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OF THE AIR FORCE**

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Volume 2**



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Weather

**AIR AND SPACE WEATHER
OPERATIONS – EXPLOITATION**

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This manual implements Air Force Policy Directive (AFPD) 15-1, *Air Force Weather Operations*. This publication applies to all organizations in the US Air Force (USAF) with weather forces assigned, to include Air Force Reserve Command (AFRC), Air National Guard (ANG) and government-contracted weather operations if stated in the Statement of Work (SOW) or Performance Work Statement (PWS). This publication provides Air Force weather personnel and organizations guidance on how to accomplish operations for integration and exploitation as described in AFI 15-128, *Air Force Weather Roles and Responsibilities* and Army Regulation 115-10/AFJI 15-157 (IP), *Weather Support for the US Army*. Major commands (MAJCOMs), field operating agencies (FOAs) and direct reporting units (DRUs), send one copy of supplements to AF/A3O-W, 1490 Air Force Pentagon, Washington DC 20330-1490 for coordination. Refer recommended changes and questions about this publication to the office of primary responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Form 847s from the field through the appropriate functional chain of command. MAJCOM Functionals, FOAs, and DRUs send one copy of implementing instructions to AF/A3O-WP, 1490 Air Force Pentagon, Washington, DC 20330-1490 for review and coordination.

Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) AFMAN 33-363, *Management of Records* and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at <https://www.my.af.mil/afrims/afrims/afrims/rims.cfm>. This publication applies to AFRC units and to the ANG. Effective use of the guidance and procedures in this manual will enhance

the quality, timeliness, and relevance of air and space weather information, products, and services. In this manual, “will” and “shall” indicate mandatory requirements. “Should” is used to indicate a preferred but not mandatory practice or method of accomplishment. “May” indicates an acceptable or suggested method of accomplishment.

SUMMARY OF CHANGES

This manual has been divided into two volumes and must be completely reviewed. Volume One contains information on overarching weather principles and weather characterization, Volume Two contains information concerning integration and exploitation of weather data. Guidance specific to the unique operations of Special Operations Weather Teams (SOWT) will be maintained in AFI 15-135, *Special Operations Weather*.

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Chapter 1

STAFF INTEGRATION FUNCTION

1.1. Weather Integration and Exploitation. Exploitation/integration applies to all weather organizations responsible for delivering environmental information for a military operation. Weather exploitation units (EU) provide direct or continuing support to a mission set and determine both environmental threats and effective decision points to inject weather into the planning and execution process of the mission. This allows for development of courses of action during the planning process to mitigate these threats. The outcome of these processes is the delivery of decision-quality environmental information to decision-makers. Decision-quality environmental threat information requires mission specific thresholds, adjusted for temporal and spatial resolution, be applied to characterization products. The timing and format of this information will be coordinated with the end user to ensure its effectiveness in the decision-making process.

1.2. Exploitation Units.

1.2.1. EUs will use the Mission Execution Forecast Process (MEFP) to tailor weather products and provide decision-quality environmental information for mission planning and execution for their supported unit. EU personnel will understand their unit's mission and tactics, along with characterization unit (CU) capabilities in order to better anticipate, exploit and integrate weather information. EU personnel are also responsible for direct interface with supervisors of flying (SOF), Air Traffic Control (ATC), Operations Centers, the servicing OWS, and other operational users in the supported unit. EU leadership will also infuse elements of weather observing, meteorological watch (METWATCH), and resource protection roles (e.g., Severe Weather Action Plan (SWAP)) into keeping the servicing CU informed of current weather. EUs will participate in CU collaboration sessions to focus on product fidelity/accuracy with respect to operational thresholds.

1.2.2. Staff Integration functions. EU leadership will ensure their unit is adequately resourced to meet both operational and staff requirements. In addition to leadership and management of unit activities, these unit members will also function as a direct interface with the supported unit commander and staff, and provide direct support to command, control and planning functions. If additional resources are required to perform operational or staff functions, EU leadership will submit a request through their supported unit chain of command.

1.2.2.1. All members of the EU (including the Commander/Officer in Charge (OIC), Noncommissioned Officer in Charge (NCOIC), or civilian equivalent(s)) will be position qualified on all tasks for their duty positions. OIC/NCOIC/civilian equivalent(s) will be position qualified on all unit duty positions.

1.2.2.2. Members will use the MEFP to tailor weather products and provide decision-quality environmental information for mission planning and execution for their supported unit.

1.2.3. Optimum integration incorporates the continuous feed of information into the planning and execution processes. EUs that are fully integrated seamlessly operate with their

supported unit(s) by operating and training with them to conduct full-spectrum operations and provide continuous weather information into the decision-making process.

1.2.3.1. EUs will develop SOPs to incorporate weather information into the daily operations of their supported unit(s).

1.2.3.2. EUs will develop, conduct and participate in training that incorporates supported unit(s) mission and tactics.

1.2.4. Weather forces supporting Air Force operations will maintain the capability to deploy to main (and forward area) operating locations in support of their aligned AF aircraft, unit, warfighting weapon systems or as described in their DOC statement.

1.2.4.1. AFW personnel will integrate into warfighting headquarters, Air and Space Operations Centers (AOCs), and flying wing/group/squadron mission planning cells to enable warfighters to fully exploit weather and space environmental information.

1.2.4.2. EUs will encourage supported commanders to include weather forces in operational exercises to provide combat-related training and gain experience with aircrews and ground forces in simulated, yet realistic, wartime environments.

1.2.5. EUs supporting US Army operations will maintain the capability to deploy to main (and forward area) operating locations in support of their aligned warfighting unit or as described in their DOC statement.

1.2.5.1. EUs supporting Army operations will integrate with the intelligence, operations and planning cells (i.e., S2, S3, S5) of their aligned warfighting unit.

1.2.5.2. The supporting weather squadron will provide appropriate weather representation to their aligned Army unit and assist the Commander Air Force Forces Staff Weather Officer (COMAFFOR SWO) in employing AFW forces supporting Army operations, as required.

1.2.6. Forward-deployed AFW forces supporting military operations will leverage environmental characterization information from centralized weather organizations via a combination of reachback and distributed operations to provide tailored environmental effects information essential to planning and executing land operations.

1.3. Documentation. EU leadership will ensure that information on weather services are documented in respective supported unit operations plans, contingency plans, memoranda of understanding, host-tenant support agreements, emergency management plan(s), airfield local operating procedures, weather support plan or SOPs. MAJCOM Functionals may publish overarching weather plans, supplements and/or annexes to describe MAJCOM-unique weather operations requirements, processes or products that address all or part of the documentation requirement.

1.3.1. Weather annexes and plans will be reviewed and revised no greater than biennially or IAW with host/parent unit procedures if the time is less than biennially. EU leadership will initiate an out-of-cycle formal review to accurately reflect operational changes resulting from supported unit mission changes, equipment upgrades or significant changes in overarching guidance.

1.3.2. Weather operations information in Operation Plans (OPLANs) annexes will be clearly written and agree with other prescribing directives. Where technical terms are necessary, ensure they are defined. Normally, weather information included in another document is not repeated; a reference will suffice. However, if the customer does not have access to the referenced material, include pertinent elements of the information in the annex. Attachments and appendices are acceptable methods of documenting information such as Aviation Selected Special Weather Report (SPECI) observation criteria and product formats.

1.3.3. EUs will at a minimum formally document information and procedures pertaining to the following when applicable:

1.3.3.1. EU Duty Priorities as determined by mission requirements (see examples of duty priorities in [Table 1.1](#)), hours of operations and contact information.

Table 1.1. Example Duty Priorities (EU)

<i>Order Of Priority</i>	<i>Duties</i>
1	Perform EU Emergency War Order (EWO) Taskings.
2	Execute EU Evacuation.
3	Respond To Aircraft/Ground Emergencies.
4	Respond to Pilot to Metro Service (PMSV) Contacts.
5	Provide Weather Information for Supervisor of Flying (SOF).
6	SWAP Operations.
7	Augment Automated Meteorological Observing System Observations for Mandatory Elements.
8	Collaborate with CU.
9	Mission Execution Forecast Process -- Produce and Disseminate Forecasts.
10	Disseminate Urgent PIREPs.
11	Disseminate PIREPs.
12	Perform MISSIONWATCH Activities.
13	Provide Briefings.
14	Weather Functional Training.
15	Accomplish Administrative Tasks.

1.3.3.2. Airfield SPECI observation criteria.

1.3.3.3. Airfield LOCAL observation criteria (manual observing stations only).

1.3.3.4. Limitations of airfield weather sensors (i.e., blocked wind sensors).

1.3.3.5. Details of the Cooperative Weather Watch with ATC.

1.3.3.6. Resource protection and emergency actions resulting from weather events/natural disasters.

1.3.3.7. Watch, Warning, and Advisory criteria, lead times and areas of coverage.

1.3.3.8. Dissemination Processes (i.e., Pyramid alert scheme, both primary and backup) and watch/warning numbering.

1.3.3.9. Alternate Operating Location (AOL) (e.g., location, limitations, contact information).

1.3.3.10. Relaying tropical storm warnings (if applicable).

1.3.3.11. Severe Weather Action Procedures.

1.3.3.12. Weather services provided to supported unit(s) and all tenant/associate units on the installation.

1.3.3.13. Mission-limiting environmental conditions.

- 1.3.3.14. Flying/Non-Flying/Space Missions.
 - 1.3.3.15. Weather Forecast Information/Mission Weather Product (MWP) Product Descriptions (e.g., sample products, formats, delivery methods, decoding).
 - 1.3.3.16. Tactical Decision Aid (TDA) Information (if applicable).
 - 1.3.3.17. Bioenvironmental information (i.e., wind chill, heat stress).
 - 1.3.3.18. MISSIONWATCH (e.g., MWP amendment criteria, dissemination of MWP amendments).
 - 1.3.3.19. Pilot-to-Metro Service (e.g., radio frequency, number for phone patches, limitations, and outage procedures).
 - 1.3.3.20. CU-EU Interactions.
 - 1.3.3.20.1. CU Responsibilities (e.g., information, products, services).
 - 1.3.3.20.2. EU Responsibilities (e.g., information, products, services).
 - 1.3.3.20.3. Obtaining weather information when the EU is unavailable (i.e., closed, deployed, evacuated).
 - 1.3.3.20.4. Back-up support provided by the EU in the event of an OWS interruption (e.g., product assumption, duration). EUs will ensure they have procedures established to assume flight weather briefing support, local Terminal Aerodrome Forecast (TAF) and weather watch, warning and advisory responsibility during significant OWS communication outages, evacuations or catastrophic events.
 - 1.3.3.21. Eyes Forward - Collaboration Procedures.
 - 1.3.3.22. Staff Meteorological Functions.
 - 1.3.3.23. Emergency/Crisis Action Response.
 - 1.3.3.24. Climatology services.
 - 1.3.3.25. Instrument refresher course briefings.
 - 1.3.3.26. ATC limited observation program.
 - 1.3.3.27. Pre-deployment planning.
 - 1.3.3.28. Installation Data Page
- 1.3.4. EUs will document supported units weather sensitivities and will review and update sensitivities on a frequency not to exceed one year.
- 1.3.5. EUs will also document other training areas used (e.g., drop zone, landing zone).
- 1.3.6. EUs providing lightning warnings to off-base customers will document the supported agencies requirements in local operations plans and annexes or the installation data page as appropriate.
- 1.3.7. To ensure the most current forecast reference materials (FRM) are on file, EUs will forward newly created or updated documents to their servicing OWS. Servicing OWSs will review and maintain the material for active locations. OWSs will submit material for

deactivated units for archive and historical reference to the Air Force Weather Technical Library (AFWTL) (HQ AFWA/A6OK).

1.3.8. Forecast Techniques and Rules of Thumb (ROT). Weather organizations will determine which forecast techniques and ROTs are applicable and integrate them into the forecast process.

1.3.8.1. ROTs are locally developed forecasting and product tailoring tools. EUs will forward ROTs to their servicing OWS for validation and documentation of forecast effectiveness. ROTs under development will be designated as “experimental” in local procedures and OWS-maintained FRMs until validated.

1.3.8.2. To validate a ROT, use it with other forecast tools and techniques for at least one season to determine its forecast accuracy. If the ROT is valid and adds value, integrate the ROT into unit processes and procedures. Modify and revalidate or discard a ROT that cannot be validated.

1.3.8.3. Servicing OWS submits validated ROTs that may be useful to other units for inclusion in the AFWTL.

1.3.8.4. Incorporate validated ROTs into OWS-maintained FRMs.

1.3.9. EUs will document important elements of their operations within formal written documentation (e.g., Standard Operating Procedures or Operational Instructions).

1.3.9.1. EUs will develop and maintain SOPs. Unit SOPs will be located where they effectively and efficiently aid the unit in meeting operational objectives.

1.3.9.2. EU leadership will review SOPs for accuracy within 90-days of a change in EU leadership, when mandated changes occur within the organization, and/or at a frequency not to exceed one year from the current publication date. SOPs will be horizontally consistent with other weather documents (e.g., plans and annexes, airfield local operating procedures, installation data page).

1.3.9.3. All EU personnel will review SOPs applicable to the areas for which they are position-qualified at least annually. EU leadership will ensure this review is documented.

1.3.9.4. AF weather organizations will develop and maintain SOPs for the following areas when applicable:

1.3.9.4.1. Open/Close procedures (may be in a checklist form).

1.3.9.4.2. Severe Weather Action Plan (SWAP) procedures.

1.3.9.4.3. Take/augment/ disseminate observations using Automated Meteorological Observing System (AMOS).

1.3.9.4.4. Manual observing and dissemination procedures.

1.3.9.4.5. SPECI and LOCAL criteria.

1.3.9.4.6. ATC Cooperative Weather Watch procedures.

1.3.9.4.7. PIREP procedures.

1.3.9.4.8. Mission Weather Product Procedures.

- 1.3.9.4.9. Disseminating weather decision aids/forecast products procedures.
- 1.3.9.4.10. MISSIONWATCH procedures.
- 1.3.9.4.11. Post-mission analysis.
- 1.3.9.4.12. Lead weather unit (LWU) procedures.
- 1.3.9.4.13. Arranging weather support operations for supported unit(s) from another weather unit.
- 1.3.9.4.14. Continuity of Operations Procedures (COOP)/ AOL procedures to include:
 - 1.3.9.4.14.1. Weather equipment outage and backup procedures.
 - 1.3.9.4.14.2. Communications outage and backup procedures.
 - 1.3.9.4.14.3. EUs will establish procedures to provide back-up capabilities for all required OWS products in the event that the supporting OWS initializes their COOP operations IAW AFMAN 15-129 VOL 1.
- 1.3.9.4.15. Aircraft/Ground Mishap.
- 1.3.9.4.16. CBRN support.
- 1.3.9.4.17. Before and After-the-Fact Quality Assurance for non-automated products.

1.4. CU – EU Documentation and Collaboration. This section provides direction on the establishment of support between the CU and its supported EUs. This structure implements the roles and responsibilities covered in AFI 15-128, *Weather Roles and Responsibilities*, including those that apply to establishment of installation data pages in place of previous individual memorandums of agreement (MOAs). Items deemed unique or specific at the MAJCOM level will be addressed in supplements to this instruction.

1.4.1. CU/EU Documentation.

1.4.1.1. The installation data page will include, but is not limited to:

- 1.4.1.1.1. EU primary/AOL contact information.
- 1.4.1.1.2. TAF Specification and Amendment (SPEC/AMD) criteria.
- 1.4.1.1.3. Weather watch, warning and advisory (WWA) criteria, lead times and areas of coverage.
- 1.4.1.1.4. SWAP activation criteria.
- 1.4.1.1.5. Primary/alternate POC for WWA dissemination.

1.4.1.2. EU leadership will review installation data pages within 90 days of assignment or annually, whichever occurs first; to ensure consistency with supported unit requirements. Updated/reviewed installation data pages will have the date of review or updated publication date published on the document. EU leadership will inform the CU of any changes that occur on the installation to update the installation data page. Any support issue between the CU and the EU that cannot be resolved at the appropriate subordinate levels through the chain of command will be elevated to the functional higher headquarters for resolution.

1.4.2. Collaboration. CU-EU leadership will emphasize the importance of teamwork, open lines of communication, and constructive feedback.

1.4.2.1. The CU and EU together will:

1.4.2.1.1. Ensure the timely issuance of WWAs with supported customers.

1.4.2.1.2. Establish procedures to manage severe weather threats, to include recalling of weather personnel.

1.4.2.1.3. CUs will determine mandatory forecast review criteria of severe weather events as required. EUs may request reviews for severe weather events that negatively influence the effective execution of military operations. The CU is the primary OPR for the formal review, and the EU will provide inputs and coordination, as required.

1.4.2.1.4. Assist the installation commander and disaster preparedness personnel providing technical material and/or developing presentations to educate installation agencies on the purpose, applicability and operating procedures of the weather watch and warning system.

1.4.2.2. EUs will provide feedback to the CU on the accuracy, timeliness and relevance of weather products and information. Route reports of unsatisfactory products or services at the lowest levels of operations. Forward all unresolved issues to the CU Operations Superintendent and/or Director of Operations through the EUs similar chain of command (Operations Superintendent/Director of Operations, etc.).

1.4.2.3. Limited duty EUs will coordinate weather support for their supported organizations during their hours of closure far enough in advance with the servicing CU to ensure proper hand off of support. EUs will notify their supporting CU upon closing of operations and verify finalization of support arrangements including flight weather briefings.

1.4.2.4. Limited duty EUs will notify their servicing CU when resuming operations at the beginning of their operational duty day. EUs will use this contact to gain environmental situational awareness of current and forecast conditions, discuss any active/imminent resource protection products and receive handover of flight briefing responsibility.

1.4.2.5. EU leadership will forward updated changes in documented support to their servicing CU, as required. If these updates drive further changes to CU-EU operations, prior coordination between CU-EU leadership is mandatory. Agreed upon changes will be documented on the installation data page.

1.4.2.6. EUs will notify the CU Operations Superintendent or regional zone OIC when temporary changes to duty hours occur (e.g., Family Day, Goal Day, other closures/extensions). This notification will be made no later than 24 hours in advance of the closure to allow the CU to reallocate its resources, as required.

1.4.2.7. EUs will review the FRM for the installation hosted electronically by the CU at least annually. Provide updates (e.g., new airfield weather sensors, local mission types) to allow the CU to update the installation's electronic FRM, as required.

1.5. Expeditionary Operations. Expeditionary operations outlined below are for units that are preparing for new or emerging requirements (e.g., non-sustainment operations) and will deploy with their supported unit. Individual weather personnel will deploy IAW pre-deployment checklists and procedures outlined by their supported unit.

1.5.1. Pre-deployment Activities. Prior to deployment, weather organizations will follow procedures outlined in AFI 15-127, *Air Force Weather Training* and the following:

1.5.1.1. Collect Go/No-Go thresholds for the deployed location using deployed mission and operational requirements, rules of engagement, and theater specific environmental impacts of the supported unit.

1.5.1.2. Participate in pre-deployment planning to ensure theater-specific environmental impacts are factored into supported unit deployment activities.

1.5.1.3. Develop tactical SOPs that incorporate major functions of daily supported activities (e.g., duty priorities, manual observing and augmentation of automated sensors). Duty priorities should be coordinated with the supported unit. Duty priorities in **Table 1.2** are provided as an example.

Table 1.2. Example Duty Priorities for Deployed/Expeditionary EUs

Wartime defense of the duty site/location, including CBRNE defense measures.
Wartime support of the principal staff elements.
Aircraft/ground emergencies.
PMSV calls.
Prepare and disseminate Weather Watches/Warnings/Advisories.
Augment AMOS/Take and record manual surface weather observations.
Maintain/restore primary communications.
Prepare/issue Mission Weather Products.
Other briefings and staff functions.
Note: Based on the judgment of the OIC, NCOIC, or the EU technician on duty, these priorities may be changed, especially if there is danger to life or property.

1.5.2. Deployed equipment.

1.5.2.1. EUs will deploy with unit type code (UTC) tasked equipment and weapons. Requests for additional equipment will be submitted through MAJCOM Functional channels.

1.5.2.2. Inventory tasked equipment before deployment and upon arrival.

1.5.3. EU members deploying to a contingency theater will follow reporting instructions listed on their orders, and other applicable guidance provided by the Joint Meteorological and Oceanographic Officer (JMO) Meteorological and Oceanographic (METOC) Letter of

Instruction (LOI) or Expeditionary Weather Squadron/ Expeditionary Operations Support Squadron.

1.6. Support Assistance Request (SAR).

1.6.1. AF weather organizations and other supported units will submit a SAR when requesting specialized terrestrial, space, or climatological services from supporting weather organizations (e.g., AFWA, 14 WS), or specialized theater-level support from servicing OWSs for their respective AOR.

1.6.2. Organizations will submit requests for unclassified support directly to the appropriate supporting weather organizations or OWS using the SAR function on the applicable web page. Organizations may also submit requests for unclassified support via telephone, fax, or e-mail when the applicable web page is not available.

1.6.3. Organizations will submit requests for classified support using the SAR function on Secure Internet Protocol Router Network (SIPRNET) or other classified dissemination systems. Organizations may also submit requests for classified support via secure telephone, fax, or e-mail when the applicable web page is not available.

1.6.4. Organizations must provide as much detail as possible in order to clearly state the requirement. If there is a problem in providing the support, the supporting weather organization or OWS will contact the requestor to clarify the requirement and to discuss alternatives.

1.6.5. To determine the servicing OWS in an AOR, refer to Air Force Visual Aid (AFVA) 15-136, *AF Weather OWS AORs-CONUS* and AFVA 15-137, *AF Weather OWS AORs - OCONUS* available on the Air Force Departmental Publishing Office (AFDPO) web site (i.e., Air Force e-Publishing website).

1.6.6. Organizations may submit SARs for recurring, infrequent or one-time support. If the SAR is for support that must be delivered under strict time constraints, organizations will submit the SAR far enough in advance to allow the supporting weather organization or OWS to work the request effectively. For recurring support, organizations may develop a "pre-positioned" SAR with the appropriate supporting weather organization or OWS that may be activated short-notice by telephone, fax, or e-mail.

1.6.7. EUs will direct agencies needing specialized support to the appropriate supporting weather organizations or OWS and guide them through the SAR process to make their request.

1.7. KQ Identifiers. AFWA, acting on behalf of all the United States military services, assigns special use ICAO identifiers beginning with "KQ", for use by deployed units supporting real-world contingencies; deployed/in-garrison units providing support during exercises; classified operating locations; and units that have requested, but not yet received a permanent location identifier.

1.7.1. Exploitation Units will:

1.7.1.1. Request KQ IDs through the lead METOC element to HQ AFWA's Current Operations Division:

1.7.1.1.1. During normal duty hours (non-holiday weekdays 0700L-1600L, U.S. Central Time): Non-secure: DSN (312) 271-5984 or 272-3162 / Commercial (402) 294-5984 or 232-3162, or e-mail afwakq@offutt.af.mil Secure: DSN (312) 272-4390, or e-mail AFWAOPS@offutt.af.smil.mil.

1.7.1.1.2. During non-duty hours (after 1600L/before 0700L, U.S. Central Time, weekends and holidays) or in case of emergency: Non-secure: e-mail afwaops@afwa.af.mil Secure: DSN (312) 272-4390, or e-mail AFWAOPS@offutt.af.smil.mil.

1.7.1.1.3. All requests for KQ IDs should be made as far in advance as possible to ensure timely issuance.

1.7.1.1.4. For peacetime KQ identifier requests, the Air Force lead METOC element is normally the MAJCOM Functional Manager, the Navy lead METOC element for KQ requests is normally Fleet Numerical METOC Center (FNMOC), and the Marine Corps lead element is the Marine Expeditionary Force (MEF) SWO. For wartime and contingency operations, the lead METOC element is the Senior METOC Officer (SMO) responsible for establishing the weather force for the particular contingency. The SMO may designate a Joint METOC Officer (JMO) to execute this responsibility. Requestors, through the lead METOC element or SMO/JMO, will provide the following information:

1.7.1.1.4.1. Start and stop dates (if known).

1.7.1.1.4.2. Name, organizations, e-mail address, and DSN/commercial phone number of POC.

1.7.1.1.4.3. Classification of location and supported operation or exercise.

1.7.1.1.4.4. Name of exercise, test, contingency, etc.

1.7.1.1.4.5. Releasability (for non-DoD use or handled as “sensitive” non-releasable).

1.7.1.1.4.6. Location name, latitude, longitude, and elevation; must specify whether in degrees/minutes/feet or degrees/decimal/meters. **Note:** AFWA will convert all lat/lon readings into degrees/minutes.

1.7.1.1.4.7. Runway headings for airfield primary runways (if available).

1.7.1.1.4.8. Observation equipment to be used.

1.7.1.1.4.9. Military Grid Reference System (MGRS) coordinates (if known).

1.7.1.1.4.10. World Meteorological Organization number/block station number (if assigned).

1.7.2. Once this information is provided, the KQ ID manager will issue a new KQ ID. If mission and time constraints limit the amount of information the requestor can provide or the ability to submit the request through the lead METOC element, the KQ ID manager will issue a KQ ID and follow up with the POC when time permits.

1.7.3. Once the KQ ID is no longer required, the requestor will contact the KQ ID manager and the lead METOC element to discontinue the use of identifier.

1.7.4. Classified KQ Compromise. Once a classified KQ ID compromise is identified, the individual or organization who discovered the compromise will immediately notify the AFWA KQ ID manager through the operations center, using appropriate security and communication measures.

1.8. Coordinated Weather Operations. Weather organizations must coordinate weather information for missions involving more than one unit or service. Coordinated weather operations ensure decision-makers at every level receive consistent and relevant weather information. It also ensures a comprehensive and standardized set of decision-grade weather information is used and available across all command levels.

1.8.1. When two or more military units operate together and share the same airspace/battlespace (e.g., air refueling routes, military operating areas, drop zones), a lead weather unit (LWU) will be identified using the rules in Table 1.3. as a guide to coordinate overall weather services for the supported mission(s). In some instances, the LWU for a given supported mission is identified in an applicable joint/Air Force letter of instruction, operations plan (OPLAN) or execution order (EXORD). In the absence of such guidance, the EU supporting the mission's command and control (C2) element is the LWU.

1.8.2. Control MWPs (CMWP) are issued by LWUs for common operations area(s) used by multiple units/missions operating together in a shared airspace/battlespace. Supporting EUs will not deviate from the mission-critical weather thresholds specified in CMWPs without prior coordination with the responsible LWU.

1.8.3. The OWS responsible for a geographic region or COCOM AOR is responsible for developing the suite of Operational/Theater-scale products specified in AFMAN 15-129 Volume 1 for its AOR. The OWS will provide model output and manually generated forecast products for military operating areas (e.g., air refueling routes, training area/ranges, drop zones) for use by LWUs/EUs supporting two or more units operating together in a shared airspace/battlespace.

Table 1.3. Prioritized Rules for Determining the Lead Weather Unit

<i>Rule</i>	<i>Type of Mission</i>	<i>Designated Lead Weather Unit</i>
1.	Joint Missions	Joint Meteorological and Oceanographic (METOC) Officer (JMO) defines weather for a Joint Operation in a Joint Operations METOC Letter of Instruction or support message.
2.	GLOBAL POWER	Weather unit providing the Combat Air Force C2 element with weather information. Note: The C2 element for GLOBAL POWER mission is typically delegated to the wing-level.
3.	CORONET	Weather unit providing the ACC C2 element with weather information. Note: Normally the ACC Air Operations Squadron Weather Flight.
4.	Integrated Flight Management (IFM) missions	Weather unit assigned to the IFM C2 element.
5.	GLOBAL REACH	Weather unit integrated with the AMC C2 Element (Note: Normally the 618 AOC (TACC)/XOW).
6.	Air Refueling	Missions Weather unit servicing the lead receiving aircraft unit.
7.	Unmanned Aircraft	Weather unit assigned to the Unmanned Aircraft Operational-Level C2 element (e.g., 432d Wing Operations Center, Global Hawk Operations Center).
8.	Joint Airborne/Air Transportability Training (JA/ATTs) & DZ	Weather unit servicing the lead airlift aircraft unit.
9.	Landing Zones(LZ) & Land Maneuver	Weather unit attached to the lead Army unit.
10.	Deployed or Transient	Weather unit assigned/attached to the unit at home station (i.e., provide or arrange for weather support).
11.	Special Operations	Lead weather unit depends on nature of the operation. (Note: When Special Operations Forces operate solely in their own channels, the Special Operations Forces WF or 23 WS will be the lead weather unit).

1.8.3.1. The LWU will:

1.8.3.1.1. Coordinate with all EUs/CUs involved in the supported mission(s) to identify and obtain point of contact (POC) information (e.g., secure/non-secure telephone numbers, fax numbers, email addresses) for each organization.

1.8.3.2. Collect information to define supported mission schedule(s), types (e.g., aerial refueling, air drops, combat sorties and ground tactics), weapon systems and critical weather thresholds from the supported C2 element and supporting EU/CU POCs.

1.8.3.3. Determine MWP, data and service requirements for the supported mission(s).

1.8.3.4. Coordinate with the supporting OWS(s)/CU(s) to request any specialized forecast products (e.g., JOAF, charts) needed to develop the CMWP, as required.

1.8.3.5. Determine the CMWP format (e.g., text, graphics), content, delivery method/times and amendment criteria. See [Attachment 5](#) for guidance on preparing alphanumeric CMWPs.

1.8.3.6. Coordinate CMWP issue times and delivery methods with the supported C2 element and supporting EUs/CUs involved in the mission(s).

1.8.3.7. Use all applicable supporting OWS/CU forecast products and weather data to develop CMWPs for supported missions.

1.8.3.8. Use the MEFP to predict, tailor, integrate and issue CMWPs for supported missions.

1.8.3.9. Coordinate with all supporting EUs and OWSs/CUs to MISSIONWATCH the CMWP and amend it as required based on mission critical weather thresholds.

1.8.4. Integrated Flight Management (IFM) Missions. IFM is a Mobility Air Force (MAF) core process designed to provide dynamic, proactive mission management and near real-time C2. Flight Managers (FMs) act as virtual crewmembers, using electronic flight planning/filing, flight following, maintenance, transportation and weather resources to centrally plan and aid aircrews in the execution of MAF sorties/missions. Fused flight management information, shared situational awareness, collaborative decision making and dynamic planning/adjustment enable FMs to act as the primary point-of-contact for real-time weather operations for mobility forces around the world.

1.8.4.1. FMs interact with weather agencies much as the flying crewmembers do. FMs review en route hazards, takeoff, arrival and alternate weather, SIGMETs, etc., and often act as the conduit to pass weather information (including the MWP) to the flying crewmembers.

1.8.4.2. Weather operations for IFM missions. [Table 1.4](#) shows the lead weather unit responsible for producing the CMWP and servicing the C2 agency and aircrew for IFM missions.

Table 1.4. Lead Weather Unit for IFM Missions

<u>MAF C2 Agency</u>	<u>Lead Weather Unit</u>	<u>Mission Type</u>	<u>Location/Area</u>
618 AOC (TACC)	618 AOC (TACC)/XOW	Strategic Airlift/Air Refueling	Global
603 AOC/AMD (USAFE)	21 OWS/FWB	Theater Airlift/Air Refueling	EUCOM / AFRICOM
613 AOC/AMD (PACAF)	17 OWS/FWB	Theater Airlift/Air Refueling	PACOM

1.8.4.3. Specific duties and responsibilities of the PACAF and USAFE weather units providing weather information to theater AOC Air Mobility Division-controlled IFM missions will be documented in MAJCOM level instructions.

1.9. COOP.

1.9.1. General. AF weather organizations will be prepared to continue uninterrupted mission-essential functions during a national security emergency or other disruptive conditions, such as major equipment/communications outages or evacuations. To ensure continuity of operations during these situations, organizations will develop processes to use alternate equipment/systems, operate from alternate locations or arrange transfer of critical functions to other organizations. Organizations aligned to provide continuity of operations support for another unit must be capable of providing that support and should be fully prepared to assume the responsibility within one hour of initiation.

1.9.2. Exploitation Unit COOP. EUs at main operating locations (garrison operations) will establish an AOL to continue providing mission-essential functions to parent/host unit activities. EUs at expeditionary locations will establish AOL procedures as quickly as the tactical situation permits. EU leaders will coordinate with supported agencies to select an appropriate location and secure the needed communications and other specified resource requirements. At a minimum, EUs will establish communication from the AOL with the local ATC facility, command post, primary installation customers, and the supporting CU. See AFMAN 15-111, *Surface Weather Observations* for applicable observing duties at a back-up location.

1.9.2.1. EUs at main operating locations will develop COOP SOPs for the AOL. In addition to SOPs, EUs should include AOL activities in a supported unit COOP or emergency management plan(s). EUs at expeditionary locations will develop these procedures as the tactical situation permits.

1.9.2.2. All personnel will be task certified to operate at the AOL.

1.9.2.3. EUs will notify the supporting CU when moving to the AOL. The EU will provide the OWS temporary telephone numbers and any changes in the weather warning and advisory notification procedures.

1.9.2.4. At a minimum, all position-qualified EU personnel will exercise AOL operations annually. Real world events meet this requirement if properly evaluated and documented, to include lessons learned. EUs at expeditionary locations in steady state or peacekeeping operations should exercise AOL operations more frequently to ensure proficiency following personnel rotations.

Chapter 2

MISSION INTEGRATION FUNCTION

2.1. Mission Integration Function. Mission integration requires gaining an in-depth understanding of supported mission platforms, equipment, and systems capabilities/sensitivities as well as mission processes (e.g., ORM, COP, tactics, etc.) in order to reliably inject timely, accurate, and relevant environmental information at every decision point in the mission planning and execution process in an effort to optimize mission success.

2.2. Mission Weather Products (MWP). MWPs fuse theater scale products with local mission requirements enabling the direct inject of weather impacts into warfighter planning and/or execution. MWPs are “living documents” and any/all feedback will be applied to internal MISSIONWATCH/METWATCH processes to enhance training, forecast proficiency, and product accuracy. MWPs include flight weather briefings, Intelligence Preparation of the Operational Environment (IPOE) products, mission planning briefs, environmental inputs to mission analysis, environmental staff estimates, and any other weather product prepared to meet the needs of a supported unit. MWPs are primarily developed by EUs utilizing the MEFP.

2.2.1. EU leadership will ensure environmental information is integrated into all phases of supported operations by developing, documenting, and applying the following procedures:

2.2.1.1. Identify and document critical points in each phase of the operation cycle (i.e., assessment, planning, execution, military decision-making process (MDMP), IPOE) and exploit opportunities to provide decision-makers with actionable environmental information at these points.

2.2.1.2. Use information obtained from supported units or derived from authoritative sources such as AFD 11-2, *Aircraft Rules and Regulations*, technical orders, 11-series AFI Volume 3s on specific Aircraft Operations Procedures, AFI 11-202V3, *General Flight Rules* and AR 95-1, *Flight Regulations* including any supplements to:

2.2.1.2.1. Identify critical (Go/No-Go) mission-limiting environmental thresholds applicable to supported unit operations. EU leadership will develop a logical, repeatable process to ensure the MEFP flexibly responds to temporary restrictions, changes to rules of engagement, and other transitory mission-limiting environmental factors.

2.2.1.2.2. Tailor MWPs to include forecasts for all critical Go/No-Go mission limiting environmental thresholds applicable to supported unit operations.

2.2.1.3. Use access to locally available command and control (C2)/mission planning systems and integrate into supported unit(s) to the maximum extent possible (Personnel TEMPO (PERSTEMPO) and Operational TEMPO (OPSTEMPO) permitting). This will be done in order to:

2.2.1.3.1. Collect relevant information about mission planning and execution.

2.2.1.3.2. Provide timely, accurate, and relevant environmental information for planning and execution.

2.2.1.3.3. Obtain feedback from users on forecast and observed environmental conditions applicable to their respective missions.

2.3. Mission Execution Forecast Process (MEFP). The MEFP is an organized and systematic process to apply environmental characterizations and provide decision-quality environmental information to mitigate risks and exploit asymmetric capabilities in the MDMP. The MEFP will specify how to apply environmental characterizations to mitigate mission limitations and meet operational requirements. EUs will develop processes and procedures to establish meteorological situational awareness and apply environmental characterizations for the parent/host unit's decision cycle. The end result of the MEFP is a MWP.

2.3.1. The MEFP is a continuous cycle that adapts as supported unit needs change. EUs will develop internal processes to improve the MEFP based on feedback from the supported unit.

2.3.2. The complete MEFP will be detailed in SOPs, checklists, flowcharts or other decision aids.

2.3.3. The MEFP consists of two primary components, Administrative and Operational:

2.3.3.1. Administrative Process. These are steps within the MEFP which will be accomplished by EU leadership to maximize the effectiveness of military operations. These steps will be reviewed annually. **Table 2.1** details administrative processes.

2.3.3.1.1. The format, timing and dissemination of the MWP from the MEFP will be driven by supported unit(s) requirements. EUs will coordinate with the supported unit(s) to determine the content and format to ensure it contains decision-grade information applicable to the mission.

2.3.3.1.2. EUs may use GO/NO-GO products to convey environmental information. These products are effective in the planning and allocation phases of an operational decision cycle and easily convey information to multiple users.

2.3.3.1.3. Enterprise-sustained software programs that present the forecast in a format highlighting direct impacts to the customer (e.g., Integrated Weather Effects Decision Aid (IWEDA), Target Acquisition Weather Software (TAWS)) may be used in the operational decision cycle and should be specific to a particular mission. Software programs not sustained and/or maintained by accredited organizations will not be used.

2.3.3.1.4. EUs will apply supported unit weather sensitivities and requirements to tailor weather products to meet operational needs as specified by supported unit activities with an environmental impact (e.g., flight ops, transportation, maintenance, civil engineering, logistics activities).

Table 2.1. MEFP Administrative Processes

<p>1. Define Weather Thresholds</p> <ul style="list-style-type: none"> a. Identify critical “Go/No-Go” terrestrial and space weather threshold values (i.e., airframe, mission types, weapon systems, decision timelines). b. Identify critical resource protection thresholds (e.g., maintenance, security forces, logistics, emergency response). c. Know where these parameters are applied (e.g., airfields, ranges, DZs, ARs, low-fly routes). d. Identify training requirements to ensure all assigned weather Airmen are able to mitigate mission-impacting environmental hazards. <p>2. Attain and Maintain Situational Awareness</p> <ul style="list-style-type: none"> a. Identify logical process for obtaining situational awareness to identify trends and characterization of the atmosphere to others (e.g., shift change, shift duty checklist). b. Leverage characterization products from DoD, U.S. Government (USG) and coalition sources. Utilize characterization products from academic or commercial sources only when suitable DoD, USG, or coalition products are unavailable. c. Determine best products to use (primary and back-up) for each step including purpose of the product utilized and value to the MEFP (e.g., ROTs, climatology, space, topography). d. Include CU collaboration and communications. e. Include review of centrally and/or locally established C2 systems (e.g., Global Decision Support System (GDSS), unit flying schedules). <p>3. Coordinate Operations</p> <ul style="list-style-type: none"> a. Identify times, criteria, and delivery format of environmental information for established supported units (e.g., LAN/Web Page, mass briefing, flight weather briefing, crisis action briefing). b. Provide or arrange for support for units when away from home station. c. Request special terrestrial, climatic, and space weather products via SAR, if required. <p>4. Mission Verification/MISSIONWATCH</p> <ul style="list-style-type: none"> a. Determine parameters, timelines, and critical thresholds for MISSIONWATCH. b. Standardize mission products utilized in order to report MWP Verification (MWPVER) in accordance with MAJCOM and AF guidance.

2.3.3.2. Operational Process. This is the executable phase of the MEFP. [Table 2.2](#) details operational processes.

2.3.3.2.1. EUs will define a methodology to incorporate characterization products, forecasting techniques, and a logical, verifiable process (the MEFP) to conduct weather operations. The process will identify data sources, document forecast methods and describe methods of obtaining weather situational awareness.

2.3.3.2.2. EUs will ensure all processes and procedures for meteorological information, and refining weather products are first evaluated from the servicing CU, government sources, educational sources, then non-government civilian sources in that order. AFWA TN-98/002, *Meteorological Techniques*, will be incorporated into the MEFP until replaced with a set of centrally-managed weather techniques and procedures optimized for EUs.

2.3.3.2.3. CUs are responsible for providing visualization products and forecast reasoning that can be used by EUs to quickly ascertain the state of the atmosphere. EUs will limit analysis efforts to mission-scale effects along mission routes and operating areas (e.g. terrain influences) to refine characterization products. EUs will not re-characterize the environment at hemispheric or synoptic scales.

2.3.3.2.3.1. EUs will use CU-issued graphical and alphanumeric analysis and forecast products, TAFs, Watches, Warnings (WW), and Forecast Weather Advisories (FWA) in developing the MWP, as well as for updating supported unit(s) decision-makers on environmental impacts to operations.

2.3.3.2.3.2. EUs will discuss potential changes to characterization products with their servicing CU when significant disagreements exist or the need to amend products or issue warnings that have not been issued or amended. The CU will have final issue authority.

2.3.3.2.3.3. EUs will alert the CU to developing situations not coded in meteorological reports that potentially drive amendments to forecast products from the CU or impact flight safety.

2.3.3.2.3.4. EUs will maintain consistency with Joint METOC Coordination Cell (JMCC)/Joint METOC Coordination Office (JMCO) guidance during joint/combined operations, as required.

Table 2.2. MEFP Operational Process

<ol style="list-style-type: none"> 1. Obtain Situational Awareness <ol style="list-style-type: none"> a. Identify mission types (e.g., air, ground, change of command, maintenance) b. Utilize pre-established procedures (e.g., shift change, shift duty checklist, open/close procedures). c. Review applicable products from CUs. 2. Determine "Weather Threat(s) of the Day" <ol style="list-style-type: none"> a. Identify potential threats to mission execution. b. Prioritize support based on mission priority and threat to mission execution. c. Identify weather products best utilized to mitigate weather impacts. 3. MWP Generation/Dissemination <ol style="list-style-type: none"> a. Conduct appropriate-scale review of global and theater-level products to identify state of the atmosphere affecting a particular mission. b. Apply real-time data (e.g., Pilot Reports (PIREPs), radar, satellite imagery, surface observations). c. Apply specific forecast techniques (e.g., icing, turbulence, contrails, rules of thumb). d. Integrate geographic, terrain, and vegetation influences on the weather and the mission. e. Review space weather conditions and effects on the mission. f. Generate forecast in proper format employing critical "Go/No-Go" thresholds. Generate Tactical Decision Aid (TDA) output, as required. g. Evaluate product for accuracy and disseminate in accordance with established guidelines (e.g., C2 system, LAN/Web Page) to appropriate customers, decision-makers, and other weather units. h. Retain MWPs IAW the AF Records Disposition Schedule and AFI 33-364, <i>Records Disposition - Procedures and Responsibilities</i>. 4. MISSIONWATCH/Mission Verification <ol style="list-style-type: none"> a. Conduct MISSIONWATCH utilizing real-time weather products at established intervals. b. If capability exists, communicate with established POC if thresholds cross critical "Go/No-Go" parameters. c. Gather feedback from customers and review weather products as necessary to verify MWP. d. Develop forecast review based on established guidelines if necessary.

2.4. Flight Weather Briefings (FWB).

2.4.1. Weather units preparing and presenting FWBs will:

2.4.1.1. Use AF-approved briefing systems (GDSS, Flight Weather Briefer, etc.), DD Form 175-1, *Flight Weather Briefing*, MAJCOM form, computerized equivalent, or verbal briefings as the standard tool for delivering flight weather briefings. DD Form 175-1, *Flight Weather Briefing* will be accomplished IAW procedures outlined in **Attachment 2** of this manual. Technicians presenting flight weather briefings will focus

on customer needs and tailor briefings to the mission. At a minimum, briefings will include the following:

- 2.4.1.1.1. General meteorological situation for the mission area.
 - 2.4.1.1.2. Current and forecast weather (including flight hazards and Significant Meteorological Information (SIGMETs)/ Airmen's Meteorological Information (AIRMETs)) for takeoff.
 - 2.4.1.1.3. Forecasted en route weather (including flight hazards and SIGMETs/AIRMETs). **Note:** At a minimum, brief flight hazards within 25 miles either side of the route and within 5,000 feet above and below the planned flight level.
 - 2.4.1.1.4. Forecast conditions at destinations and alternate airfields. **Note:** At a minimum, brief destination/alternate hazards within a 100 mile radius of the airfield and from the surface to 5,000 feet above the planned flight level for take-off and landing.
- 2.4.1.2. Evaluate, interpret, and apply the contents from watches, warnings, advisories and forecasts. Relay the complete text of weather watches, warnings, and advisories for departure location, destination(s), and alternate airfield(s).
- 2.4.1.3. Use the term “thunderstorms” rather than “cumulonimbus” or “CBs” when briefing aircrews. Standard aerial coverage definitions/percentages for thunderstorm areas are covered in AFMAN 15-129 Volume 1, *Air and Space Weather Operations-Characterization*.
- 2.4.1.4. Request aircrews provide PIREPs during takeoff/landing, and en route, and indicate the means of providing them (i.e., PMSV, ATC, phone patch).
- 2.4.1.5. Have paper or electronic copy of current applicable Flight Information Publication (FLIPs) and other flight weather briefing references listed in [Table 2.3](#).

Table 2.3. Flight Weather Briefing References

AFI 11-202V3, *General Flight Rules* and MAJCOM Supplement (if published)

AFH 11-203V1 & V2, *Weather for Aircrews*

AFI 11-2 MDS (e.g., AFI 11-2F-15EV3 for the F-15E, AFI 11-2F-16V3 for the F-16)

AR 95-1, *Aviation Flight Regulations*

AR 95-23, *Unmanned Aircraft Systems*

OPNAVINST 3710.7 series, *NATOPS General Flight and Operating Instructions*

FAA *Aeronautical Information Manual* (NWS In-Flight Weather Advisories)

FAA Order 7340 series, *Contractions Handbook*

FAA Order 7350.8P, *Location Identifiers*

2.4.1.6. Give the briefing to the aircrew and retain a duplicate copy, in either electronic or paper hardcopy format in unit files. The briefing may also be sent to the aircrew via DoD e-mail, fax, or posted to a web page.

2.4.1.7. Develop MISSIONWATCH procedures to include amend and update criteria.

2.4.2. Transient Aircrews. There may be cases that result in aircrews transiting or staging through an airfield without receiving weather information from their supporting EU. EUs will employ the “provide or arrange for” concept when faced with requests from transient aircrews. IAW duty priorities, EUs will provide a briefing or update an existing briefing form for transient aircrews. If an EU is unable to provide a transient aircrew a FWB or update an existing briefing, then the EU will:

2.4.2.1. Direct the aircrew to a dedicated web-based briefing terminal or access to a computer to allow aircrews to self-brief or schedule a FWB from the supporting CU.

2.4.2.2. Provide telephone contact information for the servicing OWS.

2.4.2.3. Under no circumstances will an EU deny assistance to an aircrew seeking a FWB.

2.5. Provide or Arrange for Support.

2.5.1. EUs are the primary source of tailored weather information for their supported unit(s). When mission activities occur, away from the main operating location, EUs retain responsibility to determine the most effective means of ensuring their units receive mission execution weather information.

2.5.1.1. When the capability exists, EUs will provide MWPs for their supported unit(s) assets transiting another location by reachback to the main operating location or deploying with the supported unit(s).

2.5.1.2. EUs that cannot provide MWPs for supported unit(s) missions transiting or staging from another location must arrange support by any of the following means:

2.5.1.2.1. Request assistance from the EU at the transient or staged location.

2.5.1.2.2. Request assistance from the CU servicing the transient or staged operating location. (Example: EU enters mission data into the servicing CU's briefing system (e.g., Program Generation Server/Scheduler (PGS/S), GDSS) and relays contact information and briefing number assigned by the briefing system to the aircrew).

2.5.1.2.3. If follow-on mission data is not known at execution from home station, provide the appropriate CU web site or telephone information to the departing aircrew (e.g., in an off-station cross country training mission staging from another airfield, the EU technicians provide flight briefing cell contact numbers for the CU servicing the staged airfield).

2.5.2. EU Availability. EUs will have personnel on duty when their supported unit is performing their primary operation, duty, or mission and/or when ATC is open and no automated observing system capability exists.

2.5.2.1. EUs are not required to be on duty when ATC is closed, unless SWAP has been implemented and it is necessary to provide the eyes forward function, or to supplement for tornadic activity IAW AFMAN 15-111, *Surface Weather Observations*. The servicing CU will provide FWB support to flights conducted outside normal organization operations when ATC is closed and EU personnel are unavailable.

2.5.2.2. EUs will enter a FWB request via the servicing CU web page when the supported unit provides advance notification of intent to conduct operations, and the EU is unable to provide MWPs.

2.5.2.3. EUs will coordinate requests for briefing support with the servicing CU on larger flying operations when the EU cannot provide MWPs to the supported unit(s) due to manning levels or temporary duty commitments.

2.5.3. Aero Club Activities. EUs and CUs will provide flight weather briefings to Aero Club members performing official Air Force operational duties (i.e. Civil Air Patrol and Initial Flying Training Programs). EUs will provide or arrange briefings when such Aero Club flights are in a transient status through the appropriate CU or Flight Service Station. EUs will not remain open on weekends or times outside normal ATC published operating hours to provide briefings for routine Aero Club flying activities. EUs will advise Aero Club members performing official flight duties of the CU web page request process and self-briefing capabilities.

2.6. Flight Weather Briefing Documentation and Retention. All FWBs, regardless of delivery format, will be documented, maintained, and retained IAW the AF Records Disposition Schedule and AFI 33-364, *Records Disposition - Procedures and Responsibilities*. Maintain a record copy of the following mandatory items:

2.6.1. Briefing time.

2.6.2. Briefer initials.

2.6.3. Aircrew call sign or mission number.

2.6.4. All information relayed to aircrew.

2.6.5. Void Time (as applicable).

2.6.6. **Table 2.4.** illustrates an example of a locally developed Aircrew Briefing Log.

Table 2.4. Aircrew Briefing Log

<i>AIRCREW BRIEFING LOG</i>						PERIOD OF RECORD		
						FROM XX Month XXXX	TO XX Month XXXX	
ACFT TYPE	ACFT IDENT	DEP POINT/ DTG ETD	FL	DEST/ DTG ETA	SIGNIFICANT/SEVERE WEATHER BRIEFED		DTG WX BRF	PILOT NAME
					PHENOMENA/LOCATION	BASED ON	VOID	FCSTR INIT
UH1	Huey1	OFF 01/1000Z	030	SUX 01/1030Z	LGT TURBC SFC-020	PIREPS	01/0900Z	DJ
							01/1030Z	AH

2.7. Web-Based Aircrew Briefings.

2.7.1. Weather organizations will publish and provide access information and procedures to supported flying units for computer/web-based briefing applications. Procedures will address how aircrews request/schedule a weather briefing and include contact information for clarification and follow-up. When the capability exists, this service will be provided by an Air Force web enterprise service.

2.7.2. CUs will use web-based briefing applications to:

2.7.2.1. Provide flight weather briefings to aircrews or EUs requesting briefings for aircrews transiting their AOR.

2.7.2.2. Provide flight weather briefing services to Air National Guard, Army National Guard, Air Force Reserve, and Army Reserve units without a collocated or designated weather support organization.

2.8. Air Mobility Command Weather Briefings. The 618 AOC (TACC)/XOW is the weather element for all AMC-gained missions. These missions receive AMC-unique weather packages embedded in flight papers provided to the aircrews.

2.8.1. 618 AOC (TACC)/XOW will:

2.8.1.1. Provide all mission weather packages and threat assessments for AMC IFM missions under 618 AOC (TACC) command and control. (NOTE: IAW AFI 11-207, *Combat Aircraft Delivery*, all CORONET tanker support missions are under 618 AOC (TACC) command and control.) (EXCEPTIONS: Very Important Person Special Airlift Mission (VIPSAM) and USSTRATCOM-tasks (TF-294) missions are supported by local weather flights IAW wing procedures. Contract commercial carriers provide for their own weather support.)

2.8.1.2. Provide mission weather packages for all AMC IFM missions IAW AFI 11-255V3, *Integrated Flight Management Responsibilities and Procedures*.

2.8.1.3. Provide mission weather packages to designated AMC and AMC-gained, non-IFM missions.

2.8.2. EUs will:

2.8.2.1. Update take-off weather data and notify 618 AOC (TACC)/XOW if the update includes any of the criteria listed in [Table 2.5](#)

Table 2.5. Integrated Flight Management standard mission-limiting criteria

Ceiling/visibility less than or equal to 200ft/1/2sm (or other published airfield limitations)
Dry runway crosswind 25kts or greater
Wet runway crosswind 20kts or greater
Forecast low-level wind shear for KC-10 operations
Observed low-level wind shear for all AMC aircraft
Predominant thunderstorms on station
Freezing precipitation
Moderate (or greater severity) turbulence/icing
Forecast or observed volcanic ash on takeoff

2.8.2.2. Provide access to meteorological satellite imagery, radar imagery, and other perishable weather data to crews upon request IAW with established duty priorities.

2.8.2.3. Consult/coordinate with 618 AOC(TACC)/XOW as required to resolve any aircrew concerns/issues with the mission weather package. Facilitate discussions between aircrew members and 618 AOC(TACC)/XOW to elaborate on weather impacts and/or answer aircrew questions. The 618 AOC(TACC)/XOW is the final arbiter for weather issues involving AMC sorties/missions.

2.9. Air Combat Command Air Operations Squadron (ACC AOS) Controlled Missions. The ACC AOS/AOSW Weather Flight (ACC AOS/AOW) is the lead weather organization for all ACC AOS-controlled missions (which includes all CORONET movements). EUs supporting launch, alternate, abort and destination bases for ACC AOS-controlled missions will:

2.9.1. Brief aircrews using ACC AOS/AOSW CMWPs.

2.9.2. Coordinate deviations from CMWPs with ACC AOS/AOSW.

2.9.3. Debrief arriving aircrews at destination bases and report any deviations from the CMWP (weather not as forecast) to ACC AOS/AOSW.

2.10. Pilot Reports (PIREPs) and Significant Meteorological Information (SIGMETs). EUs will actively monitor and apply PIREPs and SIGMETs to MWP processes. EU leadership will coordinate with local air traffic control towers and radar approach control facilities to develop local procedures to ensure weather operators receive PIREPs relayed to Air Traffic Control. Local operating procedures will include timeline requirements (e.g., Air Traffic Control/Supervisors of Flying will relay pilot report information to weather not later than 5 minutes after receipt) and requirements for relaying all PIREPS to the servicing CU.

2.11. Tactical Decision Aids (TDA). EUs will use only those TDAs developed, certified, and approved by DoD or AFW coalition sources.

2.11.1. Target Acquisition Weather Software (TAWS). TAWS predicts the maximum detection or lock-on range of air-to-ground electro-optical weapons and sensor systems. For the weather input, TAWS may use real-time or model weather data downloaded directly from AFWA or a Navy reach-back data server. Weather personnel will use situational awareness products provided by the CU to adjust modeled parameters used in the TDA to improve the accuracy of the TDA output. In addition to its use by AF weather personnel, pilots in mission planning incorporate TAWS into the Pilot Flight Planning System.

2.11.2. Integrated Weather Effects Decision Aids (IWEDA). IWEDA is a rules-based TDA application. IWEDA supports both Army and Air Force systems, and improves interoperability. IWEDA uses artificial intelligence techniques and knowledge of atmospheric effects with model data to enhance and expand current weather decision capabilities. It allows commanders to compare weather-based advantages/disadvantages of friendly and enemy systems.

2.11.3. Tactical Decision Aids for Reserve Component Forces. CUs should provide model output for meteorological parameters required for tactical decision aids run for Reserve Component units without a collocated EU.

2.12. Tropical Cyclone Products.

2.12.1. EUs will fully utilize and not deviate from the tropical cyclone information provided by the servicing CU (i.e., Tropical Cyclone-Threat Analysis Product (TC-TAP)) derived from specialized tropical forecast organizations.

2.12.1.1. EUs will provide tropical cyclone forecasts and updates to supported organizations as required for mission execution decisions such as evacuation and force protection.

2.12.1.2. EUs will use the MEFP to tailor the official tropical cyclone forecasts into a specific mission forecast product for their supported customers. Tailoring may include local effects of vegetation/ground cover, terrain, and position relative to the storm. Inland locations may often require the frictional TC-TAP application.

2.12.2. EUs will provide the necessary forecast services/products required for installation commanders to determine or declare a Tropical Cyclone Condition of Readiness and Hurricane Condition as outlined in local Operation Plans. EUs will also provide the necessary forecast services/products required for installation commanders to make mission execution decisions such as evacuation and resource protection.

2.12.3. EUs will follow installation public affairs policies and procedures regarding the release of tropical cyclone forecasts to the general public.

2.13. Space Weather Products. EUs will incorporate space weather products into their MEFP to provide mission-enhancing information to supported units.

2.14. Volcanic Ash. EUs will utilize appropriate theater-specific volcanic ash products from the civil Volcanic Ash Advisory Centers (VAAC) and supplement with 2WS products and services. All VAAC and 2 WS products are available on the Air Force weather web service.

2.15. Chemical, Biological, Radiological, Nuclear and High-Yield Explosive (CBRNE).

2.15.1. Air Force Weather forces will serve as Weather SME to CBRN operations IAW roles and responsibilities laid out in AFI 15-128 *Air Force Weather Roles and Responsibilities*, AFI 10-2501, *Air Force Emergency Management (EM) Program Planning and Operations*, and AFMAN 10-2503, *Operations in a Chemical, Biological, Radiological, Nuclear, and High-Yield Explosive (CBRNE) Environment*.

2.15.2. At the installation level, EU Staff Integration function will:

2.15.2.1. Routinely meet with installation EM, Fire Emergency Services (FES), and Bioenvironmental Engineering (BEE) to achieve appropriate mission immersion.

2.15.2.2. Get familiar with the CBRN plume models utilized by these ESFs (e.g., Joint Effects Model (JEM), Area Locations of Hazardous Atmospheres (ALOHA), Computer-Aided Management of Emergency Operations (CAMEO), etc.), their tactical decision aid outputs, and uses in installation commanders' decision cycles.

2.15.2.3. Understand the variety of possible weather input options within each model for each type of C, B, R, N and E event. See JEM Users Manual, for details, available on the AFWKC.

2.15.2.4. Recommend and provide the most appropriate weather data type for EM and other ESFs to use to run their chosen CBRNE model to assess a real-time event which has occurred at a specific location and time. The Staff Integration function's familiarity with EM's and other ESF's CBRNE models and associated weather input parameters/data types will help in determining the optimal weather data type for the chosen CBRNE model.

2.15.2.5. In most cases, transport models can be configured to automatically pull observed or forecast gridded model data from DTRA. Provide a region-specific model data recommendation consistent with the CU model. For example, if the CU consistently uses the WRF model then the transport model should be configured to default to the WRF. Historical climatological data should not be recommended except for training or long-term planning where "canned" scenarios are being used.

2.15.2.6. If surface observations or alphanumeric forecasts are requested, make sure that observations and forecasts provided are representative of the location/time of the CBRN event.

2.15.2.7. Work closely with EM or other ESF functions to ensure the supported commander gets a consistent picture.

2.15.2.8. Upon request from Disaster Preparedness or any other agency, obtain/provide CDMs from the servicing CU.

2.16. Shift Change Briefings/Forecast Discussions. A systematic approach will be established (i.e., shift change and shift duty checklist) to ensure a thorough understanding of the state of the atmosphere and how it impacts the mission. This will include a review of CU analysis and forecast products (e.g., hemispheric, synoptic, mesoscale patterns and key parameters, TAFs, METWATCH products and space weather products), collaboration done with the CU (Meteorological Conference (METCONs) and discussion bulletins), the forecast challenge(s) for the shift/day and significant weather impacts on the current and planned missions.

2.17. Mission-Scale Meteorological Watch (MISSIONWATCH). MISSIONWATCH is a deliberate process for monitoring terrestrial weather or the space environment for specific mission-limiting environmental factors. The MISSIONWATCH process identifies and alerts decision makers to changes affecting mission success. EUs will:

2.17.1. Develop procedures to determine critical thresholds requiring intensified MISSIONWATCH and update supported unit(s) on changes to environmental conditions critical to the mission.

2.17.2. Maintain a MISSIONWATCH tailored to the mission(s) of the day.

2.17.3. Employ sound Operational Risk Management (ORM) techniques, outlined in *AFMAN 15-129 Volume 1, Air and Space Weather Operations-Characterization*, to assign risk, allocate resources, and direct activities to conduct MISSIONWATCH for supported unit(s) missions.

2.17.4. Conduct a MISSIONWATCH for critical portions of every mission placed at risk due to environmental conditions.

2.17.5. Inform the servicing CU when weather products issued by the CU do not accurately reflect observed conditions and impact flight safety.

2.17.6. Structure MISSIONWATCH processes to match basic steps outlined in **Table 2.6**.

2.17.7. Use the following tools in the MISSIONWATCH process:

2.17.7.1. Meteorological Satellite (METSAT) imagery (e.g., Infrared, Visible, Water Vapor, Microwave).

2.17.7.2. Real-time surface and upper air data (e.g., alphanumeric products, PIREPs, and SIGMETs).

2.17.7.3. Weather radar/lightning data.

2.17.7.4. Other data sources (e.g., tower cameras, on-line weather resources, and indigenous products).

Table 2.6. Basic MISSIONWATCH Steps

1.	Determine the mission(s) placed at risk due to terrestrial or space weather conditions.
2.	Continuously monitor at risk mission routes, areas, installation, etc., for significant changes. Spot-check low risk missions.
3.	Focus on mission-limiting weather thresholds for each specific mission.
4.	Evaluate for change in risk category and reprioritize MISSIONWATCH as appropriate. Notify operational users of weather conditions crossing mission-limiting thresholds.
5.	Integrate weather impacts into operational alternatives decision process.
6.	Update MWP as necessary.
7.	Continue to monitor missions based on MISSIONWATCH threat.

2.18. Weather Watch, Warning, and Advisory (WWA) Program. Refer to **Attachments 3 and 4** for detailed instructions on completing AF IMT 3806 and AF IMT 3807.

2.18.1. Weather Watches and Warnings. EUs are responsible for coordinating supported unit(s) weather watch and warning criteria, as well as tropical cyclone forecasts, to include the Desired Lead Times and notification methods with the servicing CU.

2.18.1.1. EUs will limit weather warning criteria, not already defined in AFMAN 15-129 Volume 1, *Air and Space Weather Operations-Characterization*, to weather phenomena that threaten life or property, or cause the supported unit to take protective action.

2.18.1.2. Observed Lightning weather warnings. Lightning warnings are issued when lightning is observed or detected within 5 nautical miles of any pre-determined location or activity.

2.18.1.3. EUs will issue and cancel observed lightning warnings during duty hours. When issuing or canceling an observed lightning warning, the EU will provide timely notification to supported units IAW AFOSH Standards 91-66, *General Industrial Operations & AFOSH Standards 91-100, Aircraft Flight Line – Ground Operations and Activities*.

2.18.1.4. EUs issue observed lightning warnings separately from, and at times, concurrent with CU-issued warnings for any other criteria. The observed lightning and forecast tornado warnings are the only warning that may be issued separately from warnings for other criteria.

2.18.1.5. During non-duty hours, the servicing CU will issue and cancel observed lightning warnings.

2.18.1.6. EUs will issue weather warnings for forecast phenomena when imminent weather conditions pose a hazard to life and property, and time of onset does not allow collaboration with the servicing CU.

2.18.2. The EU issuing a weather warning will contact the supporting CU as soon as possible after local dissemination to ensure warning information is entered into the CU warning tracking and verification system and that expanded METWATCH is assumed by the CU. When deployed, EUs will rely on customer-furnished communications to relay weather warning information back to the CU.

2.18.3. Weather Advisories. Weather advisories are special notices provided to an operational user to notify them of environmental conditions impacting operations. EUs will:

2.18.3.1. Coordinate forecast weather advisory requirements with the servicing CU and document the requirement on the installation data page.

2.18.3.2. Coordinate the desired lead time based upon the supported unit(s) requirements and the CU's capability to provide such advance notice. These requirements will be documented on the installation data page. Lead time calculation is determined from the issue time of the initial weather warning or forecast weather advisory for a forecast weather advisory resulting from a weather warning downgrade.

2.18.3.3. Issue Observed Weather Advisories while on duty. CUs will issue observed weather advisories during EU off-duty hours, provided they have the tools and capability to do so.

2.19. Severe Weather Action Plan (SWAP). EU leadership will develop a SWAP. The SWAP will define the events, personnel requirements, and operating procedures (e.g., "eyes forward" and customer interaction) required to help mitigate the threat of severe/mission-limiting weather.

2.19.1. In concert with and support of installation commander requirements, EUs will conduct and document annual exercises of the SWAP and ensure validity of plans to respond to severe weather. Real world events meet this requirement if properly evaluated and documented, to include lessons learned.

2.19.2. SWAP Procedures. The EU will ensure sufficient manpower when implementing SWAP to meet the increased demand for timely weather information from its supported unit(s) during significant weather events.

2.19.3. The EU will request assistance through their MAJCOM/FOA/DRU/OWS on SWAP execution problems not resolvable at the local level, or for severe weather forecasting seminars, as required.

2.20. Severe Weather Reporting (e. g., OPREP-3). EUs will develop procedures to provide appropriate information to the installation agency (i.e., command post, operations center, etc.) IAW AFI 10-206, *Operational Reporting* and installation policies. EUs will ensure the CU and parent MAJCOM functional are aware of the reported weather event as soon as practical.

2.21. MWP Reviews. EU leadership will determine the MWPs to be reviewed, monitor the performance of the products, and assign the reviews as required. MWP reviews focus on a particular weather event at a single location or region and examine the effectiveness of forecast reasoning, tools, and methods employed. Leadership will also coordinate parameters for MWP reviews and review requests from CUs. EUs will develop performance feedback mechanisms to incorporate seasonal training or specific forecast parameter improvement.

2.21.1. EUs will develop a consistent approach to conduct and document MWP reviews. The servicing OWS will include pertinent commentary/input from EUs in MWP reviews.

2.21.2. MWP reviews should be short (typically three pages or less), simple to complete, and focused on a specific part of the MEFP. The MWP review will briefly outline the tools and reasoning used to make the forecast product and describe potential improvements to the EU forecast processes.

Chapter 3

AIRFIELD SUPPORT FUNCTION

3.1. Airfield Support Function. The Airfield Support Function consists of weather observing, meteorological watch, and resource protection.

3.1.1. EUs responsible for the official airfield observation will prepare routine and special weather observations and make them available to CUs and users in the AOR requiring this information. Observations will be recorded and disseminated in accordance with AFMAN 15-111, *Surface Weather Observations*, and MAJCOM supplements, as applicable.

3.1.2. “Eyes Forward.” EUs will relay significant, time-sensitive meteorological information not found in coded meteorological reports to relative CUs to assist in characterization operations.

3.1.2.1. EUs will retain an “eyes forward” role with the CU providing resource protection products under circumstances where the US National Weather Service or a host nation issues the aerodrome forecast and/or observation.

3.1.2.2. Expeditionary/deployed EUs will relay pertinent observations from tactical or fixed radars, upper air soundings, and any other meteorological information to the servicing CU or another agency as tasked in the OPLAN, EXORD, JMO LOI, etc for the ongoing operation. Units will also ensure mission impacting weather information is provided to their customers if operations occur away from main operating locations.

3.2. Flight Information Publication (FLIP) Review.

3.2.1. EUs will have procedures to review each new edition of applicable DoD FLIPs as soon as possible after publication, including the Radar Instrument Approach Minimums, local Notice To Airmen (NOTAMs), and applicable directives for changes in:

3.2.1.1. Airfield minima affecting SPECI/LOCAL observation criteria (reference Radar Instrument Approach Minimums).

3.2.1.2. Pilot-to-Metro-Service (PMSV) contact information (reference IFR Supplement).

3.2.1.3. Supporting OWS contact information.

3.2.1.4. Airfield services hours, if different from airfield hours (reference IFR Supplement).

3.2.2. Coordinate updates or changes to DoD FLIPs through the local airfield management office or responsible agency using the standardized procedures and formats found in the General Planning FLIP.

3.3. Pilot-To-Metro-Service (PMSV). PMSV systems vary in type across both Air Force and Army locations. These systems are not required for weather personnel to accomplish their mission; however, if installed, these systems provide a valuable service to aircrews. Organizations that provide PMSV will develop procedures for operations. All contacts with airborne aircrews, including phone patches, High Frequency (HF)/Ultra High Frequency (UHF)

radio contacts, aircrew generated computer messages, satellite communications equipment, and cell phones will be considered PMSV contacts. EUs will:

- 3.3.1. Use proper radio discipline and standard phraseology found in FAA Order 7110.10, *Flight Service*, when using the PMSV.
- 3.3.2. Respond to all PMSV contacts IAW Unit Duty Priorities (as applicable). Weather organizations monitoring common PMSV radio frequencies will respond if another weather organization does not answer an aircrew request after two contact attempts.
- 3.3.3. Pass only current, complete, and relevant information to aircrews. Warn aircrews of all weather hazards along their flight route. Relay the position and movement of any weather hazards to the aircrew.
- 3.3.4. Do not vector aircraft around hazards, such as thunderstorms.
- 3.3.5. Solicit a PIREP at the conclusion of every airborne contact.
- 3.3.6. Log all PMSV contacts (including phone calls). **Figure 3.1** illustrates an example of a locally developed PMSV log. WFs will log the following information, at a minimum, for each contact:
 - 3.3.6.1. Aircraft call sign or number.
 - 3.3.6.2. Brief summation of the information passed to the aircrew.
 - 3.3.6.3. Date Time Group (DTG) of the contact.

Figure 3.1. Example PMSV Log

PILOT TO METRO SERVICE (PMSV) LOG						MONTH: XXX 01		
NO	CALL SIGN	TIME	INFORMATION GIVEN AIRCREW	PIREPS, TURBULENCE, REMARKS	INIT	DISSEMINATION		
----	-----	-----	-----1 XXX 01 --	-----	-----	LOCAL -----	LONG -----	
1	TOWER	0001Z	RADIO CHECK – Loud/Clear		TM			
2	PUFFY 55	0640Z	WNDS CBI – COS 27060, FCST 0900Z COS 29010 7 SCT030 3005	LCK-CBI 180 LGT TURBC 220	RG		X	
3	JOY 31	0650Z	LCL FCST 0800Z 29010 7 SCT030 OVC050 3008	OVR SGF OVC CI TOP 330 LGT CAT 350 C-141	RG		X	

- 3.3.7. Log one PMSV radio equipment check each day (an operational or ATC contact meets this requirement).
 - 3.3.7.1. Record any discrepancies, such as weak transmission strength, weak reception, distortion, static, etc., on the PMSV log to assist maintenance personnel in correcting the problem.

3.3.7.2. Log out PMSV contact equipment (i.e., radio, telephone) IAW locally developed procedures or as specified by MAJCOM/higher headquarters directives.

3.3.8. UHF/Very High Frequency (VHF) Radio Outages. EUs with radio equipment will arrange for another agency (i.e., ATC tower, radar) or another weather organization to provide backup during radio outages, as capability exists, and will notify the backup unit when the equipment is back in operation. Request base/airfield operations personnel include PMSV outages in Airfield Advisories and Notice to Airmen (NOTAMs).

3.4. PIREPS. All PIREPs, regardless of delivery format, will be documented, maintained, and retained IAW the AF Records Disposition Schedule and AFI 33-364, *Records Disposition - Procedures and Responsibilities*. EUs will:

3.4.1. Develop and implement procedures to encourage aircrews to provide timely PIREPs to collect meteorological elements of operational significance to flying or surface activities, and assist local flying operations (e.g., turbulence, icing, cloud bases and/or tops when departing/arriving, in-flight visibility at low levels, upper winds, valley fog, etc).

3.4.2. Develop specific procedures to ensure weather technicians properly encode and disseminate PIREPs in accordance with AFMAN 15-124, *Meteorological Codes*.

3.4.2.1. Immediately disseminate all urgent PIREPs locally and longline.

3.4.2.2. Disseminate all routine PIREPs locally and longline unless two or more PIREPS have substantially the same information. In this case disseminate only the most recent. Include a remark indicating the number of reports of the same phenomena and the time interval in which they were received (e.g., "3 RPTS last five minutes," "NUMEROUS ACFT").

3.5. Aircraft/Ground Mishap Data Save. EUs will:

3.5.1. Save all applicable and available terrestrial and space weather data when notified of any aircraft or ground mishaps (weather-related or not) requiring OPREP-3 reporting or local reporting requirements IAW AFI 10-206, *Operational Reporting*. Coordinate with other units (i.e., OWS, TACC) to ensure required data is saved.

3.5.2. Ensure all data used in the development of any weather information, product, or service provided to a customer are saved, including but not limited to:

3.5.2.1. METSAT imagery (i.e., Visible, Infrared, Water Vapor).

3.5.2.2. Radar products if available (i.e., Base Reflectivity, Velocity-Azimuth Display Winds, Echo Tops, Composite Reflectivity, Base Velocity).

3.5.2.3. Upper air package.

3.5.2.4. Hazard charts (i.e., thunderstorm, lower and upper level turbulence, icing).

3.5.2.5. PIREPs, SIGMETs.

3.5.2.6. TAFs and observations for departure point, destination, and any alternate(s).

3.5.2.7. Weather warnings, watches, and advisories.

3.5.2.8. Upper air soundings enroute and nearest the mishap site.

3.5.2.9. Briefing material provided to the mishap aircrew (i.e., DD Form 175-1, mesoscale tailored graphics).

3.5.3. EUs will notify the OWS Operations Floor Production Supervisor of all aircraft mishaps as soon as possible after notification of the event. **Note:** Expedient notification is critical to archiving data pertinent to the mishap.

3.5.4. Gather the saved data and hold it until requested or send the data to the organization requesting the data save.

3.5.5. Do not dispose of the data until the organization initiating the data save determines it is no longer needed and coordinates the disposition with all organizations involved.

3.5.6. EUs will coordinate with AFWA Operations to save any applicable data and products that cannot be saved locally. EUs contacting AFWA will provide a specific list of data to be saved.

3.6. Collocated weather organizations. Airfields with multiple weather organizations assigned will have one as the responsible weather organization for airfield services. The responsible weather organization is determined by the supported organization that has Senior Airfield Authority (SAA) for that base as directed by the Joint Force Commander. For example, if a tanker unit is the SAA for a particular base with fighters and Army aircraft, then that tanker unit/OSS weather organization will be the responsible weather organization supporting airfield services.

3.7. Airfield Operations Board (AOB). EUs will participate as a member of the AOB as directed in AFI 13-204 Vol III, *Airfield Operations Procedures and Programs*.

Chapter 4

SPECIALIZED SUPPORT OPERATIONS

4.1. Weather Support for Air and Space Operations Centers (AOC). Weather organizations supporting AOC operations will utilize the MEFP to develop MWP and provide support IAW AFI 13-1AOC, Volume 3, *Operational Procedures-Air and Space Operations Center*. Weather organizations will use all available information (e.g., alphanumeric data, satellite) to collect weather data for injection into key elements of the Air Tasking Order (ATO) cycle, and to integrate environmental effects to enhance combat capability. Proactive application of weather impacts will help shape AOC operations during mission planning and execution.

4.2. Unmanned Aircraft Support. Unmanned aircraft are categorized into five groups according to their maximum gross takeoff weight, normal operating altitude, and speed (see Attachment 1). Small unmanned aircraft (Groups 1 and 2) are typically not on the ATO and receive general weather support (i.e., area forecasts) not tailored to specific missions. Large unmanned aircraft (Groups 3-5) receive direct weather support as described below.

4.2.1. Air Force Remotely Piloted Aircraft (RPA) Support. The Air Force refers to Group 4 and larger unmanned aircraft as RPA. Group 4 and 5 RPA (i.e., MQ-1/9 and RQ-4) are considered no different than manned aircraft by the Air Force and will be operated IAW AFI 11-202V3, *General Flight Rules*. Therefore, weather organizations supporting Group 4 and 5 RPA will provide integrated weather support to pilots and sensor operators IAW the MEFP. Group 4 and 5 RPA are employed using a distributed form of command and control known as remote split operations (RSO). Utilizing RSO, a pilot at a launch and recovery element (LRE) takes off and lands the aircraft while a pilot at a mission control element (MCE) flies the tasked mission. The tactical operations of multiple LREs and MCEs are coordinated at the operational level by the 432d Wing Operations Center (MQ-1/9) and Global Hawk Operations Center (RQ-4).

4.2.1.1. Due to the distributed nature of RSO, multiple weather organizations may support a single RPA mission: the EU collocated with the LRE, the EU collocated with the MCE, the EU collocated with the operational-level C2 center (C2 EU), the AOC WST, the regional OWS, and (often) a EU collocated with a supported ground commander. Some organizations may perform more than one role (i.e., the C2 EU may also support tactical-level MCEs). Since Go/No-Go weather decisions are made at the operational level, the C2 EU is the LWU if multiple weather organizations are involved in RSO support.

4.2.1.1.1. The C2 EU is responsible for the controlling MWP (if required) and Go/No-Go weather recommendations to the operational-level C2 center (i.e., 432d Wing Operations Center or Global Hawk Operations Center).

4.2.1.1.2. The EU directly supporting the MCE is responsible for the MWPs (excluding take-off and landing weather if provided by a LRE EU), MWP updates to support dynamic re-tasking, and MISSIONWATCH. MISSIONWATCH will include the LRE location, divert location(s), mission operating area(s), mission and contingency flight routes, and satellite uplink/downlink nodes in the RSO

communications architecture. If no MCE EU is assigned, the C2 EU will provide this support.

4.2.1.1.3. EUs supporting RPA LREs will provide airfield support, take-off and landing forecasts, observed advisories, and “eyes forward” support for other weather organizations supporting RSO. The LRE EU will coordinate with the C2 EU and MCE EU if take-off and landing weather is forecast to exceed RPA mission-limiting weather thresholds (see AFI 11-2 Volume 3 instructions for the MQ-1, MQ-9, and RQ-4). CU TAF and WWA support for LRE locations will incorporate all RPA mission-limiting thresholds. A summary of LRE EU, MCE EU, C2 EU and CU responsibilities for Group 4 and 5 RPA weather support is provided in Table 4.1.

Table 4.1. Group 4 and 5 RPA Weather Support Requirements

Weather Support Required	LRE EU ¹	MCE EU ²	C2 WF (LWU)	OWS
Airfield Support (Wx Observations, Meteorological Watch, PMSV)	X			
Take-Off and Landing Forecast	X			
Mission Weather Products (Excluding Take-Off and Landing Weather)		X		
Controlling Mission Weather Product			X	
TAFs, WWAs, Regional-Scale Weather Products				X
Observed Advisories	X			
MISSIONWATCH		X		

Notes:

1. If an EU is not assigned to the LRE location, an OWS may be required to provide LRE support (e.g., RQ-4s operating from Naval Air Station Sigonella, Italy will be supported from the 21 OWS because no EU is assigned).
2. Some MCEs are directly supported by an EU (e.g., Air National Guard EUs, the 319 OSS/OSW at Grand Forks AFB). MCEs not directly supported by an EU receive this support from the C2 EU (e.g., 432 OSS/OSW, 9 OSS/OSW).

4.2.1.2. EUs and CUs will use all available means (e.g., SIPRNET, mIRC Internet Relay Chat) to coordinate RPA weather support. As part of their LWU responsibility, the C2 EU will adjudicate disagreements among other weather organizations, if necessary. The C2 EU will inform all weather organizations involved in RSO mission support, and if possible weather organizations attached to supported ground commanders, when observed or forecast weather conditions may impact (or have impacted) the planned mission.

4.2.1.3. C2 EUs and/or MCE EUs will inform their supporting CU(s) when regional-scale weather products do not meet the unique temporal and spatial requirements for RPA

support (i.e., EUs will inform the CU when they are forced to characterize to produce RPA MWPs). To ensure CU products keep pace with changing support requirements, RPA EUs will utilize the SAR process to request higher temporal/spatial fidelity weather products as new requirements emerge.

4.2.2. Army Unmanned Aircraft System (UAS) Support.

4.2.2.1. EUs supporting Army UAS will:

4.2.2.1.1. Provide general weather support for Group 1 and 2 UAS (e.g., RQ-11B Raven and gasoline engine Micro-Air Vehicle (gMAV)). General weather support consists of “area forecasts” not tailored to specific missions.

4.2.2.1.2. Provide direct weather support for Group 3-5 UAS pilots and payload operators IAW the MEFP (e.g., RQ-7B Shadow, MQ-1C Gray Eagle, and MQ-5B Hunter). Minimum weather conditions for UAS operations and mission-limiting weather thresholds are contained in Army Regulation 95-23, *Unmanned Aircraft System Flight Regulations*, and UAS-specific technical manuals (e.g., TM 1-1550-696-10, MQ-1C Operating Procedures; TM 1-1550-692-10, MQ-5B Operating Procedures).

4.2.2.2. Army UAS’ are typically employed in a decentralized manner and optimized for full integration into organic unit operations at the division-level and below. Therefore, to enable decentralized operations, EUs at each echelon operating Group 3-5 UAS’ will provide or arrange for direct weather support for their UAS assets (e.g., EUs at Combat Aviation Brigades (CABs) will support their CAB’s UAS, EUs at Brigade Combat Teams (BCTs) will support their BCT’s UAS, etc.). Group 3-5 UAS operating without a collocated EU will be supported by the CAB EU or servicing OWS.

4.2.2.2.1. Army UAS are typically launched and recovered near the Ground Control Station (GCS). Therefore, the EU supporting the GCS will also support launch/recovery (L/R) operations. Weather support for geographically separated L/R sites will be arranged by the EU supporting the GCS.

4.2.2.2.2. Weather support to the GCS crew will consist of MWPs, updates to support dynamic re-tasking and MISSIONWATCH. MISSIONWATCH will include the L/R site, divert location(s), mission operating area(s), and mission/contingency flight routes.

4.2.2.2.3. EUs, CUs and AOC WSTs (for Army UAS operating above the coordinating altitude) will use all means available to coordinate UAS weather support (e.g., SIPRNET, Non-Secure Internet Protocol Router Network (NIPRNET), mIRC chat, instant messaging, phone).

4.2.2.2.4. EUs supporting UAS will inform their supporting CU(s) when regional-scale weather products do not meet the unique temporal and spatial requirements for UAS support (i.e., EUs will inform the CU when they are forced to characterize to produce UAS MWPs). To ensure OWS products keep pace with changing support requirements, EUs will utilize the SAR process to request higher temporal/spatial fidelity weather products as new UAS support requirements emerge.

4.2.3. Lighter than Air Vehicle Support. Lighter than air vehicles are categorized by the highest level of any of their operating criteria (e.g., Tethered Aerostat Radar System operating above 3,500' AGL is a Group 3 unmanned aircraft regardless of its other operating criteria). Similar to other unmanned aircraft support, Group 1 and 2 lighter than air vehicles will receive general weather support and Group 3-5 will receive direct weather support.

4.3. Weather Support to 618 AOC/Tanker Airlift Control Center (TACC). 618 AOC (TACC)/XOW will utilize the MEFP to develop MWPs. 618 AOC(TACC)/XOW will use all available information (e.g., OWS products, alphanumeric data, satellite) for injection into key elements of mission planning and/or execution, and to integrate environmental effects to enhance combat capability. 618 AOC(TACC)/XOW will:

- 4.3.1. Provide 24-hour global surveillance to determine strategic, operational, and tactical weather threats to AMC assets.
- 4.3.2. Provide a continuous RED/GREEN risk management (RM) assessment of each 618 AOC (TACC)-controlled mission.
- 4.3.3. Respond to airborne contacts for IFM and Mission Weather Services sorties/missions.
- 4.3.4. Resolve differences between 618 AOC (TACC)/XOW forecasts and CU products.

4.4. Weather Support to Air Combat Command Air Operations Squadron (ACC AOS) Missions. The ACC AOS Weather Flight (ACC AOS/AOSW) will:

- 4.4.1. Use the MEFP to tailor and integrate decision-grade weather information into supported ACC AOS-controlled and non-AOS controlled missions.
- 4.4.2. Prepare a CMWP to include a horizontal weather depiction and forecast discussion for each supported ACC AOS-controlled mission.
- 4.4.3. Coordinate with supporting CUs as needed to resolve issues with characterization product meshing when supported missions cross AOR boundaries.
- 4.4.4. Post CMWPs on the appropriate ACC AOS web page (classified or unclassified) and/or disseminate directly to end users not later than (NLT) 6 hours prior to mission launch (L-6).
- 4.4.5. Provide MISSIONWATCH services to the ACC AOS Mission Control Center (AOS MCC) for AOS-controlled aircraft movements.
- 4.4.6. Advise the ACC AOS MCC as soon as possible when weather parameters at designated airfields along the mission route cross mission-limiting thresholds.
- 4.4.7. Issue amendments to CMWPs IAW ACC AOS amendment criteria.
- 4.4.8. Post CMWP amendments to the ACC AOS web page, notify the ACC AOS MCC by telephone or in person, and inform the senior ACC staff member of significant weather impacts to ACC bases or operations.

4.5. Space Weather Support Cooperation

- 4.5.1. 21st Operations Support Squadron Weather Flight (21 OSS/OSW). The 21 OSS/OSW North American Aerospace Defense Command (NORAD) Support section provides 24/7

space and terrestrial weather support to NORAD Operations, 21st Space Wing, US Northern Command (USNORTHCOM), and US Strategic Command (USSTRATCOM).

4.5.2. 614 Air and Space Operations Center Weather Specialty Team (614 AOC/CODW). 614 AOC/CODW provides terrestrial and space weather support to the 614th AOC also known as the Joint Space Operations Center (JSPOC). The weather team also supports Headquarters 14th Air Force (14 AF), with tailored space weather support including anomaly/impact assessments and space alert/warning notification. Other customers include 14 AF weather units and US Strategic Command (USSTRATCOM).

4.5.3. 21 OSS/OSW and 614 AOC/CODW will work closely with 2d Weather Squadron (2 WS) as the CU for space weather.

4.5.4. Assessment Procedures. 21 OSS/OSW and 614 AOC/CODW provide near real time space weather assessments to their respective supported units. These units will:

4.5.4.1. Notify 2 WS and flight leadership (if available) and form a consensus on the assessment.

4.5.4.2. Provide the assessment to the requesting supported unit.

4.5.4.3. If the assessment was time critical not allowing for contact of 2 WS or flight leadership, units will provide their organic assessment as required. The unit will then validate the provided assessment with flight leadership and 2 WS as soon as possible after-the-fact.

4.5.4.4. If the after-the-fact assessment evaluation differs significantly from the initial assessment, the applicable unit should provide this change to the supported unit as quickly as possible with specific rationale explaining the reasons for the difference.

4.5.4.5. In all cases when a space weather assessment is provided or a space weather impact is reported, the applicable weather unit will ensure the information is accurately documented and cross-fed to MAJCOM weather functional managers, HQ AFWA, 2 WG and 2 WS.

4.6. Weather Support for Space Launch and Range Operations. 45th Weather Squadron (45 WS) and 30th Operations Support Squadron Weather Flight (30 OSS/OSW) will utilize the MEFP to develop MWP's to support their respective wing missions and launch ranges as directed.

Chapter 5

AIR FORCE WEATHER SYSTEMS

5.1. General Operating Procedures/Functions. AFW organizations will develop procedures to ensure all meteorological observing equipment/sensors and other dedicated computer/communication systems (i.e., WSR-88D, PMSV) are operated properly. Procedures will include troubleshooting procedures, reporting and tracking equipment/communication outages, and applicable back-up equipment/systems if available.

5.2. Meteorological Equipment. AF Weather organizations will comply with the following requirements applicable to all assigned user/operator-maintained meteorological equipment used in the production of weather data.

5.2.1. Perform required user/operator maintenance IAW equipment Technical Orders (TOs) and operator manuals.

5.2.2. Maintain applicable operator manuals and/or TOs (soft or hard copy) on hand for each piece of assigned fixed and deployable meteorological equipment.

5.2.3. Operate meteorological equipment IAW applicable TOs and/or operator manuals

5.2.4. Appoint a system manager for meteorological systems (i.e., FMH-5 Joint Environmental Toolkit (JET), FMQ-19, etc.). System managers will maintain a continuity file with the following information:

5.2.4.1. Appointment letters for the primary and alternate system manager.

5.2.4.2. System siting/location information of sensors, servers, and workstations.

5.2.4.3. A listing of user account holders, with POCs for each workcenter.

5.2.4.4. Outage, MAJCOM POC, and AFWA POC.

5.2.4.5. Copies of the approval to operate and AF authority to connect, or Army certificate of networkiness, as appropriate. Note: These documents are stored/maintained by Air Force Space Command/A6 (AFSPC/A6). AFWA/A6 will be able to assist weather organizations that need copies of these documents.

5.2.4.6. System specific configuration information needed to manage the weather system (i.e., products received and/or produced).

5.2.4.7. Copies of any support agreements that affect the operation or maintenance of the system.

5.3. Technical Assistance. Weather organizations that require technical assistance for AFW fielded systems will notify the AFWA Fielded Systems Service Center (FSSC). The AFWA FSSC is the single point of contact for weather organizations requiring technical assistance and provides a 24-hour a day, 7-days a week service to handle trouble calls. The FSSC will maintain detailed information on all outages and will track these outages until successful resolution. **Note:** AF weather organizations will not contact the contractors directly unless otherwise directed.

5.3.1. The FSSC will record outage data to identify trends, extended outages, etc., and submit to AF/ Director of Weather (AF/A3O-W) in the AFWA daily update. The FSSC will also prioritize the management of existing outages and provide customers with timely updates when estimated restoration times change and when jobs are closed. Finally, customers will be contacted on a recurring basis in order to ascertain that each customer's concerns have been fully resolved.

5.3.2. Weather organizations should conduct basic troubleshooting first to determine the nature of the equipment outage using system manuals, local troubleshooting guides, or instructions available from 2nd Combat Weather Systems Squadron before contacting the FSSC. With assistance from the FSSC, weather personnel will generally be able to resolve most problems. If the problem cannot be resolved, the FSSC will contact the appropriate maintenance agency. In some cases, the FSSC may direct the weather organization to contact their local communication agency.

5.3.3. Weather organizations will accomplish the following IAW AFI 33-118, *Electromagnetic Spectrum Management or FM 6-20.70 Army Electromagnetic Spectrum Operations*:

5.3.3.1. Submit radio frequency assignment requests to the Installation Spectrum Manager (ISM) for equipment (e.g., PMSV, AMOS, radar). Contact the MAJCOM Functional Manager for assistance in obtaining system specific radio frequency assignment request inputs.

5.3.3.2. Report any frequency interference to the ISM.

5.4. Weather Radar (i. e., WSR-88D, PDR, EWR). Weather organizations will:

5.4.1. Coordinate significant changes affecting the control and operation (i.e., range, elevation, display parameters, and screen capture intervals for the imagery products provided on the Local Area Network [LAN] and the CU), and maintenance of the weather radar with the servicing CU. **Note:** This applies to organizations with Master System Control functions and/or tactical radars.

5.4.2. Develop procedures for the proper configuration and operation of radar equipment IAW Technical Orders (TOs), equipment manuals, and applicable handbooks.

5.4.3. Weather technicians employing a Doppler radar in MISSIONWATCH/METWATCH activities will:

5.4.3.1. Determine the radar's status, alert area locations and thresholds, and readouts such as current Volume Coverage Pattern (VCP), Routine Product Set (RPS) list, and environmental factors (e.g., environmental winds vs. VWP, tropopause height, height of -20 C isotherm) prior to data interpretation.

5.4.3.2. Make optimum use of the RPS lists for the current VCP and alert paired product listings for storm interrogation and choose the best product to use for a particular forecast pattern.

5.4.4. Ensure the following information is available to the operator: list of points of contact (e.g., maintenance for units with Unit Control Position responsibility), system troubleshooting guide, and a breakdown of the products on the RPS for the various VCPs.

5.4.5. Develop local procedures for reporting equipment outages and troubleshooting problems to include startup, restart, and shutdown, as appropriate.

5.4.6. Correctly identify and interpret relevant weather radar signatures and products common to the weather organization's area of operations.

5.5. Pre-Deployment and Periodic Operations Checks/Inventories.

5.5.1. Semiannually, weather organizations with deployable tactical meteorological equipment will:

5.5.1.1. Set up, do an operations check, and troubleshoot all assigned deployable tactical meteorological equipment. Organizations will incorporate operations checks and troubleshooting into their recurring training.

5.5.1.2. Inventory the system. Retain a copy and notify the MAJCOM Weather Functional and AFWA FSSC of outages or shortfalls. **Note:** A detailed TMQ-53 inventory and packing list is included in the TMQ-53 T.O.

5.5.2. When weather units are tasked to deploy equipment they will:

5.5.2.1. Perform an operations check and inventory the system. Immediately notify the MAJCOM Weather Division and AFWA FSSC of any shortfalls.

5.5.2.2. Obtain a system number and complete the Redistribution Order spreadsheet. Notify MAJCOM weather functional of any problems. Redistribution Order spreadsheets can be obtained from the base equipment managers or MAJCOM weather functional managers.

5.5.2.3. Turn system over to supporting AFB Logistics Readiness Squadron or other local shipping agency (Army installations) IAW shipping instructions. Notify MAJCOM weather functional of any problems.

5.5.2.4. Notify MAJCOM weather functional manager when system is shipped.

5.5.2.5. Verify the system is transferred off losing equipment account (CA/CRL).

5.5.2.6. Update the Air and Space Expeditionary Force (AEF) Reporting Tool (ART) and the Status of Resources and Training System (SORTS).

HERBERT J. CARLISLE, Lt. Gen, USAF
DCS, Operations, Plans and Requirements

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Prescribed Forms

DD Form 175-1, *Flight Weather Briefing*

AF Form 847, *Recommendation For Change of Publication*

AF IMT 3806, *Weather Watch Advisory Log*

AF IMT 3807, *Watch/Warning Notification and Verification*

Abbreviations and Acronyms

A3O—W ---Director of Weather

ACC—--Air Combat Command

AEF---Air and Space Expeditionary Force

AF---Air Force

AFCENT---Air Force Component of United States Central Command

AFDPO---Air Force Departmental Publishing Office

AFI---Air Force Instruction

AFMAN---Air Force Manual

AFOSH---Air Force Occupational Safety and Health

AFSOUTH---Air Force Component of United States Southern Command

AFVA---Air Force Visual Aid

AFWA---Air Force Weather Agency

AFW---Air Force Weather

AIRMET---Airmen's Meteorological Information

ALOHA---Area Locations of Hazardous Atmospheres

AMC---Air Mobility Command

AMOS--- Automatic Meteorological Observing System

ANG---Air National Guard

AOB---Airfield Operations Board

AOC---Air and Space Operations Center

AOL---Alternate Operating Location

AOR---Area of Responsibility

AR---Air Refueling

ART---Air Expeditionary Forces Reporting Tool

ATC---Air Traffic Control

ATO---Air Tasking Order

BEE---Bioenvironmental Engineering

C2---Command and Control

CA/CRL---Custodian Authorization/Custody Receipt Listing

CAMEO---Computer-Aided Management of Emergency Operations

CB---Cumulonimbus

CBRN---Chemical, Biological, Radiological, and Nuclear

CBRNE---Chemical, Biological, Radiological, Nuclear, and High-yield Explosive

CDM---Chemical Downwind Message

COA---Course of Action
COCOM---Combatant Command
COMAFFOR---Commander Air Force Forces
CONUS---Continental United States
COOP---Continuity of Operations Plan
COP---Common Operating Picture
DD---Defense Department
DLT---Desired Lead Time
DoD---Department of Defense
DRU---Direct Reporting Unit
DSN---Defense Switching Network
DTG---Date Time Group
DZ---Drop Zone
EDM---Effective Downwind Message
EM---Emergency Management/Manager
EOC---Emergency Operations Center
EUCOM---European Command
EWR---Ellison Weather Radar
EWXS---Expeditionary Weather Squadron
FAA---Federal Aviation Administration
FES---Fire Emergency Services
FITL---Forecaster-in-the-Loop
FLIP---Flight Information Publication
FM---Field Manual
FM---Flight Manager
FNMOC---Fleet Numerical Meteorological Oceanographic Command
FRM---Forecast Reference Material
FSSC--- Fielded Systems Service Center
FWA---Forecast Weather Advisory
FWB---Flight Weather Briefing
GDSS---Global Decision Support System
GMTF---Global Mobility Task Force

HQ---Headquarters
IAW---In Accordance With
ICAO---International Civil Aviation Organization
IFM---Integrated Flight Management
IPOE---Intelligence Preparation of the Operational Environment
IP---Inter-service Publication
IWEDA---Integrated Weather Effects Decision Aid
JA/ATT---Joint Airborne/Air Transportability Training
JAAWIN---Joint Air Force and Army Weather Information Network
JEM---Joint Effects Model
JET---Joint Environmental Toolkit
JMO---Joint Meteorological and Oceanographic Officer
JOAF---Joint Operational Area Forecast
JOC---Joint Operations Center
JOEF---Joint Operational Effects Federation
JOPP---Joint Operational Planning Process
JWARN---Joint Warning and Reporting Network
L/R---Launch/Recovery
LAN---Local Area Network
LOI---Letter of Instruction
LZ---Landing Zone
MAF---Mobility Air Forces
MAJCOM---Major Command (Air Force)
MDMP---Military Decision Making Process
MEF---Mission Execution Forecast
MEFP---Mission Execution Forecast Process
METAR---Aviation Routine Weather Report
METCON---Meteorological Conference
METOC---Meteorological and Oceanographic
METSAT---Meteorological Satellite
METWATCH---Meteorological Watch
MISSIONWATCH---Mission-Scale Meteorological Watch

MOAF—Military Operating Area Forecast
MOA—Memorandum of Agreement
MTOE—Modified Table of Organization and Equipment
MWP—Mission Weather Product
MWS—Mission Weather Services
NCOIC—Non-commissioned Officer In Charge
NOTAM—Notice to Airmen
NVG—Night Vision Goggle
NWP—Numerical Weather Prediction
OIC—Officer In Charge
OPLAN—Operations Plan
OPREP—Operational Report
OPR—Office of Primary Responsibility
OPSTEMPO—Operations Tempo
ORM—Operational Risk Management
OSS—Operations Support Squadron
OWS—Operational Weather Squadron
PACAF—Pacific Air Forces
PACAFI—Pacific Air Forces Instruction
PACOM—Pacific Command
PDR—Portable Doppler Radar
PERSTEMPO—Personnel Tempo
PGS/S—Program Generation Server/Scheduler
PIREPS—Pilot Reports
PMSV—Pilot-to-Metro Service
POC—Point of Contact
ROT—Rule of Thumb
RPA—Remotely Piloted Aircraft
RPS—Routine Product Set
RSO—Remote Split Operations
SAA—Senior Airfield Authority
SAR—Support Assistance Request

SECAF----Secretary of the Air Force
SIGMET----Significant Meteorological Information
SIPRnet----SECRET Internet Protocol Router Network
SME----Subject Matter Expert
SMO----Senior METOC Officer
SOF----Supervisor of Flying
SOP----Standard Operating Procedure
SORTS----Status of Resources and Training System
SOWT----Special Operations Weather Team
SPEC/AMD----Specification/Amendment
SPECI----Aviation Selected Special Weather Report
SWAP----Severe Weather Action Plan
SWO----Staff Weather Officer
TACC----Tanker Airlift Control Center
TAF----Terminal Aerodrome Forecast
TAWS----Target Acquisition Weapons Software
TC---TAP ---Tropical Cyclone Threat Analysis Product
TDA----Tactical Decision Aid
TN----Technical Note
TO----Technical Order
USAFE----United States Air Forces, Europe
USAF----United States Air Force
VAAC----Volcanic Ash Advisory Center
VCP----Volume Coverage Pattern
VFR----Visual Flight Rules
VIPSAM----Very Important Person Special Airlift Mission
VWP----Velocity Azimuth Display Wind Profile
WF----Weather Flight
WMO----World Meteorological Organization
WST----Weather Specialty Team
WS----Weather Squadron
WWA---- Watches, Warning and Advisory

Terms

Decision Cycles—Joint Operational Planning Process (JOPP), Military Decision Making Process (MDMP), Joint Intelligence Preparation of the Operational Environment, Intelligence Preparation of the Operational Environment (IPOE), Operational Risk Management (ORM) process, and Common Operating Picture (COP).

Group 1 UAS— Unmanned aircraft typically less than 20 pounds in weight that normally operate below 1200 feet above ground level (AGL) at speeds less than 250 knots (e.g., RQ-11B Raven, gMAV).

Group 2 UAS— Unmanned aircraft in the 21-55 pound weight class that normally operate below 3500 feet AGL at speeds less than 250 knots (e.g., Scan Eagle).

Group 3 UAS— Unmanned aircraft that weigh more than 55 pounds, but less than 1320 pounds, and normally operate below 18,000 feet mean sea level (MSL) at speeds less than 250 knots (e.g., RQ-7B Shadow).

Group 4 UAS— Unmanned aircraft that weigh more than 1320 pounds and normally operate below 18,000 feet MSL at any speed (e.g., MQ-1B Predator, MQ-1C Gray Eagle, MQ-5B Hunter).

Group 5 UAS— Unmanned aircraft that weigh more than 1320 pounds and normally operate higher than 18,000 feet MSL at any speed (e.g., MQ-9A Reaper, RQ-4 Global Hawk).

Launch and Recovery Element— Deployed personnel based at a forward location who are responsible for the launch, recovery and ground support of a RPA.

METWATCH—A deliberate process for monitoring the terrestrial weather or space environment in an area or region. The purpose of a METWATCH is to identify when and where observed conditions significantly diverge from forecast conditions and determine courses of action to update or amend a forecast product or group of products and notify designated agencies.

Military Operating Area Forecast—A forecast guidance product that provides the weather or space environmental conditions for a specific area in which military operations are occurring.

Mission Control Element— A GCS (usually established in a geographically separated location) responsible for taking a RPA from an LRE following takeoff, executing the mission and then handing the RPA back to the LRE for recovery and landing.

Mission Execution Forecast Process (MEFP)— A systematic, repeatable process for tailoring weather products and forecasting mission-limiting meteorological parameters and providing decision quality environmental information for an operational end user. This process provides a basic framework for fusing perishable meteorological data, operational and strategic forecast products, and an understanding of the supported user's tactics which will be applied to any mission their supported user may undertake. The MEFP describes an end-to-end process incorporating management steps, forecast development, mission meteorological watch, and post-mission analysis of the information provided.

Mission Integration—The ability to understand mission platforms, equipment, and systems capabilities/sensitivities as well as mission processes (e.g., JOPP, MDMP, IPOE, ORM, COP, tactics, etc.) and inject the right information at the right time every time, enabling mitigation of

environmental threats as early as possible in the mission planning process, ultimately optimizing mission execution.

Mission Profile—describes a mission's operating platform(s), route, flight level(s), weapons systems, equipment, target(s), tactics/techniques/procedures (TTPs), and timing.

MISSIONWATCH—A deliberate process of monitoring terrestrial weather or the space environment for specific mission-limiting environmental factors that may adversely impact missions in execution. The MISSIONWATCH process is performed by WFs and WSTs and is intended to identify previously unidentified environmental threats and alert decision-makers at the operational unit and/or airborne mission commanders, enabling dynamic changes to mission profiles that may mitigate the environmental threat and optimize the chance of mission success.

Mission Weather Product (MWP)—Any weather product or group of weather products generated by an EU that is integrated into the military decision making process. MWPs may be planning or execution products and are not limited to aviation missions.

Special Weather Statement (SWS)—An OWS notice to supported customers of meteorological effects which could impact future operations. This notice is for situational awareness purposes only and does not require action by supported customers.

Terminal Aerodrome Forecast (TAF) ---A coded weather bulletin providing forecast information for an aerodrome complex to facilitate flight planning and command and control. TAFs are formatted IAW AFMAN 15-124, Meteorological Codes, and amended IAW AFMAN 15-129, Air and Space Weather Operations-Characterization.

Weather Advisory—A special weather product to alert an end user of the occurrence of, or imminent occurrence of weather conditions impacting operations.

Weather Flight (WF)—Weather flights, detachments, and operating locations whose primary purpose is to facilitate exploitation of the environment through integration at every step of the operations planning and execution process. The WF may be located with the supported unit on an Air Force base, Army post, remotely located in another weather unit, or at a deployed location.

Weather Warning—A special weather product to facilitate resource protection decisions. Weather Warnings alert designated agencies to the imminent or actual occurrence of weather conditions of such intensity as to pose a hazard to life or property for which the agency must take immediate protective actions.

Weather Watch—A special weather product to facilitate resource protection decisions. Weather Watches provide advance notice to designated agencies of the existence of a potential for weather conditions of such intensity as to pose a hazard to life or property for which the agency should consider taking protective measures.

Attachment 2

DD FORM 175-1, FLIGHT WEATHER BRIEFING INSTRUCTIONS

A2.1. General Instructions. Unless directed by MAJCOMs, higher headquarters, or local operating procedures, all entries in the individual blocks are at the discretion of the briefer, based on aircrew requirements and the weather situation. Entries on the DD Form 175-1 or equivalent briefing form must be horizontally and vertically consistent and show sound meteorological reasoning. For example, if a weather warning or advisory for surface wind is indicated in block 11, the surface wind forecast in block 9 should reflect the warning or advisory wind criteria, along with the warning or advisory number entered in block 13. Enter all times in UTC, all winds in five digits (six for wind speeds over 99 knots), and record all heights in hundreds of feet with the surface level as "SFC."

A2.2. PART I - TAKEOFF DATA. Enter the general forecast for takeoff 1 hour either side of the estimated time of departure (ETD).

A2.2.1. Block 1. **DATE.** Enter the UTC departure date in the format needed for operational use and communication with C2 systems (e.g., DD MMM YYYY, YYYY MM DD).

A2.2.2. Block 2. **ACFT TYPE/NO.** Enter aircraft type (F117, B52, C5) and radio call sign, mission number, or the last three digits of the tail number.

A2.2.3. Block 3. **DEP PT/ETD.** Enter the departure location identifier (ICAO ID#) and estimated time of departure. Enter departure grid point or latitude/longitude for locations that do not have location identifiers.

A2.2.4. Block 4. **RWY TEMP.** Enter the runway temperature (prefixed with a "+" or "-" as applicable) and designate degrees Celsius or Fahrenheit used.

A2.2.5. Block 5. **DEW POINT.** Enter the runway temperature (prefixed with a "+" or "-" as applicable) and designate degrees Celsius or Fahrenheit used..

A2.2.6. Block 6. **TEMP DEV.** Enter in degrees Celsius unless requested in Fahrenheit. For USAF flights, enter "Temp Dev" as the difference between the forecast temperatures for climb and the US Standard Atmosphere temperature. For Navy/Marine flights, enter the difference between forecast runway temperature (prefixed with a "+" or "-" as applicable) and US Standard Atmosphere temperature corresponding to field elevation.

A2.2.7. Block 7. **PRES ALT.** Enter the pressure altitude in feet with algebraic sign. Primarily used by USAF aviators. Army aviators usually use density altitude.

A2.2.8. Block 8. **DENSITY ALT.** Enter in feet with algebraic sign. Primarily used by Army aviators in mountainous terrain only.

A2.2.9. Block 9. **SFC WIND.** Enter the surface wind direction in Magnetic for missions departing your airfield, and in True direction for missions departing another airfield. Designate "M" for magnetic" or "T" for true. Enter surface wind direction to the nearest 10 degrees in three digits and surface wind speed (including gust) in two or three digits. Ensure wind entries use a minimum of 5 digits (3 digits for direction and 2 digits for speed). Surface winds will have 2 digits to represent gusts, while winds aloft will use 3 digits for speed when

winds exceed 99 knots. Enter "VRB" for a forecast variable wind direction and "CALM" when the winds are forecast calm.

A2.2.10. Block 10. **CLIMB WINDS.** Enter the true direction. Enter a representative wind (or winds) from takeoff to cruise altitude. Enter wind direction to the nearest 10 degrees in three digits and wind speed in two or three digits to the nearest 5 knots. Enter climb winds in layers if there are significant differences (wind speed changes of greater than or equal to 20 knots and/or wind direction changes greater than or equal to 30 degrees and the wind speed is expected to be over 25 knots) from one stratum to another.

A2.2.11. Block 11. **LOCAL WEATHER WATCH/WARNING/ADVISORY.** Enter any known forecast/observed weather watch, warning, or advisory valid for ETD +/-1 hour. When watch, warning, and advisory information for a location are not available (e.g., remote briefing), enter "Check with local flight agencies." Inform the aircrew that the status of local weather watches, warnings, and/or advisories is undeterminable, and recommend they check with the local ATC or airfield operations for any weather watches, warnings, or advisories that may be in effect.

A2.2.12. Block 12. **Runway Surface Condition (RSC)/Runway Condition Reading (RCR).** Enter the latest reported Runway Surface Condition/Runway Condition Reading (RSC/RCR) for the departure airfield, if available (e.g., WR//, RCRNR, IRPSR10, P DRY). When RSC/RCR is not available, enter "N/A."

A2.2.13. Block 13. **REMARKS/TAKEOFF ALTN FCST.** Enter remarks on weather that will affect takeoff and climb (e.g., inversions, icing, turbulence, low level wind shear). Ensure the contents of the briefing and the local TAF are consistent. If requested, enter a forecast for the specific takeoff alternate and time.

Figure A2.1. Example PART I - TAKEOFF DATA

FLIGHT WEATHER BRIEFING							
PART I - TAKEOFF DATA							
1. DATE 20 Mar 02	2. ACFT TYPE/NO. C130/CATS01	3. DEP PT/ETD KOFFM410 Z	4. RWY TMP -2 °F/C	5. DEWPOINT -3 °F/C	6. TEMP DEV	7. PRES ALT +1130 FT	8. DENSITY ALT FT
9. SFC WIND 29012G18	10. CLIMB WINDS 24025 (SFC-060) 21035 (060-100)	11. LOCAL WEATHER WATCH/WARNING/ADVISORY 03-10 SNOW 4 - 6 INCHES VALID 20M200Z TO 20/2000Z				12. RSC/RCR LSR15	
13. REMARKS/TAKEOFF ALTN FCST MDT RIME ICG 005-140 DURGC KOFF				TAKE OFF ALTN KSUX VALID 1410-1540Z 08012 4 -SN OVC018 ALSTG 29.95 TEMPO 1 SN OVC009			

A2.3. PART II – ENROUTE & MISSION DATA. Enter data for the duration of the specific mission and the entire route of flight. Brief hazards for the specific mission (if applicable) and enroute generally within 25 miles either side of the route and within 5,000 feet above and below the planned flight level. Insert or attach forecasts for drop zones, ranges, air-refueling areas, or low-level routes, etc., as applicable to the specific mission.

A2.3.1. Block 14. **FLT LEVEL/WINDS/TEMP.** Enter planned flight level in hundreds of feet in three digits (e.g., "280" for 28,000 feet, "080" for 8,000 feet). Enter true wind direction at flight level in tens of degrees and speed to the nearest 5 knots. Enter forecast flight level temperature in degrees Celsius (prefixed with a "+" or "-" as applicable). If there are significant wind speed and direction changes, break the forecast into legs (e.g., BLV-

MXF 27045/-45). Otherwise, brief a representative wind and temperature for the entire route (e.g., 32040/-38). If a computer flight plan (CFP) is available, review it for accuracy before briefing aircrews. If accurate, enter "See CFP" in this block. Check "See Attached" if providing a CFP or specific wind charts.

A2.3.2. Block 15. **SPACE WEATHER.** Check the appropriate block indicating the Frequency (FREQ), Global Positioning System (GPS), and Radiation (RAD) as applicable to the specific mission. Indicate the boundaries of the degradation in the space provided in block 15, (e.g., UHF 20N180W to Paya Lebar). When using the High Altitude Radiation Dosage Chart, 10.0 to less than 100.0 milirems per hour constitute marginal and 100.0 milirems per hour and greater constitute severe. A second option is to simply check the appropriate blocks and attach the applicable Space Weather charts to the DD Form 175-1. Indicate there are attachments by writing "SEE ATTACHED" in block 15 and check "Yes" in block 34.

A2.3.3. Block 16. **SOLAR/LUNAR.** Enter the location specified by the aircrew, Beginning Morning Nautical Twilight (BMNT), Sunrise, Sunset, Ending Evening Nautical Twilight (EENT), Moonrise (MR), Moonset (MS), and Percent Moon Illumination (ILLUM).

A2.3.4. Block 17. **CLOUDS AT FLT LEVEL.** Check appropriate block. "Yes" implies flight in cloud at least 45 percent of the time; "No" implies the flight will be in cloud less than 1 percent of the time; and "In and Out" implies the flight will be in cloud between 1 percent and 45 percent of the time.

A2.3.5. Block 18. **OBSCURATIONS AT FLT LEVEL RESTRICTING VISIBILITY.** Check the appropriate block. If "Yes," enter the type of forecast obscurations that could potentially restrict the in-flight visibility along the planned route or mission flight level (e.g., fog, haze, smoke, etc.). Specify the intensity and location if applicable.

A2.3.6. Block 19. **MINIMUM CEILING.** Enter the lowest ceiling enroute and for the specific mission (if applicable) in hundreds of feet **AGL**, and the geographical location (e.g., "060 ft BLV-MXF"). If the minimum ceiling is over hilly or mountainous terrain, or in thunderstorms, so indicate; e.g., "010 feet BOSTON MTS," or "020 feet SW KY TSTMS."

A2.3.7. Block 20. **MAXIMUM CLOUD TOPS.** Enter maximum tops of cloud layers (exclusive of thunderstorm tops) with more than 4/8 coverage in hundreds of feet **MSL** and the geographical location.

A2.3.8. Block 21. **MINIMUM FREEZING LEVEL.** Enter the height and geographical location of the lowest freezing level enroute and for the specific mission (if applicable) in hundreds of feet Mean Sea Level. If the lowest freezing level is at the surface, enter "SFC" and geographical location.

A2.3.9. Block 22. **THUNDERSTORMS.** Enter the name and DTG of the thunderstorm product used (e.g., OWS products, radar summary, satellite imagery, NWS or foreign weather service In-Flight Weather Advisories). Enter the type, extent, maximum tops, and geographical location of thunderstorms affecting the route or specific mission. The extent percentages on the DD Form 175-1 directly correspond to the Maximum Instantaneous Coverage (MIC) depicted on OWS thunderstorm products. Never use the terms "cumulonimbus" or "CB." Instead, use "thunderstorm."

A2.3.10. Block 23. **TURBULENCE** (not associated with thunderstorms). Enter the name and DTG of the turbulence forecast product used (e.g., AFWA/OWS products, NWS or foreign In-Flight Weather Advisories). Enter the type, intensity, levels, and locations of turbulence affecting the route or specific mission.

A2.3.11. Block 24. **ICING** (not associated with thunderstorms). Enter the name and DTG of the icing forecast product used (e.g., AFWA/OWS products, NWS or foreign In-Flight Weather Advisories). Enter the type, intensity, levels, and locations of icing affecting the route or specific mission.

Note: Like AFWA and OWS forecast products, In-Flight Weather Advisories are advisory in nature and should be used as guidance when preparing the enroute forecast. They must be carefully evaluated and tempered with all available data (e.g., radar, PIREPs/AIREPs, upper air soundings, online resources) to determine the potential effects on the specific mission and aircraft. Even if not used as the basis for the forecast, weather personnel must alert aircrews to all existing In-Flight Weather Advisories that affect their mission. If the weather briefer disagrees with the advisory, annotate the fact in the "Remarks" section of the DD Form 175-1 or equivalent. Whether or not the condition described is potentially hazardous to a particular flight is for the pilot to evaluate based on experience, the mission, and the operational limits of the aircraft. See FAA *Aeronautical Information Manual* for detailed information on NWS In-Flight Weather Advisories.

A2.3.12. Block 25. **PRECIPITATION**. Enter the type, intensity, character, and geographical location of precipitation areas affecting the route or specific mission. This block is for precipitation encountered at flight level, not at the surface.

Figure A2.2. Example PART II – EN ROUTE & MISSION DATA

PART II – ENROUTE & MISSION DATA																													
14. FLT LEVEL/WINDS/TEMP			SEE ATTACHED			15. SPACE WEATHER UHF 20N180W to Paya Lebar			16. SOLAR/ LUNAR		LOCATION																		
						NO IMPACT		MARGINAL	SEVERE		BMNT 0600 Z																		
100			KOFF – KSUX 210351-10			FREQ		X		SR 0628 Z	MR 2023 Z																		
			KSUX – Nm MN 170501-05			GPS	X			SS 1836 Z	MS 0755 Z																		
						RAD	X			EENT 1904 Z	ILLUM 92 %																		
17. CLOUDS AT FLT LEVEL						18. OBSCURATIONS AT FLT LEVEL RESTRICTING VISIBILITY																							
<input checked="" type="checkbox"/>	YES	<input type="checkbox"/>	NO	IN AND OUT		<input type="checkbox"/>	YES	<input checked="" type="checkbox"/>	NO	TYPE																			
19. MINIMUM CEILING : LOCATION						20. MAXIMUM CLOUD TOPS : LOCATION				21. MINIMUM FREEZING LVL : LOCATION																			
003		Ern NE		FT AGL		280		NE, IA, Sm SD		FT MSL		SFC		RTE		FT MSL													
22. THUNDERSTORMS			23. TURBULENCE			24. ICING			25. PRECIPITATION																				
CHART 15 OWS 20 11Z			CHART 15 OWS 20 11Z			CHART 15 OWS 20 11Z			CHART																				
<input checked="" type="checkbox"/>	NONE	<input type="checkbox"/>	AREA	<input type="checkbox"/>	LINE	<input type="checkbox"/>	NONE	<input type="checkbox"/>	IN CLEAR	<input type="checkbox"/>	IN CLOUD	<input type="checkbox"/>	NONE	<input type="checkbox"/>	RIME	<input type="checkbox"/>	MIXED	<input type="checkbox"/>	CLEAR	<input type="checkbox"/>	NONE	<input type="checkbox"/>	DRIZZLE	<input type="checkbox"/>	RAIN	<input type="checkbox"/>	SNOW	<input type="checkbox"/>	PELLET
HAIL, SEVERE TURBULENCE, ICING, HEAVY PRECIPITATION, LIGHTNING & WIND SHEAR EXPECTED IN AND NEAR THUNDERSTORMS			LEVELS			LEVELS			FREEZING																				
			080-120			SFC – 140																							
LOCATION			LOCATION			LOCATION			LOCATION																				
			Ern NE – Sm SD			NE, IA, Sm SD			NE, IA, Sm SD																				

A2.4. PART III - AERODROME FORECASTS. Brief the worst conditions expected to prevail during the valid period for both destination and alternate. Ensure the aircrew is briefed on, and fully understand, the entire weather situation at the destination and alternates. The need for and the selection of an alternate is a pilot decision. However, weather technicians need to be familiar with the basic USAF, Army, and Navy/Marine provisions for alternate selection. Refer to AFI 11-202V3, *General Flight Rules*, Army Regulation 95-1, *Flight Regulations*, or OPNAVINST 3710.7, *NATOPS General Flight and Operating Instructions* for specific alternate requirements. Enter forecasts for subsequent stops and alternates on request, but advise the pilot that updates are necessary. Brief destination forecasts in terms the aircrew understands and prefers.

A2.4.1. Block 26. **DEST/ALTN.** Enter the appropriate station identifier (ICAO) for the destination (DEST) or alternate (ALTN) aerodrome forecast. Designate DEST or ALTN used. Place conditions described by a TEMPO group on the next line, line through ~~DEST/ALTN~~, and enter TEMPO in the block. **Note:** PGS/S-developed briefings place TEMPO groups on the same line. Place local hazard forecasts from the TAF in the Remarks section. For Army multi-stop missions, where the forecast for all stops is similar, enter "A/S" (for "all stops"), enter the worst conditions expected along the route, and identify the location having the worst condition. These entries imply conditions at all other stops are the same, or better.

A2.4.2. Block 27. **VALID TIME.** For USAF and Navy/Marine missions, enter valid time as 1 hour either side of ETA. For flights less than 1 hour, the valid period will be ETD to ETA plus 1 hour. Briefings for Army missions require a valid time from ETA through 1 hour after ETA. For "A/S" entries, valid times are determined from original ETD to last stop ETA plus 1 hour.

A2.4.3. Block 28. **SFC WIND.** Enter true wind direction if the destination is an airfield other than your own. If the flight departs from and terminates at your own airfield with no intermediate stops, enter the wind direction magnetic. Designate "M" for magnetic" or "T" for true. Enter the wind direction to the nearest 10 degrees, and speed (including gusts) to the nearest whole knot. For "A/S" missions, enter the highest wind speed expected (including gusts) and the location.

A2.4.4. Block 29. **VSBY/WEA.** Enter the lowest prevailing visibility and weather expected during the valid period. Represent in statute miles for CONUS and overseas US locations, and in meters for other overseas locations, unless otherwise specified by the aircrew.

A2.4.5. Block 30. **CLOUD LAYERS.** Enter the lowest prevailing sky condition expected during the valid period. Weather briefers must fully evaluate all NWS probability groups (i.e. PROB30/40%) and indigenous variations of the TAF code. If necessary, use the Remarks section to record the briefer's assessment and translation of these conditions.

A2.4.6. Block 31. **ALTIMETER/RWY TEMP/PRES ALT.** Enter the lowest altimeter setting expected during the valid period in all cases except those in which it is impossible to obtain or determine. Enter the forecast temperature (RWY TMP) and designate degrees Celsius or Fahrenheit used (prefixed with a "+" or "-" as applicable). Enter the forecast pressure altitude (PRES ALT) for the arrival time at the destination.

Figure A2.3. Example PART III – AERODROME FORECASTS

PART III – AERODROME FORECASTS							
26. DEST/ALTN	27. VALID TIME	28. SFC WIND	29. VSBY/WEA	30. CLOUD LAYERS	31. ALTMETER	RWY TEMP	PRES ALT
DEST/ALTN KOFF	ZTO Z 1705 – 1905	M 04012G18	T 1/2 SN	OVC005	INS 29.70	*F/C -1	FT +1150
DEST/ALTN	ZTO Z	M T			INS	*F/C	FT
DEST/ALTN KSUX	ZTO Z 1735 – 1935	M 06014	T 6 -SN	OVC012	INS 29.80	*F/C	FT
DEST/ALTN TEMPO	ZTO Z	M T	1 -SN BR	OVC005	INS	*F/C	FT
DEST/ALTN	ZTO Z	M T			INS	*F/C	FT
DEST/ALTN KRDR	ZTO Z 1800 – 2000	M 06009	T 7	SCT060 BKN090	INS 30.04	*F/C	FT
DEST/ALTN	ZTO Z	M T			INS	*F/C	FT
DEST/ALTN	ZTO Z	M T			INS	*F/C	FT

A2.5. PART IV - COMMENTS/REMARKS.

A2.5.1. Block 32. **BRIEFED RSC/RCR**. Check the appropriate block and enter the latest available RSC/RCR value briefed to the aircrew for the destination and the alternate in the Remarks section. If unavailable, annotate “N/A”.

A2.5.2. Block 33. **PMSV**. Enter the PMSV frequency and/or phone patch number of the weather unit providing the briefing. If PIREPs are requested for specific areas, enter the areas in Remarks (e.g., Request PIREP DURGC).

A2.5.3. Block 34. **ATTACHMENTS**. Check the appropriate block indicating if attachments are provided with the briefing.

A2.5.3.1. Block 35. **REMARKS**. Enter any other significant data (e.g., data for which there was insufficient space in other blocks and specialized mission forecasts, such as low-level mission areas, air refueling, or gunnery/bombing ranges, etc.) Weather briefings provided electronically (e.g., faxed, posted on web page, or e-mailed) must include the following statement: *"Call (ICAO) at DSN ###-#### or commercial (###) ###-#### for a weather update."* Also include information on how the aircrew can get weather support at the next location. For example: "For Wx updates/briefs at Eglin AFB, call 28OWS at DSN 965-0588 or toll free at 1-877-297-4429."

Figure A2.4. Example PART IV - COMMENTS/REMARKS

PART IV - COMMENTS/REMARKS							
32. BRIEFED RSC/RCR	<input checked="" type="checkbox"/>	YES	NOT AVAILABLE	33. PMSV KOFF 342.5	34. ATTACHMENTS	YES	<input checked="" type="checkbox"/> NO
35. REMARKS Request PIREP DURGC MDT RIME ICG 050-100 DURGD KOFF. KRDR DRY				Call Eglin AFB at DSN ###-#### or commercial (###) ###-#### for a weather update.			

A2.6. PART V - BRIEFING RECORD.

A2.6.1. Block 36. **WX BRIEFED TIME**. Enter time the briefing was provided. For briefings sent electronically, this will be the time the briefing was faxed, posted on a web page, local LAN, or passed to a central dispatch facility (TACC, AOC Air Mobility Division,

etc.). Append an "E" in front of the time (e.g., E1015Z) if the crew was not verbally briefed. If the crew calls later for a verbal briefing, put a solidus after the "E" time and enter the verbal brief time (e.g., E1015Z/1035Z).

A2.6.2. Block 37. **FLIMSY BRIEFING NUMBER.** If a flight weather briefing folder, flimsy, or CFP was prepared for this mission, enter the folder, flimsy, or CFP identification number.

A2.6.3. Block 38. **FORECASTER'S INITIALS.** Enter the initials of the weather briefer or the forecaster preparing and disseminating the briefing.

A2.6.4. Block 39. **NAME OF PERSON RECEIVING BRIEFING.** (Remote briefings only). If available, enter receiver's name and, if applicable, military grade.

A2.6.5. Block 40. **VOID TIME.** (Army and Navy/Marine Corps only). Army: Add 1:30 to the "Weather Briefed" time. For Army briefings sent electronically, calculate the void time from the "E" time (paragraph A6.6.1). If the crew calls later for a verbal briefing, recalculate the void time from the verbal briefing time and enter the new void time after the first time (e.g., 1145Z/1205Z). Navy/Marines: Add 1/2 hour to ETD. **Note:** Navy and Marine Corps aircrews are required to receive a flight weather briefing within 3 hours of ETD. Adjust the void time if the ETD changes.

A2.6.6. Block 41. **EXTENDED TO/INITIALS.** (Army and Navy/Marine Corps Only). When an Army or Navy/Marine pilot asks for an extension, recheck all weather entries, rebrief, and indicate the required changes (i.e. highlight/bold if electronic, green ink if paper) and enter the initials of the forecaster providing the extension. Extensions follow the same rule as for void times.

A2.6.7. Block 42. **WX REBRIEFED TIME/INITIALS.** (Not required for Army, Army equivalent is "Extended To") If weather rebriefed is different than originally briefed, indicate the changes to original weather entries as specified in Block 41 and enter the rebriefing time and initials of the forecast providing the rebrief.

A2.6.8. Block 43. **WX DEBRIEF TIME/INITIALS.** Enter the time the aircrew debriefed and the initials of the forecaster receiving the debriefing.

Figure A2.5. Example PART V - BRIEFING RECORD

PART V - BRIEFING RECORD			
36. WX BRIEFED TIME E1329M345 Z	37. FLIMSY BRIEFING NO.	38. FORECASTER'S INITIALS LM	39. NAME OF PERSON RECEIVING BRIEFING
40. VOID TIME 1459M515 Z	41. EXTENDED TO / INITIALS Z	42. WX REBRIEFED TIME / INITIALS Z	43. WX DEBRIEF TIME / INITIALS 1930/IB Z

DD Form 175-1, Revision Date (EG)

Attachment 3**INSTRUCTIONS FOR COMPLETING AF IMT 3807, WATCH/WARNING
NOTIFICATION AND VERIFICATION**

A3.1. General Instructions. Unit leaders may use these instructions as guidance in preparing local procedures for logging weather watches and warnings. Enter all times in UTC.

A3.1.1. **Block 1. Number.** Enter the locally specified number, or numbers when a watch and corresponding warning have different numbers (e.g., Watch # A4-008, WW # 4-002).

A3.1.2. **Block 2. Location.** Enter the location (installation or area) for which the watch/warning is valid.

A3.1.3. **Block 3. Date.** Enter the issue date of the watch/warning.

A3.1.4. **Block 4. Issued By.** Enter the name or initials of the individual who issues the watch/warning.

A3.1.5. **Block 5. Verified By.** Enter the name or initials of the individual who verifies the warning.

A3.1.6. **Block 6. Criteria:**

A3.1.6.1. **Watches/Warnings Are Issued For The Following.** Enter the watch/warning criteria.

A3.1.6.2. **Desired Lead-Time.** Enter the desired lead-time.

A3.1.6.3. **Valid Period.** Enter the valid period of the watch/warning on the appropriate line (opposite the criteria for which the watch/warning is issued). The ending time for observed lightning will reflect the estimated duration.

A3.1.6.4. **Forecast.** Enter the specific value or category forecast if different than that listed in the watch/warning criteria block. For example, if the threshold is for winds greater than 35 knots, but the forecast is for 40 knots, specify 40 knots in this block.

A3.1.6.5. **Verification.** See AFMAN 15-129, *Air and Space Weather Operations - Characterization* for verification procedures.

A3.1.6.5.1. **Occurred.** Enter the time the weather element first occurred within the area covered by the warning. For WWs issued for winds 50 knots or greater, or hail 3/4 inch or greater that do not occur within the area covered by the warning but DO occur within 10 nautical miles, use the time the event occurred within 10 nautical miles. If the weather element did not occur, leave blank and indicate the nonoccurrence in the Did Not Occur block.

A3.1.6.5.2. **Did Not Occur.** Check those weather elements that did not occur.

A3.1.6.5.3. **Lead-Time.** Enter the actual lead-time of each verified weather element. In cases where a warning downgrades an earlier warning that did not verify (with no break in coverage), compute actual lead-time using the issue time of the earlier warning.

A3.1.6.5.4. **Timing Error.** Enter the timing error if a lead-time was computed.

A3.1.6.6. **Text.** Enter the text and valid period of the watch or warning as disseminated to customers. Overprinting the text of standardized watch warning criteria (with blanks for specific values) may improve relay times. For example, overprint:

**THUNDERSTORMS WITH _____ WINDS AND _____ INCH HAIL OR
WINDS _____ KNOTS NOT ASSOCIATED WITH THUNDERSTORMS**

This space may also be used to document extension information.

A3.1.6.7. Block 7. Dissemination:

A3.1.6.7.1. **Agency.** List all agencies notified of the watch or warning. Include the primary dissemination system and all agencies not on the primary dissemination requiring notification. Some agencies on the primary dissemination system may require a backup call to verify receipt (indicated by an *); do not use the time of backup calls in verification statistics.

A3.1.6.7.2. **Contact.** List primary and secondary means of contacting the agencies, for example, N-TFS/x1234.

A3.1.6.7.3. **Agency Criteria.** Mark the watch/warning criteria for each agency.

A3.1.6.7.4. **Watch Issued.** Enter the dissemination/notification time, the initials of the forecaster issuing the watch, and the initials of the person receiving the watch if that agency requires a backup call or is not on the primary dissemination system.

A3.1.6.7.5. **Watch Cancelled.** Enter the dissemination/notification time, the initials of the forecaster cancelling the watch, and the initials of the person receiving the cancellation if that agency requires a backup call or is not on the primary dissemination system. If the watch runs full term, enter an appropriate remark such as "allowed to expire" or "ATE."

A3.1.6.7.6. **Warning Issued.** Enter the dissemination/notification time, the initials of the forecaster issuing the warning, and the initials of the person receiving the warning if that agency requires a backup call or is not on the primary dissemination system.

A3.1.6.7.7. **Warning Cancelled.** Enter the dissemination/notification time, the initials of the forecaster cancelling the warning, and the initials of the person receiving the cancellation if that agency requires a backup call or is not on the primary dissemination system. If the warning runs full term, enter an appropriate remark such as "allowed to expire" or "ATE."

A3.1.6.8. **Block 8. Remarks.** Use for miscellaneous information.

A3.1.6.9. **Block 9. Pertinent Observations** (back of form). List all pertinent observations, both "official" and "unofficial," radar information if available, and other information that verifies and/or justifies the watch/WW, or provides reasoning why the warning was not cancelled when it did not verify. Include available information (i.e. radar information, off-duty observer reports, locally reported weather conditions) used to verify warnings for winds greater than or equal to 50 knots or hail greater than or equal to 3/4 inch (or the substituted local severe weather thresholds where different) that are reported or observed within *10 nautical* miles rather than in the area covered by the warning.

A3.1.6.10. **Block 10. Forecast Review and Comments** (back of form). Use for forecast review information. AF weather leaders can use this space to include written comments on weather watches and warnings.

Attachment 4**INSTRUCTIONS FOR COMPLETING AF IMT 3806, WEATHER WATCH ADVISORY LOG**

A4.1. General Instructions. Unit leaders may use these instructions as guidance in preparing local procedures for logging forecast and observed weather advisories. Enter all times in UTC.

A4.1.1. **Date.** Enter the month and year.

A4.1.2. **Issued.** Enter the issue DTG.

A4.1.3. **Valid.** Enter the valid time of the WA. Leave blank for observed WAs.

A4.1.4. **Terminal or Area.** Enter the installation or area for which the advisory is being issued. Enter the locally assigned WA number (e.g., WA # 05-A05).

A4.1.5. **Text.** Enter the text of the advisory.

A4.1.6. **Dissemination.** Use this section to enter information for the initial issuance, extensions, and cancellations of WAs. If the WA is allowed to expire, enter a remark such as "allowed to expire" or "ATE" in one of the time blocks. Use the Remarks block or back of the form if needed.

A4.1.6.1. **Agency.** Enter the agencies notified of the WA. Include the primary dissemination system and all agencies not on the primary dissemination system that must be notified. **Note:** Minimize individual notification calls to no more than three.

A4.1.6.2. **Time.** Enter the time each agency was notified.

A4.1.6.3. **Initials.** Enter the initials of the individual receiving the WA information, if required. This is normally used for agencies not on the primary dissemination system and for follow-up calls.

A4.1.6.4. **Forecaster.** Enter the name or initials of the forecaster issuing, extending, or canceling the WA.

A4.1.7. **Remarks.** Use as required.

A4.1.8. **Verification.** Verify all forecast WAs either objectively or subjectively as determined by unit leaders. For WAs containing multiple phenomena, verify each phenomenon separately.

A4.1.8.1. **Occurred.** Check "Yes, No, or Not Applicable."

A4.1.8.2. **Lead-Time.** Enter the actual lead-time. Lead-time is not required for observed WAs, downgrades of previously verified WAs or WAs with no break in coverage, or extensions unless the WA has not yet verified. In cases where a WA downgrades an earlier warning or advisory that *DID NOT* verify (with no break in coverage), compute the lead-time using the issue time of the earlier warning or advisory.

A4.1.8.3. **Timing Error.** Enter the calculated timing error, if required.

A4.1.8.4. **Verified By.** Enter the initials of the individual verifying the advisory.

A4.1.8.5. **Comments/Remarks.** Enter enough meteorological reasoning and information, such as observations, radar reports, and PIREPs, to verify and/or justify the WA. This includes information to verify the WA objectively or subjectively.

Attachment 5

EXAMPLE MOAF AND CONTROLLING MWP (CMWP)

A5.1. General. Figure A5.1 contains suggested weather parameters for various A/N MOAFs. The CMWP in Figure A5.2 contains several different MOAFs for specific missions conducted within one large multiple-unit operation. In this example, the individual MOAFs are combined to form the official CMWP developed by the lead weather unit. The lead weather unit aligned with the C2 element will coordinate the CMWP with all weather units supporting missions participating in the multiple-unit operation. These weather units will produce a MWP from the information in the CMWP. See Chapter 1, Coordinated Weather Operations, for detailed guidance. Figures A5.3 and A5.4 provide examples of MOAFs functioning as the official CMWP for a multiple-unit operation.

Figure A5.1. Suggested Weather Parameters for A/N MOAFs

Higher-Altitude MOAFs	Weather Parameters
Air Refueling (AR) Tracks, High-Altitude Orbits Air Combat Maneuver/Training Areas IFR Military Training Routes (Instrument Route)	<ul style="list-style-type: none"> - Degree of cloud cover, and heights of cloud bases and tops of layers. - In-flight visibility (AR and other MOAFs), as required. - Turbulence (category II) & Icing. - Thunderstorm coverage and MAX tops. - Winds and temperatures (at flight level). - Minimum altimeter for duration of mission (as required).
Lower-Altitude MOAF	Weather Parameters
Drop Zone (DZ), Landing Zone (LZ), VFR Military Training Routes (VR), Slow-Speed Low-Altitude Training Routes, Forward Arming and Refueling Point (FARPs), Training Ranges (e.g., Nellis Range, Eglin Range, National Training Center at Ft Irwin, etc.), Extraction Zones (EZ), Target Areas, Low-Altitude Orbits	<ul style="list-style-type: none"> - Degree of cloud cover, and heights of cloud bases and tops of layers. - Surface visibility. - Surface weather. - DZ winds and temperatures at the surface, 200, 500, 700, 1000, 1,500, 2,000, and 3,000 or a specified drop altitude (AGL). Include wind and temperature forecasts for additional altitudes as required. - Turbulence (category II) & Icing. - Thunderstorm coverage and MAX tops. - Minimum altimeter for duration of mission (as required). - MAX/MIN temperature F° or C° (as required). - Low Level Wind Shear (LLWS) (as required).

NOTES:

1. Route, Orbit, and Air Combat Maneuver/Training Area MOAFs. Provide forecasts for weather parameters at the route/orbit altitude for the duration of the mission. Provide forecasts for weather parameters within 25 miles either side of the planned route/orbit, and within 1,000 feet above and below the route/orbit (or as specified by the customer for VR/Instrument Route missions).
2. AR MOAFs. Provide forecasts for weather parameters within 25 miles either side of the AR track and within 1,000 feet above and below the AR track. Provide forecasts for weather parameters valid for 30 minutes before entering the AR track to 1 hour after exiting.
3. LZ MOAFs. Prepare LZ MOAFs for the specific location in TAF format, or as required by the customer. Valid time will be 1 hour before and 1 hour after period of the mission.
4. EZ MOAFs. Prepare EZ MOAFs for the specific location in TAF or DZ format, depending on the extraction altitude and customer requirements. Valid time will be 1 hour before and 1 hour after period of the mission.
5. Format MOAFs for Target Areas, FARPs, Combat Maneuver Areas, Instrument/Low Level Routes, Tactical Ranges, and Gunnery Ranges as required by the customer. Valid time will be 1 hour before and 1 hour after period of the mission.

Figure A5.2. Example CMWP for an Operation with Multiple Missions

FXUS 1 KXXX (if entered in the AWN).

CMWP FOR MISSION NUMBER & DEPARTURE STATION

PART 1. SYNOPTIC DISCUSSION: VT: XX/XXXXZ - XXXXZ JULY XXXX. A STATIONARY COLD FRONT EXTENDS FROM THE GREAT LAKES INTO CENTRAL IL, IA, AND SOUTH-CENTRAL NE AND REACHES WESTWARD TO A LOW IN CENTRAL CO. A HIGH PRESSURE RIDGE DOMINATES THE SOUTHEAST US.

PART 2. ROUTE X FORECAST: VT: XX/XXXXZ - XXXXZ JULY XXXX.

ALL FORECAST HEIGHTS MSL.

CLOUDS:	180	260
	FEW	BKN
	150	240

TURBC: NONE

ICING: NONE

TSTMS: ISOLD, MAX TOPS 360

PART 3. CLEAR TARGET DZ FORECAST: VT: XX/XXXXZ - XXXXZ JULY XXXX.

ALL FORECAST HEIGHTS AGL.

	WINDS:	TEMPS:
SFC:	28010/18	P23C
200 FT:	28011	P22C
500 FT:	28012	P21C
700 FT:	28012	P20C
1,000 FT:	28013	P19C
1,500 FT:	30014	P18C
2,000 FT:	32015	P17C
3,000 FT:	33017	P15C
SFC VIS/WX:	6 HZ	
TSTMS:	NONE	

ICING: NONE
 TURBC: NONE
 CLOUDS: SKC
 MIN ALSTG: 29.92 INS

PART 4. ORBIT X FORECAST: VT: XX/XXXXXZ - XXXXZ JULY XXXX.

ALL FORECAST HEIGHTS AGL. (Low altitude example).

CLOUDS: 050
 BKN
 025

SFC VIS/WX: 4 HZ
 WIND/TEMP: 2,500 FT AGL: 27019/P16C
 TSTMS: NONE
 ICING: NONE
 TURBC: OCNL LGT 030 TO 060

PART 5. AR XXX FORECAST: VT: XX/XXXXXZ - XXXXZ JULY XXXX.

ALL FORECAST HEIGHTS MSL.

FLIGHT LEVEL 240 MSL

CLOUDS: 260 350
 SCT BKN
 180 300

VIS: 1 Nautical Mile (NM) IN CLD, 7+ OUT
 FL WINDS: 25030KTS
 TSTMS: ISOLD, MAX TOPS 380
 ICING: LGT MXD 180 TO 220
 TURBC: LGT TURBC 180 TO 240 WESTERN 1/3 OF
 TRACK

PART 6. CONFIRMATION: PLEASE ACKNOWLEDGE RECEIPT BY PHONE (DSN XXX-XXXX), E-MAIL, FAX, OR SERVICE MESSAGE.

Figure A5.3. Example CMWP for a JA/ATT Mission

JA/ATT CMWP FOR MSN NUMBER XXX – KAAA (Mission Number & Departure Station).

1. MISSION DESCRIPTION: ON 17 JULY XXXX, ONE XXX AW C17 WILL DEPART KAAA AND FLY THE FOLLOWING ITINERARY.

2. ITINERARY: ALL DATES JULY XXXX/ALL TIMES UTC.

ARRIVAL	STATION	DEPARTURE	REMARKS
	KAAA	17/1500	ORIGIN
17/1900	FIRST TARGET DZ PA	17/1950	DROP
17/2020	KBBB	17/2235	OFF LOAD
17/2335	KCCC	19/1400	REST
19/1500	KDDD	19/1715	LOAD
19/2200	SECOND TARGET DZ NJ	19/2230	DROP
19/2300	KEEE	20/2230	REST
20/2359	KFFF	21/0215	LOAD
21/0300	THIRD TARGET DZ NY	21/0340	DROP
21/0410	KFFF	21/2140	REST
22/0310	KAAA		TERMINATE

3. COORDINATION:

A. KAAA: WILL PROVIDE INITIAL CREW BRIEFING TO FIRST TARGET DZ AND KBBB.

B. KBBB: PLEASE PROVIDE FIRST TARGET DZ FORECAST TO KAAA WITH INFO COPIES TO KCCC NLT 17/1300Z AND CREW BRIEF TO KCCC.

C. KCCC: PLEASE PROVIDE CREW BRIEFING TO KDDD, SECOND TARGET DZ, AND KEEE.

D. KEEE: PLEASE PROVIDE FORECAST FOR SECOND TARGET DZ TO KCCC WITH INFO COPIES TO KAAA AND KDDD NLT 19/1200Z AND CREW BRIEF TO KFFF.

E. KFFF: PLEASE PROVIDE CREW BRIEFING TO THIRD TARGET DZ, AND RETURN MISSION BRIEF TO KAAA.

F. KGGG: PLEASE PROVIDE THIRD TARGET DZ FORECAST TO KFFF WITH INFO COPIES TO KAAA AND KDDD NLT 20/2215Z.

4. MISSION PRODUCTS:

(1). FIRST TARGET DZ FORECAST – KBBB.

3X.XXN 9X.XXW (Lat/Long).

TOT: 17/1950Z DROP ALTITUDE 1000 AGL.

VT: 17/1850Z - 2050Z JULY XXXX.

(2). SECOND TARGET DZ – KEEE.

3X.XXN 7X.XXW.

TOT: 19/2230Z DROP ALTITUDE 800 AGL.

VT: 19/2130Z - 2330Z JULY XXXX.

(3). THIRD TARGET DZ – KGGG.

4X.XXN 7X.XXW.

TOT: 21/0300Z DROP ALTITUDE 800 AGL.

VT: 21/0200Z - 0400Z JULY XXXX.

5. POINTS OF CONTACT:

- A. 12 OSS/OSW (KAAA): TSGT DOE, DSN 123-4567.
- B. 45 OSS/OSW (KBBB): SSGT RAY, DSN 234-5678.
- C. 67 OSS/OSW (KCCC): MSGT MEE, DSN 345-6789.
- D. 89 OSS/OSW (KDDD): TSGT FAAH, DSN 456-7890.
- E. 101 OSS/OSW (KEEE): 1 LT SOW, DSN 567-8910.
- F. 68 OSS/OSW (KFFF): SSGT LAAH, DSN 678-9101.
- G. 15 OSS/OSW (KGGG): 2 LT TEA, DSN 789-1011.

6. REMARKS: PLEASE NOTIFY KAAA POC OF ANY PROBLEMS IN PROVIDING SUPPORT TO THIS MISSION. 12 OSS/OSW SENDS, 2 LT GREEN.

Figure A5.4. Example CMWP for Range Control

VALID TIME VT: XX/XXXXZ - XXXXZ JULY XXXX.
 ALL FORECAST HEIGHTS AGL.
 AVERAGE RANGE SURFACE ELEVATION: +190 FEET MSL.
 CLOUDS: 040 120
 SCT BKN
 020 070 (LYRD)
 AFT 17Z: 040 120
 BKN OVC
 020 070 (SOLID)

 SFC VIS/WX: 7+/NONE
 SFC WINDS: 32008KTS
 MIN ALSTG: 30.02INS
 TSTMS: ISOLD, MAX TOPS 350
 TURBC: LGT SFC TO 130
 ICING: LGT RIME 070 TO 120
 LLWS: NONE
 MAX/MIN TEMP: P21C/P18C
 REMARKS: NONE
 WINDS/TEMPS ALOFT:
 200 FT: 28010KTS/P16C 3,000 FT: 33030KTS/P09C
 500 FT: 30010KTS/P15C 5,000 FT: 34035KTS/P03C
 700 FT: 31015KTS/P14C 7,000 FT: 35040KTS/00C
 1,000 FT: 32015KTS/P13C 9,000 FT: 35045KTS/M03C
 1,500 FT: 34020KTS/P12C 11,000 FT: 35050KTS/M06C
 2,000 FT: 33025KTS/P11C 13,000 FT: 35055KTS/M09C
 NEAREST METAR SITE: KXXX (4 NM W).
 FCSTR: TSGT CARES, QA: 1LT CHECKS.
 DSN 321-5678, EXT 222.