BY ORDER OF THE COMMANDER
341ST MISSILE WING

341ST MISSILE WING INSTRUCTION
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Weather

WEATHER SUPPORT DOCUMENT

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This instruction complements AFMAN 15-129, Air and Space Weather Operations; Air Force Policy Directive (AFPD) 15-1, Weather Operations; AFMAN 10-206, Operational Reporting (OPREP); AFMAN 15-111, Surface Weather Observations; AFMAN 15-124, Meteorological Codes; AFI 15-128, Weather Force Structure; AFI 15-128 supplement, Weather Force Structure; AFI 10-2501, Emergency Management Program; AFMAN 91-203, Air Force Occupational Safety, Fire, and Health Standards, and establishes responsibilities and weather support procedures for Malmstrom AFB. It provides general information for weather services, including weather observations and forecasts; weather warnings, watches, and advisories; dissemination of information; and reciprocal support. It applies to units assigned to the 341st Missile Wing and subordinate units, and units assigned to, or supported by, Malmstrom Air Force Base. This instruction does not apply to the Air National Guard (ANG) or the Air Force Reserve (AFRC). Waivers to this instruction are not authorized. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using AF Form 847, Recommendation for Change of Publication; route AF Form 847 through the wing publishing office. Ensure all records created as a result of prescribed processes in this publication are maintained in accordance with this publication and disposed of in accordance with the Air Force Records Disposition Schedule located in the Air Force Records Information Management System.

SUMMARY OF CHANGES

This document contains significant changes to **chapter 8** reflecting a change in Air Force Weather policy regarding issuing authority of watches, warnings, and advisories. This document also

contains minor changes that reflect other updated regulations, telephone numbers, and supporting agencies. Supported agencies will maintain the current level of weather support received since the previous revision.

Chapter 1

GENERAL INFORMATION

1.1. General.

1.1.1. The 341st Operations Support Squadron, Weather Flight (341 OSS/OSW), is responsible for providing or arranging weather support for the 341 MW and all other Malmstrom AFB agencies. This instruction establishes weather support requirements and procedures as outlined in Air Force directives and has been coordinated at the local level to meet the mission needs of all supported customers. The 341 OSS/OSW is the focal point for all weather-related issues. This instruction establishes requirements and procedures pertaining to weather support during peacetime operations. This instruction will be reviewed biennially and updated as required.

1.1.2. Contacting the 341 OSS/OSW: Weather personnel can be reached by phone at: **DSN: 632-2710/2981; COMM: 406-731-2710/2981**, During non-duty hours, the 341 OSS/OSW can be reached via Command Post at DSN 632-3801.

1.1.3. References, abbreviations, acronyms, and certain terms used in this document are defined in **Attachment 1**.

1.2. Concept of Operations (Operational Weather Squadron (OWS)-Weather Flight Concept).

1.2.1. The 25 OWS at Davis-Monthan AFB, Arizona provides regional and operational-level weather products and information to Air Force units in the western regions of the Continental United States (CONUS) and Canada.

1.2.2. Based on the guidance in the Strategic Plan, the 341 OSS/OSW will focus on providing tactical-level weather products and information needed for mission execution and provide weather products and information to the commander of deployed forces during wartime, contingency, and exercise operations.

1.3. Responsibilities.

1.3.1. The 25 OWS provides timely, accurate, and relevant weather information and products for Air Force and Army operations in the western U.S. AOR. Forecast products for Malmstrom AFB are produced in collaboration with the 341 OSS/OSW. Additionally, the 341 OSS/OSW will support the base in educating agencies on the purpose, applicability, and operating procedures of weather products and base operations as required by directives (AFI 10-2501) or directed by the 341 MW Commander (341 MW/CC).

1.3.2. The 341 OSS/OSW provides or arranges for weather support to the Helicopter Operations Desk and all other Malmstrom AFB agencies. Weather support includes tailored mission execution forecasts for helicopter missions, ground support mission, mission watch (MISSIONWATCH) functions, flight weather briefings, Crisis Action Team (CAT) briefings, Wing Operations Cell (WOC) briefings, aircrew and staff briefings, exercise/contingency support, climatology briefings and resource protection services for Malmstrom AFB. Weather products are tailored specifically to meet operations requirements.

Table 1.1. 341OSS/OSW Duty Priority Listing.

341 OSS/OSW Duty Priorities	
Order of Priority	**Duties**
1	Perform Emergency War Order (EWO) Taskings
2	Execute 341 OSS/OSW Evacuation
3	SWAP Operations (Imminent Hazardous Threats)
4	Issue Forecast and Observed Weather Warnings, Watches, and Advisories
5	Respond to Aircraft/Ground Emergencies. (These include aircraft emergencies and mishaps, accidental release of toxic chemicals, or any operation involving the safety of aircraft, material, or personnel)
6	Provide CAT-1 Briefs / Permission Calls
7	Provide Missile Movement Briefs
8	Provide 40 HS & 550 HS Supervisor of Flying (SOF) Support
9	Support Airborne Aircraft via Pilot to Metro Service (PMSV)
10	Augment / Backup the FMQ-22 for METAR / SPECI / COR // Perform Sensor Troubleshoot Base and MAF sites
11	Produce and Disseminate Mission Execution Forecast (MEF / FLIMSY) & Terminal Aerodrome Forecast (TAF)
12	Disseminate Urgent PIREPs / AIREPs (Pilot Report/Air Report) then all other PIREPs / AIREPs
13	Perform MISSIONWATCH tasks
14	Conduct Weather Functional Training
15	Accomplish Administrative and Other Duties

1.4. Operational Hours. Normal Weather Station hours of operation are listed in the Flight Information Publication (FLIP). The 341 OSS/OSW will always have a forecaster in the office during active missions. Staff services, listed in **Chapter 5**, are available during normal duty hours or as required. Should the 341 OSS/OSW close for holidays or weekends, there will always be a standby forecaster on call after hours and can be reached via Command Post.

1.5. Backup Weather Support Procedures.

1.5.1. If the 341 OSS/OSW is unable to provide weather support in an emergency situation and all the primary methods of back-up support have been exhausted, the 25 OWS will provide backup support for continuity of operations and is not a substitute for sustained direct support by the local WF/Det in IDP agreements. The support is according to the following three tiers of mission support outlined in **Table 1.2**.

1.5.2. Backup power requirements. The 341 OSS/OSW operations section is located in Bldg. 1441 which has backup generator power. In the event of significant outages, 341 OSS/OSW operations will move to the alternate operating location (AOL) as outlined in **paragraph 1.7**. If the AOL is also without power, other primary sources of back-up will be used. In the event of a base-wide outage and the primary sources are unable to carry out support the 25 OWS will provide backup support according to the three tiers of mission support outlined in **Table 1.2**.

Table 1.2. Three-Tier Backup Support Priority Table.

Mission Types of Products and Services Backup Priority	
Tier 1a	Wartime, contingency, and military operations other than war
Tier 1b	Resource protection. Wartime-related MEFs, alert weather briefings, other real world contingency MEFs, and flight weather briefs. Forecast weather watches, warnings, and advisories Must back up. Immediate transfer to backup unit
Tier 2	Peacetime and exercise operations. MEFs for local training and exercises, IFR/VFR route forecasts, air refueling route forecasts, etc. No impact to necessitate a move from the 341 OSW team as verbal's can be given in place of MEFs for local training. Other support can be coordinated on paper or with another weather flight as needed
Tier 3	Mission Planning Five-day outlook forecast, climatology requests, staff support, etc. No impact to necessitate a move from the 341 OSW

1.5.3. 25 OWS backup weather support procedures. When weather operations at the 341 OSS/OSW are interrupted for any reason (e.g. base-wide power outage, natural disaster, etc.) the responsibility for Malmstrom AFB's TAF will be transferred to the identified primary back-up unless unable to support due to mission constraints. All weather watches, warnings, and advisories for MAFB and the 341st Missile Complex will be transferred to the 25 OWS until such time as the 341 OSS/OSW can resume operations.

1.6. Alternate Operating Location (AOL).

1.6.1. In the event the 341 OSS/OSW evacuates, operations will resume at the Wing Operations Cell (WOC). In the event that the AOL is shut down, operations will resume via laptop in building 500 within the Command Suite.

1.6.2. Affected agencies (40 HS, 550 HS,CP, 25 OWS, Missile Maintenance Operations Center (MMOC) and Mission Security Control (MSC)) will be notified of the evacuation and subsequent return to the primary work center.

1.6.3. Wind and pressure values from any form of back up equipment will be estimated while at the AOL.

1.6.4. The AOL has the following limitations:

1.6.4.1. Local observations of weather conditions will be constrained to what the local infrastructure and geographical placement will allow in terms of visibility and airfield weather conditions as well as the estimation of wind direction and wind speed.

1.7. Release of Weather Information to Non-Department of Defense (DoD) Agencies and Individuals. Weather information will not be released to non-government agencies or the general public without approval from Public Affairs Office (341 MW/PA) and Staff Judge Advocate (341 MW/JA). Any questions/clarifications will be coordinated through the 341 OSS/OSW CC/Flight Chief.

1.8. Post-Mission Analysis/Feedback.

1.8.1. Per AFMAN 15-129, the 341 OSS/OSW will make every effort to obtain feedback from users on forecast and observed environmental conditions applicable to their respective missions. Customers have opportunity to provide feedback via reverse side of the daily flimsy and communications listed below. This information will be used to ensure proper quality assurance (QA) and to provide a metrics database. Informal feedback methods include:

1.8.1.1. Email the Flight Commander, Flight Chief, or 341 OSS/OSW organizational email (**341oss.osw2@us.af.mil**).

1.8.1.2. Phone calls to the Flight Commander (731-3268) or Flight Chief (731-2981).

1.8.1.3. Face to face feedback after any briefing.

1.8.2. The 341 OSS/OSW will, in turn, utilize this data to refine their mission support role and gauge unit strengths and weaknesses. Representative sample sizes are necessary to accurately reflect the satisfaction and accuracy of the weather support being provided to Malmstrom's flying units and ground units by the 341 OSS/OSW.

1.9. Mishap Procedures. When the airfield is advised of an emergency or mishap, the 341 OSS/OSW will save all applicable data used in the development of any weather product, and/or service provided for an investigation (to include MEFs, model output, space weather products, mission impact slides, etc.) consulting with and/or ascertaining the assistance of the 25 OWS on an as-needed basis.

1.10. Change Requests. All supported units should coordinate with the 341 OSS/OSW leadership to change this instruction or request special or additional support not addressed in this instruction.

Chapter 2

MISSION INFORMATION

2.1. General. This chapter will identify local weapons systems, the most common missions, and operating areas, and weather sensitivities associated with the organization, weapons systems, missions, and aircrews.

2.2. Supported Organization/Mission/Requirements. The 341 OSS/OSW provides weather support to the following organizations (and their associated units) with the accompanying missions and requirements:

Table 2.1. Malmstrom AFB Agency/Mission/Requirement Listing.

Organization	Mission	Requirements
Helicopter Operations Desk	Provide helicopter support for Malmstrom AFB and the missile complex	All WWA see Chapter 8
Missile Maintenance Operations Center (MMOC)	Provide truck transportation for parts and components for the Minuteman III missile systems	All WWA see Chapter 8
Missile Field Control Center (MFCC)	Monitor and track all ground movements in the missile complex	All WWA see Chapter 8
Command Post (CP)	Wing, base, and complex command and control, mission monitoring, emergency management, and resource protection	All WWA see Chapter 8

2.3. Geographic Area of Responsibility. The 341 OSS/OSW provides mission tailored weather support for Malmstrom AFB and the missile complex.

Figure 2.1. UH-1N Huey.

2.4. Airframe specific weather limitations.

Table 2.2. UH-1N Huey Facts.

Aircraft Category Type	**Cat I**
Manufacturer	Bell
Power Plant	(2) Pratt & Whitney @ 916 shp each
Cruise Speed	90-100 kts
Top Speed	130 kts
Complex Cruise Altitude	100-500 ft AGL
Max Cruise Altitude	15,000 ft MSL
Aircraft Weight	6,000 lbs
Max Takeoff Weight	10,500 lbs
Turbulence	MDT or Below
Icing	None (no icing equipment)

Table 2.3. UH-1N Huey Weather Limitations.

Criteria	**Impact**
Ceiling ≤ 700 ft **	Recommend cancel training missions. Security missions still a go.
Ceiling ≤ 500 ft	Recommend cancel all missions
Visibility ≤ 2 Mile **	Recommend cancel training missions. Security missions still a go.
Visibility ≤ 1 Mile	Recommend cancel all missions
Surface Wind Gust Spread > 20 Knots **	Recommend no training flights
Surface Wind 40-45 Knots (non-convective)	Recommend no training flights
Surface Wind ≥ 45 Knots (non-convective)	Recommend cancel Takeoffs/landings. (Cancel Start-ups / Shutdowns)
Freezing Precipitation (any amount)	Recommend cancel all operations
Turbulence – Severe or Extreme (forecast)	Recommend change routes or cancel missions
LLWS **	Recommend change routes or cancel missions
Icing – Light or Greater	Recommend protect aircraft, cancel operations
Lightning within 5NM	Recommend protect aircraft, delay operations
Hail ≥ ¾”	Recommend protect aircraft, delay operations
** Should be briefed to pilots if PIREPs confirm the existence of these criteria; however, no watch or advisory is needed. Per the 40 HS/CC, they are not considered significant enough to necessitate the issuance of a separate watch or advisory.	

2.5. MH-139A Grey Wolf Helicopter. The helicopter is in the testing phase. Once used for operations, the 341 OSS/OSW will work with the 550th HS to determine any needed updates to weather limiting criteria.

Figure 2.2. MH-139A Grey Wolf figure.

Table 2.4. MH-139A Grey Wolf Facts.

Aircraft Category Type	**CAT II**
Manufacturer	Boeing/Leonardo
Power Plant	(2) Pratt & Whitney PT6C-67C1
Cruise Speed	140kts
Top Speed	167kts
Complex Cruise Altitude	100-500 ft AGL
Max Cruise Altitude	20,000 ft MSL
Aircraft Weight	9,000 lbs
Max Takeoff Weight	15,516 lbs
Turbulence	MDT or Below
Icing	Limited
Current WX Minimums (until temp guidance rescinded)	1500’ Ceilings 3 SM Visibility

Table 2.5. MH-139A Grey Wolf Weather Limitations.

Criteria	Impact
Ceiling ≤ 1500 ft *	Recommend cancel all missions.
Visibility ≤ 3 Mile*	Recommend cancel all missions
Minimum Temperature for Ground Starting -40°C	Recommend cancel all missions
Minimum Ambient Air Temperature -40°C	Recommend cancel all missions
Minimum for Flight Control Check with Electric Hydraulic Pump -50C	Recommend cancel all missions
Minimum for Hydraulic Starting -40C	Recommend cancel all missions
Surface Wind > 20 Knots or Gust Spread > 15 Knots**	Recommend Blade Tie Down
Rotor Start/Stop Max Wind Speed ≥ 60 Knots	Recommend cancel Takeoffs/landings. (Cancel Start-ups / Shut Downs)
Freezing Precipitation (any amount)	Recommend cancel all operations
Turbulence – Severe or Extreme (forecast)	Recommend change routes or cancel missions
LLWS **	Recommend change routes or cancel missions
Icing – Moderate or Greater	Recommend protect aircraft, cancel operations
Lightning within 5NM	Recommend protect aircraft, delay operations
Hail ≥ ¾”	Recommend protect aircraft, delay operations
*Valid until temporary guidance is rescinded ** Should be briefed to pilots if PIREPs confirm the existence of these criteria; however, no watch or advisory is needed. Per the 40 HS/CC, they are not considered significant enough to necessitate the issuance of a separate watch or advisory.	

Figure 2.3. Payload Transport (PT).

Table 2.6. PT Weather limitations.

Criteria	Impact
Winds, Sustained > 35 kts	Should not be moved
Winds, Gust > 52 kts	Should not be moved

Figure 2.4. Transport Erector (TE).

Table 2.7. TE Weather limitations.

Criteria	Impact
Winds, Gust > 35 kts	Should not be erected
Winds Sustained > 35 kts	Should not be moved
Winds, Gust > 52 kts	Should not be moved

Table 2.8. Weather Sensitivity on Airframes and Related Programs.

	Non-Conv Winds (kts)		SvrTS	Precipitation					Turbulence		
	TE Warn	High Wind WW	Hail ≥3/4" High Wind	FZDZ	FZRA	SN 1/2-<6"	SN >6"	RA >2"	LGT	MDT	SVR
UH-1N											
PT Truck				Road	Road	Road	Road	Road			
TE Truck	No Erect			Road	Road	Road	Road	Road			

	CIG		VIS		Icing		
	< 700'	< 500'	< 2sm	< 1sm	LGT	MDT	SVR
UH-1N	Training Missions	All Missions	Training Missions	All Missions			
PT Truck				Road			
TE Truck				Road			
SKS(K9)							

N/A GO MARG NO GO Road= Could impact TCF decisions on road conditions.

2.6. Training, Missions, Operating Areas, and Weather Sensitivities. Pilot/driver discretion is used to determine mission go/no-go regardless of the weather phenomena listed in the MEF or briefed.

2.7. RIVET MILE description. To overhaul and maintain the Launch Facilities and Missile Alert Facilities that house and support the Minuteman III weapon system to extend the usable life beyond 2030 while meeting the available weapon system alert requirements throughout the Programmed Depot Maintenance phase.

Table 2.9. RIVET MILE limitations.

Criteria	Impact
Blizzard	Door should not be jacked/cease operations
Heavy Snow	Door should not be jacked/cease operations
Winds Sustained > 35 kts and/or gust 52 kts	Door should not be jacked/environmental shelter should not be erected/cease operations
Winds > 18 kts	Crane operations cease and environmental shelter cannot be erected.

Table 2.10. 341MW Weather Limitations.

Weather Phenomena	Lead Time (min)	Impact	Customer Action
Tornado	15	Personal injury; Equipment damage	Severe Weather Action Procedures (SWAP); All operations take cover
Severe Thunderstorm (Hail ≥ ¾", Winds sustained ≥ 35 kts / Gust ≥ 52 kts)	30	Personal injury; Equipment damage	SWAP; All outdoor operations should be prepared to take cover
Freezing Precipitation	60	Delay or cease operations	SWAP; Yellow/Red road conditions possible; Helicopter grounded
Blizzard (Winds ≥ 30 kts, visibility ≤ ¼ sm, snow/blowing snow, and conditions lasting at least 3 hrs)	90	Delay or cease operations	SWAP; Yellow/Red road conditions likely
Fresh Snow (≥ ½" but < 6")	Observed	Flight Hazard; Road hazard	Yellow road conditions likely
Heavy Snow (≥ 6" in 12 hours)	90	Flight Hazard; Road hazard	SWAP; Yellow/Red road conditions likely
Heavy Rain (≥ 2" in 12 hours)	90	Road hazard	Yellow/Red road conditions possible
TE Wind Warning (Wind gusts ≥ 35 kts)	60	TE hazard	TE cannot be erected
High Winds (Winds sustained ≥ 35 kts / Gusts ≥ 52 kts)	60	Road hazard; Personal injury	Yellow road conditions: TE/PT shouldn't be moved; Outdoor activities restricted
Level I Wind Chill (<0F)	Observed	Personnel hazard	Outdoor activities restricted; cold weather gear essential
Level II Wind Chill (<-40F)	Observed	Personnel hazard	Outdoor activities restricted, potential frostbite conditions. Cold weather gear essential
Level III Wind Chill (<-65F)	Observed	Personnel hazard	Outdoor activities cease, frostbite conditions. Cold weather gear essential

Lightning w/in 5NM	Observed	Delay operations	Outdoor fueling activities cease; PT, TE, Crane, ESA Room maintenance sites seek shelter. Helicopters grounded
Lightning w/in 10NM	Observed	Delay operations	WSA and munitions activities cease certain activities IAW established procedures/EACs
Winds > 45 kts	Observed	Delay operations	Helicopter cancel start-ups/shutdowns
Icing (> light)	Observed	Flight hazard	Helicopter change route/cancel flights
Turbulence (> Moderate	Observed	Flight hazard	Helicopter change route/cancel flights
Ceiling/Visibility (< 500 ft / < 1 SM)	Observed	Flight hazard	Helicopter change route/cancel flights

2.8. Ground Movement Limitations. Actual road conditions are determined by MFCC and wing leadership.

Chapter 3

AIRFIELD OBSERVATION SERVICES

3.1. General. Airfield observation services include those weather-related actions that affect the Malmstrom aerodrome (defined within 5SM of the main helipad) or the base as a whole.

3.2. Observations. Malmstrom uses the FMQ-22 running in fully automatic mode as its primary source for observations. When augmentation or back-up is needed, it is done in accordance with AFMAN 15-111. **Attachment 3** contains examples of the different types of observations.

3.2.1. Official Manual Observing Site. Malmstrom's official observation site is located near the windsock on the airfield.

3.2.2. Observation Site Limitations. The southwest is obstructed by buildings / hangars, though does not impede the view of either end of the runway. Due to a lack of markers, there are limited 1-5 mile indicators and night time markers at both the primary and alternate observing locations.

3.2.3. METAR (Meteorological Aerodrome Report). Routine METAR observations are disseminated every hour 56 minutes after the hour. The observation is automatically generated by JET and is disseminated longline and displayed locally.

3.2.4. SPECI (Special Observation). SPECI observations are taken whenever certain weather events, defined in AFMAN 15-111, and listed in **Attachment 4**, occur at Malmstrom AFB. This type of observation is also automatically generated by JET and is disseminated longline and displayed locally.

3.2.5. LOCAL (Locally Generated Observation). A LOCAL observation will consist of altimeter setting only and be passed verbally to the SOF.

3.3. Basic Weather Watch (BWW). Besides monitoring the FMQ-22's scheduled hourly METAR observations, weather personnel recheck weather conditions at least every 20 minutes when conditions listed in AFMAN 15-111 para 2.14.1 are observed to be occurring or are forecast to occur within one hour. See **attachment 4**. **NOTE:** In addition to the listed requirements, weather personnel will remain alert for any other changes in weather conditions that will require a SPECI observation. Weather personnel will also monitor area observation and forecast products as often as necessary to keep abreast of changes expected to affect their area of responsibility.

3.4. Cooperative Weather Watch (CWW). The CWW is a process for Facility Managers (FMs), ground crews, security forces, maintenance crews, flying unit personnel, and/or anyone else out in the complex or on base to report changes in weather conditions to the on-duty weather forecaster (DSN: 631-2710/2981, COMM: 406-731-2710/2981). CWW inherently dictates close contact between the 341 OSS/OSW and the previously mentioned organizations or personnel, especially FM personnel. The FMs receive one-on-one training by the 341 OSS/OSW and are a valuable resource out in the missile complex. 341 OSS/OSW leadership will be responsible for ensuring CWW compliance by coordinating training with associated CWW unit leadership. Due to the vastness of the missile complex, there may be significant difference in complex weather and Malmstrom AFB. FMs will notify weather personnel when any of the following are seen or occur at the MAFs:

3.4.1. Hail.

3.4.2. Tornadoes and/or funnel clouds.

3.4.3. Any damage caused by weather.

3.5. Continuous Weather Watch. The FMQ-22 will conduct a Continuous Weather Watch when in fully automatic mode (normal configuration). The FMQ-22 will monitor weather conditions continuously. In addition to taking METARs, the FMQ-22 will take and disseminate observations as conditions occur that meet SPECI observation criteria. Weather flights may perform a Continuous Weather Watch during FMQ-22 augmentation if locally determined to be more appropriate due to existing meteorological conditions.

3.6. METWATCH. Provides an organized approach for weather personnel to maintain situational awareness of the current/future meteorological situation within designated areas. This process involves notifying supported units and updating any forecast products when pre-established weather conditions or changes not forecasted (timing, location, or forecast values) in weather occur or are expected to occur. All on-site meteorological and commercial data sources (Satellite, Weather Radar, Websites, National Oceanic Atmospheric Administration (NOAA) Weather Radio, etc.) may be used to accomplish this task. The 341 OSS/OSW will perform a continuous METWATCH for Malmstrom AFB and the complex.

3.7. Pilot-to-METRO Service (PMSV) Support. Weather information is available via PMSV during duty hours on frequency 239.8 MHz. During closure hours, PMSV will not be monitored. There will be a minimum of one radio check each day to verify PMSV radio is in full service. For aircraft outside the range of our PMSV system, PMSV support can be obtained through a phone patch to the 341 MW/CP at DSN 632-3801, Commercial 406-731-3801, or to the 25 OWS at DSN 228-6598/6599/6588, Commercial 520-882-6598/6599/6588.

3.7.1. In the event of a PMSV outage, the 341 OSS/OSW will notify the 40 HS, 550 HS, CP, and the 25 OWS.

3.7.1.1. Long Term Outage (over four hours): 341 OSS/OSW members will contact and complete the following:

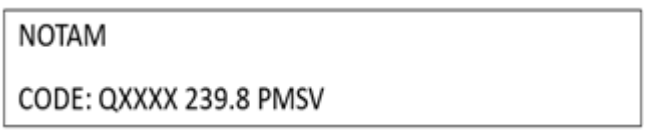
3.7.1.1.1. 40 & 550 HS: Ensure SOF is aware of the extended outage.

3.7.1.1.2. CP: Ensure CP is aware of the extended outage.

3.7.1.1.3. 25 OWS, DSN 228-7655: Ensure 25 OWS is aware of the extended outage.

3.7.1.1.4. Heliport Management, DSN 632-1589/Commercial 406-731-1589: Place request for PMSV outage in local Safety Notice to Airmen (NOTAM). Prepare/provide the following message: (The decoded message will read: “Frequency 239.8 PMSV not available.” See **Figure 3.1**.).

Figure 3.1. NOTAM.



3.7.1.1.5. Brief aircrews of outage. Provide alternate contact options.

3.7.1.2. Recovery. 341 OSS/OSW members will perform a radio check then notify all affected units when the PMSV equipment is back in operation.

Chapter 4

MISSION EXECUTION FORECAST (MEF) SERVICES

4.1. General. Mission forecast services are those weather-related actions directly related to completing each customer's daily mission(s). The MEF is the primary tool used to accomplish these tasks. MEFs are tailored to individual customer requirements and may be anything from a local flight weather briefing to a change-of-command weather forecast. Any event, both flying and non-flying, which will be affected by weather normally requires a MEF.

4.2. Terminal Aerodrome Forecast (TAF). Malmstrom AFB TAFs will be produced and disseminated by the 341 OSS/OSW in accordance with AFI 15-128, AFMAN 15-124, and AFMAN 15-129. Forecast specification and amendment criteria are listed in **Attachment 4**. TAFs cover a 30-hour period and are valid for 8 hours. TAFs will apply to the area within a 5SM radius of the Malmstrom AFB helipad and will be issued every 8 hours. The TAF will be amended during flying operations to properly represent the current conditions.

4.3. Mission Execution Forecasts (MEF). MEFs are mission-specific forecasts that are developed using a 4-step process outlined in AFMAN 15-129, and may be provided by several methods (verbally, person-to-person, 175-1s, etc.) During this process, the 341 OSS/OSW will fuse, and tailor products created by strategic and theater weather centers, as well as information supplied by local units (e.g., flying schedule) and agencies. The result is a product designed to provide timely, accurate, and relevant weather intelligence to various customers by whatever means proves most effective. Due to the size of the 341 Missile Complex and the extreme variability in Montana weather, forecasters will make every effort to delineate differing weather conditions across the complex. MEFs must be horizontally consistent with (but not necessarily mirror) products issued by the 25 OWS and the 557th Weather Wing. During rapidly changing conditions, emergencies, or when conditions threaten resource protection, the 341 OSS/OSW will amend the MEF to accurately reflect conditions.

4.3.1. Flying MEF. The 341 OSS/OSW will produce a variety of weather products to support aviation movements throughout the missile complex. Primary products will include the FLIMSY (Forecast for Local or Informational Message) and the Flight Weather Briefs.

4.3.1.1. FLIMSY MEF. MEFs are generated by the 341 OSS/OSW forecaster as needed. The FLIMSY is the primary briefing tool for all wing flying missions. The FLIMSY provides, at a minimum, temperature, pressure altitude, and density altitude per each one-hour period. The FLIMSY will also include flight-level winds up to 10Kft MSL, enroute weather, missile flight area specific observations (if appropriate), significant weather impacts, space weather impacts, and UH-1N specific (CAT-I) and MH-139 specific (CAT-II) turbulence forecasts. Applicable watches, warnings, and advisories will also be included. The UH-1N and MH-139 specific FLIMSY may also include local airport/refuel location TAFs. The FLIMSY should have a section for comments to allow forecasters to annotate missile complex specific impacts or weather phenomena. The FLIMSY will typically cover a flight period from 0800L to 0200L but may be modified with coordination between the 341 OSS/OSW, the 40 HS, and the 550 HS. Additionally, other alternate briefing forms are available, such as DD Form 175-1 and verbal briefings. The 341 OSS/OSW forecaster will also perform a MISSIONWATCH for mission limiting weather at Malmstrom and the complex.

4.3.1.2. Flight Weather Briefings. Weather personnel will provide traditional Flight Weather Briefings (DD Form 175-1, Flight Weather Briefing) to aircrews flying outside of the 341st Missile Complex area. Briefings will be requested as soon as possible to complete the 175-1. Aircrews operating away from home base will schedule flight weather briefings with the Malmstrom weather flight or the appropriate OWS, preferably two or more hours prior to flight time. There is an internet-based aircrew weather briefing system in the operations/flight planning area for transient aircrews to obtain weather data from the appropriate OWS. The 25 OWS can be contacted by phone (DSN 228-6598/6599/6588) or fax (DSN 228-7361).

4.3.1.3. If immediate weather support is needed, and the 341 OSS/OSW forecaster is not available, aircrews can obtain weather information from the 15 OWS: **https://15ows.us.af.mil/**

4.3.2. Ground Support MEFs. The 341 OSS/OSW will produce a variety of weather products to support ground movements throughout the missile complex.

4.3.2.1. Ground Support Brief. The 341 OSS/OSW will produce a Ground Support Brief slide in support of all Malmstrom AFB operations. This brief includes a satellite slide, radar & current conditions slide, missile squadron forecast slide, wind chill slide / plow recommendation (winter), fire weather slide (spring/summer), 24-hour Malmstrom forecast slide, and a 5-day outlook slide.

4.3.2.2. CAT-1 Brief. The 341 OSS/OSW will produce a Pre-Brief Route Forecast for the CAT-I briefing held the day prior to be briefed in person. The CAT-I Route Forecast Pre-Brief will be completed and provided to customers NLT 4 hours prior to the CAT-I in-person briefing time. Forecaster must verify general route to/from site utilizing Missile Maintenance (MX) Schedule to determine forecast conditions along route. Location of mission as well as all route information is classified sensitive and will not be discussed openly. The 341 OSS/OSW will also verbally brief the Route Forecast in a variety of telecons with the MFCC/MSC, convoy commander, and group and wing leadership.

4.3.2.3. Missile Movement Brief. The 341 OSS/OSW will produce a Missile Movement Weather brief to be incorporated into the main Missile Movement brief given by maintenance and will be briefed in person.

4.4. MISSIONWATCH. This term is used to describe the process by which the 341 OSS/OSW monitors the weather for all local missions, to include all working areas. All on-site meteorological and commercial data sources (satellite, radar, internet sites, etc.) may be used to accomplish this task. It is through this method that MEF amendments/updates are accomplished. During rapidly changing weather, the 341 OSS/OSW will amend/update the MEF as required and contact the appropriate agencies (i.e. 341 MW/CP, WOC, Helicopter Operations, and MMOC) to pass on critical changes.

Chapter 5

STAFF WEATHER SERVICES

5.1. General. Staff services are those briefings provided primarily by 341 OSS/OSW leadership. These briefings are a specialized type of MEF focused on a particular event/audience. Examples include, but are not limited to, staff meetings, emergency (real world or exercise) meetings, and Instrument Refresher Course briefings.

5.2. Operational Hours. Most briefs are provided during normal duty hours (M-F 0730-1630L). Contingency, exercise briefings, and other briefing support are provided as needed.

5.3. Wing Staff. Wing Staff weather briefings for 341 MW will be provided quarterly or upon request. Standard information includes a satellite picture, local forecast, extended weather outlook, and seasonal climatology.

5.4. Inspector General (IG) In-Briefs. IG in-briefs for 341 MW will be provided as required. Standard information includes a satellite picture, radar, Malmstrom Forecast and the 5-day weather outlook. More information can be provided as requested.

5.5. Crisis Action Team (CAT) Briefings. The 341 OSS/OSW will provide weather briefings as required for the CAT. This includes but is not limited to real-world events, exercise, and deployment briefings. Each briefing will be tailored to provide the appropriate weather intelligence required by wing leadership. Briefings will be in PowerPoint format and briefed in-person as notified.

5.6. Emergency Operations Center (EOC) Briefings. The 341 OSS/OSW will provide weather briefings as required for the EOC. This includes but is not limited to real-world events, exercise, and deployment briefings. Each briefing will be tailored to provide the appropriate weather intelligence required by wing leadership. Briefings will be in PowerPoint format and briefed in-person as requested.

5.7. Instrument Refresher Course (IRC) Briefings. The 341 OSS/OSW provides IRC briefings as requested by the 40 and 550 HS in accordance with AFMAN 11-210, Instrument Refresher Program (IRP), and AFMAN 15-129. The weather portion of the briefing consists of an overview of the 341 OSS/OSW's Airfield and Mission Services, 341 OSS/OSW capabilities, 341 OSS/OSW and 25 OWS responsibilities, resource protection, seasonal/regional weather, space weather impacts (when applicable), and any other information deemed relevant by operational commanders or IRC instructors.

5.8. Flight Information Publication (FLIP) Weather Updates. The 341 OSS/OSW is responsible for ensuring all weather information in the FLIP is accurate. The FLIP is checked for accuracy as soon as possible after publication.

5.9. Climatology Briefs. The 341 OSS/OSW can provide climatology data for Malmstrom AFB by request. For locations other than Malmstrom, the 341 OSS/OSW will utilize the 14 WS climatology database to provide requested information.

Chapter 6

SPACE WEATHER SUPPORT AND SERVICES

6.1. General. Many of our weapons and communications systems use satellites and radio waves (High Frequency (HF), Very High Frequency (VHF), Ultra High Frequency (UHF), Extremely High Frequency (EHF), Low Frequency (LF), and Very Low Frequency (VLF)), that can be rendered useless by electro-magnetic radiation from the sun. This chapter contains some brief information regarding space weather limitations, alerts and warnings, and products available to Malmstrom personnel.

6.2. Limitations. Like terrestrial weather, there are numerous factors that influence space weather. One of the biggest limitations we have in identifying and forecasting space weather is a lack of sensors. Additionally, given the speed of light and solar wind, our ability to provide lead-times for significant space events is extremely limited.

6.3. Space Weather Alerts and Warnings. Space Weather is continuously monitored by the 2d Weather Squadron at Offutt AFB, and bulletins are issued for any space weather event forecasted to cause impacts to global communications. 341 OSS/OSW forecasters will monitor space weather bulletins for any impacts affecting the local area and update the MEF accordingly.

6.4. Products. Numerous space weather products are available on Air Force Weather Web Services (AFW-WEBS). Most space weather products from the 2d Weather Squadron are “now-casts” and/or very short-term forecasts (6-hourly period), so the duty forecaster will check websites for updated products when a new TAF is issued and update the MEF accordingly.

6.4.1. GPS Products. GPS products are primarily “now-casts” and/or <1 hourly forecast. Duty forecasters will only need to monitor these products when specifically requested via emailing **341oss.osw2@us.af.mil** or calling the forecaster line at 731-2710.

Chapter 7

SPECIAL MISSION REQUIREMENTS

7.1. General. This chapter contains all the unique local requirements submitted by various organizations and verified by the 341 OSS/OSW leadership. The requirements will be reviewed annually by the requesting unit and updated as required.

7.2. 341st Public Affairs (341 MW/PA) will coordinate tours of the base weather station by community groups and others with the 341 OSS/OSW leadership.

7.3. 341st Command Post (341 MW/CP) will ensure dissemination of weather warnings as outlined in Chapter 9 of this instruction.

7.3.1. Notify the 341 OSS/OSW forecaster on duty immediately of all aircraft/ground emergencies, incidents, or accidents via phone and/or secondary crash-net.

7.3.2. 341 OSS/OSW will ensure CP is notified of any scheduled maintenance/planned outages.

7.3.3. Run applicable checklist to notify wing leadership and various base agencies of severe weather when notified by the 341 OSS/OSW or 25 OWS.

7.4. 341st Wing Safety (341 MW/SE) may request any and all-weather information pertaining to a mishap. Once requested, the 341 OSS/OSW forecaster will provide the information to 341 MW/SE, Safety Investigation Board and/or wing leadership as soon as possible.

7.5. 341st Communications Squadron (341 CS). Will maintain the PMSV radio and ensure that scheduled maintenance does not degrade the MISSIONWATCH and/or METWATCH performed by the 341 OSS/OSW during periods of inclement weather and notify the 341 OSS/OSW duty forecaster prior to starting any routine maintenance.

7.6. 341st Civil Engineer Squadron, Readiness and Emergency Management Flight (341 CES/CEX). Will contact the 341 OSS/OSW for pertinent weather information as required.

7.6.1. The 341 OSS/OSW will provide weather data (observations and forecasts) to 341 CES/CEX running Nuclear, Biological, and Chemical (NBC) dispersion models for NBC consequence assessments and toxic corridor.

7.6.2. The 341 OSS/OSW will provide Effective Downwind Messages (EDM) and Chemical Downwind Messages (CDM) as requested.

7.7. 341st Maintenance Group (341 MXG) will. Contact the 341 OSS/OSW for pertinent weather information as requested.

7.8. 341st Security Forces Group (341 SFG) 341 OSW will communicate severe weather impacts with 341 SFG who will report any hazardous weather (tornado, hail size, blizzard, etc.).

7.9. Facility Managers (FMs) will promptly inform the 341 OSS/OSW of any hazardous weather reported by FMs personnel (tornado, hail, blizzard, etc.).

7.9.1. The 341 OSS/OSW will provide a weather operations orientation briefing to all new FMs to aid in identifying severe weather and troubleshooting sensors out in the field.

7.10. 120th Airlift Wing (120 AW). The 341 OSS/OSW will provide weather data and mission briefs when requested.

7.11. 819th Red Horse Squadron (819 RHS). Cold weather forecasts, ground support forecasts, and verbal briefings will be provided to support construction.

7.12. 583MMXS/MXDPA (RIVET MILE). Will notify the weather flight of sites being worked so the RIVET MILE team can receive weather notifications based on weather limiting conditions. These notifications will be provided when doors are jacked, or environmental shelters are erected.

7.12.1. See **Chapter 2** for weather limitations for equipment. Notifications will be made by the forecaster when high winds are forecast when doors are jacked. When significant precipitation is forecasted so that environmental shelters can be erected. Wind forecasts will be provided when environmental shelters are erected. The 583 MMXS will contact the weather flight for wind information regarding crane operations and environmental shelter set-up. The 341 OSS/OSW will only provide real-time sensor updates for any operation limited by 18 knots.

7.12.2. The weather flight will also provide the Ground Support Forecast, customer basic access accounts for meteorological data, and seasonal climatology outlooks. The 583MMXS/MXDPA will provide the weather flight with after the fact mission impacts during weather events including significant delays, monetary values of equipment, and number of personnel affected.

Chapter 8

RESOURCES PROTECTION SERVICES

8.1. General. This chapter contains details on weather watches, warnings, and advisories. Resource protection is accomplished by the 341 OSS/OSW. When the weather station is closed, standby personnel will monitor weather conditions of emerging threats or issue any required warnings/advisories/watches if the threat is imminent. The 341 OSS/OSW issues any forecasted warning for the 341st Missile Complex if there is an immediate threat to life and/or property. In the case of a base-wide outage or outage limitations, the 25 OWS will resume support of all watches, warnings, and advisories, for Malmstrom AFB and the 341st Missile Complex as needed. The goal is to provide uninterrupted resource protection to Malmstrom AFB and the missile complex. All mission products to include the TAF, MEF, and other products will be transferred to the primary source. For a complete base-wide outage the OSW will resume support in-person and with verbal's, to then fall on the other primary sources as necessary. Only resource protection via WWAs would fall onto the 25 OWS for a complete and total outage, so long as not in COOP.

8.2. Weather Watches. A Weather Watch is a special notice sent to customers indicating that conditions are favorable for the development of a particular type of weather phenomena (e.g., tornadoes, hail, etc.). Watches are issued for a 5 NM radius of the center-point of the main base helipad as well as for each of the missile squadrons within the 341 MW complex. The 341 OSS/OSW is responsible for issuing all watches for Malmstrom AFB and the 341st Missile Complex. Whenever feasible, watches for similar conditions in multiple areas will be combined with the location of the criteria specified in the text of the watch to reduce the volume of notifications. **Table 8.1** contains all the watches and desired lead-times (DLT) issued for Malmstrom AFB and the missile complex.

8.3. Forecasted Weather Warnings. Weather warnings are special notices sent out to customers alerting them that a predefined weather event which will pose a threat to life or property is expected to occur. Warnings are issued for a 5 NM radius of the center-point of the Malmstrom helipad as well as for each of the missile squadrons within the 341 MW complex. The 341 OSS/OSW is responsible for issuing all warnings for the 341st Missile Complex and Malmstrom AFB. Whenever feasible, warnings for similar conditions in multiple areas will be combined with the location of the criteria specified in the text of the warning to reduce the volume of notifications. Forecasted warnings, with their desired lead-times, are contained in **Table 8.2**.

Table 8.1. Weather Watches for Malmstrom AFB & 341st Missile Complex.

Criteria	DLT (minutes)
Blizzard (Conditions lasting ≥ 3 hours, winds (sustain/gust) ≥ 30KTS, visibility ≤ ¼ SM in snow/blowing snow)	As Potential Warrants
Freezing Precipitation	As Potential Warrants
Severe Thunderstorms (Potential for Hail ≥ ¾ IN and/or Sustained Winds ≥ 35KTS and/or Gusts ≥ 52KTS)	As Potential Warrants
Heavy Rain (≥ 2 inches in 12 hours)	As Potential Warrants
Heavy Snow (snowfall accumulation ≥ 6 inches in 12 hours)	As Potential Warrants
High Winds (Sustained Winds ≥ 35KTS and/or Gusts ≥ 52KTS)	As Potential Warrants
Lightning within 5 NM	30
Tornado	As Potential Warrants

Table 8.2. Forecasted Weather Warnings for Malmstrom AFB & 341st Missile Complex.

Criteria	DLT (minutes)
Zilch (System Test)	0
Wind Conditions (TE Wind Gusts ≥ 35KTS) See Note 1	60
Blizzard Conditions (Forecast conditions lasting ≥ 3 hours, winds sustained/gust ≥ 30 KTS, visibility < ¼ SM in snow/blowing snow)	90
Freezing Precipitation	60
Heavy Rain (≥ 2 inches in 12 hours)	90
Heavy Snow (Forecasted snowfall ≥ 6 inches in 12 hours)	90
Severe Thunderstorms (Forecasted Hail ≥ ¾ inch and/or Sustained Winds ≥ 35KTS and/or Gusts ≥ 52KTS)	30
High Winds (Sustained Winds ≥ 35KTS and/or Gusts ≥ 52KTS)	60
Tornado	15
Note 1: Issued only during duty hours for TE operations.	

8.4. Observed Weather Warnings. In accordance with AFI 91-203, Air Force Consolidated Occupational Safety Instruction, lightning warnings are the only type of observed warning issued for Malmstrom AFB or the missile complex. Lightning warnings are not issued until lightning is observed, either visually, audibly or via the National Lightning Detection Network. The lightning warning will remain valid until lightning has not occurred in the area for 15 minutes. The 341 OSS/OSW and/or the back-up support agency (i.e. the AFGSC designated weather flight or the 25 OWS), depending on outage conditions, will provide timely notification to all supported units upon issuance and expiration of a lightning warning. Whenever feasible, warnings for similar conditions in multiple areas will be combined with the location of the criteria specified in the text of the warning to reduce the volume of notifications. Observed weather warnings are contained in **Tables 8.3** and **Table 8.4**.

Table 8.3. Observed Warnings for Malmstrom AFB.

Criteria
Lightning within 5 NM
Lightning within 10 NM (phone call to Weapon Storage Area (WSA) during normal duty hours 731-6113/6115/6117.

Table 8.4. Observed Warnings for the 341st Missile Complex.

Criteria
Lightning within the Complex or Squadrons (a separate warning will be issued for individual MFER sites)
Observed lightning at MFER Site (Bravo, Charlie, Echo, Golf, Hotel, Lima, and November

8.5. Observed Weather Advisories. An observed weather advisory is a special notice sent to operators alerting them that a predefined weather phenomenon which may impact operations is currently occurring on Malmstrom AFB as well as for any locations within the 341 MW complex. Whenever feasible, advisories for similar conditions in multiple areas will be combined with the location of the criteria specified in the text of the advisory to reduce the volume of notifications. Observed weather advisories are in **Tables 8.5** and **Table 8.6**.

Table 8.5. Observed Weather Advisories for Malmstrom AFB.

Criteria
Snow Advisory (fresh snowfall ≥ ½ inches but < 6 inches)
Wind Advisory (≥ 45KTS)
Turbulence Advisory (> Moderate)
Icing Advisory (≥ Light)
Ceiling/Visibility (Ceiling < 500FT and/or Visibility < 1SM)
Level I wind chill temperature < 0°F
Level II wind chill temperature <-40°F
Level III wind chill temperature <-65°F

Table 8.6. Observed Weather Advisories for the 341st Missile Complex.

Criteria
Snow Advisory (fresh snowfall ≥ ½ inches but < 6 inches)
Wind Advisory (≥ 45KTS)
Turbulence Advisory (> Moderate)
Icing Advisory (≥ Light)
Ceiling/Visibility (Ceiling < 500FT and/or Visibility < 1SM)
Observed Crosswinds. TE Crosswind from the west or east >= 35kts
Level II wind chill temperature <-40°F
Level III wind chill temperature <-65°F

8.6. Format. Advisories, watches, and warnings will be numbered consecutively by identifying the type of weather message (watch, warning, or advisory) followed by a five-digit number. The first two numbers indicate the current month while the second three numbers indicate the sequence number. For example, the message "Weather Warning 02-005" means the month is February (02), and this is the fifth (005) warning issued in the month. The message "Weather Advisory 12-013" means the month is December (12) and this is the thirteenth (013) advisory issued in the month. Examples of different messages are contained in **Attachment 3** section A3.3. NOTE: If JET is inoperable, the AF Form 3806 and/or AF Form 3807 will be filled out by the duty forecaster, who will then notify the applicable agencies by phone.

8.7. Upgrades/Downgrades. Advisories and warnings will be upgraded (i.e., winds increase from 35 knots to 50 knots) or downgraded as required. Upgrades should meet the desired lead times specified above. Only one forecasted warning may be in effect at one time. If a warning is issued for one criterion and it becomes necessary to warn for another criteria, a new warning, with a new number, will be issued to include all criteria expected. A separate valid time may be specified for each criterion, if necessary.

8.8. Amendments. Amendments to weather warnings and watches will only be issued to change the valid time and will be issued before the original watch or warning expires. New warnings and watches will be issued for any change in weather criteria.

8.9. Cancellation. Warnings and watches may be cancelled when the weather phenomena are no longer occurring or expected to occur. However, if not canceled, they will expire at the end of the valid period. Observed advisories will be canceled when the criteria are no longer occurring and is not expected to occur again in the next hour. See **paragraph 8.4** for cancellation of observed lightning warnings.

8.10. Severe Weather Action Plan (SWAP). SWAP is in place to ensure sufficient personnel are available during potential/actual severe weather events or during meteorological/operational events critical to mission success. For these procedures, severe weather is defined as any weather phenomenon considered critical enough by the customer to require advance/special notice and subsequent actions to prevent serious injury or damage to personnel, property, or resources. It is imperative that timely and accurate weather watches, warnings, and advisories are disseminated to all Malmstrom AFB agencies to ensure personnel and resource protection. The 341 OSS/OSW SWAP conditions are listed in **table 8.7**.

8.10.1. 341 OSS/OSW Responsibilities. The 341 OSS/OSW will perform the SWAP responsibilities as defined in AFMAN 15-129 and AFMAN 10-206. More specifically, 341 OSS/OSW will accomplish the following procedures for notification:

8.10.1.1. During normal duty hours, the duty forecaster will implement SWAP whenever one or more conditions in **Table 8.7** are met. During standby hours, the duty forecaster at the 341 OSS/OSW will notify Flight leadership and report within an hour of SWAP conditions according to SWAP procedures.

8.10.1.2. Activation. The duty forecaster will discuss the meteorological situation with Flight Leadership, then the duty forecaster will determine manning requirements and the recall of additional personnel (or place on standby) if deemed necessary. Any additional personnel will report to the weather station as soon as possible after notification by the duty forecaster. Once the member has arrived, they will assist in evaluating the situation, determine the need to recall additional personnel, and execute the SWAP duties/responsibilities in **Table 8.8**.

8.10.1.3. Weather personnel will augment the FMQ-22 if needed.

Table 8.7. Conditions Requiring SWAP.

Criteria
Blizzard (Base and Complex)
Freezing Precipitation (Base and Complex)
Severe Thunderstorms (Base and Complex)
Heavy Snow (Base and Complex)
Tornado (Base and Complex)
Heavy Rain (Base and Complex)

Table 8.8. SWAP Duties/Responsibilities.

SWAP Duties/Responsibilities		
		Duty/Standby Forecaster
1		Issue forecasted warnings for base and complex
2		Notify appropriate agencies of the issuance of Watches/Warnings.
3		Advise senior base leadership of the situation as requested.
4		Issue observed warnings/advisories.
5		Review SWAP duty checklist and begin any duties, as necessary, until the oncoming/alternate forecaster arrives. Initiate and maintain an events log as time permits IAW local policy.
6		Conduct a concise forecast discussion of the current situation to apprise oncoming/alternate forecaster upon their arrival.
7		Review PIREPs (Pilot Reports), SIGMETs (Significant Meteorological Reports) and area NWS (National Weather Service) forecasts and products for severe weather reports. If applicable, incorporate into products.
8		Update Mission Execution Forecast (MEF) as needed.
9		Work closely with other forecasters. Allow them to accomplish tasks which will free duty forecaster to handle critical tasks such as watch/warning/advisory issuance/notification, MEF amendments
10		If required, provide inputs to post-event OPREP-3 (operation report) or Commander's Critical Information Reports (CCIR) to Command Post. Archive data for and perform forecast review as necessary.

11		Conduct post-event review and discussion to provide team members with feedback (positive and negative).
		Oncoming/Alternate Forecaster
1		When first notified report to the station as soon as safely possible. Determine if the situation warrants the recall/stand-by placement of additional personnel.
2		Upon arrival, receive initial forecast discussion from Duty Forecaster.
3		Complete tasks as directed by the Duty/Standby Forecaster.
		Radar Operator (optional/as needed)
1		Interrogate storms and related phenomena using GR products.
2		Keep Duty Forecasters, NCOIC and Flight Commander informed of local severe activity.
3		During tornado and thunderstorm events, provide the Duty Forecaster with storm positions and movements.
4		During thunderstorm events, advise the other forecasters when thunderstorms are within 10nm and 5 nm.
5		Answer phones and questions. Prioritize calls for the Duty Forecaster and Team Chief. Direct calls from unofficial sources to Public Affairs.
6		Answer PMSV (Pilot-to-Metro Service) calls.
7		Assist other team members as needed.
8		Archive data if deemed necessary.
9		Provide inputs to and contribute to forecast review. Provide inputs to OPREP-3 report (if required).
		Flight Leadership/Ranking Forecaster
		Ensure the following tasks are accomplished on a recurring basis:
1		Recall additional personnel if needed
2		Adjust duties as deemed necessary
3		As requested, keep senior base leadership, command post and customers apprised of latest developments
4		Keep personnel focused on assigned tasks
5		Review all forecast products for accuracy and horizontal consistency (e.g., watches/warnings/advisories, TAFs (Terminal Aerodrome Forecast) and MEFs)
6		Provide meteorological expertise and guide decision making.

8.10.2. Post Event Procedures. If severe weather occurs, accomplish the following:

8.10.2.1. The 341 OSS/OSW will perform a “data save” and provide all pertinent information to the 341 OSS/OSW leadership. The flight leadership will compile the information and provide a summary to the 25 OWS and AFGSC/A3OW for further dissemination at their discretion.

8.10.3. Significant Weather Operational Reports (OPREP). In the event that significant weather occurs that requires or is related to an operational report IAW AFMAN 10-206, the 341 OSS/OSW will attempt to gather and provide the 341 MW/CP as much weather-related information as possible/requested to be included in the operational report.

8.10.3.1. The 341 OSS/OSW will notify 25 OWS and AFGSC/A3OW of any OPREP-3 and severe weather reports immediately after fulfilling any local distribution requirement for post-analysis and verification. Request 25 OWS to provide required information, if needed, by performing a weather data save.

8.11. Chemical Downwind Messages (CDM)/Effective Downwind Messages (EDM). The 341 OSS/OSW is the primary unit for providing CDM/EDM support. CDM bulletins can be produced in station but are also available on the 557 WW / AFW-WEBS & AFW-BIFROST websites. They are used to determine the spread of chemical and biological agents that are released at the surface (CDM) as from a fuel leak and aloft (EDM) as from a nuclear detonation.

Chapter 9

WEATHER INFORMATION DISSEMINATION

9.1. General. This chapter describes the weather dissemination systems, dissemination procedures, and back-up systems and procedures. Timely and effective dissemination of weather Watches, Warnings and Advisories is crucial to the success of the wing mission and resource protection. Most organizations will receive this information via the Joint Environmental Toolkit while some organizations will receive courtesy calls.

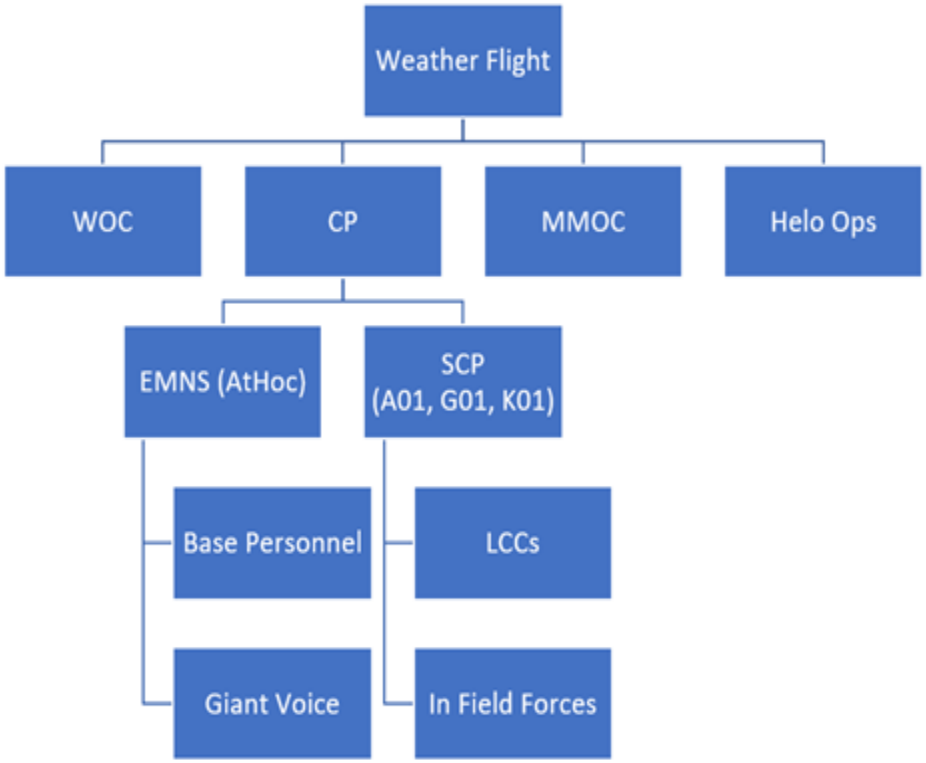
9.2. Dissemination and Back-up Systems. Currently the 341 OSS/OSW uses the Joint Environmental Toolkit (JET) as its primary method of disseminating observations, forecasts, and warnings, watches, and advisories (WWA). JET consists of a dedicated computer server in the Network Control Center connected through the base local area network (LAN). The CP, 40 HS, and WOC (comprised of MMOC, MSC, and MFCC) have user accounts to access the JET webpage. Agencies currently without JET passwords will receive critical weather information through the wing's dissemination system (ATHOC notifications, email, pop-ups, etc.). The 341 OSS/OSW will follow backup dissemination procedures documented in the local SOPs if JET becomes inoperative.

9.3. Dissemination and Back-Up Procedures. Observations will be taken only when augmentation is needed (hail, tornado, funnel cloud, volcanic ash and items deemed necessary for flight safety) and disseminated through JET as described in **Chapter 3**. When JET is out of service, observations will be disseminated long-line through AFW-WEBS. If all long-line transmission resources are out of service, then Observations will be submitted via telephone to the 25 OWS. Locally, observations will be relayed by the 341 OSS/OSW to the 40 and 550 HS via telephone.

9.3.1. Weather Watches, Warnings, and Advisories (WWA). WWAs will be disseminated via JET (see **paragraph 9.2** for a list of the organizations) When WWAs are issued, 341 OSS/OSW will give a courtesy call to the MMOC and MSC during CAT missions and call the SOF during normal operations. If JET is out of service, the 341 OSS/OSW will contact the same organizations as well as CP.

9.4. Base Warning Notification Pyramid Structure Diagrams. The following diagram shows how WWAs are sent through the wing.

Figure 9.1. Base Warning Notification Pyramid Structure Diagram.



Note: The CP does not notify all the above for every situation. AtHoc notification requirements and restrictions can be found in AFMAN 10-207, Command Posts and AFMAN 10-206, Operational Reports.

Chapter 10

WEATHER EQUIPMENT

10.1. General. This chapter provides a brief description of the meteorological and communications equipment used by the 341 OSS/OSW. Additionally, it provides information on back-up systems and maintenance.

10.2. Meteorological Equipment. The 341 OSS/OSW uses a wide range of equipment to determine the current state of the atmosphere. These critical systems are used continuously to provide customers the most timely, accurate and relevant weather intelligence possible.

10.2.1. FMQ-22. The FMQ-22 is an integrated weather system consisting of multiple weather sensors and information technology components that continually measure wind speed and direction, temperature, dew point, humidity, visibility, barometric pressure, altimeter setting, sea level pressure, cloud heights & coverage, pressure altitude, density altitude, freezing precipitation, precipitation type and liquid precipitation amounts. However, it cannot accurately measure sector visibility, sky conditions throughout the horizon circle, accumulated snowfall, hail, and when a tornado is occurring. It automatically generates surface aviation weather observations based on user-defined events, either by time or occurrence of a particular weather element or category. The FMQ-22 runs in fully automatic mode and is the primary source of Malmstrom AFB's official observation. The backup for the FMQ-22 consists of the Kestrel 4500, TMQ-53, and manual observation. The FMQ-22 is also installed at all 15 MAF locations.

10.2.2. Gibson Ridge (GR) Radar Software. The 341 OSS/OSW uses the GR2Analyst and GR3Analyst radar software which encodes Next Generation Radar (NEXRAD) data. This software can display any NWS radar in CONUS. We primarily use the KTFX radar, which is linked to the Great Falls NWS radar, or the KBLX radar, which is linked to the Billings NWS. If radar software is unavailable, AFW-WEBS or AFW-BIFROST is the primary backup radar data source.

10.2.3. Lightning: The 341 OSS/OSW obtains real-time lightning data through AFW-WEBS as well as AFW-BIFROST.

10.3. Communications Equipment. JET. This is our primary system for disseminating forecasts, observations, warnings, watches, and advisories.

10.3.1. PMSV Radio. The Pilot-To-Metro-Service Radio (239.8 MHz) allows the 341 OSS/OSW to communicate with aircrews, both on the ground and flying. If the PMSV is out of service, aircrews can contact the 25 OWS via phone patch (where possible) to get weather data.

10.3.2. Phones/Hotlines. The 341 OSS/OSW has a secondary crash-net phone used by the CP for passing along critical, time-sensitive information rapidly.

10.3.3. Local Area Network (LAN). The 341 OSS/OSW relies heavily on the LAN to improve the timeliness and accuracy of weather intelligence to our customers. The 341 OSS/OSW's ability to support the wing would be degraded if the base network were to go down. According to the support agreement in the IDP, the 25 OWS takes over WWAs and TAF support during base outages until the 341 OSS/OSW can resume support.

10.4. Maintenance. The organizations in **Table 10.1** provide preventive maintenance and repair for the weather equipment.

Table 10.1. Maintenance Providers.

Equipment	Provider
PMSV	Comm Focal Point, DSN: 632-2666, COMM: 406-731-2666
FMQ-22	Fielded Systems Support: 271-2586 / Jet SCA Server Outage x2666 / x2771, Haight-Bey (Contractor)

10.5. Building Power. Building 1441 is equipped with a back-up generator . If a power-outage occurs, the 341 OSS/OSW will remain in place for normal duties.

Chapter 11

OWS/WEATHER FLIGHT BACK UP SUPPORT

11.1. General. This chapter briefly describes how weather services will be provided should any such events occur requiring backup procedures. The 341 OSS/OSW will coordinate transfer of responsibility with the 25 OWS.

11.2. 25OWS. When weather operations at 341 OSS/OSW are interrupted (e.g., power outage, natural disaster, etc.), associated TAF, weather watch, warning and advisory responsibility will be transferred to the 25 OWS until the 341 OSS/OSW is postured to resume operations.

11.3. 341OSS/OSW. For standard station evacuations, support will resume from the alternate operating location site. For longer interruptions, the 341 OSS/OSW will coordinate required support with other organizations. The 25 OWS will not normally produce and disseminate tactical-level weather products for Malmstrom AFB mission execution.

Chapter 12

RECIPROCAL SUPPORT

12.1. General. This chapter describes support required by the 341 OSS/OSW to accomplish its daily mission. Per AFMAN 15-129, support to the 341 OSS/OSW by other local agencies that are mandated by USAF or other local directives are not included in this chapter.

12.2. 341st Command Post (341 MW/CP) will notify the 341 OSS/OSW with sufficient lead time of any wing briefings that may involve or require weather support. NOTE: Information on briefing format is usually needed. Preparation time varies based on required format.

12.2.1. Utilize the JET software for prompt notification of weather watches, warnings, and advisories.

12.2.2. Disseminate weather watches, warnings, and advisories according to local procedures.

12.2.3. Notify senior wing leadership when any severe weather watch (e.g., tornado, > 3/4-inch hail, blizzard, heavy snow, freezing precip), is issued.

12.3. 40th and 550th Helicopter Squadrons (40 HS and 550 HS). Will provide 341 OSS/OSW with timely notification of changes to schedule operations that affect weather support requirements.

12.3.1. Notify the 341 OSS/OSW of required additional support as soon as it becomes known to include monitoring of alternate observations/forecasts and tracking of weather conditions that may affect local flying operations.

12.3.2. Coordinate and provide time during flying safety meetings for weather presentations on selected subjects.

12.3.3. Provide the 341 OSS/OSW with access to a weekly flying schedule via PEX and notify of any additional weather support requirements or flying requirements over and above the daily flying schedule. In addition, as a minimum, the schedules must include take-off and landing times and the location/time of in-flight operations.

12.3.4. Provide a pilot report (PIREP) of any significant or unexpected weather encountered in flight via PMSV and/or debrief to the 341 OSS/OSW.

12.3.5. Provide the 341 OSS/OSW feedback via the provided feedback form and/or verbally post flight.

12.4. 341st Communications Squadron (341 CS) will maintain the PMSV radio and troubleshoot FMQ-22 communications IAW the JET Service Level Agreement.

12.4.1. Coordinate with off-base agencies to repair off-base lines.

12.4.2. Ensure that established maintenance response times are met.

DANIEL J. VOORHIES, Colonel, USAF
Commander, 341st Missile Wing

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFMAN15-129, *Air and Space Weather Operations,* 7 September 2023

AFPD15-1, *Weather Operations,* 28 May 2024

AFMAN10-206, *Operational Reporting (OPREP)*, 18 June 2018

AFMAN15-111, *Surface Weather Observations*, 12 March 2019

AFMAN15-124, *Meteorological Codes,* 16 January 2019

DAFI10-2501, *Emergency Management Program*, 16 October 2023

DAFMAN91-203, *Air Force Occupational Safety, Fire, and Health Standards*, 25 March 2022

Prescribed Forms

None

Adopted Forms

DD Form 175-1, *Flight Weather Briefings*

AF Form 847, *Recommendation for Change of Publication*

AF Form 3806, *Weather Watch Advisory Log*

AF Form 3807, *Watch/Warning Notification and Variation*

Abbreviations and Acronyms

557TH—Weather Wing Headquarters (Offutt AFB, NE)

AIREP—Air Report

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFW—Air Force Weather

AFW-WEBS—Air Force Weather Web Services

AGL—Above Ground Level

AOL—Alternate Operating Location

AOR—Area of Responsibility

AFW-BIFROST—Air Force Weather Bridging Environmental Intelligence for Responsive Operational Support Portal

C—Degrees—Celsius

CAT—Crisis Action Team

CAT-I—Category 1 Mission / Nuclear Convoy

Cig—Ceiling

CMEF—Controlling Mission Execution Forecast

CONUS—Continental United States

DLT—Desired Lead Time

DSN—Defense Switched Network

EHF—Extremely High Frequency

EOC—Emergency Operations Center

EWO—Emergency War Order

°F—Degrees Fahrenheit

FMQ-22—Fixed Meteorological Equipment version 22

Ft—Feet

Kt(s)—Knot(s) / Nautical miles per hour

FLIP—Flight Information Publication

GPS—Global Positioning System

HF—High Frequency

Hg—Atomic Symbol for Mercury

HS—Helicopter Squadron

ICAO—International Civil Aviation Organization

IFR—Instrument Flight Rules

JET—Joint Environmental Toolkit

LF—Low Frequency

LLWS—Low Level Wind Shear

LOCAL—Local Meteorological Observation

MAF—Missile Alert Facility

MDT—Moderate

MEF—Missile Execution Forecast

METAR—Meteorological Aerodrome Report

METWATCH—Meteorological Watch

MFCC—Missile Field Control Center

MISSIONWATCH—Mission Watch

MMOC—Missile Maintenance Operations Center

MSC—Missile Security Center

MW—Missile Wing

MHz—Megahertz

MSL—Mean Sea Level

NEXRAD—Next Generation Weather Radar

NM—Nautical Mile

NOTAM—Notice to Airman

NWS—National Weather Service

OI—Operating Instruction

OPR—Office of Primary Responsibility

OPREP—Operational Report

OSW—Operation Support, Weather

OWS—Operational Weather Squadron

PIREP—Pilot Report

PMSV—Pilot-to-Metro Service

RAWS—Remote Automated Weather System

SATCOM—Satellite Communication

SCC—Security Control Center

SM—Statute Mile

SOF—Supervisor of Flying

SOP—Standard Operating Procedures

SPECI—Special Meteorological Observation

SWAP—Severe Weather Action Plan

TAF—Terminal Aerodrome Forecast

TEMPO—Temporary Conditions

UHF—Ultra High Frequency

UUA—Urgent Upper Air report (Form of PIREP)

VFR—Visual Flight Rules

VHF—Very High Frequency

VLF—Very Low Frequency

WWA—Watch, Warning and Advisory

Terms

Ceiling—The height of the lowest broken (mostly cloudy) or overcast (cloudy) layer, when combined with coverage below it.

Celsius—A Metric unit used to measure temperature in which water freezes at 0° and boils at 100° under standard conditions.

Cooperative Weather Watch—Cooperation between the 341 OSS/OSW, 40 HS, MMOC, FMs and personnel deployed in the missile field to ensure critical weather data is passed to weather agencies.

Desired Lead-time—The amount of advance notice a supported agency needs to react to an advisory or warning.

Fahrenheit—An English Standard unit used to measure temperature in which water freezes at 32° and boils at 212° under standard conditions.

Flimsy—Slang term for a weather brief. Originally it was known as Forecast for Local or Informational Message (FLIMse).

Forecast Weather Advisory—An advisory issued when critical weather conditions are forecast to occur. It's accompanied by a valid time and a desired lead-time.

Knot—A unit of speed equal to one nautical mile (1.852 km) per hour, approximately 1.151 mph.

METWATCH (Meteorological Watch)—The process of the 25 OWS and the 341 OSS/OSW monitoring Montana's weather. The purpose is to identify when and where observed conditions are different from forecast conditions so the forecast product can be amended and designated agencies notified.

MISSIONWATCH (Mission Watch)—The process of the 341 OSS/OSW monitoring the weather for a specific mission. The purpose is to identify and alert 341 MW customers to changes in the Mission Execution Forecast or provide a new MEF because of changes to the mission itself.

Observed Weather Advisory—An advisory issued when critical weather conditions are observed to occur. No valid times or desired lead times accompany this advisory.

Pilot—to-Metro Service (PMSV) - A two-way radio service used for exchange of weather information between the Weather Flight and aircraft.

Statute Mile (SM)—A standard mile equaling 5280 feet.

Severe Thunderstorm—A thunderstorm with 35 knot sustained winds, 52 knot wind gusts, greater than or equal to ¾ inch hail, tornadoes, or any combination of the above.

Weather Advisory—A special notice provided to a supported agency when an established weather condition that could affect its operation is occurring or is expected to occur.

Weather Warning—A special notice provided to a supported agency when an established weather condition of such intensity as to pose a hazard to property or life is occurring or is expected to occur. A weather warning is issued for situations that require the supported agency to take protective action.

Weather Watch—A special notice provided to customers to alert them that atmospheric conditions are favorable for the development of severe weather. A warning will be issued if severe weather activity appears imminent.

Zulu—A system of time, also known as Greenwich Mean Time or Universal Time Coordinate, and is the local time for the Greenwich Observatory, Greenwich, England.

Attachment 2

SAMPLE WEATHER PRODUCTS AND DECODING GUIDELINES

A2.1. Observations.

A2.1.1. Sample

Figure A2.1. Sample.

METAR KGFA 301456Z AUTO 22008G15KT 6SM –RA OVC010 11/07 A3007 RMK AO2 SLP213 T01060067
(1) METAR (2)KGFA (3)301456Z (4)AUTO (5)22008G15KT (6)6SM (7)–RA (8)OVC010 (9)11/07 (10)A3007 (11)RMK (11.1)AO2 (11.2)SLP213 (11.3)T01060067

A2.1.2. Sample Breakdown

A2.1.2.1. Type of Observation (1). There are three types of observations:

A2.1.2.1.1. Meteorological Observation (METAR). This is an observation taken routinely in accordance with AFMAN 15-111.

A2.1.2.1.2. Special Observation (SPECI). This is an observation taken because of one of the special criteria (listed in **attachment 4**) being met.

A2.1.2.1.3. Local (LOCAL). This is an observation which is manually generated by the 341 OSS/OSW when backing-up the FMQ-22. They will only be done as single element observations for altimeter setting changes.

A2.1.2.2. Station Identifier (2). This is also called the International Civil Aviation Organization (ICAO). This code identifies the location of the observation (in this case KGFA=Malmstrom AFB).

A2.1.2.3. Date and Time (3). The date is the first two digits (30) and represents the 30th day of the month. The time is the next five characters (1456Z) and represents the time the last element of the observation was observed and transmitted in Zulu (GMT).

A2.1.2.4. Report Modifier (4). Either AUTO, meaning that the observation was transmitted with no human intervention, or COR, meaning that a human observer corrected the observation. This identifier can also be left blank if neither term apply.

A2.1.2.5. Wind (5). The first three digits provide the direction the wind is coming from in degrees (220) calculated clockwise from north. The next two (or three) digits are the sustained wind speed (08), G = gusts and the last two (or three) digits are the gust speed (15) measured in knots.

A2.1.2.6. Prevailing Visibility (6). The greatest distance that features can be distinguished through at least half the horizon circle, reported in statute miles (SM). The most common visibility reported is 7 miles, however Malmstrom’s FMQ-22 reports up to 10 miles.

A2.1.2.7. Present Weather (7). This is any weather phenomenon that is occurring on the airfield. This is mandatory anytime the visibility is less than 7 miles. **Table A2.1** lists the present weather codes.

Table A2.1. Weather Phenomena Codes.

Qualifier		Weather Phenomena		
Intensity	Descriptor	Precipitation	Obscuration	Other
- Light	MI Shallow	DZ Drizzle	BR Mist	PO Dust/Sand Whirl
Moderate	PR Partial	RA Rain	FG Fog	SQ Squall
+ Heavy	BC Patches	SN Snow	FU Smoke	FC Funnel Cloud or Tornado
VC Vicinity	DR Low Drifting	SG Snow Grains	VA Volcanic Ash	SS Sandstorm
	BL Blowing	IC Ice Crystals (diamond dust)	DU Dust	DS Dust Storm
	SH Showers	PL Ice Pellets (sleet)	SA Sand	
	TS Thunderstorm	GR Hail (≥1/2”)	HZ Haze	
	FZ Freezing	GS Small Hail or Snow Pellets (graupel)	SP Spray	
		UP Unknown Precipitation		

A2.1.2.8. Cloud Height (8). The first three characters describe the amount of clouds present at the airfield. They fall into the following categories:

A2.1.2.8.1. CLR – Clear Sky

A2.1.2.8.2. FEW – Few; 1/8 to 2/8 coverage

A2.1.2.8.3. SCT – Scattered; 3/8 to 4/8 coverage

A2.1.2.8.4. BKN – Broken; 5/8 to 7/8 coverage

A2.1.2.8.5. OVC – Overcast; 8/8 coverage

A2.1.2.8.6. VV – Vertical visibility; normally used during heavy fog, indicates how far up into the fog can be seen.

A2.1.2.8.7. The last three digits (none for SKC) is the height above the airfield of the clouds in hundreds of feet (080=08000 or 8,000ft and 110=11000 or 11,000ft).

A2.1.2.9. Air Temperature/Dew Point (9). These are in °C with negative temperatures designated with an M (M09 = -9°C).

A2.1.2.10. Altimeter Setting (10). This is in inches of Hg (A3007 = 30.07 in Hg).

A2.1.2.11. RMK (11). This is the beginning of the "remark" section. A plethora of information can be added to this section (see **Table A2.2** for commonly seen items). For simplicity, only the items in this example will be addressed.

A2.1.2.11.1. AO2. Automated site.

A2.1.2.11.2. SLP213. Sea Level Pressure in millibars (mb). If the digits are less than 700, then place a 10 in front and a decimal one from the end (213 = 1021.3mb). If the digits are greater than 700, place a 9 in front and a decimal one from the end (988 = 998.8mb)

A2.1.2.11.3. T01060067. Actual temperature and dew point. First four digits are temperature to one decimal place (0106 = 10.6°C) and the last four digits are dew point to one decimal place (0067 = 6.7°C).

A2.2. Common Remarks is RMK Section.

Table A2.2. Common Remarks is RMK Section.

A02A – Automated site which is being augmented by a human observer	
CB – Cumulonimbus	CONS – Continuous
DA – Density Altitude	DSIPTD – Dissipated
DSNT – Distant	FROPA – Frontal Passage
ESTMD – Estimated	LTG - Lightning
FRQ – Frequent	MOV – Moving
LWR – Lower	OCNL – Occasional
MOVD - Moved	OHD – Overhead
PA – Pressure Altitude	PK WND – Peak Wind
PRESFR – Pressure Falling Rapidly	PRESRR – Pressure Rising Rapidly
RWY – Runway	T – Towering
TCU – Towering Cumulus	TWR – Tower
UNKN - Unknown	VIS – Visibility
WSHFT – Wind Shift	STNRY – Stationary
$ - A fault with one of the sensors has been detected	

Table A2.3. Terminal Aerodrome Forecast (TAF).

KGFA 2511/2617 31005KT 9999 SCT015 SCT250 QNH3015INS BECMG 2514/2515 03009KT 9999 SCT027 BKN250 QNH3010INS BECMG 2517/2518 12010KT 5000 SHRA SCT010 BKN025 OVC080 QNH3005INS TEMPO 2519/2522 VRB10G20KT 0800 TSRA SCT008 BKN015CB OVC030 TX24/2600Z TN10/2610Z The forecast follows the same general format as the observation with the following exceptions:

A2.2.1. Valid Date /Time. Forecasts are generally valid for a 30-hour period. In this example the forecast is valid from the 25th at 1100 Zulu (or GMT) until the 26th at 1700 Z.

A2.2.2. BECMG. This is a code to indicate that the predominant conditions of the previous line will change to (or become) the conditions listed in that line of the forecast. The conditions will change during the time period that follows the BECMG code (1400 to 1500 Z or 1700 to 1800Z in the above example).

A2.2.3. TEMPO. This code means that the conditions listed on that line will occur at least once anytime between the time frame following the TEMPO code (1900Z to 2200Z in this example) and last for less than 30 total minutes of each hour (45 minutes or less for thunderstorms).

A2.2.4. QNH3015INS. Altimeter Setting 30.15 in Hg and is the lowest expected for the valid time period.

A2.2.5. Max Temp/Min Temp (TX24/2600Z TN10/2610Z). TX24/2600Z indicates a maximum temperature of 24 Celsius to occur on the 26th at 00Z. TN10/2610Z indicates a minimum temperature of 10 Celsius to occur on the 26th at 10Z (note: M indicates a minus sign in front of the number: TNM05 = -5 C).

A2.3. Weather Warnings Samples.

A2.3.1. Observed Weather Advisory.

Table A2.4. Weather Advisory.

VALID 30/2200Z (30/1600L) TO UFN FRESH SNOW ADVISORY FOR: 10TH MISSILE SQUADRON SNOW ADVISORY FOR FRESH SNOWFALL 1/2" OR GREATER, BUT LESS THAN 6” IS OBSERVED FOR THE 10TH MS.

A2.3.2. Weather Watch.

Table A2.5. Weather Watch.

VALID 02/1200Z (02/006L) TO 03/1800Z (03/1200L)

Table A2.6. Heavy Snow Watch.

FOR: 490TH MISSILE SQUADRON CONDITIONS ARE FAVORABLE FOR THE DEVELOPMENT OF 6” OR MORE OF FRESH SNOWFALL. A HEAVY SNOW WARNING WILL BE ISSUED WHEN 6” OR MORE OF FRESH SNOW IS IMMINENT.

A2.3.3. Observed Weather Warning.

Table A2.7. Weather Warning.

VALID 30/2043Z (30/1443L) TO UFN LIGHTNING WARNING FOR: MALMSTROM AFB LIGHTNING IS OCCURING WITHIN 5 NM OF MALMSTROM AFB.

A2.3.4. Forecast Weather Warning.

Table A2.8. Weather Warning.

VALID 30/2100Z (30/1500L) TO 30/2300Z (30/1700L) HIGH WIND WARNING FOR: 341ST MISSILE COMPLEX HIGH WINDS GREATER THAN OR EQUAL TO SUSTAINED 35 KTS AND/OR GUST 52 KTS ARE FORECAST TO OCCUR.

Attachment 3

SPECIAL WEATHER OBSERVING CRITERIA

A3.1. SPECI. A special weather observation (SPECI) will be taken and disseminated during airfield operating hours for criteria listed in this attachment.

A3.1.1. Ceiling (automated). When the ceiling goes below or, if below, increases to equal or exceed any of the values listed below:

Table A3.1. Ceiling (automated).

Height (feet)
3000FT
2000FT
1500FT
1000FT
800FT
700FT
500FT
300FT
200FT
100FT

A3.1.2. Visibility (automated). When visibility goes below or, if below, increases to equal or exceed any of the values listed below:

Table A3.2. Visibility (automated).

Visibility (statute miles)
3SM
2SM
1 1/2SM
1SM
3/4SM
1/2SM
1/4SM

A3.1.3. Weather (automated).

A3.1.3.1. Precipitation (any form).

A3.1.3.2. Thunderstorms.

A3.1.3.3. Fog or mist.

A3.1.4. Weather (manual augmentation).

A3.1.4.1. Volcanic eruption or ash cloud when first observed.

A3.1.4.2. Hail begins or ends.

A3.1.4.3. Tornado, Funnel Cloud, or Waterspout.

A3.1.4.3.1. Observed.

A3.1.4.3.2. Disappears from sight or ends.

A3.1.4.4. Upon Resumption of Observing Function.

A3.1.4.5. A Single-Element Special Observation. It is taken only when a delay in reporting all elements would cause an immediate threat of life or property (e.g., tornadoes).

A3.1.4.6. Aircraft Mishap.

A3.1.4.7. Any other meteorological situation, which in the opinion of the weather personnel is significant to the safety of aircraft operations or resource protection.

Attachment 4

FORECAST SPECIFICATION AND AMENDMENT CRITERIA

A4.1. Specification criteria. The TAF will specify the time of occurrence, the duration, and the intensity (if applicable) of expected weather conditions. The following weather criteria will be specified in TAFs if expected to occur during the forecast period.

A4.1.1. Ceiling is forecast to decrease less than, or if below, is forecast to equal or exceed any of the following levels:

Table A4.1. Ceiling (feet).

Ceiling (feet)
GTE 2000FT
LT 2000FT but GTE 1000FT
LT 1000FT but GTE 700FT
LT 700FT but GTE 500FT
LT 500FT

A4.1.2. Visibility is forecast to decrease, or if below, is forecast to increase to equal or exceed any of the following value:

Table A4.2. Visibility (statute miles).

Visibility (statute miles)
GTE 3SM
LT 3SM but GTE 2SM
LT 2SM but GTE 1SM
LT 1SM but GTE 1/4SM
LT 1/4SM

A4.1.3. A change in wind speed of 10 knots or more, or a change in wind direction greater than 30 degrees when the predominant wind speed or gust is expected to be in excess of 15 knots.

A4.1.4. Icing and/or turbulence at or below 10,000 feet not associated with thunderstorms.

A4.1.5. Precipitation.

A4.1.6. Any weather warning or advisory criteria that can be specified in the TAF.

A4.1.7. Thunderstorms.

A4.2. TAF Amendment Criteria. The TAF will be amended by the 341 OSS/OSW for the following amendment criteria listed:

A4.2.1. When the ceiling or visibility is observed, or later forecast, to increase to or exceed, or decrease to less than any of the following levels and was not specified in the TAF. Ceiling (feet) Visibility (statute miles)

Table A4.3. Ceiling (feet)/Visibility (statute miles).

Ceiling (feet)	Visibility (statute miles)
GTE 2000FT	GTE 3SM
LT 2000FT but GTE 1000FT	LT 3SM but GTE 2SM
LT 1000FT but GTE 700FT	LT 2SM but GTE 1SM
LT 700FT and GTE 500FT	LT 1SM but GTE 1/4SM
LT 500FT	LT 1/4SM

A4.2.2. Wind Speed: The difference between the sustained wind speed and the forecast wind speed is > 10 knots and/or the difference between the observed gusts is > 10 knots from the forecast gust. For example, amend a forecast specifying surface winds of 23018G25KT if observed sustained wind speed is 28 knots or more, or if the observed gusts are 35 knots or higher. Similarly, amend the TAF if sustained winds are 8 knots or less, or gusts are 15 knots or less. Wind Direction: A change >30 degrees when the sustained wind speed or gusts are expected to be over 15 knots.

A4.2.3. Precipitation when:

A4.2.3.1. Un-forecasted freezing precipitation begins or ends.

A4.2.3.2. The beginning or ending of precipitation causes local weather warnings or advisories that can be specified in the TAF, to be issued, canceled, or amended.

A4.2.3.3. The forecaster considers the occurrence or nonoccurrence of precipitation to be operationally significant.

A4.2.4. Icing, not associated with thunderstorms, from the surface to 10,000 feet AGL. The beginning or ending of icing first meets, exceeds, or decreases below light or greater thresholds and was not specified in the forecast.

A4.2.5. Turbulence (for Cat II aircraft), not associated with thunderstorms, from the surface to 10,000 feet AGL is expected. The beginning or ending of turbulence first meets, exceeds, or decreases below light or greater thresholds and was not specified in the forecast. Note: the 341 OSS/OSW tailors this information to account for CAT 1 aircraft.

A4.2.6. Weather warning and/or TAF amendable weather advisory criteria:

A4.2.6.1. Occur, or are expected to occur, during the forecast period, but were not specified in the forecast.

A4.2.6.2. Were specified in the forecast but are no longer occurring or expected to occur during the forecast period.

A4.2.7. Specification of Temporary Conditions: Forecast conditions specified as temporary become predominant conditions. Forecast conditions specified as temporary do not occur as forecast. Forecast conditions specified as temporary are no longer expected to occur.

A4.2.8. Changes to Predominant Conditions: Forecast change conditions (BECMG group) occur before the beginning of the specified period of change and are expected to persist. Forecast change conditions (BECMG group) do not occur by the specified time. Forecast change conditions (BECMG group) are no longer expected to occur.

A4.2.9. Representative Conditions: Forecast conditions are considered unrepresentative of existing or forecast conditions and amending the forecast improves safety, flight planning, operations efficiency, or assistance to in-flight aircraft.