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AIR COMBAT COMMAND

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Weather

WEATHER OPERATIONS READINESS

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Chapter 1

MISSION

1.1. Overview. As part of the joint team, ACC weather forces deliver accurate, consistent, relevant and timely environmental data, information, products, and services in support of global operations. By executing core processes to collect, analyze, predict, tailor, and proactively integrate environmental information into commander's decision cycles, weather forces contribute their specialized capabilities to information advantage. Commanders use this environmental information advantage to execute operations in the land, air, space, maritime, and cyber domains to achieve joint force objectives.

1.2. Weather Operations Readiness. To comply with the Secretary of the Air Force's Vision for Weather Operations 2024, ACC weather organizations must transition from a producer of weather information to a unit-aligned, mission-focused integrated capability that uniquely contributes to warfighter agility. This involves aligning weather missions with unit readiness criteria and objectives, integrating weather capabilities into planning and exercises, and understanding adversary centers of gravity and operational limitations to optimize friendly freedom of action. Additionally, environmental considerations must be integrated into strategy, plans, operations, and assessment cycles to identify optimal timing, location, and employment of assets for mission success.

Chapter 2

DOCTRINE, TACTICS, AND RESOURCES FOR WEATHER OPERATIONS

2.1. Overview. Weather organizations must be familiar with joint and Air Force doctrine to enhance operational effectiveness, readiness, and adaptability in diverse and complex environments. They must also be familiar with Tactics, Techniques, and Procedures (TTP) for functions and supported platforms for standardized guidance on how to effectively execute specific tasks and missions.

2.2. Joint and Air Force Doctrine. The purpose of joint and Air Force doctrine is to provide a comprehensive framework of principles, guidelines, and best practices that guide the planning, execution, and coordination of military operations. Joint doctrine ensures interoperability and cohesive action among different branches of the armed forces, promoting unified efforts in achieving strategic objectives. Air Force doctrine, specifically, focuses on the unique capabilities and roles of air and space power, offering guidance on the effective employment of these assets to achieve air superiority and support ground, cyber, space, and maritime operations to accomplish mission objectives. Relevant non-functional publications include Joint Publication (JP) 2-0, *Joint Intelligence*; Air Force Doctrine Publication (AFDP) 2-0, *Intelligence*; Army Doctrine Publication (ADP) 2-0, *Intelligence*; JP 3-0, *Joint Campaigns Operations*; AFDP 3-0, *Operations,* ADP 3-0, *Operations*; and JP 5-0, *Joint Planning*; AFDP 5-0, *Planning,* ADP 5-0, *The Operations Process*. JP 3-59, *Meteorological and Oceanographic Operations* and AFDP 3-59, *Weather Operations* provide comprehensive guidance on the integration and employment of METOC operations within joint and Air Force operations, respectively.

2.2.1. Weather organizations should refer to JP 2-0/AFDP 2-0/ADP 2-0, as applicable, and provide intelligence organizations with an overview of their weather capabilities. In addition, they should also request access to pertinent intelligence tools where weather and environmental input may add value. This will facilitate a more comprehensive understanding of the operational environment and may enable commanders to develop courses of action that put adversaries into dilemmas created by the natural environment.

2.2.2. Weather organizations should refer to JP 3-0/AFDP 3-0/ADP 3-0, as applicable, and become familiar with the competition continuum and emerging concepts such as Agile Combat Employment.

2.2.3. Weather organizations should refer to JP 5-0/AFDP 5-0/ADP 5-0, as applicable, and become familiar with the Joint Planning Process (JPP), Air Force Planning Process (AFPP), and the Military Decision Making Process (MDMP).

2.3. Tactics, Techniques, and Procedures (TTP). The purpose of TTPs is to provide detailed, standardized guidance on how to effectively execute specific tasks and missions. TTPs serve as practical instructions that enhance operational efficiency, consistency, and effectiveness by outlining best practices and proven methods for various military activities. They ensure that personnel across different units and branches can perform their duties in a coordinated and cohesive manner, thereby improving overall mission success and readiness. TTPs also facilitate adaptability and innovation by allowing for the incorporation of lessons learned and evolving strategies in response to changing operational environments and threats.

2.3.1. Air Force TTPs relevant to weather operations include AFTTP 3-1.IPE/3.3 IPE, *Combat Fundamentals Integrated Planning and Execution*; AFTTP 3-1.IW/3-3.IW *Combat Fundamentals Information Warfare*, AFTTP 3-1.IW/3-3.IW for wing Mission Design Series (MDS) platforms, and AFTTP 3-4.15, *Weather Operations*. Weather organizations will prioritize the review of AFTTP for their supported MDS and request inclusion in 561st Weapons Squadron Weapons and Tactics Flight (561 WS/OSK)-hosted rewrite conferences.

2.3.2. Other TTPs relevant to weather operations include US Army Field Manuals (FMs), Army Techniques Publications (ATPs), and Multi-Service Tactics, Techniques, and Procedures (MTTP).

2.3.3. Links to TTP documents are included in **Attachment 2**.

2.4. Other Resources.

2.4.1. Operational Command Training Program (OCTP) SharePoint®. At the operational level, the OCTP SharePoint® provides a wealth of reference and training material related to mission planning at the Air Operations Center (AOC) and Air Force Forces (AFFOR) Staff. This includes handbooks that provide framework guidance for the Air Mobility Division, AOC Commander, Battle Staff Director, Combat Operations Division, Combat Plans Division and "snapshots" that capture essential elements for many other functions and concepts: **https://intelshare.intelink.gov/sites/C2/OCTP/SitePages/Home.aspx** (NIPR) / **https://intelshare.intelink.sgov.gov/sites/505ccwchqportal/SitePages/Home.aspx** (SIPR)

2.4.2. Air Force Weather Key Leaders Desk Reference Guide. Weather Flight (WF)/Detachment (Det) leadership will review this document for an overview of tasks commonly accomplished by WF and weather Det leaders, including a brief explanation of best practices and references to pertinent Air Force Instructions or other official guidance. The guide can be found at: **https://www.my.af.mil/gcss-af/USAF/AFP40/d/s6925EC1350090FB5E044080020E329A9/Topics/MAJCOM_Flight_Desk_References/Flight_Detachment_Desk_Reference.pdf**. Compliance with this requirement will be documented in an MFR.

Chapter 3

WEATHER INTEGRATION INTO OPERATIONS

3.1. Overview. Weather organizations enhance mission planning by seamlessly integrating into planning processes and providing mission planners with timely insights on weather-related hazards and mission-impacting environmental conditions, enabling adjustments to plans prior to execution. They also play a vital role in mission execution by applying supported-unit weather thresholds to daily operations, guided by authoritative sources such as AFMANs, AFTTPs, Army Regulations, and mission-specific doctrine. Environmental information, spanning time scales from months in advance to near real-time, is leveraged to support the full spectrum of mission planning and execution.

3.2. [557th Weather Wing Only] Air Component Planning.

3.2.1. The integration of environmental information into operations, activities, and investments assists commanders in their understanding of the operational information environment and optimizes the Joint Fires Network, generally referred to as a long-range kill chain (LRKC). This integration is essential for enhancing operational effectiveness and enabling the timely and scalable delivery of environmental data and insights on friendly and adversary TTP within planning and Distributed Common Ground System (DCGS) activities. Weather integration must enable real-time environmental assessments for simultaneous dynamic targets and supports Artificial Intelligence (AI)/Machine Learning (ML)-enabled kill chains through automated weather impact assessments and predictive environmental modeling.

3.2.2. To support air component planning, the 557 WW will:

3.2.2.1. Coordinate with air component operations staff personnel and DCGS commanders to identify environmental information needs, with emphasis on real-time weather impact assessments for dynamic targeting, environmental factors affecting adversary capabilities and tactics, and space and terrestrial environmental propagation conditions for electronic warfare and communications.

3.2.2.2. Provide qualified subject matter experts (SMEs) to air component planners, AOCs, and DCGS, ensuring weather support for time-sensitive targeting and AI/ML integration specialists for automated systems. If the demand exceeds 557 WW capacity to support, the 557 WW will request the command requiring additional support to submit a Request for Forces (RFF) or Request for Support (RFS) in accordance with Department of the Air Force Instruction (DAFI) 15-129, *Air and Space Weather Operations*.

3.2.2.3. Provide expertise and oversight of environmental data and information systems to ensure Air Force Weather Weapon System (AFWWS) output is exposed and Visible, Accessible, Understandable, Linked, Trustworthy, Interoperable, and Secure (VAULTIS) to integrate into the DAF battle network and other key system platforms, as necessary, to support automated weather feeds into targeting algorithms, predictive modeling for mission planning, and standardized weather data formats compatible with AI/ML processing.

3.2.2.4. Provide specialized dynamic targeting weather support for time-sensitive targeting, automated weather routing for strike packages, real-time atmospheric propagation modeling, and weather-based target prioritization recommendations.

3.2.2.5. Participate in exercises, experiments, and events to validate weather integration into high-speed kill chains, test contested environment weather operations procedures and refine AI/ML weather assessment algorithms.

3.2.2.6. Develop and maintain contested environment weather capabilities including defensive cyber operations, redundant systems, and mobile capabilities.

3.2.2.7. Document known METOC effects on, and limitations of, adversary weapon systems.

3.2.2.8. Identify shortfalls and lessons learned to ACC/A3W IAW **Chapter 8**.

3.2.3. Refer to the OCTP Air Component Community of Excellence SharePoint® for best practices to enhance operational-level warfighting processes (see **paragraph 2.4.1**.).

3.3. [Army-Support Only] Army Service Component Command (ASCC) Planning.

3.3.1. The integration of environmental information into operations, activities, and investments assists Army commanders' awareness of the operational information environment. This integration is essential for enhancing operational effectiveness and enabling the timely and scalable delivery of environmental data and insights on friendly and adversary TTPs.

3.3.2. To support land component planning, ASCC weather support personnel will:

3.3.2.1. Coordinate with ASCC operations staff personnel to identify environmental information needs.

3.3.2.2. Coordinate with 557 WW to ensure AFWWS output is exposed and VAULTIS to integrate into ASCC networks and other key system platforms, as necessary.

3.3.2.3. Identify and report shortfalls and lessons learned to ACC/A3W IAW **Chapter 8**.

3.4. [Air Operations Center (AOC) Weather Specialty Teams (WSTs) Only] Target Planning.

3.4.1. AOCs benefit from WSTs integrating METOC information into targeting processes by optimizing the timing, location, and selection of resources, thereby enhancing operational effectiveness. This integration allows AOCs to exploit environmental effects to create dilemmas for adversaries and adjust plans to maximize friendly freedom of action and maneuver, ensuring more informed and strategic decision making.

3.4.2. To support METOC integration, AOC WSTs will:

3.4.2.1. Integrate METOC information early in the targeting process to ensure that environmental effects are considered from the outset, optimizing the timing, location, and selection of weapons and sensors to maximize effectiveness.

3.4.2.2. Use medium- to long-range forecasts and climatological information to identify potential environmental impacts on both enemy and friendly operations, allowing planners to mitigate adverse effects on friendly forces while exploiting asymmetric environmental effects on enemy capabilities.

3.4.2.3. Provide real-time or near real-time METOC information to support dynamic re-attack, time-sensitive targets, combat search and rescue operations, and other emerging

requirements, ensuring that decision makers have the most current environmental data to make informed decisions.

3.4.2.4. Provide METOC-effects decision aid information, including electro-optical, electro-magnetic, and space METOC-effects guidance, to the Master Air Attack Plan (MAAP) Team and Targeting Effects Team (TET) to help determine the optimal timing and selection of weapons based on environmental conditions.

3.4.2.5. Maintain situational awareness of METOC and solar conditions, providing timely notifications of METOC elements affecting launch and recovery bases, active orbits/tracks, routes of flight, and other operations to help adjust mission plans as necessary to account for environmental impacts.

3.4.2.6. Collaborate with Intelligence, Surveillance, and Reconnaissance (ISR) analysts to identify the probable METOC sensitivities of enemy capabilities, helping to determine likely enemy courses of action and highlighting instances where enemy capabilities are degraded more than friendly capabilities, offering an exploitable advantage.

3.4.2.7. Coordinate with Intelligence SMEs to study METOC effects on enemy weapons systems and provide insights on how these effects can be exploited, helping the MAAP and TET teams understand threats to friendly forces and adjust their plans accordingly to maximize the probability of achieving desired effects.

3.4.2.8. Coordinate with 557 WW to integrate wing-hosted environmental data into AOC systems.

3.5. Mission Planning.

3.5.1. Weather plays a critical role in mission planning by providing timely and accurate environmental information that impacts decision-making processes at various levels of military operations. This includes integrating weather data into mission planning cells and enhancing the performance of weapon systems through information derived from tactical decision aids. Air Force-support weather organizations will refer to AFTTP 3-1.IPE/3.IPE, *Combat Fundamentals Integrated Planning and Employment* (as a general guide) and MDS-specific AFTTP to integrate environmental data and information into planning for their supported organization(s). Army-support organizations will refer to ATP 2-01.3, *Intelligence Preparation of the Operational Environment (IPOE)* and mission-specific guidance to support planning by the G/S-2, G/S-33, and G/S-35 by focusing on both friendly and adversary impacts on Warfighting Functions (Command and Control (C2), Intelligence, Fires, Sustainment, Movement and Maneuver, and Protection) for long-term plans and near-term operations.

3.5.2. To support mission planning, weather organizations will:

3.5.2.1. Obtain and maintain access to appropriate security enclaves where mission planning occurs (e.g., SIPRNet, Joint Worldwide Intelligence Communications System).

3.5.2.2. Utilize historical data for deliberate and long-range planning.

3.5.2.2.1. Leverage 14th Weather Squadron (14 WS) expertise to describe expected environmental impacts in historical terms, predicting possible impacts 2-4 weeks in advance of planned events; identify temporal patterns impacting operations, to include adversary forces. To support mission planning, the 14 WS Climate Monitoring, Analysis, and Prediction (CMAP) can provide an assessment of the climate (including

primary teleconnection patterns), a review of recent significant weather events, an outlook for temperature and precipitation, and climate impacts by Geographic Combatant Command (CCMD) Area of Responsibility (AOR). Contact the 14 WS CMAP team at **14WS.CXOC.CMAP@us.af.mil**. Additionally, 14 WS has a robust support assistance/analysis request (SAR) capability to exploit the historical database to provide unique and highly tailorable outputs in support of operations, mission planning, exercises, or other research. The 14 WS will analyze requests, determine the capability to produce the desired result, and fine-tune the result. These SAR requests can be submitted on the website at **https://climate.af.mil/sar/** or via email at **14WS_SAR@us.af.mil**.

3.5.2.2.2. Leverage 2d Weather Squadron (2 WS) expertise on space and terrestrial weather impacts to the Electromagnetic Spectrum to understand how friendly and adversary communication pathways, satellite uplink/downlink, and GPS accuracy are affected by the environment and identify mitigation strategies to ensure uninterrupted communications and data networks.

3.5.2.3. Incorporate numerical weather model output into mission planning products within 10 days of execution. As perishable atmospheric and space weather data becomes relevant closer to the event, blend this information into existing products to refine the forecast. Leverage 16th Weather Squadron (16 WS) capabilities to quickly employ highly tailored numerical model output for emerging mission needs. This capability is critical for enabling supported units to optimize operations based on precise environmental data customized to specific thresholds, platforms, or operational areas for near and long-term planning. Requests for specialized model runs or tailored data products should be coordinated through the 16 WS Stakeholder Engagement team 2-4 weeks prior to execution. **16ws.wxp.engagementteam@us.af.mil**.

3.5.2.4. **(Operations Support Squadron [OSS] WF Only)** Mission Planning Cell (MPC) support. OSS WFs will integrate environmental information into MPC standard products and meetings (if required, request MPC access through the OSS Commander [OSS/CC]). Atmospheric and space weather information will account for all impacts to aircraft participating in the mission (e.g., strikers, escorts, Suppression of Enemy Air Defenses, Defensive Counter Air, tankers) and all communication systems/data links for both primary and contingency plans. In addition to standard weather data, mission planners may request information derived from tactical decision aids during the initial Air Tasking Order (ATO) breakout meeting as described in AFTTP 3-3.IPE, paragraph 4.3 (e.g., Target Acquisition Weapons Software-derived thermal crossover times).

3.5.2.5. [OSS WF Only] Flying Hour Program (FHP) Support. OSS WFs will coordinate with Squadron Aircrew Resource Management (SARM)/Host Aircrew Resource Management (HARM) offices to optimize the wing's FHP through tailored integration of environmental information. Utilize local flying and range schedules to determine weapons loadouts, pilot qualifications (e.g., ACC ceiling/visibility pilot categories), and training requirements to determine how and when the environment will impact sortie execution. This can be done months in advance by using climatological data to optimize range scheduling to days before the flying schedule is finalized. Weather flights should recommend the optimal timing and location of wing flying operations while changes can

still be made to the flying schedule (e.g., recommend sorties for less experienced pilots to be scheduled in the early afternoon if low visibility due to morning fog is a factor).

3.5.2.6. [OSS WF Only] Information Warfare Working Group (IWWG). OSS WFs will utilize the ACC IWWG Handbook as a guide to support the wing's IWWG during each phase of the Air Force Force Generation (AFFORGEN) cycle. For general Information Warfare (IW) TTP, refer to AFTTP 3-1.IW/3-3.IW, *Combat Fundamentals Information Warfare*.

3.5.2.7. Provide Tactical Decision Aid (TDA) support, or weather inputs to operators utilizing TDAs, as required.

3.6. Mission Execution.

3.6.1. Weather organizations employ the Mission Execution Forecast Process (MEFP) to integrate supported-unit weather thresholds into daily operations, ensuring alignment with authoritative guidance and maintaining the appropriate security level. This process is guided by continuous interaction with supported units and authoritative sources, with organizations regularly reviewing and optimizing the MEFP to address tactical deficiencies. They submit process improvement recommendations as needed and provide detailed briefings to leadership on mission-impacting weather events to enhance operational effectiveness.

3.6.1.1. **(AF-Support Only)** At a minimum, include AFMAN 11-202V3 *Flight Operations*; MDS-specific guidance such as AFMAN 11-2F-16 Volume 1, *F-16—Aircrew Training*; 11-2F-16 Volume 2, *F-16—Aircrew Evaluation Criteria*; 11-2F-16 Volume 3, *F-16—Operations Procedures*; and local supplements; MDS-specific AFTTP such as AFTTP 3-1.MDS/AFTTP 3-3.MDS; and Mission Support Group thresholds for installation activities. If necessary, contact OSK for assistance with incorporating MDS-specific AFTTP guidance.

3.6.1.2. **(Army-Support Only)** At a minimum, include Army Regulation (AR) 95-1, *Flight Regulations*; doctrine documents specific to supported mission(s) (e.g., FM 3-04, *Army Aviation*, ATP 2-01.3, *Intelligence Preparation of the Operational Environment (IPOE),* ATP 3-04.1 *Aviation Tactical Employment*); and garrison thresholds for installation activities. If necessary, contact Combat Aviation Brigade (CAB)/Battalion (BN) SMEs to understand and incorporate environmental impacts for supported weapon systems or platforms.

3.6.1.3. Briefings to wing or garrison leadership will detail the onset, duration, and severity/intensity of all mission-impacting weather events (including impacts to personnel who reside off base), at a minimum.

3.6.2. Continuous Process Improvement.

3.6.2.1. Weather organizations will continuously review their MEFP and optimize it for mission support.

3.6.2.2. Tactical Improvement Proposal (TIP) Process.

3.6.2.2.1. Air Force-support organizations that identify a non-materiel solution to a MDS tactical deficiency should submit a TIP to their OSK for validation IAW DAFMAN 11-260, *Tactics Development Program*.

3.6.2.2.2. [557 WW Only] 557 WW organizations should submit TIP's to the 2d Combat Weather Systems Squadron (2 CWSS) utilizing the 557 WW's WEPTAC SharePoint® site: **https://usaf.dps.mil/teams/557WW/WingStaff/WEPTAC/**.

3.6.2.2.3. Army-support organizations should contact their supported unit SMEs to account for undocumented tactics, tactical problem areas, or propose new tactics related to weather support.

3.6.2.2.4. To submit a TIP for AFTTP 3-4.15, *Weather Operations*, see ACC Weather Training and Inspections Branch's (ACC/A3WT's) SharePoint® site: (**https://usaf.dps.mil/teams/ACCA3A3WTTrainingInspections/SitePages/Home.aspx**).

Chapter 4

WEATHER EQUIPMENT

4.1. Overview. Weather sensing and other equipment, including operational information systems must be properly accounted for, inventoried, and operations checked on a regular basis to ensure it is fully mission capable.

4.2. Accountability.

4.2.1. Weather organizations will ensure equipment is properly accounted for using the appropriate accounts (e.g., Customer Authorization/Custody Receipt Listings [CA/CRL]).

4.2.2. Equipment valued at $5,000 or greater must be on a CA/CRL. Units must work with their supporting Logistics Readiness Squadron to add equipment missing from the CA/CRL; contact ACC/A3W to resolve any issues adding equipment to the appropriate accounts.

4.3. Inventory.

4.3.1. All units will conduct and document an annual inventory of equipment, to include any radio equipment (e.g., Pilot-to-Meteorological Service radio).

4.3.2. **(Army-Support Only)** . Conduct an annual review identifying discrepancies, changes, issues, or missing items of aligned Modified Table of Organization and Equipment (MTOE) using Force Management Solutions Web Capability (FMSWeb): **https://fmsweb.army.mil/protected/splash/welcome.aspx**. Updates are typically published by the Army every October for the following fiscal year. Document all discrepancy findings, expected downtime, associated training or mission impacts, and relevant interactions with the owning Army unit on equipment status. Elevate significant discrepancies, as directed, through the chain of command to ACC Operating Location-G U. S. Army Forces Command (FORSCOM) (ACC/A3 OL-G).

4.4. Operations Checks.

4.4.1. Weather units will conduct and document operations checks of all on-hand equipment, including satellite communications capability (if so equipped) no less than annually.

4.4.2. For barometers, document the comparison with a known standard on the barometer itself, using a weather-resistant label, since personnel may not have access to digital documentation in a Denied, Degraded, Intermittent, and Limited (DDIL) or Contested Degraded Operations (CDO) environment. Capability to recalibrate Kestrels is available through local Precision Measurement Equipment Laboratory (PMEL) organizations every 18 months.

4.4.3. TMQ-53, Tactical Meteorological Observing System.

4.4.3.1. Document results using technical order (TO) 31M1-2TMQ53-1, *AN/TMQ-53 Tactical Meteorological Observing System (TMOS)*, Tables 1-4 through 1-8 and retain for one year.

4.4.3.2. If a TMQ-53 component is inoperative, damaged, or lost, open a ticket with the Contract Logistics Support (CLS) Help Desk and inform your chain of command.

4.4.4. TMQ-625, Advanced Micro Weather Sensor (AMWS)

4.4.4.1. Document results using **Table 4.1** and retain for one year.

Table 4.1. Remote Weather Observation Package Operations Check Template.

Component	**Serial Number**	**IMEI Number**	**On-hand, missing, or damaged**
M-625 AMWS			
Pelican Case			
Power and data cables			
Canvas bag			
Tripod			
Tripod bag			
Sandbag			
Rubber straps (x2)			
Operations Check (OK or Discrepancies noted):			
Initials: Date:			

4.4.4.2. If an AMWS is inoperative, damaged, or lost, inform your chain of command and provide the Short Burst Data (SBD) Domain Admin (SDA) or Alternate SDA with the following:

4.4.4.2.1. AMWS International Mobile Equipment Identity (IMEI) number and serial number. The IMEI is a 15-digit number assigned to every cellular-enabled mobile electronic device.

4.4.4.2.2. Owning unit, address, and Point of Contact (POC) (name, rank, Defense Switched Network [DSN] phone number and email address).

4.4.4.2.3. A brief description of what happened (e.g., fell over in high winds, lost during a night move at the National Training Center) and pictures of the damage.

4.4.4.2.4. The Accountable Supply Distribution Activity (ASDA or SDA) will deactivate the AMWS SBD modem, if appropriate, and provide guidance on how to contact the vendor to determine if a damaged item is repairable.

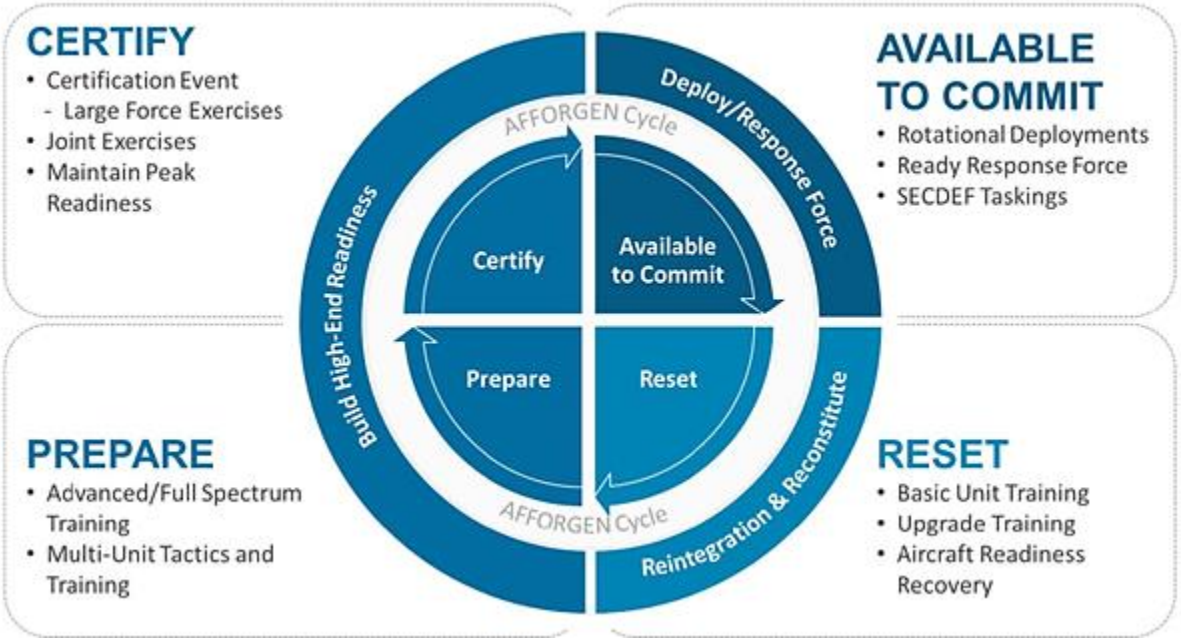
Chapter 5

AIR FORCE FORCE GENERATION (AFFORGEN)

5.1. Overview. Weather units are expected to align training with the Air Force's Force Generation cycle, prioritizing proficiency in mission-aligned/essential tasks across all phases – from foundational skills to theater-specific readiness. This includes utilizing provided training plans, conducting quarterly simulations in contested environments, and actively reporting readiness and capability gaps through established Air Force channels.

5.2. Air Force Force Generation (AFFORGEN). AFFORGEN is the structured process for organizing, training, and equipping forces to ensure readiness and availability for global operations. It establishes a 24-month rotational cycle, divided into four 6-month phases: Reset, Prepare, Ready, and Available to Commit (reference **Figure 5.1**.).

Figure 5.1. Air Force Force Generation (AFFORGEN) Construct.



5.2.1. Training and Certification Standards for Units of Action Supporting AFFORGEN.

5.2.1.1. Headquarters, United States Air Force (HAF) issued directives outlining training and certification standards for USAF Units of Action (UoAs) supporting the AFFORGEN process. These directives establish a baseline for UoAs – including Expeditionary Airbases (XABs), Air Task Forces (ATFs), and Deployable Combat Wings (DCWs) – to effectively develop training resources and prepare for certification events that validate readiness. **Note:** Guidance specific to DCWs and In-Place Combat Wings (ICWs) are still under development and will be distributed once available. Weather organizations within these UoAs will:

5.2.1.1.1. Utilize the AF Deputy Chief of Staff for Operations (AF/A3) Orders SIPR SharePoint® site to access Training Plan Guidance and Training/Certification Orders.

These resources detail the expectations for UoAs and outline operational requirements (**https://intelshare.intelink.sgov.gov/sites/afa3/SitePages/Orders.aspx**).

5.2.1.1.2. Ensure local training programs provide proficiency in (XAB) Mission-Aligned Training Tasks or in (ATF/DCW) Mission Essential Tasks (METs)/Management Operating Procedures (MOPs). These requirements are outlined in HAF Training and Certification Orders, as well as those identified within the Defense Readiness Reporting System (DRRS) (**https://drrs.csd.disa.smil.mil/drrs/login**).

5.2.1.1.3. Engage with immediate commanders/directors to better integrate, plan, and prepare how weather personnel can train and execute to support these METs/MOPs. These focus areas will be different within each UoA (e.g., ATF 15W will engage directly with Command and Control Force Element's (C2FE's) A3, ATF 1W will engage directly with Combat Air Base Squadron (CABS) commander).

5.2.1.1.4. Conduct a quarterly exercise of the weather operations portion of the supported organization's Primary, Alternate, Contingent, and Emergency (PACE) plan in a simulated Contested, Degraded, and Operationally Limited (CDO-L) environment using only fielded AFWWS tools (e.g., WxStream/Helios) and supported organization communications capabilities on all relevant security enclaves.

5.2.1.1.5. Directly engage with ACC/A3W to identify any Organize, Train, and Equip (OT&E) requirements or hurdles that need to be addressed prior to any exercises or contingency operations.

5.2.1.1.6. Submit After Action Report (AAR) inputs or identified capability gaps IAW **Chapter 8** through the chain of command to ACC/A3W for any exercises, quarterly simulations, or events as they are completed to identify readiness, capability, and assessment reporting IAW AFI 10-201, *Force Readiness Reporting*.

5.2.2. AFFORGEN-Aligned Phases and Training Levels.

5.2.2.1. Reset Phase/100-Level Training: This phase focuses on individual and in-garrison training requirements, addressing foundational skill sets and part-task training that require minimal outside agency support. It should be completed prior to any certification capstone event. Examples of this training include addressing knowledge, skills, and abilities; addressing key foundational skills; and Mission Ready Airmen (MRA) training, including Ready Airman Training (RAT), Expeditionary Functional Training, Formal Training Courses, and Rehearsals of Concept (ROC). Weather units in the Reset Phase will:

5.2.2.1.1. Complete the Reset Phase Exercise/Pre-Deployment Checklist located in **Attachment 3**.

5.2.2.1.2. [ATF Command Echelon (CE) 15W] Begin/accomplish A-Staff training to the maximum extent possible by completing all required courses and training requirements identified in Annex A of the ATF Training Plan Guidance Fragmentary Order (FRAGORD). For 15Ws identified for MRA, see the ATF HQ MRA Table of Authorizations (ToA) Tables in Annex D.

5.2.2.1.3. [ATF CABS 1W personnel] Begin/accomplish training requirements identified in Annex B of the ATF Training Plan Guidance FRAGORD.

5.2.2.1.4. [ATF Mission Generation Force Element (MGFE) 1W personnel] Begin/accomplish training requirements identified in Section 3.E. of the ATF Training Plan Guidance FRAGORD.

5.2.2.1.5. Reassess all applicable (XAB) Mission-Aligned Training Tasks or (ATF/DCW) METs/MOPs, utilizing lessons learned to determine if processes need to be adjusted.

5.2.2.1.6. Ensure both 15W and 1W071 ATF/DCW leaders work with their appropriate chain of command to attend the Combat Support Instructor Course (CSIC) hosted by the Air Force Installation & Mission Support Center (AFIMSC), if applicable.

5.2.2.2. Prepare Phase/200-Level Training: This phase integrates cross-functional mission-capable teams to complete training requirements, culminating in unit events where they are assessed against METs to generate combat airpower. This training is typically organized and resourced at the Wing level or below, focusing on AOR familiarization and interoperability. An example of this training is cross-functional mission-capable teams performing Force Element (FE) training, culminating in multi-FE training events where C2, Expeditionary Air Base Squadron (ABS), or MGFE are assessed against METs. This includes Combat Support Training Range (CSTR) Exercises, Command Post Exercises (CPXs), and Advanced Ready Training (ART). Weather units in the Prepare Phase will:

5.2.2.2.1. Complete the Prepare Phase Exercise/Pre-Deployment Checklist located in **Attachment 3**.

5.2.2.2.2. [All ATF Personnel] Identify MRA core tasks within the MRA ToA that have been assigned to ATF/DCW Weather personnel and follow the commander's guidance on how to be properly train to the appropriate skill level through local SMEs to execute their functional mission set.

5.2.2.2.3. [ATF CE 15W] Continue training on requirements listed within Annex A of the ATF Training Plan Guidance FRAGORD. They may also be required to train/participate in Multi-Force Unit Training Events and/or Exercises as directed by the ATF Commander.

5.2.2.2.4. [ATF CABS 1W personnel] Train on requirements listed within Annex B of the ATF Training Plan Guidance FRAGORD to support integrated cross-functional training events where C2, CABS, or MGFE are assessed against METs. These core missions will include sustainment, protection, and airfield operations. Members will work with their CABS leadership to determine where they will be involved.

5.2.2.2.5. [ATF MGFE 1W personnel] Train on requirements listed within Section 3.B.2.B. of the ATF Training Plan Guidance FRAGORD to accomplish higher level courses and tasks with a greater degree of complexity with the ATF Force Elements. This includes participating in the Multi-Force Unit Training Events and/or Exercises as directed by the ATF Commander.

5.2.2.2.6. Ensure all personnel training records are updated, completed, and certified prior to the beginning of the AFFORGEN Certify Phase.

5.2.2.3. Certify Phase (Beginning)/300-Level Training: This phase focuses on multi-unit training conducted at off-station locations. It serves as the certification for each UoA force element, including C2, CABS, and MGFE. The goal is to demonstrate the ability to meet readiness standards and execute the ACE scheme of maneuver. Training can be organized and resourced by either the Wing or Major Command (MAJCOM), or a combination of both. Examples of this training include CSTR, field exercises, and Agile/Virtual Flag exercises. ***This training is required for all Air Task Force (ATF) elements***. Weather units in this phase will:

5.2.2.3.1. Complete the applicable Certify Phase Exercise/Pre-Deployment Checklist located in **Attachment 3**.

5.2.2.3.2. Complete applicable equipment and system checks utilizing Equipment and Systems Requirements located in **Attachment 4**.

5.2.2.3.3. Coordinate and conduct primary weather Air Force Specialty Code (AFSC) skill level requirements in support of Base Operating Support (BOS), providing sustainment, protection, and airfield management.

5.2.2.3.4. Ensure a smooth flow of communication, coordination, and requirements are occurring between CABS, MGFEs, and the CE 15W.

5.2.2.3.5. [ATF CABS 1W personnel] Conduct and complete the 300-Level CABS critical items focused on core mission sets of sustainment, protection, and airfield operations when integrated with other units and or Force Elements within the ATF as directed by Annex B of the ATF Training Plan Guidance FRAGORD.

5.2.2.4. Certify Phase (Middle/End)/400-Level Training: This phase focuses on theater-informed training and events conducted after the 300-Level baseline certification. It integrates the critical elements of a full ATF, including aligned Command Echelon Teams (CETs), MGFEs, and Mission Support Teams to address theater-specific requirements. The training events are designed to simulate high-fidelity, high-tempo conflict and joint training against a peer adversary in a highly contested joint/coalition environment. These events are organized and resourced by the MAJCOM. Examples of this training include Exercises REFORPAC and BAMBOO EAGLE. Weather units in this phase will:

5.2.2.4.1. Complete the applicable Certify Phase Exercise/Pre-Deployment Checklist located in **Attachment 3**.

5.2.2.4.2. Complete applicable equipment and system checks utilizing Equipment and Systems Requirements located in **Attachment 4**.

5.2.2.4.3. Actively deploy with their organization to demonstrate the ability to meet readiness standards and execute an ACE scheme of maneuver.

5.2.2.4.4. Coordinate and conduct primary weather AFSC skill level requirements in support of BOS, providing sustainment, protection, and airfield management.

5.2.2.4.5. Ensure a smooth flow of communication, coordination, and requirements are occurring between CABS, MGFEs, and the CE 15W.

5.2.2.4.6. [ATF CABS 1W personnel] Conduct and complete the 300-Level/400-Level CABS critical items focused on core mission sets of sustainment, protection, and

airfield operations when integrated with other units and/or Force Elements within the ATF as directed by Annex B of the ATF Training Plan Guidance FRAGORD.

5.2.2.5. Commit Phase: This phase is the availability to execute a deployment, respond to a crisis, and/or support joint operations. Weather units in this phase will:

5.2.2.5.1. Complete any remaining items on the Exercise/Pre-Deployment Checklist located in **Attachment 3** prior to Ready to Load Date (RLD).

5.2.2.5.2. Complete any remaining equipment and system checks utilizing Equipment and Systems Requirements located in **Attachment 4** prior to RLD.

5.2.2.5.3. Coordinate with the Unit Deployment Manager (UDM) on any remaining deployment-related items prior to internal deadlines to meet RLD.

Chapter 6

EVALUATIONS, TRAINING, AND EXERCISES

6.1. Overview. Evaluations are essential for maintaining readiness by regularly assessing and improving operations. Leadership uses checklists to review procedures, keep documentation current, and provide training through assistance visits. Training includes maintaining task lists and records, ensuring equipment proficiency, and conducting regular training sessions. Exercises confirm the readiness of forces by assessing weather capabilities in a simulated deployed environment and validating training standards.

6.2. Evaluations. Evaluations play a key role in enhancing readiness by ensuring that operations are continuously monitored and improved. This continuous evaluation process helps identify areas that need improvement and ensures that all procedures and documents are current.

6.2.1. Continuous Evaluation. WF/Det leadership will continually evaluate their operations with the appropriate Management Internal Control Toolset (MICT) Self-Assessment Checklists (SAC) for DAFI 15-129; this publication; and ACCI Management Internal Control Toolset (MICT) Self-Assessment Checklists (SAC) IAW DAFI 90-302_ACCSUP, *The Inspection System of the Department of the Air Force*.

6.2.2. Documentation and Procedures. Maintain all appropriate documents and procedures as identified in DAFI 15-129 (e.g., Duty Priorities, Weather Support Document, MEFP, Flight Information Publications (FLIPs), Standard Operating Procedures (SOPs)). Units will upload all current documentation into MICT and review MICT quarterly (at a minimum) to ensure information and documentation are current (**https://mict.cce.af.mil**).

6.2.3. Staff Assistance Visits (SAV). A SAV is a non-IG visit conducted by Pertinent Oversight Authorities (POAs) and/or functional SMEs IAW DAFI 90-302. SAVs help a unit better understand the intent of higher headquarters policy and allow POAs an opportunity to train personnel to improve problem areas. Due to staff resource limitations, most ACC/A3W SAVs will be conducted virtually and will be coordinated with appropriate POAs/SMEs for SAV completion, if necessary.

6.3. Training. Units must develop and maintain a Master Task List (MTL) and training records, to include mandated courses. Personnel must be proficient in Tactical Meteorological Equipment (TACMET) equipment setup and usage, and units are required to conduct quarterly continuation training to maintain weather operations currency.

6.3.1. ACC Weather units will develop and maintain a MTL and training records IAW DAFMAN 36-2689, *Training Program*, including additional information within the current Career Field Education and Training Plan (CEFTP) CFETP1W0X1 and the 15W Talent Management Framework posted on Air Force Director of Weather's (AF/A3DW's) SharePoint® page (**https://www.my.af.mil/gcss-af/USAF/ep/globalTab.do?channelPageId=s6925EC1350090FB5E044080020E329A9&command=org**). The MTL will include mandated courses for specific units, such as the Army Weather Support Course, Evasion and Conduct After Capture, and the Space Weather Support Course.

6.3.2. Training records will include all mandated items listed in the references above, as well as training requirements, certifications, and recertifications covering AFFORGEN-related

events in line with the AFFORGEN cycle (e.g., MRA training, PACE/Alternate Operating Location [AOL] events, training requirements outlined within HAF Orders, hands-on TACMET certification, and manual observing recertification).

6.3.3. TACMET Training. Personnel must be able to set-up and obtain readings on all assigned TACMET equipment within one hour, to include but not limited to the TMQ-53 and AMWS (two-person task). At a minimum, each member will have hands-on certification of all assigned TACMET equipment during their unit's AFFORGEN Prepare phase.

6.3.4. Utilize the HAF-developed Electronic Training Record Template (located on ACC/A3WT's SharePoint® page) to maintain personnel training records. Units will not use myTraining until it is at Full Operational Capability.

6.3.5. Unless actively deployed during their AFFORGEN Commit Phase, weather units will conduct quarterly continuation training to maintain weather operations currency, which will include, but is not limited to, generate mission execution forecasts for 24 hours, incorporate forecast reference and training materials available on ACC/A3WT's SharePoint® Repository and 14 WS NIPR/SIPR websites, and review procedures pertaining to CDO-L operations (e.g., manual observing IAW AFMAN 15-111, *Surface Weather Observations*, tactical visual aids, single-station and limited-data forecasting).

6.3.6. Ensure all documentation and plans (SOPs, PACE, AOL, etc.) are self-inspected 90 days after new unit leadership assignment and annually thereafter to identify plan effectiveness and areas for improvement. Results will be locally documented and available upon request. See **Attachment 5** for example PACE plans.

6.4. Exercise Support. USAF exercises validate the ability of various forces to execute missions and prepare for deployments and combat operations. These exercises are standardized, coordinated, and integrated to ensure readiness and effectiveness across all levels of command.

6.4.1. IAW AFI 10-204, *Air Force Service Exercise Program and Support to Joint and National Exercise Program*, and 10-204_ACCSUP, *Air Force Service Exercise Program and Support to Joint and National Exercise Program*, , exercises validate USAF aviation, cyber, information warfare, electronic warfare, logistics, tactical and operational C2, and ISR forces' ability to execute presidentially ordered Combatant Commander (CCDR) Unified Command Plan (UCP) missions.

6.4.2. As directed by the Chief of Staff of the Air Force's (CSAF's) Operational Training and Test Infrastructure Flight Plan 2035, exercises prepare USAF forces for deployments and combat operations when allocated by the Secretary of Defense (SECDEF) as approved in the Secretary of Defense Orders Book (SDOB) and ordered in the Global Force Management Allocation Plan (GFMAP). Exercises are a critical component of readiness training and assessment. Exercises are culminating events used to stress and evaluate USAF forces to ensure they are ready to perform designated core tactical and operational level of war functions. Furthermore, exercises help USAF commanders evaluate the readiness of their units.

6.4.3. Joint Event Life Cycle (JELC). To standardize the life cycle of the AF exercise enterprise, exercise program managers at all echelons should design exercises from the planned requirements and assess exercise results using those same requirements. Exercise planners shall utilize Chairman, Joint Chiefs of Staff Manual (CJCSM) 3500.03F, *Joint Training Manual for the Armed Forces of the United States*, and reference the JELC as a model for

managing AF exercises. The programming cycle of AF exercises should take 12-18 months from the design stage to the evaluation, analysis and reports stage. The ACC Exercise Coordination Working Group (ECWG) process should also reflect the JELC's methodology and timeline.

6.4.4. IAW AFI 10-204, paragraph 2.7.1., ACC Operations Division (ACC/A3O) is the lead command focal point for exercise coordination and scheduling and chairs the ECWG. IAW AFI 10-204_ACCSUP, ACC Functional Area Managers/Representatives will be prepared to source support to ACC exercises in accordance with the planning guidance presented in the COMACC Exercise Plans.

6.4.5. ACC/A3W will utilize the Joint Training Platform (JTT) hosted by the Joint Staff (JS) to appropriately source/task units to fulfil requirements as identified by CCMDs in support of official exercises. Units that are tasked utilizing this process will regard it as an official tasking and the tasked unit will determine how best to source the requirement. 557 WW will be formally notified by ACC when they have been tasked in JTT. No additional tasking order will be generated from ACC/A3W. ACC weather organizations will:

6.4.5.1. Integrate weather capabilities into exercise development, focusing on planning cycles to effectively employ air, land, and space power.

6.4.5.2. Be familiar with and follow all HAF-issued orders (e.g., Expeditionary Air Base (XAB)/Air Task Force (ATF)/Deployable Combat Wing (DCW) Training and Certification Plans) regarding mandatory training requirements; these may be found via ACC/A3's SIPR Orders SharePoint® (**https://intelshare.intelink.sgov.gov/sites/afa3/SitePages/Orders.aspx**)

6.4.6. Planning. Integrate early and often into the supported unit's exercise planning cell to identify supported exercises to ensure that weather personnel are identified as exercise participants, are included in travel, lodging, and sustenance plans, and have sufficient time to develop and integrate weather desired learning objectives into the exercise letter of instruction. Consider utilization of 14 WS products and expertise in planning activities to ensure these desired learning objectives are integrating historical data, to include extremes, within the Area of Interest (AOI).

6.4.7. Army Support Exercises. Review the Army Synchronization Tool (AST) for the latest authoritative Combat Training Center (CTC) schedules (CTC centers, National Training Center (Ft Irwin, CA), Joint Readiness Training Center (Ft Polk, LA), Joint Multinational Readiness Center (Hohenfels, GE), and Warfighter Exercises (WFX). The AST can be accessed via this link: ast.forscom.army.mil. AST requires user registration and approval, and some Teams training to gain full access.

6.4.7.1. Units participating in any exercise will submit an AAR through their chain of command to ACC/A3W IAW **Chapter 8**.

6.5. Exercise Operations Special Topics. ACC Weather organizations will:

6.5.1. Understand the purpose of a Temporary Location Identifier (KQ), how to use identifiers to support exercise and real-world operations, and the process of obtaining a KQ identifier, which is outlined in DAFI 15-129, for official TACMET observation dissemination on approved military networks.

6.5.2. For both real-world and exercise military operations, host-nation and local weather observations are not considered adequate substitutes for official TACMET weather observations which are specifically designed to provide standardized, mission-critical meteorological data that directly support military operations and ensure operational effectiveness. To determine appropriate use of host-nation and local observations, units must coordinate with the COCOM Senior METOC Officer [real-world operations] or the lead exercise organizer [exercise operations] to ensure weather data is utilized in a manner that aligns with objectives and requirements.

6.5.3. Practice using KQ identifiers with TACMET on a quarterly basis when supporting specific missions, such as C2 Force Element XAB, CABS, ATF, DCW, or assigned to support Army Response Forces. These results will be reported when submitting the quarterly PACE plan report.

Chapter 7

WEATHER TECHNICAL READINESS

7.1. Overview. The ACC weather operations metrics program will measure the performance of weather units' ability to characterize and exploit environmental information for planning and executing AF and Army Core Service Functions. The intent is to answer the question: how good are our data and products in providing accurate and timely environmental impacts to decision makers and commanders at all levels? Additionally, it will enable considerations to focus training and direct resources towards improvement areas critical to warfighting operations.

7.2. Digital Transformation. As weather operations undergo digital transformation, it's critical for metrics to capture where weather Airmen add value beyond numerical weather prediction capabilities. This insight will inform decisions on where to invest our time and energy to maximize efficiency for warfighting operations and leverage automation. AI/ML and advanced data analytic tools must be leveraged to capture unit, individual, numerical weather, and AI/ML application performance in predicting critical environmental conditions to set the foundation for further transformation efforts. Capturing metrics will optimize the development of tools to attain an asymmetric environmental advantage for AF, Army, intelligence community, and DoD operations.

7.3. Air Combat Command (ACC) tactical weather units will:

7.3.1. Apply climatology to operator's mission limiting thresholds to analyze the frequency of environmental impact occurrence for operating location(s) by month, hour, and platform/mission leveraging 14th Weather Squadron (14 WS) products or requests for support.

7.3.2. Integrate the results into the weather training program and wing-level briefings to adequately prepare the weather team and wing leadership for seasonal environmental impacts.

7.3.3. Maintain a metrics program for all categories of data or products they create within the metrics baseline in **paragraph 7.5**.

7.4. 557th Weather Wing (557 WW) will:

7.4.1. Maintain a weather metrics program focused on the ability to predict worldwide mission impacting environmental events at operational and strategic levels.

7.4.2. Incorporate metrics into training and a continuous process improvement for data, objects, and products produced that depict mission impacting environmental thresholds.

7.4.3. Provide recommendations for metrics program modifications to ACC/A3W.

7.4.4. Implement new metrics as directed by their commander to enhance Air Force Weather's ability to positively impact AF and Army Core function planning and execution.

7.5. Readiness Reporting. ACC Commanders with weather personnel will use metrics as one criterion to assess their weather readiness when evaluating their ability to meet METs in Defense Readiness Reporting Systems.

7.6. Weather Metrics Baseline.

7.6.1. Weather Watch, Warning and Advisory (WWA) Verification (WARNVER): A threshold-based MOP that reports WWA accuracy and timeliness by measuring whether the criteria stated in the WWA were met or not met according to the predetermined desired lead

time (DLT). **Attachment 6** details specific WARNVER processes, procedures, MOPs, technical readiness metrics and standards.

7.6.2. Terminal Aerodrome Forecast (TAF) Verification (TAFVER): A threshold-based product that reports TAF accuracy by verifying forecast conditions against observed conditions and includes the same calculations for the Global Air-Land Weather Exploitation Model (GALWEM) generated TAF. The intent is to determine where a human in the loop adds or detracts value compared to an automated GALWEM TAF. Unless otherwise directed, the current Bridging Environmental Intelligence For Responsive Operational Support (BIFROST) TAFVER capabilities will be leveraged by any organization that issues TAFs to review technical performance and target improvement areas. Ideally, units will focus on areas where TAFVER shows that forecasters provide value added above baseline model data, typically in the first 0-10 hours of the forecast. **Note:** Units are not required to conduct TAFVER until the capability is fielded within BIFROST.

7.6.3. Operational Verification (OPVER): A threshold-based metric that reports when and how forecast weather information impacts mission planning and when actual weather phenomena impact mission execution. OPVER measures the performance of Mission Execution Forecasts (MEFs). **Attachment 7** details specific OPVER processes and MOPs.

7.6.4. MEFs are defined as products generated by weather organizations that are focused on execution of aviation, space, ground (Operations Group, Mission Support Group or other organizational operations) or maritime operations. MEFs include but are not limited to: Department of Defense (DD) Form 175-1, *Flight Weather Briefing*, verbal forecasts, computer-based presentation briefing software, flimsies for local flying, and other non-standard forms that are given to an operator for mission execution.

7.6.5. Organizations that produce forecast WWAs will:

7.6.5.1. Establish and maintain a WARNVER program to assess WWA performance, analyze trends and identify/address forecast technique and/or training shortfalls as required.

7.6.5.2. Collect and report WARNVER MOPs for supported locations according to **Attachment 6**.

7.6.5.3. Assess operational performance using WARNVER MOPs, identify and document performance trends at the organization level. In addition, organizations will assess performance of individual weather personnel, identify improvement areas, and direct performance improvement measures or additional training as required.

7.6.5.4. Provide consolidated WARNVER metrics for all supported locations to their first commander in their chain of command and ACC/A3W NLT the 15th day of the month for the previous month. Upload metrics to the ACC Weather Metrics Folder General | ACC Weather Metrics | Microsoft Teams.

7.6.5.5. Unit leadership will analyze WARNVER metrics for individual forecasters and their unit overall at a minimum monthly. Additionally, unit leadership will:

7.6.5.5.1. Identify individuals exceeding standards, capture their processes, cross feed them to their unit personnel and incorporate lessons learned into the unit training program.

7.6.5.5.2. Identify required not issued and negative lead time WWAs. Conduct root cause analysis, create unit training materials and references to capture lessons learned.

7.6.5.5.3. Identify individuals that fail to meet standards, complete root cause analysis, and schedule additional training for all WWAs they struggle with.

7.6.5.5.4. Document unit trends, conduct seasonal analysis of high miss WWA categories and incorporate into seasonal refresher training for the unit.

7.6.6. Organizations that produce TAFs will (when TAFVER is fielded in BIFROST):

7.6.6.1. Establish and maintain a TAFVER program to assess TAF performance, analyze trends and identify/address forecast technique and/or training shortfalls as required.

7.6.6.2. Collect and report TAFVER MOPs for all supported locations according to **Attachment 7** for both the model-generated (no Forecaster-in-the-Loop [FITL]) and the final FITL TAFs).

7.6.6.3. Assess performance using TAFVER metrics and document performance trends at the organization level down to the individual forecaster.

7.6.6.4. Assess metrics to evaluate FITL TAF to the model TAF to determine at what hours and which criteria forecasters add value. Units will focus forecasting efforts on criteria and times where forecasters add value. Units will not modify model data for the times and hours where they are proven to not add value.

7.6.6.5. Provide consolidated TAFVER metrics for all supported locations to their commander and ACC/A3W NLT the 15th day of the month for the previous month. Upload TAFVER the ACC Weather Metrics Folder General | ACC Weather Metrics | Microsoft Teams.

7.6.6.6. Cross-feed any improved verification methods or tools developed to ACC/A3W.

7.6.7. Organizations that produce MEFs will:

7.6.7.1. Establish and maintain an OPVER program to measure MEF performance, analyze trends and implement training as required.

7.6.7.1.1. At a minimum, apply climatology per **paragraph 7.3.1** to their operations and select the top three mission impacting environmental events by month and capture Mission Execution Forecast Verification (MEFVER) data for the forecast and observed events.

7.6.7.1.2. Add any commander-specified OPVER criteria and capture MEFVER data for the forecast and observed events.

7.6.7.2. Provide weather criteria that will be considered a “criteria event” (based on operational impacts) to ACC/A3W for reference.

7.6.7.3. Collect, analyze and report OPVER metrics according to **Attachment 8**.

7.6.7.4. Document Commander OPVER criteria approval in an MFR signed by their commander on an annual basis.

7.6.7.5. Provide consolidated OPVER metrics for all supported locations to their commander and ACC/A3W NLT the 15th day of the month for the previous month. Upload

OPVER results to the Weather Metrics Folder General | ACC Weather Metrics | Microsoft Teams.

7.6.7.6. Units will develop, implement, and document processes to use OPVER metrics to identify shortfalls in characterization products, approved techniques, internal processes, training, and certification.

7.6.7.6.1. Unit leadership will analyze OPVER metrics for individual forecasters and their unit overall at a minimum of monthly.

7.6.7.6.2. Additionally, unit leadership will:

7.6.7.6.2.1. Identify individuals that excel at predicting criteria events, capture their processes, cross feed them to their unit personnel and incorporate lessons learned into the unit training program.

7.6.7.6.2.2. Identify individuals that struggle to identify criteria events. Conduct root cause analysis, and leverage lessons learned to create unit training materials to improve criteria event forecast capabilities.

7.6.7.6.2.3. Document unit trends, conduct seasonal analysis of high miss criteria events and incorporate into seasonal refresher training for the unit.

7.6.7.7. Request MAJCOM technical assistance if needed to analyze and exploit results from OPVER metrics.

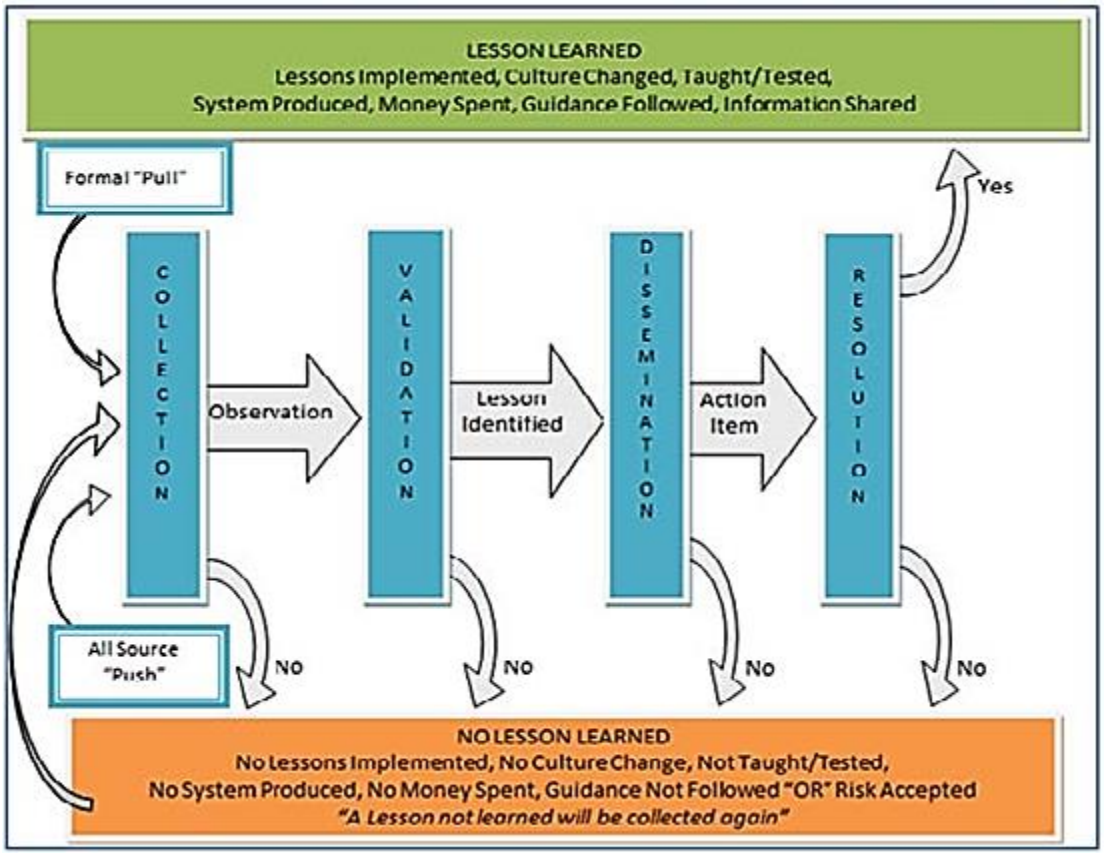
7.6.8. Cross-feed improved verification methods and tools developed to ACC/A3W.

Chapter 8

AFTER ACTION REPORTS (AARS) AND LESSONS LEARNED (LL)

8.1. Overview. IAW AFI 10-1302, *Air Force Lessons Learned Program*, and DAFI 15-129, ACC/A3W collects, validates, disseminates, and resolves LL to enhance readiness, improve capability, and inform concept development in areas such as Agile Combat Employment. By capturing what worked well and what didn't, units can benefit from the experiences of their fellow Airmen to refine TTP; enhance training; and improve decision-making. This focus on LL is crucial to support the Air Force's operational imperatives and ensure units are organized, trained, and equipped to succeed in competition and conflict (see **Figure 8.1**.).

Figure 8.1. Air Force Lessons Learned Process.



8.2. Required Information. See AFI 10-1302, Chapter 3 regarding how individuals and units collect observations to enter the LL process.

8.3. Method of Transmission. AARs and LL will be submitted online via A3W's NIPRNet public SharePoint® site or via email for classified submissions (contact ACC/A3WO via **acc.a3wo@us.af.mil** for specific SIPRNet and Joint Worldwide Intelligence Communication System (JWICS) email addresses): **https://usaf.dps.mil/teams/ACC_Weather_Forces/Shared%20Documents/Forms/AllItems.aspx?csf=1&web=1&e=06x8n0&cid=bff1de8a%2De520%2D4dc5%2Db96a%2D06095f4f3dc6&FolderCTID=0x012000B38E2A072459594B9678568400602003&id=%2Fteams%2FACC%5FWeather%5FForces%2FShared%20Documents%2FGeneral%2F02%2E%20AARs%2C%20Lessons%20Learned**. Following submission to SharePoint®, A3W will make this information available in the Joint Lessons Learned Information System (JLLIS) for wider access on multiple enclaves.

BRIAN S. LAIDLAW, Brigadier General, USAF
Director of Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

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FM 3-13, *Information Operations*, 16 February 2016

FM 3-60, *Army Targeting*, 11 August 2023

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JP 3-0, *Joint Campaigns and Operations*, 18 June 2022

JP 3-04, *Information in Joint Operations*, 14 September 2022

JP 3-59, *Meteorological and Oceanographic Operations*, 25 November 2024

JP 3-60, *Joint Targeting*, 20 September 2024

JP 3-85, *Joint Electromagnetic Spectrum Operations*, 22 May 2020

JP 5-0, *Joint Planning*, 1 July 2025

T.O. 31M1-2TMQ53-1, *AN/TMQ-53 Tactical Meteorological Observing System (TMOS),* 25 November 2015

Prescribed Forms

None

Adopted Forms

AF Form 3803, *Surface Weather Observations (METAR/SPECI)*

AF Form 3806, *Weather Watch Advisory Log*

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

DAF Form 847, *Recommendation for Change of Product*

DD Form 175-1, *Flight Weather Briefing*

Abbreviations and Acronyms

AAR—After Action Report

ABS—Air Base Squadron

ACC—Air Combat Command

ACE—Agile Combat Employment

ADCON—Administrative Control

AETF—Air Expeditionary Task Force

AF—Air Force

AFDP—Air Force Doctrine Publication

AFI—Air Force Instruction

AFIMSC—Air Force Installation & Mission Support Center

AFMAN—Air Force Manual

AFFOR—Air Force Forces

AFFORGEN—Air Forces Force Generation

AFPD—Air Force Policy Directive

AFPP—Air Force Planning Process

AFR—Air Force Reserve

AFSC—Air Force Specialty Code

AFTTP—Air Force Tactics and Techniques Publication

AFLCMC—Air Force Life Cycle Management Center

AFWWS—Air Force Weather Weapon System

AFWDDO—Air Force Weather Data Domain Officer

AI—Artificial Intelligence

AMWS—Advanced Micro Weather Sensor

ANG—Air National Guard

AOC—Air Operations Center

AOL—Alternate Operating Location

AOR—Area of Responsibility

ap—Available Points

APACS—Aircraft and Personnel Automated Clearance System

AR—Army Regulation

ART—Advanced Ready Training

ASCC—Army Service Component Command

ASDA/SDA—Accountable Supply Distribution Activity

ASOC—Air Support Operations Center

ATF—Air Task Force

ATO—Air Tasking Order

ATP—Army Techniques Publication

BCC—Battle Control Center

BCT—Brigade Combat Team

BIFROST—Bridging Environmental Intelligence For Responsive Operational Support

BN—Battalion

BOS—Base Operating Support

C2—Command and Control

C2FE—Command and Control Force Element

C2IMERA—Command and Control Incident Management Emergency Response Application

CAB—Combat Aviation Brigade

CABS—Combat Air Base Squadron

CA/CRL—Custodian Authorization/Custody Receipt List

CAC—Common Access Card

CCDR—Combatant Commander

CDO—Contested Degraded Operations

CDO-L—Contested, Degraded, and Operationally Limited

CE—Command Echelon

CET—Command Echelon Team

CFETP—Career Field Education and Training Plan

CJCSM—Chairman, Joint Chiefs of Staff Manual

CL—Contingency Location

CLS—Contract Logistics Support

CMAP—Climate Monitoring, Analysis, and Prediction

CCMD—Combatant Command

CONEMP/CONOPS—Concept of Employment/Concept of Operations

CPX—Command Post Exercise

CRC—Control and Reporting Center

CSI—Critical Success Index

CSIC—Combat Support Instructor Course

CSTR—Combat Support Training Range

CTC—Combat Training Center

DAF—Department of the Air Force

DAFI—Department of the Air Force Instruction

DAFMAN—Department of the Air Force Manual

DAFPD—Department of the Air Force Policy Directive

DCGS—Distributed Common Ground System

DCW—Deployable Combat Wing

DD—Department of Defense (in reference to form numbers)

DDIL—Denied, Degraded, Intermittent, and Limited

Det—Detachment

DLT—Desired Lead Time

DoD—Department of Defense

DRRS—Defense Readiness Reporting System

DS—Direct Support

DSN—Defense Switched Network

DTS—Defense Travel System

EMCON—Emission Control

EMI—Electromagnetic Interference

EMS—Electromagnetic Spectrum

EMSO—Electromagnetic Spectrum Operations

ECWG—Exercise Coordination Working Group

EXORD—Execute Order

FAR—False Alarm Ratio

FCG—Foreign Clearance Guide

FE—Force Element

FHP—Flying Hour Program

FITL—Forecaster-in-the-Loop

FLIP—Flight Information Publication

FM—Field Manual

FMSWeb—Force Management Solutions Web Capability

FORSCOM—United States Army Forces Command

FRAGORD—Fragmentary Order

GALWEM—Global Air-Land Weather Exploitation Model

GFMAP—Global Force Management Allocation Plan

GPS—Global Positioning System

GTC—Government Travel Card

HAF—Headquarters, United States Air Force

HARM—Host Aircrew Resource Management

HQ—Headquarters

ICW—In-Pace Combat Wings

IMEI—International Mobile Equipment Identity

IPOE—Intelligence Preparation of the Operational Environment

IR—Infrared

ISR—Intelligence, Surveillance, and Reconnaissance

IW—Information Warfare

IWOS—Integrated Weather Observation System

IWWG—Information Warfare Working Group

JADC2—Joint All-Domain Command and Control

JELC—Joint Event Life Cycle

JLLIS—Joint Lessons Learned Information System

JP—Joint Publication

JPP—Joint Planning Process

JS—Joint Staff

JTT—Joint Training Platform

JWICS—Joint Worldwide Intelligence Communication System

KQ—Temporary Location Identifier

LL—Lessons Learned

LRKC—Long-Range Kill Chain

MAAP—Master Air Attack Plan

MAJCOM—Major Command

MDMP—Military Decision Making Process

MDS—Mission Design Series

MEF—Mission Execution Forecast

MEFP—Mission Execution Forecast Process

MEFVER—Mission Execution Forecast Verification

MET—Mission Essential Task

METL—Mission Essential Task List

METOC—Meteorological and Oceanographic

METWATCH—Meteorological Watch

MFR—Memorandum for Record

MGFE—Mission Generation Force Element

MICT—Management Internal Control Toolkit

mIRC—Microsoft Internet Relay Client

ML—Machine Learning

MOK—Mobile Observation Kit

MOP—Measure of Performance

MOPs—Management Operating Procedures

MPC—Mission Planning Cell

MRA—Mission Ready Airman

MTL—Master Task List

MTOE—Modified Table of Organization and Equipment

MTTP—Multi-Service Tactics, Techniques, and Procedures

NIPR/NIPRNet—Non-secure Internet Protocol Router/Network

NATO—North Atlantic Treaty Organization

NDS—National Defense Strategy

NLT—No Later Than

NM—Nautical Mile(s)

NMS—National Military Strategy

NSS—National Security Strategy

NOAA—National Oceanic and Atmospheric Administration

NWM—Numerical Weather Model

OCTP—Operational Command Training Program

OPCON—Operational Control

OPLAN—Operations Plan

OPORD—Operations Order

OPR—Office of Primary Responsibility

Ops—Operations

OPVER—Operational Verification

OSS—Operations Support Squadron

OT&E—Organize, Train, and Equip

PACE—Primary, Alternate, Contingency, and Emergency

pcf—Points for Correct Forecast

PIREP—Pilot Reports

PMEL—Precision Measurement Equipment Laboratory

POA—Pertinent Oversight Authorities

POC—Point of Contact

PWS—Performance Work Statement

RAT—Ready Airman Training

RFF/RFI/RFS—Request for Forces/Request for Information/Request for Support

RFF—Request for Forces

RFI—Radio Frequency Interference

RFS—Request for Support

ROC—Rehearsals of Concept

SAC—Self-Assessment Checklist

SAR—Support Assistance/Analysis Request

SARM—Squadron Aircrew Resource Management

SATCOM—Satellite Communications

SAV—Staff Assistance Visit

SBD—Short Burst Data (Iridium)

SDA—Short-Burst Data Domain Admin

SDOB—Secretary of Defense Orders Book

SECDEF—Secretary of Defense

SIPR/SIPRNet—Secure Internet Protocol Router/Network

SME—Subject Matter Expert

SOP—Standard Operating Procedure

STW—Sub-Threshold WWA

SVOIP—Secure Voice Over Internet Protocol

SWO—Staff Weather Officer

TACMET—Tactical Meteorological Equipment

TACON—Tactical Control

TACP—Tactical Air Control Party

TACS—Theater Air Control System

TACSAT—Tactical Satellite

TAF—Terminal Aerodrome Forecast

TAFVER—Terminal Aerodrome Forecast (TAF) Verification

TAWS—Target Acquisition Weapons Software

TDA—Tactical Decision Aid

TET—Targeting Effects Team

TIP—Tactical Improvement Proposals

TO—Technical Order

TTP—Tactics Techniques and Procedures

UCP—Unified Command Plan

UDM—Unit Deployment Manager

UoA—Units of Action

USAF—United States Air Force

USSF—United States Space Force

UTC—Unit Type Code

VAULTIS—Visible, Accessible, Understandable, Linked, Trustworthy, Interoperable, Secure

VOIP—Voice Over Internet Protocol

VOSIP—Voice Over Secure Internet Protocol

WARNORD—Warning Order

WARNVER—Watch, Warning, and Advisory (WWA) Verification

WDA—Weather Data Analysis

WF—Weather Flight

WOC—Wing Operations Center

WS—Weather Squadron

WWA—Watch, Warning and Advisories

WX—Weather

XAB—Expeditionary Air Base

Office Symbols

561 WS/OSK—561st Weapons Squadron Weapons and Tactics Flight

ACC/A3—ACC Director of Operations

ACC/A3O—ACC Operations Division

ACC/A3W—ACC Weather Operations Division

ACC/A3WO—ACC Weather Operations, Plans, & Programs Branch

ACC/A3WC—ACC Weather Contingency and Readiness Branch

ACC/A3WT—ACC Weather Training and Inspections Branch

ACC/A3 OL—G—ACC Operating Location-G FORSCOM

AF/A3—AF Deputy Chief of Staff for Operations

AF/A3DW—Air Force Director of Weather

CSAF—Chief of Staff of the Air Force

Terms

Approval Authority—Senior leader responsible for contributing to and implementing policies and guidance/procedures pertaining to his/her functional area(s) (e.g., heads of functional two-letter offices).

Attachment 2

TACTICS, TECHNIQUES, PROCEDURES (TTP) AND DOCUMENT LINKS

Table A2.1. Tactics, Techniques, Procedures (TTP) And Document Links.

Description	Link	Network
AFTTP 3-1.IPE	https://intelshare.intelink.sgov.gov/sites/561jts	SIPRNet
AFTTP 3-3.IPE	https://go.intelink.gov/F044vGW	NIPRNet
AFTTP 3-1.IPE	https://intelshare.intelink.ic.gov/sites/561jts	JWICS
AFTTP 3-1.IW	https://intelshare.intelink.sgov.gov/sites/561jts	SIPRNet
AFTTP 3-3.IW	https://go.intelink.gov/7mPaWho	Intelink
MDS AFTTPs 3-1	https://intelshare.intelink.sgov.gov/sites/561jts	SIPRNet
MDS AFTTPs 3-3	https://intelshare.intelink.gov/sites/561jts/SitePages/Home.aspx	Intelink
AFTTP 3-4.15		Intelink
MTTP	https://www.alssa.mil/	NIPRNet
AFTTP 3-4.15		
ATP 3-04.1	https://armypubs.army.mil/epubs/DR_pubs/DR_d/pdf/web/ARN21970_ATP_3-04x1_FINAL_WEB.pdf	Intelink
MTTP	https://intelshare.intelink.sgov.gov/sites/alsa	SIPRNet
JP 3-04	https://jdeis.js.mil/jdeis/new_pubs/jp3_04.pdf	NIPRNet
AFDP 3-13	https://www.doctrine.af.mil/	NIPRNet
Army FM 3-13	https://armypubs.army.mil/epubs/DR_pubs/DR_a/pdf/web/FM%203-13%20FINAL%20WEB.pdf	
AFTTP 3-3.IW	https://intelshare.intelink.gov/sites/561jts/afttp/AFTTP%20Volumes/AFTTP%203-3.IW_26%20January%202024_.pdf	Intelink
JP 3-85	https://jdeis.js.mil/jdeis/new_pubs/jp3_85.pdf	
AFDP 3-85	https://www.doctrine.af.mil/Portals/61/documents/AFDP_3-85/AFDP%203-85%20Electromagnetic%20Spectrum%20Ops.pdf	
Helpful US Navy IW/EMSO references (Navy IW doctrine and CONOPS) are classified and available on SIPR at https://doctrine.navy.smil.mil (requires user account registration).		
See also US Air Force Strategy for IW, US Air Force Operating Concept for IW, COMACC Intent for IW.		

Attachment 3

ACC EXERCISE/PRE-DEPLOYMENT CHECKLIST

A3.1. Preparation. All weather units preparing for an exercise or deployment will utilize this functionally aligned checklist to ensure preparations are completed.

A3.2. Reset Phase.

Table A3.1. AFFORGEN Reset Phase Requirements.

FOCUS: 100-Level Training/Functionally Aligned Training (1W CFETP/15W TMF)
- Complete annual positional recertifications for all personnel -- NOTE: All personnel are directed to conduct/maintain AFSC-centric training as outlined within the AF 1W CFETP and 15W Talent Management Framework (TMF). -- Personnel will maintain their skill level proficiency by conducting annual proficiency training as outlined within these documents.
- Confirm all individual training records are updated, signed, and certified. -- Done IAW applicable AF guidance.
- Complete any weather-specific course attendance (if required).

A3.3. Prepare Phase.

Table A3.2. AFFORGEN Prepare Phase Requirements.

FOCUS: 200-Level Training/MRA Training/Unit-Level Interoperability (For non-UoA deployment, once notification occurs, complete this checklist)
- Review strategic documents to understand strategic level priorities and the DoD approach to address threats. -- National Security Strategy (NSS), National Defense Strategy (NDS), National Military Strategy (NMS).
- Identify and coordinate with unit's A/S/G/J 6 Directorate. -- Dedicated NIPR & access to SIPR capabilities. -- NIPR/SIPR Laptops. --- Coordinate, download, and update software for individual systems IAW **Attachment 4** -- Individual SIPR Accounts and Tokens. -- Individual JWICS access (if applicable). -- VOIP/SVOIP Phones. -- Radio/Weather Sensor & Equipment Frequencies.
- Identify and review applicable OPLANs for mission-aligned requirements.
- Coordinate with Wing/XAB/ATF/DCW exercise planners to integrate weather capabilities into exercise development.
- Identify and coordinate with unit's A/S/G/J 2/3 Directorates to determine Base PACE Plan and additional

support requirements. -- Ensure access to applicable systems IAW **Attachment 4** and obtain training (if required).
- Determine applicable weather equipment requirements.
- Develop functional (i.e., weather-centric) PACE Plan.
- Determine RFS and/or RFF requirements. -- Ensure appropriate request processes are generated (e.g., JTT, 5-paragraph Mission Command format, etc.) and pushed up through unit's chain of command. -- Contact ACC/A3WC for questions, if necessary.
- Inventory and Ops Check equipment.
- Ensure all personnel have mandatory equipment as listed in **Attachment 4**.
- Install required software on deployable computers and ops check.
- Coordinate with Logistics Readiness Squadrons to determine when equipment must be packed up and who is responsible for packing (i.e., palletization).
- Pull and review long range planning weather data for AOR. -- Brief appropriate leaders, planners, and applicable personnel on impacts to mission, assets, and members, as appropriate.
- Coordinate with personnel supporting MGFEs that may deploy with the supported unit and obtain mission-limiting weather threshold for their aircraft (if required).
---------- *Work with the unit's UDM on the following items* ----------
- Air Force Deployment Folder review/AFFORGEN requirements.
- Confirm reporting instructions (if available).
- Identify theater training requirements.
- Review Foreign Clearance Guide (FCG), if applicable.
- Start Aircraft and Personnel Automated Clearance System (APACS) entry, if applicable.
- Ensure Common Access Card (CAC) will be valid through deployment duration.
- Ensure Government Travel Card (GTC) will be valid through deployment duration. -- Discuss with UDM on changing GTC status to "Mission Critical."
- Identify planning meetings, times, and locations for proper integration.
- Determine if NATO orders are required.
- Begin Medical out-processing.

A3.4. Certify Phase.

Table A3.3. Air Force Force Generation (AFFORGEN) Initial Certify Phase Requirements.

FOCUS: 300-Level Training/Individual Unit of Action Certification **(For non-UoA deployment, perform these 45 to 90 days from RLD)**
- Inventory and Ops Check equipment that will be utilized for deployment.
- Submit KQ requests (if applicable). -- **Note:** If TACMET will be utilized for official observations in any situation (e.g., exercise, deployment), a KQ *must* be generated and utilized for that piece of equipment.
- Ensure back-up forms, products templates, and SOPs are physically and readily available.
- Pull and review illumination data for AOR.
- Review command relationship and understand appropriate lines of authority.
---------- *Work with the unit's UDM on the following items* ----------
- Identify funding organization and begin cross-org (as required).
- Obtain courier memo (if required).
- Draft and submit DTS orders (if required).
- Confirm manifest information (if required).

Table A3.4. Air Force Force Generation (AFFORGEN) Mid-Certify Phase Requirements.

FOCUS: 400-Level Training/Full Unit of Action Certification **(For non-UoA deployment, perform these 15 to 45 days from RLD)**
- Inventory and Ops Check equipment that will be utilized for deployment.
- Ensure all team members log into all laptops being utilized (e.g., exercise, deployment) if coming from in-garrison location (NIPR, SIPR, etc.).
---------- *Perform the following items 01 to 15 days from RLD* ----------
- Download and backup weather data for use until dedicated comms are connected. -- WxStream/Helios; local copies of products.
- Conduct bag drags/gear checks (packing lists).
- Pick up weapons (if required).

Attachment 4

EQUIPMENT & SYSTEMS REQUIREMENTS FOR DIFFERNG SUPPORT TYPES

A4.1. Equipment. At a minimum, Air Force weather units will utilize the following equipment given their appropriate situation:

Table A4.1. Air Force Force Generation (AFFORGEN) Equipment List.

ACE C2 HUB	ACE MGFE SPOKE
- TMQ-53 or IWOS	- MOK
- MOK	- AMWS
- NIPR Laptop (Dedicated)	- NIPR Laptop (Dedicated)
- SIPR Tokens (With active accounts)	- SIPR Tokens (With active accounts)
- SIPR (Access to system)	- SIPR (Access to system)
- JWICS Account (If required)	- VOIP
- JWICS (Access to system, if required)	- SVOIP (Access to system)
- VOIP	- PMSV (Access to system)
- SVOIP (Access to system)	----------

A4.2. Minimum Equipment List (when supporting Army). At a minimum, Air Force weather units supporting Army Operations will utilize the following equipment given their appropriate situation:

Table A4.2. Army Weather Support Equipment List.

ARMY HQ ELEMENT	ARMY AVIATION UNIT
- AMWS	- TMQ-53 or IWOS
- MOK	- MOK
- NIPR Laptop (Dedicated)	- AMWS (If available)
- SIPR Tokens (With active accounts)	- NIPR Laptop (Dedicated)
- SIPR (Access to system)	- SIPR (Access to system)
- JWICS Account (If required)	- VOIP
- JWICS (Access to system, if required)	- SVOIP (Access to system)
- VOIP	- PMSV (Access to system)
- SVOIP (Access to system)	----------

A4.3. Minimum Software/Platforms. At a minimum, Air Force weather units will utilize the following software and/or platforms to support their respective mission sets, to include ensuring active accounts, as well as appropriate training on how to operate said features:

Table A4.3. Weather-Specific Software List.

AIR FORCE MISSIONS	ARMY MISSIONS
- BIFROST	- BIFROST
- Mark-IVB	- Mark-IVB
- WxStream/Helios	- WxStream/Helios
- C2IMERA	- Supported Unit’s C2 Program
- MAVEN	- MAVEN
- ChatSurfer	- ChatSurfer
- TAWS	- TAWS

Attachment 5

PACE AND CONTINUITY PLANS

A5.1. Communications Primary, Alternate, Contingent, and Emergency (PACE) Plan.

A5.1.1. Develop and Maintain PACE Plan. Develop and maintain a comprehensive PACE plan in coordination with the parent wing's A-Staff to support both home-station and deployed operations. This includes automated and manual observation support, resource protection (e.g.,WWAs), and mission generation support (e.g., RAT Ready Training Area—Basic Communication). See Figures **A5.1** and **A5.2** for examples.

A5.1.2. Develop and Maintain Continuity Plans. Develop and maintain continuity plans (e.g., AOL and PACE Plans to mitigate disruption, disaster, and/or gaps in METOC support continuity during home-station operations or within clusters when deployed.

A5.1.3. Develop and maintain "Bug-Out Kit." Develop and maintain a "bug-out kit" that contains essential documents to support unit continuity plans. The kit should include but is not limited to: (1) customer contact card(s), (2) unit SOPs, (3) forms for manual observations and resource protection (e.g., AF Form 3803, *Surface Weather Obeservations (METAR/SPECI);* AF Form 3806, Weather Watch Advisory Log; AF From 3807, *Watch/Warning Notification and Verification*), (4) PACE Plan, (5) documentation for weapon system platform support, (6) FLIPs, and (7) 14 WS Climate Go Kits (**https://climate.af.mil/climate_go_kit/**). Review and update the "bug-out kit" monthly to ensure all necessary information is readily available in the event of a disruption or emergency, including full NIPRNet outages.

Figure A5.1. Simplified PACE Plan (not for operational use).

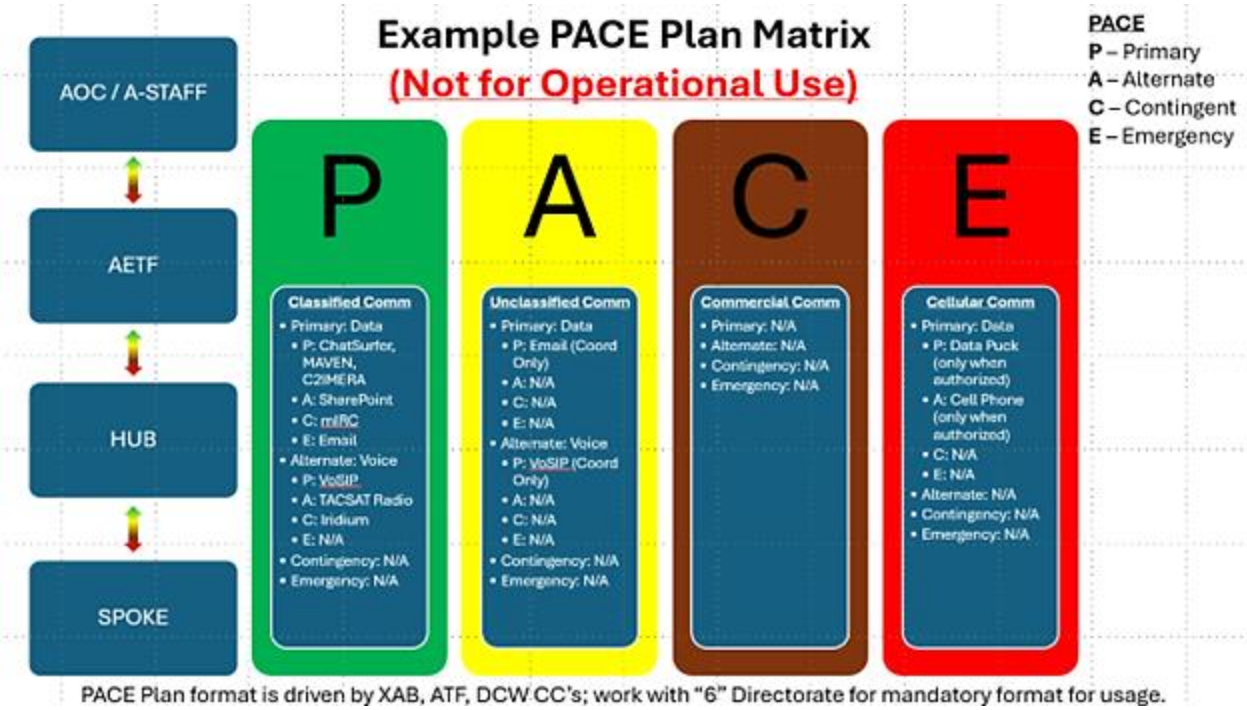
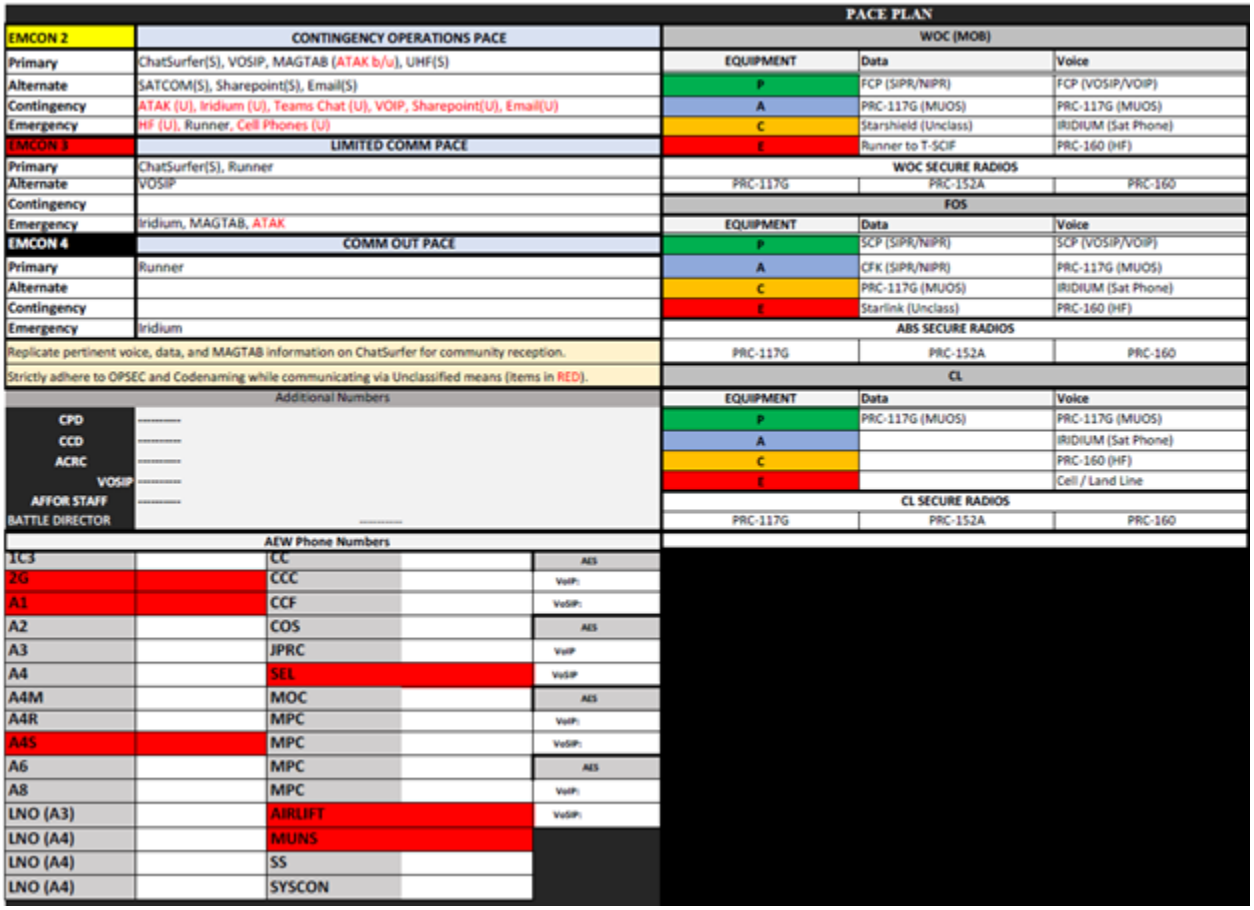


Figure A5.2. Sample Primary, Alternate, Contingent, Emergency (PACE) Plan used during Exercise BAMBOO EAGLE 25-1.



PACE PLAN

EMCON 2	CONTINGENCY OPERATIONS PACE
Primary	ChatSurfer(S), VOSIP, MAGTAB (ATAK b/u), UHF(S)
Alternate	SATCOM(S), Sharepoint(S), Email(S)
Contingency	ATAK (U), Iridium (U), Teams Chat (U), VOIP, Sharepoint(U), Email(U)
Emergency	HF (U), Runner, Cell Phones (U)
EMCON 3	LIMITED COMM PACE
Primary	ChatSurfer(S), Runner
Alternate	VOSIP
Contingency	
Emergency	Iridium, MAGTAB, ATAK
EMCON 4	COMM OUT PACE
Primary	Runner
Alternate	
Contingency	
Emergency	Iridium

Replicate pertinent voice, data, and MAGTAB information on ChatSurfer for community reception.

Strictly adhere to OPSEC and Codenaming while communicating via Unclassified means (items in RED).

Additional Numbers	
CPD	----------
CCD	----------
ACRC	----------
VOSIP	----------
AFFOR STAFF	----------
BATTLE DIRECTOR	----------

AEW Phone Numbers				
1C3		CC		AES
2G		CCC		VoIP:
A1		CCF		VoSIP:
A2		COS		AES
A3		JPRC		VoIP
A4		SEL		VoSIP
A4M		MOC		AES
A4R		MPC		VoIP:
A4S		MPC		VoSIP:
A6		MPC		AES
A8		MPC		VoIP:
LNO (A3)		AIRLIFT		VoSIP:
LNO (A4)		MUNS		
LNO (A4)		SS		
LNO (A4)		SYSCON		

WOC (MOB)

EQUIPMENT	Data	Voice
P	FCP (SIPR/NIPR)	FCP (VOSIP/VOIP)
A	PRC-117G (MUOS)	PRC-117G (MUOS)
C	Starshield (Unclass)	IRIDIUM (Sat Phone)
E	Runner to T-SCIF	PRC-160 (HF)

WOC SECURE RADIOS

PRC-117G	PRC-152A	PRC-160

FOS

EQUIPMENT	Data	Voice
P	SCP (SIPR/NIPR)	SCP (VOSIP/VOIP)
A	CFK (SIPR/NIPR)	PRC-117G (MUOS)
C	PRC-117G (MUOS)	IRIDIUM (Sat Phone)
E	Starlink (Unclass)	PRC-160 (HF)

ABS SECURE RADIOS

PRC-117G	PRC-152A	PRC-160

CL

EQUIPMENT	Data	Voice
P	PRC-117G (MUOS)	PRC-117G (MUOS)
A		IRIDIUM (Sat Phone)
C		PRC-160 (HF)
E		Cell / Land Line

CL SECURE RADIOS

PRC-117G	PRC-152A	PRC-160

Attachment 6

ACC WEATHER OPERATIONS WWA METRICS

Table A6.1. WARNVER Measures of Performance (MOPs).

WARNVER MOPs. MOP	**Individual Event Calculation (**for events that occur within the specified verification distance)	**Combined Event Calculation (**for all events that occur within the specified verification distance)
Met DLT Percentage	The total number of forecast events that occurred and met the full desired lead time (“met DLT”) divided by the total number of events that occurred (“Required”).	The total number of forecast WWA events that occurred and met the full (“met DLT”) divided by the total number of WWA events that occurred (“Required”).
Positive Lead Time (PLT) Percentage	The total number of forecast events with positive lead time (“PLT”) divided by the total number of forecast events that occurred (“Required”).	The total number of WWA events with positive lead time (“PLT”) divided by the total number of events that occurred (“Required”).
False Alarm Ratio (FAR)	The number of False Alarm WWAs divided by the number of issued WWAs.	The total number of False Alarm WWAs divided by the total number of issued WWAs.
Required Not Issued (RNI) Percentage	The total number of WWAs that were required, but not issued, divided by the total number of events that met the event thresholds.	The total number of WWA events that were required, but not issued, divided by the total number of events that met the WWA thresholds.
Negative Lead Time Percentage	The total number of criteria WWAs issued with negative lead-time, divided by the total number of events that met the criteria thresholds. The total number of WWA events with negative lead-time divided by the total number of events that met the criteria thresholds.	The total number of criteria WWAs issued with negative lead-time, divided by the total number of events that met the criteria thresholds. The total number of WWA events with negative lead-time divided by the total number of events that met the criteria thresholds.

Sub-threshold WWA (STW) Percentage	Calculate the number of WWA events where the WWA criteria occurred but was one category less intense than the forecast intensity specified* divided by the total number of WWA events predicted for the intensity forecast. Note, this only applies to moderate or greater categories. * One WWA category less is the next reportable level below the WWA criteria. For example, a 35-49-knot event is STW for a 50+ WWA. ½" hail is STW for a ¾" or greater hail warning. For WWAs concerning precipitation accumulation use one unit of measure below the warning threshold. For example, a heavy snow warning for 2" is STW for 1".	Report separately for each criterion; also include a group with all forecast warnings combined and a group with all forecast advisories combined.
Justified FAR	The number of issued WWAs that met 90% of the desired threshold, divided by the number of issued WWAs. For lightning watches, use double the verification distance for Justified FAR, for example a 5-NM WWA would be justified with strikes at or within 10 NM (that occur after issuance).	Report separately for each criterion; also include a group with all forecast warnings combined and a group with all forecast advisories combined. **Note:** Justified FARs are still counted as False Alarms.

Table A6.2. WARNVER Standards.

MOP	Standard
Met DLT	Greater than, or equal to 75%
PLT	Greater than, or equal to 90%
FAR	Less than, or equal to 45%
Negative Lead Time	Less than, or equal to 10%

Figure A6.1. Sample Watch, Warning, and Advisory (WWA) Metrics Report for ACC/A3W.

Seymour Johnson

WWA Type	Required	Issued	met DLT	PLT	NLT	False Alarms	RNI	Sub Threshold WWA (STW)	Justified False Alarm (JFA)	mDLT%	PLT%	NLT%	FA Ratio	RNI%	STW%	JFA Ratio
Tornado																
Severe Thunderstorms		1				1		1					100.0%		100.0%	0.0%
Moderate Thunderstorms	2	3	2	2		1			1	100.0%	100.0%	0.0%	33.3%	0.0%	0.0%	33.3%
Damaging Winds																
Strong Winds	2	5	1	2		3			2	50.0%	100.0%	0.0%	60.0%	0.0%	0.0%	40.0%
Heavy Rain																
Heavy Snow																
Freezing Precipitation																
Blizzard																
Dust Storm																
Sand Storm																
All Other Warnings																
Warning Totals	4	9	3	4	0	5	0	1	3	75.0%	100.0%	0.0%	55.6%	0.0%	11.1%	33.3%
Forecast Advisories	8	12	6	8		4			4	75.0%	100.0%	0.0%	33.3%	0.0%	0.0%	33.3%
Lightning Watches	7	11	5	7		4			1	71.4%	100.0%	0.0%	36.4%	0.0%	0.0%	9.1%
Advisory & Lightning Totals	15	23	11	15	0	8	0	0	5	73.3%	100.0%	0.0%	34.8%	0.0%	0.0%	21.7%
All WWAs	19	32	14	19	0	13	0	1	8	73.7%	100.0%	0.0%	40.6%	0.0%	3.1%	25.0%

Attachment 7

TERMINAL AERODROME FORECAST VERIFICATION (TAFVER)

Table A7.1. Sample Terminal Aerodrome Forecast Verification (TAFVER) Measures of Performance (MOPs).

	Evaluate	Requirement	Hourly Score and Overall Percentage Correct
Ceiling (cig)	All specification and amendment criteria as documented on the Installation data page/Installation Weather support plan (or equivalent)	Verify within forecast categories as a correct forecast or an incorrect forecast for all groups.	The hourly score is one point for a correct forecast and zero points for an incorrect forecast. The overall TAF cig percentage correct is the total number of points for correct forecasts (pcf) divided by the total number of available points (ap) multiplied by 100 ((pcf/ap)*100).
Visibility (vis)	All specification and amendment criteria as documented on the Installation data page/Installation Weather support plan (or equivalent)	Verify within forecast categories as a correct forecast or an incorrect forecast for all groups.	The hourly score is one point for a correct forecast and zero points for an incorrect forecast. The overall TAF vis percentage correct is the total number of points for correct forecasts (pcf) divided by the total number of available points (ap) multiplied by 100 ((pcf/ap)*100).
Wind Speed	+ or - 9 knots	Verify all forecast groups where wind speeds are GTE than 6 knots. If the forecast is within 9 knots it is a correct forecast. For 10	The hourly score is one point for a correct forecast and zero points for an incorrect forecast. The overall TAF Wind Speed

		knots or greater of error the forecast is incorrect.	percentage correct is the total number of points for correct forecasts (pcf) divided by the total number of available points (ap) multiplied by 100 ((pcf/ap)*100).
Wind Direction	+ or - 50/30 degrees	Verify all forecast groups. For periods when winds are more than 6 knots but less than 15 knots, if the forecast direction is within 50 degrees, the forecast is correct. For periods when winds are greater than, or equal to, 15 knots, if the forecast direction is within 30 degrees the forecast is correct. When the forecast error is greater than these thresholds, the forecast is incorrect.	The hourly score is one point for a correct forecast and zero points for an incorrect forecast. The overall TAF Wind Direction percentage correct is the total number of points for correct forecasts (pcf) divided by the total number of available points (ap) multiplied by 100 ((pcf/ap)*100).
Wind Gusts	+ or - 10 knots of observed gusts	If gusts occur and are within 10 knots of the forecast criteria or no gusts are forecast and no gusts occur, it is counted as a correct forecast. For all cases where gusts are not forecast and gusts occur, no points are awarded.	The hourly score is one point for a correct forecast and zero points for an incorrect forecast. The overall TAF Wind Gust percentage correct is the total number of points for correct forecasts (pcf) divided by the total number of available points (ap) multiplied by 100 ((pcf/ap)*100).

Present Weather	Each phenomenon separately, precipitation in liquid, freezing, or frozen, obscurations, and other. Intensity/proximity qualifiers are not mandatory for verification.	Verify all forecast groups using the Critical Success Index (CSI), which is correct forecast/(correct forecast + incorrect forecasts). Total score ranges from 1 to 0. An incorrect forecast is when a phenomenon is forecast but not observed or not forecast but was observed.	The hourly score is the hourly CSI, with a perfect forecast = to 1 point, and less than a perfect forecast a fraction of a point as defined by the CSI formula. The overall TAF present weather score is the sum of the number of points (and fractions of a point) awarded each hour each for correct forecasts (pcf) divided by the total number of available points (ap) multiplied by 100 ((pcf/ap)*100).
Lowest Altimeter Setting	Measured for every forecast group (except TEMPO).	Verify within forecast categories as a correct forecast or an incorrect forecast as follows: If the lowest altimeter observed during a given hour was no more than .05 inches (ins) Hg lower than forecast during that hour it counts as a correct forecast. If the lowest altimeter observed during a given hour was more than .05 ins Hg lower than forecast during that hour it counts as an incorrect forecast.	The hourly score is one point for a correct forecast and zero points for an incorrect forecast. The overall TAF lowest altimeter setting percentage correct is the total number of points for correct forecasts (pcf) divided by the total number of available points (ap) multiplied by 100 ((pcf/ap)*100).
Combined TAF Accuracy	The overall TAF score using all available points earned divided by the possible available points for every hour in the TAF for all groups that were forecast, BECMG, TEMPO, and FM.	Compute the sum of the total points correctly forecast (pcf) per group and divide by the sum of the total available points (ap) per group. (BECMG pcf + TEMPO pcf + FM pcf)/(BECMG ap + TEMPO ap + FM ap)	

Table A7.2. Terminal Aerodrome Forecast Verification (TAFVER) Technical Metrics.

Criteria	Requirement (BCMG, TEMPO and FM)	Hourly Score and Overall Percentage Correct (BCMG, TEMPO and FM)
Category cig Accuracy	As described in **Table A2.1.** for individual weather personnel. Identify individual skills and deficiencies and take actions as necessary.	As described in **Table A2.1.** for individual weather personnel.
Category vis Accuracy	As described in **Table A2.1.** for individual weather personnel. Identify individual skills and deficiencies and take actions as necessary.	As described in **Table A2.1.** for individual weather personnel.
Category cig bias	Number of total hours forecast for each cig category divided by the number of hours observed in each cig category.	Report scores by hour in the TAF and an overall score for all hours of the TAF.
Category vis bias	Number of total hours forecast for each vis category divided by the number of hours observed in each vis category.	Report scores by hour in the TAF and an overall score for all hours of the TAF.
Present Weather Accuracy	As described in **Table A2.1.** for individual weather personnel. Identify individual skills and deficiencies and take actions as necessary.	As described in **Table A2.1.** for individual weather personnel.
Present Weather Bias	Number of total hours forecast for each present weather event divided by the number of hours observed in each present weather category.	Report scores by hour in the TAF and an overall score for all hours of the TAF.
FITL Value Added	Compute TAFVER MOPs according to **Table A2.1.** for the model produced TAF (if applicable). Subtract the model produced TAF MOPs from the FITL TAF MOPs to determine the FITL value added.	Report scores by hour in the TAF for each MOP in **Table A2.1.** and include an overall score for all hours of the TAF

Attachment 8

OPERATIONAL VERIFICATION (OPVER)

A8.1. Operational Verification (OPVER) Statistical Evaluation Methods and Management Operating Procedures (MOPs).

A8.1.1. Statistical Evaluation Methods.

A8.1.2. Define and document WP and MEF mission impacting weather criteria to include at a minimum: takeoff, route/operating area, landing and divert criteria for every supported aviation platform and mission.

A8.1.2.1. Mission-impacting criteria should include but are not limited to platform limitations, pilot categories, training limitations, airfield minimum, and tactical requirements.

A8.1.2.2. Conduct post-mission analysis for all FITL WPs and MEFs. If a WP is subject to a Meteorological Watch (METWATCH) and amended, it must be verified for all events that are forecast or observed to meet a forecast criterion. Where available, use objective data vice subjective data to verify WP or MEF element accuracy. Objective verification data may include but is not limited to radar-derived parameters, direct pilot or supported commander feedback, surface weather observations, lightning detection data, formal pilot debriefs and pilot reports (PIREP) from mission aircraft. It is essential that weather organizations producing WPs and MEFs complete the process by obtaining post-mission analysis data.

A8.1.2.3. Conduct subjective post-mission analysis when objective data is unavailable or when subjective data would assist in determining whether elements of every WP or every MEF verified. Subjective verification data includes sources deemed credible by unit leadership and may include, but is not limited to satellite imagery interpretation, PIREPs from other aircraft in the vicinity of the mission area and other credible weather reports.

A8.1.2.4. Regardless of the mission outcome (proceed as is/cancel/change), OPVER will be conducted for all MEFs. Sometimes, several MEFs may be necessary to complete a mission. For example, if an MEF is presented, and the mission is changed to correspond with timing for conditions that are more favorable, then a new MEF may be required or an update to the previous one to match the mission changes. These count as two MEFs, both requiring verification.

A8.1.2.5. To compute OPVER metrics, weather organizations will:

A8.1.2.5.1. Use the OPVER computation grid in **Table A8.1** to standardize the collection and analysis of WP and MEF data. WPs will be verified at the beginning and ending of the valid period, and hourly through the first six hours, there after products will be verified every three hours. For example, a WP valid for 6 hours will be verified at the beginning of the valid time, and hourly thereafter. A WP valid for 14 hours will be verified at the beginning of the valid period, hourly through the first 6 hours, at the 9, 12 and 14 hour points.

A8.1.2.5.2. Record WP and MEF verification totals separately using **Table A8.1**.

A8.1.2.5.3. Block A (mandatory): “Criteria Event WP, Criteria EventObserved.” The total in block A is the number of correct WP Criteria Event WP forecasts.

A8.1.2.5.4. Block B (mandatory): “No Criteria Event WP, Criteria Event Observed.” The total in block B is the number of incorrect WP No Criteria EventWP forecasts.

A8.1.2.5.5. Block C (mandatory): “Criteria Event WP, No Criteria Event Observed.” The total in block C is the number of incorrect WP Criteria Event WP forecasts.

A8.1.2.5.6. Block D (optional for manual calculations): “No Criteria Event WP, No Criteria Event Observed.” The total in block D is the number of correct WPNo Criteria Event WP forecasts.

A8.1.2.5.7. If available, record the monthly total of MEFs and WPs that resulted in a mission change (MEFC/WPC) to avoid forecast Criteria.. For example, if 25 missions were modified based on MEFs to avoid a significant snowstorm, a high wind event and a thunderstorm event, ensure that number is recorded as 25 MEFCs. A8.1.2.6.8. Compute WP and MEF metrics according to **Table A8.2** and **Table A8.3**.

Table A8.1. WP/MEF Grid.

		FORECAST Conditions (MEF/WPs)		
		Criteria Event WPs/MEFs	**No Criteria Event WPs/MEFs**	**Totals**
OBSERVED Conditions	**Criteria Event OBSERVED**	A	B (Miss)	Total Criteria Event OBSERVED: A + B
	No Criteria Event OBSERVED	C (False Alarm)	D	Total No Criteria Event OBSERVED: C + D
	Totals	Total Criteria Event WPs/MEF: A + C	Total No Criteria Event WPs/MEFs: B + D	Total WPs/MEFs: A + B + C + D

Table A8.2. WP/MEF Metrics.

Performance Metric	Formula	Description
Accuracy (Optional)	(A+D)/(A+B+C+D) x 100%	Accuracy indicates the percentage of accurate WPs/MEFs compared to all WPs/MEFs issued. **CAUTION**: Do not use this metric alone to judge the overall performance of the WP program due to the naturally occurring high percentage of "No Criteria Event WPs, No Criteria Event Observed" outcomes at many operating locations. Use "Criteria Event Accuracy" and "No Criteria Event Accuracy" metrics to shed light on problem areas.
Criteria Event Accuracy (Mandatory)	(A/(A+C)) x 100%	Criteria Event Accuracy indicates percentage of Criteria Event WP/MEFs that verified correctly. This tells leadership how often a forecast for mission impacting weather verified.
No Criteria Event Accuracy (Optional)	(D/(B+D)) x 100%	No Criteria Event Accuracy indicates percentage of no operational criteria WP/MEF forecasts that were correctly made. This tells leadership how often a forecast for non-mission impacting weather verified.
Mitigation Rate (Optional)	((MEFC +WPC) /(criteria events forecast for MEFs/WPs))*100	Take the monthly total of MEFCs and WPCs (MEFs and WPs that resulted in mission changes) and divide by the monthly total of WP and MEF criteria event forecasts. Multiply by 100 to determine the mitigation rate, or percentage of time operators acted on criteria event forecasts for WPs/MEFs. The higher the

		mitigation rate the more successful the MEF/WP program is. The most successful outcome of a mission impacting forecast is when operators accept the input and change their mission profiles to mitigate the risk. There will be instances where operators cannot change missions and must try to accomplish the sortie or mission despite a forecast. Consider tracking those situations separately.

Table A8.3. WP/MEF Technical Metrics.

Performance Metric	Formula	Description
Criteria Event Bias (Mandatory)	(A+C)/(A+B)	Criteria Event Bias reveals whether mission impacting events were either over or under forecast. Criteria Event WP Bias > 1 means Criteria Event WPs were over forecast. Criteria Event WP Bias < 1 means Criteria Event WPs were under forecast. For example, a Criteria Event Bias of 2 means mission impacting events were forecast 200% more than they occurred, a Criteria Event of 0.5 means mission impacting events were under forecast 50% of the time. It is important to compare Criteria Event Bias to Criteria Event accuracy. An ideal balance would show the capability to predict mission impacting events without a high level of over forecasting.
No Criteria Event Bias (Optional)	(B+D)/(C+D)	"No Criteria Event WP Bias" reveals whether non-mission impacting weather forecasts events were either over or under forecast. "No Criteria Event Bias" > 1 means non-mission impacting weather forecasts were over forecast. "No Criteria Event Bias" < 1 means non-mission impacting weather forecasts were under forecast. For example, a No Criteria Event Bias of 2 means non-mission impacting weather forecasts were forecast 200% more than they occurred, a No Criteria Event of 0.5 means non-mission impacting weather forecasts events were under forecast

		50% of the time. It is important to compare this metric with the No Criteria Event Accuracy.

Figure A8.1. Sample OPVER MEFVER Calculation Workbook Design.

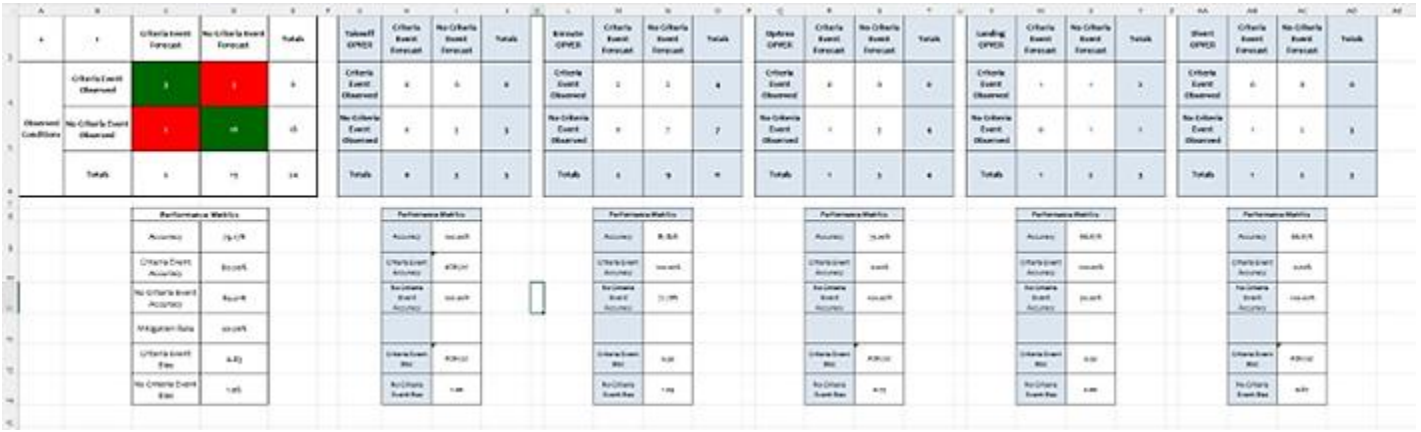


Figure A8.2. Sample OPVER MEFVER Calculation Workbook Design (Sheet 2).