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SUPPORT TO AIR TRAFFIC CONTROL FACILITIES

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SUMMARY OF REVISIONS: Supersedes NWSI 10-803 “Support to Air Traffic Control Facilities” dated March, 12, 2012 . This instruction details the procedures NWS Weather Forecast Offices (WFOs), Alaska Aviation Weather Unit (AAWU), Center Weather Service Units (CWSUs) and the Aviation Weather Center (AWC) use to provide weather support to the Federal Aviation Administration (FAA) Air Traffic Control Facilities. Several changes have been made to this document to better explain, streamline, and reflect the support services NWS will provide.

- Chapter 7.5: Updated wording.
- Chapter 10.1: Added local driven metrics.
- Chapter 11 New. Discuss how CWSU employees will report flight emergencies to others within the National Weather Service.
- Chapter 12: New. Training plan for all NWS employees who work operational shift(s) at a CWSU.

//Signed//
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8/8/13
Date

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1. **Purpose.** This directive provides general procedures for National Weather Service (NWS) meteorological support to Federal Aviation Administration (FAA) Air Traffic Facilities. Specific guidelines are provided for NWS participation in jointly (FAA/NWS) operated weather service facilities.

2. **General.** NWS support is designed to improve aviation safety and enhance efficient flow of air traffic by forecasting and monitoring adverse weather. Efficiency is affected by maintaining close coordination with traffic managers whose decisions affect the flow of air traffic through the National Airspace System (NAS).

Any local request from FAA personnel to deviate from this document needs to be requested in writing. The written documentation needs to be from the Air Traffic Manager (ATM) and Traffic Management Officer (TMO) at the Air Route Traffic Control Center (ARTCC) to the Center Weather Service Unit (CWSU) Meteorologist-In-Charge (MIC) and Aviation Service Branch Chief or designee and the FAA Contracting Officer’s Technical Representative (COTR). The NWS ASB Branch Chief or designee will have 14 days to reply to the request and either approve or deny the local deviation. No deviation from this document is allowed in the “Quality Assurance” section (Chapter 10).

3. **Background.** NWS meteorologists in Center Weather Service Unit (CWSU) and FAA Traffic Management Unit (TMU) specialists are components of joint FAA/NWS units directly supporting the FAA’s 21 Air Route Traffic Control Centers (ARTCC). NWS personnel work as a team with FAA Air Traffic Control (ATC) specialists assigned to the TMU. The TMU specialists, Traffic Management Coordinators (TMCs) and Supervisory Traffic Management Coordinators (STMCs), are the designated interface between CWSU meteorologists and ARTCC controllers, FAA facilities within the ARTCC area of responsibility, and CWSU product users. They provide information critical to the safe and efficient flow of air traffic and serve the NAS directly. CWSU forecasters provide meteorological consultation, forecasts, and advice to ARTCC managers, staff, and other supported FAA facilities and activities, regarding weather impact on their missions, equipment outages and repairs, and FAA staffing. In the event that assigned resources make it impossible to accomplish all of the assigned duties, the CWSU staff should work with the TMU, and refer to the local Station Duty Manual (see NWSI 10-1608 *Station Duty Manual*) for guidance, to determine which task(s) are most important.

CWSU staff members provide meteorological training for ARTCC personnel. The CWSU is also the liaison between FAA facilities and other NWS offices in its area. CWSU meteorologists may assist in the distribution of weather forecasts, advisories, and warnings issued by other NWS offices. Complete details of the relationship between the FAA and the CWSU are contained in an interagency agreement.

Weather support is accomplished through various products and verbal briefings describing weather conditions (forecasts or observations) which may affect air traffic flow or operational safety in the ARTCC's portion of the NAS (the CWSU area of responsibility), and in other locally-defined, special operations areas (e.g., offshore helicopter operations areas). Additionally, the CWSU provides advisories of hazardous weather conditions for airborne aircraft. These advisories are disseminated through NWS and FAA communications systems and are available to both internal FAA and external aviation users. The CWSU meteorologists should remain cognizant of FAA requirements and procedures to adequately perform these tasks.

4. Air Traffic Meteorological Concerns. Aviation operations impacted by adverse weather places increased demands on the FAA Air Traffic resources that facilitate safe and efficient use of airspace and airports. FAA personnel need the best weather information available to enhance their mission of supporting aviation operations. Required weather information includes, but is not limited to, the following:

- a. Convective weather including thunderstorm timing, tops, movement, intensity, and weather characteristics such as broken lines, solid lines, large clusters, etc.
- b. Operationally significant ceilings/visibility
- c. Cloud tops and bases
- d. Winds and temperatures for the surface and aloft
- e. Wind shear
- f. Operationally significant pressure changes
- g. Precipitation intensity and type
- h. Turbulence
- i. Icing
- j. Volcanic ash
- k. Space Weather

The specific operational situation dictates the significance of any particular aviation weather phenomenon.

5. Support To Air Traffic Facilities.

5.1 Air Traffic Facilities.

- a. ARTCC. ARTCCs provide ATC service to aircraft operating on Instrument Flight Rules (IFR) flight plans within controlled airspace, principally during the en route phase of flight. When equipment capabilities and controller work load permit, certain advisory and assistance services may also be provided to Visual Flight Rules (VFR) aircraft.
- b. TMU. The TMU in an ARTCC is responsible for the management of facility air traffic. The TMU is usually under the direct supervision of Traffic Management Officer (TMO). The TMO, or designee per interagency agreement, of each ARTCC has operational responsibility for the collocated CWSU. The TMO, or designee per interagency agreement, oversees CWSU operations and brings any special local weather support requirements to the attention of the CWSU Meteorologist in Charge (MIC).
- c. Airport Traffic Control Tower (ATCT). The ATCT is an airport terminal facility which uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport. The ATCT authorizes aircraft to land or take off at the airport it controls or to transit the associated airspace regardless of flight plan or weather conditions. An ATCT may also provide approach control services (radar or non-radar).
- d. Terminal Radar Approach Control (TRACON) Facility. The TRACON is a terminal ATC facility usually located within the vicinity of an airport. The TRACON controls approaching and departing aircraft.
- e. Automated Flight Service Station (AFSS) and Flight Service Station (FSS). Provide information, services and weather to pilots in preflight briefings and during en route travel. Typically information covered by AFSS/FSS will be notice-to-airmen (NOTAMs), the filing, opening, and closing of flight plans, monitoring navigational aids (NAVAIDs) for operational use and disseminating pilot reports. The CWSU will provide briefing support to AFSS/FSS as requested.

5.2 CWSU Support. The CWSU meteorologist provides direct support to ATC operations. The CWSU meteorologist:

- a. Provides meteorological forecasts, information and briefings in support of ATC operations;
- b. Issues Center Weather Advisories (CWAs) and Meteorological Impact Statements (MISs) as conditions warrant, In Accordance With (IAW) this directive;
- c. Solicits pilot reports (PIREPs) through the ATC work force;
- d. Advises FAA personnel on conditions meeting urgent PIREP criteria within 150 nautical miles of the ARTCC boundaries to proper FAA personnel;

- e. Collaborates with local WFOs and Aviation Weather Center (AWC) on aviation products as requested including participation in TAF coordination and in collaborative decision making sessions, such as the Collaborative Convective Forecast Product (CCFP) respectively;
- f. Participates in weather discussions with ATC personnel and with Air Traffic Control System Command Center (ATCSCC) personnel as requested;
- g. Provides meteorological forecasts and information to pilots in contact with the ARTCC through appropriate ARTCC personnel;
- h. Assists in backing up an adjacent CWSU if requested (see Appendix B);
- i. Conducts weather training and product familiarization sessions for ARTCC personnel; and
- j. Coordinates duty priorities with the ARTCC and TMU;
- k. Produces TRACON Approach and Arrival Gate Forecast for the 8 TRACONs listed here (<http://www.aviationweather.gov/cwsu>) or per local request;
- l. Provides weather information to government pilots as requested.

5.3 WFO, AWC And Alaska Aviation Weather Unit (AAWU) Support. WFOs (and AAWU for Alaska) provide collaborative and technical expertise in support of the CWSU mission. During the hours the CWSU is closed, provide direct meteorological support through advice and consultation to the TMU/ARTCC and any ATCTs IAW local agreements. Support consists of:

- a. Assisting the CWSU and/or ARTCC during in-flight emergencies;
 - b. Providing the ARTCC with forecast services and critical weather updates as needed during the hours the CWSU is closed; and
 - c. Providing Information Technology (IT) and IT security support for the CWSUs.
- NWS Regional Headquarters (RH) may choose to provide this support for CWSUs in their local area.

6. CWSU Lines Of Authority. The supporting WFO's MIC is the first line supervisor of the CWSU MIC and is responsible for supporting the operations of the CWSU. The WFO MIC provides administrative, IT and training support to NWS personnel at the CWSU. In Alaska, the AAWU MIC is the first line supervisor of the CWSU's MIC. The supporting MIC's FAA contact at the ARTCC is the TMO or their designee.

The supporting MIC should ensure all WFO forecasters are aware of CWSU services and have a general knowledge of ARTCC meteorological needs. Forecaster exchanges between WFOs and CWSUs are encouraged. Further, NWS meteorologists are encouraged to visit ARTCCs, ATCTs, TRACONs, and AFSS/FSSs as part of their aviation training.

The supporting WFO/AAWU MIC or their designee monitors and evaluates the various aviation

weather services between relevant NWS and FAA facilities. Service, product, data, or data exchange deficiencies should be documented and forwarded to the respective NWS Regional Meteorological Services Division (MSD) or their equivalent (known hereafter as regional MSD),

The supporting MIC or their designee are encouraged to make semi-annual visits to the CWSU, and send a written report of each visit to the regional MSD with copies to the CWSU MIC, the TMO, and Aviation Services Branch of the Office of Climate, Water, and Weather Services (OCWWS), NWSH via the home region MSD.

6.1 CWSU MIC Responsibilities. The CWSU MIC is the first line supervisor for assigned CWSU meteorologists. In this position, the CWSU MIC:

- a. Serves as NWS liaison to the supported ARTCC and is responsible for ensuring all CWSU services are provided to the FAA;
- b. Has oversight of CWSU service obligations, labor-management relations, meteorological training for CWSU staff, and specified training for ARTCC staff;
- c. In agreement with the ARTCC TMO (or a designee with responsibility for CWSU operational oversight), establishes CWSU meteorologist duty hours IAW the IA and the NWS Collective Bargaining Agreement and implements procedures and policies detailed in this instruction and compatible or approved alternate instructions to meet special local requirements; and
- d. Works with the ARTCC TMO to arrange access to office supplies, internet and voice communications, and other day-to-day necessities for the CWSU office.

It may be necessary to change or amend the CWSU meteorologist's duty hours. Duty hours may change permanently or temporarily depending on the circumstances. There are two primary reasons CWSU duty hours may need to be changed: (1) Operational need and/or (2) staffing shortages. The following is a guideline of how changes to duty hours should be communicated:

1. Permanent (long term): The CWSU MIC (or acting) will ask for written notice of the change from the TMO and then coordinate the change with the WFO/AAWU MIC.
2. Temporary (short term): The CWSU MIC (or acting) will request changes due to staffing directly to the TMO. The TMO will request changes due to weather directly to the CWSU MIC (or acting).
3. Temporary (longer term): The CWSU MIC (or acting), WFO/AAWU MIC and the FAA ARTCC TMO will discuss temporary changes to the CWSU's duty hours from short staffing. If all parties agree, the hours may be changed.

In all cases, the CWSU MIC will inform the regional MSD or their equivalent of all changes to CWSU duty hours. The regional MSD will notify the National Weather Service Headquarters, Aviation Services Branch.

7. CWSU Operations And Products.

7.1 Product Preparation. Products issued by the CWSU that are available to external users such as the CWA, MIS and products available on CWSU webpages are restricted to the boundaries of the ARTCC airspace. One exception would be for CWAs. A CWA may be issued to include portions of an adjoining ARTCC airspace after coordination with the other ARTCC CWSU. Products produced for internal use such as WARP graphics may describe conditions outside the ARTCC airspace. When describing conditions outside ARTCC airspace ensure information is consistent with other CWSU/NWS forecasts.

Reference points used in CWAs to describe the location will be the same as those used in SIGMETs and AIRMETs (See NWSI 10-811 *En route Forecasts and Advisories*), or distances from these points. The Miami CWSU uses the following reference points for CWAs, or the associated latitude and longitude coordinates, issued for the Bahama Islands: ZBV (Bimini Island), ZFP (Freeport on Grand Bahama Island), ZQA (Nassau on New Providence Island), ZLS (Stella Maris on Long Island), ZIN (Matthew Town on Great Inagua Island), and GTK (Grand Turk Island).

To describe the area clearly and accurately a minimum number of CWA points are used. Points outside the ARTCC area may be used after coordination with the adjoining CWSUs. To keep advisory broadcast as brief as possible CWSU products need to be concise. When using a distance in CWSU products all references are in nautical miles (NM).

International Civil Aviation Organization (ICAO) contractions will be used. If an ICAO contraction conflicts with a 3-letter station identifier, then the FAA, NWS or general-use contraction are acceptable. If an ICAO contraction is not available, then either the word should be spelled out or an FAA, NWS or general-use contraction will be used. Only valid contractions may be used and are listed at:

<http://www.faa.gov/documentLibrary/media/Order/CNT.pdf>.

7.2 Briefings. Schedule briefings will be developed locally in agreement with the TMO or designee. However, at a minimum a scheduled CWSU briefing includes current and forecast weather conditions expected in the ARTCC operations area during the upcoming shift, and an outlook for the following shift or, if the CWSU is ceasing operations, the overnight hours. On occasion CWSU Meteorologists provide briefings that may cover areas outside of their ARTCC operations to include neighboring (first tier) ARTCCs. These briefings are important as they provide TMU with the ability to accurately plan for en route weather issues. For ATC and TMU personnel to make the necessary operational adjustments to the NAS all CWSU briefings provide clear, concise and definitive meteorological guidance to address the questions/needs of the FAA personnel. When briefing FAA personnel on weather outside of your center CWSUs coordinate between CWSUs so both TMUs and ATCSCC receive a consistent message.

A briefing product (alphanumeric or graphic) should contain a heading with the ARTCC designator (zzz); CWSU BRIEFING; date and time (UTC) issued; and valid date and time (UTC). For example:

ZKC CWSU BRIEFING 141805Z VALID TIL 151100Z

The following information should be included in each briefing when appropriate. Local requirements may determine the order of the items b-g:

- a. Advisories in effect at the time of the briefing; e.g., SIGMETs, AIRMETs, airport weather warnings, CWAs, MISs, etc;
- b. Synopsis - discussion of weather systems and their movements;
- c. An outlook of en route flight conditions, e.g., convective weather, turbulence, icing, volcanic ash, etc.
- d. Terminal weather, i.e., convection, heavy snow, freezing precipitation, low IFR ceiling and/or visibility, and/or operationally significant surface winds, for designated large airports;
- e. Wind direction and speed at key flight levels, including jet stream location(s);
- f. Freezing level; and
- g. Locally required items affecting the ARTCC area of responsibility, e.g., altimeter settings forecast or observed below 29.92 inches or above 31.00 inches.

7.3 Meteorological Impact Statement (MIS)

7.3.1 MIS. The MIS is a non-technical plain language product intended primarily for FAA traffic managers and those involved in planning aircraft routings.

7.3.2 Standardization Of The MIS. The MIS is a brief non-technical discussion of meteorological events causing or expecting to cause the disruption of the safe flow of air traffic. This is followed by specifics such as what is causing the disruption, area, altitudes and movement. The MIS valid times are determined according to local policy. The MIS is limited to not exceed a 48 hour valid period. When the forecast is no longer descriptive of expected conditions the MIS is either updated or cancelled. The MIS may refer to an on-line graphic, especially for complex situations, using a specific web address and provide a brief description of the weather that is included in the text MIS. MIS products are numbered sequentially beginning at Midnight local time each day. The MIS is disseminated and stored as a “replaceable product”. If the expiration time of the MIS is after the closing time of the CWSU, then a “No updates available after dddhmmZ” message should be included at the end of the MIS text, where dd = date, hh= hour, mm= minutes.

7.3.3 MIS Format. The MIS format consists of an FAA header line, the words “FOR ATC PLANNING PURPOSES ONLY”, and the text.

1. Header Line: zzz MIS ii Valid ddtttt-ddtttt

Zzz is the ARTCC identification (i.e. ZJX),
MIS is the product type,
ii is the 2-digit sequential issuance number,
and ddtttt is the valid beginning and ending date/time UTC.

2. The line immediately below the header line reads “FOR ATC PLANNING PURPOSES ONLY”.
3. The maximum length of the MIS is 4 lines. The MIS is non-technical in nature to convey expected weather and impacts in the clearest and simplest manner possible to the user. (References to a graphical product on the local CWSU website or aviationweather.gov may be included.)

7.4 CWA

7.4.1 CWA. A CWA is issued for hazardous weather when there is no existing AWC or AAWU advisory in effect. A CWA may also be issued to supplement an advisory that has already been issued by AWC or AAWU. If a CWA is issued to supplement another NWS product, the product should be consistent.

7.4.2 Situations When A CWA Should Be Issued. A CWA should be issued when each of the following conditions exist:

1. There is no existing AWC or AAWU advisory in effect.
2. Any of the following condition occur:
 - a. Conditions meeting convective SIGMET criteria (see NWSI 10-811)
 - b. Icing – moderate or greater
 - c. Turbulence – moderate or greater
 - d. Heavy and extreme precipitation
 - e. Freezing precipitation
 - f. Conditions at or approaching Low IFR (See NWSI 10-813)
 - g. Surface wind gust at or above 30 knots
 - h. Low Level Wind Shear (Surface – 2000 feet)
 - i. Volcanic ash, dust storms or sandstorms
 - j. When a hazard has grown significantly outside of the boundary defined by the AWC or AAWU advisory
 - k. To upgrade a thunderstorm advisory to include severe thunderstorms
 - l. To upgrade an AIRMET to include isolated severe turbulence or icing (If greater than isolated severe turbulence or icing is occurring, then a new (non-supplementary) CWA should be issued
 - m. To define a line of thunderstorms within a larger area covered by the AWC or AAWU advisory
 - n. To better define hazards expected at a major terminal already within an AWC or AAWU advisory
3. Anything that in the judgment of the CWSU forecaster will add value to an existing advisory
4. In the forecaster’s judgment the conditions listed above, or any others may adversely impact the safe flow of air traffic

7.4.3 CWA Coordination With Other Offices.

1. AWC. Coordination with AWC should take place before issuing a CWA to avoid a duplicate advisory being issued simultaneously by AWC. Coordination may be done via chat or by telephone. If there is no AWC response using chat, then a telephone call can be initiated if time permits. If AWC to CWSU coordination was unable to occur the CWSU product is issued at the CWSU's discretion. When coordinating convective CWAs the AWC person to coordinate with is the Convective SIGMET Forecaster.. For all other CWAs the CWSU forecaster coordinates with the appropriate FA Forecaster.
2. Neighboring CWSUs. When your CWA may impact another CWSU's airspace, then the CWA will be coordinated with the impacted CWSU.. Coordination may be done via "NWSchat" or by phone.. If CWSU to CWSU coordination was unable to occur, the CWSU who wants to issue the product may issue the product. However, the issuing CWSU needs to make an effort to avoid issuing the product for any airspace beyond their ARTCC boundaries.
3. WFO. CWA coordination with WFOs is normally not necessary except to report occurrences of severe weather.

7.4.4 CWA Format. The first line of each CWA's FAA communications system header is an ARTCC identifier immediately followed by a phenomenon Number (1-6). The Phenomenon Number assigned to each meteorological hazard is distinct. The first event of the local calendar day which requires a CWA is assigned Phenomenon Number 1. The next CWA issued for a new hazard is Phenomenon Number 2 and so on. Once all six Phenomenon Numbers have been used, then the next CWA issuance would return to Phenomenon Number 1. Each successive CWA issued for the same hazard retains the same Phenomenon Number.

The issuance time is on the first line. The issuance time is when the CWA becomes valid. When a CWA is issued with some lead time on the event, the time entered is the issuance time. The CWA is valid from the issuance time until the expiration time.

The product identifier is a three digit number on the second line of the product after the issuance time. The first digit is the Phenomenon Number. The second two digits are an issuance number. Issuance numbers are issued sequentially beginning with 01 and followed by the VALID TIL time. CWAs are limited to not exceed two (2) hours. If the conditions associated with the meteorological hazard are expected to persist beyond two hours, then a remark may be appended to the CWA stating that conditions might continue beyond the expiration time. (i.e. CONDS CONT BYD 2030Z).

The third line contains the location of the hazard and starts with the word "FROM" except when the location is defined by a single point. Three-letter In Flight Advisory (IFA) points (Appendix E) are used to define the location of the hazard. For lines and polygon defined areas, up to five IFA points may be used. Using a large number of points to make a polygon fit exactly against ARTCC boundaries or another existing advisory is not necessary. Since CWAs are broadcast by ATC Controllers and Flight Service Specialists, using large numbers of IFA points results in additional workload for those broadcasting the CWA and increases the chance for confusion by the users of the CWA. In nearly all cases five or fewer points should be adequate in defining the hazard.

Each IFA point can further be defined by using a direction and distance from the IFA point. The direction may be any of the commonly used 16 points of the compass. For most lines and polygons, the forecaster may round to the nearest 5 miles for IFA points. For single point IFAs, the forecaster may use his or her best judgment in determining whether to round to the nearest 5 miles, or use an exact distance to the point. IFA points will be separated by dashes. The last IFA point used to define a hazard should end the line. Do not use a period or any other punctuation to end the line. For all hazards defined by two or more points, start with the northern-most point and proceed clockwise with additional points. For lines, define north to south or west to east. For polygon areas, end with the same IFA point you started with. Use the closest IFA points when defining a hazard. For example, use “20S COU” instead of “90WSW STL”.

The fourth line is the text line.

1. Lines: NWSI 10-811, Section 6.2.1.a. defines a line of thunderstorms as being at least 60 miles long with thunderstorms affecting at least 40 percent of its length. When defining a line hazard, begin with either “LINE” or “DVLPG LINE”. If the line does not meet the definition of at least 60 miles long and 40 percent coverage, then use “DVLPG LINE” if you expect the line to build. Do not use phrases such as “LINE OF ISOL TS” or “LINE OF SCT SEV TS” as this may be confusing to the user. Use nautical miles when describing the width of a line.(i.e., DVLPG LINE TS...15NM WIDE). If the line is greater than 20NM wide, then define it as an AREA instead of a line. After the width report line movement followed by tops. After tops additional remarks may be included.
2. Areas: NWSI 10-811, Section 6.2.1.b. defines an area as affecting at least 3000 square miles covering at least 40 percent of the area. When defining an Area, begin with either “AREA” or “DVLPG AREA”. If coverage is less than the defined 3000 square miles with 40 percent coverage, then use “DVLPG AREA”. If the area was defined using only two points, then a width may be included using nautical miles (e.g. AREA TS...30NM WIDE). Next report the movement of the area followed by the tops. After tops additional remarks may be included. Do not use phrases such as “AREA OF ISOL TS” that may be confusing to the user.
3. Isolated: Use “ISOL” when using a single point to define a hazard. Begin the CWA with “ISOL” followed by a diameter. Use “DIAM” and the distance across the hazard in nautical miles (e.g. ISOL SEV TS DIAM 10NM). Next report the movement of the area followed by the tops. As a general rule for isolated thunderstorms, only issue a CWA for an isolated severe thunderstorm. Isolated general thunderstorms should not require a CWA unless they are located near a major terminal, an arrival/departure gatepost or any other location where it may significantly impact air traffic operations.
4. Embedded Thunderstorms: When thunderstorms are occurring within a larger area of layered cloudiness, haze or stratiform precipitation they are considered embedded (EMBD). Use the procedures above to define a LINE, AREA or ISOL EMBD TS.

5. Defining Movement: Movement should be in the same format as the SIGMET and Convective SIGMET (NWSI 10-811 Section 6.2.4.f.) (i.e., MOV FROM 26030KT).
6. Reporting Tops: Use the same reporting procedures as for Convective SIGMETs (NWSI 10-811 Section 6.2.4.g.). Tops from 18,000 to 45,000 feet is reported in thousands of feet and include “FL” (i.e., TOPS TO FL180, TOPS TO FL450). Tops below 18,000 feet should use a three digit number without the “FL” designator (i.e., TOPS 060, TOPS 170). Tops above 45,000 feet is reported as “TOPS ABV FL450”.
7. Trends: On the last line of each CWA briefly describe what you expect to occur during the duration of your advisory. (Examples “CONDS EXPECTED TO LAST TIL 13Z THEN IMPROVE TO VFR BY 14Z”, “TS COVERAGE EXPECTED TO INCREASE THRU 18Z”)
8. For IFR, icing and turbulence CWAs, define the location as an “AREA”. Do not define the location as a LINE, ISOL, or EMBD. Define the location as an AREA where reports of hazardous conditions have been received or are expected during the valid time of the CWA. This also goes for defining altitudes. Large areas with large altitudes limit the effectiveness of the CWA.
9. CWSUs with an over-water component in the CWA may use latitude and longitude coordinates as defined in NWSI 10-811 *Enroute Forecasts and Advisories*. 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 (i.e. N4030 W10530 – N3800 W10400 – N3700 W10700 – N4030 W10530).
10. VTEC coding appends latitude and longitude information to the end of the text portion of a CWA. Certain CWA composition programs incorporate VTEC coding based on the IFA points used in the CWA. Other CWA composition methods do not use VTEC coding. Until VTEC coding becomes widely used in all CWA composition methods, the addition of VTEC coded latitude and longitude information in CWAs is considered optional.
11. When describing levels of precipitation, the following terms are used to comply with FAA Administrative Order 7110.10: Light (LGT), Moderate (MOD), Heavy (HVY), and Extreme (EXTRM). These terms are applied only to intensity of precipitation; other terms may be applied in modification of icing, turbulence, or thunderstorms.

When including thunderstorms in a CWA or MIS, precipitation may also be included by using only those modifiers listed in the above paragraph. The type of precipitation associated with the thunderstorm (TS) follows the symbol TS.

The symbol TS may be preceded by only one modifier, SEV. If a thunderstorm does not meet the criteria for SEV no modifier should be placed in front of the symbol.

7.4.5 CWA Cancellations. When issuing CWAs for thunderstorms, it is good practice to have the CWA expire at the top of the hour. If a Convective SIGMET is issued it will then replace the CWA as it is about to expire. If a SIGMET or Convective SIGMET is issued for the same hazard where an existing CWA is still valid, then the CWA should be cancelled. The CWA need not be cancelled if it has less than 15 minutes until it expires, or if it contains additional more specific information than the AWC advisory. To cancel a CWA, issue another CWA using the next higher number in sequence. For example, if CWA 201 is in effect, cancel it by issuing CWA 202. The expiration time for the new CWA should be 15 minutes after the issuance time. The cancellation CWA may contain information referring to other advisories that are replacing the CWA, such as a new Convective SIGMET.

7.5 TRACON Approach And Departure Gate Forecasts

7.5.1 Product/Service Description. TRACON Approach and Departure Gate Forecasts complements the Collaborative Convection Forecast Product by providing greater detail of convective occurrence. TRACON Approach and Departure Gate Forecasts are required for Atlanta, Chicago, Dallas/Fort Worth, Denver, Houston, Miami, New York and Potomac (<http://www.aviationweather.gov/cwsu>) but may also be created per local request as long as the product is displayed IAW this directive.

7.5.2 Purpose. TRACON Approach and Departure Gate Forecasts will provide ATCSCC, ARTCC, TMU and TRACON a graphical product for planning air traffic flow safely and efficiently around convection into and out of the TRACON area. The graphic will provide easy to interpret color-coded convective forecasts and allow partners to make more informed decisions regarding the air traffic flow through the NAS.

7.5.3 Audience. The target audience for this graphical product includes the ATCSCC, ARTCC TMU and TRACONs serviced by the CWSU or WFO issuing the product. Other FAA aviation users will have access to the product through the CWSU website.

7.5.4 Presentation Format. Use any appropriate graphical creation software and then upload to the web. See Figure 7.1.

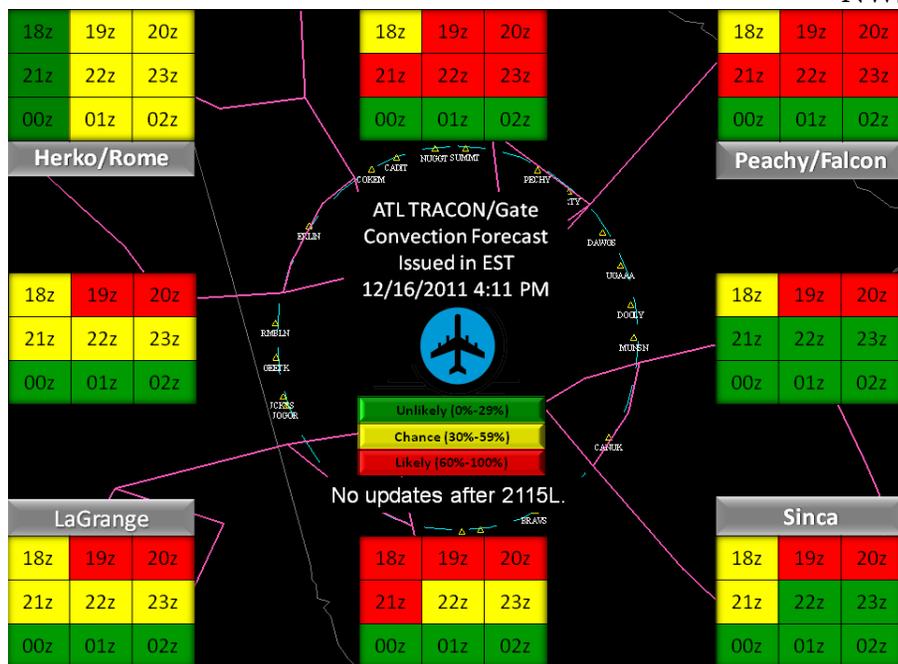


Figure 7.1.

7.5.5 Format And Scientific Basis. The TRACON Approach and Departure Gate Forecast are issued by the required CWSUs (per 7.5.1) daily for the likelihood of convection affecting the air traffic control sectors associated with arrival and departure gates. Convection is defined as moderate or greater precipitation and tops equal to or exceeding FL250. Use the following values and colors to indicate the likelihood of convection affecting the sector.

Unlikely (0%-29%)	Green	R=0 G=155 B=0
Chance (30%-59%)	Yellow	R=255 G=255 B=0
Likely (60%-100%)	Red	R=255 G=0 B=0

Figure 7.2.

Guidance from the Storm Prediction Center (SPC) and the National Center for Environmental Prediction (NCEP) should be considered. Trends in satellite, lightning and radar data should be considered in addition to the mesoscale analysis and the CCFP forecasts as well as Corridor Integrated Weather System (CIWS) and Consolidated Storm Prediction for Aviation (CoSPA). Collaboration between the CWSU and WFO is necessary to ensure consistent convective forecasts. Strive for consistency between this forecast and other convective forecasts. This product needs to be consistent in design, format and content before issuance.

Forecasts are in 1 hour intervals for a minimum of 3 hours and a maximum of 12 hours. Each interval has a color associated with the likelihood of convection affecting the sector. See Figure 7.2.

1. A forecast of no convection may be issued when no (0% chance) convection is forecasted in the area for extended periods of time (e.g. winter, strong ridging). This product is a single forecast that can be used to alleviate the workload of the forecaster during times of no convection and should state that the TRACON/Approach and Departure Forecast will be updated when convection is once again expected. See Figure 7.3.

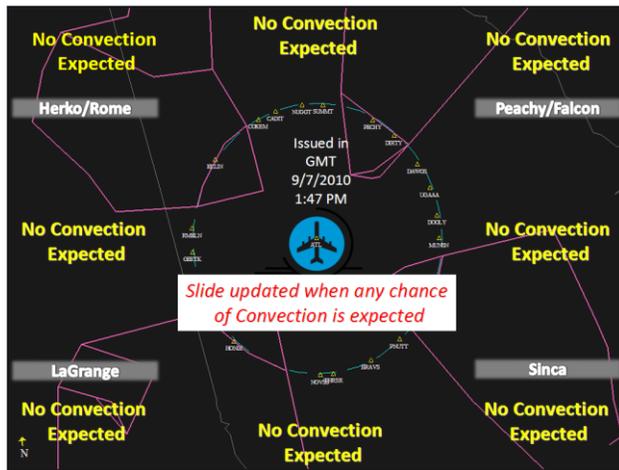


Figure 7.3.

2. The background for the forecast may be generated from the FAA's Performance Data Analysis and Reporting System (PDARS) available at each ARTCC, or other graphics software. The map background is black to reduce controller eye strain in dark control rooms and to provide product consistency.
3. Automated TRACON/Gate forecast may be developed.(Fig. 7.4). Automated TRACON/ Approach and Departure Gate convection forecasts may be derived from meteorological models or gridded data produced at the parent WFO, but should follow the same standards as the manually developed products stated above.

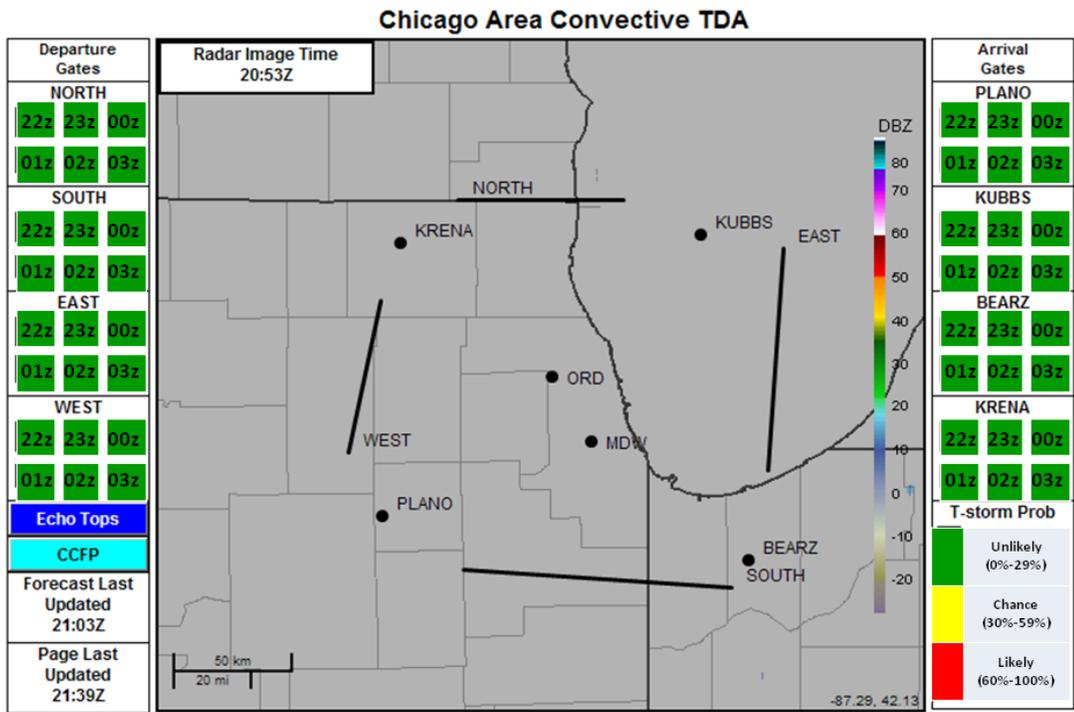


Figure 7.4.

7.5.6 Product Availability. The TRACON Approach and Departure Gate Forecast Product is issued each morning, afternoon and evening. Times of issuance should be within 15 minutes of 0700L, 1300L and 1900L (at a minimum). If product is valid during a time the CWSU is closed, the product needs to have disclaimer citing product will not be updated until CWSU opens.

7.5.7 Non-Convective TRACON/Gate Forecasts. Non-convective TRACON Approach and Departure Gate Forecast, such as icing, compression and other hazards, may also be developed. Non-Convective TRACON/Gate Forecast have the same black map background and same green, yellow, red color scheme to maintain a consistency with convective TRACON and Departure Gate Forecast. Established procedures are contained in NWS Instruction 10-102.

7.5.8 Graphical Weather Impact Products. Graphical Weather Impact products may be developed and used to provide a quick reference to ARTCC users, or augment the official alphanumeric MIS products with specific details as locally determined. A graphical Weather Impact Product should depict significant hazards with clearly defined boundaries. (See Figure 8.1)

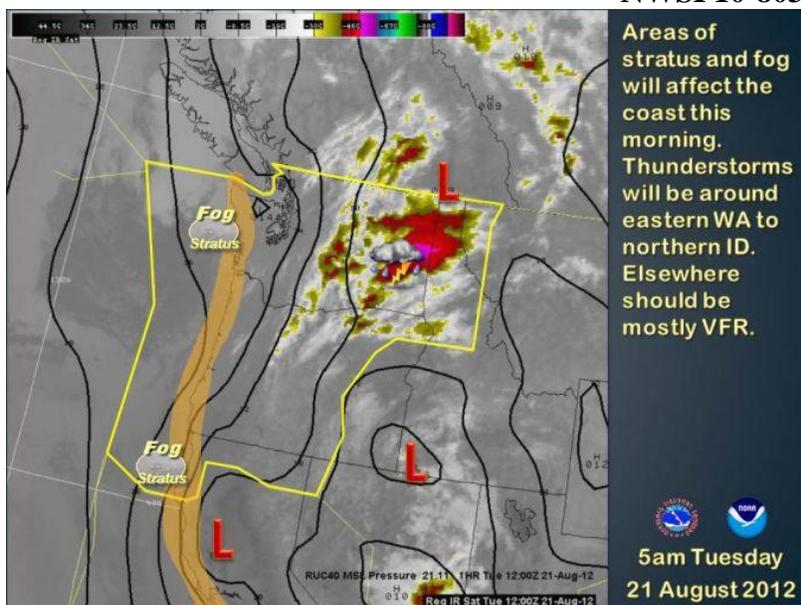


Figure 8.1

7.6 Forecast Coordination. Forecast products issued by WFOs, AWC, AAWU, other NCEP centers, and CWSUs often address the same spatial and temporal events. CWSU meteorologists will ensure forecasts, advisories, or information they provide are consistent with other forecast products, whether those products are issued locally or by other NWS offices. Coordination with responsible NWS offices prior to product issuances is important and necessary, especially when those products concern unexpected or suddenly changing observed weather conditions. To maintain consistency CWSUs are encouraged to use National Weather Service Chat (NWS Chat) whenever possible. This coordination prevents or minimizes confusion to end users and reduces impacts to aviation safety. In the interest of preserving forecast consistency, the issuing office's decision on the forecast product is considered final. The following is an exception: CWSU meteorologists routinely provide TMU decision-makers with TRACON-area weather briefings. The TRACON-area briefing typically contains high-resolution details on weather conditions expected to occur within the TRACON's airspace.

CWSU personnel coordinate with personnel at the appropriate WFOs/AAWU/AWC to avoid discrepancies between their TRACON-area weather briefings and the affected forecasts. However, since the TRACON briefing and other aviation forecasts can involve different spatial and time resolution, minor differences may occur. Occurrences when CWSU/WFO/AAWU/AWC coordination fails to produce a common forecast solution should be documented on the CWSU operations log. In any case, the CWSU meteorologist is the final authority for the TRACON-area weather briefing, the WFO forecaster is the final authority for the TAF, and AAWU/AWC is the final authority for their in-flight advisories and CCFP.

When there are repeated significant forecast differences between the CWSU area weather briefing and other aviation forecasts, the MICs of the CWSU and the WFO(s)/AAWU/AWC should coordinate to resolve the problem.

7.6.1 TAF Collaboration. The TAF for the core airports (http://aspmhelp.faa.gov/index.php/Core_30) is an important part in determining air traffic flow at the terminal and throughout the NAS. Consistency between the TAF and the information provided by the CWSU meteorologist is paramount in providing the FAA with the needed

weather information to aid in their decision-making process. The CWSU and WFO MICs need to agree to the content and level of detail provided in the collaboration process. CWSU and WFO MICs are encouraged to keep documentation of that agreement in their respective offices.

For CWSUs with one or more of the core airports in their area of responsibility, the CWSU meteorologist collaborates on the TAF for each core airport(s) with the WFO meteorologist responsible for issuing the TAF as necessary. The collaboration can be conducted using any method available to the meteorologist (e.g. telephone, chat, etc.) and should include the production of the core collaboration product described in section 7.6.2 below. Regardless of the coordination method, the CWSU Meteorologist logs the coordination in his/her shift log.

7.6.2 Collaborative Core Product. The CWSU meteorologists provide airport-specific operations information for each of the core airports in their area of responsibility to the WFO issuing the TAF. Other airports may be added to this requirement in coordination with the local WFO. This information should be in the form of a core product on the AWIPS Remote Display. This product is designed as a technical communication between qualified meteorologists, and not intended for use by non-meteorologists or the general public.

The CWSU Meteorologist coordinates with TAF writers at least once prior to each scheduled TAF issuance (see NWSI 10-813, *Terminal Aerodrome Forecasts*, for TAF issuance times) during the CWSU operational hours by sending input into the TAF for each of their core airports to the responsible WFO. The core product should contain a brief discussion of the anticipated weather elements for inclusion in the TAF and weather impacts at the affected airport using the format below. The weather impacts are generally static and for the TAF forecaster’s information only. They do not need to be changed with each core product issuance. To minimize workload issues, those CWSUs with multiple core airports should incorporate the information for each core airport into a single core product whenever possible.

CWSUs with operational hours starting at 1100 UTC or later should not provide a collaborative core product to the WFO for the 1200Z issuance unless the meteorologist has adequate time and information to provide input to the WFO. In these cases, and as time allows, the CWSU meteorologist should contact the WFO meteorologist to discuss the TAF.

Example:

```

OEPZFW
CONCERNS...WIND TREND CDFROPA. CDFRNT CRRNTLY NR A ADM-XBP-BKD LN...CONTS TO MOV SEWRD THIS AM. 18Z
STILL LUKS GOOD FOR CDFROPA AT THE DFW TERM. VFR CONDS AHD AND BHND THE FNT WL PRVL THRU THE
AFTN/EVE HRS.ONLY CLDS TO MENTION DURG THIS PD WL BE SCT/BKN CI. AFT 06Z THUR XPECTG TO SEE BKN-
OVC MVFR CIGS DVLP AS ISNETRPC LIFT AT 295K BFNS TO SATURATE THE LWR LYRS PER NMM.
    
```

ADDITIONAL/OPTIONAL ELEMENTS

```

DFW AIRPORT ACCEPTANCE RATE...S FLOW 126.
DFW WX DELAYS/ACFT...NONE.
    
```

IMPORTANT NUMBERS FOR DFW (Timing of onset/ending very important)

CIGS	VSBY	ARRIVALS/HR (AAR)	IMPACT
>4000	>6	120+	No ARTCC problems
1000-4000	3-6	112-114	Limited or no vis approaches (NO VAPS)
200-900	1/2-3	96	In-trail spacing needed (MIT)
<200	<1/4	78-84	Significant delays (MIT GDP)
TSRA		0+	Variable delays (MIT GDP GS)
FZRA/FZDZ			Major delays for de-icing (MIT GDP GS)
WINDSHIFTS			Up to 30 minutes of ground/airborne delays to switch rwys.

CROSSWINDS		
20-24KT	114-84	MIT
>25KT	< 78	MIT GDP

Miles in Trail (MIT) Ground Delay Program (GDP) Ground Stop (GS)

NWSChat may be used for collaboration between offices in lieu of the core airport product, as long as it meets the requirements stated above. Entries indicating airport operational limitations and weather concerns should be made specific to each core airport and posted prior to mandatory TAF issuance time stated in NWS10-813 during CWSU operating hours. NWSChat also provides a permanent written log of the conversation, so entries in other logs may not be required.

7.7 Support To Enroute Flight Advisory Services (EFAS) And Automated Flight Service Stations/Flight Service Stations (AFSS/FSS). The CWSU in each ARTCC is designated the primary support facility for each associated EFAS facility. CWSUs (and WFOs when CWSUs are closed) should assist the EFAS specialist to the best of their ability. Exchange of weather information can be helpful to both parties since the EFAS staff has access to additional sources of PIREP information.

Shift briefings for AFSS/FSS personnel should normally be done by the CWSU IAW FAA Order 7110.10. Weather support when the CWSU is closed or not available (unless back-up services are in effect) is the responsibility of designated WFOs IAW FAA Order 7110.10. This responsibility ensures the link with a NWS facility able to provide 24-hour support remains clear. Refer any requests for CWSU Pilot Weather Briefings (PWBs) to an AFSS/FSS.

8. Operational Records. The CWSU MIC is responsible for ensuring shift logs are maintained. Information logs include, but not limited to, weather discussions, briefings, non routine products and equipment functionality. Each entry has the time, the name or initials of the individual providing the information, and a brief summary of the discussion or product issued.

Electronically displayed products generated on AWIPS or any other computerized system should not be printed solely for retention purposes. Worksheets used to update briefings or to supplement other products need not be retained. If the FAA ARTCC requires the CWSU daily operations log or its equivalent be turned over to the FAA as part of a facility record, the CWSU needs to provide the local ARTCC a copy of the log to meet NWS retention purposes.

8.1 Retention. CWSU logs will be retained in accordance with NOAA policies and practices as stated in NWSI 1-803, *Records Management*. Retain texts of written weather briefings and hard copy graphic records, and copies of the Daily Record of Facility Operation Log (FAA Form 7230-4) or its equivalent prepared by the CWSU for 30 days at the CWSU. After 30 days, copies of all these records should be retained for 5 years at either the CWSU or supporting WFO.

8.2 Protection Of CWSU Records. All requests for copies of weather exhibits or written records prepared by CWSU meteorologists are handled IAW NWSI 10-2003. In the event of an aircraft mishap or accident within the ARTCC's area of responsibility, retention procedures described above will be followed unless otherwise requested by the Manager, Forensic Services, Office of Climate Water and Weather Services, NWSH. In the event of a major accident, all relevant products prepared by CWSU meteorologists, including available observations, charts, and forecasts are collected together. If space is limited in the CWSU work area, the records may

be forwarded to the appropriate WFO. These records should be protected and retained in either the CWSU or the WFO for at least 30 days, allowing time to determine:

- a. To what extent weather was a factor, and/or
- b. What weather information is required for investigation purposes.

After 30 days, follow normal retention procedures unless the Forensic Services manager requests otherwise.

8.3 Statements. Refer to NWSI 10-2004, 10-2005, and 10-2006 for detailed instructions for handling requests for information, including forecaster statements. CWSU meteorologists do not provide written statements concerning a system incident, or an aircraft incident or accident to any government or public offices, agencies, organizations, or individuals outside of NWS without the approval of the Forensic Services manager at NWSH.

There is no requirement to allow anyone that is not part of a government investigation team to question or interview personnel in connection with an aircraft accident, whether in person or over the phone. Refer requests for interviews to the Forensic Services manager at NWSH.

9. Back-Up Of CWSU Operations.

9.1 General. In the event of scheduled and unscheduled CWSU closures, the following plan is recommended to be used for the time a CWSU is closed:

a. Upon request AWC will provide consultation directly to ATCSCC. AWC does not issue CWAs and cannot be expected to perform the duties of the CWSU. In Alaska, the AAWU may provide backup weather support to the Anchorage ARTCC.

b. During CWSU duty hours if a CWSU is non-operational (either unstaffed or for other reasons), for all or part of that time, the adjacent CWSU (or AAWU for Alaska) should provide, if able to do so, back-up CWAs, MISs, briefings, TRACON gates forecasts and other support (if necessary) to FAA facilities such as the ARTCC, TRACONs, ATCTs, and FSS. The back-up pairings can be found in Appendix B. In the event the non-operational CWSU back-up site is unable to assume back-up the non-operational CWSU may contact another neighboring CWSUs to see if they can assume back-up.

If the back-up CWSU is being impacted by weather such that support to the affected CWSU's FAA-supported facilities would cause undue hardship, then support to these facilities would be on an as-requested basis. Such occurrences should be logged with the reason(s) for not providing support.

Restoration of normal service occurs when the affected CWSU is back in operation and no longer needs back-up. Briefings, TRACON Gate forecasts, MISs, and other products may contain different criteria for each CWSU. Therefore, the CWSU providing back-up may not be able to provide the same range of services that the affected CWSU provided to its ARTCC.

Each CWSU MIC should ensure that their staff is fully trained on their paired CWSUs unique requirements and are capable of performing them. Information exchanges are necessary

between CWSU pairs and should include support requirement information about the operational and meteorological differences between the CWSUs should back-up become necessary. Information should be shared as to the type and extent of back-up which is to be provided.

9.2. Notification Procedures. When the CWSU determines it will be unstaffed or non-operational, the CWSU should inform its back-up CWSU, the ARTCC Operations Manager, supporting WFO, NWS Region MSD, and the AWC forecaster for the region in which the CWSU resides, i.e. FA East, FA Central, FA West, or the AAWU for Alaska. If time permits, the back-up CWSU should call the ATCSCC National Operations Manager when they have assumed responsibility for the affected CWSU.

If the back-up CWSU is unavailable for support, the affected CWSU should call the AWC lead forecaster. The AWC should support the closed CWSU with its own products, except for the CWA, MIS, TRACON Gate forecasts and briefings. No support to other air traffic facilities in the closed CWSU's operational area should be given or expected in this case. NOTE: This occurrence should also be logged with a reason for the backup not being available.

The WFO/AAWU can be considered as a resource for the ARTCC in the event the CWSU is not in operation. The WFO/AAWU cannot provide all the services of a CWSU. The WFO/AAWU can answer questions about the TAF and weather affecting its local terminal as workload permits.

The closing CWSU should issue a MIS specifying which CWSU has backup responsibility, any expected MIS criteria weather, the closing time, and reopening time (if known).

9.3. MIS Example For Back-Up Operations:

```
FAUS20 KZDV 092112
ZDV MIS 01 VALID 070200-070400
...FOR ATC PLANNING PURPOSES ONLY...
ZDV CWSU WILL CLOSE 07/0200Z DUE TO SHORT STAFFING. ZAB CWSU WILL
ASSUME SERVICE BACKUP. ZDV CWSU WILL REOPEN 071230Z.
```

9.4. Back-Up Exercise: CWSUs perform a back-up exercise at least once a year. This exercise should be coordinated with the local WFO, the primary back-up for the CWSU (see Appendix B) and AWC. The exercise at a minimum should consist of issuing the back-up sites CWAs and checking all phone numbers to make sure they are current.

10. Quality Assurance. CWSUs verify the quality of services to the ARTCC, TRACON, or Tower for decision support. These are the type of forecasts that are provided in person, via telephone or VSCS to the FAA member needing information which will directly impact his or her operational decision.

10.1 Forecast Accuracy. CWSUs measure decision support services for their TMU. This is accomplished using the Forecast Accuracy Matrix available at <https://ocwww.weather.gov/cwsu/fam.shtml> along with the following guidance.

1. All CWSUs select one (1) core airport to monitor forecast accuracy and service delivery. In the event that a CWSU does not have a core airport within their area of responsibility,

another locally important airport can be used.

2. CWSU MICs ensure tracking of all operationally significant wind shifts. At a minimum CWSUs MICs track the number of wind shifts, POD, FAR and lead time of operational wind shifts. This information is reported by each CWSU MIC to the RAM on a monthly basis by the 15th of the following month. The RAM ensures the accuracy and timeliness of the reports from his/her region. ASB compiles all reports and sends to FAA on at least a quarterly basis. Operational significant wind shifts for the purpose of this document are defined as a shift in wind speed, direction or combination of that would normally require a runway change. A wind shift is significant if it occurs during peak demand times. It is recommended that peak demand times be determined on a local basis by the CWSU MIC with input from the TMO as times will vary greatly by ARTCC.
3. CWSUs will work with their TMO/TMU to develop two additional locally driven metrics. Those locally driven metrics are tracked and reported monthly to their Regions and ASB.

10.2 CCFP. The CCFP is issued by the AWC during the convective season (typically March-October) to assist FAA decision makers in planning safe and efficient jet routes throughout the NAS. The product is issued at the top of hour, every two hours, from 0700-0100 UTC. Prior to issuance the producers of the product hold a 30 minute chat session for collaboration and coordination with CWSUs, FAA personnel and airline meteorologists. The chat session begins at 15 minutes past the hour and goes to 15 minutes till the next hour (example 1415z-1445z chat for 15z issuance).

10.2.1 Participation Requirements. Meteorologists at the CWSUs are expected to participate on the CCFP when convection is expected in their area of responsibility.

Participation tracking occurs during “peak planning times” (shown in the table below at chat times 1 and 2) for all CWSUs except ZAN. All CWSUs (except ZAN) are expected to participate at least 90% of the time when their ARTCC is in the SPC Outlook for convection.

CWSU	Chat 1 Issuance Time (In Daylight Time)	SPC Outlook	Chat 2 Issuance Time (In Daylight Time)	SPC Outlook
ZBW, ZNY, ZDC, ZOB, ZID, ZTL, ZJX and ZMA	1500z	1300Z	1900z	1630Z
ZAU, ZMP, ZKC, ZME, ZHU and ZFW	1300z	1300Z	1900z	1630Z

ZDV, ZAB, ZSE, ZOA, ZLA and ZLC	1700z	1630Z	2100z	2000Z
------------------------------------	-------	-------	-------	-------

10.2.2 Quality Assurance For CCFP Participation. RAMs oversee the participation of each CWSU. Participation for this document is considered when the CWSU is logged in to the CCFP Chat and provides at least one comment. Late or missed logins are not considered as participation. If a CWSU has technical difficulties logging into the chat it needs to be reported to the RAM and ASB. The participation scores will be calculated monthly by ASB and sent to the RAMs. This information will also be reported to the FAA on at least a quarterly basis.

10.3 Quality Assurance For CWAs. This illustrates quality control of CWAs. This number is reported as the number of CWAs with formatting error(s) out of the total number of CWAs issued. The reports are generated by each CWSU MIC evaluating each CWA for proper format, time (beginning and ending), and content. This information is reported by each CWSU MIC to the RAM on a monthly basis by the 15th of the following month. The RAM ensures the accuracy and timeliness of the reports from his/her region. ASB compiles all reports and sends to FAA on at least a quarterly basis.

10.4 Quality Assurance For MISs. This illustrates quality control of MISs. The number is reported as the number of MISs with error(s) out of the total number of MISs including the product length. The reports are generated by each CWSU MIC evaluating each MIS for proper format, time (beginning and ending), and content. This information is reported by each CWSU MIC to the RAM on a monthly basis by the 15th of the following month. The RAM ensures the accuracy and timeliness of the reports from his/her region. ASB compiles all reports and sends to FAA on at least a quarterly basis.

10.5 Quality Assurance For Hours Without Service. This illustrates the total number of hours a CWSU is closed and receiving back-up services from another CWSU. In the event a CWSU is closed and back-up is being provided the MIC needs to report how many hours back-up service was provided and why the back-up service was needed (emergency sick leave, short staffing, etc.). This information is reported by each CWSU MIC to the RAM on a monthly basis by the 15th of the following month. The RAM ensures the accuracy and timeliness of the reports from his/her region. ASB compiles all reports and sends to FAA on at least a quarterly basis.

10.6 Quality Assurance For Missed Stand-Up Briefings. This illustrates the number of stand-up briefings not being performed by the CWSU. If a stand-up briefing is missed the CWSU MIC needs to report how many briefings were missed and provide a reason why a briefing was missed (sick leave, limited duty hours, etc.). This information is reported by each CWSU MIC to the RAM on a monthly basis by the 15th of the following month. The RAM ensures the accuracy and timeliness of the reports from his/her region. ASB compiles all reports and send to FAA on at least a quarterly basis.

11. Procedure on Reporting of Non-Accident Aircraft Weather Incidents. This procedure describes the steps to be taken in the event of an en route weather-related aircraft incident. For reporting purposes, a weather incident is defined when an aircraft encounters in-flight weather conditions where:

- an aircraft encounters volcanic ash
- an aircraft encounters weather conditions where emergency procedures were implemented and the event is expected to glean the public's attention

CWSU are the primary source of information for en route aviation incidents during their normal hours of operation. CWSUs are in close contact with their associated ARTCC and may receive firsthand information via discussions with supervisors and controllers, or via Urgent Pilot Reports.

Upon receipt of a report of an incident, the associated CWSU will gather as much of the following information as possible:

- Type of incident
- Aircraft type involved, and airline if applicable
- Details of the incident
- Number of injuries or fatalities
- Valid weather product(s) at/near the time of incident (AIRMETs, SIGMETs, PIREPs, CWAs, etc.) as applicable

This information is then sent to their Regional Operations Center for distribution.

If notification of an event occurs during hours the CWSUs are closed, the Aviation Weather Center (AWC) or AAWU will send reports to the National Weather Service Operations Center for distribution and coordinate with the appropriate CWSU after the office opens.

12. Training Plan. The CWSU MICs will use the National CWSU Training Plan found at <https://ocwws.weather.gov/cwsu/training.shtml> for training of all meteorologists who work operational shifts at a CWSU. Each CWSU MIC may add or remove items in the local and optional sections from the training plan to best meet the needs of that ARTCC.

**Appendix A
CWSU Support Facility Locations**

CWSU	Supporting NWS WFO
ZAB Albuquerque Center	WFO Albuquerque, NM
ZAN Anchorage Center	AAWU
ZTL Atlanta Center	WFO Peachtree, GA
ZBW Boston Center	WFO Boston/Taunton, MA
ZAU Chicago Center	WFO Chicago, IL
ZOB Cleveland Center	WFO Cleveland, OH
ZDV Denver Center	WFO Denver-Boulder, CO
ZFW Fort Worth Center	WFO Fort Worth, TX
ZHU Houston Center	WFO Houston/Galveston, TX
ZID Indianapolis Center	WFO Indianapolis, IN
ZJX Jacksonville Center	WFO Jacksonville, FL
ZKC Kansas City Center	WFO Kansas City/Pleasant Hill, MO
ZLA Los Angeles Center	WFO Los Angeles/Oxnard, CA
ZME Memphis Center	WFO Memphis, TN
ZMA Miami Center	WFO Miami-South Florida, FL
ZMP Minneapolis Center	WFO Chanhassen, MN
ZNY New York Center	WFO Upton, NY
ZOA Oakland Center	WFO San Francisco Bay Area/Monterey, CA
ZLC Salt Lake City Center	WFO Salt Lake City, UT
ZSE Seattle Center	WFO Seattle, WA
ZDC Washington Center	WFO Baltimore/Washington Sterling, VA

Appendix B
CWSU Back-Up Pairings

Station Needing Backup	Station Doing Backup
ZAB	ZDV
ZAN	AAWU
ZTL	ZME
ZBW	ZOB
ZAU	ZID
ZDV	ZAB
ZFW	ZHU
ZHU	ZFW
ZOB	ZBW
ZID	ZAU
ZJX	ZMA
ZKC	ZMP
ZLA	ZOA
ZME	ZTL
ZMA	ZJX
ZMP	ZKC
ZNY	ZDC
ZOA	ZLA
ZLC	ZSE
ZSE	ZLC
ZDC	ZNY

Appendix C
MIS Examples

ZKC MIS 01 VALID 281415-291200

...FOR ATC PLANNING PURPOSES ONLY...

AN UPPER-LVL DISTURBANCE OVER COLORADO IS FCST TO MOVE EAST INTO WRN KS BY 00Z. AS THE DISTURBANCE APCHS WRN KS...TS ARE FCST TO DVLP ALG A DRYLINE EXTENDING FROM WRN KS TO THE TEXAS PANHANDLE. SCT TS FCST TO DVLP 18Z-20Z OVER ZKC W HYS-MMB LINE.

ZAB MIS 02 VALID 281300-290300

...FOR ATC PLANNING PURPOSES ONLY...

AN UPPER-LVL DISTURBANCE OVER COLORADO COMBINED WITH A STRONG JET STREAM MOVING ACROSS THE SWRN U.S. IS FCST TO PRODUCE AREAS OF TURBULENCE ACROSS PORTIONS OF ZAB. THE TURBULENCE IS FCST TO SUBSIDE AFT 00Z AS THE DISTURBANCE AND JETSTREAM MOVE FURTHER EAST.

ZBW MIS 03 VALID 302100-311200

...FOR ATC PLANNING PURPOSES ONLY...

A COLD FRONT IS BECMG STNR FROM WRN PA TO SRN NJ WITH A MOIST NE LOW-LVL FLOW PRODUCING AREAS OF LOW CLOUDS AND FOG. AS THE COLDER AIR DEEPENS AREAS OF ICING ARE FCST TO DVLP. OVER ZBW E BGR-CMK LINE...LGT OCNL MOD RIME ICE DVLPG 00Z-03Z BTN 020 AND 080.

**Appendix D
CWA Examples**

1. Line of Thunderstorms:

ZKC1 CWA 011915
ZKC CWA 101 VALID UNTIL 012000
FROM 65N MCI-30W BUM-45SE ICT
DVLPG LINE TS 10NM WIDE MOV FROM 25030KT TOPS TO FL410. MOD TO
HVY PCNP IS EXPECTED

ZKC1 CWA 012000
ZKC CWA 102 VALID UNTIL 012100
FROM 70NNE MCI-20W BUM-60W OSW
LINE SEV TS 15NM WIDE MOV FROM 25025KT TOPS ABV FL450. HAIL 1 INCH
REP. TS VC KMCI THRU 21Z. ..THIS IS ADDN INFO TO CONVECTIVE SIGMET
55C.

2. Area of Thunderstorms:

ZFW2 CWA 021210
ZFW CWA 202 VALID UNTIL 021300
FROM 75W OKC-15S CDS
AREA TS 40NM WIDE MOV FROM 19015KT TOPS TO FL370.

ZFW1 CWA 181227
ZFW CWA 101 VALID UNTIL 181300
FROM 45W ADM -55SW ADM -ABI -40SSE CDS -60E CDS - 45W ADM
AREA TSRA MOV FROM 27020KT TOPS TO FL380. MOD TO HVY PCPN.

3. Isolated Thunderstorms:

ZDV3 CWA 172115
ZDV CWA 301 VALID UNTIL 172200
15NW DEN
ISOL TS...DIAM 10NM...MOV FROM 32025KT...TOP FL350. TS VC KDEN THRU
22Z. MICROBURSTS...WIND GUST TO 45KT POSS. ..THIS IS ADDN INFO TO
CONVECTIVE SIGMET 70C.

ZAU3 CWA 181405
ZAU CWA 301 VALID UNTIL 181500
45SW ORD
ISOL SEV TS DIAM 15NM MOV FROM 21025KT TOP FL430. HAIL TO 1 INCH
WIND GUST 50KT POSS.

4. **Embedded Thunderstorms:**

ZMA4 CWA 181410
ZMA CWA 402 VALID UNTIL 181500
15SSW MIA
ISOL EMBD TS DIAM 10NM MOV FROM 21025KT TOP FL370. TS VC KMIA
THRU 15Z WIND GUST 35KT POSS.

5. **Cancel CWA:**

ZFW5 CWA 181305
ZFW CWA 502 VALID UNTIL 181320
CANCEL ZFW CWA 501. SEE CONVECTIVE SIGMET 83C.

ZOB5 CWA 202100
ZOB CWA 503 VALID UNTIL 202115
CANCEL ZOB CWA 502. ICING CONDS HAVE IMPR WITH SEV ICE NO
LONGER EXPECTED. SEE AIRMET ZULU.

6. **Turbulence CWA:**

ZID6 CWA 210100
ZID CWA 601 VALID UNTIL 210300
FROM FWA-CVG-PXV-TTH-FWA
AREA OCNL MOD ISOL SEV TURB FL290-350. CONDS MOV NE AND CONT
BYD 03Z. THIS IS ADDN INFO TO AIRMET TANGO. ..NO UPDATES AVBL AFT
02Z.

ZOA1 CWA 221400
ZOA CWA 101 VALID UNTIL 221600
FROM RBL-30E FMG-50S CZQ-OAK-RBL
AREA FRQ MOD OCNL SEV TURB FL180-230. CONDS MOV SE AND CONT BYD
16Z.
..THIS IS ADDN INFO TO AIRMET TANGO.

ZNY2 CWA 232100
ZNY CWA 203 VALID UNTIL 232300
FROM HNK-JFK-HAR-HNK
AREA OCNL MOD ISOL SEV TURB BLW 060 AND LLWS. CONDS ENDING BY
23Z.

7. **Icing CWA:**

ZMP3 CWA 240010
ZMP CWA 301 VALID UNTIL 240210
FROM INL-EAU-RWF-INL
AREA OCNL MOD ISOL SEV RIME/MX ICE 100-FL180. CONDS MOV E AND
CONT BYD 0210Z. ..THIS IS ADDN INFO TO AIRMET ZULU.. ..NO UPDATES

AVBL AFT 0200Z.

ZLC4 CWA 251420
ZLC CWA 401 VALID UNTIL 251620
FROM GGW-SHR-GTF-GGW
AREA OCNL SEV MX/CLR ICE 120-170. CONDS IMPR TO LGT ISOL MOD
RIME/MX ICE BY 1620Z. ..THIS IS ADDN INFO TO SIGMET QUEBEC.

8. IFR/LIFR CWA:

ZLA5 CWA 261415
ZLA CWA 501 VALID UNTIL 261615
FROM HEC-MZB-50SW LAX-HEC
AREA CIGS BLW 010 VIS BLW 3SM -DZ BR. CONDS CONT BYD 1615Z.

ZDC6 CWA 271500
ZDC CWA 603 VALID UNTIL 271700
FROM ORF-75E ILM-RDU-ORF
AREA OCNL CIGS BLW 005/VIS AOB 1/2SM FG. CONDS ENDING BY 17Z.
..THIS IS ADDN INFO TO AIRMET SIERRA.

Appendix E Plotting Point Map

