Docket No. SA-509

Exhibit No. 5-C

NATIONAL TRANSPORTATION SAFETY BOARD

Washington D.C.

Meteorological Data C

Index

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE

STATEMENT

National Weather Service
CWSU Atlanta Center
Hampton, GA 30228
July 29, 1994

The following is a report concerning the crash of US Air Flight #1016 at Charlotte, NC on July 2, 1994 at 2242 UTC (1842 EDT).

My name is Arthur W. Ayers, Jr., Meteorologist in Charge of the Center Weather Service Unit (CWSU) at Atlanta Center. I was the aviation forecaster on duty for the 1800 UTC--0200 UTC shift on July 2, 1994. The following is a summary of my actions surrounding the time of the accident beginning with thoughts about weather developments across Atlanta Center's airspace the afternoon and evening of the accident.

Surface analyses, stability indexes, satellite imagery and other guidance indicated the potential for widely scattered thunderstorms in the vicinity of a surface trough oriented along the southern and eastern boundaries of Atlanta Center's airspace. Charlotte TRACON was briefed on the thunderstorm potential at 1908 UTC using the 300 telephone system. The Graphic Weather Bulletin, which was faxed to Charlotte TRACON at 1920 UTC, forecast isolated level 4-5 thunderstorms in the vicinity of Charlotte until 0100 UTC.

At the 2010 UTC stand-up briefing I also briefed center personnel on the potential for widely scattered thunderstorms in the vicinity of the surface trough. Isolated thunderstorms were forecast elsewhere.

After the stand-up briefing I used available radar imagery and lightning detection graphics to met watch thunderstorm development across Atlanta Center's airspace. The radar data included doppler radar from Maxwell AFB, Radar Remote Weather Display System (RRWDS) imagery from 6 individual radars, and the Weather Services Incorporated (WSI) mosaic provided through the Harris Meteorologist Weather Processor. There were questions concerning the reliability of the WSI mosaic since a number of radars were either out to service or had been removed from the mosaic by WSI.

Therefore I relied more heavily on the doppler radar and the RRWDS radars to brief Tuscaloosa, Birmingham, Augusta, and Montgomery towers and Atlanta Center personnel on thunderstorm development prior to the accident. About the time of the accident, I was using the Maxwell AFB doppler radar to study thunderstorm intensity, tops and movement in Columbus tower's airspace. At 2243 UTC Ed DeLacy, Atlanta Center Traffic

Management Unit (TMU), inquired about thunderstorm development in the Charlotte area. I used the Athens, GA NWS radar and the Maiden, NC FAA radar (RRWDS data) to check the weather in the vicinity of the Charlotte airport. The Athens radar, which is about 140 nautical miles from Charlotte, indicated level 1-2 intensity. The Maiden radar, which is about 35 nautical miles northwest of the Charlotte airport, indicated a small level 3 near the Charlotte airport. This information was given to the Atlanta Center TMU. At 2244 UTC I briefed Columbus TRACON on the tops and movement of level 3 thunderstorms in their airspace. At 2253 UTC I briefed Charlotte TRACON on a possible level 3 thunderstorm on the north edge of the airport. Although the Maiden radar often reads a level or two above NWS radars, its proximity to the Charlotte airport makes it the radar of choice for watching weather in the Charlotte area. I did not have access to the doppler radar at Columbia, SC. At 2258 UTC the Atlanta Center Area Manager in Charge informed me that a DC9 had crashed at Charlotte.

Based on the information available to me, in my judgement none of the thunderstorm activity in Atlanta Center's airspace which I observed on the 1800 UTC--0200 UTC shift of July 2, 1994 met criteria for the issuance of a Center Weather Advisory.

[redacted]

Arthur W. Ayers, Jr.
MIC, CWSU Atlanta

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1.3.2 CWA Criteria. When supported by real time information (e.g. PIREPS, radar) a CWA should be issued under any of the following conditions:

a. As a supplement to an existing Convective Sigmet, Non-convective Sigmet, or Airmet, when in the judgement of the forecaster the CWA will improve or update the definition of the phenomena with respect to the Atlanta Center area.

b. When an In-Flight Advisory has not been issued, but observed or forecast conditions meet Convective Sigmet, Non-Convective Sigmet, or Airmet criteria. Such a CWA should be coordinated with the Convective Sigmet Unit or NAWAU, preferably before issuance, if time permits. If the CWA meets Convective Sigmet or Non-Convective Sigmet criteria it should be disseminated as an "Urgent CWA" (UCWA).

c. When observed or forecast conditions will have an adverse impact on the safety of air traffic within the ZTL area, even though such conditions do not meet In-Flight Advisory Criteria. For example thunderstorms near one of the inbound fixes to Atlanta or Charlotte could cause the TMU to re-route traffic to other fixes.

The forecaster should reserve CWA's for those occasions when it is desired to focus attention on phenomena which will have an affect on the safe and/or efficient flow of air traffic. CWA's which duplicate other In-Flight Advisories often burden communication networks and/or controllers. To efficiently discharge CWA responsibility, the forecaster must be cognizant of the In-Flight Advisories which are in effect and their criteria for issuance. These criteria are found in WSOM Chapter D-22.

1.3.3 Content. The CWA will consist of the location of phenomena and a text describing the phenomena. Location should be outlined using 16 point compass distance from airports/VOR's (WSOM Exhibit D-22-1) starting with the northern most point and proceeding clockwise. Following the location, the text will describe the coverage, intensity, type, vertical extent, movement, and if appropriate, forecast of phenomena (e.g. LN FCST TO MOV E 30 KTS THRU 2015Z. GSTS TO 45 KTS PSBL). Phenomena which are geographically separated require separate CWA's. A single CWA may be issued to describe two phenomena in the same area. Heights which are not in reference to MSL should be noted by AGL or CIG. When conditions are forecast to extend beyond the valid time of the CWA's, this should be indicated and additional CWA's issued.

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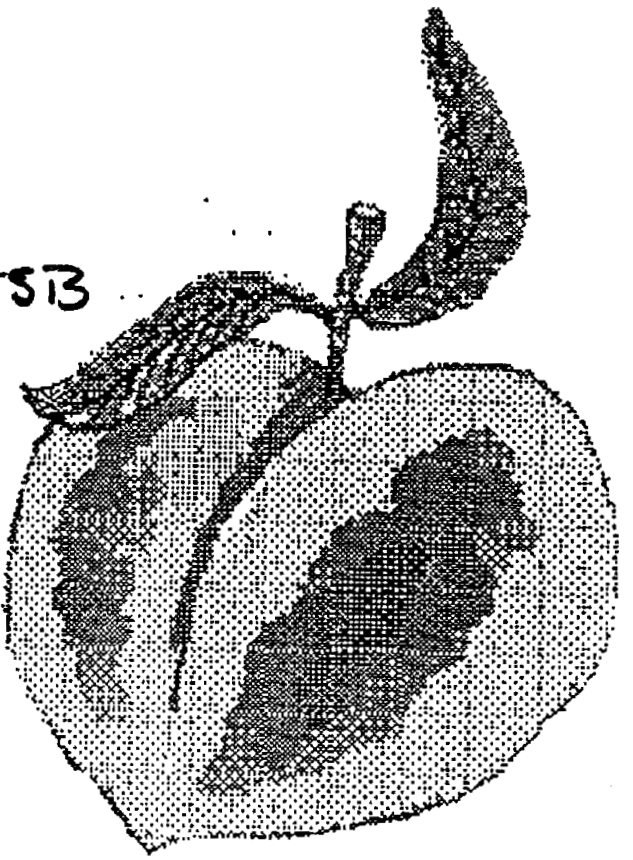
ATLANTA ARTCC

FAX

DATE: 07/03/94

TO: BILL KNEAS - NTSB
ROOM #320

FROM: ART AYERS
MIC CWSU ATLANTA



INSTRUCTIONS:

PER YOUR REQUEST

ATLANTA ARTC CENTER
299 WOOLSEY ROAD
HAMPTON, GA 30228
FAX NO. 404-946-7938

PAGE 1 OF 2

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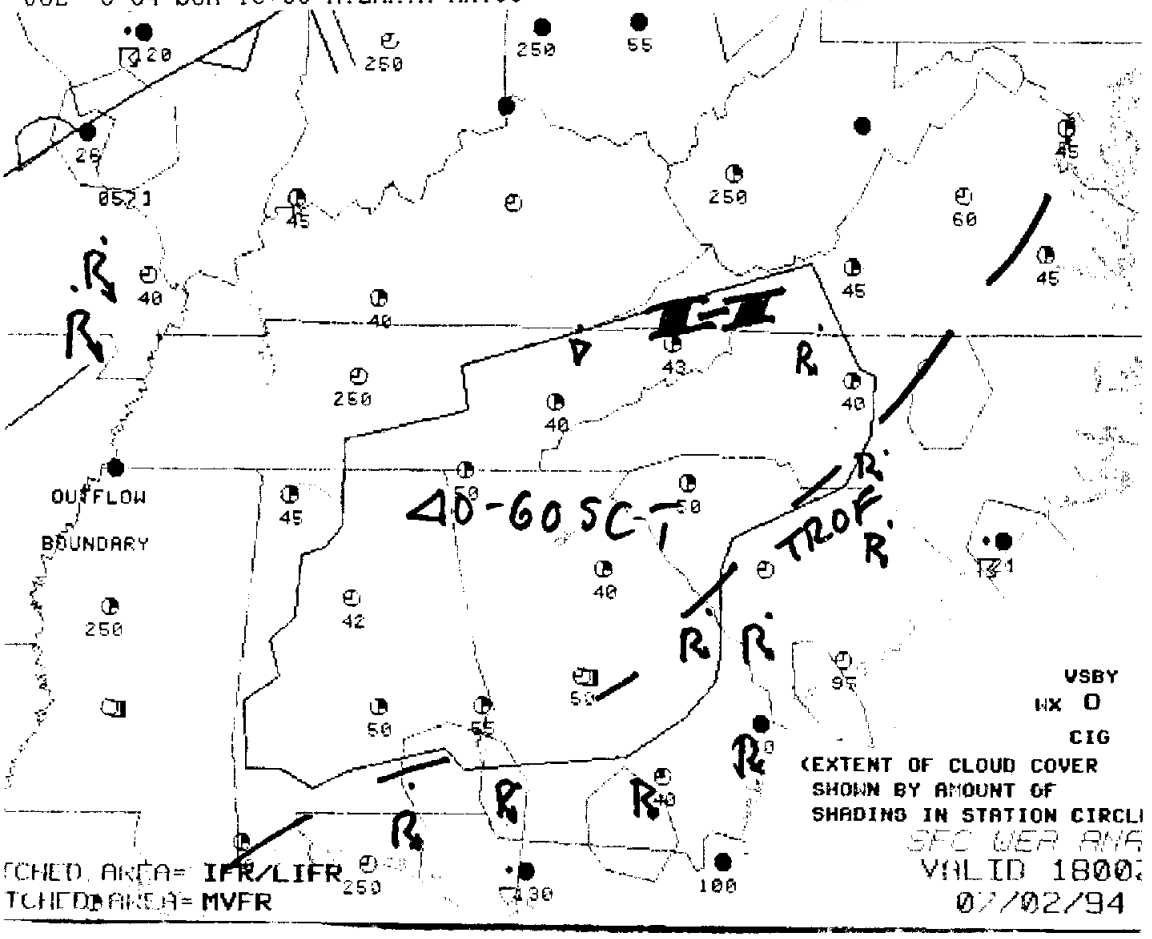

DAY: Saturday
DATE:07/02/94
TIME:19:24 UTC

PIREPS to:
MET: 635
TMU: 224

SOME SYMBOLS:

RAIN ,,DRZL

SHWR **SNW

TSTM

ICE PELLETS

--- --- JTSTR

*REMEMBER: TSTMS imply SVR or greater TURBC, SVR ICG, low level WIND SHEAR, psbl HAIL, and LIFR conditions.

FORECAST AND IMPACT ON OPERATIONS VALID UNTIL 04Z

SYNOPSIS...AFTN/EVE HEAT FIRING WDLY SCT TSTMS MAINLY ALG SFC TROF NEAR E ZTL BNDRY. WEAK HIGH PRESSURE DIMINISHES TSTM THREAT ELSW.

CLDS (CIG)/VSBY...CLT 45 SCT 250 SCT 8 ISOLD C10 OVC 1TRW+ G45 VCNTY..AFT 02Z 50 SCT 7. ATL 50 SCT 8..AFT 22Z 50 SCT 8 ISOLD C10 OVC 1TRW+ VCNTY..AFT 01Z 250 SCT 7.

PCPN/SHWRS/TSTMS...ISOLD LVL 4-5 TSTMS WITH TOPS 450-500 DMSHG AFT 01Z.

FRZG LVL...NR 140.

ICG...NO SGFNT ICG FCST OUTSIDE TSTMS.

TURBC...NO SGFNT TURBC FCST OUTSIDE TSTMS.

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#ZTL MIS 01 021335-030135
FM 35SE BKW TO GSO TO AMG TO 40N MOB TO BNA TO 35SE BKW
WDLY SCT LVL 3-5 TSTMS DVLPG AFT 17Z. MVMT FM 3510 XCPT
CVR S AL S GA FM 1708. MAX TOPS 450-500.

FM 35SE BKW TO GSO TO AGS TO PHM TO BNA TO 35SE BKW
OCNL MDT TURBC 25Z-44Ø DUE TO WNDSHR. CONDS DMSHG FM W
AFT 2ØZ.
HU

Jul 2 13 37 94

TRANSMITTED
MESSAGE STORED ON DISK

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PERSONNEL STATEMENT

FEDERAL AVIATION ADMINISTRATION
ATLANTA ARTC CENTER

July 25, 1994

The following is a report concerning the accident involving USA1016, on July 2, 1994, at Charlotte, NC (CLT) at 2242 UTC.

My name is Edmund M. deLacy (ED). I am employed as an Air Traffic Control Specialist by the Federal Aviation Administration at the Atlanta Air Route Traffic Control Center, Hampton, Georgia.

During the period 1650 UTC on July 2, 1994 to 0140 UTC on July 3, 1994, I was on duty in the Atlanta ARTCC. I was working the Charlotte Meter position from 2221 UTC to 2338 UTC.

At approximately 2239 UTC, the Charlotte Approach Control Traffic Management Coordinator (CLT TMC) advised me that thunderstorms were impacting the arrivals and he lowered the airport acceptance rate. I then contacted the Atlanta ARTCC Center Weather Service Unit (CWSU) for more detailed information on the reported weather. This was done for planning purposes of both arrivals and departures at Charlotte.

[redacted]
Edmund M. deLacy, ATCS
Atlanta ARTCC

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DAILY RECORD OF FACILITY OPERATION

PAGE NO. 1

DATE 07/02/94

CHECKED BY

CHIEF

LOCATION	IDENTIFICATION	TYPE FACILITY	OPERATING POSITION
HAMPTON, GA	ZTL	ARTCC	CWSU

TIME (GMT)	REMARKS
1013	HU ON DUTY
1101	BRAD CLT TRACON
1145	BRAD ATL TRACON
1152	UA
1210	STANDUP
1227	UA
1335	MIS 01
1450	RADARS MISSING FROM WSI MOSAIC. CALLED HARRIS
1510	ATL/CLT FCSTS TO TMU
1624	UA
1641	WW 541 TO WC
1723	CALLED TYS TRACON - LVL 4 TSTM 280/50-60 TOP 350-390 MOVG FM 2710
1728	WW 542 TO WC
1729	BRAD AT - LVL 4 TSTM SQ WNW TYS TOPS 350-390
1747	
1808	BRAD CLT TRACON - LVL 3-4 CELL BLDG @ 15 E CLT
1811	BRAD AT, AZ CELL E CLT & BRAD ON LVL 3-4'S AT 5ZM TWD LWH
1826	HU OFF DUTY
1850	BILT SE, AGS TRACON, AG, LVL 4's ~ 400
1908	BIRF CLT TRACON
1912	BIRF ATL TRACON
1918	FAX GWB ATL/CLT
1921	WW 544 TO WC
2010	BIRF ZTL
2044	BRF TCL TWR, BHM TRACON
2048	BRF AGS TRACON LVL 5 10W AGS LVL 2 20S AGS
2057	BIRF AT LVL 4'S 400 LVT - 30W HCH
2123	BRF IND, AG, BHM TRACON LVL 4'S 300
2121	BRF MGM RADCON AGS LVL 4 25W MGM 300
2144	BRF CSG TRACON LVL 3'S 300
2243	BIRF TMU LVL 2-3 VCNTY CLT
2253	BRF CLT PSBL LVL 3 NE SIDE OF CLT ARPT
2258	AWIC INFORMED THAT WC9 CRASHED AT CLT

I CERTIFY that entries above are correct; that all scheduled operations have been accomplished, except as noted, and that all abnormal occurrences and conditions have been recorded.

SIGNATURE(S) OF WATCH SUPERVISOR(S)

[redacted]

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FAA Form 7230-4 (4-82) Supersedes previous edition

DAILY RECORD OF FACILITY OPERATION

PAGE NO. 2

DATE 07/02/94

CHECKED BY

CHIEF

LOCATION	IDENTIFICATION	TYPE FACILITY	OPERATING POSITION
HAMPTON, GA	ZTL	ARTCC	CWSU

TIME (GMT)	REMARKS
2323	CLT SA01S TO THMIC
2353	BRF MCN TRACON LVL 4 10 N MCN - ATL TRACON
—	APPARENT LVL 1 SE OF ATL 10-20 MI
0110	BRF CHA/TYS TRACON LVL 5 30D 35DW TYS
0115	BRF MCN TRACON LVL 4 30B
0116	BRF ATL TRACON LVL 4 30SE ATL
0123	BRF A7 LVL 5 30 SW TYS
0205	FAX GWB TO ATL/NO ANS CLT - BRF TMU ON WX OVR NGT &
—	PASS ATL/CLT FTS.
0300	MIS 02
0310	WS OFF DUTY

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I CERTIFY that entries above are correct, that all scheduled operations have been accomplished, except as noted, and that all abnormal occurrences and conditions have been recorded.

SIGNATURE(S) OF WATCH SUPERVISOR(S)

[redacted]

FAA Form 7230-4 (4-82) Supersedes previous edition

NATIONAL WEATHER SERVICE
SILVER SPRING, MARYLAND 20910

Operations Manual Letter 2-84

Date of Issue:	March 22, 1984	**Effective Date:**	March 15, 1984
In Reply Refer To:	W/OM13x1	**File With:**	D-25

Subject: Delay of Effective Date and Addition of Urgent Center Weather Advisory

Reference(s):

WSOM Chapter D-25, Issuance 84-1, dated 2/10/84.

The purpose of this Operations Manual Letter is twofold.

1. The effective date of WSOM Chapter D-25, Support to Air Traffic Facilities, has been changed from March 15, to April 16, 1984. This change has been made to ensure that all necessary equipment and arrangements are in place and tested prior to implementation of the new instructions.

2. In order to avoid the possibility of having a Center Weather Advisory (CWA) issued in advance of a SIGMET, but arrive after the SIGMET due to communications handling, the "Urgent" message type has been added.

Section 4.3.3, paragraph a.2 describes one situation in which a CWA will be issued. This paragraph is amended to add the following:

> When the National Aviation Weather Advisory Unit product to be issued is a SIGMET, the CWSU forecaster will issue an "Urgent CWA" indicated by the message type "UCWA" in place of the normal "CWA". All subsequent CWA's issued for the same phenomenon will have the normal message type designation.

The message format following paragraph b is amended to add "UCWA" as an alternative message type.

Use of the urgent message type should be restricted to the situation described above. However, it may also be used in those rare situations where circumstances require its use to avoid a dangerous delay in the dissemination of a CWA.

These changes will not affect the handling of CWA's in the AFOS system since they will both be assigned the same WMO message type.

for Richard E. Hallgren
Assistant Administrator
for Weather Services

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

February 10, 1984

W/OM13x1

TO: All Holders of Operations Manual

SUBJECT: Transmittal Memorandum for Operations Manual Issuance 84-1

1. Material Transmitted:

WSOM Chapter D-25, Support to Air Traffic Facilities.

2. Summary:

The entire chapter has been revised. Major changes are as follows.

a. The chapter was restructured to more clearly state the air traffic facilities support to be provided by all designated elements of the National Weather Service. The sample Center Weather Service Unit (CWSU) Station Duty Manual has been deleted.

b. Definitions and terminology for all relevant FAA facilities and personnel have been updated.

c. The Central Flow Weather Service Unit (CFWSU) is described and its responsibilities defined.

d. The responsibilities, relationships, and priorities of the members of the CWSU, especially those of the recently added meteorologists in charge and the weather coordinator, have been defined, redefined, or clarified.

e. The products prepared by the CWSU to provide advice and consultation to the National Airspace System have been updated, redefined, and/or clarified.

f. The responsibility, methodology, and priority for the dissemination of these products have been defined.

g. The need for National Weather Service product coordination between facilities providing air traffic facility support has been defined.

h. The role, responsibility, and accountability of the National Weather Service area manager in CWSU and air traffic facility support have been clarified and emphasized.

i. The responsibility for providing pressure trend information to air traffic facilities has been transferred to the National Aviation Weather Advisory Unit which will communicate through the CFWSU.

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3. Effect on Other Instructions:

This chapter is effective as of 1000 Greenwich Mean Time on March 15, 1984. It supersedes WSOM Chapter D-25, Issuance 78-13, dated August 8, 1978; Issuance 79-1, dated February 14, 1979; Operations Manual Letter 8-83, dated April 4, 1983; and any regional or local agreements with air traffic facilities which are at variance with the policies and instructions contained herein.

for [redacted]

Richard E. Hallgren
Assistant Administrator
for Weather Services

SUPPORT TO AIR TRAFFIC FACILITIES

Table of Contents

Table of Contents

Exhibits

1. Purpose. This chapter provides the National Weather Service's (NWS) policies on weather support of Federal Aviation Administration (FAA) Air Traffic Facilities. This support is designed to improve safety and enhance the efficient flow of air traffic. It is provided through specialized forecasts, nowcasts, and briefings.

1.1 Description of Air Traffic Facilities Supported.

a. "Central Flow Control Facility (CFCF). CFCF is a part of the Air Traffic Control Command Center (ATCCC) located at the Federal Aviation Administration Headquarters. The ATCCC is an air traffic service facility consisting of CFCF and three other operational units: Central Altitude Reservation Function (CARF); Airport Reservation Office (ARO); and ATC Contingency Command Post. The CFCF is responsible for the coordination and approval of all major inter-center flow control restrictions made on a system basis in order to obtain maximum utilization of the airspace.

b. "Air Route Traffic Control Center (ARTCC). A radar facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.

c. "Approach Control Facility. An Air Traffic Control (ATC) facility providing approach control service to one or more terminal areas.

d. "Airport Traffic Control Tower. A terminal facility providing ATC services to aircraft operating on the movement area and in the vicinity of an airport.

e. "Flight Service Station (FSS). An air traffic facility providing pilot weather briefing, en route communications, and VFR search and rescue services; assistance to lost aircraft and aircraft in emergency situations; relay of ATC clearances; preflight and in-flight advisory services, and other services to pilots, via air/ground communications facilities including the Enroute Flight Advisory Service (EFAS), a service specifically designed to provide timely weather information directly to the en route pilot."

2. General. The FAA requires the best possible weather information affecting the safe and efficient utilization of airspace and airports to assist in air traffic management. This includes information on the following:

a. Convective weather.
b. Low ceilings and visibility.
c. Cloud tops.
d. Wind, both surface and aloft.
e. Wind shear.

N

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f. Significant pressure changes.
g. Precipitation.
h. Turbulence.
i. Icing.

3. Central Flow Weather Service Unit (CFWSU). The CFWSU consists of NWS meteorologists assigned to CFCF for the purpose of providing consultation and advice for use by the staff of the ATCCC concerning weather conditions that may adversely affect the National Airspace System (NAS) during the next 24-hour period. This support is provided through detailed briefings of current and forecast weather several times a day.

3.1 CFWSU Meteorologist Responsibilities. The CFWSU meteorologists:

a. participate in Severe Weather Avoidance Nationwide (SWAN) plan activities as a primary source of weather information to the affected ATCCC unit;

b. coordinate with one or more Center Weather Service Units (CWSU's) concerning weather affecting the ARTCC areas; and

c. are consultants to ARTCC weather coordinators in the contiguous U.S. in the absence of a CWSU meteorologist. This backup service is intended only during unavoidable breaks in scheduled coverage, i.e., sick leave or unit vacancies which leave the CWSU meteorologist in charge (MIC) unable to cover a regularly scheduled shift. (NOTE: When support is required, the MIC of a CWSU should arrange CFWSU backup sufficiently far in advance to allow the impact of the request to be evaluated. CFWSU is authorized, when necessary, to request that an adjacent CWSU assist in meeting this backup responsibility.)

4. Center Weather Service Unit (CWSU). The CWSU is a joint agency aviation weather support team composed of NWS meteorologists and an FAA controller or traffic management coordinator assigned to the weather coordinator position. The purpose of the CWSU is to provide weather consultation and advice to managers and staff within the ARTCC and to other supported FAA facilities. This is done through briefings and products (forecasts and nowcasts) describing actual or forecast adverse weather conditions which may affect air traffic flow or operational safety over the ARTCC's portion of the NAS or other locally defined special operations (e.g., offshore helicopter operations). The CWSU also provides weather information dissemination services making products available to outside users including pilots, dispatchers, and service companies. Exhibits D-25-1 and D-25-2 describe the area of responsibility and relationships, respectively, for each CWSU. Locally designated products for conditions outside of these areas may be prepared if, in the MIC's judgment, sufficient information and resources are available. CWSU meteorologist staffs operate two shifts per day with the actual duty hours determined by the MIC, in consonance with the ARTCC's manager, i.e., the air traffic manager (ATM).

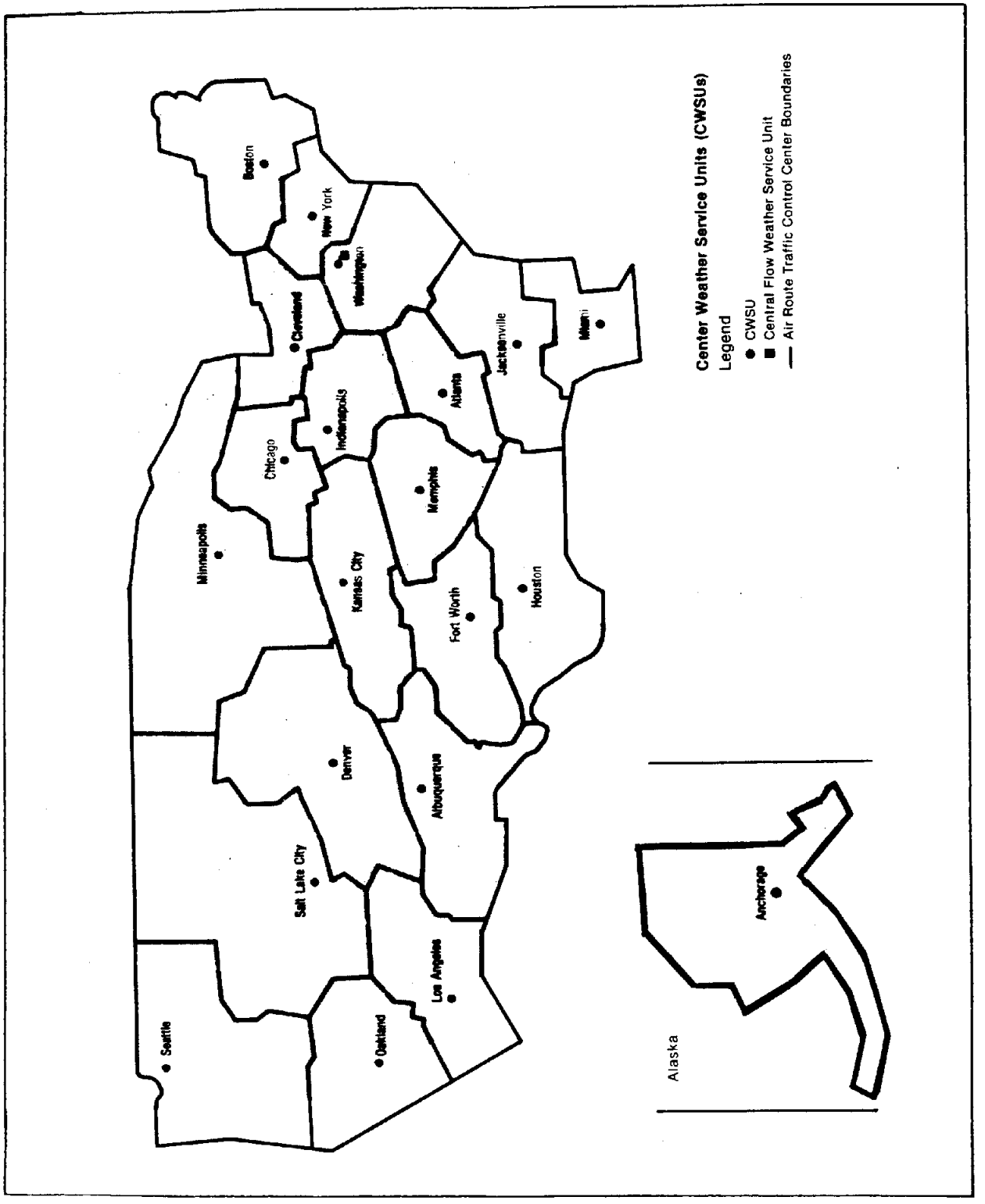

Exhibit D-25-1: Air Route Traffic Control Center/CWSU Areas

ARTCC/ID LOCATION	NWS SUPPORT FACILITY	WSFO's IN CWSU AREA OF RESPONSIBILITY	SSU SUPPORTING CWSU
ALBUQUERQUE/ZAB ALBUQUERQUE, NM	WSFO ABQ	ABQ, LBB, OKC, PHX. DEN	MKC
ANCHORAGE/ZAN ANCHORAGE, AK	WSFO ANC	ANC, FAI, JNU	ANC
ATLANTA/ZTL HAMPTON, GA	WSFO ATL	ATL, BHM, MEM, RDU, CRW, DCA	WBC
BOSTON/ZBW NASHUA, NH	WSFO BOS	BOS, ALB, PWM,	WBC
CHICAGO/ZAU AURORA, IL	WSFO CHI	CHI, IND, ARB, MKE, DSM	MKC
CLEVELAND/ZOB OBERLIN, OH	WSFO CLE	CLE, PIT, BUF, CRW, DTW	WBC
DENVER/ZDU LONGMONT, CO	WSFO DEN	ABQ, CYS, DEN, FSD, OMA PHX, SLC, TOP, GTF	MKC
FORT WORTH/ZFW EULESS, TX	WSFO DFW	DFW, OKC, MSY, LIT, ABQ, LBB	MSY
HOUSTON/ZHU HOUSTON, TX	WSFO SAT	DFW, MSY, SAT, JAN, LBB, BHM	MSY
INDIANAPOLIS/ZID INDIANAPOLIS, IN	WSFO IND	IND, SDF, CLE, CRW, MEM, CHI	MKC
JACKSONVILLE/ZJX HILLIARD, FL	WSFO MIA	CAE, ATL, MIA, BHM	MIA
KANSAS CITY/ZKC OLATHE, KS	WSFO TOP	TOP, STL, CHI, OMA, DEN, OKC, DSM, LBB	MKC
LOS ANGELES/ZLA PALMDALE, CA	WSFO LAX	LAX, PHX, RNO, SFO, SLC	SFO
MEMPHIS/ZME MEMPHIS, TN	WSFO MEM	MEM, LIT, JAN, BHM, MSY, CHI, SDF, STL	MSY
MIAMI/ZMA MIAMI, FL	WSFO MIA	MIA	MIA
MINNEAPOLIS/ZMP FARMINGTON, MN	WSFO MSP	ARB, BIS, DSM, FSD, MKE MSP, OMA. STL, TOP	MKC
NEW YORK/ZNY RONKONKOMA, NY	WSFO NYC	NYC, PHL, ALB, BOS	WBC
OAKLAND/ZOA FREMONT, CA	WSFO SFO	LAX, RNO, SFO	SFO
SALT LAKE CITY/ZLC SALT LAKE CITY, UT	WSFO SLC	BIS, BOI, CYS, DEN, FSD GTF, PDX, RNO, SLC	SFO
SEATTLE/ZSE AUBURN, WA	WSFO SEA	BOI, GTF, PDX, RNO, SEA, SFO	SFO
WASHINGTON/ZDC LEESBURG, VA	WSFO WBC	DCA, PHL, CRW, RDU	WBC

Exhibit D-25-2: Relationships of Center Weather Service Units

4.1 Responsibilities.

4.1.1 The ARTCC Manager. The ATM of each ARTCC has operational responsibility for the CWSU. ATM's oversee implementation of FAA and NWS CWSU operating policies and bring any special local requirements to the attention of the CWSU MIC.

4.1.2 The CWSU Meteorologist in Charge. The CWSU MIC is the first line supervisor of the assigned meteorologists. The MIC determines the procedures to be followed in implementing this chapter, FAA order 7210.38A and compatible or approved procedures to meet special local requirements. Such procedures will be detailed in the CWSU Station Duty Manual (SDM).

4.1.3 The CWSU Meteorologist. The CWSU meteorologists are forecasters who monitor, review, analyze, and interpret weather information pertinent to the airways and air traffic terminals in the ARTCC area of responsibility. They prepare briefings, nowcasts, and forecasts to inform FAA area supervisors, traffic management coordinators, sector controllers, other supported FAA facilities, and the CFWSU meteorologists of any weather conditions or changes that may affect the safe flow of air traffic. This is done either directly or through the weather coordinator.

The CWSU meteorologists have the following responsibilities:

a. Provide detailed briefings of current and forecast weather conditions affecting the NAS for ARTCC and designated EFAS and/or control tower personnel at least once per shift. Additional briefings may be scheduled routinely or provided as conditions require.

b. Solicit Pilot Reports (PIREP), through the weather coordinator directly from the controllers, from known or suspected areas where conditions meet or approach advisory criteria. Solicited or unsolicited PIREP's meeting urgent PIREP criteria will be immediately relayed by the CWSU into the FAA's Leased Service A System (LSAS) for nationwide distribution. Other PIREP's will be relayed by the weather coordinator or, as higher priority duties permit, by the meteorologist.

c. Ensure that reports of conditions meeting Urgent PIREP criteria (including wind shear) reach the appropriate Weather Service Forecast Office(s) (WSFO), the National Aviation Weather Advisory Unit (NAWAU), and/or the CFWSU meteorologist via the LSAS or by telephone.

d. Relay Pilot Reports of conditions meeting Severe Weather Warning criteria to the NWS office with local warning responsibility via telephone.

e. Relay reports of winds meeting Winds Aloft Forecast amendment criteria to the appropriate WSFO for action.

f. Conduct weather training sessions for the ARTCC controllers, as workload permits.

g. Coordinate with the CFWSU or act as consultants to CFCF in situations where weather conditions impede the normal flow of traffic in their ARTCC area.

h. Issue forecasts and nowcasts [Meteorological Impact Statements (MIS) and Center Weather Advisories (CWA)] when conditions warrant.

i. Disseminate CWSU products and other specified pertinent weather intelligence (products and information) within the ARTCC to appropriate FAA facilities within the ARTCC area of responsibility and to other users when the weather coordinator position is not staffed.

j. Provide special, on-request Pilot Weather Briefings (PWB) to U.S. Government units (e.g., Air Force One), and courtesy PWB's to FAA pilot employees in or in contact with the ARTCC. These briefings will be provided only by CWSU meteorologists holding valid PWB certificates and as workload permits. Briefings will be conducted and documented in accordance with WSOM Chapter D-26. Weather consultation and advice (as opposed to a direct forecaster to pilot PWB) may also be provided to airborne pilots in contact with the ARTCC, either through appropriate ARTCC personnel or directly, during weather-related emergencies. Procedures for any direct forecaster to pilot communications must be clearly stated in the CWSU SDM. Any other PWB duties are not the function of the CWSU and will be referred to a Flight Service Station or National Weather Service Office.

4.1.4 The Weather Coordinator. While the CWSU meteorologists interact directly with NWS components, the weather coordinator is the designated interface between the CWSU meteorologist and the ARTCC controllers, FAA facilities within the ARTCC area of responsibility, and users to whom CWSU products are disseminated. The task of gathering and forwarding weather information into and out of the CWSU, as reflected by the duties listed in exhibit D-25-3, rests with the weather coordinator when that position is staffed. This will ensure that PIREP's are collected to enhance the CWSU information data base and are disseminated through the FAA LSAS; and that ARTCC tailored weather information is relayed to intra-facility positions and appropriate external FAA facilities and other users.

4.2 Priority of Duties. The CWSU weather coordinator and the CWSU meteorologist will operate as a team with each providing special skills for the enhancement of ARTCC operations. This team concept should result in a cooperative effort to fulfill the responsibilities and duties previously outlined. In the event that weather conditions and/or staffing deficiencies make it impossible to accomplish all of the assigned duties, the CWSU staff will use the list of duty priorities (exhibit D-25-3) to determine which tasks will be done first. It is recommended that a copy of this list be posted in the CWSU work area as a ready reference for the staff and for the information of ARTCC personnel. It should be emphasized that this list is not a schedule of tasks nor must the listed order of duties necessarily be reflected in task schedules as determined at the local level. The weather coordinator position, when staffed, will have primary responsibility for the duties indicated in

Center Weather Service Unit Priority of Duties

1. Prepare Center Weather Advisory (CWA) (LSAS dissemination)
& 2. Disseminate CWA within ARTCC
3. Provide weather consultation to airborne pilot in contact with ARTCC involved in a weather-related emergency
4. Coordinate with NWS office(s) issuing product(s) affected by CWA
5. Disseminate Pilot Report (PIREP) meeting urgent criteria (via LSAS)
6. Disseminate Urgent PIREP to appropriate NWS office(s)/unit(s) (if not accomplished by 5).
& 7. Disseminate Urgent PIREP within ARTCC
8. Prepare scheduled briefing
9. Deliver scheduled briefing for assembled ARTCC personnel
& 10. Disseminate CWA beyond the ARTCC (via other than LSAS)
11. Coordinate with NWS office(s) issuing product(s) affected by Meteorological Impact Statement (MIS)
12. Prepare MIS (LSAS dissemination)
13. Deliver scheduled briefing to dispersed ARTCC personnel and/or designated EFAS and control tower personnel
14. Provide special PWB to requesting U.S. Government unit (e.g., AF One)
15. Solicit/gather PIREP's or other weather intelligence
16. Prepare locally specified displays of time-critical conditions within or affecting the ARTCC area of responsibility
& 17. Disseminate Meteorological Impact Statement (via other than LSAS)
18. Disseminate nonurgent PIREP's
& 19. Disseminate other weather intelligence within the ARTCC as specified by local requirements
20. Provide courtesy Pilot Weather Briefing to FAA pilot employee

Exhibit D-25-3: Center Weather Service Unit Priority of Duties

exhibit D-25-3 by the ampersand (&). These items will be of top priority with assistance from the meteorologist if other meteorologist's duties permit.

4.3 Briefings and Products. The CWSU will issue and disseminate briefings and products as detailed in this chapter and additionally as specified in the Station Duty Manual. The conditions described in these products will be restricted to those within the horizontal boundaries of the ARTCC's area of responsibility and will include all altitudes within these boundaries. Points used to describe the areal location and extent of these conditions should be the minimum number necessary to describe the area accurately. If appropriate, nearby points outside of the ARTCC area may be used to simplify the area shape or reduce the number of points required to describe where the conditions are occurring or expected. When the conditions described extend beyond the ARTCC's area, that fact should be included in the text especially for products available to pilots in flight.

All abbreviations and contractions used in CWSU products will be consistent with FAA Contractions Handbook 7340.1. Terms used will be consistent with WSOM Chapters D-20 and D-22. All times will be expressed numerically, e.g., "BY 01Z" will be used instead of "BY SUNSET" or "BY EVENING."

The issuance time of regularly scheduled briefings and products will be developed locally in consonance with the ATM or designee. The criteria, content, and sample alphanumeric formats of the national standard briefings and products are shown below. Graphic representations of these may be prepared and displayed within the ARTCC in addition to the alphanumeric version. If no operational use exists for the alphanumeric version of the briefings' content, then they need not be prepared.

Retention instructions contained in this chapter and in WSOM Chapter D-90 refer only to the alphanumeric versions of CWSU briefings and products. Redundant graphic versions need not be retained unless no operational use is made of an alphanumeric version of a product or briefing. Worksheets used to update briefings or to supplement other products also need not be retained.

All users of CWSU products should be kept aware of the fact that these products are not available 24 hours a day. This may be accomplished by adding the remark "LAST" to the end of those products which will be in effect when the unit's duty hours end.

4.3.1 Briefings. A CWSU briefing will consist of a discussion of current and forecast weather conditions relevant to the ARTCC area during the shift in which it is issued (generally 6 to 8 hours) and an outlook extending into the following shift or through the overnight off-duty hours period. Each briefing will contain as a minimum the information shown in the sample alphanumeric briefing format below. If no operational use exists for an alphanumeric version of the briefing content, any graphic version will contain the same information, appropriately labeled, and should be on the fewest possible number of separate sheets. The graphic version of the briefing, in this case will be retained (see section 4.8.1).

Format

ARTCC Designator "CWSU BRIEFING" Date and time (GMT) issued - Date and time ending

a. MET Impact Statement - conditions meeting any nonconvective MIS criterion or thunderstorms (when issued at the same time as the briefing)

b. Synopsis - discussion of weather systems and their movements

c. General Weather and Outlook - flight conditions (weather, turbulence, icing, etc.), clouds, and visibility

d. Terminal Weather - for locally designated large hub airports, including surface winds even if below 10 knots. NOTE: The FAA has defined large hub as an area, city, or standard metropolitan statistical area where at least 1 percent of all scheduled air carrier passengers in the U.S. are enplaned.

e. Location(s) and speed(s) of jetstream(s)

f. Freezing Level

Example

ZHU CWSU BRIEFING 252145-261000

MET IMPACT STATEMENT...SCT EMBEDDED TSTMS ACROSS ZHU AREA FM SRN TX TO FL WILL CONTINUE NEXT FEW HOURS WITH ISOLATED EMBEDDED TSTMS TOPS AROUND 500 WITHIN 50 MILE RADIUS OF MSY. TSTMS WILL DECREASE RAPIDLY AFTER 00Z.

SYNOPSIS...STNRY FNT EXTDS FM TX PNHDL NR AMA TO LOW PRES SYS OVR SRN AR THEN EWD ACRS KY AND NC INTO ATLC OCEAN. HI PRES SYS CNTRD OVR NY.

GENERAL WEATHER...CLDS 20-50 SCT OCNLY BKN WITH SCT TSTMS SRN TX TO FL GENLY 30 TO 130 MILES INLAND MOVG NWWD AT 10-15KTS. TOPS IN STRONGEST TSTMS LOCATED OVR SRN LA AND MS ARE ABV 500.

OTLK 05Z-10Z...VFR XCPT PTCHY GF AFT 08Z.

TERMINALS...HOU/IAH AND NEW/MSY 20-40 SCT OCNLY BKN 120 BKN 250 BKN-OVC 2206 CHC 20 OVC 2TRW+ G35. AFT 02Z 120 SCT XCPT PTCHY 2-5GF AFT 08Z.

JETSTREAM...50-70 KT JET EXTENDS FM CNTRL OH NEWD TO ME.

FREEZING LVL...140-150.

4.3.2 Meteorological Impact Statement. An MIS is an unscheduled flow control and air traffic/flight operations planning forecast. It describes conditions expected to begin generally 4 to 12 hours after issuance or conditions existing at the time the briefing is issued or when CWSU operations begin if they will persist for at least 3 hours. It is an air traffic oriented forecast product intended for those personnel at ARTCC, CFWSU/CFCF, and large hub terminal air traffic facilities responsible for making flow control and flow control related decisions. It will enable them to include the impact of expected locally and/or nationally specified weather conditions in those decisions. As a minimum, an MIS will be issued when:

a. any of the following conditions occur or are forecast to occur

1. Conditions meeting Convective SIGMET criteria (see WSOM Chapter D-22)
2. Icing - moderate or greater
3. Turbulence - moderate or greater
4. Heavy precipitation
5. Freezing precipitation
6. Conditions at or approaching low IFR (WSOM Chapter D-21)
7. Surface winds (including gusts) 30 knots or greater
8. Low level wind shear (within 2,000 feet of the surface)
9. Volcanic ash, dust storms, or sandstorm; and

b. the conditions listed above will, in the forecasters judgment, impact the flow of air traffic within the ARTCC area of responsibility; and

c. the forecast lead time (the time between issuance and onset of a phenomenon), in the forecasters judgment, is sufficient to make issuance of a CWA unnecessary or premature.

The statement will describe the location of the phenomenon, using ARTCC relevant points of reference (e.g., VOR's) and including the height, extent, intensity, and movement. MIS issuances will be numbered sequentially beginning at midnight local time each day. Forecasters should be aware that the MIS is disseminated and stored as a replaceable product. This means that each issuance must contain the details of all pertinent, known conditions meeting MIS issuance criteria including continuing conditions described in previously issued MIS's.

The statement will be distributed to ARTCC area supervisors and traffic management coordinators and entered through FAA LSAS and other communications media so that it will be available for dissemination to FAA and NWS facilities including adjacent CWSU's, the CFWSU, and locally designated hub terminal facilities. Distribution may be directly by the CWSU meteorologist or through the weather coordinator. When an MIS is issued concurrently with a briefing, it will be distributed to those media and facilities mentioned above which do not receive an alphanumeric version of the briefing's contents.

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Format

ARTCC Designator "MIS" issuance number Date and time (GMT) issued - Valid-until date and time (GMT)

TEXT

Example

ZJX MIS 02 111245-120100

SCT LVL 3 AND 4 TSTMS ALG N-S RTES S OF ILM AND E OF SAV-OMN LN DVLPG BY 16Z. MAX TOPS 350-400. ELSW ZJX AREA LVL 3 AND 4 TSTMS FRMG IN SHRT LNS OR CLUSTERS AFT 17Z WITH FEW RCHG LVL 5-6. CELLS MOVG GENLY SEWD 10 KTS CONT THRU 00Z. CONDS LWRG OCNLY TO LIFR IN HVY PCPN AFT 17Z.

The format of the MIS communications header above and in the CWA format below must be followed exactly if the products are to be disseminated through the LSAS.

4.3.3 Center Weather Advisory (CWA). The CWA is an unscheduled in-flight flow-control, air traffic, and air crew advisory. It is for the guidance of the ARTCC personnel, air crews in flight, designated FAA facilities, and CFWSU meteorologists for use in anticipating and avoiding adverse weather conditions in the en route and terminal environments. By nature of its short lead time, the CWA is not a flight planning product. It is generally a Nowcast for conditions beginning within the next 2 hours and also should reflect the weather conditions in existence at the time of issuance. If conditions are expected to persist beyond the valid period of the advisory, a statement to that effect should be included in the last line of the advisory text and additional CWA's issued. If conditions extend beyond the ARTCC area, a statement to that effect should be included in the text.

Each CWA will have a phenomenon number (1-6) immediately following the ARTCC identifier. A number will be assigned to each meteorologically distinct condition (e.g., jetstream Clear Air Turbulence) or group of conditions (e.g., low IFR and icing northwest of a low center) meeting CWA issuance criteria. This will make it possible to store and disseminate CWA's for up to six unrelated conditions with each capable of being individually updated. The CWA will contain an issuance time and a valid-until time in the heading line. The difference between the two will not exceed 2 hours.

CWA issuances for each phenomenon will be sequentially numbered starting at midnight local time each day. The headers of CWA's that are based on existing nonconvective SIGMET's or AIRMET's will include the associated alphanumeric designator (e.g., JULIETT 4) following the issuance number of the CWA and a solidus (/). Each CWA will be disseminated, either directly by the CWSU meteorologist or through the weather coordinato, to the affected ARTCC sectors and terminal facilities for broadcast and to the LSAS. A hard copy of each CWA will be time stamped after dissemination.

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There are three situations in which a CWA could be issued:

a. The CWSU meteorologist will issue a CWA:

1. As a supplement to an existing SIGMET (including Convective SIGMET), AIRMET, or Area Forecast (FA) section. The issuance of a CWA in this circumstance should be limited to those occasions, when, in the judgment of the CWSU meteorologist, a redefining statement, update, or advanced amendment is adequately supported by real-time information. Such information regarding the phenomenon covered by the NAWAU product may be in the form of pilot reports, radar, satellite, or information from other sources. The purpose of the CWA, in this case, is to improve or update the definition of the phenomenon in terms of relevance to users within the ARTCC area, location, movement, extent, and/or intensity. For an IFR AIRMET, for example, a CWA describing the area(s) of low IFR (LIFR) conditions in terms of ARTCC reference points would be a valid redefinition of the location and "intensity" relevant to the ARTCC's area and meeting documented requirements.

2. When an In-flight Advisory has not yet been issued but observed or expected weather conditions meet SIGMET/AIRMET criteria based on current pilot reports and reinforced by other sources of information about existing meteorological conditions. In this situation, the CWSU meteorologist should call the appropriate forecaster at the NAWAU or appropriate Alaska WSFO. If the CWSU forecaster determines that it is necessary to issue a CWA to allow lead-time while the SIGMET/AIRMET is being prepared, the CWA will be issued and should indicate that a SIGMET/AIRMET will be issued shortly.

b. The CWSU meteorologist may issue a CWA:

When observed or developing weather conditions do not meet SIGMET (including Convective SIGMET) or AIRMET criteria, e.g., in terms of intensity or areal coverage, but current pilot reports or other weather information sources indicate that an existing or anticipated meteorological phenomena will adversely affect the safe flow of air traffic within the ARTCC area of responsibility. In this situation the data available must be sufficient, in the judgment of the CWSU meteorologist, to support both the issuance of such an advisory and, if necessary, its continuation.

Format

ARTCC Designator and Phenomenon number (numbers 1-6 for replaceability) "CWA" issuance number (two digit)/In-flight Advisory alphanumeric designator (if applicable) Date and Time (GMT) issued - Valid-until date and time

TEXT

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Examples

ZOB3 CWA 01 032141-032300

LN LVL 5 AND 6 TSTMS 10S DET TO 40N DJB TO 40 E SBN TO 80SE MKG MOVG FROM 2525. 3/4 INCH HAIL RPRTD LAST 5 MINS 20 SW YIP. LVL 4-6 TSTMS CONTG DTW AREA BYD 2300.

ZKC1 CWA 01/ALFA 4 121528-121728

NMRS RPTS OF MDT TO SVR ICG 080-090 30 MILE RADIUS OF STL. LGT OR NEG ICG RPTD 040-120 RMNDR OF ZKC AREA AND NE OF AREA.

4.4 Forecast Coordination. Frequently the forecast products issued by the NAWAU, national centers, or WSFO's and the CWSU, will address the same event within the same area and time period. Maximum coordination between the responsible offices prior to CWA issuance is essential in these cases to avoid confusion and avert any possible negative impact on aviation safety. To ensure adequate forecast coordination, the CWSU forecasters will communicate with WSFO's and national centers to discuss those CWSU products (i.e., CWA's or MIS's) to be issued as preliminary advisories or advanced amendments to scheduled Area or Terminal Forecasts, In-flight advisories, watches, warnings, or bulletins. This is particularly important when those products concern unexpected or suddenly changing weather conditions. A CWA may be issued before coordination:

a. when time is of the essence and meteorological phenomena have an immediate effect on the safe flow of air traffic within the ARTCC area of responsibility or

b. in other situations where meteorological phenomena affect the flow of air traffic but are not currently meeting or approaching In-flight Advisory criteria.

The NAWAU and the Alaska WSFO's have the final responsibility for issuing Area Forecasts and In-flight Advisories and thus their concurrence in the issuance of CWA's amending or preceding one of their products is highly desirable. The concurrence of WSFO's with Terminal Forecast (FT) responsibility for large hub area airports is likewise desirable before the issuance of a CWSU product which implies an amendment to that FT. In situations where a CWA has been issued prior to coordination, notification of the NAWAU or appropriate NWS national center or WSFO must follow as soon as higher priority duties permit.

A CWA issuance for conditions not meeting In-flight Advisory criteria, while generally based on those criteria, is primarily due to the forecaster's recognition that a condition is having a negative impact on the safe flow of air traffic. Prior coordination with the NAWAU in this situation should take place if the CWA indicates a trend towards an In-flight Advisory criterion. Other NWS offices and/or units whose product(s) may be impacted by the CWA

also should receive prior notification of the issuance, if time permits. In either case the CWSU forecaster has the final responsibility for issuing a CWA.

All users and forecasters should understand that every In-flight advisory does not require a CWA. Also, every product for which a CWA is issued does not require amendment by the originating office. The guidelines and authorizations in this chapter do not affect the amendment instructions for various products contained in other WSOM chapters. Regardless of whether coordination has yet been accomplished, CWSU products will be relayed to the appropriate intra- and inter-facility communications system(s) as valid updates or amendments of the relevant products. They will remain valid unless and until canceled by the CWSU or superseded by subsequent issuances from the responsible NWS unit, national center, or office. CWA's not issued in relation to any other product will be disseminated as valid weather advisories. CWSU products are immediately available for all dissemination methods including radio broadcasts by ARTCC, FSS, and terminal facility personnel.

4.5 Relationship of CWSU to FSS. Each CWSU acts as a source of meteorological expertise to specific Flight Service Stations, including those with EFAS positions, when weather conditions impede or threaten the normal flow of air traffic. However, pre-shift briefings for FSS personnel will not normally be done by the CWSU. These, and routine weather support, remain the responsibility of designated weather service forecast offices or weather service offices. This ensures that the link with an NWS facility capable of providing full-time support will remain clear cut. Close cooperation should exist, however, between the CWSU and EFAS (Flight Watch) staffs since on-duty CWSU meteorologists will be continuously aware of any aviation weather forecast problems and EFAS specialists have access to additional sources of PIREP information. In addition, any requests, for Pilot Weather Briefings received by the CWSU from outside the ARTCC and any from within the center which workload prohibits, will normally be referred to the FSS.

4.6 Relationship of CWSU to the WSFO/Area Manager and Region. The CWSU meteorologists are under the supervision of the CWSU MIC whose first line supervisor is the NWS area manager (AM) whose area of responsibility includes the operating location of the CWSU. The AM's FAA contact at the ARTCC is the ATM or an appropriate designee. Technical guidance and support for the CWSU is also the responsibility of the AM who may designate the Weather Service Evaluations Officer (WSEO) as the focal point for this activity. It is expected that the AM or designee will maintain a working level familiarity with the CWSU's operations and will therefore be in a position to adequately support the technical and coordination requirements of the CWSU with other NWS facilities. Semiannual visits to the CWSU should be made by the WSEO. A written report of each visit should be sent to the Regional Aviation Meteorologist (RAM) (or the regional official in an equivalent position) through the AM with copies to the CWSU MIC and the ATM. The NWS contact, for operational policies or practices which imply or require departures from the instructions in this chapter or those in the approved CWSU SDM, is the RAM (or

equivalent) of the region in which the CWSU is located. The RAM will consult with the appropriate CWSU MIC on any proposed variances and will advise NWS Headquarters, Aviation Services Branch prior to implementation.

4.7 Station Duty Manual (SDM). All CWSU's will maintain an SDM in accordance with existing NWS directives. The SDM is developed in consonance with the ATM or appropriate designee and will contain all guidelines and instructions for meeting national and agreed to local requirements. No variations in the national standards will be implemented without prior approval (see Section 4.6).

A copy of all SDM's should be on file with the NWS area manager having administrative responsibility. A copy will be forwarded to the Regional Aviation Meteorologist (or equivalent) for review, to ensure that basic minimum requirements are met and that CWSU operations within the region are as standardized as local ARTCC requirements permit. Regional and area manager approval of all SDM's are required. Review and approval of SDM changes or amendments are required prior to implementation. A historical SDM file will be maintained at the WSFO having administrative responsibility for the CWSU. Retention of superseded and/or canceled portions of the SDM in this file will be in accordance with WSOM Chapters A-13 and D-90 and any applicable subsequent issuances.

4.8 Handling of Weather Records.

4.8.1 Retention. All written records composed at CWSU's (shift briefing texts/content, MIS's, and CWA's) will be retained by the unit for 1 month and then mailed to the WSFO that has administrative responsibility for the unit. It will be retained for 5 years at that office. Daily Record of Facility Operation (FAA 7230.4 or equivalent) sheets will be retained at the CWSU for 90 days. FAA retention of copies of this record is the responsibility of the ATM.

4.8.2 Protection of Records. All requests for certified copies of weather exhibits prepared by the CWSU meteorologists and all requests for uncertified copies from anyone other than the management of the assigned ARTCC should be directed to the retaining WSFO. Requests coming during the 30-day CWSU retention period will still be processed through the WSFO. In the event of an accident (within the area of responsibility of the ARTCC facility), retention procedures described above will be followed unless otherwise requested by the Aviation Safety and Evaluation (ASE) Program Leader, NWS Headquarters. In the event of a major accident, all pertinent products prepared by the CWSU meteorologists and other pertinent observations, charts, and forecasts available to the CWSU meteorologists should be forwarded to the appropriate AM as soon as possible. These records will be protected and retained in the WSFO for at least 1 month to provide time for determining:

a. to what extent weather is a factor, and/or

b. what weather information will be required for investigation purposes.

After this period, normal retention procedures will be followed unless the ASE Program Leader requests otherwise. The definition of a major accident is contained in WSOM Chapter D-90.

4.8.3 Statements. No written statements by CWSU meteorologists concerning a system incident, or an aircraft incident or accident, will be provided to offices, agencies, organizations, or individuals (government or public) outside of the NWS without the approval of the ASE Program Leader. Any such statements will concern only the meteorological facts and must be reviewed by the appropriate regional headquarters and the ASE Program Leader. The statement may also be forwarded to the NOAA General Counsel before being furnished to the requester. When a written statement is prepared, one copy will be forwarded to regional headquarters through the NWS AM. A second copy will be forwarded directly to the ASE Program Leader.

The comments of CWSU meteorologists are not a matter of public record. There is no requirement that anyone other than members of a government investigation team be allowed to question or interview personnel in connection with an aircraft accident. When an accident has occurred and the details are being discussed by persons outside of the NWS; or when being questioned or interviewed in connection with an accident, NWS personnel should attempt to determine that their verbal comments are not being recorded. Should a request to record such comments be made it will be referred to the ASE Program Leader. Any such arrangements will be made at the regional or NWS headquarters level.

5. Weather Service Forecast Office (WSFO). The WSFO will provide meteorological support to the ARTCC through the CWSU. During CWSU off-duty hours, WSFO support will be through the weather coordinator ATM or appropriate designee.

Open lines of communication must be maintained between the WSFO's, CWSU's, FSS's, and towers within the ARTCC area to ensure the timely exchange of necessary weather information. The NWS area manager has the responsibility to monitor and evaluate the various links between the relevant NWS and FAA facilities. This may be delegated to the WSEO. Any deficiencies will be documented and forwarded to the RAM (or equivalent) either as part of a WSEO station visit report (with appropriate distribution) or as a separate memo with copies to the supervisors of the NWS and FAA facilities or units involved. Attempts to remedy any deficiencies should be made at the local level. However, if all else fails, the problem should be brought to the NWS regional or headquarters level where steps will be taken to ensure that the requirements and responsibilities placed on an NWS facility will be reduced to a level that available communications can support.

Included in the communications capabilities should be links that will allow the designated WSFO or WSO to:

a. provide CWSU and/or FSS pre-shift briefings as per local arrangements;

b. assist the ARTCC during in-flight emergencies when a pilot could be involved in a critical weather situation (if CWSU is not in operation); and

c. provide ARTCC with critical weather updates (if CWSU is not in operation).

All NWS forecasts (FA's, FT's, advisories, warnings, etc.) will be received at the ARTCC via the Weather Message Switching Center (WMSC). The WSFO will give the following weather information to the CWSU or to the weather coordinator when CWSU meteorologists are not on duty:

Terminal Weather - A forecast of heavy snow, freezing precipitation, or low IFR ceiling and/or visibility conditions which may disrupt landing/takeoff operations at large hub area airports is cause for alerting the relevant CWSU/ARTCC. During CWSU off-duty hours, the WSFO should notify those control tower facilities to which direct communications (e.g., Hotlines) have been provided.

6. NWS Support Facilities for CFWSU/CWSU. The NWS support facilities listed below are available to CFWSU and to CWSU's for consultation.

a. National Meteorological Center -- Aviation Weather Branch;
b. National Severe Storms Forecast Center;
c. National Aviation Weather Advisory Unit (or Alaska WSFO's);
d. National Hurricane Center; and
e. Eastern Pacific Hurricane Center (WSFO San Francisco).

CFWSU will be the usual CWSU interface with the national centers; however, because of the direct availability of PIREP's at the ARTCC's, a national center or unit may contact the CWSU directly for real-time data.

6.1 National Meteorological Center (NMC), Aviation Weather Branch. NMC provides routine aviation guidance forecasts of cloud cover, ceilings, visibilities, turbulence, icing, and wind. This guidance includes Clear Air Turbulence forecasts that can be refined through the timely receipt of PIREP's.

6.2 National Severe Storms Forecast Center (NSSFC). NSSFC is responsible for issuing messages concerning expected severe local storms, including tornadoes. NSSFC alerts CFWSU of impending Severe Weather Watches.

6.3 National Aviation Weather Advisory Unit (NAWAU). NAWAU issues aviation area forecasts, nonconvective In-flight Advisories (AIRMET's and

SIGMET's) and hourly and special Convective SIGMET's when conditions warrant (see WSOM Chapter D-20 and D-22). This unit must closely interact with CWSU's both for requesting and receiving PIREP's and for coordination of NAWAU and CWSU products.

The NAWAU will also give the following weather information to the CFWSU or the CFCF shift supervisor for relay to the appropriate CWSU or to the weather coordinator when CWSU meteorologists are not on duty:

Pressure Trends - NAWAU should notify CFWSU/CFCF whenever significant pressure changes are expected. A pressure change is considered to be significant when the surface pressure change equals one-half inch of mercury (approximately 17 millibars) or more during an 8-hour period. This information will be used to alert controllers to changes in the lowest usable flight level above 18,000 feet. See exhibit D-25-4.

In Alaska, WSFO's issue Area Forecasts and/or In-flight Advisories and must provide support equivalent to that provided by NAWAU.

6.4 National Hurricane Center (NHC). NHC has tropical storm and hurricane forecast and warning responsibility for the Atlantic, Caribbean, and Gulf of Mexico. Part of its warning responsibility is delegated to Hurricane Warning Offices at Boston, Washington, and San Juan. The Eastern Pacific Hurricane Center at San Francisco is responsible for tropical storm warnings for the Eastern Pacific Ocean from 140 West longitude to the West Coast of the U.S. The tropical storm and hurricane advisories are issued routinely every 6 hours, as warranted. The CWSU may consult directly with the appropriate hurricane center concerning tropical storms and hurricane advisories which could directly impact their ARTCC area of responsibility.

6.5 Satellite Services Unit (SSU). SSU's located at Washington, DC; Miami, FL; New Orleans, LA; Kansas City, MO; San Francisco, CA; Anchorage, AK, and Honolulu, HI, are available to support the CFWSU and CWSU's. This support is in two forms. First, the SSU is responsible for transmitting Geostationary Operational Environmental Satellite (GOES) photos and also preparing and distributing Satellite Interpretation Messages (SIM) four times daily (except Miami) with updates as required. Second, the SSU provides a consultation service to the CWSU on a real-time basis to discuss developing weather as viewed from satellites.

The CWSU meteorologist should contact the SSU when assistance is required. However, the SSU may take the initiative to contact the CWSU when the SSU meteorologist sees a development known to be of operational concern to the CWSU. Because of the direct availability of PIREP's at the ARTCC, the SSU may also contact the CWSU directly for real-time data.

91.81 Altimeter Settings.

(a) Each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating --

(1) Below 18,000 feet MSL, to--

(i) The current reported altimeter setting of a station along the route within 100 nautical miles of the aircraft; (ii) If there is no station within the area prescribed in subdivision (i) of this subparagraph, the current reported altimeter setting of an appropriate available station; or (iii) In the case of an aircraft not equipped with a radio, the elevation of the departure airport or an appropriate altimeter setting available before departure; or

(2) At or above 18,000 feet MSL, to 29.92" Hg.

(b) The lowest usable flight level is determined by the atmospheric pressure in the area of operation, as shown in the following table:

Current Altimeter Setting	Lowest Usable Flight Level
29.92 (or higher)	180
29.91 thru 29.42	185
29.41 thru 28.92	190
28.91 thru 28.42	195
28.41 thru 27.92	200
27.91 thru 27.42	205
27.41 thru 26.92	210

(c) To convert minimum altitude prescribed under §§91.79 and 91.119 to the minimum flight level, the pilot shall take the flight-level equivalent of the minimum altitude in feet and add the appropriate number of feet specified below, according to the current reported altimeter setting:

Current Altimeter Setting	Adjustment Factor
29.92 (or higher)	NONE
29.91 thru 29.42	500 feet
29.41 thru 28.92	1000 feet
28.91 thru 28.42	1500 feet
28.41 thru 27.92	2000 feet
27.91 thru 27.42	2500 feet
27.41 thru 26.92	3000 feet

Exhibit D-25-4: Federal Aviation Regulation Part 91, Para. 91.81 - Altimeter Setting