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LUKE AIR FORCE BASE

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Weather

WEATHER SUPPORT

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This instruction implements Air Force Policy Directive (AFPD) 15-1, *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 and 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. Refer recommended changes and questions about this publication to the OPR using the DAF Form 847, *Recommendation for Change of Publication*; route DAF Forms 847 from the field through the appropriate functional chain of command. Ensure all records generated as a result of processes prescribed in this publication adhere to Air Force Instruction (AFI) 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. This publication may not be supplemented. The authorities to waive wing, unit, delta or garrison level requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. Submit requests for waivers through the chain of command to the appropriate tier waiver approval authority or alternately to the publication OPR for non-tired compliance items. See DAF Manual (DAFMAN) 90-161, *Publishing Processes and Procedures,* 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

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SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. Major changes include updating the duties and responsibilities of the Luke Weather Flight (WF hereafter), establishing a new Continuity of Operations (COOP) agreement between the Luke WF and the Davis-Monthan WF, discontinuing the production and dissemination of all Target Acquisition Weapons Software (TAWS) products, adjustments to desired lead times for weather WWAs, annotating the handover of all WWA criteria to the Luke WF, replacing the WF's Joint Environmental Toolkit (JET) system with Bridging Environmental Intelligence for Responsive Operational Support Portal (BIFROST), updating the Mission Execution Forecast graphics to reflect the current provided product, recreating the Mission Weather thresholds tables for visual clarity (**Attachment 10**), removing the A/OA-10 Flying Weather Impacts, and the correction of grammatical and contextual errors.

Chapter 1

ROLES & RESPONSIBILITIES

1.1. Overview.

1.1.1. The complete analysis and integration of weather products from the 56th Operations Support Squadron (56 OSS) WF and the 557th Weather Wing (557 WW) is discussed. The WF provides and arranges weather intel for the 56 FW and all associated units assigned to and located at Luke AFB. The 557 WW is a Meteorological and Oceanographic (METOC) Production Center that provides global and regional graphical weather support to the WF and all other weather units in the Western Continental United States. The 557 WW is a service-retained, reach-back organization that provides trusted METOC data and information to primarily fulfill combatant command and component requirements. This instruction establishes the requirements and procedures pertaining to the WF support and will be reviewed no less than biennially.

1.1.2. Analysis. Weather analysis depends on the ability to collect accurate data, process the data, correctly analyze the resulting information, and use that information to produce a coherent picture of the present and future state of the air, land, sea, and space environments.

1.1.3. Integration. Weather integration provides direct or continuing support to a mission set and determines both environmental threats and effective decision points to inject weather into the planning and execution process of the mission. This allows for development of courses of action during the planning process to mitigate these threats. The outcome of these processes is the delivery of decision-quality environmental information to decision-makers. Decision-quality environmental threat information requires mission-specific thresholds, and appropriate temporal and spatial resolution, be applied to analysis products.

1.1.4. Relationship between analysis and integration. As defined in AFPD15-1, *Weather Operations*, integration focuses on mission profiles and the associated operationally significant weather parameters and values. Integration always begins with analyzed data and information that is already available. A necessary step in integration may be taking strategic or operational level products, and through further analysis, refining them to the level and specification criteria of the mission.

1.2. Concept of Operations.

1.2.1. The 557 WW has been designated with the primary responsibility for analysis of the air and space environment up to the tropopause for the United States. The 2nd Weather Squadron provides analysis of the Space Weather environment worldwide. The WF tailors that analysis into airfield weather support and mission execution forecasts, staff weather services and all additional weather support integrated into Luke AFB's planning process.

1.2.2. The 557 WW, provides regional and operational-level weather products and information to units worldwide. The WF performs continuous monitoring covering both Luke AFB and the surrounding mission ranges of the terrestrial and space weather environment called Meteorological Watch (METWATCH). METWATCH is crucial to Luke AFB receiving resource protection notifications, forecasts, updates, and pertinent data.

1.2.3. The WF is the focal point for all weather support to Luke AFB. The WF conducts MISSIONWATCH by alerting decision makers of mission-limiting environmental factors potentially impacting mission execution. The WF commander serves as the base's senior weather officer and facilitates staff integration and the weather support structure.

1.3. Duty Priorities.

1.3.1. The WF duty priorities are noted within **Table 1.1**. The WF personnel follow these duty priorities to save and preserve life and property when the environment poses imminent danger.

Table 1.1. 56 OSS/OSW Duty Priorities.

Priority	Duty Priority
1	Wartime defense of the duty site/location
2	Perform EU Emergency War Order (EWO) Tasks
3	Execute Evacuation/Continuity of Operations Plan
4	Issue/Disseminate WWAs
5	Respond to Aircraft/Ground Emergencies
6	Respond to supplementation/back up calls
7	Provide information to the Supervisor of Flying (SOF)
8	Disseminate weather observation
9	Disseminate Urgent Unsolicited Advisory (UUA) Pilot Reports (PIREPs)
10	Disseminate Terminal Aerodrome Forecasts (TAFs)
11	Provide Flight Weather Briefings
12	Collaborate Weather Products with supported units
13	METWATCH/Amend products
14	Respond to Support Assistance Requests (SAR) or request for information
15	Provide staff briefings/non-standard weather products
16	Accomplish weather functional training
17	Accomplish administrative tasks

Chapter 2

WEATHER FLIGHT OPERATIONS

2.1. General.

2.1.1. WF operations are broken down into three functions: Airfield Services, Mission Integration, and Staff Integration. These functions can be read in greater detail in their respective chapters (Chapters **4**, **5**, & 6). WF daily operations provide and coordinate all weather support services to Luke AFB and its tenant units IAW DAFMAN 15-129, *Air and Space Weather Operations*, paragraph 4.1.8..

2.2. Flight Location, Hours of Operations, & Contact Information.

2.2.1. The WF is in the 56 OSS building 453, room 139. The address is 7254 Fighter Country Ave, Luke AFB, AZ 85309-1215.

2.2.2. The WF is manned from 1000Z until the airfield closes, Monday through Friday. During weekend, holidays, and 56 FW training days, the WF will remain on standby. Additionally, a certified weather technician will be physically present during controlled airfield 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. Standby weather technicians will be contacted during unscheduled airfield openings and implementation of Severe Weather Action Plan (SWAP) procedures through the on-duty weather technician, Standby cell phone: 602-315-1081, or Luke Command Post (CP) at DSN: 896-5600, commercial: 623-856-5600.

2.3. Release of Weather Information.

2.3.1. 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 (PA). When information is requested by non-DoD agencies, weather technicians will refer them to 56 FW PA.

2.4. COOP.

2.4.1. COOPs are periods of time where a weather unit's operations and duties are accomplished by another weather unit. COOPs ensure proper continuation of weather operations in the event of a disaster, emergency, or any other event that would hinder support. The WF and Davis-Monthan WF (Airfield Forecaster DSN: 312-228-6014; Mission Briefer DSN: 312-228-6016) provide and practice COOP procedures to ensure continuity. The 557 WW will only communicate and initiate a COOP affecting the WF when Air Force Weather's Joint Environmental Toolkit (JET) server needs to be moved to a different server.

2.4.2. For flight safety reasons, the Luke WF will not evacuate during base exercises outside of real-world events that require such action.

2.4.3. If the 25th Operational Weather Squadron (OWS), which is based out of Davis-Monthan AFB, initiates a COOP, a different numbered OWS will take over JET sensor responsibilities and the JET Integrated Weather Warning Capability (IWWC) responsibility for the Western Continental United States, which includes Luke AFB. Luke WF operations will continue as normal unless a COOP is initiated by the WF.

2.4.4. When either the Luke WF or the Davis-Monthan WF initiates a COOP, the recipient WF will take on the following responsibilities:

2.4.4.1. Issue and disseminate WWAs in a timely manner.

2.4.4.2. Prepare and publish the Terminal Aerodrome Forecast (TAF).

2.4.4.3. Prepare and publish the backup Mission Execution Forecast (MEF). Please see **Attachment 7** for details.

2.4.4.4. Prepare and publish Flight Weather Briefs upon request from the WF initiating the COOP.

2.5. Alternate Operating Location (AOL).

2.5.1. AOL is a secondary weather operations site, which allows for continued weather support in the event the primary location is evacuated, or unavailable. The Luke WF AOL is the Tower Simulator Facility, building 955. In the event of a prolonged communications outage or building evacuation in building 453, the WF will relocate to the AOL and notify the Air Traffic Control (ATC), Supervisory of Flying (SOF), Radar Approach Control (RAPCON), CP, AM Ops, Maintenance Operations Center (MOC), Davis-Monthan WF, 61 FS, 62 FS, 63 FS, 308 FS, 309 FS, 310 FS, 312 FS, and 425 FS. When located at the AOL, weather personnel can be contacted at DSN 896-3570, commercial (623) 856-3570.

2.5.2. 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.

2.6. Pilot Report (PIREP) Support.

2.6.1. SOF, RAPCON, and ATC personnel will 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 prioritized IAW 56 OSS/OSW Duty Priorities listed in **Table 1.1**.

2.7. Supported Unit & Mission Requirements.

2.7.1. The WF provides support to the 56 FW and the surrounding flying ranges used by Luke AFB flying assets. The location and criteria monitored are briefly outlined below.

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

2.7.3. Mission Weather Limitations. The WF coordinates weather limitations to our flying mission with the 56 Operations Group (OG) Standard Evaluation Team annually. See Figures **A10.1**-**A10.4** “Luke AFB’s F-35 Mission Criteria & Luke AFB’s F-16 Mission Criteria” for flying weather limitations. These limitations are used to create Mission Weather Products (MWPs).

2.7.4. Customer Weather Impacts. The WF communicates with various base agencies on their operational weather limitations and response actions during specific weather events. Customers should contact the WF if there are any changes to weather impacts or support requirements.

2.8. Post Mission Analysis & Feedback.

2.8.1. 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:

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

2.8.1.2. PIREPs transmitted via phone from ATC or the Top 3.

2.8.1.3. SOF and Operations Supervisor End of Day reports.

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

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

2.9. BIFROST.

2.9.1. BIFROST is expected to replace JET as the primary resource used for issuing WWAs, preparing and disseminating Flight Weather Briefs, and analyzing up-to-the-minute weather sensors on the Luke airfield and all other Air Force Weather-operated sensors. A memorandum will be prepared and disseminated for the WF's supported units to reflect this expected transition.

Chapter 3

METEOROLOGICAL & COMMUNICATION EQUIPMENT

3.1. General.

3.1.1. This chapter provides a brief description on the wide range of equipment used 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.

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 the following: temperature, dew point 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.

3.2.2. Tactical Meteorological Observing System (TMOS) TMQ-53. The TMOS is a field-deployable, compact weather station. This portable system can be easily and rapidly deployed and offers broad sensor capabilities like the FMQ-19.

3.2.3. Micro Weather Sensor (MWS). The MWS is an all-in-one weather station that measures temperature, pressure, cloud ceilings, wind speed and direction, lightning, visibility, and relative humidity. It also contains a camera to collect horizon changes. While it lacks the high spatial and temporal resolution of the FMQ-19 and TMOS, its small size and few parts makes it less challenging for installation purposes, taking only a few minutes to set up and tear down. Like the TMOS, it can also be rapidly deployed.

3.2.4. Kestrel 5500. The handheld Kestrel provides backup observing capabilities should components of the FMQ-19 become inoperable.

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

3.2.5.1. LTS2005. The LTS2005 is a subscription service provided and operated by Vaisala 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 at Luke AFB and within the flying ranges.

3.2.5.2. 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 Local Area Network (LAN) access and is subject to update delays.

3.2.5.3. AllisonHouse Lightning Display. AllisonHouse is a company that displays weather data through several weather software platforms. Using Earth Network's Total Lightning Network, AllisonHouse delivers reliable and precise lightning detection on a weather radar software package created by Gibson Ridge Software, LLC. While this

lightning display relies on LAN access, new lightning strikes are updated roughly every 60 seconds.

3.2.6. Gibson Ridge Radar Software. The WF utilizes two software programs to interpret Next Generation Radar (NEXRAD) radar data: Gibson Ridge's 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. 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.

3.2.7. 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 and is the primary method of disseminating observations, forecasts, and WWAs.

3.3.2. The automated dissemination system 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 direct connection to the Luke AFB Airfield Automation System (AFAS) or IDS-5 server located in the RAPCON facility. The AFAS and IDS-5 servers, integrated through the LAN, provide weather information to both Tower and RAPCON. Additionally, the DM WF has the capability to access the JET system in the absence of WF personnel.

3.4. Equipment Maintenance.

3.4.1. The following organizations provide preventive maintenance and repair weather and communications equipment:

Table 3.1. Equipment maintenance.

Equipment	Servicing Organization
FMQ-19	56 OSS/OSAM (RAWS)
LTS2005	Luke WF
GR2Analyst and GRLevel3	Luke WF
Automated Dissemination System	557 Weather Wing (557 WW) Fielded Systems
JET Sensor Collection Application (SCA) Maintainer	56 OSS/OSAM (RAWS)
Micro Weather Sensor	56 OSS/OSAM (RAWS)
Phones/Hotlines	56 CS/SCXPV (Voice Network Systems)

3.5. Building Power.

3.5.1. Building 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.

4.1.1. Airfield Services is responsible for all weather support actions that affect Luke AFB. The WF technician communicates with the SOF, ATC, 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.

4.2. Weather Observations.

4.2.1. Surface weather observations are recorded and disseminated IAW AFMAN15-111, *Surface Weather Observations*. Any observation provided by the FMQ-19 is considered an official observation. Weather technicians can verify accuracy of observations and augment, when necessary, prior to dissemination.

4.2.2. Types of Weather Observations. There are two types of observations that are used at Luke AFB, routine and special. See **Attachment 4** for observation format, and decoding.

4.2.2.1. Aviation Routine Weather Report (METAR). A METAR is a regularly scheduled observation recorded and disseminated every hour, within the last five minutes of the hour. METARs are disseminated locally and longline.

4.2.2.2. 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.

4.2.3. 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 AOL observation point is located outside the Tower Simulator Facility, building 955.

4.2.3.1. Official Observing Point & AOL Limitations. Both official observing points have limitations due to their locations (listed below). See **paragraph 2.5** for AOL procedures.

4.2.3.2. Official Observing Point Limitations.

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

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

4.2.3.2.3. 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.

4.2.3.3. AOL Observing Point Limitations:

4.2.3.3.1. 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.

4.2.3.3.2. Buildings, hangars, and trees block portions of the sky as well as ground visibility reference markers, especially east through south.

4.2.3.3.3. Ground visibility references beyond 1 ½ miles are limited. This degrades determination of nighttime visibility.

4.2.4. FMQ-19 Operations. The FMQ-19 is operated in full automated mode to provide the official METAR and SPECI observations for Luke AFB, except when augmentation is required IAW AFMAN 15-111, *Surface Weather Observations*, 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).

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 AFMAN15-111, paragraph 3.2, 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.

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 sensor's 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 whenever requested by ATC or SOF to ensure representative conditions are reported in the official airfield observation.

4.3. TAFs.

4.3.1. TAFs are forecasts for a specific location. Luke AFB TAFs are produced by the Luke WF. TAFs are valid for 30 hours, and issued at 0400Z, 1200Z, and 2000Z during airfield operating hours. TAF references are followed IAW AFMAN15-124, *Meteorological Codes* and DAFMAN15-129. See **Attachment 6** for TAF coding explanations.

4.4. Specification & Amendment Criteria.

4.4.1. The Luke AFB TAF will be specified and amended IAW categories listed in DAFMAN15-129, local airfield minimums listed in flight publication manuals, and within the

WF Installation Data Page (IDP). TAF specification and amendment criteria are listed within **Attachment 6** of this document.

4.5. Basic Weather Watch (BWW).

4.5.1. A BWW is conducted when the airfield is open, and during periods when 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, a BWW will be conducted.

4.6. Cooperative Weather Watch (CWW).

4.6.1. AFMAN15-111 requires the WF to establish a CWW program that encompasses the report of tower visibility, local PIREPs, and any occurrence of previously unreported conditions from ATC that are critical to the safety or efficiency of local operations and resources. This program includes ATC, SOF, and the flying squadrons, and is in place to ensure accurate weather conditions are reported.

4.6.2. The weather technician will reevaluate weather conditions whenever a reliable source (e.g., ATC or aircrew) 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 and the Luke MEF.

4.6.3. 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:

4.6.3.1. Tornado or funnel cloud.

4.6.3.2. Hail begins or ends.

4.6.3.3. Thunder and/or lightning.

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

4.6.4.1. Tower 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.

4.6.4.2. Precipitation begins or ends.

4.6.4.3. PIREPS given to ATC.

4.6.4.4. Active runway changes.

4.6.5. Weather technicians 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.

4.6.6. Flying Squadron personnel will relay PIREPs to the WF directly or through ATC Tower or RAPCON. Pilots will receive annual refresher training during the Instrument Refresher Course (IRC) brief.

4.7. METWATCH.

4.7.1. 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.

Chapter 5

MISSION INTEGRATION FUNCTION

5.1. General.

5.1.1. The mission integration function interfaces with the SOF 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. MWPs.

5.2.1. 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, extended weather forecasts, and the DD Form 175-1, *Flight Weather Briefing*. See **Attachment 7** for sample products, formats, and decoding information. These products must be horizontally consistent with products displayed or issued by the 557 WW.

5.2.2. The primary MWP is the MEF. The Luke AFB Mission Execution Forecast (MEF) is considered the official planning forecast for the 56 FW. Weather technicians will follow the MEF process, utilizing flying schedules, mission profiles, and pilot limitations to provide mission tailored briefings. MEFs are designed to provide critical go/no-go weather information. The MEF is posted on the 56 FW Weather webpage at file://52nuex-fs-002/56og/56OSS/OSW_Website/WeatherSite/default/default.html. See **Attachment 7** for an example.

5.2.3. The Luke MEF is derived from the Luke AFB TAF. It is valid during airfield operating hours. The first MEF of the day is issued 30 minutes prior to the first brief time of the day, as annotated in Graduate Training Information Management Systems (GTIMS). It is updated at 2100Z, 0500Z (for flights departing after 0500Z) and as required for changing weather conditions. The Luke MEF provides Range, Air Refueling Track, and Military Operating Area Forecasts.

5.2.4. Alternate Airfield Forecasts. Current forecasts are collected for planning purposes. Forecast information for KGXF, KPHX, KTUS, KDMA, KNYL, KLSV, KIWA, and KEDW is collected, consolidated and available within the MEF located on the Weather Web Page.

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.

5.2.5.1. For scheduled Cross Country flights, request FWBs 24 hours prior to the brief time.

5.2.5.2. 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.

5.3.1. The MEF will be amended when forecasted/occurring weather criteria is no longer representative. The SOF and flying Squadrons will be notified of the MEF amendment. In

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

5.4. MWP Verification.

5.4.1. The WF will conduct post-mission analysis of their forecasts to verify operational effectiveness. This aids in identifying areas of needed improvement and the baseline for the metrics program. See **Paragraph 6.6** for meteorological verification.

5.5. MISSIONWATCH.

5.5.1. 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.

5.6.1. Top 3 briefings provide situational awareness on weather impacts to mission profiles. These briefings 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 un-forecasted change 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.

5.7.1. The WF produces a general notification of space weather (HF, UHF, GPS error) within the MEF. More information can be provided upon request. See **Attachment 7**.

5.8. Tropical Weather.

5.8.1. While there is no tropical weather support dictated by Luke AFB, the weather flight will comply and communicate any actions needed with the Luke AFB Installation Emergency Management Plan (IEMP) 10-2. Any required TC-TAP procedures will be coordinated with the 26 OWS.

Chapter 6

STAFF INTEGRATION FUNCTION

6.1. General.

6.1.1. 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.

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

6.3. Climatology Services.

6.3.1. Units requiring climate information must contact the WF at least three duty days 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. IDP.

6.4.1. The IDP is a quick reference guide that annotates the weather support provided to Luke AFB. The IDP is located on the 56 FW webpage in the Luke IDP link. WF leadership will review the IDP within 90 days of initial assignment and annually to ensure consistency with supported units. Official updates to the Luke AFB IDP will be completed by WF leadership.

6.5. Flight Information Publications (FLIPs).

6.5.1. FLIPs are references for enroute and flight data pertaining to military operations in 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 FLIPs manager.

6.6. Weather OPVER and METRICS.

6.6.1. The Operations Verification (OPVER) program provides data regarding individual and unit accuracy of weather products and the effectiveness of weather information provided to the customer. The METRICS program is tailored to customer defined thresholds and points of critical mission failure. It is used to aid and improve overall operational processes by providing flight leadership a tool to gauge the forecast accuracy within the most used operational flying areas.

6.7. Chemical, Biological, Radiological, Nuclear, and High-yield Explosive (CBRNE) Coordination.

6.7.1. The WF will provide weather subject matter expertise to CBRNE control center operations IAW DAFMAN15-129 and 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.

6.8.1. The WF will provide any briefing listed below as requested.

6.8.2. IRC. IRCs fulfill an annual pilot recertification requirement. 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 responsibilities, resource protection and seasonal weather impacts.

6.8.3. 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.

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

6.8.5. Large Force Employment (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 requested weather information to the pilots.

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

6.8.6.1. Flying Squadron Deployments. Prior to Squadron deployment, the WF will either provide support for the deployed unit or arrange for the weather flight at the deployed location to provide resource protection and mission planning weather support. Prior to departure, weather outlooks will be provided to the squadron project officer upon request. Weather personnel will be available for planning briefs and will provide an in-person 175-1 as requested. In the event of a CORONET movement, the WF will coordinate with the ACC project officer for 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.

6.8.6.2. Pre-Deployment Planning Briefings. Seasonal climatology information will be provided for inclusion into reporting instructions given to deploying members. The WF will provide these briefings upon request.

6.8.7. Wing Standup Briefings. Wing Standup briefings will be conducted when requested by 56 FW leadership. Flight leadership will complete slides containing the five-day forecasts for, at minimum, Luke AFB, AZ (KLUF) and Klamath Falls, OR (KLMT) upon request. Additionally, both a short descriptive forecast and a seasonal climate outlook will be annotated for each location. The slide will be due to the 56 FW Executive Officer or Director of Staff no later than 1200L the Monday prior.

6.8.8. Maintenance Briefings. Maintenance briefings will be conducted when requested by 56 MXG leadership. Flight leadership will complete a single slide containing the five-day forecast for Luke AFB, AZ. The slide will be due to the MOC no later than 0500L the morning of the brief.

6.9. Weather Training.

6.9.1. The WF has the responsibility to train weather 1W031 Airmen who transition straight from technical training. New Airmen will be enrolled in the 1W051 Weather Journeyman Course upon arrival on station. Airmen will have 9 months to complete the course and will

work directly with their supervisor and trainers to annotate progress. Additionally, the WF is responsible for providing limited weather observer training to Luke AFB and Laguna Army Airfield (AAF) ATC personnel.

6.10. Wing Inspection Team (WIT).

6.10.1. 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 through the 56 OSS Self-Assessment Program Manager.

Chapter 7

RESOURCE PROTECTION

7.1. General. This section details actions completed by the WF to provide resource protection to Luke AFB. Specific rules governing format, issuing, amending, extending, and cancelling WWAs can be found in DAFMAN15-129.

7.2. Delineation of Duties.

7.2.1. The WF is responsible for issuing all forecasted and observed WWAs. The Davis-Monthan WF can issue forecasted and observed WWAs when the WF does not have the capability (i.e., communication outage); however, the on-duty Luke WF weather technician must remain informed.

7.3. Unit Requirements.

7.3.1. Units are responsible for coordinating additional weather support pertinent to their mission with the WF as documented through the IDP. Units can submit requests via email through the WF org box at **56OSS.OSW@us.af.mil**.

7.4. WWAs.

7.4.1. WWAs are crucial to the protection of resources and personnel from weather. The sections below describe and define each WWA while **Attachment 2** has a list of the current WWAs for Luke AFB.

7.4.2. Weather Watches. A watch notifies Luke AFB of **potential** environmental conditions that meet an intensity threshold, 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 meeting an intensity threshold 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 nautical miles (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 or is occurring. 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 MEF during 56 FW flying hours.

7.5. WWA Dissemination & Notification Chain.

7.5.1. The WF will use IWWC 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. Operational Report-3 (OPREP-3).

7.6.1. The WF submits weather data when notified by the Luke CP for OPREP-3 reporting. The WF keeps procedures on hand to comply with this directive.

7.7. SWAP.

7.7.1. SWAP ensures that enough resources are available to provide the 56 FW with proper weather support during any severe weather outbreak. The WF will initiate the Severe Weather Action Team when severe weather thresholds are forecasted to occur and/or occurring. See **Attachment 2**, **Table A2.3** for severe weather criteria.

7.8. Mishap Procedures.

7.8.1. 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 times requested. Once the required information is gathered, it is delivered to the 56 FW Flight Safety Office for incorporation into Safety Investigation Boards. **Note:** Flying squadrons requesting weather data for investigation purposes should go through Flight Safety. Direct inquiries to the WF will be referred to the Flight Safety Office, however, access to unclassified weather material will not be denied. Questions should be funneled to Flight Leadership.

Chapter 8

RECIPROCAL SUPPORT

8.1. General.

8.1.1. This chapter outlines how the WF provides support to both 56 FW flying and non-flying units. The WF communicates with other base agencies to identify and document specific operational weather impacts and limitations, as well as action taken based on weather impacted. Updated forecasts and weather products are available to base agencies upon request. Any questions or changes regarding weather support will be directed to WF leadership.

8.2. 56 FW & Staff Agencies.

8.2.1. The 56 FW is the primary source of how the WF conducts/supports weather communication, safety, and procedures for Luke AFB and associated assets. DAFI10-2501, *Emergency Management Program,* is implemented into local guidance on installation severe weather preparedness, capabilities, requirements, and procedures. This guidance is reviewed and updated no less than annually.

8.2.1.1. Luke AFB CP accomplishes the tasks below:

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

8.2.1.1.2. Disseminates WWA notifications according to Quick Reaction Checklists and notifies the WF of updates as needed for the notification chain outlined in **Figure A2.1** "Weather Watch/Warning Dissemination Matrix" and **Figure A2.2** "Weather Advisory Decision Matrix".

8.2.1.1.3. Requests OPREPs involving any weather events impacting operations at Luke AFB (e.g., aircraft mishaps and natural disasters).

8.2.1.1.4. Provides orientation briefs upon request.

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

8.2.1.1.6. Notifies WF when 56 FW assets require support when previously not identified within the daily schedule.

8.2.1.2. 56 FW PA. PA coordinates community group tours of the WF and assists with photography requests in support of weather operations. PA will handle weather requests from non-DoD or other non-government affiliated agencies (i.e., insurance companies, news agencies, etc.). Refer all such requests to the PA office.

8.2.1.3. 56 FW Plans & Programs (IGP). IGP coordinates Wing Contingency Plans through WF leadership prior to publishing.

8.2.1.4. 56 FW Safety (SE). SE accomplishes the tasks below.

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

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

8.2.1.4.3. Coordinates messages containing references to weather.

8.3. 56th Operations Group (56 OG).

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 56 OG 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). Provide at least two duty 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 MWPs to WF leadership and the organization box.

8.3.2.5. 944th OG Det 2. 944th OG Det 2 is a reserve flying unit assigned to the 944th FW, stationed at Luke. All weather support to this unit will follow the same guidance that is given to 56 FW flying squadrons.

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.

8.3.3.3. Requests weather data that supports 56 FW aircraft-related investigations.

8.3.4. 56 OSS.

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

8.3.4.1.1. Immediately notifies WF of all aircraft emergencies, incidents, or accidents (i.e. in-flight emergencies (IFEs) and aircraft ground mishaps).

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

8.3.4.3.3. Provides orientation brief upon request.

8.3.4.3.4. Requests local weather training coordination.

8.3.4.3.5. Provides input for the CWW as outlined in **paragraph 4.6**.

8.3.4.3.6. Provides initial ATC indoctrination.

8.3.4.3.7. Relays PIREPs within 5 minutes of receipt.

8.3.4.4. Radar, Airfield, and Weather Systems (RAWS). RAWS accomplishes the tasks below:

8.3.4.4.1. Provides routine and emergency maintenance on FMQ-19, TMOS, and Micro Weather Sensor 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. 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. 56 CS. 56 CS fulfills roles and responsibilities pertaining to server maintenance IAW 24-AF-AF/A3W-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. 56 CES. 56 CES provides emergency backup power to 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. 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. 607th Air Control Squadron (607 ACS).

8.6.1. The 607 ACS is the principal ground control radar support unit for the 56 FW and 944 FW at Luke AFB, the 355th Wing and 162 FW from Tucson and other aircraft operating in local airspace. The 607 ACS conducts formal undergraduate weapons director qualification training and initial qualification training for five ACS crew positions.

8.6.2. The 607 ACS maintains a Radar dish that is susceptible to winds greater than 35knots (kts hereafter). As a result, the WF will accomplish the following:

8.6.3. During duty hours (M-F 0700-1600) forecasters will call the 607 ACS no later than (NLT) 150 minutes prior to the expected onset of 40kt winds sustained or gusts. During non-duty hours, forecasters will call the standby number at 602-828-1138. Ensure time of notification, name person contacted, and the information provided is logged.

8.7. Gila Bend Air Force Auxiliary Airfield (GBAFAF).

8.7.1. See **Chapter 9** for information on GBAFAF.

8.8. Laguna Army Airfield.

8.8.1. The WF will serve as the focal point of training for Laguna AAF Tower personnel and will provide a practical training program to certify Laguna AAF air traffic controllers as limited weather observers. WF will also make a site visit to Laguna AAF to recertify and/or update visibility markers yearly.

8.8.2. Laguna AAF Tower personnel will maintain training dates for tower personnel and notify the 56 OSS/OSW NLT 30 days from currency expiration to allow for training.

8.8.3. Laguna AAF Tower personnel will contact the 56 OSS/OSW NLT 30 days prior to visibility aids/charts expiration to ensure no breaks in continuity or when changes occur on the airfield (in respect to visibility markers).

8.9. All Other Weather Support Recipients.

8.9.1. Notifies WF of problems with JET equipment.

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

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

Chapter 9

GILA BEND AIR FORCE AUXILARY AIRFIELD (GBAFAF)

9.1. General.

9.1.1. This chapter outlines and defines responsibilities and establishes procedures for cross-communication and weather support between Gila Bend Air Force Auxiliary Airfield (GBAFAF) Weather Personnel and 56th OSS Weather Flight.

9.2. GBAFAF Mission.

9.2.1. Gila Bend is an Air Force operated Auxiliary Airfield located approximately 57 miles southwest of Luke AFB. GBAFAF is the preferred alternate/divert location for 56 FW assets. The GBAFAF Weather Office and the WF provide and arrange weather support to the 56 FW and all associated units assigned to and located at Luke AFB. Additionally, numerous units utilize GBAFAF, while operating in the Barry M. Goldwater Range (BMGR). Primary supported airframes include F-16s, F-35s, and A-10s (See Figures A10.1-A10.4 "Luke AFB's F-35 Mission Criteria & Luke AFB's F-16 Mission Criteria" for flying weather impacts).

9.3. GBAFAF Weather Office Hours of Operation.

9.3.1. The GBAFAF Weather Office is a limited duty station with operating hours dictated by the Barry M. Goldwater East flying schedule, with special consideration for the 56 FW flying schedule.

9.3.2. Based on BMGR East/56 FW flying schedule, weather technicians are available 30 minutes prior to first range mission time or 15 minutes prior to first take off, until the last Luke AFB land time or 15 minutes after last range time, whichever is latest. Weather technicians are not required to be on station after the airfield has closed for the duty day. Weather Observer Technicians provide coverage between the hours of 0730-2330 weekdays and 0800-1700 one weekend a month; however, these hours may vary based on flying schedule mentioned above. They are also required to support operations outside of these hours at the direction of the 56th Range Management Office (56 RMO).

9.4. Responsibilities.

9.4.1. Weather Technicians communicate weather information to Gila Bend ATC Tower, ECC, Luke AFB, the 557 WW, and other operational users within the 56 FW. Additionally, GBAFAF Weather Technicians infuse elements of weather observing, and WWA roles to function as the "eyes forward" for the 557 WW.

9.4.1.1. Meteorological Services provided:

9.4.1.2. Observation Services. Weather Technicians provide a BWW during airfield operating hours at GBAFAF. The BWW includes surface weather observations taken on the hour (record) and as required by the criteria in AFMAN15-111. Observations are recorded by FMQ-23 and disseminated both longline and locally through the Joint Environmental toolkit (JET) software.

9.4.1.3. WWAs. Weather Technicians will issue or cancel, as appropriate, WWAs according to AFMAN15-129, and LAFBI15-101. Criteria for issuance shall be as required

in LAFBI15-101. GBAFAF weather personnel will notify the WF of any issued/canceled observed WWAs within 10 minutes of issuing or cancelling.

9.4.1.4. Eyes Forward Support is performed to assist the WF mission watch the area and update the mission execution forecast products for Luke flying operations during local flying. GBAFAF weather immediately notifies the WF of the occurrence of surface winds $\geq$ 25, 30, 35, and 50 kts, lightning, and thunderstorms, mammatus and cumulonimbus cloud types, as well as the following: ceilings form or dissipate below 3,000 ft above ground level (AGL); surface obscurations such as blowing dust are observed; any size hail occurs; one inch of rain or greater accumulation; and whenever a tornado or funnel cloud is observed.

9.4.1.5. Meteorological Watch. Weather Technicians conduct a BWW during all hours of operation for GBAFAF according to the guidance in AFMAN 15-111, DAFMAN 15-129, and LAFBI 15-101. Pertinent information is relayed within 10 minutes when no other duty priorities are required, to the 557 WW, 56 OSS/OSW, all open manned ranges, Range Operations Control Center, Security Forces, ECC and COR.

9.4.1.6. Outage Reports. Weather Technicians continually monitor the operational status of all meteorological and weather communications equipment fixed at GBAFAF. Contractors report equipment outages to 56 OSS/OSW. Equipment problems are logged out and contractor developed restoration priorities are accomplished.

9.4.1.6.1. During outages the contractor shall notify 56 OSS/OSW, 557 WW, or any other operational AF weather unit to request dissemination of the GBAFAF weather observations in the AWN. Observations shall be manually taken and disseminated using AFWEBS as the primary dissemination system.

9.5. 56 OSS WF Responsibilities.

9.5.1. 56 OSS WF acts as a Weather Focal Point for GBAFAF weather technicians. 56 OSS WF relays GBAFAF weather conditions and issued observed advisories, watches, and warnings to all affected 56 FW flying assets. Additionally, 56 OSS/OSW provides a GBAFAF forecast within the Mission Execution Forecast (MEF) up to three times daily. The initial forecast is issued 30 minutes prior to the first brief time of the day as annotated in GTIMS. The second forecast is issued at 2100Z. WF personnel will call and collaborate the second forecast with GBAFAF personnel NLT 2030Z. A third forecast will be issued if required to due to late flying, NLT 0500Z.

9.5.2. The WF provides backup support during outages. In the event of a communications outage, 56 OSS/OSW can disseminate GBAFAF weather information and relay it to affected base agencies.

9.5.3. Training. WF will serve as a focal point of training for GBAFAF weather personnel if needed. WF will provide a practical training program to recertify GBAFAF weather technicians as weather observers when manning is available.

9.5.3.1. Training consists of hands-on training and Computer Based Training modules. GBAFAF weather technicians will be recertified on conducting automated and manual observations, augmentation and supplementation procedures, and back-up procedures.

9.5.3.2. If the WF conducts recertification training, they will maintain training records and notify GBAFAF weather technicians of recertification dates and training requirements.

9.5.3.3. Training dates are confirmed with the WF Training Manager.

9.5.3.4. The WF will also provide a practical training program to certify GBAFAF air traffic controllers as limited weather observers and establish a CWW program.

9.5.3.5. The WF will recertify and validate GBAFAF visibility charts. GBAFAF weather technicians will contact the WF NLT 30 days prior to visibility aids/charts expiration to ensure no breaks in continuity or when changes occur on the airfield (in respect to visibility markers).

JASON M. RUESCHHOFF
Brigadier General, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 33-322, *Records Management and Information Governance Program*, 23 March 2020

AFMAN 11-202V3, *Flight Operations*, 10 January 2022

AFMAN 11-2F-16V3, *F-16 Operations Procedures*, 4 February 2020

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AFVA 91-209, *Air Force Occupational Safety and Health Program*, 14 October 2016

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DAFI 10-2501, *Emergency Management Program*, 16 October 2023

DAFMAN 15-129, *Air and Space Weather Operations*, 7 September 2023

LUKEAFBI 13-204, *Airfield Operations and Base Flying Procedures*, 18 November 2021

LUKEAFBI 15-101, *Weather Support*, 25 February 2022

Luke AFB 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, *Mishap Response Plan*, 12 November 2020

Adopted Forms

DAF Form 847, *Recommendation for Change of Publication*

DD Form 175-1, *Flight Weather Briefing*

Abbreviations and Acronyms

ADS—Automated Data System

AFAS—Airfield Automation System

GBAFAF—Gila Bend Air Force Auxiliary Airfield

AFB—Air Force Base

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFW-WEBS—Air Force Weather Webpage

AGL—Above Ground Level

AMOS—Automated Meteorological Observation System

AOL—Alternate Operating Location

AOR—Area of Responsibility

ATC—Air Traffic Control

BIFROST—Bridging Environmental Intelligence for Responsive Operational Support Portal

BWW—Basic Weather Watch

CES—Civil Engineering Squadron

CONUS—Continental United States

COOP—Continuity of Operations

CP—Command Post

CS—Communications Squadron

CWW—Cooperative Weather Watch

ENTLN—Earth Network's Total Lightning Network

FLIP—Flight Information Publication

FS—Fighter Squadron

FW—Fighter Wing

FWB—Flight Weather Briefs

GTIMS—Graduate Training Information Management Systems

HF—High Frequency

IAW—In Accordance With

IDP—Installation Data Page

IRC—Instrument Refresher Course

JET—Joint Environmental Toolkit

KTS—Knots

LAN—Local Area Network

LFE—Large Force Employment

LOCAL—Aviation Selected Local Weather Report

MEF—Mission Execution Forecast

METAR—Aviation Routine Meteorological Report

METOC—Meteorological & Oceanographic

METWATCH—Meteorological Watch

MOA—Military Operating Area

MOC—Maintenance Operations Center

MWP—Mission Weather Product

MWS—Micro Weather Sensor

NEXRAD—Next Generation Radar

NLDN—National Lightning Detection Network

NLT—No Later Than

NM—Nautical Mile(s)

OG—Operations Group

OPR—Office of Primary Responsibility

OPREP—Operational Report

OPVER—Operations Verification

OSS—Operations Support Squadron

OWS—Operational Weather Squadron

PA—Public Affairs

PIREP—Pilot Report

PK WND—Peak Wind

PRESFR—Pressure Falling Rapidly

PRESRR—Pressure Rapidly Rising

RAPCON—Radar Approach Control

RVR—Runway Visual Range

SM—Statute 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

TMOS—Tactical Meteorological Observing System

UHF—Ultra High Frequency

UA—Unsolicited Advisory PIREP

UUA—Urgent Unsolicited Advisory PIREP

VIS—Visibility

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 WF personnel 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 collects information from other sources and disseminates as needed.

Desired Lead Time—The total amount of time required to disseminate a forecast WWA 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 Weather Flight and 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.

Severe Thunderstorm—A thunderstorm presenting a threat to lives or property that requires agencies to enhance resource protection measures. Thunderstorms producing hail greater than or equal to 3/4-inch diameter and/or surface wind greater than or equal to 50 kts is considered severe.

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

Attachment 2

LUKE AFB WWA FORMAT, DISSEMINATION, & LIST OF CURRENT WWAS

A2.1. WWA Format Elements.

A2.1.1. **Format of Line 1:** Each WWA contains the WWA type and a five-digit ID number. The first two digits of the ID number represent the month (MM) and the last three represent the order of the watch, warning, or advisory (i.e., the tenth warning issued in April would be represented as Warning #04-010).

A2.1.2. **Format of Line 2:** Each WWA will be listed with its individual Valid Times. The format of the valid times for forecasted WWAs is "Valid DD/HHmmZ (DD/HHmmL) to DD/HHmmZ (DD/HHmmL). For observed WWAs, the format is "Valid DD/HHmmZ (DD/HHmmL) to UFN".

A2.1.3. **Format of Line 3:** Text of the WWA. Each WWA provides a detailed explanation to the watch, warning or advisory and any additional remarks required (i.e., maximum value expected).

Figure A2.1. Weather Watch Example.

```
Weather Watch 09-012 or Luke AFB (KLUF)
Valid 22/0645Z (21/2345L) to 22/1400Z (22/0700L)
Potential for Hail >= 1/2 but < 3/4 in.
```

Figure A2.2. Weather Warning Example.

```
Weather Warning 07-001 for Luke AFB (KLUF)
Valid 12/1545Z (12/0845L) to UFN
Observed Lightning occurring within 5 nm. of the runway complex
```

Figure A2.3. Weather Advisory Example.

```
Weather Advisory 12-009 for Luke AFB (KLUF)
Valid 11/1330Z (11/0630L) to UFN
Observed F-16 ICE FOD Conditions potential exists Temperature <= 7 C. (45F) with DPD <=5C (9F)
```

Figure A2.4. Weather WWA Blank Example.

```
Weather [TYPE] MM-### for Luke AFB (KLUF)
Valid DD/HHMmmZ (DD/HHmmL) to DD/HHMmmZ (DD/HHmmL)
Forecasted or Observed phenomina. If observed, end time will reflect as UFN.
```

A2.2. WWA Dissemination.

A2.2.1. **Watches, Warnings, & Advisories:** The Luke Weather Flight will issue all WWAs for Luke AFB unless a COOP has been activated. If a COOP has been activated, the Luke Weather Flight will issue all Observed WWAs, and the Davis-Monthan Weather Flight will issue all Forecasted WWAs.

Table A2.1. Weather Watch/Warning Dissemination Matrix.

Watches and warnings are issued to the following agencies through IWWC. If IWWC is not operational, backup calls will be made to the following agencies: Tower, RAPCON, SOF, Command Post, MOCC, and Airfield Operations. The Command Post, MOCC, and Airfield Operations further disseminate based on the matrix below. Note: Airfield Operations only notifies via the secondary crash net and tower net for warnings, not for watches.			
IWWC	**SOF**	**56 FW Command Post**	**MOCC**
• Tower • RAPCON • SOF • Command Post • MOCC • Base Operations		Via ENS: • CE Service Desk • Airspace Management • MOCC • Flying Squadrons • Contracting • Comm MOCC • F-16 Simulator (bldg 940, 938, 500, ACES) • 607 ACS • Security Forces • Airfield Management Ops • Ground Safety • Fuel Shop • EOD • DRMO • Fire Department • Gila Bend Range Ops • Gila Bend Base Ops • Golf Course • Swimming Pools • Fitness Center • Group CC Offices (during duty hrs only): ○ OG/CC ○ MSG/CC ○ MXG/CC ○ MDG/CC • Via CC's net (during flying hrs only): ○ FW/CC ○ FW/CV ○ OG/CC ○ MSG/CC ○ MXG/CC ○ MDG/CC For winds > 50 kts and/or TS w/in 5 miles Broadcast over All Call	Via all nets and/or ENS, as applicable: • MOS/CC • 56 AMX • 756 AMX • MXG/QA • POL • ACMI • Egress Shop • Fuel Shop • Munitions Control • EOR North • Transient Alert • FTD • WLT • CMS Pro-Super • EMS Pro-Super • F-16 AIS • Comptroller • Sensors Shop • PMEL

Table A2.2. Weather Advisory Dissemination Matrix.

Advisories are issued to the following agencies through IWWC. If IWWC is not operational, backup calls will be made to the following agencies: Tower, RAPCON, SOF, Command Post, MOCC, and Airfield Operations. The Command Post and MOCC further disseminate based on the matrix below.			
IWWC	**SOF**	**56 FW Command Post**	**MOCC**
• Tower • RAPCON • SOF • Command Post • MOCC • Base Operations		• Via CC's net (during flying hrs only): ○ FW/CC ○ FW/CV ○ OG/CC ○ MSG/CC ○ MXG/CC ○ MDG/CC • Via ENS: For winds 25 kts or greater: • Comm MOC • Airfield Management Ops • CES Services Desk • 607 ACS • Fire Department • Security Forces • Airspace Management • MOC Thunderstorms w/in 25 NM: • Comm MOC • CE Services Desk • Airfield Management Ops • 607 ACS • Fire Department • Security Forces • Airspace Management • MOC • Fitness Center • Swimming Pools • Golf Course • F-16 Flight Sim (bldg 940, 938, 500, ACES)	Via all nets and/or ENS, as applicable: • MOS/CC • 56 AMX • 756 AMX • MXG/QA • POL • ACMI • Egress Shop • Fuel Shop • Munitions Control • EOR North • Transient Alert • FTD • WLT • CMS Pro-Super • EMS Pro-Super • F-16 AIS • Comptroller • Sensors Shop PMEL

A2.3. Current list of WWAs for Luke AFB.

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

Weather Advisories		
Advisory Type	**Forecast/Observed**	**Desired Lead Time**
Surface Winds	Forecasted Surface Winds ≥ 25 but < 35 knots	30 minutes
Thunderstorms**	Observed Lightning or Thunderstorms are occurring within 35 NM of the airfield	Observed
Thunderstorms**	Observed Lightning or Thunderstorms are occurring within 25 NM of the airfield	Observed
Thunderstorms**	Observed Lightning or Thunderstorms are occurring within 10 NM of the airfield	Observed
Ice FOD F-16**	Observed Ice FOD Conditions occurring (Temp less than or equal to 7°C with dewpoint spread less than 5°C)	Observed
Crosswinds**	Observed Crosswinds ≥ 10 but < 15 knots including gusts at Luke AFB (with RSC wet)	Observed
Crosswinds**	Observed Crosswinds ≥ 15 but < 20 knots including gusts at Luke AFB	Observed
Crosswinds**	Observed Crosswinds ≥ 20 but < 25 knots including gusts at Luke AFB	Observed
Crosswinds**	Observed Crosswinds ≥ 25 knots Including gusts at Luke AFB	Observed
Turbulence**	Observed CAT II Severe or Greater Turbulence occurring from the surface to 10kft AGL	Observed
Icing**	Observed Moderate or Greater icing occurring from the surface to 10kft AGL	Observed
Wind Shear**	Observed Low Level Wind Shear occurring	Observed
Thermal Stress**	Observed Index of Thermal Stress Caution	Observed
Thermal Stress**	Observed Index of Thermal Stress Danger	Observed
Chill Stress**	Observed Chill Index Caution Less than 15°F	Observed
Chill Stress**	Observed Chill Index No Fly Zone less than -25°F	Observed
**Issued during Wing flying hours only		

Table A2.4. Forecast Weather Watches for Luke AFB.

Weather Watches		
Watch Type	**Forecast**	**Desired Lead Time**
Freezing Precipitation**	Potential for Freezing Precipitation exists	As Potential Warrants
Damaging Hail**	Potential for Damaging Hail ≥ 3/4 in	As Potential Warrants
Large Hail	Potential for Large Hail ≥ 1/2 but < 3/4 in	As Potential Warrants
Heavy Rain**	Potential for Heavy Rain ≥ 1 in within 6 hours; Flooding is possible.	As Potential Warrants
Lightning+	Potential for Lightning or Thunderstorms within 25 NM of the airfield	30 minutes
Lightning	Potential for Lightning within 5 NM of the airfield	30 minutes
Damaging Winds**	Potential for Damaging Winds ≥ 50 kts	As Potential Warrants
Tornado**	Potential for Tornado or Funnel Cloud exists	As Potential Warrants
**Denotes SWAP criteria +Denotes only forecasted during active flying hours		

Table A2.5. Forecast/Observed Weather Warnings for Luke AFB.

Weather Warnings		
Warning Type	**Forecast/Observed**	**Desired Lead Time**
Freezing Precipitation**	Freezing Precipitation expected	60 minutes
Damaging Hail**	Forecasted Damaging Hail ≥ 3/4 in	60 minutes
Large Hail**	Forecasted Large Hail ≥ 1/2 but < 3/4 in	60 minutes
Heavy Rain**	Forecasted Heavy Rain ≥ 1 in within 6 hours; Flooding is possible.	60 minutes
Damaging Winds**	Forecasted Damaging Winds ≥ 50 kts	120 minutes
High Winds	High Winds ≥ 35 but < 50 kts	30 minutes
Lightning	Observed Lightning within 5 NM of the airfield	Observed
Tornado**	Tornado or Funnel Cloud expected	30 minutes
**Denotes SWAP criteria		

Attachment 3

SPECIAL OBSERVATION CRITERIA

A3.1. SPECI observations.

A3.1.1. SPECI observations will be taken and disseminated IAW AFMAN 15-111 and the DoD Flight Information Publications (FLIP). A SPECI observation will be taken when any of the following conditions start or end.

Table A3.1. Category Definition.

Category Meaning	
All Categories have been labeled IAW AFMAN11-202 Vol3	
Category	**Meaning**
E	Aircrew must file for an alternate if forecast conditions are less than 2000/3
D	Airfield qualifies as an alternate
C	Airfield qualifies as an alternate
B	Airfield does not qualify as an alternate for flight planning but is still suitable for arrival provided a suitable alternate is available
A	Airfield is not a suitable destination

Table A3.2. Ceiling.

SPECI Ceiling Criteria		
Ceiling: If the ceiling is If the ceiling is observed less than, or if below, increased to equal to or exceeds the below criteria, a SPECI observation will be issued.		
Ceilings	**Reference**	**Category**
GTE 13,000FT	LAFBI13-204	E
LT 13,000FT but GTE 8,000FT	LAFBI13-204	E
LT 8,000FT but GTE 6,000FT	LAFBI13-204	E
LT 6,000FT but GTE 4,000FT	LAFBI13-204	E
LT 4,000FT but GTE 3,000FT	LAFBI13-204	E
LT 3,000FT but GTE 2,500FT	AFI11-2f-35v3; AFMAN15-111	E
LT 2,500Ft but GTE 2,000FT	LAFBI13-204	E
LT 2,000FT but GTE 1,500FT	AFI11-2f-35v3; AFI11-2f-16v3; AFMAN15-111; AFI11-202v3; DAFMAN 15-129	D
LT 1,500FT but GTE 1,000FT	AFI11-2f-35v3; AFI11-2f-16v3; AFMAN15-111; DAFMAN15-129	D
LT 1,000FT but GTE 800FT	AFI11-202v3; AFMAN15-111; DAFMAN 15-129	C
LT 800FT but GTE 700FT	LAFBI13-204; AFI11-202v3; AFMAN15-111; DAFMAN15-129	C
LT 700FT but GTE 500FT	AFMAN15-111	B

LT 500FT but GTE 300FT	LAFBI13-204; AFI11-202v3; AFI11-2f-16v3; AFMAN15-111	B
LT 300FT but GTE 200FT	AFMAN15-111; DAFMAN 15-129	B
LT 200FT but GTE 100FT	LAFBI13-204; AFMAN15-111; DAFMAN 15-129	A
LT 100FT	AFMAN 15-111	A

Table A3.3. Visibility.

SPECI Visibility Criteria		
Visibility: Once Observed less than, or if below, increased to equal to or exceeds the below criteria, a SPECI will be issued.		
Visibility	**Reference**	**Category**
GTE 5SM(8000M)	LAFBI 13-204; AFI 11-202v3; AFI 11-2f-35v3; AFI 11-2f-16v3;	E
LT 5SM(8000M) but GTE 3SM	LAFBI 13-204; AFI 11-202v3; AFI 11-2f-35v3; AFI 11-2f-16v3; DAFMAN 15-129	E
LT 3SM (4800M) but GTE 2SM	AFI 11-202v3; AFI 11-2f-16v3; AFI 11-2f-35v3; AFMAN 15-111; DAFMAN 15-129	D
LT 2SM (3200M) but GTE 1 1/2SM	AFI 11-202v3; LAFBI 13-204; AFMAN 15-111; DAFMAN 15-129	B
LT 1 1/2SM(2400M) but GTE 1SM	AFI 11-202v3; AFI 11-2f-16v3; AFMAN 15-111	B
LT 1SM(1600M) but GTE 3/4SM	AFMAN 15-111	B
LT 3/4SM(1200M) but GTE 1/2SM	AFMAN 15-111	B
LT 1/2SM(800M) but GTE 1/4SM	LAFBI 13-204; AFMAN 15-111; DAFMAN 15-129	A
LT 1/4SM	AFMAN 15-111	A

Table A3.4. SPECI RVR Criteria.

SPECI RVR Criteria	
Runway Visual Range (RVR). Reported whenever the prevailing visibility is first observed less than 1SM and again when is becomes greater than 1SM. The highest value during the preceding 10 minutes from the designated RVR runway must decreases 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.	
Criteria	**Reference**
6,000 feet	AFMAN 15-111, DOD FLIP
5,000 feet	AFMAN 15-111
4,000 feet	DOD FLIP
2,400 feet	AFMAN 15-111
2,000 feet	AFMAN 15-111

Table A3.5. SPECI Criteria – Other Weather Elements.

SPECI Criteria – Other Weather Elements	
Other Weather Elements. Special observations will be taken when any elements within this table occur, or when they stop occurring.	
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 **Note:** 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. **Note:** 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 the beginning or ending of one type while another is in progress (e.g., snow changing to rain and snow).	AFMAN 15-111
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.	AFMAN 15-111

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. **Note:** 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

METAR, SPECI, & LOCAL DEFINITION, DISSEMINATION, & EXAMPLE

A4.1. METAR, SPECI, & LOCAL Definition.

A4.1.1. Aviation Routine Weather Report (METAR). A METAR is a routine scheduled observation as well as the primary observation code used by the United States. METARs will be disseminated in between the 55th and 59th minute of every hour.

A4.1.2. Aviation Selected Special Weather Report (SPECI). A SPECI is an unscheduled observation completed and transmitted when any of the special criteria are observed or sensed.

A4.1.3. Aviation Selected Local Weather Report (LOCAL). A LOCAL is an unscheduled observation, reported to the nearest minute, not meeting SPECI criteria.

A4.2. Dissemination Procedures.

A4.2.1. All METARs and SPECIs will be disseminated through JET and should be available to all users within three minutes of dissemination either through JET, the Aviation Weather Center, or other applications that collect and disseminate METAR Data such as ForeFlight.

A4.2.2. LOCAL observations will not be transmitted off of JET and will not be accessible from services such as the Aviation Weather Center.

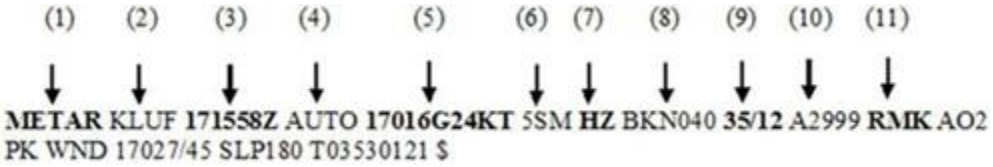
A4.2.3. If JET is down and not disseminating METARs and SPECIs the Weather Flight will upload them through AFWWEBS.

A4.2.4. If for any reason METARs and SPECIs are not being transmitted off of the Air Force Network, but are still available via JET, these will be considered disseminated.

A4.3. METAR Example.

A4.3.1. This attachment provides example format for METAR and SPECI observations.

Figure A4.1. Example Observation.



A4.4. Observation Format.

A4.4.1. **(1) Type of report.** Either an Aviation Routine Weather Report (METAR) or Special Observation (SPECI).

A4.4.2. **(2) Station Identifier.** A four-letter identifier used to identify the observing location (KLUF is the Luke AFB identifier)

A4.4.3. **(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.

A4.4.4. **(4) Report Identifier.** This will either state AUTO or will be blank. AUTO identifies the report as fully automated with no human intervention.

A4.4.5. **(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.

A4.4.6. **(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.).

A4.4.7. **(7) Present Weather Group.** Any weather phenomenon that is occurring on the airfield. This is mandatory anytime the visibility is less than 7 SM.

A4.4.8. **(8) Sky Condition.** Cloud bases in hundreds of feet Above Ground Level (AGL).

A4.4.9. **(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.

A4.4.10. **(10) Altimeter Setting.** Measured in inches of mercury.

A4.4.11. **(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

PIREP DEFINITION, REQUIREMENTS, DISSEMINATION & EXAMPLE

A5.1. PIREP Definition.

A5.1.1. A PIREP is a report of in-flight weather provided by an aircraft crewmember.

A5.1.2. For a better understanding of PIREP format and what can be encoded within a PIREP, please refer to AFMAN15-124 (16 Jan. 2019) **Chapter 2** (Pages 21 – 32).

A5.2. PIREP Requirements.

A5.2.1. 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. If these elements are not available for the PIREP, it will not be transmitted longline.

A5.3. PIREP Dissemination.

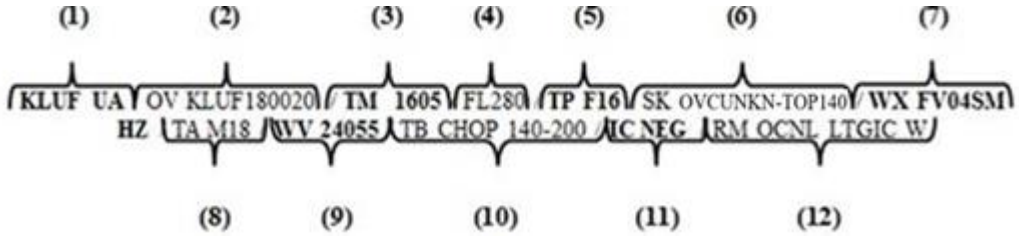
A5.3.1. All PIREPs received by the WF that meet the standard dissemination criteria will be disseminated longline through JET. Back-up options include using the AFW-WEBS Alphanumeric upload option.

A5.3.1.1. All PIREPs received by the WF that do not meet the standard dissemination criteria outlined but are significant to flying operations and flight safety will be verbally passed along to aircrews, ATC agencies/SOF.

A5.4. PIREP Example.

A5.4.1. **Figure A5.1** is decoded on the next page with brief explanations. (see next page)

Figure A5.1. Example PIREP Decoding.



A5.4.1.1. **(1) Transmitting Organization & Type of Report:** KCCC identifier of transmitting organization (KLUF) followed by the type of PIREP, UA for Routine PIREP, or UUA for Urgent PIREP.

A5.4.1.2. **(2) Location of Aircraft:** e.g., OV KLUF180020 (20 nautical miles south of Luke AFB).

A5.4.1.3. **(3) Time:** The time the weather phenomenon was encountered or occurred, e.g., 1605 Zulu.

A5.4.1.4. **(4) Flight Level:** Flight Level, in hundreds of feet above mean sea level (MSL), when the phenomenon was first encountered, e.g., FL280 (28,000FT MSL).

A5.4.1.5. **(5) Type of aircraft:** If unknown UNKN will be entered. In this example an F-16 reported the weather phenomena and was reported as TP F16.

A5.4.1.6. **(6) Sky Cover:** SK is the sky cover and heights of clouds experienced by the aircraft formatted as [Condition][Base]-Top [Tops]. Base and tops are reported in hundreds of feet above mean sea level (MSL). This example is OVCUNKN-TOP140, UNKN for unknown cloud bases, OVC for overcast clouds, tops of clouds at 14,000 MSL.

A5.4.1.7. **(7) Weather in Flight:** This data depicts the weather experience to include flight visibility (FV), e.g., flight visibility 4 statute miles in haze is encoded as WX FV04SM HZ.

A5.4.1.8. **(8) Temperature:** This is the reported outside air temperature, e.g., TA M18 is negative 18 degrees Celsius.

A5.4.1.9. **(9) Wind:** This details the wind direction and speed, e.g., wind direct from the southwest, 240 degrees at 55 knots is encoded as WV 24055.

A5.4.1.10. **(10) Turbulence:** TB followed by the intensity of turbulence and its location, in hundreds of feet above MSL. This indicated the aircraft encountered light CHOP turbulence between 14,000 feet and 20,000 feet.

A5.4.1.11. **(11) Icing:** IC followed by the intensity, type, and location. This indicates the aircraft experience no icing.

A5.4.1.12. **(12) Remarks:** 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 is encoded as OCNL LTGIC W.

Attachment 6

TAF DEFINITION, DISSEMINATION, AMMENDMENT CITERIA & EXAMPLE

A6.1. TAF Definition.

A6.1.1. The Terminal Aerodrome Forecast (TAF) is the official forecast of aviation activity for U.S. airports. A TAF is issued starting at 1200Z (0500L) and every 8 hours after that, for as long as the airfield is open. 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.

A6.2. TAF Dissemination.

A6.2.1. The TAF for Luke AFB will be disseminated through JET and should be available to all users within three minutes of dissemination either through JET, the Aviation Weather Center, or other applications that collect and disseminate METAR Data such as ForeFlight.

A6.2.2. If JET is down and not disseminating TAFs, the Weather Flight will disseminate the TAF Through AFWWEBS. It will then be available through other sites and apps such as Aviation Weather Center.

A6.2.3. An hour-by-hour breakdown of the TAF is available on the second page of the Luke MEF.

A6.3. TAF Amendment Criteria.

A6.3.1. The TAF will be amended for any of the following criteria:

A6.3.1.1. Ceiling or Visibility: The ceiling forms or dissipates below or visibility increases or decreases to less than, or if below, increases to equal or exceed the values in **Table A6.1**.

Table A6.1. TAF Ceiling and Visibility Specification and Amendment Criteria.

TAF Ceiling and Visibility 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 3,000FT	GTE 3SM (4800M)
LT 3,000FT but GTE 2,000FT	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)

A6.3.1.2. Other Amendment Criteria: Any weather phenomena that occur or stop occurring outside of their previously forecasted times will cause an amendment to be issued for the TAF. **Table A6.2** provides a list of such phenomena.

Table A6.2. Standard TAF Specification and Amendment Criteria Other Than Ceiling and Visibility.

Standard TAF 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. Remarks. The Luke WF utilizes the following remarks accordingly.

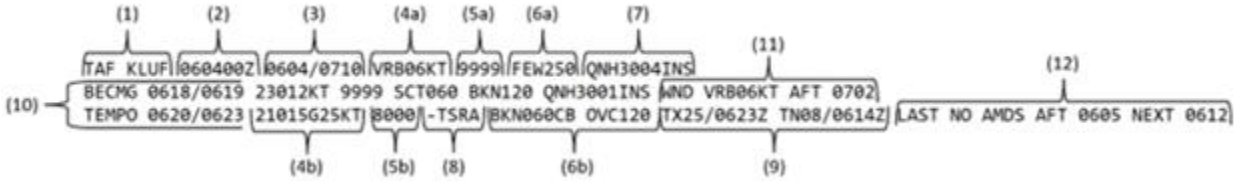
Note: YYGG/YYGG = Date/Time Group.

A6.4.1. Limited METWATCH. The Luke WF 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.

A6.4.2. Last No Amendments. The Luke WF 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.

A6.5. Example TAF Decoding.

Figure A6.1. Example TAF Decoding.



A6.5.1. **Product and Location Identifiers:** TAF followed by the ICAO, which is KLUF for Luke AFB.

A6.5.2. **Time of posting:** In the format DDHHmm (in Zulu Time). This is not included in TAFs produced by the Navy or Marine Corps.

A6.5.3. **Valid Time:** This is the first and last hours the forecast is valid for.

A6.5.4. **Wind direction and speed (a & b):** States wind direction and speed following the DDDssKT format. 4a is an example of wind without a predominant direction. 4b shows gusts added to the wind speed in the format DDDssGssKT.

A6.5.5. **Visibility (a & b):** Reported in meters. 9999 means unlimited visibility, which for most locations is 7SM. Reduced visibility as seen in 5b will be followed by a visibility restrictor. To convert to miles, reference **Table A3.3**. in **Attachment 3**.

A6.5.6. **Sky Condition (a & b):** List the amount of the sky that is covered as well as the height of the base of the clouds in AGL. Coverage is formatted in eighths, with FEW as 1-2, SCT as 3-4, BKN as 5-7, and OVC as 8/8. As shown in 6b, if there are thunderstorms forecasted, a 'CB' will be placed as the base of the storms.

A6.5.7. **Altimeter Setting:** Listed as QNH####INS. It is reported in inches of mercury, and a decimal should be added in the middle of the readout.

A6.5.8. **Weather and/or Obstruction to visibility:** Left out when no weather is expected. Can be started with a + or – to denote either strong or weak weather systems. If weather phenomena are forecasted in a predominant line, the next predominant line must include a NSW (No Significant Weather) remark to denote the end of weather at the station.

A6.5.9. **Temperature:** The forecast for the max and minimum temperature. X denotes maximum, and N denotes minimum. An M will precede the temperature for any negative values. The format is TXxx/DDHHZ TNxx/DDHHZ.

A6.5.10. **Change Group Identifier:** Either a BECMG (becoming) or TEMPO (temporary) for KLUF. The NWS will also use the FM (from), and PROB (probability) groups. The format is CGID DDHH/DDHH (Zulu time). For BECMG lines, the first and second times will denote the period of time where the forecast is transitioning from the previous line to the current. TEMPO indicates a temporary condition that will only occur for less than half of the time between the first and second times on the line. TEMPO groups do not have to have all weather phenomena listed in them, only the ones that are expected to change.

A6.5.11. Inter-TAF Remarks: Placed at the end of the change group line. At Luke, usually used to denote when winds change from a predominant direction to a variable direction.

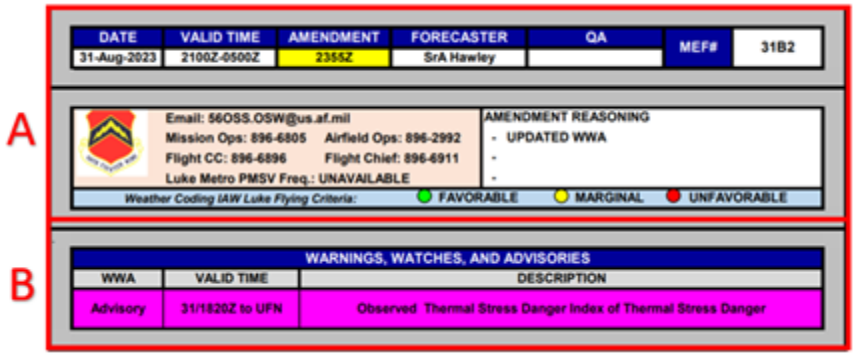
A6.5.12. End-of-TAF Remarks: For KLUF, usually to notate when the weather shop is closing.

Attachment 7

SAMPLE MISSION WEATHER PRODUCTS

A7.1. Mission Execution Forecast (MEF). The MEF is a tailored product with mission specific data for 56FW aircrews. The MEF is characterized into three sections: Luke AFB MEF, Range MEF, and Visual Flying Routes. MEFs can be located on the Weather Web Page. A printable MEF can be obtained by clicking on "Printable Luke MEF" at the top. Figures **A7.1**-**A7.5** provides the MEF sample, format, and decoding.

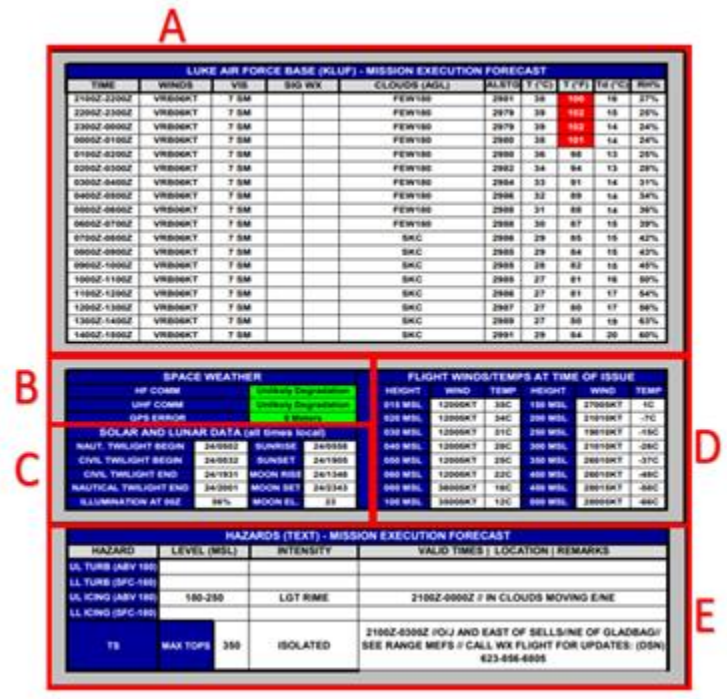
Figure A7.1. MEF, Sample Format, and Decoding (Luke AFB Basic Information).



A. Date, Valid Time (Z) includes COR or AMD as appropriate, forecaster name, QA forecaster, wx flt info, and amendment reasoning

B. Valid Weather Watches, Warnings, and Advisories

Figure A7.2. MEF Sample, Format, and Decoding (Luke Airfield, Space Weather, Solar & Lunar Data, Flight Level Winds & Temperatures, and Flight Weather Hazards).



A. Luke forecast conditions include winds, visibility, significant weather, clouds, Altimeter Setting, Temperature, Dewpoint, and Relative Humidity

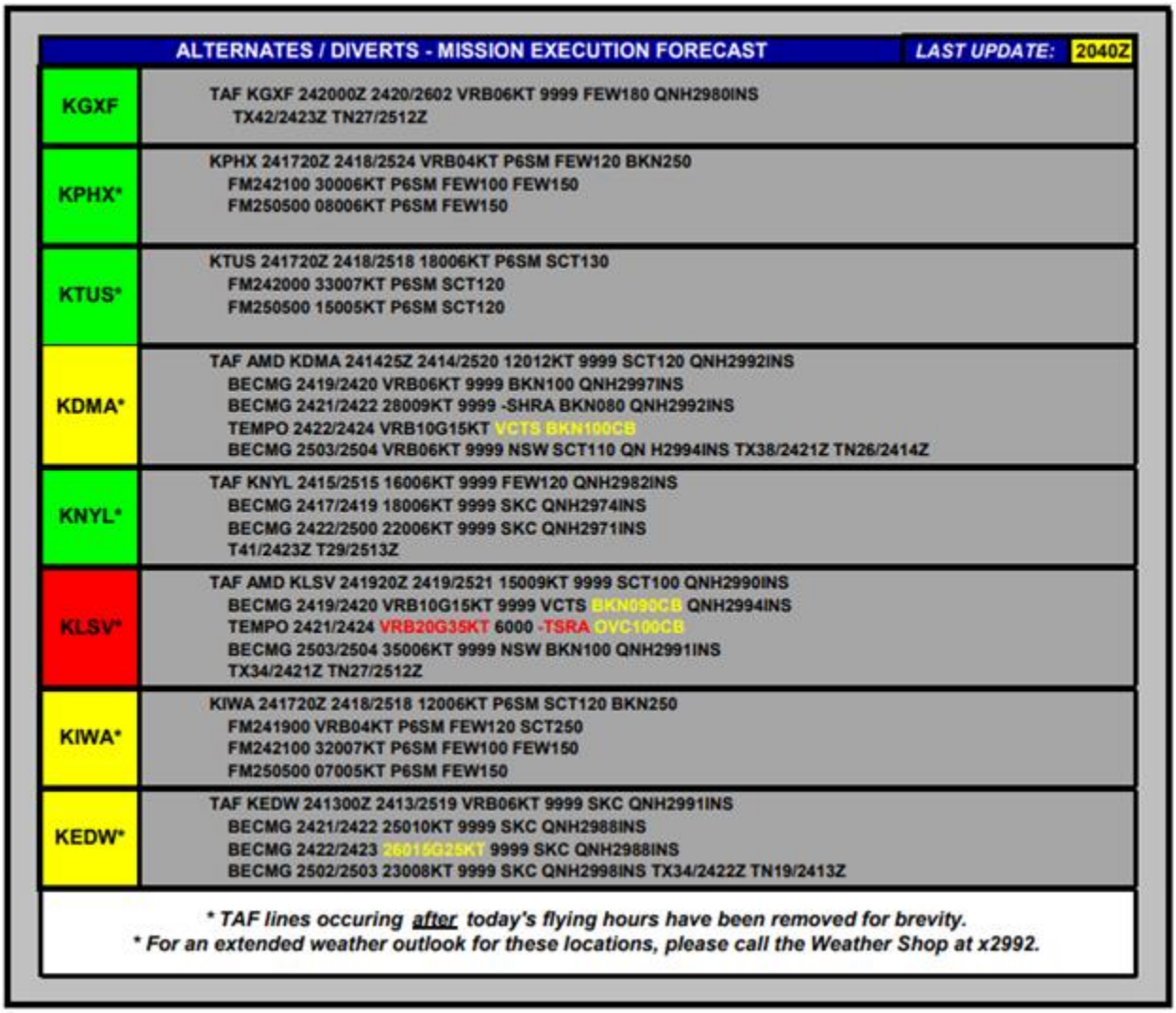
B. Space Weather (HF, UHF, GPS Error)

C. Solar/Lunar Data

D. Flight Level winds and Temps

E. Hazards time forecast (icing and turbulence levels, and thunderstorm intensity (removed hazards map)

Figure A7.3. MEF Sample, Format, and Decoding (Alternate/Divert Location TAFs).



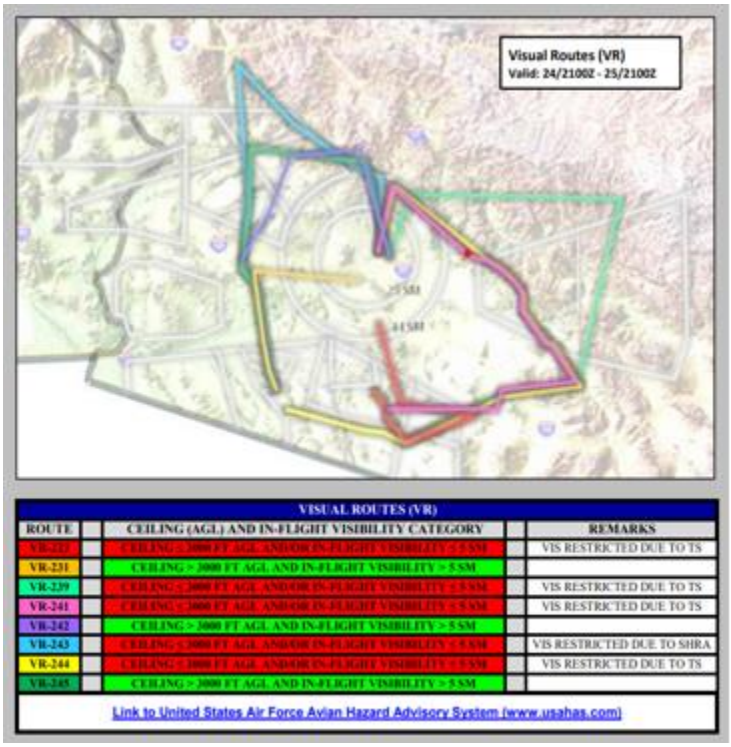
ALTERNATES / DIVERTS - MISSION EXECUTION FORECAST *LAST UPDATE:* 2040Z

KGXF	TAF KGXF 242000Z 2420/2602 VRB06KT 9999 FEW180 QNH2980INS TX42/2423Z TN27/2512Z
KPHX*	KPHX 241720Z 2418/2524 VRB04KT P6SM FEW120 BKN250 FM242100 30006KT P6SM FEW100 FEW150 FM250500 08006KT P6SM FEW150
KTUS*	KTUS 241720Z 2418/2518 18006KT P6SM SCT130 FM242000 33007KT P6SM SCT120 FM250500 15005KT P6SM SCT120
KDMA*	TAF AMD KDMA 241425Z 2414/2520 12012KT 9999 SCT120 QNH2992INS BECMG 2419/2420 VRB06KT 9999 BKN100 QNH2997INS BECMG 2421/2422 28009KT 9999 -SHRA BKN080 QNH2992INS TEMPO 2422/2424 VRB10G15KT VCTS BKN100CB BECMG 2503/2504 VRB06KT 9999 NSW SCT110 QN H2994INS TX38/2421Z TN26/2414Z
KNYL*	TAF KNYL 2415/2515 16006KT 9999 FEW120 QNH2982INS BECMG 2417/2419 18006KT 9999 SKC QNH2974INS BECMG 2422/2500 22006KT 9999 SKC QNH2971INS T41/2423Z T29/2513Z
KLSV*	TAF AMD KLSV 241920Z 2419/2521 15009KT 9999 SCT100 QNH2990INS BECMG 2419/2420 VRB10G15KT 9999 VCTS BKN090CB QNH2994INS TEMPO 2421/2424 VRB20G35KT 6000 -TSRA OVC100CB BECMG 2503/2504 35006KT 9999 NSW BKN100 QNH2991INS TX34/2421Z TN27/2512Z
KIWA*	KIWA 241720Z 2418/2518 12006KT P6SM SCT120 BKN250 FM241900 VRB04KT P6SM FEW120 SCT250 FM242100 32007KT P6SM FEW100 FEW150 FM250500 07005KT P6SM FEW150
KEDW*	TAF KEDW 241300Z 2413/2519 VRB06KT 9999 SKC QNH2991INS BECMG 2421/2422 25010KT 9999 SKC QNH2988INS BECMG 2422/2423 26015G25KT 9999 SKC QNH2988INS BECMG 2502/2503 23008KT 9999 SKC QNH2998INS TX34/2422Z TN19/2413Z

** TAF lines occuring after today's flying hours have been removed for brevity.*
** For an extended weather outlook for these locations, please call the Weather Shop at x2992.*

Figure A7.4. MEF Sample, Format, and Decoding (Range Forecasts).

Figure A7.5. MEF Sample, Format, and Decoding (Visual Route Weather).



VISUAL ROUTES (VR)

ROUTE	CEILING (AGL) AND IN-FLIGHT VISIBILITY CATEGORY	REMARKS
VR-233	CEILING < 3000 FT AGL AND/OR IN-FLIGHT VISIBILITY < 5 SM	VIS RESTRICTED DUE TO TS
VR-231	CEILING > 3000 FT AGL AND IN-FLIGHT VISIBILITY > 5 SM	
VR-239	CEILING < 3000 FT AGL AND/OR IN-FLIGHT VISIBILITY < 5 SM	VIS RESTRICTED DUE TO TS
VR-241	CEILING < 3000 FT AGL AND/OR IN-FLIGHT VISIBILITY < 5 SM	VIS RESTRICTED DUE TO TS
VR-242	CEILING > 3000 FT AGL AND IN-FLIGHT VISIBILITY > 5 SM	
VR-243	CEILING < 3000 FT AGL AND/OR IN-FLIGHT VISIBILITY < 5 SM	VIS RESTRICTED DUE TO SHRA
VR-244	CEILING < 3000 FT AGL AND/OR IN-FLIGHT VISIBILITY < 5 SM	VIS RESTRICTED DUE TO TS
VR-245	CEILING > 3000 FT AGL AND IN-FLIGHT VISIBILITY > 5 SM	

Link to United States Air Force Avian Hazard Advisory System (www.usahas.com)

Figure A7.6. MEF Sample, Format, and Decoding (Satellite Imagery; image subject to change depending on present weather conditions).

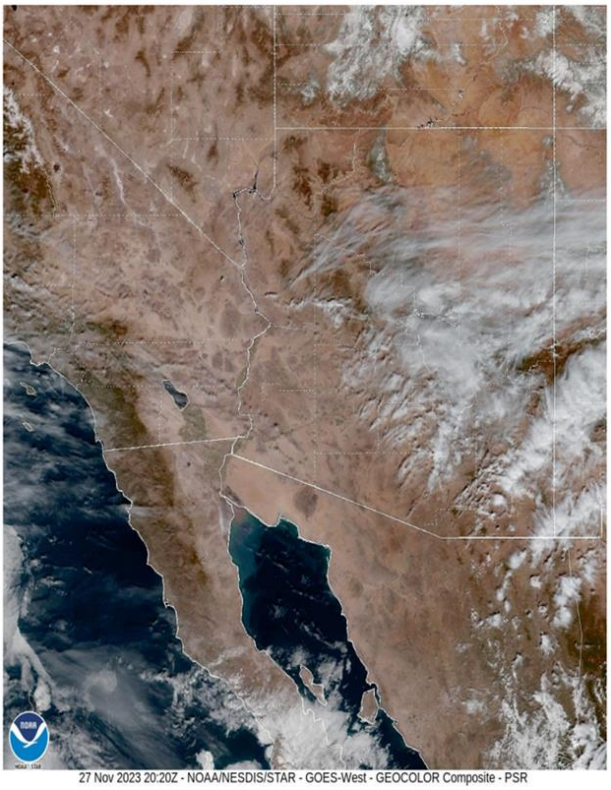
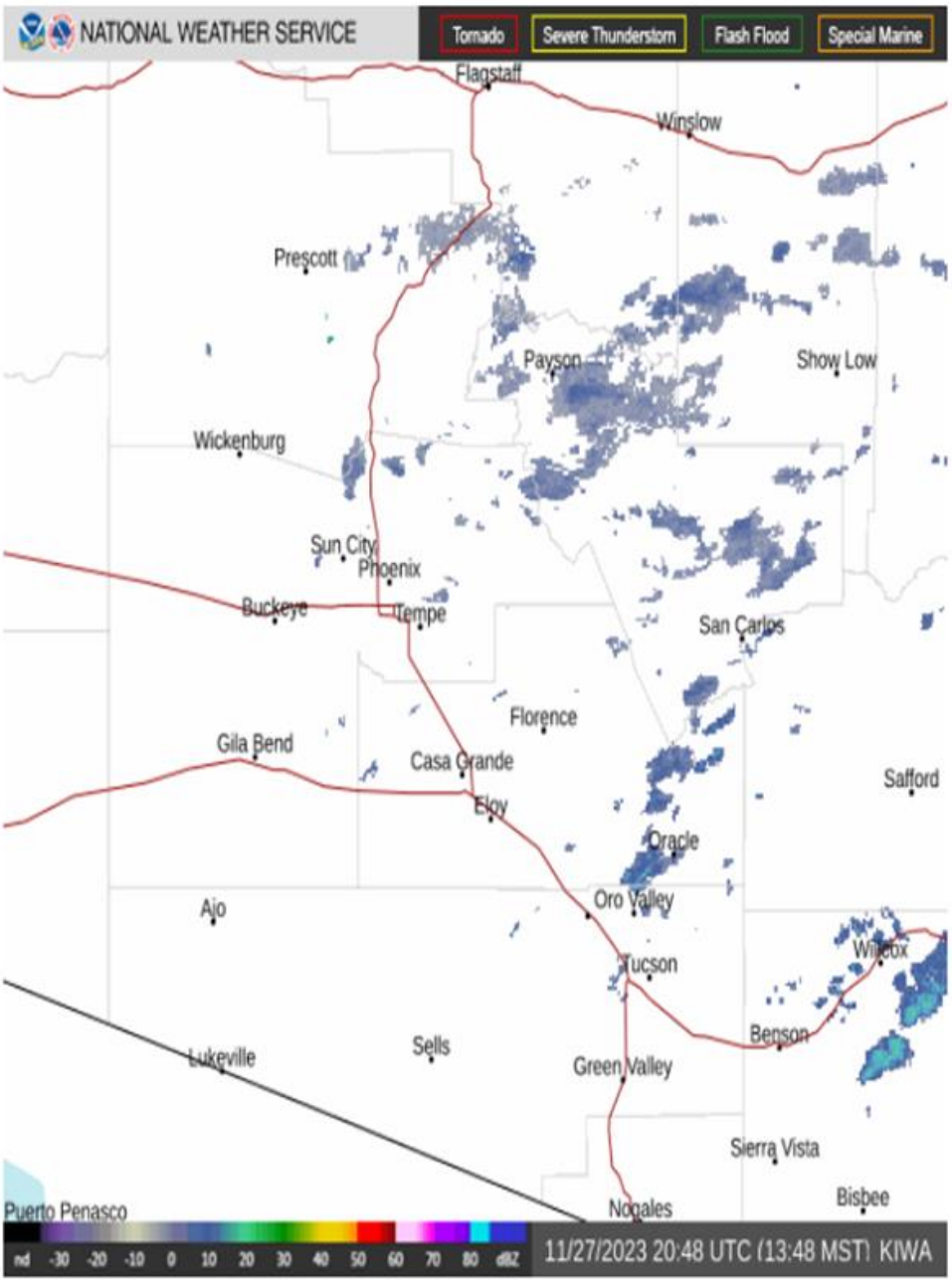
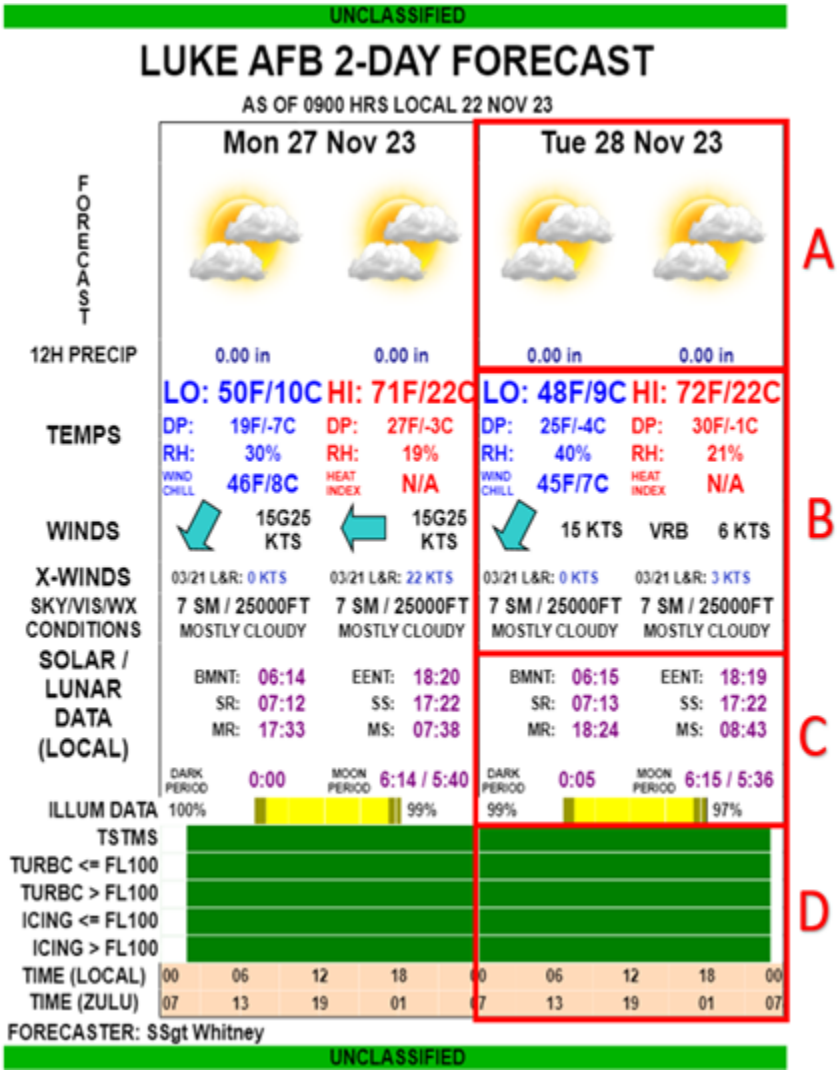


Figure A7.7. MEF Sample, Format, and Decoding (Radar; image subject to change depending on present weather conditions).



A7.2. Planning Weather. Planning Weather is available on the Weather Web Page in the Flying Outlook tab for the 56 OG and MX Outlook tab for the 56 MXG. The Flying Outlook is produced on Friday (or last day of flying) for Monday (or first day of flying) and Tuesday of the following week, which covers Luke AFB, the southern flying ranges, and the northern flying ranges. If flying is scheduled over the weekend, forecasts will also be provided for weekend flying days. Below is an example of the Flying Outlook and the MX Outlook, respectively, for Luke AFB.

Figure A7.8. Flying Outlook for Luke AFB.



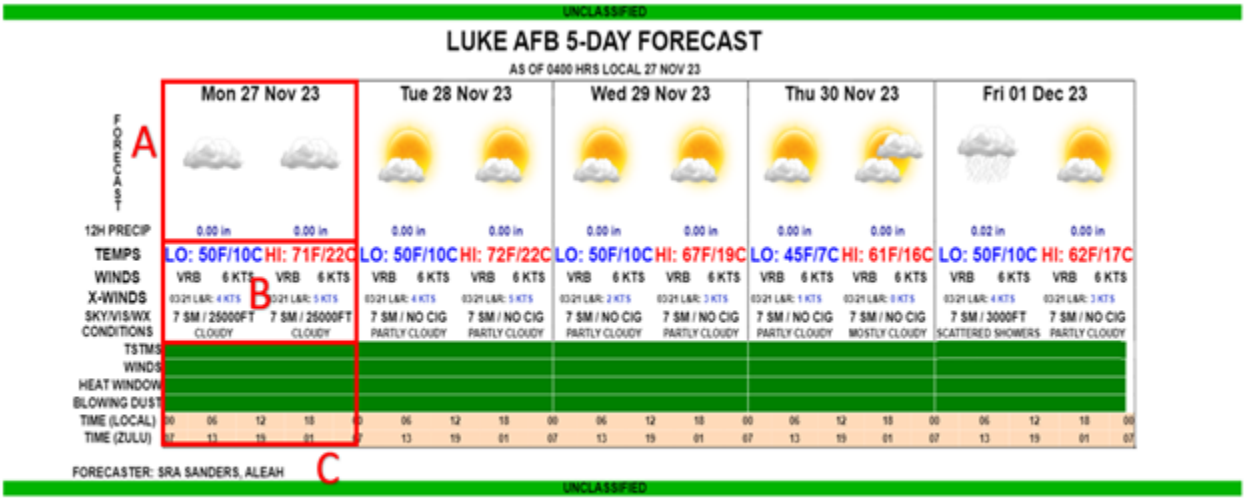
A. Date, forecasted graphic sky condition and precipitation accumulation (in)

B. Forecasted max/min temperature, dewpoint, relative humidity, heat index/wind chill, wind speed/direction, cross wind, visibility, height of lowest cloud base expected, and expected weather

C. Illumination data, sun/moon rise/set, beginning/ending nautical twilight

D. Hazards forecast (thunderstorms, turbulence, icing) and time

Figure A7.9. MX Outlook for Luke AFB.



A. Date, forecasted graphic sky condition and precipitation accumulation
B. Expected temperatures, winds, crosswinds, visibility, clouds, and weather conditions
C. Timing of thunderstorms, winds, extreme heat, and blowing dust

Figure A7.10. Illumination Data Example.

Illumination Data November 2021 (1st)						
Time (UTC)	Solar Elevation (°)	Solar Azimuth (° True)	Lunar Elevation (°)	Lunar Azimuth (° True)	Lunar Phase (%)	Ground Illumination (mlux)
0000	7	248	-18	295	20	6738740.29
0100	-5	256	-29	305	19	8004.58
0200	-18	264	-38	318	19	1.2
0300	-30	272	-45	335	18	0.5
0400	-42	282	-48	355	18	0.5
0500	-54	294	-47	16	18	0.5
0600	-65	315	-42	35	17	0.5
0700	-71	350	-34	50	17	0.5
0800	-68	32	-25	62	17	0.5
0900	-59	58	-14	72	16	0.5
1000	-48	74	-2	80	16	0.51
1100	-36	84	10	88	16	0.83
1200	-23	93	22	97	15	1.39
1300	-11	101	34	106	15	26.23
1400	2	109	45	119	15	1761849.45
1500	13	118	54	136	14	15356463.89
1600	23	128	61	161	14	33803260.02
1700	32	141	61	191	14	51724326.18
1800	39	157	56	218	13	64423856.72
1900	42	176	47	236	13	69778882.8
2000	41	195	36	249	13	67622642.31
2100	35	212	24	259	12	58074579.59
2200	28	227	12	267	12	41867284.68
2300	18	238	0	275	12	23019549.98

Ground Illumination <2 mlux highlighted green

Attachment 8

SAMPLE STAFF WEATHER BRIEFINGS

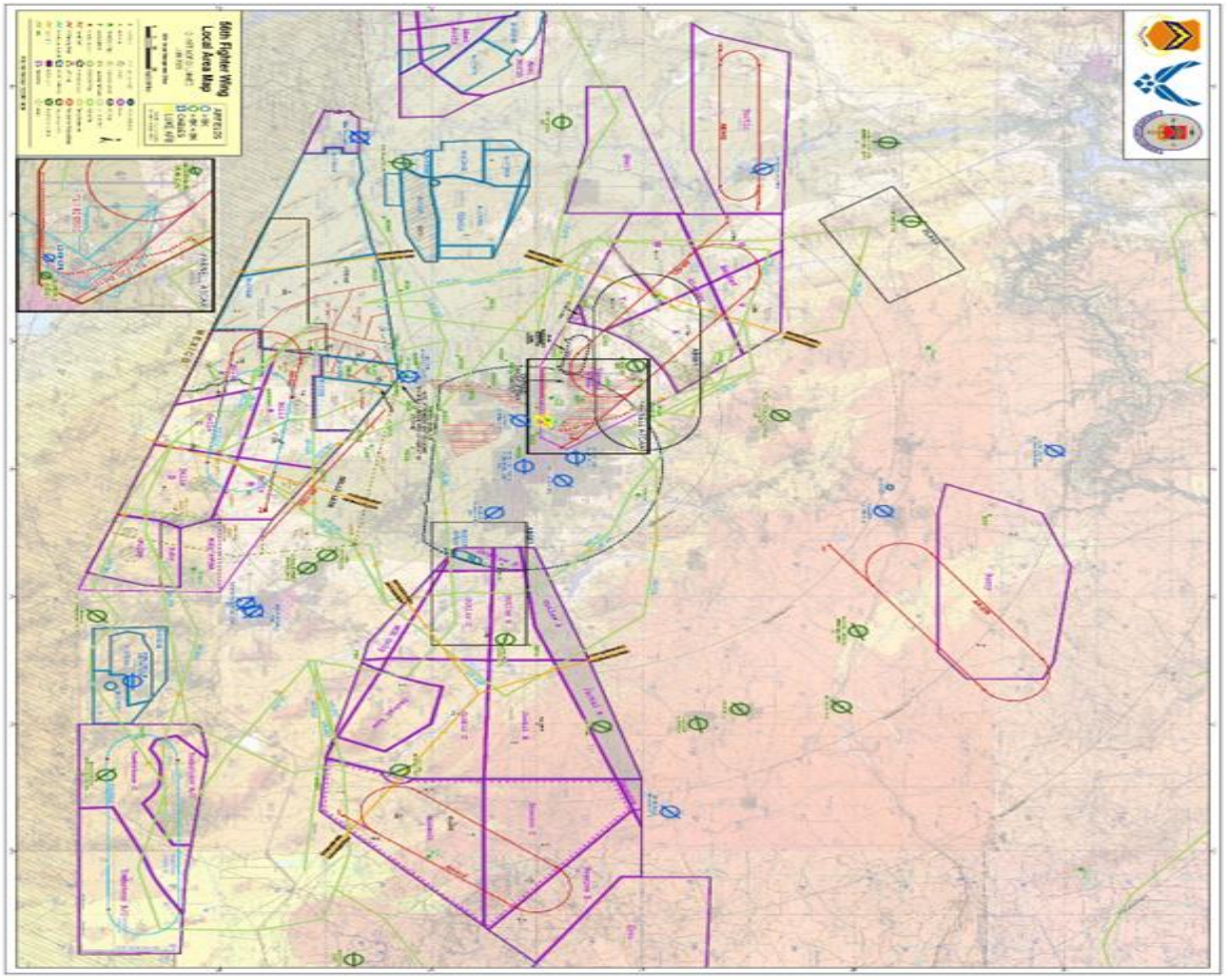
A8.1. Staff Weather Briefing Products. Staff weather briefing products serve as a vital method of fulfilling the staff integration function requirements as discussed in **Chapter 6** of this instruction. **Figure A8.1** provides a sample staff weather products and information on format and decoding.

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

Attachment 9

MAP FLYING RANGES' AIRSPACE

Figure A9.1. Flying Area Map.



Attachment 10

56 FW FLYING WEATHER IMPACTS

Figure A10.1. Page 1 of Luke Airfield F-35 Flying Weather Impacts (page 1 of 2).

Luke AFB Flying Criteria		
Categories (All Heights are in AGL)		F-35
		Unfavorable
SFO/PFO	High Key	High Key
	Cloud Ceilings	< 8000FT
	SFC Winds	≥ 35KT
	Low Key	Low Key
	Cloud Ceilings	< 3000FT
	SFC Winds	≥ 35KT
PWC	Pilot Weather Category	Pilot Weather Category
	Cloud Ceilings	< 500FT / 1.5 SM
	SFC Winds	≥ 35KT
Take off and Landings	Formations	Formations
	SFC Winds	≥ 35KT
	Cross Winds	N/A
	T/O (Single Ship)	T/O (Single Ship)
	Cloud Ceilings	< 2600FT; OVC
	SFC Winds	≥ 35KT
	Crosswinds	(Wet/Dry): ≥ 10/20KT
	Landing (Single Ship)	Landing (Single Ship)
	SFC Winds	≥ 35KT
	Cross Winds	(Wet/Dry): ≥ 10/20KT
	VFR	VFR
	Cloud Ceilings	≤ 1500FT; OVC < 1500FT / < 2SM
	SFC Winds	≥ 35KT
	IFR Bingo (Divert)	IFR Bingo (Divert)
	Cloud Ceilings	N/A
	SFC Winds	≥ 35KT
	IFR Recovery	IFR Recovery
	Cloud Ceilings	<2000FT / 3SM
	SFC Winds	≥ 35KT

Figure A10.2. Page 2 of Luke Airfield F-35 Flying Weather Impacts (page 2 of 2).

Luke AFB Flying Criteria			
Categories (All Heights are in AGL)		F-35	
		Unfavorable	
Other Requirements	Divert Base Required	Divert Base Required	
	Cloud Ceilings	< 2000FT	
	SFC Winds	≥ 35KT	
	Thunderstorms	TS w/in 10 NM	
	Cloud Ceilings	< 500FT / 1.5 SM	
	Thunerstorms	TS w/in 25 NM	
	SFC Winds	N/A	
	Categories	Maintenance Operations	
	Thunderstorms	TS w/in 25 NM	TS w/in 5 NM
	SFC Winds	≥ 25KT	≥ 35KT
	Temperature	FITS Caution	FITS Danger Outside Air Temp 100F (Limit to 45 min)

Figure A10.3. Page 1 of Luke Airfield F-16 Flying Weather Impacts (page 1 of 2).

Luke AFB Flying Criteria				
Categories (All Heights are in AGL)		IP F-16	Graduate F-16	Student F-16
		Unfavorable		
SFO/PFO	High Key	High Key		
	Cloud Ceilings	< 8000FT		
	SFC Winds	≥ 35KT		
	Low Key	Low Key		
	Cloud Ceilings	< 3000FT		
	SFC Winds	≥ 35KT		
PWC	Pilot Weather Category	Pilot Weather Category		
	Cloud Ceilings	< 300FT / 1 SM	< 500FT / 1.5 SM	< 700FT / 2 SM
	SFC Winds	≥ 35KT		
Take off and Landings	Formations	Formations		
	SFC Winds	≥ 35KT		
	Cross Winds	≥ 15KT		
	T/O (Single Ship)	T/O (Single Ship)		
	Cloud Ceilings	<1500FT / 2SM		
	SFC Winds	≥ 35KT		
	Crosswinds	≥ 25KT		≥ 20KT
	Landing (Single Ship)	Landing (Single Ship)		
	SFC Winds	≥ 35KT		
	Cross Winds	(Wet/Dry): ≥ 20/25KT		(Wet/Dry): ≥ 15/20KT
	VFR	VFR		
	Cloud Ceilings	< 1500FT / 3SM		< 1500FT / 3SM
	SFC Winds	≥ 35KT		

Figure A10.4. Page 2 of Luke Airfield F-16 Flying Weather Impacts (page 2 of 2).

Luke AFB Flying Criteria				
Categories (All Heights are in AGL)		IP F-16	Graduate F-16	Student F-16
		Unfavorable		
T/O & Landings	IFR Bingo (Divert)	IFR Bingo (Divert)		
	IFR Recovery	IFR Recovery		
	Cloud Ceilings	<2000FT / 3SM		
Other Requirements	Divert Base Required	Divert Base Required		
	SFC Winds	≥ 35KT		
	Thunderstorms	TS w/in 5 NM		
	Cloud Ceilings	< 300FT / 1 SM	< 500FT / 1.5 SM	< 700FT / 2 SM
	Thunerstorms	TS w/in 5 NM		
	Categories	Maintenance Operations		
	Thunderstorms	TS w/in 25 NM	TS w/in 5 NM	
	SFC Winds	≥ 25KT	≥ 35KT	
	Temperature	FITS Caution	FITS Danger Outside Air Temp 100F (Limit to 45 min)	

Figure A10.5. Page 1 of Luke AFB's F-35 Mission Criteria (page 1 of 3).

Range Missions		
Mission Types		F-35 Unfavorable
Air to Air Training Missions	TR, TR 1 - 6, I, I-1	TR, TR 1 - 6, I, I-1
	Cloud Ceilings	N/A
	Clear Airspace (SCT or lower)	
	In-Flight Horizontal VIS	
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	I 2-3, INST	I 2-3, INST
	Cloud Ceilings	N/A
	In-Flight Horizontal VIS	
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	SFC VIS (KLUF)	N/A
	LSDT, LSDT 1-2, LASDT, LASDT 1-2	LSDT, LSDT 1-2, LASDT, LASDT 1-2
	Cloud Ceilings	N/A
	Clear Airspace (SCT or lower)	
	In-Flight Horizontal VIS	
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 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	N/A
	Clear Airspace (SCT or lower)	
	In-Flight Horizontal VIS	
	Illumination	
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained

Figure A10.6. Page 2 of Luke AFB's F-35 Mission Criteria (page 2 of 3).

Range Missions		
Mission Types		F-35 Unfavorable
Air to Air Training Missions	AHC	AHC
	Cloud Ceilings	N/A
	Clear Airspace (SCT or lower)	
	In-Flight Horizontal VIS	
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	ACM, ACM 1-4, ACT, ACT 1-2, DACT, INT,INT 1-7, TI, 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	N/A
	Clear Airspace (SCT or lower)	
	In-Flight Horizontal VIS	
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
AR	Air Refueling	Air Refueling
	Clear Airspace (SCT or lower)	N/A
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
Air to Ground Training Missions	NVG (Hi-Illum Ops)	NVG (Hi-Illum Ops)
	In-Flight Horizontal VIS	≤ 3 SM
	Illumination	N/A
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	NS 1-3, NS23, NS 27, NS41, NS44	NS 1-3, NS23, NS 27, NS41, NS44
	Cloud Ceilings	N/A
	In-Flight Horizontal VIS	≤ 3 SM
	Illumination	N/A
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained

Figure A10.7. Page 3 of Luke AFB's F-35 Mission Criteria (page 3 of 3).

Range Missions		
Mission Types		F-35
		Unfavorable
Air to Ground Training Missions	ASC, FTR, LANT, MANT	ASC, FTR, LANT, MANT
	Cloud Ceilings	N/A
	In-Flight Horizontal VIS	≤ 3 SM
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	SN 1-5	SN 1-5
	Cloud Ceilings	N/A
	In-Flight Horizontal VIS	≤ 3 SM
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	CAS, SAT, SAT 1-7	CAS, SAT, SAT 1-7
	Cloud Ceilings	N/A
	In-Flight Horizontal VIS	≤ 3 SM
	T-Storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	SAT 3-5, SA, SA 1-4	SAT 3-5, SA, SA 1-4
	Cloud Ceilings	N/A
	In-Flight Horizontal VIS	≤ 3 SM
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	SA 5-9	SA 5-9
	Cloud Ceilings	N/A
	In-Flight Horizontal VIS	≤ 3 SM
	T-storms	TS w/in 25NM
	Turbulence (Fcst/Observed)	Moderate or > Turbulence
	Icing (Fcst/Observed)	Any Icing
	SFC Winds (Ranges)	≥ 35KT Sustained

Figure A10.8. Page 1 of Luke AFB's F-16 Mission Criteria (Page 1 of 3).

Range Missions		
Mission Types		F-16
		Unfavorable
Air to Air Training Missions	TR, TR 1 - 6, I, I-1	TR, TR 1 - 6, I, I-1
	Clear Airspace (SCT or lower)	< 10 KFT of clear airspace
	In-Flight Horizontal VIS	< 5 NM
	Turbulence (Fcst/Observed)	Severe or > Turbulence
	Icing (Fcst/Observed)	Moderate or > Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	I 2-3, INST	I 2-3, INST
	Cloud Ceilings	Cig < 3 KFT @ LUF OR
	Turbulence (Fcst/Observed)	Severe or > Turbulence
	Icing (Fcst/Observed)	Moderate or > Icing
	SFC Winds (Ranges)	≥ 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
	Clear Airspace (SCT or lower)	< 5 KFT clear airspace
	In-Flight Horizontal VIS	< 5 NM
	Turbulence (Fcst/Observed)	Severe or > Turbulence
	Icing (Fcst/Observed)	Moderate or > Icing
	SFC Winds (Ranges)	≥ 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 < 13 KFT
	Clear Airspace (SCT or lower)	< 5 KFT of clear airspace
	In-Flight Horizontal VIS	< 5 NM
	Turbulence (Fcst/Observed)	Severe or > Turbulence
	Icing (Fcst/Observed)	Moderate or > Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	AHC	AHC
	Cloud Ceilings	Cig < 13 KFT
	Clear Airspace (SCT or lower)	< 10 KFT of clear airspace
	In-Flight Horizontal VIS	< 5 NM
	Turbulence (Fcst/Observed)	Severe or > Turbulence
	Icing (Fcst/Observed)	Moderate or > Icing
	SFC Winds (Ranges)	≥ 35KT Sustained

Figure A10.9. Page 2 of Luke AFB's F-16 Mission Criteria (Page 2 of 3).

Air to Air Training Missions	ACM, ACM 1-4, ACT, ACT 1-2, DACT, INT,INT 1-7, TI, 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 < 13 KFT
	Clear Airspace (SCT or lower)	< 5 KFT of clear airspace
	In-Flight Horizontal VIS	< 5 NM
	Turbulence (Fcst/Observed)	Severe or > Turbulence
	Icing (Fcst/Observed)	Moderate or > Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	Air Refueling	Air Refueling
	Turbulence (Fcst/Observed)	Severe or > Turbulence
	Icing (Fcst/Observed)	Moderate or > Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
	NVG (Hi-Illum Ops)	NVG (Hi-Illum Ops)
	In-Flight Horizontal VIS	No Discernible Horizon / ≤ 3 SM
	Turbulence (Fcst/Observed)	Severe or > Turbulence
	Icing (Fcst/Observed)	Moderate or > Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
AR	NS 1-3, NS23, NS 27, NS41, NS44	NS 1-3, NS23, NS 27, NS41, NS44
	Cloud Ceilings	Cig < 10 KFT
	In-Flight Horizontal VIS	No Discernible Horizon
	Turbulence (Fcst/Observed)	Severe or > Turbulence
	Icing (Fcst/Observed)	Moderate or > Icing
	SFC Winds (Ranges)	≥ 35KT Sustained
Air to Ground Training Missions	ASC, FTR, LANT, MANT	ASC, FTR, LANT, MANT
	Cloud Ceilings	Cig < 10 KFT
	In-Flight Horizontal VIS	< 5 NM
	Turbulence (Fcst/Observed)	Severe or > Turbulence
	Icing (Fcst/Observed)	Moderate or > Icing
	SFC Winds (Ranges)	≥ 35KT Sustained

Figure A10.10. Page 3 of Luke AFB's F-16 Mission Criteria (page 3 of 3).

Air to Ground Training Missions		
	SN 1-5	**SN 1-5**
	Cloud Ceilings	**Cig < 20 KFT**
	In-Flight Horizontal VIS	**< 5 NM**
	Turbulence (Fcst/Observed)	**Severe or > Turbulence**
	Icing (Fcst/Observed)	**Moderate or > Icing**
	SFC Winds (Ranges)	**≥ 35KT Sustained**
	CAS, SAT, SAT 1-7	**CAS, SAT, SAT 1-7**
	Cloud Ceilings	**Cig < 8 KFT**
	In-Flight Horizontal VIS	**< 5 NM**
	Turbulence (Fcst/Observed)	**Severe or > Turbulence**
	Icing (Fcst/Observed)	**Moderate or > Icing**
	SFC Winds (Ranges)	**≥ 35KT Sustained**
	SAT 3-5, SA, SA 1-4	**SAT 3-5, SA, SA 1-4**
	Cloud Ceilings	**Cig < 18 KFT**
	In-Flight Horizontal VIS	**< 5 NM**
	Turbulence (Fcst/Observed)	**Severe or > Turbulence**
	Icing (Fcst/Observed)	**Moderate or > Icing**
	SFC Winds (Ranges)	**≥ 35KT Sustained**
	SA 5-9	**SA 5-9**
	Cloud Ceilings	**Cig < 8 KFT**
	In-Flight Horizontal VIS	**< 5 NM**
	Turbulence (Fcst/Observed)	**Severe or > Turbulence**
	Icing (Fcst/Observed)	**Moderate or > Icing**
	SFC Winds (Ranges)	**≥ 35KT Sustained**