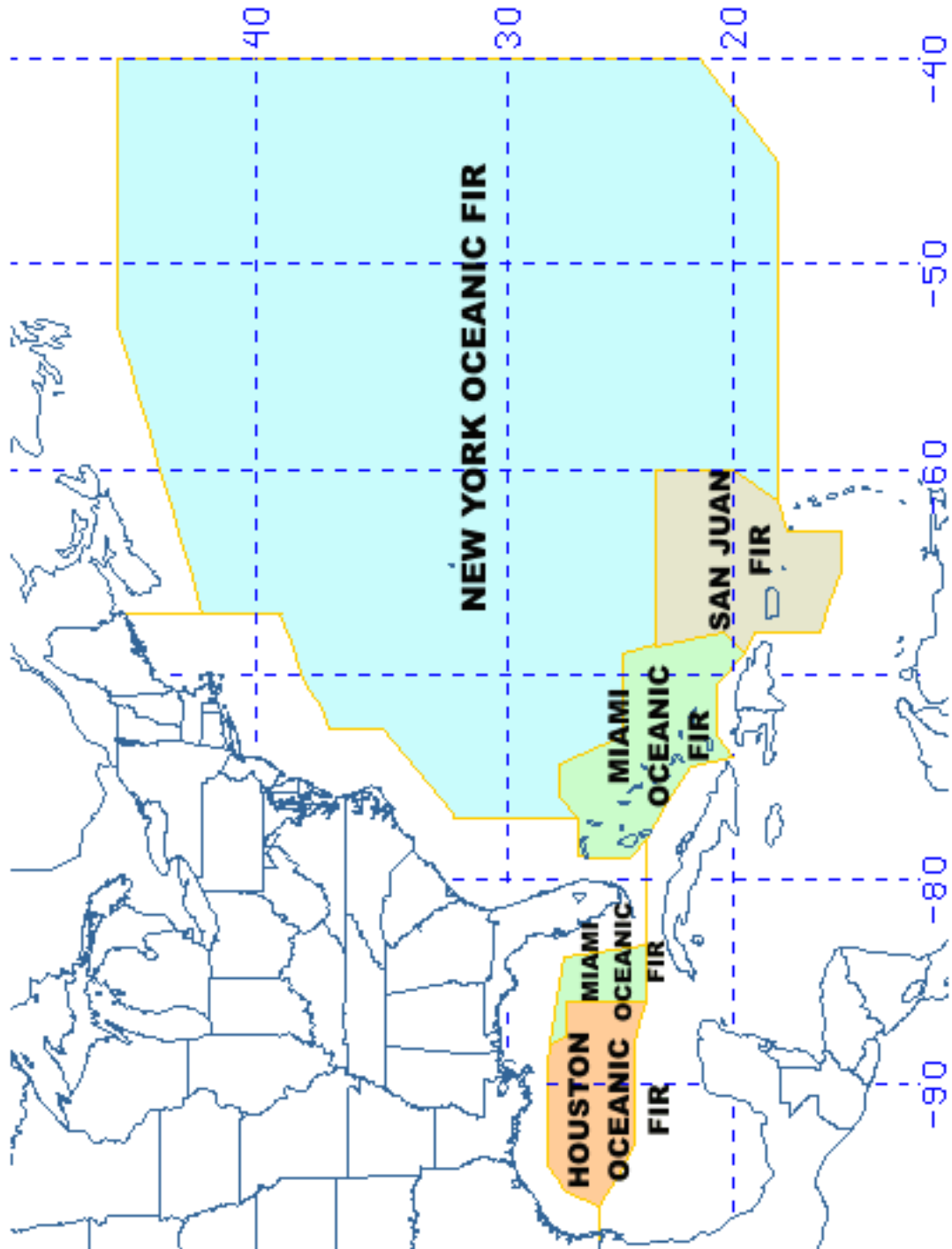
B3.3 FA

<u>WMO HEADER</u>	<u>AWIPS ID</u>
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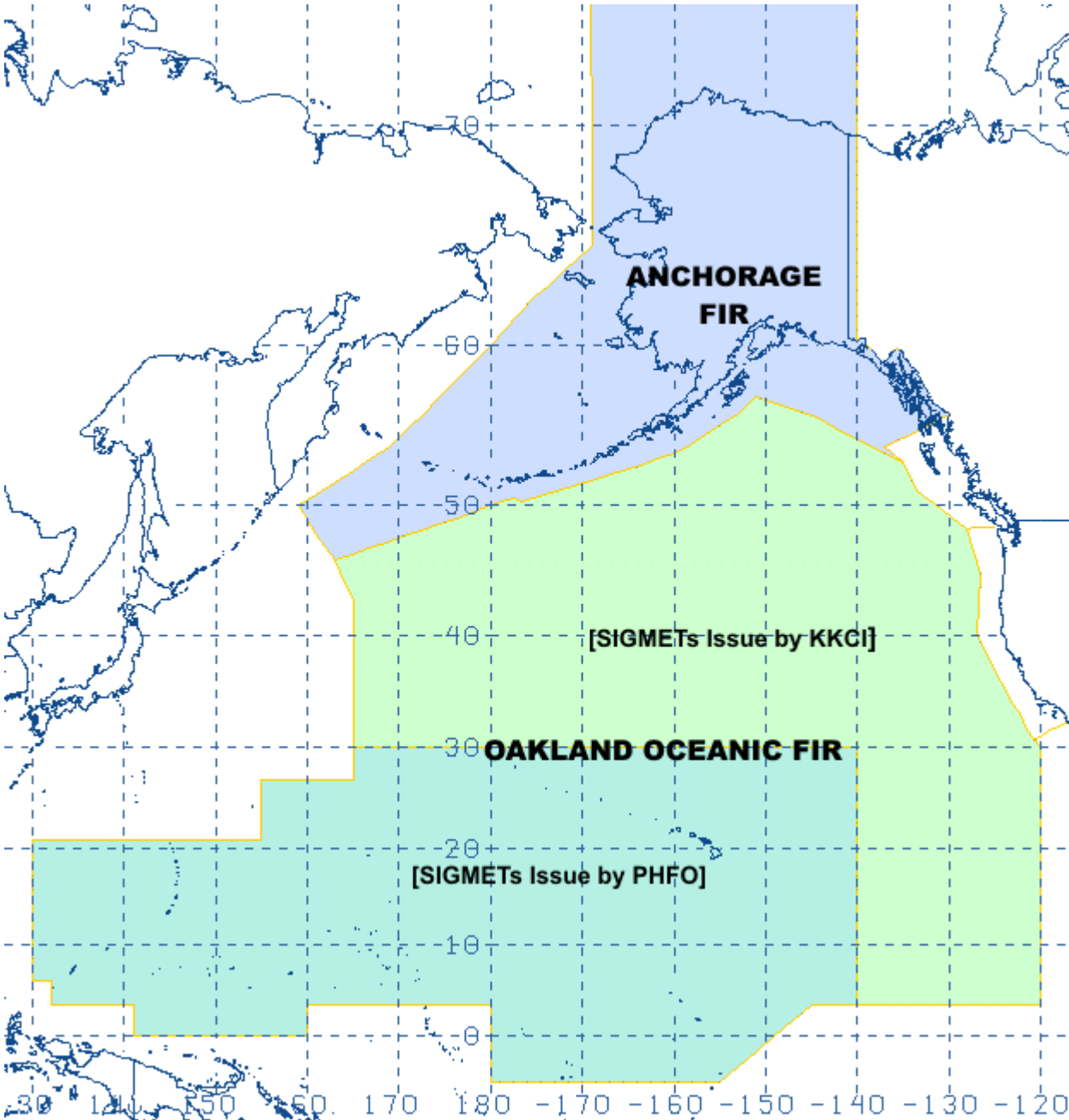
FAHW31 PHFO	FA0HI
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APPENDIX C - Areas of Responsibility

C1 AWC (KKCI) SIGMET area of responsibility in the Atlantic Basin



C2 SIGMET Areas of Responsibility in the Pacific Basin



C3 Convective SIGMETs Areas of Responsibility for the CONUS



C4 FA Areas of Responsibility

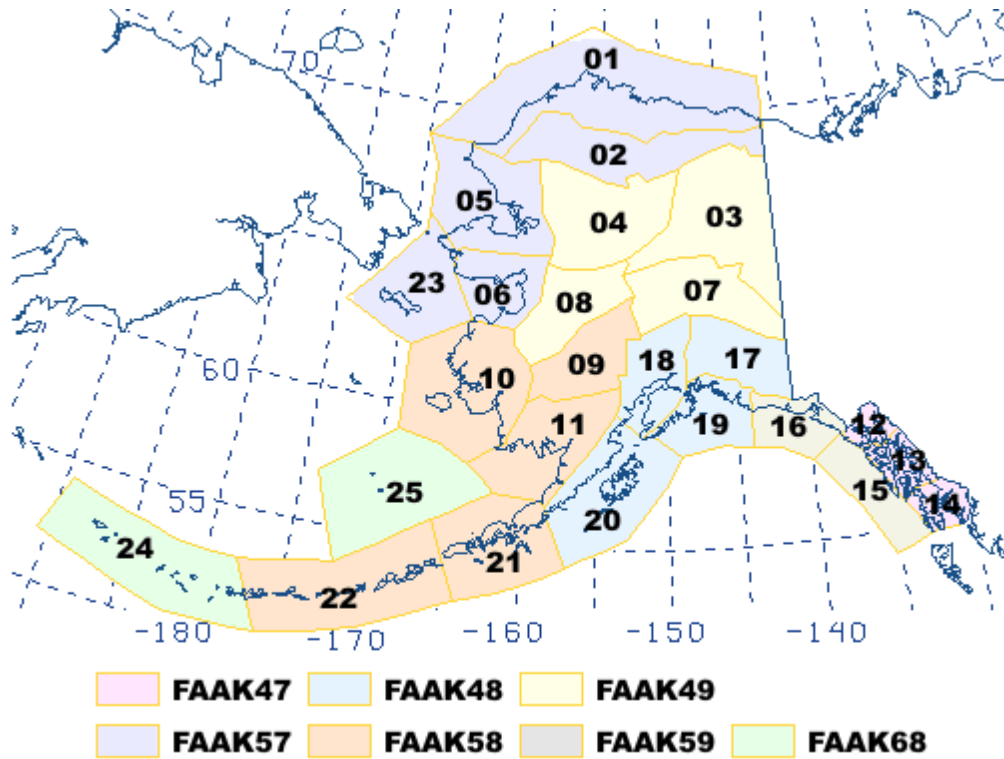
C4.1 Gulf of Mexico FA (AWC)



C4.2 Caribbean FA (AWC)



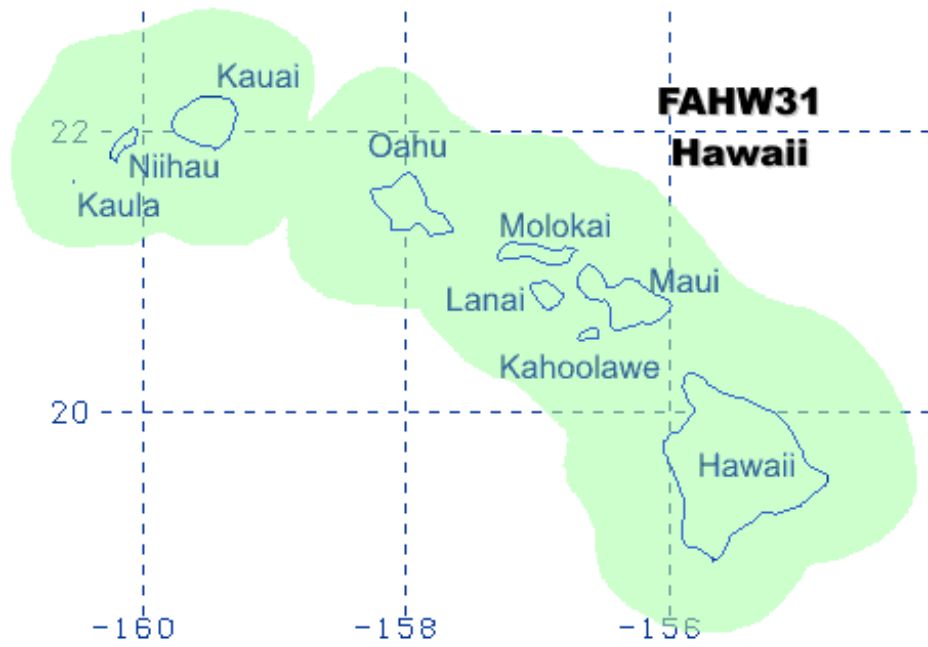
C4.3 AAWU Flight Advisory and FA Reference Points



Zones

- | | |
|---|---|
| 1. Arctic Coast Coastal | 13. Central Southeast Alaska |
| 2. North Slopes of the Brooks Range | 14. Southern Southeast Alaska |
| 3. Upper Yukon Valley | 15. Coastal Southeast Alaska |
| 4. Koyukuk and Upper Kobuk Valley | 16. Eastern Gulf Coast |
| 5. Northern Seward Peninsula-Lower Kobuk Valley | 17. Copper River Basin |
| 6. Southern Seward Peninsula-Eastern Norton Sound | 18. Cook Inlet-Susitna Valley |
| 7. Tanana Valley | 19. Central Gulf Coast |
| 8. Lower Yukon Valley | 20. Kodiak Island |
| 9. Kuskowim Valley | 21. Alaska Peninsula-Port Heiden to Unimak Pass |
| 10. Yukon-Kuskowim Delta | 22. Unimak Pass to Adak |
| 11. Bristol Bay | 23. St. Lawrence Island-Bering Sea Coast |
| 12. Lynn Canal and Glacier Bay | 24. Adak to Attu |
| | 25. Pribilof Islands and Southeast Bering Sea |

C4.4 Hawaiian FA areas



APPENDIX D - Definition of Terms

Embedded (EMBD) Thunderstorms or CB: Thunderstorms or CB clouds that are embedded in cloud layers or concealed by haze.

Extreme Turbulence (EXTREME TURB): Turbulence in which aircraft is violently tossed about and is practically impossible to control. It may cause structural damage.

Flight Information Region (FIR): An airspace of defined dimensions within which flight information service and alerting service are provided.

Flight Levels: A surface of constant atmospheric pressure which is related to a specific pressure datum, 1013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

Frequent (FRQ) thunderstorms or CB: Consisting of elements with little or no separation between adjacent thunderstorms with a maximum spatial coverage greater than 75 percent of the area affected by the phenomena at a fixed time or during the period of validity.

Instrument Meteorological Conditions (IMC): Ceiling < 1,000 feet and/or visibility < 3 miles. When LIMC is used as a sub-category of IMC for a product, IMC conditions are ceiling \geq 500 feet and < 1,000 feet and /or visibility \geq 1 mile and < 3 miles.

Isolated (ISOL) thunderstorms or CB: Consisting of individual features affecting an area with a maximum spatial coverage < 50 percent of the area affected by the phenomena at a fixed time or during the period of validity.

Line (of thunderstorms) (LINE TS): For SIGMET is defined as being at least 60 miles long with thunderstorms affecting at least 40 percent of its length.

Low Instrument Meteorological Conditions (LIMC): Ceiling < 500 feet and/or visibility < 1 SM. LIMC is a sub-category of Instrument Meteorological Conditions.

Marginal Visual Meteorological Conditions (MVMC): Ceiling \geq 1,000 feet to \leq 3,000 feet and/or visibility \geq 3 to \leq 5 miles.

Moderate Icing (MOD ICE): The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or diversion is necessary.

Moderate Turbulence (MOD TURB): Turbulence that causes changes in attitude (pitch, roll, yaw) and/or altitude, but the aircraft remains in positive control at all times. It usually causes variations in indicated airspeed.

A Turbulence Index ranging from 6 to 14, i.e., the peak value of the Eddy Dissipation Rate is between 0.1 and 0.3, reported from an aircraft during the en route phase of flight based on Eddy Dissipation Rate.

Mountain Obscuration (MT OBSC): Conditions over significant portions of mountainous geographical areas are such that pilots in flight should not expect to maintain visual meteorological conditions or visual contact with mountains or mountain ridges near their route of flight.

Obscured (OBSC) thunderstorms or CB: Obscured by haze, smoke or cloud or cannot be readily seen due to darkness.

Occasional (OCNL) thunderstorms or CB: An area with a maximum spatial coverage between 50 and 75 percent of the area affected by the phenomena at a fixed time of during the period of validity.

Scattered (SCT): ≥ 25 percent to ≤ 50 percent of area affected.

Severe Icing (SEV ICE): The rate of accumulation is such that normal deicing/anti-icing equipment fails to reduce or control the hazard. Immediate diversion is necessary.

Severe Turbulence (SEV TURB): 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. A Turbulence Index ranging from 15 to 27, i.e., the peak value of the Eddy Dissipation Rate is exceeding 0.5, reported from an aircraft during the en-route phase of flight based on Eddy Dissipation Rate.

Visual Meteorological Conditions (VMC): Ceiling $> 3,000$ feet and visibility > 5 miles.

Volcanic Eruption: For this directive, a volcano eruption has occurred when an eruption report is received from a volcano observatory. A volcanic eruption is also considered to have occurred regardless of volcano observatory notification if reported by PIREP, or ground observer, or if remote sensing data indicates that an eruption has occurred based on satellite imagery or WSR- 88D radar data or any other reliable sources are identified.

Volcanic Ash: For the purpose of this chapter volcanic ash is any ash that can be seen by any one or more of the following: satellite imagery (visible, IR, or multi channel), PIREPs, ground observations, radar and ship reports.

Very High Frequency Omnidirectional Range (VOR): a type of short-range navigation system; an antenna location in this system is often referred to colloquially as a VOR.

Widely scattered (WDLY SCT): Less than 25 percent of area affected.

Widespread (WDSPR): 50 percent or greater of the area affected.