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56TH FIGHTER WING (AETC)**

**LUKE AIR FORCE BASE
INSTRUCTION 15-101**



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Weather

WEATHER SUPPORT

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This instruction implements Air Force Policy Directive (AFPD) 15-1, *Air Force Weather Operations*. It establishes responsibilities and weather support procedures, general information including weather services to include weather observations and forecasts, weather watches, warnings, and advisories (WWAs), space weather, supported services, dissemination of information, and reciprocal support. See Attachment 1 for a Glossary of Reference & Supporting Information. This publication applies to units assigned to the 56th Fighter Wing (56 FW), subordinate units and tenant units assigned to or supported by Luke Air Force Base (AFB). This publication applies to Air Force Reserve Command & Air National Guard units assigned to Luke AFB. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW AFMAN 33-363, *Management of Records*, and disposed of IAW the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force Form (AF Form) 847, *Recommendation for Change of Publication*; route AF Form 847s from the field through the appropriate functional chain of command. This publication may be supplemented at any level, but all direct supplements must be routed to the OPR of this publication for coordination prior to certification and approval. The authorities to waive wing/unit level requirements in this publication are identified with Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See AFI 33-360 for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval, authority, or alternately, to the Publication OPR for non-tiered compliance items. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the AF.

SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. Major changes include: the incorporation of updated F-16 and F-35 weather criteria into daily operations; the removal of weather elements no longer used or referenced, the transition of Air Force Weather Agency's (AFWA's) re-designation as the 557th Weather Wing (557 WW); the re-definition of airfield, mission, and staff positional responsibilities to a functional responsibility; the improvement of localized operations and procedures of Luke AFB; and the simplification of concepts, deletion of repeated topics, and correction of grammatical and contextual errors. The overall format of this document has been corrected to include base concepts within eight chapters while product explanations and references are located within the attachments or referenced to the Luke AFB SharePoint.

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Chapter 1

ROLES & RESPONSIBILITIES

1.1. Overview. The 25th Operational Weather Squadron (25 OWS) and the 56th Operations Support Squadron Weather Flight (56 OSS/OSW or WF) are designated as Luke AFB's weather Characterization Unit (CU) and Exploitation Unit (EU). Both units provide and arrange weather support to the 56 FW and all associated units assigned to and located at Luke AFB. This instruction establishes the requirements and procedures pertaining to the 56 OSS/OSW's weather support and will be reviewed no less than biennially.

1.1.1. Characterization is the process of understanding a weather environment's transition, intensity, and significant features over an area. CUs are the primary source in collecting, analyzing, and predicting large scale weather patterns in an air and space environment. CUs communicate with EUs within their Area of Responsibility (AOR).

1.1.2. Exploitation is the ability to minimize the impact of environmental threats while simultaneously capitalizing on conditions that maximize operational efficiency. EUs are the primary weather source for integrating and tailoring information to the unit they have responsibility over.

1.1.3. EU & CU definition, roles, and responsibilities are outlined and defined within AFI 15-128 *Air Force Weather Roles and Responsibilities*, AFMAN 15-129V1 *Air and Space Weather Operations – Characterization*, and AFMAN 15-129V2 *Air and Space Weather Operations – Exploitation*.

1.2. Concept of Operations. The 25 OWS is the authoritative source for weather analysis while the WF integrates that analysis into Luke AFB's planning process. Both units work in conjunction to provide the best weather service supporting mission needs.

1.2.1. The 25 OWS is located at Davis-Monthan AFB, Arizona and provides regional and operational-level weather products and information to units within the Western Continental United States (WCONUS). The 25 OWS also performs a continuous monitoring of the WCONUS's terrestrial and space weather environment called Meteorological Watch (METWATCH). METWATCH is crucial to Luke AFB receiving resource protection notifications, forecasts, updates, and pertinent data.

1.2.2. The WF is the focal point for all weather support to Luke AFB. The WF alerts decision makers on mission-limiting environmental factors potentially impacting mission execution. This process is called MISSIONWATCH.

1.3. Duty Priorities. The 25 OWS duty priorities are noted within Table 1.1. and 1.2. The WF duty priorities are noted within Table 1.3. The WF and 25 OWS personnel follow these duty priorities to save and preserve life and property when the environment poses imminent danger.

Table 1.1. 25 OWS Mission Execution Support Duty Priorities.

Priority	Duty Priority
1	Perform Emergency War Order Tasks (EWO); Support Combat, Contingency and Military Operations Other Than War (MOOTW); and/or Support Western Air Defense Sector (WADS) Operations
2	Support Organizations During Aircraft/Ground Emergencies
3	Execute OWS Building Evacuation
4	Provide Pilot-to-Metro (PMSV) Service
5	Disseminate Routine (UA) or Urgent (UUA) Pilot Weather Reports (PIREPs)/Air Weather Reports (AIREPs)
6	Provide Scheduled Flight Weather Mission Execution Forecasts (MEFs), including Controlling Mission Execution Forecasts (CMEFs)
7	Provide Unscheduled Flight Weather MEFs
8	Prepare and Disseminate Graphical Aviation Weather Products
9	Provide Other Air and Space Weather Products, Information, and Weather Briefings
10	Accomplish Administrative Tasks and Recurring Training

Table 1.2. 25 OWS TAF/METWATCH Duty Priorities.

Priority	Duty Priority
1	Perform EWO; Support Combat, Contingency and MOOTW; and/or Support WADS Operations
2	Support Organizations During Aircraft/Ground Emergencies
3	Execute OWS Building Evacuation
4	Provide Resource Protection Forecasts Weather Watches, Warnings and Advisories (WWAs)
5	Prepare and Disseminate Military Operating Area Forecasts (MOAFs) and Terminal Aerodrome Forecasts (TAFs)
6	Provide Scheduled CMEFs
7	Provide Air and Space Weather Products, Information, and Weather Briefings
8	Accomplish Other Routine Weather Requirements
9	Accomplish Administrative Tasks and Recurring Training

Table 1.3. 56 OSS/OSW Duty Priorities.

Priority	Duty Priority
1	Perform EWO Tasks
2	Execute Building Evacuation
3	Respond To Aircraft/Ground Emergencies
4	Respond to PMSV Contacts

5	Provide Information to Supervisor of Flying (SOF)
6	Conduct Severe Weather Action Plan (SWAP) Procedures
7	Provide Resource Protection WWAs
8	Collaborate with 25 OWS
9	Augment Meteorological Observing System Observations for Mandatory Elements
10	Disseminate UUA & UA PIREPs
11	Produce Mission Weather Products (MWP) & Briefings
12	Accomplish Weather Training & Administrative Tasks

Chapter 2

WEATHER FLIGHT OPERATIONS

2.1. General. The WF's daily operations provide a set schedule, contact information, and alternate methods of ensuring mission success. WF operations can be broken down into three functions: Airfield Services, Mission Integration, and Staff Integration. These functions can be read in greater detail in their respective chapters (**Chapter 4, 5, & 6**). WF leadership provides and coordinates all weather support services to Luke AFB and its tenant units IAW AFI 15-128.

2.2. Flight Location, Hours of Operations, & Contact Information. The WF is located in the 56 OSS building 453, room 139. The WF is a limited duty station with operating hours dictated by the 56 FW flying schedule.

2.2.1. Based on 56 FW flying schedule, weather technicians are available three hours prior to first take off and 30 minutes after last land or upon airfield closure, whichever is soonest. Weather technicians are not required to be on station after the airfield has closed for the duty day. Weather administrative personnel are generally available Monday-Friday from 0730L-1630L.

2.2.2. During normal duty hours, weather technicians can be reached via: Telephone. DSN: 896-2992, commercial: 623-856-2992 or email 56OSS.OSW@us.af.mil.

2.2.3. During off duty hours, the 25 OWS will provide weather support. The 25 OWS can be reached at: DSN: 228-7648, commercial: 520-228-7648.

2.2.4. Standby weather technicians are contacted during Severe Weather Action Plan (SWAP) procedures through the 56 FW Command Post (CP) at: DSN: 896-5600, commercial: 623-856-5600.

2.2.5. Weather personnel are required to be present when the airfield is open. Therefore, weather personnel will provide transient or commercial support.

2.3. Release of Weather Information. The WF leadership is responsible for releasing weather information. Weather information will not be released to non-DoD agencies or the general public without approval from the 56 FW Public Affairs and Judge Advocate offices.

2.4. Continuity of Operations (COOP) & Alternate Operating Location (AOL). COOPs are periods of time where a weather unit's operations are supported by another unit. COOPs ensure proper operations can continue if hindered or in the event of a disaster or an emergency. Both the WF and 25 OWS provide and practice COOP procedures to ensure continuity. AOLs are secondary locations during COOPs for the WF.

2.4.1. In the event of a communication outage or building evacuation, the WF communicates with the 25 OWS and relocates to the AOL at building 955, the Tower Simulator Facility. The contact information is: DSN 896-3570, commercial (623) 856-3570.

2.4.1.1. Weather technicians resume services by following duty-specific standard operating procedures (SOPs) and an evacuation checklist. If the primary weather sensor is inoperable, manual observations are taken through backup equipment. When backup equipment is used, wind speed, wind direction, and pressure measurements are estimated.

2.4.1.2. If the WF is unable to disseminate resource protection WWAs, the 25 OWS will assist by taking responsibility.

2.4.1.3. For flight safety reasons, the WF will not evacuate during base exercises.

2.4.2. If the 25 OWS initiates a COOP, the 15 OWS or 26 OWS will take over responsibility for the WCONUS. WF operations will continue as normal, unless a COOP is initiated.

2.5. Pilot to Metro Services (PMSV). Immediate weather information is available via PMSV during operating hours on frequency 267.4 MHz. Weather technicians monitor PMSV traffic for all aircraft contacts. For aircraft outside the range of the WF's PMSV system, the 25 OWS can provide support through a phone patch to the 56 FW CP. PMSV calls will be handled IAW 56 OSS/OSW Duty Priorities listed in Table 1.3.

2.6. Pilot Report (PIREP) Support. The Supervisor of Flying (SOF), Radar Approach and Control (RAPCON), and Air Traffic Control (ATC) personnel provide any PIREPS to the WF IAW FAAO 7110.65 *Air Traffic Control* within 5 minutes after receipt when possible. The WF disseminates PIREPs either locally or worldwide when operationally significant weather is reported (e.g. moderate turbulence or icing, wind shear of any type, cloud bases and tops, or thunderstorms of any type). PIREPs are handled IAW 56 OSS/OSW Duty Priorities listed in Table 1.3.

2.7. Supported Unit & Mission Requirements. The WF provides support to the 56 FW and the flying ranges. The location and criteria monitored are briefly mentioned below.

2.7.1. Area of Responsibility (AOR). The WF provides mission-tailored weather support for flying training areas used by assigned or attached units. These areas are outlined in the flying training area map included in **Attachment 10** of this document.

2.7.2. Mission Weather Limitations. The WF coordinates weather limitations to our flying mission with the 56 Operations Group (OG) Standard Evaluation Team annually and post the most recent product on the WF SharePoint page. See **Attachment 11** "56 FW Flying Weather Impacts" for flying weather limitations. These limitations are used to create MWPs.

2.7.3. Customer Weather Impacts. The WF communicates with base agencies on their operational weather limitations and response actions during specific weather events. All customer weather impacts are organized within the WF SharePoint. If data needs to be updated, please contact the WF.

2.8. Post Mission Analysis & Feedback. IAW AFMAN 15-129V2, units that regularly utilize weather support from the WF are encouraged to provide feedback. This information ensures proper quality assurance, provides a metrics database of forecast accuracy, and gauges forecasting strengths and weaknesses. Formal/informal feedback methods include:

2.8.1. Emailing through SharePoint or the 56 OSS/OSW inbox.

2.8.2. PIREPs transmitted via PMSV.

2.8.3. SOF and Operations Supervisor End of Day reports.

2.8.4. Face-to-face feedback after any briefing.

2.8.5. Provide information to WF.

2.8.6. Follow-Up Support. Pilots are encouraged to pass immediate feedback for any post-mission information or reciprocal support in accordance within **Chapter 8**.

Chapter 3

METEOROLOGICAL & COMMUNICATION EQUIPMENT

3.1. General. This chapter provides a brief description on the wide range of equipment to determine the current state of the atmosphere and formulate forecasts. Additionally, this chapter provides information on back-up systems, maintenance, and restoring priorities.

3.2. Meteorological Equipment. Below is a list of equipment used by the WF.

3.2.1. FMQ-19. The FMQ-19 is an integrated system of multiple weather sensors and data automation components that continually measure environmental conditions. This system provides responsive, reliable, accurate, real-time weather information in support of flight operations. The FMQ-19 accurately samples, measures, and reports: temperature, wind speed and direction, visibility, Runway Visual Range (RVR), cloud base height and amount of coverage, pressure, liquid equivalent precipitation accumulation, lightning strikes, and ice accretion during freezing precipitation. The handheld Kestrel provides backup should components of the FMQ-19 become non-operable.

3.2.2. Lightning Detection Systems. Lightning data is received by the FMQ-19 and two other sources:

3.2.2.1. LTS2005. The LTS2005 is a subscription service that is not dependent on the local area network (LAN) availability and is tied into the National Lightning Detection Network (NLDN). This provides the fastest and greatest accuracy for lightning strikes within the flying ranges.

3.2.2.2. Air Force Weather Webpage (AFW-WEBS). This is a java web application that provides weather products for Air Force use only. While there are many products available, AFW-WEBS can also track lightning strikes. The system is also tied into the NLDN, but is dependent on LAN access.

3.2.3. Gibson Ridge Radar Software. The WF utilizes two software programs to interpret NEXRAD radar data; GR2Analyst and GRLevel3. Weather technicians use this software to analyze complex radar signatures, obtain detailed information on storm intensity, movement, outflow boundaries, internal circulation, and wind flow. Weather technicians routinely incorporate the signatures into daily operations and resource protection. Radar products are used extensively during severe weather events monitoring the airfield, ranges, and military operating areas (MOAs). Backup radar imagery is available via numerous military and commercial websites.

3.2.4. Mark IVB Meteorological Data Station. Mark IVB provides real-time meteorological satellite imagery that can be interrogated, enhanced and customized. It provides range, MOA and airfield overlays and greatly increases situational awareness in Arizona's data sparse environment. Mark IVB is dependent on LAN availability. Backup imagery is available via numerous military and commercial websites.

3.3. Communications Equipment.

3.3.1. Joint Environmental Toolkit (JET). JET is an automated dissemination system (ADS) and is the primary method of disseminating observations, forecasts, and WWAs.

3.3.2. The ADS runs on the LAN and consists of a dedicated collection sensor device located at the 56th Communications Squadron (56 CS), along with hardware that allows for a connection to the Luke AFB Airfield Automation System (AFAS) or IDS-5 server located in the RAPCON facility. These servers, integrated through the LAN, provide weather information to both the ATC tower and RAPCON. Additionally, the 25 OWS has the capability to access the JET system in the absence of WF personnel.

3.3.3. The WF utilizes PMSV to communicate with pilots about updates or requests on weather information. See **Paragraph 2.5** for more information on PMSV.

3.3.4. The WF has several multi-line phones in the operations area that have hotlines to the ATC Tower, RAPCON, SOF, 56 FW CP, and Airfield Management Operations, and Maintenance Operations Center (MOC).

3.4. The 56 FW Weather Webpage. Online WF products may be obtained through the 56 FW SharePoint under the 56 FW Weather Web Page link. Products include, but are not limited to Luke AFB Climatology, 5-Day Forecast, and MWPs.

3.5. Equipment Maintenance. The following organizations provide preventive maintenance and repair weather and communications equipment:

Table 3.1. Equipment Servicing Organization.

Equipment	Servicing Organization
FMQ-19	56 OSS/OSM (Airfield Systems Maintenance)
LTS2005	Luke WF
GR2Analyst and GRLevel3	Luke WF
ADS (e.g. JET)	557 WW Fielded Systems
PMSV	56 OSS/OSM (Airfield Systems Maintenance)
Phones/Hotlines	56 CS/SCXPV (Voice Network Systems)

3.6. Building Power. Bldg 453 is equipped with a back-up generator. The WF maintains an uninterrupted power supply capable of powering all critical systems for a 30 minute period.

Chapter 4

AIRFIELD SUPPORT FUNCTION

4.1. General. Airfield Services is responsible for all weather support actions that affect Luke AFB. The WF technician communicates with the SOF, the 25 OWS, and other operational users within the 56 FW. Additionally, technicians use the MEF process to tailor weather products and provide decision-quality environmental information for mission planning and execution for the 56 FW. Weather technicians will infuse elements of weather observing, and WWA roles to function as the "eyes forward" for the 25 OWS.

4.2. Weather Observations. Surface weather observations are recorded and disseminated IAW AFMAN 15-111, *Surface Weather Observations*. Any observation provided by the FMQ-19 is considered the official observation. Weather technicians verify accuracy of observations prior to dissemination when required.

4.2.1. Types of Weather Observations. There are two types of observations to note that are used at Luke AFB. See [Attachment 4](#) on sample observation format, and decoding.

4.2.1.1. Aviation Routine Weather Report (METAR). A METAR is a regularly scheduled observation recorded and disseminated every 55-59 minutes after the hour. METARs are disseminated locally and longline.

4.2.1.2. Aviation Selected Special Weather Report (SPECI). A SPECI is an unscheduled observation recorded and disseminated when an operationally significant weather criteria has been observed as a predominant condition listed within [Attachment 3](#). SPECIs contain all data elements found in a METAR plus additional remarks elaborating the data within the body of the report. All SPECI reports are prepared and transmitted after the last relevant criteria is observed and will be disseminated locally and longline.

4.2.2. Official Observing Point. The official observing point is the touchdown end of the active runway which coincides with the active visibility and ceiling sensors of the FMQ-19. During periods of augmentation and manual observations, the observation point is located on the roof of building 453. In the event of an evacuation, the observation point at the AOL will be from outside of the Tower Simulator Facility, building 955.

4.2.3. Official Observing Point & AOL Limitations. Both the official point of observation on the roof of building 453 and the AOL. See [Paragraph 2.4.1](#) have limitations due to their locations.

4.2.3.1. Visual obstructions interfere with accurate visibility measurements and features moving in from an easterly direction.

4.2.3.2. Thunder may not be heard due to jet noise.

4.2.3.3. High intensity lights located near building 453 and along the runway ramp hinder the technician's ability to determine sky condition and visibility at night.

4.2.3.4. AOL limitations have similar limitations as the official observing point including:

- 4.2.3.4.1. The AOL does not have a clear view of the runway from inside. Due to this, rapidly changing weather conditions may go unnoticed for short periods of time.
- 4.2.3.4.2. Buildings, hangers and trees block portions of the sky as well as ground visibility reference markers, especially east through south.
- 4.2.3.4.3. There are few ground visibility references beyond 1 1/2 miles. This degrades determination of nighttime visibility.
- 4.2.4. FMQ-19 Operations. The WF will operate the FMQ-19 in full automated mode to provide the official METAR and SPECI observations for Luke AFB, except when augmentation is required IAW AFMAN 15-111 and this publication.
- 4.2.4.1. Automated Observation. An automated observation is any observation having been evaluated, recorded, and transmitted by an observing system without human intervention. Sky condition data is averaged and disseminated during the 30-minute period ending at the actual time of the observation. All other elements are evaluated within 10 minutes or less of the actual time of the observation.
- 4.2.4.2. Augmented Observations. Augmentation is the process of having a weather technician manually edit an observation generated by the FMQ-19. There are two augmentation processes: supplementation and back up.
- 4.2.4.2.1. Supplementation is the method of manually adding meteorological information to an automated observation that is beyond the capability of the FMQ-19 to detect or report (e.g. tornados or hail). WF personnel only supplement the automated weather observation during airfield closure hours when SWAP has been implemented to provide the eyes forward function.
- 4.2.4.2.2. Back-up is the method of manually providing meteorological data and dissemination to the FMQ-19 observation when the primary automated method is not operational or unavailable due to sensor or communication failure. When required, the WF encodes and disseminates METAR and SPECI observations IAW AFMAN 15-111, [Paragraph 3.4](#), [Attachment 2](#), [Attachment 3](#), and local backup procedures. There is no requirement to back-up the sensor when the airfield is closed. However, the technician will back-up the sensor when recalled to perform SWAP operations as needed.
- 4.2.5. FMQ-19 Limitations. Below are a few scenarios in which may cause the WF to augment the sensor data.
- 4.2.5.1. The FMQ-19 is unable to report dust or blowing dust as a visibility restrictor. When very fine dust particles are detected, the closest match in the sensors algorithm is light drizzle. Due to this occurrence, the observation will only be augmented when it becomes operationally significant.
- 4.2.5.2. The WF will verify FMQ-19 AUTO output when requested by ATC or SOF to ensure representative conditions are reported in the official airfield observation.

4.3. Terminal Aerodrome Forecasts (TAFs). TAFs are forecasts for a specific location. The Luke AFB TAFs are produced by the 25 OWS, valid for 30 hours, and issued at 0900Z, 1700Z, and 0100Z. TAF references are followed IAW AFI 15-128, AFMAN 15-129 V1 & V2. The

Luke AFB Mission Execution Forecast (MEF) is considered the official planning forecast for the 56 FW. See [Paragraph 5.2](#) and [Attachment 7](#) for TAF explanations.

4.4. Specification & Amendment Criteria. The Luke AFB TAF will be specified and amended IAW categories listed in AFMAN 15-129V1, local airfield minimums listed in flight publication manuals, and within the WF Installation Data Page (IDP). Any changes to our specification criteria will be coordinated with the 25 OWS. TAF specification and amendment criteria are listed within [Attachment 6](#) of this document.

4.5. Basic Weather Watch (BWW). A BWW is conducted when the airfield is open and during periods when any of the mandatory augmentation of the FMQ-19 is required. The BWW establishes the minimum requirements needed to ensure the proper level of situational awareness. During a BWW, weather technicians record observations, at intervals not to exceed 20 minutes from the previous manual observation check. If any of the conditions listed in [Attachment 3](#) are observed to be occurring or are forecast to occur within one hour, this generates the need to conduct a BWW.

4.6. Cooperative Weather Watch (CWW). AFMAN 15-111 requires the WF to establish a CWW program with base agencies. This program includes ATC, SOF, the Flying Squadrons, and 56th Security Forces Squadron (56 SFS) and is in place to ensure accurate weather conditions are reported.

4.6.1. The weather technician will reevaluate weather conditions whenever a reliable source (e.g., ATC, pilots or law enforcement) reports weather conditions different from the last disseminated observation. The change in weather conditions may be included in the next METAR, become the basis for a SPECI, be used to issue an observed weather advisory or warning, or be used to amend the TAF through coordination with 25 OWS forecasters and the Luke MEF.

4.6.2. Reliable sources will notify the WF when any of the following are seen or occur within five miles of Luke airfield and are not being reported:

4.6.2.1. Tornado or funnel cloud.

4.6.2.2. Hail begins or ends.

4.6.2.3. Thunder or lightning.

4.6.3. Weather certified ATC personnel will also notify the WF when any of the following occur:

4.6.3.1. Visibility decreases to less than, or increases to equal or exceed four miles. If Tower Visibility is less than 4 miles, report changes in tower prevailing visibility and sector visibility to the WF.

4.6.3.2. Precipitation begins or ends.

4.6.3.3. PIREPS given to ATC.

4.6.3.4. Active runway changes.

4.6.4. Flying Squadron personnel will relay PIREPs to the WF directly or through telephone, PMSV, ATC, or RAPCON.

4.6.5. The weather technician will provide training and certify ATC personnel as limited weather observers. ATC personnel requiring training will contact the WF to schedule an appointment. To satisfy Limited Observation Training requirements, personnel are required to pass a written exam and receive an orientation of the weather facilities.

4.7. METWATCH. METWATCH provides an organized approach for weather personnel to maintain situational awareness of current and future meteorological situations within a designated area. This process involves notifying supported units and updating any products when pre-established weather conditions or unforeseen changes in weather occur or are expected to occur.

4.8. EYES FORWARD Process. The WF's role is also known as the "Eyes Forward" process. The WF provides the 25 OWS the hands on information that satellite imagery and weather data cannot provide through a computer. This process is essential to weather observing and providing critical data to the 25 OWS for resource protection.

Chapter 5

MISSION INTEGRATION FUNCTION

5.1. General. The mission integration function interfaces with the SOF, the 25 OWS, and other operational users in the 56 FW. Additionally, they will use the MEF process to tailor weather products and provide decision-quality environmental information for mission planning and execution for the 56 FW.

5.2. Mission Weather Products (MWP). MWPs fuse theater scale products with local mission requirements enabling the direct inject of weather impacts into timely, accurate, and relevant environmental information for planning and execution. MWPs include the MEF, mission briefings, and the DD Form 175-1 (Flight Weather Briefs). See [Attachment 7](#) for sample products, formats, and decoding information. These products must be horizontally consistent with products issued by any OWS and the 557 WW.

5.2.1. The primary MWP is the MEF. The WF creates MEFs for all MOAs, ranges, air refueling tracks and cross country trips utilized by the 56 FW by following the MEF process and utilizing flying schedules, mission profile, and pilot limitations. See [Attachment 7](#) for an example. MEFs are available for all agencies via 56 FW Weather Web Page and are designed to provide critical go/no-go weather information. There are two different types of MEFs produced by the WF: Luke MEF and Range MEF.

5.2.2. The Luke MEF is a tailored product of the 25 OWS Luke AFB TAF. The Luke MEF is valid from when the airfield is open to its closure, issued 3 hours prior to first takeoff, updated at 1800Z and at 0200Z (as needed on Fridays), and updated more frequently to tailor toward mission requirements. The Luke MEF will not be issued when the airfield is closed. The Luke MEF is available for all agencies via 56 FW Intranet Web Page. [Attachment 7](#) has a list of items within the Luke MEF.

5.2.3. Range, Air Refueling Track, and Military Operating Area Forecasts are considered to be part of a Range MEF. See [Attachment 7](#) for sample Range MEF products. Range MEFs are issued 3 hrs prior to first takeoff, updated at 1900Z and at 0100Z (as needed on Fridays). Range MEFs will not be issued when the airfield is closed.

5.2.4. Alternate Airfield Forecasts. Current observations and forecasts are collected for planning purposes. Information from KPHX, KDMA, KTUS, and KNYL are collected, consolidated and available under the DIVERT WX tab within the Weather Web Page. KGXF does not produce a forecast; however, the WF produces a Range MEF as it is the primary divert base.

5.2.5. Flight Weather Briefings (FWBs). Weather technicians will provide DD Form 175-1 to aircrews as requested. Briefings are given in person at the WF or communicated over the phone. Aircrews of non-scheduled flights and transient aircrews are asked to request FWBs at least 2 hours prior to brief time.

5.3. MWP Amendments. When weather conditions cross known mission limiting criteria, the WF amends the specific MEF that is not horizontally consistent. The WF will amend the MEF as required, then contact the SOF and Flying Squadrons. In some scenarios with significant,

rapidly changing weather, be advised that higher priorities will take precedence over the amendment.

5.4. MWP Verification. The WF and 25 OWS conduct post-mission analysis of their forecasts to verify operational effectiveness. This aids in identifying areas of needed improvement and the base-line for the metrics program. See **Paragraph 6.6** for meteorological verification.

5.5. MISSIONWATCH. MISSIONWATCH is the process by which the WF monitors mission limiting weather for all local and training missions. The WF employs sound Risk Management to assign risks, allocate resources, and determine which missions are at a greater risk.

5.6. Top-3 Briefings. Top 3 briefings provide situational awareness on weather impacts to mission profiles. These briefing are provided prior to each fighter squadron's first take off. The primary method of briefing is by phone. If manning is available, weather briefs will be given in person. In the event of an unforecasted change to in weather conditions impacting flying operations, the WF will re-brief Top-3 members as soon as possible. See **Paragraph 6.8.** for other briefings provided by the WF.

5.7. Space Weather. The WF only produces a general notification of space weather within MWPs. More information can be provided upon request. See **Attachment 7.**

5.8. Electro Optic Target Decision Aide Forecasts. The WF provides information concerning the expected performance levels of electro-optical precision-guided munitions and target acquisition systems based on target characteristics, environmental conditions, and possible munitions delivery tactics.

5.8.1. Target Acquisition Weapons Software (TAWS). TAWS data includes light data (Sunrise, Sunset, Moonrise, Moonset, Illumination, and Millilux values) target acquisition information, and night vision goggle data. TAWS data is provided to all supported units upon request.

5.9. Tropical Weather. While there is no tropical weather support dictated by Luke AFB, the weather flight will comply communicate an actions needed with the Luke AFB Installation Emergency Management Plan (IEMP) 10-2.

Chapter 6

STAFF INTEGRATION FUNCTION

6.1. General. Staff services are typically accomplished by WF Leadership and delegated when appropriate. Staff responsibilities include meteorological functions such as staff briefings and coordination of documents and services.

6.2. Weather Flight Leadership. The WF leadership includes the Flight Commander, Flight Chief, and Non-Commissioned Officers in Charge over the providing airfield and mission functions. Most staff services will be conducted by these members, but can be delegated to flight members for professional growth.

6.3. Climatology Services. Units requiring climate information must contact WF at least one duty day in advance for mission specific climatological requests. The WF leverages the support of the 14th Weather Squadron Strategic Climatic Information Service for climate statistics.

6.4. Installation Data Pages (IDP). The IDP is an agreement between the 25 OWS and the WF as to what weather support will be provided. WF leadership will review the IDP within 90 days of initial assignment and annually to ensure consistency with supported unit requirements. If updates are needed to the Luke AFB IDP, WF leadership will inform the 25 OWS.

6.5. Flight Information Publications (FLIPs). FLIPs are references to enroute and flight data for military operations pertaining to a specific location. The WF is responsible for ensuring all Luke AFB weather information in the FLIP is accurate. All weather related updates fall into one of three categories: revisions, changes, or corrections and are requested through the Airfield Management FLIP manager.

6.6. Weather METRICS. The MEF Verification (MEFVER/METRIC) program provides flight personnel with feedback as to the effectiveness of weather information, as well as individual and overall unit accuracy of weather products provided to the customers. The METRICS program is a tool to aid and improve overall operational processes by providing flight management a tool to gauge the flight forecast accuracy within the most used operational flying area and is tailored to customer defined thresholds and points of critical mission failure.

6.7. Chemical, Biological, Radiological, Nuclear, and High-yield Explosive (CBRNE) Coordination. The WF will provide weather subject matter expertise (SME) to CBRNE control center operations IAW AFI 15-128, Luke IEMP 10-2. The WF representative will document weather support in existing parent/host unit plans and directives. The WF no longer produces toxic corridor plotting itself but may be called upon by the 56th Civil Engineering Squadron (56 CES) to produce weather data for reference.

6.8. Staff Weather Briefs. The WF will provide any briefing listed below as requested.

6.8.1. Instrument Refresher Course (IRC). IRCS are annual courses provided to pilots by WF personnel for recertification. The WF will brief weather slides during IRC briefings as required by course scheduling. The briefing consists of an overview of aviation weather hazards and capabilities, WF and OWS responsibilities, resource protection and seasonal weather impacts.

6.8.2. SOF Briefings. Upon request, weather technicians present upcoming seasonal weather challenges at quarterly SOF briefings and any weather support issues. New SOF members can also schedule a time to receive a weather indoctrination brief from the weather flight.

6.8.3. Climatology. Climatology information will be provided as requested.

6.8.4. Large Force Engagement (LFE) Briefings. An LFE is a multiple platform exercise where pilots simulate engaging with unknown enemy air and ground forces. Weather technicians support missions by providing face to face briefs daily, as requested, along with any vital weather information to the pilots.

6.8.5. Deployment Briefings. The WF supports two types of deployments:

6.8.5.1. Flying Squadron Deployments. Prior to Large Force Engagements (LFEs) or Dissimilar Air Combat Training (DACT) deployments, the WF provides weather outlooks to the squadron project officer upon request. Weather personnel will be available for planning briefs prior to take off. In the event of a CORONET movement, the WF will coordinate with the ACC project officer and provide support. In addition, should a flying squadron deploy to a location without indigenous weather support, the WF has the capability to deploy a forecaster with the squadron.

6.8.5.2. Pre-Deployment Planning Briefings. These briefings consist of seasonal climatology information to requesting agencies for inclusion into reporting instructions given to deploying members. The WF will provide these briefings upon request.

6.8.6. Wing Standup Briefings. Wing Standup briefings are provided during staff meetings, or as required. The briefing consists of current airfield forecast, WWAs, and a five day weather outlook.

6.9. Weather Training. The WF has the responsibility of training weather 1W031 Airmen who transition straight from technical training. New Airmen continuing is a six month training process at Luke AFB which includes classroom and on-the-job-training.

6.10. Wing Inspection Team (WIT). WIT members are designated throughout the wing to ensure Commander's Inspection Program compliance is obtained and maintained. The WF is required to designate a primary and alternate representative to support inspections, evaluations, and provide staff support during local exercises. Required support will be coordinated by 56 FW/IGI.

Chapter 7

RESOURCE PROTECTION

7.1. General. This section details actions completed by the WF and 25 OWS to provide resource protection to Luke AFB. Specific rules governing format, issuing, amending, extending and cancelling WWAs can be found in AFMAN 15-129V1.

7.2. Delineation of Duties. The 25 OWS is responsible for issuing all forecast watches and warnings for Luke AFB. The WF provides “Eyes Forward” for the 25 OWS validating forecasts and is responsible for issuing all observed criteria. In the event of imminent threat to life and property requiring an urgent dissemination, the WF can issue the forecasted warnings, but must ensure communication with the 25 OWS. When no weather technician is on staff, the 25 OWS, issues all WWAs for Luke AFB.

7.3. Unit Requirements. Units are responsible for coordinating additional weather support pertinent to their mission with the WF as documented through the Customer Actions Sheet & IDP.

7.4. Watches, Warnings, & Advisories (WWAs). WWAs are crucial to the protection of resources and personnel from weather. The sections below describe & define each WWA while [Attachment 2](#) has a list of the current WWAs for Luke AFB.

7.4.1. WWA Format & Specifics. Each WWA contains a five digit ID number, the period of time the WWA is valid, and any specific conditions expected. The first two digits of the ID number represent the month and the last three represent the order of the watch, warning, or advisory (i.e. The twelfth warning issued in March would be represented as Warning #03-012). See [Attachment 2 & 9](#) for more information.

7.4.1.1. WWAs can be upgraded, downgraded, or extended:

7.4.1.1.1. Upgrades are needed when the weather is more severe than previously anticipated.

7.4.1.1.2. Downgrades are needed when the weather is less severe than previously anticipated.

7.4.1.1.3. Extensions are needed when the valid period of an issued WWA needs to be longer.

7.4.1.2. WWAs that are upgraded, downgraded, or extended will not be given a different ID number. An explanation will be given explaining why there was a change to the original WWA.

7.4.1.3. When weather phenomena meeting WWA criteria are no longer expected during the valid time, they are canceled with an explanation.

7.4.2. Weather Watches. A watch notifies Luke AFB of a potential for environmental conditions of such intensity, as to pose a hazard to life or property and are used to make force protection and Risk Management decisions.

7.4.3. Weather Warnings. A warning notifies operational commanders when an established weather condition of such intensity as to pose a hazard to life or property is observed or forecasted to occur.

7.4.3.1. Forecast Weather Warnings. Forecast warnings are issued for weather events observed or forecasted to occur within 5 NM of the Luke AFB runway complex.

7.4.3.2. Observed Weather Warnings for Luke AFB Flying Ranges. Observed warnings occurring inside the Flying Range or MOA are issued through the Range MEFs during 56 FW flying hours.

7.4.4. Weather Advisories. An advisory notifies Luke AFB when an established environmental condition affecting operations is occurring or is expected to occur.

7.4.4.1. Forecast Weather Advisories for Luke AFB. Forecast advisories are issued when advance notice is needed to take protective actions from specific weather conditions.

7.4.4.2. Observed Weather Advisories for Luke AFB. Observed advisories are issued when a particular weather condition has occurred. Observed weather advisories are issued only during flying hours unless otherwise noted.

7.4.4.3. Observed Weather Advisories for Luke AFB Flying Ranges. Observed weather advisories occurring inside the Flying Range and MOA are issued through the Range MEFs during 56 FW flying hours.

7.5. WWA Dissemination & Notification Chain. The 25 OWS and WF will use the Integrated Weather Warning Communications System, a component of JET, as the primary dissemination system for all WWAs. The Luke WF will also contact base agencies listed in the notification chains. See [Attachment 9](#) for a diagram.

7.6. Severe Weather Action Plan (SWAP). The WF submits weather data when notified by the 56 FW CP for Operational Report 3 (OPREP-3) reporting. The WF keeps procedures on hand to comply with this directive.

7.7. Mishap Procedures. The WF ensures the collection of applicable weather data, products, and services used in the development of any mishap investigation. The WF coordinates with the 25 OWS or the providing OWS to initiate a data save of the weather information for the specific time period requested. Once the required information is gathered, the information is delivered to the 56 FW Flight Safety Office for incorporation into Safety Investigation Boards.

Chapter 8

RECIPROCAL SUPPORT

8.1. General. This chapter is a synopsis of how the WF supports the 56 FW non-flying units. The WF communicates with other base agencies to document operational weather limitations and actions taken from those limitations. Base agencies can view the latest product by navigating to the 56 FW Weather SharePoint page. Please contact WF leadership if there are any questions.

8.2. 56th Fighter Wing & Staff Agencies. The 56 FW is an integral source of how the WF supports weather communication, safety, and procedures. IAW AFI 10-2501, *Air Force Emergency Management Program Planning and Operations*, is derived into local guidance on installation severe weather preparedness, capabilities, requirements and procedures no less than annually.

8.2.1. 56 FW Command Post (CP). CP accomplishes the tasks below.

8.2.1.1. Monitors weather Automated Data Systems (ADS) for updates to weather conditions.

8.2.1.2. Disseminates WWA notifications according to Quick Reaction Checklists and notifies the WF of updates as needed for the notification chain outlined in **Paragraph A9.4**.

8.2.1.3. Requests Operational Reports involving any weather events impacting operations at Luke AFB (e.g. aircraft mishaps and natural disasters).

8.2.1.4. Notifies standby weather technicians on issued WWAs during WF non-duty hours. Standby weather technicians report to the weather station IAW SWAP Procedures in **Chapter 7.6**.

8.2.1.5. Provides orientation briefs upon request.

8.2.1.6. Notifies the WF when non-weather agencies report severe weather.

8.2.1.7. Notifies WF leadership or standby forecaster when 56 FW assets require support when previously not identified within the daily schedule.

8.2.2. 56 FW Public Affairs (PA). PA coordinates community group tours of the WF and assists with photography requests in support of weather operations.

8.2.3. 56 FW Plans & Programs (XP). XP coordinates Wing Contingency Plans through WF leadership prior to publishing.

8.2.4. 56 FW Safety (SE). SE accomplishes the tasks below.

8.2.4.1. Notifies WF of any local aircraft mishap/incidents where weather or weather service may have been a factor.

8.2.4.2. Notifies the WF of any damage on Luke AFB caused by weather.

8.2.4.3. Coordinates messages containing references to weather.

8.3. 56th Operations Group.

8.3.1. 56 OG Standardization & Evaluation (56 OG/OGV). 56 OG/OGV accomplishes the tasks below.

8.3.1.1. Validates local airfield and range mission weather limitations annually.

8.3.1.2. Invites the WF to attend quarterly SOF briefings.

8.3.1.3. Ensures SOF duties include the procedures below:

8.3.1.3.1. Updates the weather technician on primary divert locations.

8.3.1.3.2. Relays any PIREPs received within the local flying area within 5 minutes of receipt when possible.

8.3.1.3.3. Receives weather updates prior to assuming SOF duties for the day.

8.3.2. All Fighter Squadrons. All fighter squadrons accomplish the tasks below.

8.3.2.1. Encourage all pilots provide PIREPs in a timely manner.

8.3.2.2. Ensure pilots provide at least two hours notification prior to briefing time for unscheduled MEF or DD Form 175-1 requests.

8.3.2.3. Coordinate mass weather brief support (e.g., Deployment and LFE). Provides at least two business days advance notice for briefings and promptly notify the WF of any changes in brief times and locations.

8.3.2.4. Provide feedback on MWP to WF leadership.

8.3.3. 56th Training Squadron (56 TRS). The TRS accomplishes the tasks below.

8.3.3.1. Provides IRC briefing location and time two days in advance and incorporates the supplied weather briefing slides into the presentation.

8.3.3.2. Identifies and incorporates required weather information into standard F-16 and F-35 training syllabi.

8.3.4. 56th Operations Support Squadron (56 OSS).

8.3.4.1. 56 OSS Airfield Management (56 OSS/OSAA). OSAA accomplishes the tasks below.

8.3.4.1.1. Notifies WF of all aircraft emergencies, incidents, or accidents immediately.

8.3.4.1.2. Provides the most current FLIP and updates the appropriate base weather information upon request.

8.3.4.1.3. Notifies WF of any change in airfield operating hours.

8.3.4.1.4. Notifies WF of any ADS outages.

8.3.4.2. RAPCON (56 OSS/OSAR). OSAR accomplishes the tasks below.

8.3.4.2.1. Relays PIREPs within 5 minutes of receipt.

8.3.4.2.2. Provides orientation briefs upon request.

8.3.4.2.3. Notifies WF any ADS outages.

8.3.4.3. Air Traffic Control Tower (56 OSS/OSAT). OSAT accomplishes the tasks below.

8.3.4.3.1. Notifies of any ADS outages.

8.3.4.3.2. Conducts daily operational checks of the PMSV radio.

8.3.4.3.3. Notifies WF of all runway changes, runway light settings changes, or changes for RVR purposes.

8.3.4.3.4. Provides orientation brief upon request.

8.3.4.3.5. Requests local weather training coordination.

8.3.4.3.6. Provides input for the CWW as outlined in **Chapter 4.6**.

8.3.4.3.7. Provides initial ATC indoctrination.

8.3.4.3.8. Monitors PMSV radio transmission when the WF is unable due to an outage or evacuation.

8.3.4.3.9. Relays PIREPs within 5 minutes of receipt.

8.3.4.4. Airfield Systems (56 OSS/OSM). OSM accomplishes the tasks below.

8.3.4.4.1. Provides routine and emergency maintenance on PMSV and FMQ-19 equipment.

8.3.4.4.2. Responds to equipment outage notifications.

8.3.4.4.3. Coordinates any scheduled or unscheduled equipment maintenance.

8.3.4.5. Graduate Training Information Management Systems (GTIMS) Scheduling. Schedulers accomplish the following tasks.

8.3.4.5.1. Provide GTIMS flight scheduling software and access accounts.

8.4. 56th Mission Support Group.

8.4.1. 56th Communications Squadron (56 CS). 56 CS fulfills roles and responsibilities pertaining to server maintenance IAW 24-AF-AF/A30W-JET PMO memorandum of agreement as modified by A3W GRAM 15-07 on 1 Dec 2014.

8.4.2. 56th Security Forces Squadron (56 SFS). 56 SFS notifies the WF with observations of hail, tornadoes, or other significant weather encountered during routine patrols.

8.4.3. 56th Civil Engineering Squadron (56 CES). 56 CES provides emergency backup power to the weather station equipment and notifies the WF of planned switches of commercial power and backup power affecting operations.

8.5. 56th Maintenance Group (56 MXG).

8.5.1. 56th Maintenance Operations Center (MOC).

8.5.1.1. Notifies base maintenance agencies of WWAs.

8.5.1.2. Provides orientation briefs upon request.

8.5.1.3. Coordinates Emergency Actions checklist updates.

8.6. All Other Weather Support Recipients.

8.6.1. Notifies WF of problems with JET equipment.

8.6.2. Notifies WF through proper chain of command when new weather support requirements are identified.

8.6.3. Coordinates changes and additions to weather support requirements as soon as they are foreseen.

SCOTT L. PLEUS
Brigadier General, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

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AFI 10-2501, *Air Force Emergency Management Program Planning and Operations*, 24 January 2007 w/IC1, 29 April 2013 and Corrective action, 10 May 2013

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LUKEAFBI 21-110, *Radio Communications, Radar, Navigational Aids, and Back-Up Systems Reporting, Coordination, and Operations Procedures*, 9 March 2009

56 FW CP *Quick Reaction Checklists*, AETC Form 706, 1 February 2010

56 FW IEMP 10-2, *Installation Emergency Management Plan*, 12 September 2013

56 FW OPLAN 91-1, *Aircraft Mishap Response Plan*, 29 May 2014

Adopted Form(s)

AF Form 847, *Recommendation for Change of Publication*

Abbreviations and Acronyms

ADS—Automated Dissemination System

AFAS—Airfield Automation System

AFB—Air Force Base

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFW—Air Force Weather

AFW-WEBS—Air Force Weather Webpage
AFPD—Air Force Policy Directive
AGL—Above Ground Level
AIREP—Air Weather Report
AMOS—Automated Meteorological Observation System
AOL—Alternate Operating Location
AOR—Area of Responsibility
ATC—Air Traffic Control
BWW—Basic Weather Watch
CES—Civil Engineering Squadron
CIG—Ceiling
CMEF—Controlling Mission Execution Forecast
CONUS—Continental United States
COOP—Continuity of Operations
CP—Command Post
CS—Communications Squadron
CU—Characterization Unit
CWW—Cooperative Weather Watch
DACT—Dissimilar Aircraft Training
EOTDA—Electro-Optic Target Decision Aid Data
EU—Exploitation Unit
FLIP—Flight Information Publication
FS—Fighter Squadron
FW—Fighter Wing
FWB—Flight Weather Briefs
HAZMAT—Hazardous Material
HF—High Frequency
IAW—In Accordance With
IDP—Individual Data Plan
IRC—Instrument Refresher Course
JET—Joint Environmental Toolkit
KTS—Knots

LAN—Local Area Network
LFE—Large Force Engagement
LOCAL—Aviation Selected Local Weather Report
LTG—Lightning
LUKEAFBI—Luke Air Force Base Instruction
NDLN—National Detection Lightning Network
MEF—Mission Execution Forecast
METAR—Aviation Routine Meteorological Report
METSAT—Meteorological Satellite
METWATCH—Meteorological Watch
MOA—Military Operating Area
MOAF—Military Operating Forecast
MOC—Maintenance Operations Center
MOOTW—Military Operations Other Than War
MWP—Mission Weather Product
NEXRAD—Next Generation Radar
NDLN—National Lightning Detection Network
NM—Nautical Mile(s)
OG—Operations Group
OPR—Office of Primary Responsibility
OPREP—Operational Report
OSS—Operations Support Squadron
OWS—Operational Weather Squadron
PA—Public Affairs
PIREP—Pilot Report
PK WND—Peak Wind
PMSV—Pilot to Metro Service
POC—Point of Contact
PRESFR—Pressure Falling Rapidly
PRESRR—Pressure Rapidly Rising
PWC—Pilot Weather Category
QA—Qualitative Assessment

RAPCON—Radar Approach Control
RWY—Runway
RVR—Runway Visual Range
SM—Statue Mile(s)
SOF—Supervisor of Flying
SOP—Standard Operating Procedure
SPECI—Aviation Selected Special Weather Report
SWAP—Severe Weather Action Plan
TAF—Terminal Aerodrome Forecast
TDA—Tactical Decision Aid
TWR—Tower
UFN—Until Further Notice
UHF—Ultra High Frequency
UA—Routine PIREP
UUA—Urgent PIREP
VHF—Very High Frequency
VIS—Visibility
WADS—Western Air Defense Sector
WIT—Wing inspection Team
WF—Weather Flight
WW—Weather Wing
WWA—Watch, Warning, & Advisory

Terms

557th Weather Wing (557 WW)—A strategic weather center at Offutt AFB NE, providing atmospheric data and analysis/forecast products required by the regional OWSs and the WFs worldwide. The 557 WW provides the centralized repository for global observations and forecasts that are data based at 557 WW and, in turn, disseminated to DOD weather data users worldwide. In addition to global observations and forecasts collected from worldwide sources, the 557 WW collects meteorological satellite data from multiple sources. Based on global analysis of available data, 557 WW creates global analysis and forecast products to meet the forecast requirements of its supported users.

Alternate Operating Location (AOL)—A secondary location in which the WF will move to in the event that the main operating location, Building 453 is evacuated.

Basic Weather Watch (BWW)—A method of observing, recording, and disseminating significant changes in weather conditions to essential customers.

Cooperative Weather Watch (CWW)—A method of collective observing shared by the weather observer, tower personnel, and SOF, to enhance the mission of BWW. The weather observer collates information from other sources and disseminates as needed.

Desired Lead Time—The total amount of time required to disseminate a forecast WWA from the 25 OWS through the local dissemination tree to all affected end-users plus the amount of advance notice a supported organization requires to complete mandatory protective actions before the onset of a particular weather phenomenon.

Flight Information Publication (FLIP)—Booklet containing aircraft approach, landing, and takeoff guidance at various airfields, to include Luke AFB. Also lists weather restrictions on airfields.

Installation Data Page (IDP)—A document defining the specific environmental support requirements, technical data, reference material, and contact information for each organization receiving TAF and WWA support from the 25 OWS.

Instrument Refresher Course (IRC)—Continuation training for aircrews. The WF provides instructors and material for the weather segment of the course upon request.

Issue Time—The time when an agency is notified of a WWA. When more than one agency is notified, the issue time is the time the last agency is notified. Follow-up notifications are not considered when determining issue time.

METAR—A regular observation, taken and disseminated locally and longline.

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

Mission Execution Forecast (MEF)—A mission execution forecast is how flight weather information is passed to the flying customer. It can take the form of a verbal briefing, a 175-1 briefing, a weather flimsy, or other forms.

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

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

Operational Weather Squadron (OWS)—A regional forecast and weather watch center. Commonly referred to as a “hub,” Luke AFB’s servicing OWS is the 25 OWS located at Davis-Monthan AFB, Arizona.

Severe Thunderstorm—A thunderstorm presenting a threat to lives or property that requires agencies to enhance resource protection measures. Generally, thunderstorms producing hail greater than or equal to 3/4 inch diameter and/or surface wind greater than or equal to 50 knots.

Terminal Aerodrome Forecast (TAF)—A coded weather bulletin providing forecast information for an aerodrome complex to facilitate flight planning and command and control. TAFs are formatted IAW AFMAN 15-124, *Meteorological Codes*, and amended IAW AFMAN 15-129V1, *Air and Space Weather Operations-Characterization*.

Attachment 2

CURRENT LUKE AFB WWAS

Table A2.1. Forecast/Observed Weather Advisories for Luke AFB.

Weather Advisories			
Advisory Type	Forecast/Observed	Desired Lead Time	Issued by
Surface Winds	Forecasted Surface Winds ≥ 25 but < 35 knots	30 minutes	OWS
Thunderstorms*	Observed Lightning or Thunderstorms are occurring within 35NM of the airfield	Observed	WF
Thunderstorms*	Observed Lightning or Thunderstorms are occurring within 25NM of the airfield	Observed	WF
Thunderstorms*	Observed Lightning or Thunderstorms are occurring within 10NM of the airfield	Observed	WF
Ice FOD F-16*	Observed Ice FOD Conditions occurring (Temp less than or equal to 7C with dewpoint spread less than 5C)	Observed	WF
Ice FOD F-35*	Observed F-35 Ice FOD Conditions Temperature < 04 C. (40F) with precip or temp < 03 C with a dew point spread less than or equal to 03C)	Observed	WF
Crosswinds**	Observed Crosswinds ≥ 15 but < 20 knots including gusts at Luke AFB	Observed	WF
Crosswinds**	Observed Crosswinds ≥ 20 but < 25 knots including gusts at Luke AFB	Observed	WF
Crosswinds**	Observed Crosswinds ≥ 25 knots. Including gusts at Luke AFB	Observed	WF
Turbulence**	Observed CAT II Severe or Greater Turbulence occurring from the surface to 10kft AGL	Observed	WF
Icing**	Observed Moderate or Greater icing occurring from the surface to 10kft AGL	Observed	WF
Wind Shear**	Observed Low Level Wind Shear occurring	Observed	WF
Thermal Stress**	Observed Index of Thermal Stress Caution	Observed	WF
Thermal Stress**	Observed Index of Thermal Stress Danger	Observed	WF
Chill Stress**	Observed Chill Index Caution Less than 15F	Observed	WF
Chill Stress**	Observed Chill Index No Fly Zone less than -25F	Observed	WF
* Issued by the 25 OWS when Luke WF is not on duty			
** Issued during Wing flying hours only			

Table A2.2. Forecast Weather Watches for Luke AFB.

Weather Watches			
Watch Type	Forecast	Desired Lead Time	Issued by
Freezing Precipitation	Potential for Freezing Precipitation exists	As Potential Warrants	OWS
Damaging Hail	Potential for Damaging Hail \geq 3/4 inches	As Potential Warrants	OWS
Large Hail	Potential for Large Hail \geq 1/2 but $<$ 3/4 inches	As Potential Warrants	OWS
Heavy Rain	Potential for Heavy Rain \geq 2 inches within 12 hours; Flooding is possible.	As Potential Warrants	OWS
Lightning	Potential for Lightning or Thunderstorms within 25NM of the airfield	30 minutes	OWS
Lightning	Potential for Lightning within 5NM of the airfield	30 minutes	OWS
Damaging Winds	Potential for Damaging Winds \geq 50 knots	As Potential Warrants	OWS
Tornado	Potential for Tornado or Funnel Cloud exists	As Potential Warrants	OWS

Table A2.3. Forecast/Observed Weather Warnings for Luke AFB.

Weather Warnings			
Warning Type	Forecast/Observed	Desired Lead Time	Issued by
Freezing Precipitation**	Freezing Precipitation expected	90 minutes	OWS
Damaging Hail**	Forecasted Damaging Hail \geq 3/4 inches	120 minutes	OWS
Large Hail	Forecasted Large Hail \geq 1/2 but $<$ 3/4 inches	90 minutes	OWS
Heavy Rain	Forecasted Heavy Rain \geq 2 inches within 12 hours; Flooding is possible.	90 minutes	OWS
Damaging Winds**	Forecasted Damaging Winds \geq 50 knots	120 minutes	OWS
High Winds	High Winds \geq 35 but $<$ 50KTS	30 minutes	OWS
Lightning*	Observed Lightning within 5NM of the airfield	Observed	WF
Tornado**	Tornado or Funnel Cloud expected	30 minutes	OWS
* Issued by the 25 OWS when Luke WF is not on duty			
**Denotes SWAP Criteria			

Attachment 3

SPECIAL OBSERVATION CRITERIA

A3.1. SPECI observations. SPECI observations will be taken and disseminated IAW AFMAN 15-111, and DoD Flight Information Publications (FLIP). A SPECI observation will be for the following conditions.

A3.2. Ceiling. The ceiling forms or dissipates below, decreases to less than, or if below, increases to equal or exceed the Table A3.1 values.

Table A3.1. SPECI Ceiling Criteria.

SPECI Ceiling Criteria	
Criteria	Reference
13,000 feet	LAFBI 13-204
8,000 feet	LAFBI 13-204
4,000 feet	LAFBI 13-204
2,500 feet	LAFBI 13-204
2,000 feet	AFI 11-2f-35v3; AFI11-2f-16v3; AFMAN 15-111; AFI11-202V3
1,500 feet	AFI 11-2f-35v3; AFI11-2f-16v3; AFMAN 15-111; AFI11-202V3
1,000 feet	AFMAN 15-111
800 feet	AFMAN 15-111
700 feet	AFI 11-2f-35v3; AFI11-2f-16v3; AFMAN 15-111
500 feet	AFI 11-2f-35v3; AFI11-2f-16v3; AFMAN 15-111; DOD FLIP
400 feet	DOD FLIP
300 feet	AFI 11-2f-35v3; AFI11-2f-16v3; AFMAN 15-111; DOD FLIP
200 feet	AFMAN 15-111; DOD FLIP

A3.3. SPECI Sky Condition Criteria. A layer of clouds or obscuring phenomena aloft is observed below the highest published instrument minimum (including circling) applicable to the airfield and no layer was reported below this height in the previous METAR or SPECI.

Table A3.2. SPECI Sky Condition Criteria.

SPECI Sky Condition Criteria	
Criteria	Reference
400 feet	AFMAN 15-111; DOD FLIP

A3.4. Visibility. The surface visibility as reported in the body of the report decreases to less than or if below, increases to equal to exceed the Table A3.3 criteria.

Table A3.3. SPECI Visibility Criteria.

SPECI Visibility Criteria	
Criteria	Reference
5 miles	AFI11-2f-16v3; LAFBI 13-204
3 miles	AFI11-2f-16v3; AFI 11-2f-35v3; AFMAN 15-111
2 miles	AFI 11-2f-35v3; AFI11-2f-16v3; LAFBI 13-204; AFMAN 15-111
1 ½ miles	AFI11-2f-16v3; LAFBI 13-204; AFMAN 15-111; DOD FLIP

1 3/8 miles	DOD FLIP
1 1/4 miles	DOD FLIP
1 1/8 miles	DOD FLIP
1 mile	AFI 11-2f-35v3; AFI11-2f-16v3; AFMAN 15-11; DOD FLIP
7/8 mile	DOD FLIP
3/4 mile	AFMAN 15-111; DOD FLIP
1/2 mile	AFMAN 15-111; DOD FLIP

A3.5. Runway Visual Range (RVR) Criteria. Reported whenever the prevailing visibility is first observed less than 1SM and again when it becomes greater than 1SM. The highest value during the preceding 10 minutes from the designated RVR runway must decrease to less than or if below, increase to equal or exceed the values within Table A3.4. will be considered RVR reportable. RVR is first determined as unavailable (RVRNO) for the runway in use and when it's first determined that RVRNO is no longer applicable, provided conditions for RVR exist.

Table A3.4. SPECI RVR Criteria.

SPECI RVR Criteria	
Criteria	Reference
6,000 feet	AFI11-2f-16v3; LAFBI 13-204
5,000 feet	AFI11-2f-16v3; AFI 11-2f-35v3; AFMAN 15-111; DOD FLIP
4,500 feet	DOD FLIP
4,000 feet	DOD FLIP
2,400 feet	AFMAN 15-111; DOD FLIP
2,000 feet	AFMAN 15-111

A3.6. Other Weather Elements. Special observations will be taken when any elements within Table A3.5. occur.

Table A3.5. SPECI Criteria.

SPECI Criteria	
Criteria	Reference
Wind Shift: Wind direction changes by 45 degrees or more in less than 15 minutes and the wind speed is 10 knots or more throughout the wind shift.	AFMAN 15-111
Squall: A strong wind characterized by a sudden onset in which the wind speed increases by at least 16 knots and is sustained at 22 knots or more for at least one minute.	AFMAN 15-111
Volcanic Eruption: Eruption or volcanic ash first observed	AFMAN 15-111
Thunderstorm (occurring at station): begins or ends <i>Note:</i> A SPECI is not required to report the beginning of a new thunderstorm if one is currently reported.	AFMAN 15-111
Precipitation: (1) Hail (greater than 1/4" in diameter) begins or ends. (2) Freezing precipitation begins, ends, or changes intensity. (3) Ice pellets begin, end, or change intensity. (4) Any other type of precipitation begins or ends. <i>Note:</i> Except for freezing rain, freezing drizzle, hail, and ice pellets, a SPECI is not required for changes in type (e.g., drizzle changing to snow grains) or	AFMAN 15-111

the beginning or ending of one type while another is in progress (e.g., snow changing to rain and snow).	
Tornado, Funnel Cloud, or Waterspout: (1) Is observed (2) Disappears from sight or ends.	AFMAN 15-111
Tower Visibility: When notified by the control tower that tower visibility has decreased to less than or, if below, increased to equal or exceed 1, 2, or 3 statute miles and differs from the prevailing visibility.	
Upon Resumption of Observing Function: A special (SPECI) observation will be taken within 15-minutes after the weather technician returns to duty following a break in observing coverage or augmentation at the observing location unless a record observation is filed during that 15-minute period	AFMAN 15-111
Aircraft Mishap: When augmenting the AMOS, take an aircraft mishap SPECI immediately upon notification of an aircraft mishap at or near the observing location <i>Note:</i> This remark is not disseminated locally or longline	AFMAN 15-111
Miscellaneous: Any other meteorological situation that, in the weather technician's opinion, is critical	AFMAN 15-111

Attachment 4

SAMPLE OBSERVATION: FORMAT & DECODING

A4.1. General. This attachment provides example format for METAR and SPECI observations. Further information is found in AFMAN 15-111.

Figure A4.1. Example Observation.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
METAR KLUF 171558Z AUTO 17016G24KT 5SM HZ BKN040 35/12 A2999 RMK AO2 PK WND 17027/45 SLP180 T03530121 \$										

A4.2. Observation Format.

A4.2.1. **(1)** Type of report. Either an Aviation Routine Weather Report (METAR) or Special Observation (SPECI).

A4.2.2. **(2)** Station Identifier. A four letter identifier used to identify the observing location (KLUF is the Luke AFB identifier)

A4.2.3. **(3)** Date/Time Group. The date/time group in (UTC). The time is the actual time the report is transmitted longline or when the criteria for a SPECI is met or noted.

A4.2.4. **(4)** Report Identifier. This will either state AUTO or will be blank. AUTO identifies the report as fully automated with no human intervention.

A4.2.5. **(5)** Wind Group. The first three numbers is wind direction (or VRB for variable, or 000 for Calm), sustained wind speed (next 2 or 3 numbers), and winds gusts (any numbers following the 'G') if there have been any measured in knots.

A4.2.6. **(6)** Visibility Group. Recorded in statute miles or fraction of a statute mile. Any value reported as 7 SM or greater is considered "unrestricted." Any value less than 7 SM will contain a visibility restrictor (BR, FG, RA, HZ, etc.).

A4.2.7. **(7)** Present Weather Group. Any weather phenomenon that is occurring on the airfield. This is mandatory anytime the visibility is less than 7 SM.

A4.2.8. **(8)** Sky Condition. Cloud bases in hundreds of feet Above Ground Level (AGL).

A4.2.9. **(9)** Air temperature/Dew Point. Measured in degrees Celsius (°C). The first value is the air temperature and the second value following the solidus is the dew point.

A4.2.10. **(10)** Altimeter Setting. measured in inches of mercury.

A4.2.11. **(11)** Remarks. Common remarks will be listed to include AO2 – Automated observation; AO2A – augmented observation, Peak Winds (PK WND); Sea Level Pressure (SLP); and hourly maximum and minimum temperature.

Attachment 5

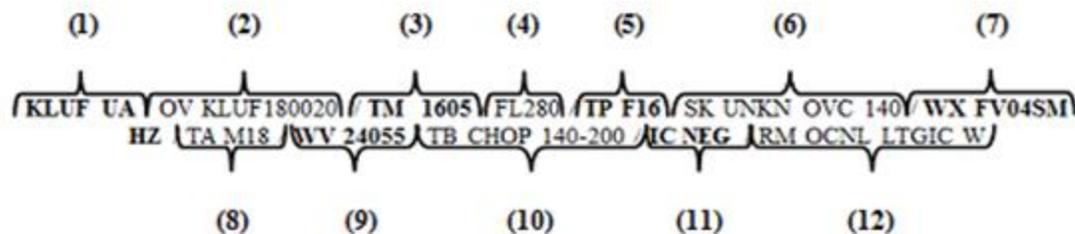
SAMPLE PIREP FORMAT & DECODING

A5.1. PIREP Format. A PIREP is a report of in-flight weather provided by an aircraft crewmember. All PIREPs received by the WF that do not meet the standard dissemination criteria outlined in **Paragraph A5.1.1** but are significant to flying operations and flight safety will be verbally passed along to aircrews, ATC agencies/SOF (if received from another credible source since JET doesn't allow the local dissemination of PIREPS. All PIREPS meeting standard dissemination criteria will be transmitted longline via JET. Back-up options include using the AFW-WEBS Alphanumeric upload option.

A5.1. 1 At a minimum, a PIREP must contain the transmitting organization, a message type, location, time, flight level, type of aircraft, and at least one other weather element.

A5.2. Figure A5.1 is decoded below with brief explanations.

Figure A5.1. Example PIREP Decoding.



A5.2.1. (1) KLUF UA: Transmitting Organization and type of report; UA Routine PIREP, UUA Urgent PIREP

A5.2.2. (2) OV KLUF180020: Location of aircraft providing information, e.g. 20 nautical miles south of Luke AFB.

A5.2.3. (3) TM 1605: The time the weather phenomenon was encountered or occurred, e.g. 1605 Zulu.

A5.2.4. (4) FL280: Flight Level, in hundreds of feet above mean sea level (MSL), when the phenomenon was first encountered, e.g. 28,000 MSL.

A5.2.5. (5) TP F16: Type of aircraft, if unknown UNKN will be entered. In this case an F-16 reported the weather phenomena.

A5.2.6. (6) SK UNKN OVC 140: SK is the sky cover and heights of clouds experienced by the aircraft, e.g. UNKN for unknown cloud bases, OVC for overcast clouds, tops of clouds at 14,000 MSL

A5.2.7. (7) WX FV04SM HZ: This data depicts the weather experience to include flight visibility (FV), e.g. flight visibility 4 statute miles in haze.

A5.2.8. (8) TA M18: This is the reported outside air temperature, e.g. negative 18 degrees Celsius.

A5.2.9. **(9)** WV 24055: This details the wind direction and speed, e.g. wind direct from the southwest, 240 degree at 55 knots.

A5.2.10. **(10)** TB LGT CHOP 140-200: This indicated the aircraft encountered light CHOP turbulence between 14,000 feet and 20,000 feet.

A5.2.11. **(11)** IC NEG: This indicates the aircraft experience no icing when it was forecasted to occur.

A5.2.12. **(12)** RM OCNL LTGIC: RM denotes remarks. This area is used to report significant weather phenomena that does not fit into any of the other blocks above or were not directly experienced by the pilot e.g. occasional lightning observed in-cloud to the west of the pilot's location.

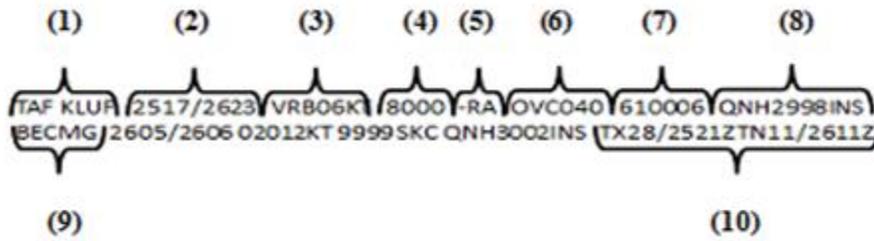
Attachment 6

SAMPLE TAF FORMAT & DECODING

A6.1. General. This attachment explains format and notification procedures for Luke AFB WWAs.

A6.1.1. The TAF in Figure A6.1 is encoded/decoded below.

Figure A6.1. Example TAF Decoding.



A6.1.1.1. (1) TAF KLUF: Location Identifier, Luke AFB.

A6.1.1.2. (2) 2517/2623: Valid time in UTC (30-hour format).

A6.1.1.3. (3) VRB06KT: Wind direction, in degree magnetic, and speed in knots, 3 digits can be used if needed.

A6.1.1.4. (4) 8000: Visibility, in meters.

A6.1.1.5. (5) -RA: Weather and/or obstructions to vision, if none, no entry will appear.

A6.1.1.6. (6) OVC040: Sky condition with amount of sky covered and heights in hundreds of feet above ground level.

A6.1.1.7. (7) 610006: Icing (5) and/or turbulence (6) as required e.g. Light icing from surface to 500 feet AGL.

A6.1.1.8. (8) QNH2998INS: Minimum altimeter setting for the forecast period.

A6.1.1.9. (9) BECMG: Change group identifier, either BECMG for a becoming conditions or TEMPO for temporary conditions.

A6.1.1.10. (10) TX28/2521Z TN11/2611Z: Forecast maximum temperature, TX, and forecast minimum temperature, TN for the forecast period. The time and dates are represented after the two digit temperature in DD/HH form.

A6.2. TAF Specification and Amendment Criteria. The 30-hour forecast specifies the time of occurrence (to the nearest hour), the duration, and the intensity (where applicable) of the weather elements listed Luke AFB and if expected to occur will be included in the forecast. If at any time the conditions listed in this section occur but are not correctly forecast or are forecast to occur and do not occur by 30 minutes after the end of the change group, the TAF must be amended.

A6.3. Ceiling. The ceiling forms or dissipates below, decreases to less than, or if below, increases to equal or exceed the Table A6.2 values.

Table A6.1. TAF Specification and Amendment Criteria.

TAF Specification and Amendment Criteria		
Ceiling and Visibility: If the ceiling or visibility is observed or expected to decrease to less than, or if below, increase to equal or exceed the below criteria, the TAF must be amended.		
Ceilings	Visibility	
GTE 2,000 FT	GTE 3SM (4800M)	
LT 2,000FT but GTE 1,000FT	LT 3SM (4800M) but GTE 2SM (3200M)	
LT 1,000FT but GTE 700FT	LT 3SM (4800M) but GTE 2SM (3200M)	
LT 700FT but GTE 200FT	LT 2SM (3200M) but GTE 1/2SM (0800M)	
LT 200FT	LT 1/2SM (800M)	
13,000 FT	N/A	
8,000 FT	5 SM (8000 M)	
4,000 FT	3 SM (4800 M)	
3,000 FT	2 SM (3200 M)	
2,500 FT	1 1/2 SM (2400 M)	
2,000 FT	1 3/8 SM (2200 M)	
1,500 FT	1 1/4 SM (2000 M)	
1,000 FT	1 1/8 SM (1800 M)	
800 FT	1 SM (1600 M)	
700 FT		
600 FT	7/8 SM (1400 M)	
500 FT	3/4 SM (1200 M)	
400 FT	1/2 SM (800 M)	
200 FT	N/A	
Standard Specification and Amendment Criteria Other Than Ceiling and Visibility		
Surface Wind Speeds	Specify wind speed changes of 10 knots or more	Amend if predominant wind speed is in error by 10 knots or more
Surface Wind Gusts	Specify onset, duration, and intensity of wind gusts	Amend if wind gust speed is in error by 10 knots or more
Surface Wind Direction	Specify a change in prevailing wind direction of more than 30 degrees when the predominant wind speed or gusts are expected to be 15 knots or more	Amend if prevailing wind speed is in error by more than 30 degrees AND winds are 15 knots or more
Icing	Specify Icing not associated with thunderstorms from surface to 10,000ft AGL	Amend if beginning or ending of icing meets, exceeds, or decreases to less than light (or greater) intensity and was improperly specified
Turbulence	(Weather Category II Aircraft) Specify turbulence not associated with thunderstorms from surface to 10,000 ft AGL	Amend if the beginning or ending of turbulence meets, exceeds, or decreases to less than moderate (or greater) intensity and was improperly specified

Weather Warning Criteria	Specify the onset, duration, and intensity of weather warning criteria	Amend if weather warning criteria occurs and is not forecast or is no longer expected to occur
Altimeter Setting	Specify the onset of altimeter settings meeting or exceeding 31.00 INS or altimeter settings 28.00 INS or less. If less than the threshold specify when altimeter settings equal or exceed the thresholds, if greater than, specify when altimeter settings will decrease to equal or less than the thresholds.	Amend if the altimeter setting meets, or is expected to meet the threshold and was not specified in forecast
Forecast Weather Advisory Criteria (issued for TAF amendable criteria)	Specify the onset, duration, and intensity of forecast weather advisory criteria at the aerodrome complex	Amend if the forecast weather advisory criteria is improperly specified, occurs and was not forecast, or is no longer expected to occur
Thunderstorms	Specify onset and duration of thunderstorms at the aerodrome complex	Amend if the start or end time of the thunderstorm is incorrectly specified
Temporary Conditions	Specify the onset and duration of temporary conditions	1. Amend if temporary conditions become predominant. 2. Amend if temporary conditions do not occur as forecast. 3. Amend if temporary conditions are no longer expected to occur.
Changes to Predominant Conditions	Specify the onset, duration, and intensity (if applicable) of changes to predominant conditions	Amend if forecast changes conditions occur before the specified period of change, do not occur, or are no longer expected to occur.
Representative Conditions		Amend if forecast conditions are not considered representative of the characterized state of the atmosphere and an amendment improves safety, flight planning, operational efficiency, or assists in-flight aircraft

A6.4. TAF Amendment Actions. The 25 OWS is primarily responsible for TAF amendment. In the event that the 25 OWS is unable to amend, the WF will amend the TAF during duty hours.

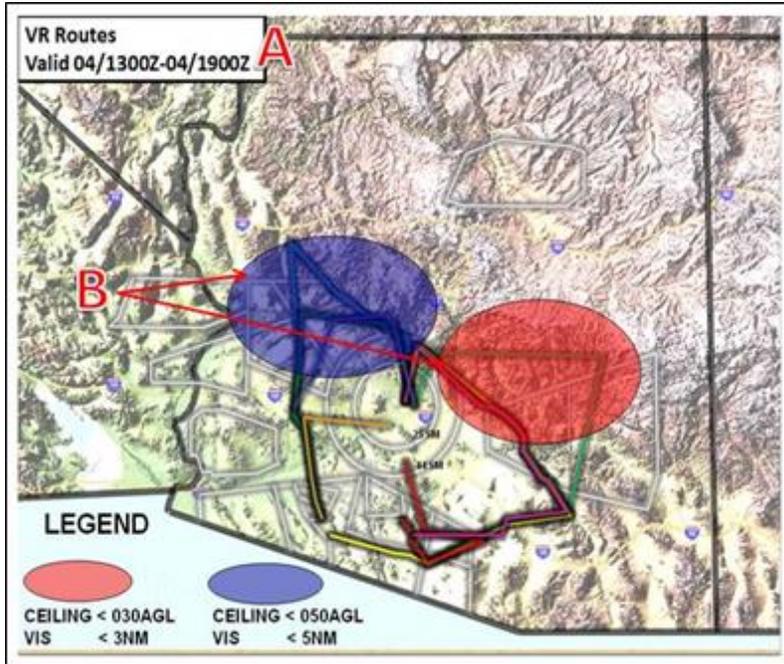
A6.5. Remarks. The 25 OWS utilizes the following remarks accordingly. **Note:** YYGG/YYGG = Date/Time Group.

A6.5.1. Limited METWATCH. The 25 OWS will append to the last line of the TAF the phrase "LIMITED METWATCH YYGG TIL YYGG" when the airfield is open and no weather personnel are on duty and an operational automated sensor is not in use.

A6.5.2. Last No Amendments. The 25 OWS will append to the last line of the TAF the phrase “LAST NO AMDS AFT YYGG NEXT YYGG” when the airfield is closed and a TAF is not required.

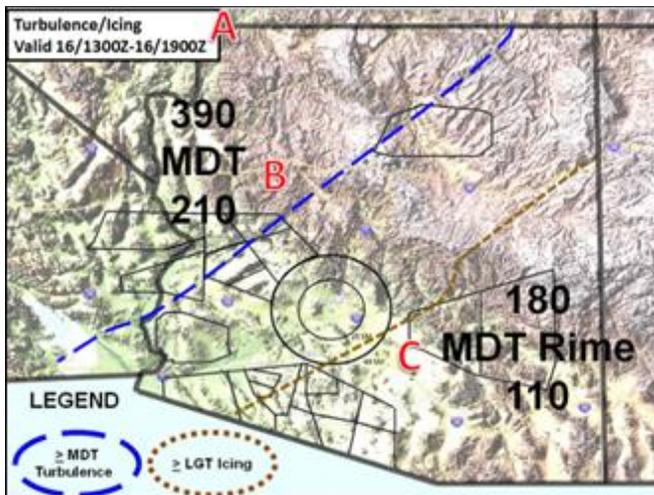
- A. Valid time (Z) (includes "COR" or "AMD" as appropriate) Range forecasts will be valid from ± 1hr scheduled usage time. AR Tracks will be valid -30 mins prior to + 1hr after scheduled usage time.
- B. Forecast conditions include clouds bases and tops (MSL), visibility in NM, weather (ie. TSRA)
- C. Flight level winds and Temps (degrees Celsius). All heights in MSL
- D. CONS (Contrails) Forecast Base and Top, Minimum Enroute Freezing Level in MSL, Forecast Minimum Altimeter, Forecast Max sustained surface wind, Forecaster and QA Initials.

Figure A7.3. MEF Sample, Format, and Decoding (VR Routes).



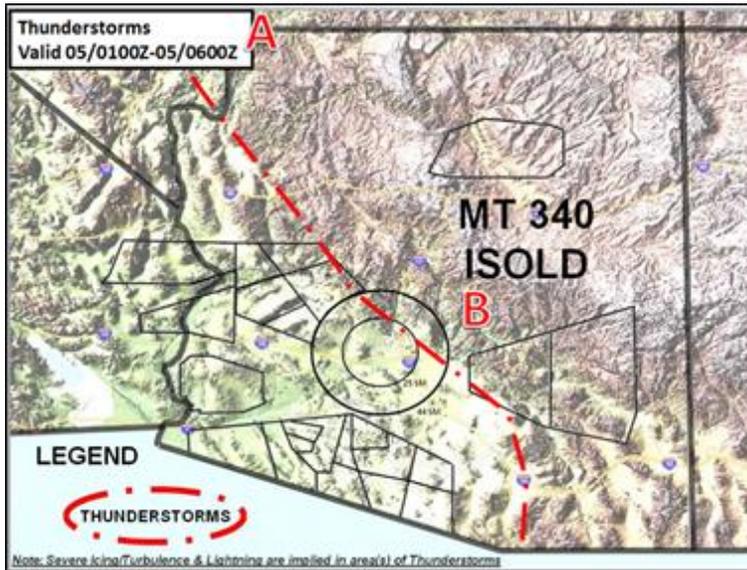
- A. Valid time (Z) reflect current date and forecast hours (13Z-19Z, 19Z-01Z, and 01Z-06Z)
- B. Identifies areas where forecast ceilings will be less than 5000FT AGL and or visibilities less than 5NM and or ceilings less than 300FT AGL and or visibilities less than 3NM

Figure A7.4. MEF Sample, Format, and Decoding (Turbulence/Icing Hazard Chart).



- A. Valid time (Z) reflect current date and forecast hours (13Z-19Z, 19Z-01Z, and 01Z-06Z)
- B. Areas of moderate or greater turbulence will be outlined in dashed blue lines with the forecast top and bottom height outlined above and below the turbulence intensity.
- C. Areas of Light or greater icing will be outlined by dashed brown lines with the forecast top and bottom height outlined above and below the intensity and type of icing.

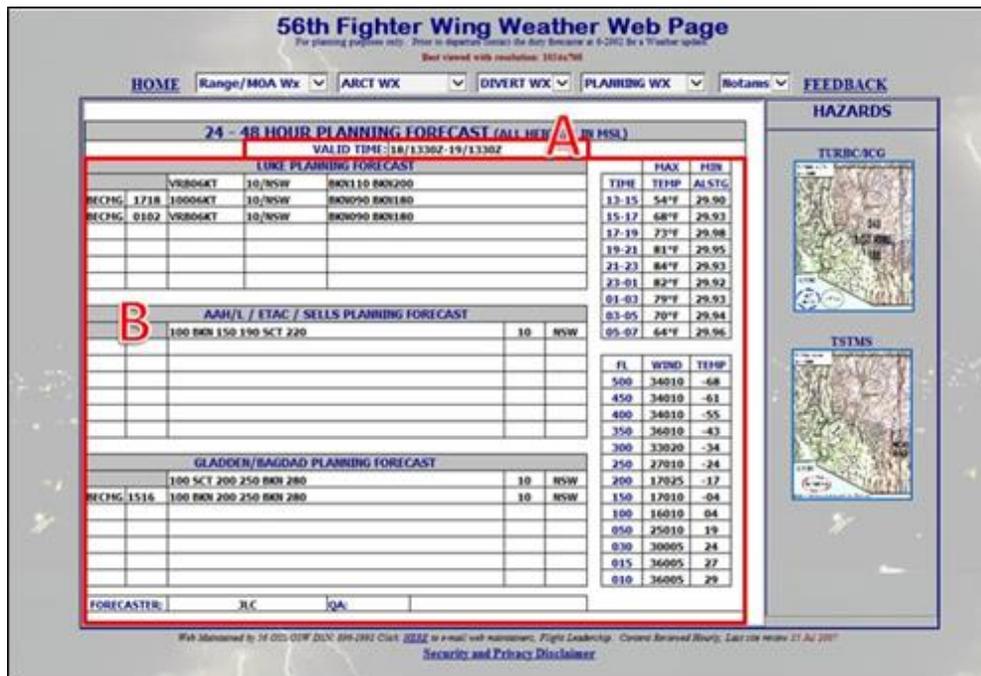
Figure A7.5. MEF Sample, Format, and Decoding (Thunderstorm Hazard Chart).



- A. Valid time (Z) reflect current date and forecast hours (13Z-19Z, 19Z-01Z, and 01Z-06Z)
- B. Areas of forecasted thunderstorms will be outlined in red alternating dashes and dots with the maximum expected tops indicated above the amount of coverage. The example above shows isolated thunderstorm coverage with maximum tops of 34,000FT.

A7.2. Planning Weather. Planning Weather is available on the Weather Web Page. The data is produced whenever 56 FW is scheduled to fly within the next 24-48 hour period.

Figure A7.6. Planning Weather Sample, Format, and Decoding.



- A. Valid Time (Z) Valid the next duty day at 1330Z through 24 hours.
- B. The Luke and Range planning weather is the same formats as the daily MEFs.

A7.3. Electro-Optic Target Decision Aide Data (EOTDA). Forecasts of transmissivity, absolute humidity, lock-on range and laser sensor ranging range are projected every 2 hours throughout the daily flying window. In addition, multiple jpeg images depicting thermal crossover times and detection ranges for various targets are created.

Figure A7.7. EOTDA Example.

ELECTRO-OPTIC FORECAST DATA																		
VALID TIME:										CALL 6-2992								
IR SENSOR INFORMATION										15Z	17Z	19Z	21Z	23Z	01Z	03Z	05Z	
4KM TRANS (%)										80 %	80 %	80 %	80 %	80 %	80 %	80 %	80 %	
ABS HUMIDITY g/m3										9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	
Lock-On Range	ZIL Truck (MI)										0.0	0.0	0.0	0.0	7.3	13.9	17.4	0.0
	Steel Tank (MI)										0.0	0.0	0.0	0.0	8.4	6.6	15.9	14.4
	Plywood Tank (MI)										9.0	9.6	0.0	17.1	21.4	22.3	19.3	0.0
	Wooden Barn (MI)										13.5	12.9	8.6	8.8	21.2	37.3	48.2	40.1
	Steel Conex Box (MI)										0.0	0.0	0.0	17.4	20.6	20.1	19.5	14.3
	Concrete Bunker (MI)										0.0	0.0	6.9	8.3	15.2	38.6	51.6	47.3
Data based on a Flight Level of:										200	AGL	Flight level subject to change if cloud cover obscures target						
FORECASTER:										JLC	QA:							

Figure A7.8. View by Time (Delta-T Graph Thermal Crossover).

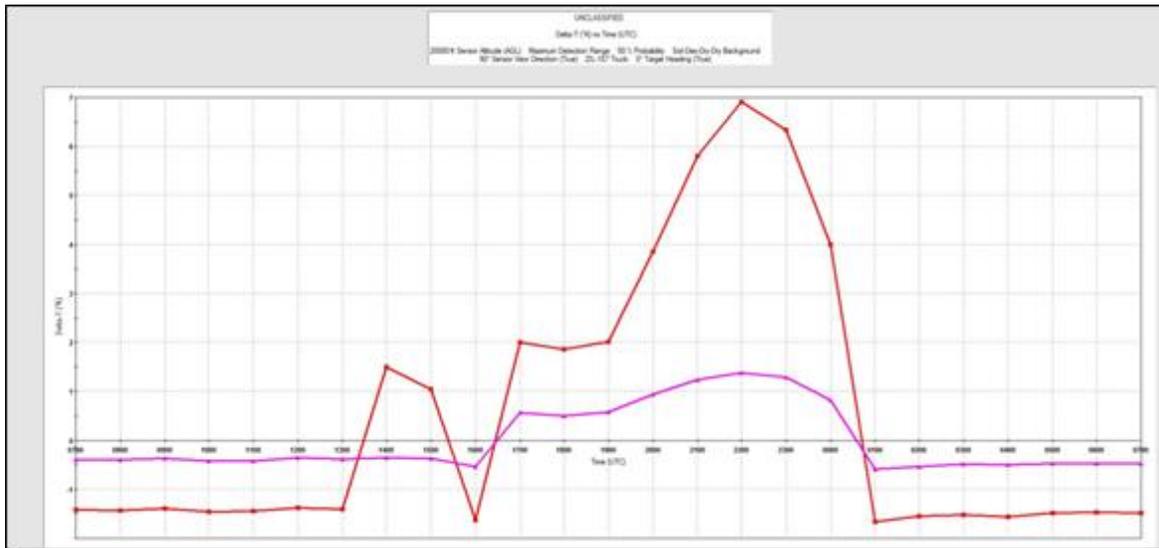
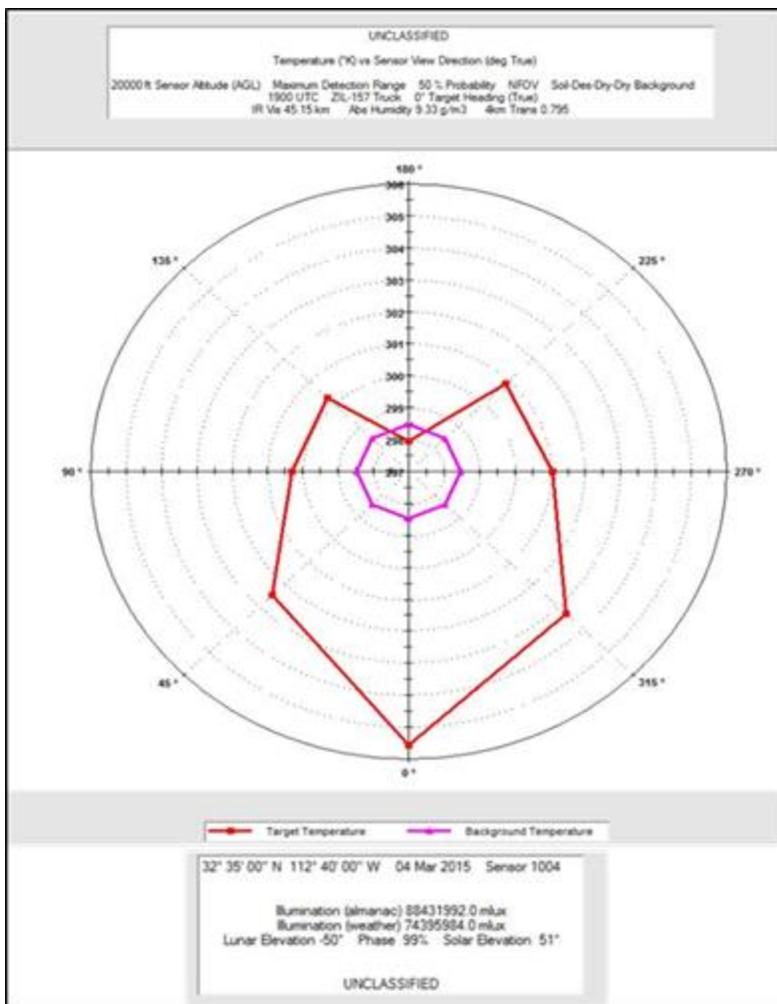


Figure A7.9. View by Direction (Detection Range).



A7.4. Solar/Lunar Data. All data is calculated for Luke AFB based on a latitude of 33°32'N and a longitude of 112°23'W.

Figure A7.10. Solar/Lunar Data Events Example.

Enter Date: <input type="text"/>									
	SUNRISE	SUNSET	Nautical Twilight		Moon		Disc Illumination %		
			Begin	End	Rise	Set	0001L	2359L	
3/4/2015	0654L	1829L	0601L	1922L	1751L	0609L	98%	10%	
3/5/2015	0653L	1829L	0559L	1923L	1844L	0642L	10%	10%	
3/6/2015	0652L	1830L	0558L	1924L	1937L	0714L	10%	98%	
3/7/2015	0651L	1831L	0557L	1925L	2030L	0746L	98%	94%	
3/8/2015	0649L	1832L	0556L	1925L	2124L	0819L	94%	89%	

Figure A7.11. Illumination Data Example.

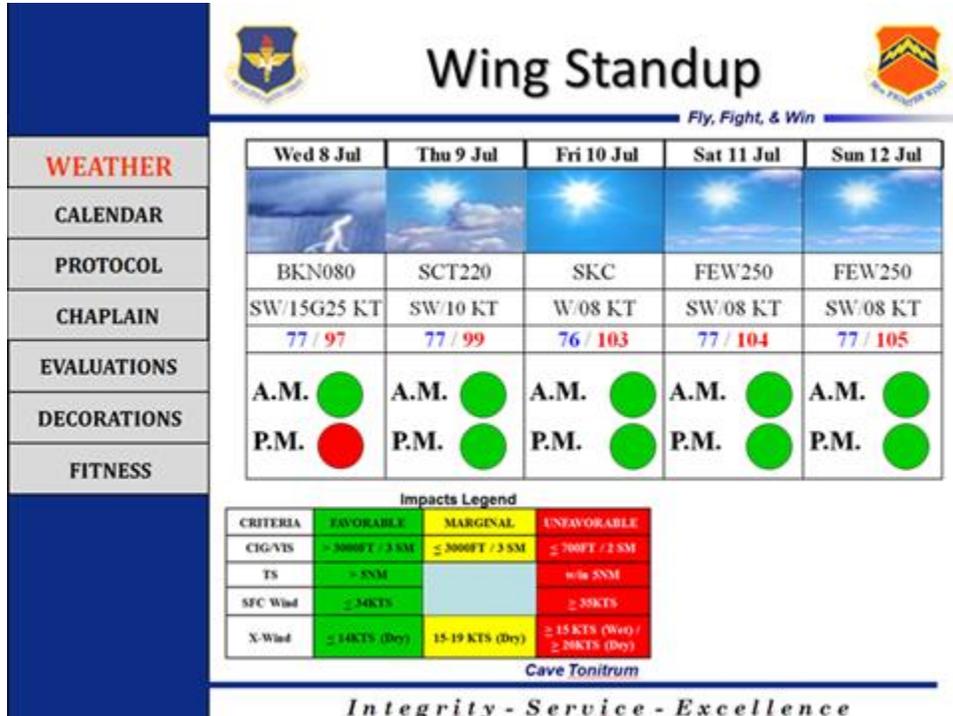
Enter Date: 3/24/2015									
Date	Time (Local)	Solar Elevation (°)	Solar Azimuth (° True)	Lunar Elevation (°)	Lunar Azimuth (° True)	Lunar Phase (%)	Ground Illumination (mils)	NVG HI / LI	
3/24/2015	01:00 L	-55	10	-25	310	20	1.62	LOW	
3/24/2015	01:00 L	-55	10	-25	310	20	1.62	LOW	
3/24/2015	02:00 L	-50	34	-33	323	21	1.62	LOW	
3/24/2015	03:00 L	-41	52	-39	338	21	1.62	LOW	
3/24/2015	04:00 L	-31	65	-41	356	22	1.62	LOW	
3/24/2015	05:00 L	-19	75	-40	14	22	1.62	LOW	
3/24/2015	06:00 L	-7	84	-35	31	22	1639.77	HIGH	
3/24/2015	07:00 L	6	92	-28	44	23	7107449	HIGH	
3/24/2015	08:00 L	18	101	-19	55	23	28386416	HIGH	
3/24/2015	09:00 L	30	111	-8	65	24	52201944	HIGH	
3/24/2015	10:00 L	41	123	3	73	24	72072544	HIGH	
3/24/2015	11:00 L	51	140	15	80	24	85406592	HIGH	
3/24/2015	12:00 L	57	163	27	88	25	92136736	HIGH	
3/24/2015	13:00 L	58	191	39	96	25	92733168	HIGH	
3/24/2015	14:00 L	52	216	51	106	26	87253552	HIGH	
3/24/2015	15:00 L	44	234	62	122	26	75271024	HIGH	
3/24/2015	16:00 L	33	247	71	150	26	56618304	HIGH	
3/24/2015	17:00 L	21	258	73	196	27	33190156	HIGH	
3/24/2015	18:00 L	8	266	66	231	27	10774927	HIGH	
3/24/2015	19:00 L	-4	275	55	250	28	23496.87	HIGH	
3/24/2015	20:00 L	-16	283	43	262	28	9.5	HIGH	
3/24/2015	21:00 L	-28	293	31	270	28	6.82	HIGH	
3/24/2015	22:00 L	-39	306	19	278	29	4.58	HIGH	
3/24/2015	23:00 L	-48	323	7	285	29	2.55	HIGH	

Attachment 8

SAMPLE STAFF WEATHER BRIEFINGS

A8.1. Staff Weather Briefing Products. Staff weather briefing products serve as a vital method of fulfilling the staff integration function requirements as discussed in **Chapter 6** of this instruction. Figure A8.1 provides a sample staff weather products and information on format and decoding.

Figure A8.1. Staff Weather Briefing (Wing Stand-up).



Note: The Luke 5-Day Forecast slide outlines the type of weather expected, high/low temperature, winds and local patten weather impacts for the next 5 days at Luke AFB. Morning and afternoon impact will be color coded according to the Impacts Legend. Slide to be briefed will not include the Impacts Legend.

Attachment 9**WATCH, WARNING, & ADVISORY FORMAT**

A9.1. General. This attachment explains format and notification procedures for Luke AFB WWAs.

Figure A9.1. Weather Watch Example.

Weather Watch 03-003 for Luke AFB (KLUF)
Valid 25/1800Z (25/1100L) to 25/2100Z (25/1400L)
Potential for Damaging Winds \geq 50 knots. Forecast value 60 knots

Figure A9.2. Weather Warning Example.

Weather Warning 03-004 for Luke AFB (KLUF)
Valid 25/2205Z (25/1505L) to UFN
Observed Lightning within 5nm is occurring within 5 nm of the Runway Complex

Figure A9.3. Weather Advisory Example.

Weather Advisory 03-022 for Luke AFB (KLUF)
Valid 25/2211Z (25/1511L) to UFN
Observed Lightning or Thunderstorms occurring within 25 nm of the airfield

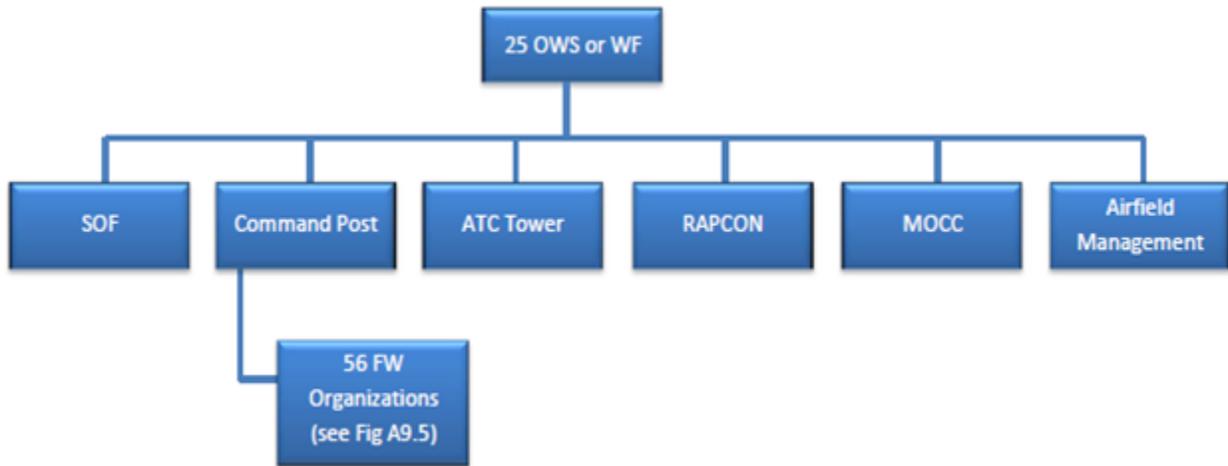
A9.2. WWA Format Elements. The text of weather warnings, watches, and advisories will contain:

A9.2.1. WWA Type and WWA number. Format numbering sequence is identified with the two-digit month, followed by the consecutive number of WWAs generated during that month. For example, “Weather Watch 03-003 for Luke AFB (KLUF)” would indicate that this is the 3rd weather watch generated in the month of March.

A9.2.2. WWA Valid time period. The start and end times of WWAs are indicated in UTC from the Local time (e.g. Valid 25/1800Z (25/1100L) to 25/2100Z (25/1400L)). There is a +7 hour conversion difference from Local to UTC.

A9.2.3. Text of the WWA. Provides detailed explanation to the watch, warning or advisory and any additional remarks required (i.e. maximum value expected).

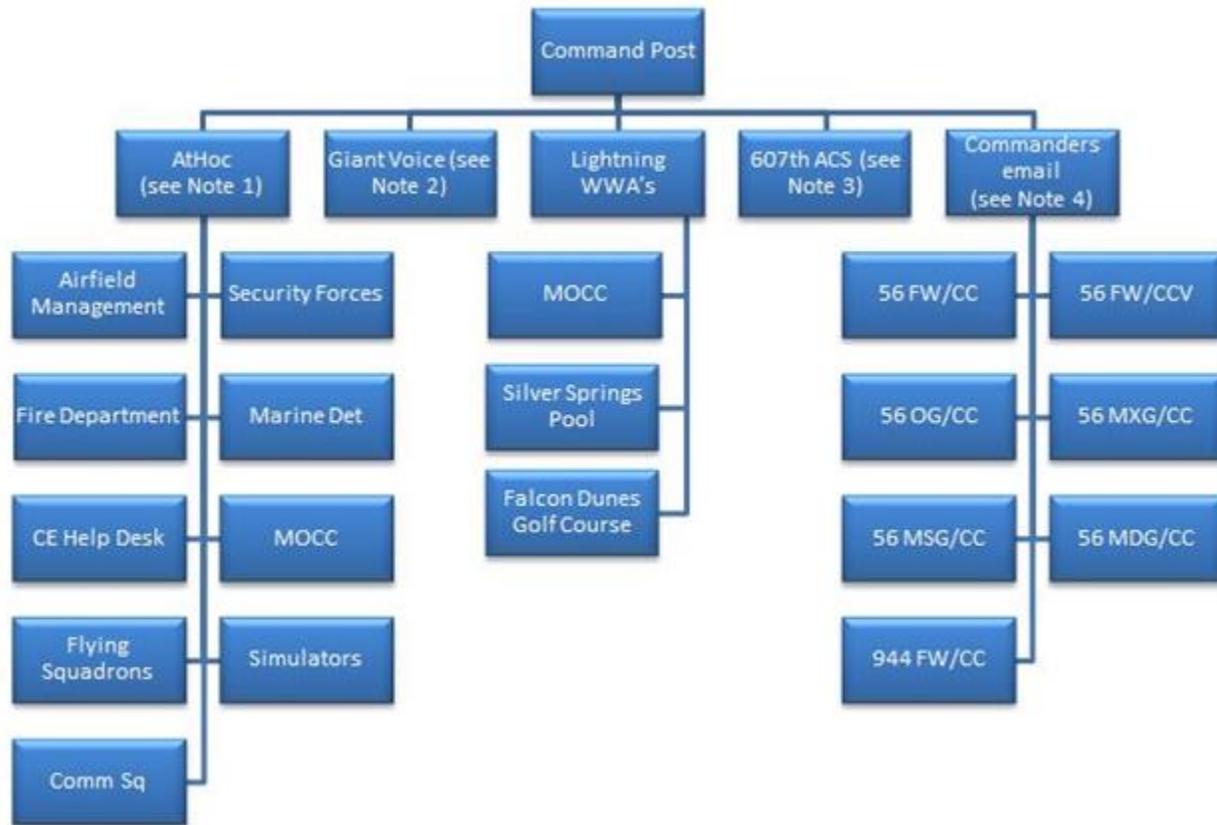
A9.3. Dissemination. Luke AFB uses a pyramid notification network process to promptly disseminate, extend or cancel weather watches, warnings and advisories. Figure A9.4. below identifies the agencies notified.

Figure A9.4. WWA Notification Pyramid.

A9.3.1. The 25 OWS and/or WF Role. The 25 OWS and/or WF initiate the notification process by disseminating, extending, or canceling WWAs via JET.

A9.3.2. The 56 FW/CP Role. The CP assumes responsibility of further dissemination. The CP will initiate quick reaction checklists based upon the WWA criteria. Figure A9.5. identifies agencies listed on the CP checklist that get notified.

Figure A9.5. Agencies notified via 56 FW/CP of weather watches, warnings, and advisories.



Note 1: If AtHoc is not operational, each agency listed under the AtHoc chain will get called.

Note 2: Giant Voice is pre-approved for use between 0700L-200L for Lightning w/I 5NM. For Life Threatening Weather (Tornado, winds \geq 50kts and Damaging Hail \geq 3/4 in) announce OVER Giant Voice regardless the time of day.

Note 3: CP will notify 607th ACS when winds are forecasted 35kts or greater during and after duty hours.

Note 4: WWA's are sent during Wing Flying Hours (For Life Threatening Weather (Tornado, winds \geq 50kts and Damaging Hail \geq 3/4 in) email will be sent regardless the time of day.

Attachment 11

56 FW FLYING WEATHER IMPACTS

Table A11.1. Luke Airfield Flying Weather Impacts.

Luke AFB Flying Criteria									
Categories (All Heights are in AGL)	IP F-16		Graduate F-16		Student F-16		F-35		
	Marginal	Unfavorable	Marginal	Unfavorable	Marginal	Unfavorable	Marginal	Unfavorable	
SFO/PFO	High Key								
	Cloud Ceilings	<13000FT	<8000FT	<13000FT	<8000FT	<13000FT	<8000FT	<13000FT	<8000FT
	SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT
PWC	Low Key								
	Cloud Ceilings	<5000FT	<3000FT	<5000FT	<3000FT	<5000FT	<3000FT	<5000FT	<3000FT
	SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT
Pilot Weather Category	Pilot Weather Category								
	Cloud Ceilings	<300FT / 1 SM		<500FT / 1.5 SM		<700FT / 2 SM	Same as F-16 PWC's		
	SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT
Take off and Landings	Formations								
	SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT
	Cross Winds		≥ 15KT		≥ 15KT		≥ 15KT		≥ 15KT
	T/O (Single Ship)								
	Cloud Ceilings		<1500FT / 2SM		<1500FT / 2SM		<1500FT / 2SM	≤ 4000FT (Any OVC Layer) / 3SM	≤ 2500FT, OVC
	SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT
	Crosswinds		≥ 25KT		≥ 25KT	Dry RWY ≥ 15KT	≥ 20KT		(Wet/Dry): ≥ 10/20KT
	Landing (Single Ship)								
	SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT
	Cross Winds		(Wet/Dry): ≥ 20/25KT		(Wet/Dry): ≥ 20/25KT	Dry RWY ≥ 15KT	(Wet/Dry): ≥ 15/20KT		(Wet/Dry): ≥ 10/20KT
	VFR								
	Cloud Ceilings	≤ 3000FT / 3SM	<1500FT / 3SM	≤ 3000FT / 3SM	<1500FT / 3SM	≤ 3000FT / 3SM	<1500FT / 3SM	OVC < 3000FT / 3SM	≤ 1500FT, OVC < 1500FT / 3SM
	SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT
	IFR Bypass (Divert)								
	Cloud Ceilings	≤ 2000FT / 3SM		≤ 2000FT / 3SM		≤ 2000FT / 3SM		Any OVC Layer	
SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT	
IFR Recovery									
Cloud Ceilings		<2000FT / 3SM		<2000FT / 3SM		<2000FT / 3SM	OVC < 3000FT / <3SM	<2000FT / 3SM	
SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT	
Divert Base Required									
Cloud Ceilings	<3000FT / <3SM	<2000FT / 3SM	<3000FT / <3SM	<2000FT / 3SM	<3000FT / <3SM	<2000FT / 3SM	<3000FT / <3SM	<2000FT / 3SM	
Thunderstorms							TS w/in 35 NM	TS w/in 25 NM	
SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT	
Aircraft Recovery and Tie Downs									
SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT	
Aircraft Engine Shut Down and End Taxi									
Thunderstorms		TS w/in 5 NM		TS w/in 5 NM		TS w/in 5 NM		TS w/in 10 NM	
Local Flying Terminated									
Cloud Ceilings	<300FT / 1 SM		<500FT / 1.5 SM		<700FT / 2 SM	Same as F-16			
Thunderstorms		TS w/in 5 NM		TS w/in 5 NM		TS w/in 5 NM	TS w/in 35 NM	TS w/in 25 NM	
SFC Winds		≥ 35KT		≥ 35KT		≥ 35KT		≥ 35KT	
Cross Winds		(Wet/Dry): ≥ 20/25KT		(Wet/Dry): ≥ 20/25KT		(Wet/Dry): ≥ 15/20KT		(Wet/Dry): ≥ 10/20KT	
Wake Turbulence									
SFC Winds	≤ 6 kts or quarter tailwind		≤ 6 kts or quarter tailwind		≤ 6 kts or quarter tailwind				

Table A11.2. Range Flying Weather Impacts.

Range Missions				
All Range Ceilings in MSL. Clear airspace is a continuous layer without a ceiling				
Mission Types	F-16		F-35	
	Marginal	Unfavorable	Marginal	Unfavorable
TR, TR 1-6, I, I-1	TR, TR 1-6, I, I-1			
Cloud Ceilings	Cig < 14 KFT @ Aux1 OR Cig < 10 KFT @ KLUF/KGVF			
Clear Airspace (SCT or lower)		< 10 KFT of clear airspace		
In-Fight Horizontal VIS	< 10 NM	< 5 NM		
T-storms	TS win Range		TS win 35NM	TS win 25NM
Turbulence (Fast Observed)		Severe or > Turbulence		Moderate or > Turbulence
Icing (Fast Observed)		Moderate or > Icing		Any Icing
SFC Winds (Range)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained
I 2-3, INST	I 2-3, INST			
Cloud Ceilings		Cig < 3 KFT @ LUF OR Cig < 4.5 KFT @ Aux1		
In-Fight Horizontal VIS	< 10 NM			
T-storms	TS win Range		TS win 35NM	TS win 25NM
Turbulence (Fast Observed)		Severe or > Turbulence		Moderate or > Turbulence
Icing (Fast Observed)		Moderate or > Icing		Any Icing
SFC Winds (Range)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained
SFC VIS (KLUF)		< 3 SM Vis @ LUF		
LSDT, LSDT 1-2, LASDT, LASDT 1-2	LSDT, LSDT 1-2, LASDT, LASDT 1-2			
Cloud Ceilings	Cig < 5 KFT	Cig < 5 KFT		
Clear Airspace (SCT or lower)	< 7 KFT clear airspace	< 5 KFT of clear airspace		
In-Fight Horizontal VIS	< 10 NM	< 5 NM		
T-storms	TS win Range		TS win 35NM	TS win 25NM
Turbulence (Fast Observed)		Severe or > Turbulence		Moderate or > Turbulence
Icing (Fast Observed)		Moderate or > Icing		Any Icing
SFC Winds (Range)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained
BFM, BFM 1-12, NS 4-22, NS 24-26, NS28-40, NS42	BFM, BFM 1-12, NS 4-22, NS 24-26, NS28-40, NS42			
Cloud Ceilings	Cig < 18 KFT	Cig < 13 KFT		
Clear Airspace (SCT or lower)	< 10 KFT clear airspace	< 5 KFT of clear airspace		
In-Fight Horizontal VIS	< 10 NM	< 5 NM		
Illumination	NS ONLY! < 2.2 mfax			
T-storms	TS win Range		TS win 35NM	TS win 25NM
Turbulence (Fast Observed)		Severe or > Turbulence		Moderate or > Turbulence
Icing (Fast Observed)		Moderate or > Icing		Any Icing
SFC Winds (Range)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained
AHC	AHC			
Cloud Ceilings	Cig < 18 KFT	Cig < 13 KFT		
Clear Airspace (SCT or lower)		< 10 KFT of clear airspace		
In-Fight Horizontal VIS	< 10 NM	< 5 NM		
T-storms	TS win Range		TS win 35NM	TS win 25NM
Turbulence (Fast Observed)		Severe or > Turbulence		Moderate or > Turbulence
Icing (Fast Observed)		Moderate or > Icing		Any Icing
SFC Winds (Range)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained
ACM, ACM 1-4, ACT, ACT 1-2, DACT, INT, INT 1-7, IL, TI 1-7, INCP, INCP 1-7	ACM, ACM 1-4, ACT, ACT 1-2, DACT, INT, INT 1-7, TI, TI 1-7, INCP, INCP 1-7			
Cloud Ceilings	Cig < 20 KFT	Cig < 15 KFT		
Clear Airspace (SCT or lower)	< 7 KFT clear airspace	< 5 KFT of clear airspace		
In-Fight Horizontal VIS	< 10 NM	< 5 NM		
T-storms	TS win Range		TS win 35NM	TS win 25NM
Turbulence (Fast Observed)		Severe or > Turbulence		Moderate or > Turbulence
Icing (Fast Observed)		Moderate or > Icing		Any Icing
SFC Winds (Range)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained

Air to Air Training Missions

Range Missions					
<small>All Range Ceilings in MSL, Clear airspace is a continuous layer without a ceiling</small>					
Mission Types		F-16		F-35	
		Marginal	Unfavorable	Marginal	Unfavorable
AR	Air Refueling	Air Refueling			
	Clear Airspace (SCT or lower)	Clouds +/- 5 KFT of Freezing Level with convective activity			
	T-storms	TS w/in Range		TS w/in 35NM	TS w/in 25NM
	Turbulence (Fast/Observed)		Severe or > Turbulence		Moderate or > Turbulence
	Icing (Fast/Observed)		Moderate or > Icing		Any Icing
	SFC Winds (Ranges)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained
Air to Ground Training Missions	NVG (Hi-Illum Ops)	NVG (Hi-Illum Ops)			
	In-Fight Horizontal VIS		Discernible Horizon	≤ 5 SM	≤ 3 SM
	Illumination	< 2.2 miles			
	T-storms	TS w/in Range		TS w/in 35NM	TS w/in 25NM
	Turbulence (Fast/Observed)		Severe or > Turbulence		Moderate or > Turbulence
	Icing (Fast/Observed)		Moderate or > Icing		Any Icing
	SFC Winds (Ranges)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained
	NS 1-3, NS23, NS 27, NS41, NS44	NS 1-3, NS23, NS 27, NS41, NS44			
	Cloud Ceilings		Cig < 10 KFT		
	In-Fight Horizontal VIS		Discernible Horizon	≤ 5 SM	≤ 3 SM
	Illumination	< 2.2 miles			
	T-storms	TS w/in Range		TS w/in 35NM	TS w/in 25NM
	Turbulence (Fast/Observed)		Severe or > Turbulence		Moderate or > Turbulence
	Icing (Fast/Observed)		Moderate or > Icing		Any Icing
	SFC Winds (Ranges)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained
	ASC, FTR, LANT, MANT	ASC, FTR, LANT, MANT			
	Cloud Ceilings		Cig < 10 KFT		
	In-Fight Horizontal VIS		< 5 NM	≤ 5 SM	≤ 3 SM
	T-storms	TS w/in Range		TS w/in 35NM	TS w/in 25NM
	Turbulence (Fast/Observed)		Severe or > Turbulence		Moderate or > Turbulence
	Icing (Fast/Observed)		Moderate or > Icing		Any Icing
	SFC Winds (Ranges)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained
	SN 1-5	SN 1-5			
	Cloud Ceilings		Cig < 20 KFT		
	In-Fight Horizontal VIS		< 5 NM	≤ 5 SM	≤ 3 SM
	T-storms	TS w/in Range		TS w/in 35NM	TS w/in 25NM
	Turbulence (Fast/Observed)		Severe or > Turbulence		Moderate or > Turbulence
	Icing (Fast/Observed)		Moderate or > Icing		Any Icing
	SFC Winds (Ranges)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained
	CAS, SAT, SAT 1-7	CAS, SAT, SAT 1-7			
Cloud Ceilings	Cig < 23 KFT	Cig < 8 KFT			
In-Fight Horizontal VIS		< 5 NM	≤ 5 SM	≤ 3 SM	
T-storms	TS w/in Range		TS w/in 35NM	TS w/in 25NM	
Turbulence (Fast/Observed)		Severe or > Turbulence		Moderate or > Turbulence	
Icing (Fast/Observed)		Moderate or > Icing		Any Icing	
SFC Winds (Ranges)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained	
SAT 3-5, SA, SA 1-4	SAT 3-5, SA, SA 1-4				
Cloud Ceilings	Cig < 23 KFT	Cig < 18 KFT			
In-Fight Horizontal VIS		< 5 NM	≤ 5 SM	≤ 3 SM	
T-storms	TS w/in Range		TS w/in 35NM	TS w/in 25NM	
Turbulence (Fast/Observed)		Severe or > Turbulence		Moderate or > Turbulence	
Icing (Fast/Observed)		Moderate or > Icing		Any Icing	
SFC Winds (Ranges)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained	
SA 5-9	SA 5-9				
Cloud Ceilings	Cig < 23 KFT	Cig < 8 KFT			
In-Fight Horizontal VIS		< 5 NM	≤ 5 SM	≤ 3 SM	
T-storms	TS w/in Range		TS w/in 35NM	TS w/in 25NM	
Turbulence (Fast/Observed)		Severe or > Turbulence		Moderate or > Turbulence	
Icing (Fast/Observed)		Moderate or > Icing		Any Icing	
SFC Winds (Ranges)		≥ 35KT Sustained	≥ 30KT Sustained	≥ 35KT Sustained	