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Weather

WEATHER SUPPORT PLAN

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This instruction identifies services, responsibilities, and procedures for weather support on Vandenberg Air Force Base (AFB) and is required by AFMAN 15-129, *Aerospace Weather Operations – Processes and Procedures*. It outlines weather support provided by the 30th Weather Squadron (30 WS) to Vandenberg AFB (VAFB) and the Western Range (WR), including support to launch operations; battle staff and contingency operations, staff support; Department of Defense (DoD) contractor support; and training. All agencies that receive support from or provide support to 30 WS are required to review this instruction annually during the anniversary month. Send recommended changes, in writing, to 30 WS/DO (900 Coral Rd, Bldg 21150, Vandenberg AFB CA 93437-5002). This instruction applies to all units assigned to VAFB. Public Law 104-13, *Paperwork Reduction Act of 1995*, affect this publication. Maintain and dispose of all records created as a result of the process described herein according to AFMAN 37-139, *Records Disposition Schedule*.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

Changes include: changes in the special and local observation criteria; changes in the Weather Warning/Watch/Advisory Notification Chain; changes in the TAF specification and amendment criteria; changes in the Toxic Hazard Zone amendment criteria; additions to weather dissemination formats; identification of the New Tactical Forecast System (NTFS) which has replaced the Automated Meteorological Information System (AMIS); and, various administrative changes.

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Chapter 1

GENERAL INFORMATION

1.1. General. The 30th Weather Squadron (30 WS) provides or arranges for all weather services to the 30th Space Wing (30 SW) and other units assigned to or operating on Vandenberg AFB (VAFB). 30 WS provides: surface and upper-air weather observations; launch and flight weather briefings; forecasts; weather warnings, watches and advisories; battle staff briefings; climatological services; meteorological assessments on operations and plans; and, staff weather support.

1.2. Terms Explained. References, Abbreviations, Acronyms, and Terms are listed and explained in [Attachment 1](#).

1.3. 30th Space Wing Mission. The 30th Space Wing manages the Western Range (WR) and supports Department of Defense space and missile testing, and placing satellites into near-polar orbit from the West Coast, using expendable boosters (Delta II, Atlas, Titan II, Titan IV and Delta IV). Wing personnel support the Minuteman III and Peacekeeper Intercontinental Ballistic Missile Follow-on Force Development Evaluation program. The Wing also supports missile launches by the Missile Defense Agency (MDA). The WR begins at the coastal boundaries of VAFB and extends westward from the California coast to the western Pacific including sites in Hawaii. Operations involve dozens of federal and commercial interests. The wing is organized into operations, launch, medical, and mission support groups. The wing's staff agencies include command post, safety, treaty, staff judge advocate, comptroller, manpower and organization, Heritage Center, plans and requirements, public affairs, history, military equal opportunity, chaplain, and protocol.

1.4. 30th Weather Squadron Mission. The 30 WS provides: operational and staff weather support to the 30 SW, Space and Missile Systems Center (SMC), NASA, & tenant units; launch weather services for all DoD, NASA, and commercial spacelift/ballistic missile launches and air operations on VAFB; observation and forecasting support for DoD & commercial spacelift, ballistic missile test, & air operations on VAFB and west coast offshore operating area; resource protection for VAFB/30 SW resources and people; trained weather professionals to support contingencies worldwide; weather data and studies for planning. The 30 WS fields and sustains weather systems to support operations at VAFB.

1.5. Supported Agencies Missions, Weapon Systems and Weather Sensitivities.

1.5.1. 576th Flight Test Squadron (576 FLTS). The 576 FLTS conducts ballistic missile follow-on test and evaluation for both the Minuteman III and Peacekeeper weapon systems. The mission of the 576 FLTS is to execute Air Force Space Command's Force Development Evaluation program for America's Intercontinental Ballistic Missile Force and serve as the Command's experts for missile systems capability and Air Force application demonstrations. In executing the Intercontinental Ballistic Missile Initial Operational Test and Evaluation and Force Development Evaluation programs, the 576 FLTS prepares for and conducts ground and flight tests to collect, analyze, and report performance, accuracy, and reliability data for the Joint Staff, USSTRATCOM, Air Staff and AFSPC. The 576 FLTS identifies missile system requirements, demonstrates current and future war fighting capabilities, and validates missile system improvements and upgrades. Launch vehicle specific weather sensitivities and support requirements change with each mission and are identified within the Universal Documentation System.

1.5.2. 30th Launch Group (30 LCG). The 30 LCG acquires, tests and sustains state-of-the-art space and missile systems and launch facilities.

1.5.3. 1st Air and Space Test Squadron (1 ASTS). The 1 ASTS works as an interface between the MDA and the 30 SW to develop, test and prepare for deployment of a national missile defense system. Using complementary interceptors, land-, sea-, air- and space-based sensors, and battle management command and control systems, the planned missile defense system will be able to engage all classes and ranges of ballistic missile threats. MDA's strategy is to develop, rigorously test, and continuously evaluate production, deployment and operational alternatives for the ballistic missile defense system. Missile defense systems being developed and tested by MDA and 1 ASTS are primarily based on hit-to-kill technology. It has been described as hitting a bullet with a bullet capability that has been successfully demonstrated in test after test. Launch vehicles and their associated weather sensitivities and support requirements change with each mission and are identified within the Universal Documentation System.

1.5.4. 2d Space Launch Squadron (2 SLS). The mission of the 2 SLS is to conduct safe, reliable, and timely launch operations from the Western Range to support Department of Defense, national, and commercial customers. The 2 SLS is responsible for launching the Titan IV heavy lift vehicle. Additionally, the 2 SLS provides mission planning and launch integration support for the commercially launched Athena, Taurus, and Pegasus light lift vehicles. Launch vehicle specific weather sensitivities and support requirements change with each mission and are identified within the Universal Documentation System.

1.5.5. 4th Space Launch Squadron (4 SLS). The mission of the 4 SLS is to provide launch site expertise representing government EELV interests. The 4 SLS is responsible for conducting EELV processing/operations surveillance, as well as, facilitating EELV mission unique systems integration. Additionally, the 4SLS provides EELV system status/information and documents EELV lessons learned. Launch vehicle specific weather sensitivities and support requirements change with each mission and are identified within the Universal Documentation System.

1.5.6. 76th Helicopter Flight (76 HF). The 76 HF conducts helicopter flight operations supporting the 30 SW. They provide fire suppression for post-launch disaster control and the Wildland Vegetation Management Program. They also provide security surveillance and response for NASA Space Shuttle recovery operations and 30 SW launch activities. They support transportation requests for priority personnel and cargo. They provide aerial photographic platform for launch documentation. The 76 HF flies UH-1N helicopters equipped with GPS, Hoist, Forward Looking Infrared (FLIR), Night Vision Goggles (NVG) and Night Sun searchlight. They utilize the Forest Penetrator, Stokes Litter, Rescue Basket, Fire Bucket, Fast Rope, Rope Ladder, Cargo Sling and Rappel Equipment for a wide range of missions. In life and death situations, the 76 HF may take off in any weather conditions provided visibility is sufficient to taxi to the takeoff area, and weather is not so severe as to make take-off impossible. Normally, the UH-1N cannot fly in areas with any icing, moderate or greater turbulence, or Low Level Wind Shear greater than or equal to 50kts. Non-critical flights will cease when the ceiling is below 200 feet or the visibility is less ½ mile.

1.5.7. Detachment 1, 22 SOPS - Vandenberg Tracking Station (VTS). The VTS provides satellite tracking and command and control, and tracking in support of the Department of Defense. The VTS is sensitive to strong winds.

1.5.8. 381st Training Group (381 TRG). The 381 TRG provides initial operations and maintenance training for the nation's space and missile forces; conducts training in ICBM air-launched missile and spacelift maintenance; provides training in ICBM attack warning, space surveillance, spacelift, and satellite operations and trains joint space fundamentals and intelligence operations. The only associated weather sensitivities are those associated with formations of students marching to and from class. The 381 TRG is notified if the main base temperature equals or exceeds 85°F and they receive lightning watches/warnings.

1.5.9. 2d Range Operations Squadron (2 ROPS). The 2 ROPS manages and operates the Western Range. The following is a list of the weather sensitivities of each range asset.

Table 1.1. Weather Sensitivities of Range Assets.

| RADAR | SENSITIVITY | RESULT |
|--------------------------|--|--|
| AN/TPQ-18 and Hair Radar | Mean winds > 40 knots and/or Max winds > 50 knots Wind Tower 57 | Antenna will be positioned to zenith in elevation and the azimuth positioned 90 degrees with respect to the direction of the wind. |
| AN/FPS-16 Radar | Mean/Max winds > 50 knots Wind Tower 56 | Antennas will be de-energized and allowed to float freely. |
| MOTR | Mean/Max winds > 50 knots Wind Tower 56 | Antenna will be de-energized. |
| 30 and 35 foot Antennas | Mean/Max winds > 70 knots Wind Tower 65 | Antennas will be stowed at zenith |
| CCT-1/2/3 | Mean/Max winds > 50 knots Wind Towers 15, 57, and 301, respectively | Antennas will be moved to zenith, de-energized, and allowed to float freely. |

1.6. Duty Priorities. 30 WS operations personnel can become task saturated at times (e.g., sudden onset of severe weather). To assist 30 WS personnel in prioritization of customer support during such times, principal duty priorities are defined in [Attachment 2](#). 30 WS forecasters and observers will adhere to, and supported agencies should have an understanding of these priorities.

1.7. Capabilities and Limitations.

1.7.1. Forecast Timeframe Limitations. 30 WS issues operational forecasts valid for periods up to 24 hours. Beyond 24 hours, all forecasts are for planning/information only. Forecasts or outlooks beyond 10 days are largely based on climatology.

1.7.2. Adequate notice is essential for optimum support. Agencies requiring weather support should contact 30 WS (606-8022) with the pertinent details as early as possible. Agencies requiring recurring support should contact the 30 WS/DO, Operations Officer (606-8684).

1.7.3. Limitations due to topography. The expanse and topography of the WR requires regional tailoring of forecast support and products. All warnings/watches/advisories will extend out to and include

10 Nautical Miles (NM) from the VAFB boundary. The exception is warnings pertaining to winds, which are issued to cover North VAFB, South VAFB, and/or the airfield. No warnings/watches/advisories will be issued for the airfield during periods of airfield closure. In these cases, North VAFB notices will apply to the airfield environment. Specific warning/watch/advisory procedures are detailed in [Chapter 4](#).

1.7.4. Representative Observation Site (ROS) Limitations. The ROS is located behind building 1765 (balloon shelter), with the airfield complex 1 ½ miles to the south. The facility does not allow a 360-degree view of the runway complex from the official observation point. There is an obstruction from 050 – 150 degrees due to Base Operations and Flight Line Fire buildings.

1.7.5. Alternate Observing Site (AOS) Limitations. The AOS is located behind building 1746. Buildings adjacent to the flightline and trees restrict the view from the northeast to southeast, out to approximately 3/8 miles.

1.7.6. Automated Surface Observing System (ASOS). 30 WS uses an ASOS for most elements of a surface observation. The weather observer augments and quality controls the ASOS observations when the airfield is open. The ASOS also has the capability to provide a fully automated weather observation for non-flight operations. Certain ASOS components and algorithms have the following technical limitations

1.7.6.1. Sensor Location. The airfield ASOS sensors are located to the south of the runway at the runway midpoint. Therefore, they may not accurately describe weather conditions at either end of the runway and manual augmentation of the ASOS observation is required during flight operations.

1.7.6.2. Sky Condition. The airfield ASOS sky condition sensor is located to the south at the midpoint of the runway, and it measures cloud heights above the sensor. Therefore it may not accurately describe cloud conditions at either end of the runway. The sky condition represents the most recent 30 minutes of 30-second sample data; the last 10 minutes of data are processed twice (double weighted) to be more responsive to the latest changes in sky condition. The sensor outputs range from surface to 12,000 feet (limitation of laser beam ceilometer). It assumes all clouds or obscuring phenomena are opaque. Ceiling is based on all layers detected and reported as either CLR, FEW, SCT, BKN, OVC or VV (indefinite ceiling) and reports a maximum of three layers. ASOS does not evaluate for variable sky cover. Variable ceiling height is reported when the ceiling varies 200 feet or more when the ceiling is 1,000 feet or less, 400 feet or more when the ceiling is between 1,100 and 2,000 feet, and 500 feet or more when the ceiling is greater than 2,000 but less than 3,000 feet.

1.7.6.3. Prevailing Visibility. First, ASOS calculates a 1-minute average visibility every minute and stores the value for 10 minutes. Second, ASOS computes a running 10-minute harmonic mean once a minute from the stored data to provide the latest visibility. Sector visibility and tower visibility is not reported. Variable visibility is reported when visibility varies by ½ mile (800 meters) or more and the average is less than 3 miles (4800 meters). Reportable values are: <1/4, 1/4, 1/2, 3/4, 1, 1 ¼, 1 ½, 1 ¾, 2, 2 ½, 3, 3 ½, 4, 5, 7, and 10 statute miles. NOTE: A harmonic mean is used in the final computation rather than an arithmetic mean because it is more responsive to rapidly decreasing visibility conditions and will generally yield a lower value than the arithmetic value.

1.7.6.4. Weather and Obscurations. ASOS will report rain (RA), snow (SN), and unknown precipitation (UP) for cases when there is precipitation but the sensor cannot determine if it is rain or snow. It will also report fog and haze.

1.7.7. Runway Visual Range (RVR) Limitations. The ROS does not have the capability to provide RVR. The AOS does have the capability to provide instantaneous RVR readings for local dissemination only. The weather squadron requires advance notice of RVR requirement to station an observer at the AOS. VAFB does not have the capability to provide a 10-minute average RVR from either the ROS or AOS.

1.8. Tasks and Responsibilities.

1.8.1. 30th Weather Squadron Commander (30 WS/CC). The 30 WS/CC is responsible for all meteorological support at VAFB. 30 WS/CC will:

1.8.1.1. Communicate directly with all commanders and staff agencies concerning weather operations and support.

1.8.1.2. Ensure provision of weather support to all DoD units and contractors on VAFB.

1.8.1.3. Organize and equip personnel to provide operational weather support for all WR activities.

1.8.1.4. Ensure observation, forecast and notification of weather phenomena for resource protection of facilities and personnel on VAFB complex.

1.8.1.5. Plan for the acquisition, integration, and support of weather sensing and processing systems to meet current and future base/wing mission requirements.

1.8.1.6. Participate on boards and committees concerning weather issues.

1.8.1.7. Provide or arrange weather briefings for: 30 SW Battle Staff; Operations Status Meetings (OSM); Strategic Arms Reduction Treaty (START); Chemical Warfare Convention (CWC); deployment; and, other meetings, as required.

1.8.1.8. Ensure duties of 30 WS leadership do not prevent availability to assist in the severe weather management process.

1.8.1.9. Provide 30 SW/CC an assessment of 30 WS's technical capabilities and upchannel requests for assistance, as required.

1.8.2. 30 WS Operations Officer (30 WS/DO). The 30 WS/DO directs operational weather support for DoD, NASA, commercial and military, ballistic and spacelift programs, conventional flight operations, senior staff support and resource protection. 30 WS/DO will:

1.8.2.1. Establish and maintain launch/range weather training and unit standardization and evaluation programs.

1.8.2.2. Provide trained and certified weather mission support commander, Launch Weather Officers (LWO), balloon editors, toxic forecasters, range weather forecasters, and observers as required in support of all launch and aviation operations.

1.8.2.3. Facilitate WR Severe Weather Preparedness Committee meetings.

1.8.2.4. Ensure back-up support for weather operations is established where needed.

1.8.2.5. Provide weather scenario inputs to 30 SW/IGI for base-wide exercises.

1.8.3. 30 WS Standardization, Evaluation and Training Flight (30 WS/DOV). 30 WS/DOV develops standardization and evaluation and training materials and procedures for all 30 WS operations personnel/positions. 30 WS/DOV performs the evaluation function for the 30 WS similar to that performed by the 30 OG/OGV for other 30 OG units. Maintains training records and ensures completion of forecaster, and launch weather team training. 30 WS/DOV will:

1.8.3.1. Manage squadron standardization and evaluation program. Assess individual proficiency, training effectiveness, and standardize launch operating procedures and written documentation.

1.8.3.2. Manage unit mobility and exercise evaluation programs to include training, certification and readiness of personnel subject to deploy in support of DoD worldwide operations.

1.8.3.3. Provide Launch Weather Team Initial Qualification Training (IQT) and Weather Mission Support Commander Training.

1.8.4. 30 WS Launch Weather Operations Flight (30 WS/DOR). 30 WS/DOR develops and provides operational weather support for all WR ballistic missile and spacelift launch activities. 30 WS/DOR will:

1.8.4.1. Evaluate all Universal Document System (UDS) materials, provide comment and coordinate required changes with 2 ROPS Program Support Manager. Provide requested responses to customer's Program Requirements and Operations Requirements Documents.

1.8.4.2. Ensure tailored operational weather briefings and launch weather support per launch mission Operation Directives (OD). On the day of launch, weather support typically consists of on console weather briefings, go/no-go weather calls, cold-spill toxic analysis, range weather forecast, upper-air weather observations from weather balloons, surface weather observations, and a specialized T-0 wind and thermodynamic forecast used by 30 SW/SE to conduct a hot spill safety analysis.

1.8.4.3. Develop and ensure compliance of operating instructions and procedures for launch weather team activities.

1.8.4.4. Ensure weather instrument and support requirements for launch operations are identified and forwarded to 30 SW/SEO for inclusion in the Range Safety Operations Requirements (RSOR).

1.8.4.5. Consult on improvements to lightning Launch Commit Criteria in coordination with NASA and the Lightning Advisory Panel.

1.8.5. 30 WS Base Weather Operations Flight (30 WS/DOO). 30WS/DOO provides resource protection using Weather Warning, Watch, and Advisory criteria established in [Chapter 4](#); Toxic Hazard Zone (THZ) forecasts; and operational weather support for all base aviation and pre-launch activities and WR aeronautical missions. 30 WS/DOO will:

1.8.5.1. Ensure issuance of forecasts for the airfield, local area, and flying operations.

1.8.5.2. Provide meteorological mission watch in support of VAFB aviation and pre-launch operations and issue required weather warnings, watches, advisories and cold-spill (only) THZ for protection of personnel and facilities.

- 1.8.5.3. Operate, monitor, and provide training to appropriate base agencies, as required, on meteorological sensing and dissemination systems.
- 1.8.5.4. Provide aircrew briefings and monitor Pilot-to-Metro Service (PMSV) radio.
- 1.8.5.5. Ensure the Central Coast Weather Associates (CCWA), contracted weather observers, provide initial local weather observation training and certification to all tower personnel (Air Traffic Control) to take limited weather observations.
- 1.8.5.6. IAW AFI 10-229, ***Responding to Severe Weather Events***, provide the following information for OPREP-3 reports to 30 SW/CP:
 - 1.8.5.6.1. The actual severe weather conditions experienced.
 - 1.8.5.6.2. The forecast valid for the time of the occurrence and any watches or warnings issued.
 - 1.8.5.6.3. The operational status of meteorological equipment at the time of the event.
- 1.8.5.7. Provide updated weather operations and sensor information for publication in Notice to Airmen (NOTAM) and Flight Information Publications (FLIP) to 30 OSS/OSAA.
- 1.8.5.8. Provide tailored weather support for senior staff and DV activities. Requesting agency will notify the Weather Operations Flight (606-3210/8022), at least two duty days prior, if possible, when requesting a trip forecast. At a minimum, include departure and arrival dates, times and locations.
- 1.8.5.9. Upon request, provide Chemical Downwind Messages to Range Safety.
- 1.8.5.10. Upon request, provide Effective Downwind Fallout Messages to CE Readiness.
- 1.8.6. 30 WS Systems Officer (30 WS/SY). 30WS/SY manages efforts to sustain, modernize, and support base and WR weather sensing and processing systems, and required communications. 30 WS/SY will:
 - 1.8.6.1. Be the technical lead to define 30 WS and supported customer requirements for new weather information systems and develop plans to acquire, integrate, and support these systems.
 - 1.8.6.2. Manage maintenance and modification of WR support weather computer systems, instrumentation systems, and data transfer (primary and back-up communications) equipment.
 - 1.8.6.3. Establish and provide oversight of appropriate contractor-supplied weather systems support. Utilizes the 30 RMS/RMQS Technical Customer Feedback process when identifying performance concerns relative to contractor-supplied weather system support.
 - 1.8.6.4. Direct/provide/oversee meteorological and climatological research/studies and scientific services in support of DoD/DoD-contracted or unit missions and operations.
- 1.8.7. 30 WS Systems Plans and Requirements Flight (30 WS/SYR). 30 WS/SYR provides technical expertise to identify requirements and develop plans to modify and replace logistically unsupportable weather systems. 30WS/SYR will:
 - 1.8.7.1. Identify WR weather support requirements and provide technical user interface into the development of plans for the modification, acquisition, integration, and support of weather data sensing/processing systems to meet current and future needs.

1.8.7.2. Upon request, provide meteorological/climatological services and/or studies affecting WR activities. WR agencies requiring such support can contact 30 WS/SYR at 606-2550.

1.8.7.3. Directs weather balloon support for daily operations.

1.8.8. 30 WS Systems Support Flight (30 WS/SYS). 30 WS/SYS is responsible for the maintenance, modification, and operation of existing weather data sensing and processing and communications systems. 30 WS/SYS will:

1.8.8.1. Oversee all matters concerning configuration management of weather sensing and processing systems.

1.8.8.2. Act as technical advisor to acquisition program manager and quality assurance specialist (QAS) for the weather system mission support requirements, provide inputs on “fitness” of performance of all weather related support activities (operations, maintenance, engineering, software development and operational analysis).

1.8.8.3. Represents 30 WS at interagency working groups that manage the weather information network connecting weather systems.

1.8.8.4. Design launch customer access of weather data information from squadron server and web site.

1.9. Release of Weather Information. Support to non-DoD agencies and the public will generally not be provided until the 30 WS/CC or designated representative, 30 SW Public Affairs Office, and 30 SW Legal Office has approved as appropriate.

Chapter 2

FORECASTING SERVICES

2.1. Hours of Operation. The Weather Operations Center (Wx Ops), located in Bldg 21150, is normally operational 24 hours a day, 7 days a week. Closures can occur on holidays and weekends with no scheduled range or flying operations. Closure will be coordinated with 30 SW/WOC.

2.2. Terminal Aerodrome Forecasts (TAF). Wx Ops forecasters prepare and disseminate (via the New Tactical Forecast System (NTFS)) a TAF ([Attachment 3](#)) for the area within a 5 statute mile radius of the airfield at 0000L, 0800L, and 1600L daily.

2.2.1. The TAF is valid for a 24-hour period. It specifies occurrence time of significant weather to the nearest hour, its forecasted duration, and its intensity where applicable.

2.2.2. TAFs disseminated when the airfield is open, or when the 76 HF are conducting flying operations, will be amended for conditions listed in [Attachment 4](#).

2.2.3. Forecasts disseminated when the airfield is closed will be amended only when the Wx Ops forecaster does not consider the TAF to be representative of existing conditions and those conditions are expected to last for 30 minutes or longer, or weather warning criteria are met for the airfield. TAFs issued when the airfield is closed are indicated by the words "LIMITED MET WATCH" on the last line. Typically, airfield closure will apply to all weekend and holiday TAFs.

2.3. Briefing Services. Wx Ops forecasters provide flight weather briefings by telephone. Flight departure, enroute, and destination weather is briefed using DD Form 175-1, **Flight Weather Briefing**, or local form. WR missions briefings will include off shore weather conditions, sea states and other information, as requested. If a flight weather briefing is requested when there is no forecaster on duty, contact the 30 SW/WOC at 606-5262.

2.4. Pilot to Metro Services (PMSV). Wx Ops forecasters provide PMSV 24 hours a day on assigned frequency 342.4MHz. Aircrews shall relay pilot reports (PIREP) during PMSV contacts.

2.5. Launch Forecasts. LWOs provide operational weather forecasts for all spacelift and ballistic missile launches. Advance L-X day forecasts will be provided in the standard format shown in [Attachment 5](#). In addition, LWOs provide on console weather briefings in accordance with the OD for each mission.

2.6. Range Forecasts. Wx Ops forecasters provide support to scheduled WR operations/tests. With the exception of launch operations, if changes to weather support requirements are expected for a specific operation/test, coordinate with the Wx Ops forecaster at 606-8022.

2.7. THZ Forecasts. Wx Ops personnel prepare/disseminate cold-spill THZs using the Air Force Toxic (AFTOX) diffusion model. Specific information is provided in [Attachment 6](#) and 30 SWI 91-106, *Toxic Hazard Assessments*.

2.7.1. Each THZ is issued with a 2-hour valid time and monitored and verified 45 minutes and 90 minutes into the valid period.

2.7.2. THZs will be amended in accordance with launch facility and safety requirements outlined in **Attachment 6**.

2.7.3. The originator of the request receives the THZ by phone and/or NTFS.

2.7.4. Hot-spill toxic forecasts are prepared and disseminated by 30 SW/SE incorporating data provided by Wx Ops personnel.

2.8. Automatic Telephone Answering Device (ATAD) Recording. Other duties permitting, the Wx Ops disseminates a plain language, public forecast via the ATAD. The recording (606-6666) is for non-operational use only.

2.9. 30 WS web site. The 30 WS web site is located on the Vandenberg Internet page under the following URL: http://www.vandenberg.af.mil/30sw/organizations/30og/weather/weather_index.html and is also located on the Vandenberg Intranet page under the following URL: https://intranet.vandenberg.af.mil/organization/30og/weather/weather_index.html. These sites provide a link to weather information for personnel and agencies operating on the Western Range. They both include our 5-day forecast product that is updated around 0600L before every duty day. The sites also include climatology, observations, weather impacts to range operations, range and launch forecasts and severe weather information.

2.10. Alternate Forecast Site (AFS). In the event Bldg 21150 is evacuated, forecasting operations and toxic hazard zone support will be conducted from the Weather Control Center in bldg 7000, phone (805) 605-8586. Service may be slightly degraded while forecaster is operating from bldg 7000.

Chapter 3

OBSERVING SERVICES

3.1. Duty Hours. At a minimum, weather observers man the Representative Observation Site (ROS) and provide surface observing services from 1 hour prior to scheduled airfield opening until airfield closes. Weather observers also conduct daily upper-air soundings/observations at 0000 UTC (ZULU) and 1200 UTC (ZULU), and as required for WR operations. Weather observation support is contracted through the Central Coast Weather Associates.

3.2. Basic Weather Watch (BWW). A BWW is conducted from the ROS, Bldg 1764, during airfield operating hours and/or when an observer is on duty. See [Attachment 1](#) for greater detail.

3.3. Cooperative Weather Watch. Vandenberg control tower personnel will perform a cooperative weather watch, IAW [Paragraph 6.10.5.](#), and notify the observer of previously unreported changes in the weather which could be critical to flight safety or other WR operations.

3.4. Special and Local Weather Observation Criteria. Criteria are derived from recommendations in AFMAN 15-111, *Surface Weather Observations*, and from DoD Flight Information Publications (FLIP) published specifically for VAFB. Criteria are defined in [Attachment 7](#) and [Attachment 8](#).

3.5. Earthquake Reporting. IAW AFMAN 15-111, *Surface Weather Observations*, the duty forecaster will complete the Earthquake USGS report and disseminate via the NTFS. The forecaster will also fill out the USGS' earthquake questionnaire located on the USGS website.

3.6. Limited Observation Support. Agencies requiring surface observing support from other VAFB locations will coordinate in advance with the Base Weather Operations (606-3210) or Launch Weather Operations (606-2553) flight chiefs, respectively.

3.7. Dissemination of Observations. Airfield observations are disseminated base-wide and to the worldwide network via NTFS when observers are on duty at the ROS. Non-augmented Automated Surface Observation System (ASOS) airfield observations are available via telephone at (805) 605-8926 when observers are not on duty at the ROS.

3.8. Upper-Air Observing. Upper-air operations are conducted from Bldg 1764, North VAFB. Prior to launch of balloons, not associated with launch operations, upper-air observing personnel (CCWA) will obtain clearance from the VAFB control tower, when manned. Upper-air personnel will contact Los Angeles Center prior to launching balloons when the VAFB control tower is not manned.

3.9. Alternate Observation Site (AOS). In the event Bldg 1764 is evacuated, surface observing support will be conducted from Base Operations, bldg 1746, phone (805) 423-0848. Service may be slightly degraded while the observer is operating from bldg 1746. There is no alternate upper-air observing location.

Chapter 4

LAUNCH WEATHER SERVICES

4.1. Preliminary Weather Support. Many weather services are provided prior to those delivered on the day of launch, such as:

4.1.1. Weather Constraint Coordination. The LWO, in consultation with the launch customer, assists in determining the launch weather constraints for each mission and how the constraints will be monitored. The resulting documents that detail the weather constraints are the OD and the launch constraints document. Launch vehicle specific weather sensitivities and support requirements change with each mission and are identified within the Universal Documentation System.

4.1.2. Balloon Tests. Upper-air weather services and the ability of the launch customer to access balloon data are often tested several times in the days and weeks leading up to the launch. Members of the launch weather team will launch the balloons and make any required editing of the data during these balloon tests.

4.1.3. Dress Rehearsals. The LWO participates in the many of the rehearsals that are part of each launch campaign to include wet dress rehearsals and mission dress rehearsals.

4.1.4. Preliminary Briefings/Reviews. The LWO provides operational weather forecasts for all spacelift and ballistic missile launches. Advance L-X day forecasts are provided in the standard format shown in [Attachment 5](#). In addition, LWOs provide weather briefings at the Group Readiness Review, Pre-Launch Readiness Review, and Launch Readiness Review as well as other reviews depending on the launch agency and vehicle. Readiness review weather briefings include the status of weather equipment and the launch weather team for the launch as well as the expected weather for the launch and a probability of violating (POV) either a user or safety weather constraint.

4.2. Day of Launch Weather Support. The 30 WS utilizes the majority of its personnel to provide weather support on the day of launch.

4.2.1. On Console Weather Support. The LWO is the Weather Control Center supervisor. The LWO leads the launch weather team and, with the concurrence of the Mission Support Commander, gives the final weather "go" for launch. During on-console briefings the LWO provides current status as either "Red" or "Green" indicating a constraint is either currently violated or not violated. The LWO will also provide a POV, which indicates the probability that a constraint will be violated at T-0. A large POV value indicates a probable "Red" condition at T-0 and allows the launch agency to choose a desired hold point in the count that occurs before an irreversible event in the countdown. If terminal countdown is entered with "Red" being the current status of a mandatory constraint, or if a mandatory constraint becomes "Red" during terminal countdown, the LWO will call a launch "Hold."

4.2.2. Upper-Air and Surface Observing. Upper-air balloon observations as well as balloon editing services are provided on the day of launch. These observations are needed by the launch customer in making the final decision to launch and by the 30 SW/SE office in determining safety of flight. The balloon schedule is determined by range safety's requirements and by the launch customer's requirements outlined in the OD. Although each mission has its own unique balloon schedule, the first balloon is generally released approximately 8-10 hours before T-0. On average, weather balloons are then

released approximately every hour, however the time between balloon releases varies widely within each mission.

4.2.3. Cold Spill Toxic Hazard Zones. Cold-spill toxic analyses are provided by the range weather forecaster during the countdown to determine the threat to the base and local population in the event of an unplanned release of toxic chemicals before the launch. An increase in the size of a cold spill THZ does not itself impact the launch countdown. It can be used range safety and/or the launch agency as a reason to avoid proceeding with a particularly dangerous stage of the countdown where the potential for a toxic spill is at its greatest.

4.2.4. Hot Spill Weather Forecast. During launch operations the 30 WS provides specialized wind and thermodynamic forecasts for T-0. These forecasts are used by 30 SW/SE to conduct hot spill safety analyses using the Rocket Exhaust Effluent Diffusion Model (REEDM). Based on the results of the REEDM output, 30 SW/SE may halt the countdown or delay the mission based on the toxic threat to personnel if a hot-spill should occur during launch.

Chapter 5

WEATHER WARNINGS, WATCHES, AND ADVISORIES

5.1. Customer Requirements. Western Range agencies and customers needing special warning, watch, and/or advisory support should document their requirements and forward them to 30 WS/DO for review and validation. Customer requirements must include weather phenomenon and thresholds (when applicable), lead-time required for notification, and actions taken by the customer upon receipt of a warning, watch or advisory. The final decision is left to the 30 WS/CC to approve changes to current lead times due to mission constraints of other users.

5.2. Severe Weather Action Procedures (SWAP). The duty forecaster will alert the Severe Weather Action Team (SWAT) if considering the issuance of any watches or warnings. The SWAT will respond four hours before the expected occurrence of a severe weather event to analyze and assess the weather threat. If the SWAT determines that their installation is at risk for severe weather, then a contingent of the SWAT will remain on duty until the threat is passed. However, if the SWAT determines that their installation is not at risk for severe weather, the weather unit will return to normal operations. The SWAT team is composed of the SWAT leader (CWSO, Superintendent, Commander or DO) and any other weather personnel deemed essential by the SWAT leader. SWAT duties take priority over all other duties.

5.3. Severe Weather Reporting. After an occurrence of severe weather (winds 50 knots or greater, hail ¼ inch or greater, or tornado), the weather unit will report the following items to 30 SW/WOC: the actual severe weather conditions experienced, the forecast valid at the time of the occurrence to include any watches or warnings issued, and the operational status of meteorological equipment at the time of the event. 30 SW/CP will report the severe weather occurrence on Vandenberg AFB in accordance with OPREP-3 reporting procedures in AFMAN 10-206, *Operational Reporting* and AFI 10-229, *Responding To Severe Weather Events*.

5.4. Weather Warning and Watch Criteria. Weather forecasters prepare and issue weather warnings and watches for VAFB as defined in [Table 1.1.](#) and [Table 5.2.](#). Desired lead-time is the advance notice a supported agency needs to react to an advisory or warning/watch and put protective measures into effect. These weather warnings, watches and required lead times deviate from the standard set of warnings and watches listed in AFMAN 15-129, *Aerospace Weather Operations -Processes And Procedures*, table 3.2. These deviations have been coordinated with Western Range Customers and the 30th Space Wing Commander to meet the unique mission and resource protection requirements of Vandenberg AFB. This requires base personnel to take appropriate protective measures due to warnings/watches issued for 10NM vice 5 NM distances, as noted in AFOSH Standard 91-100, *Aircraft Flight Line - Ground Operations And Activities*.

Table 5.1. Weather Warning Criteria

| CRITERIA | DESIRED LEADTIME | LOCATION |
|---|-------------------------|--|
| Tornado | 15 Min | Within 10NM of VAFB boundary |
| Surface Wind 35 - 49 kt for elevations below 1000' excluding tower 53 | 1 Hour | North VAFB, South VAFB and Vandenberg Airfield |
| Surface Wind \geq 50 kt for elevations below 1000' excluding tower 53 | 2 Hours | North VAFB, South VAFB and Vandenberg Airfield |
| Surface wind > 65 kt | 2 Hours | For elevations above 1000' |
| Rain \geq 2" within 12 hours | 1 Hour | Within 10NM of VAFB boundary |
| Hail \geq 1/4" | 2 Hours | Within 10NM of VAFB boundary |
| Lightning/Thunderstorms | Observed | Within 10NM of VAFB boundary |

Table 5.2. Weather Watch Criteria

| CRITERIA | DESIRED LEADTIME | LOCATION |
|-------------------------|-------------------------|------------------------------|
| Lightning/Thunderstorms | 2 Hours | Within 10NM of VAFB boundary |

5.5. Weather Advisory Criteria. Weather forecasters prepare and issue weather advisories for VAFB as defined in [Table 5.3.](#)

Table 5.3. Weather Advisory Criteria.

| CRITERIA | DESIRED LEADTIME | LOCATION |
|--|-------------------------|---|
| Icing (Any intensity) SFC to 10,000 feet | Observed | Within 10NM of VAFB boundary |
| Turbulence (Moderate or greater) SFC to 10,000 feet | Observed | Within 10NM of VAFB boundary |
| Low-Level Wind Shear below 2,000 feet above ground level (AGL) | Observed | Within 10NM of VAFB boundary |
| Surface Wind Gust Spread 20kts or greater | Observed | Airfield (flagged on ROS observation as "WA GUST SPREAD") |
| Surface Temperature \geq 85 °F | Observed | Main Base |

Chapter 6

RECIPROCAL SUPPORT

6.1. General. IAW AFI 10-229, all supported on-/off-base agencies will develop procedures to notify all unit activities and personnel of severe weather warning/watch messages and to take protective measures to protect and safeguard personnel, equipment, and facilities. Procedures should include primary and back-up notification methods (e.g., if phone lines are down), as well as, reporting to Command Post, damages caused by severe weather events, IAW AF1 10-206.

6.2. 30th Space Wing Commander (30 SW/CC) will: serve as Chair for the Western Range Severe Weather Preparedness Committee IAW AFI 10-229. Meetings will be annual and address at minimum:

- 6.2.1. Severe weather observing/forecasting capabilities.
- 6.2.2. Warning/Watch Threshold values, Desired Lead-Times and Acceptable False Alarm Rates.
- 6.2.3. Adequacy of dissemination procedures.
- 6.2.4. Adequacy of protective action procedures/resources.
- 6.2.5. Adequacy of severe weather awareness training and exercise procedures.

6.3. 30 SW/CP (VCC) will:

- 6.3.1. Relay weather warnings, watches and advisories to agencies identified in [Attachment 9](#).
 - 6.3.1.1. Should the NTFS be inoperative, relay above information and THZs to Frontier Control first, then proceed with [Attachment 9](#) notifications.
- 6.3.2. Notify 30 WS of accidents, mishaps, incidents, wildland fires or any other changes to normal operations requiring weather support.
- 6.3.3. Inform 30 WS of any incident or significant event involving weather service or 30 WS personnel.
- 6.3.4. Coordinate, if time permits, with 30 WS/CC or DO before transmitting a significant event message to higher headquarters involving weather events, service, or personnel.
- 6.3.5. Send OPREP-3 reports up-channel when severe weather (defined as winds of ≥ 50 kts, hail of $\geq \frac{3}{4}$ " and/or a tornado) occurs on Vandenberg AFB, and causes damage which impacts or impedes operations, IAW 10-229.
- 6.3.6. Inform 30 WS directly or through the Contingency Support Staff of Alert Condition (LERT-CON), Force Protection Condition, or INFOCON changes.
- 6.3.7. Conduct quarterly (minimum) tests of primary and back-up weather watch/warning dissemination systems.
- 6.3.8. Inform 30 WS when the Command Post NTFS is inoperative.

6.4. 30th Space Wing Chief of Safety (30 SW/SE) will:

- 6.4.1. Identify meteorological requirements for launch operation hazard assessments.

6.4.2. Include new and modified weather instrument and support requirements for launch operations in the RSOR when requested by 30 WS.

6.4.3. Provide required training for 30 WS individuals appointed as Interim Safety Board members or appointed to assist with accident investigations.

6.4.4. Coordinate and recommend approval to 30 SW/CC for range safety constraints concerning natural and triggered lightning. Additionally, ensure documentation of these constraints in EWR 127-1, *Eastern and Western Range Safety Requirements*.

6.4.5. Provide 30 WS/DOR a letter certifying evaluation of all launch vehicles for triboelectrification. Certification enables launch weather officers to ensure accurate evaluation of the range safety triggered lightning constraint concerning triboelectrification.

6.4.6. Ensure preparation/dissemination of hot-spill THZs associated with launch operations. Weather data necessary for these THZs are provided by the 30 WS Wx Ops personnel.

6.5. 30th Space Wing Chief of Plans (30 SW/XP) will ensure 30th Space Wing develops pre and post-severe weather response plans IAW guidance established in AFI 10-229.

6.6. 30th Space Wing Chief of Inspections & Exercises (30 SW/IGI) will:

6.6.1. Conduct semi-annual (minimum) exercises of severe weather notification and response actions.

6.6.2. Through EET observance, ensure all supported on-/off-base agencies are performing preventive and response plan procedures for severe weather.

6.6.3. When planning exercises task individual unit EET representatives to record severe weather notification times and the agency notified, then forward to 30 SW/IGI for inclusion in exercise after action reports.

6.7. 30th Civil Engineering Squadron Readiness Flight (30 CES/CEX) will:

6.7.1. Ensure base personnel are educated on local severe weather threat and applicable protective measures.

6.7.2. Ensure 30 SW Oplan 32-1, *Disaster Preparedness Operations Plan*, includes AFI 10-229 tasks and responsibilities.

6.8. Base Operations (30 OSS/OSAA) will:

6.8.1. Provide maximum advanced notice possible to 30 WS when the airfield will be open or closed outside normal operating hours.

6.8.2. Notify weather observer of any changes in the runway surface condition (RSC) reading according to AFMAN 15-111.

6.8.3. E-mail or Fax daily flying schedules to the Wx Ops, 606-0828.

6.8.4. Conduct PMSV radio checks with the Wx Ops within one hour of the airfield opening.

6.8.5. When notified, submit weather related NOTAM and FLIP updates.

6.9. Air Traffic Control Operations (30 OSS/OSA). Provide 30 WS personnel indoctrination training on local air traffic control facilities and capabilities.

6.10. Vandenberg Control Tower (30 OSS/OSA). During tower hours of operation will:

- 6.10.1. Inform the weather observer whenever the airfield wind sensor is changed.
- 6.10.2. Inform the weather observer when the active runway is changed.
- 6.10.3. Inform the Wx Ops when the NTFS is inoperative.
- 6.10.4. Relay all PIREPs to the Wx Ops forecaster.
- 6.10.5. Assist the Observer in monitoring weather conditions (perform a Cooperative Weather Watch) by notifying the weather observer of any perceived difference between the observed and reported weather conditions, which may affect flight safety. These observations will include but are not limited to:
 - 6.10.5.1. Location and movement of thunderstorms.
 - 6.10.5.2. Rapidly deteriorating visibility/tower visibility.
 - 6.10.5.3. Presence of fog that could hinder an approach and landing of arriving aircraft.
 - 6.10.5.4. Beginning and ending of precipitation.
 - 6.10.5.5. Observed lightning.
 - 6.10.5.6. Report changes in prevailing visibility to the weather observer when prevailing visibility is less than 4 statute miles and is different from the current observation visibility. If visibility observations are made from both levels, the lower value (if less than 4 miles [6000meters]) will be reported as the visibility in the body of the observation and the other value will be a remark, IAW AFMAN 15-111.
- 6.10.6. Provide the airfield observer or Wx Ops forecaster with a report of any convective activity in the local area.
- 6.10.7. If workload and duty priorities permit, monitor the 30 WS PMSV frequency during short-term PMSV outages. Per AFMAN 15-129 the forecaster will request the tower to monitor the PMSV frequency and relay all requests to the forecaster during short-term PMSV outages (normally less than 1 hour). Tower may, or may not be able to honor this request.

6.11. 76th Helicopter Flight (76 HF) will:

- 6.11.1. Provide a weekly flying schedule to 30 WS/DOO.
- 6.11.2. Provide PIREPs to the Wx Ops forecaster or ROS/airfield observer.
- 6.11.3. Identify operational weather support required during hours the airfield is closed.

6.12. Frontier Control (2 ROPS/DOUN) will:

- 6.12.1. Notify the Wx Ops (606-8022) when same day changes occur (both additions and deletions) to scheduled flight operations on the WR.

6.12.2. Notify the Wx Ops when unscheduled flight operations requiring weather support occur on the WR.

6.12.3. Direct the weather aircraft as requested by the launch weather officer during all ballistic and spacelift launch operations.

6.12.4. Frontier Control will forward all PIREPS to Wx Ops forecaster, ext. 6-8022. During launch operations, forward PIREPS to the LWO in WCC.

6.13. 30th Space Communications Squadron (30 SCS) will:

6.13.1. Conduct or arrange maintenance on all weather systems and associated circuits as identified in [Attachment 10](#). Restoral priorities are dependent on current launch operations and launch vehicle requirements.

6.13.2. Ensure 30 WS primary and back-up communications are available to meet customer specified watch/warning/advisory notification timelines.

6.14. 30th Contracting Squadron (30 CONS) will:

6.14.1. Review, coordinate, and approve all mission requirements when support is provided by 30th Space Wing mission support contracts, e.g. WROCI, SLRSC, LOSC, and WSPEC.

6.14.2. Ensure additional (new) mission requirement packages include a mission need statement (MNS) signed by the unit commander or authorized representative.

6.14.3. Ensure weather equipment maintenance of weather systems via mission support contracts. Restoral priorities are dependent on current launch operations and launch vehicle requirements. Restoral priorities are maintained in the 30 WS on-line outage log.

6.14.4. Provide contract maintenance for air conditioning systems and backup power generators at building 1764 and building 21150.

Chapter 7

DISSEMINATION OF WEATHER INFORMATION

7.1. New Tactical Forecast System (NTFS). The NTFS is used to acquire, process, display, and disseminate weather information. NTFS consists of a central processor located at the weather station with communications links to the Air Force Weather Agency (AFWA) at Offutt AFB NE. There are NTFS client weather data displays located in operational facilities on base linked to the Weather Station central processor (**Attachment 12**). The NTFS is used to transmit and receive weather observations and forecasts for on-base and off-base agencies. The NTFS is also the primary dissemination tool for local weather watches, warnings, and advisories. Should a supported agency require, or no longer require, an NTFS terminal for weather support, contact 30 WS/DOO at (606-8022). The NTFS is making a transition from using dedicated weather terminals at each agency to an open Internet based system. Any customer requiring weather data can now access current VAFB observation, forecast, and watches/warnings/advisory data via the Internet using the instructions listed at the following URL:

<http://www.vandenberg.af.mil/30sw/organizations/30og/weather/amislogin.html>.

7.2. Communication Outages.

7.2.1. NTFS External Communications. In the event that communication lines between the NTFS server and AFWA and/or the AWN are inoperative, 30 WS/DOO will make every attempt to reestablish communications. In the interim, weather data will be retrieved via the Internet, using the Joint Air Force and Army Weather Information Network (JAAWIN), or other meteorological web pages.

7.2.2. NTFS Local Communications. In the event NTFS communication lines between the weather station and local customers (**Attachment 12**) are inoperative, weather data will be disseminated to the 30 SW/WOC, Control Tower and Base Operations via telephone. The Command Post will notify Frontier Control, then proceed with **Attachment 9** notifications.

7.2.3. NTFS Terminal Outage. In the event a supported agency's NTFS terminal goes down, the supported agency will contact 30 WS/DOO at (606-8022) to notify them of the outage and arrange support during the outage.

7.3. Telephone Hotlines. Hotlines connect the 30 WS Wx Ops to other VAFB agencies as listed below. Agencies must report hotline outages to 30 SCS telephone maintenance at 6-2622.

7.3.1. 30 SW/CP (Bldg 10577)

7.3.2. Upper Air Observatory (Bldg 1764)

7.3.3. AOS (Bldg 1746)

7.3.4. 30 OSS/OSAA: Base Operations Flight Planning Room (Bldg 1746)

7.3.5. 76 HF (Bldg 1735)

7.4. Closed Circuit Television (CCTV). During WR launch operations, weather information is routinely disseminated via the VAFB CCTV network.

7.5. PMSV. Edwards AFB provides backup PMSV coverage during extended PMSV outages.

7.6. Forms Adopted. DD Form 175-1, Flight Weather Briefing,

CHAN W. KEITH, Lt Col, USAF
Commander, 30th Weather Squadron

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

DoD Flight Information Publications

AFI 10-206, *Operational Reporting*

AFI 10-229, *Responding to Severe Weather Events*

AFI 10-2501, *Full Spectrum Threat Response (FSTR) Planning and Operations*

AFMAN 15-111, *Surface Weather Observations*

AFMAN 15-129, *Aerospace Weather Operations – Processes and Procedures*

30 SW Plan 32-1, *Disaster Preparation Operations Plan*

30 SWI 91-106, *Toxic Hazard Assessments*

30 SWI 10-114, *Battle Staff Operations*

EWR 127-1, *Eastern and Western Range Safety Requirements.*

Abbreviations and Acronyms

AFTOX—Air Force Toxic Diffusion Model

AOS—Alternate Observation Site

ASOS—Automated Surface Observation System

ATAD—Automatic Telephone Answering Device

CCWA—Central Coast Weather Associates

CWC—Chemical Warfare Convention

DoD—Department of Defense

EHZ—Emission Hazard Zone

FLIP—DoD Flight Information Publications

HAZMAT—Hazardous Materials

LERTCON—Alert Condition

MARSSS—Meteorological and Range Safety Support System

METWATCH—Meteorological Watch

MSL—Mean Sea Level

NM—Nautical Miles

NOTAM—Notice to Airman

NTFS—New Tactical Forecast System

OHZ—Operational Hazard Zone
PHZ—Potential Hazard Zone
PIREP—Pilot Report
PMSV—Pilot-to-Metro-Service
ROS—Representative Observation Site
RSC—Runway Surface Condition
RSOR—Range Safety Operation Requirements
START—Strategic Arms Reduction Treaty
TAF—Terminal Aerodrome Forecast
THZ—Toxic Hazard Zone
UTC—Universal Time Coordinate (ZULU Hour)
VAFB—Vandenberg Air Force Base
VCC—Vandenberg Command Center
Wx Ops—Weather Operations Center (Bldg. 21150)
WR—Western Range

Terms

Aircraft Mishap—Term used to denote the occurrence of an aircraft accident or incident.

Airfield—The geographical coordinates are 34 degrees and 44 minutes North latitude and 120 degrees and 35 minutes West longitude with a field elevation of 367 ft above MSL. The magnetic deviation for Vandenberg AFB is +14.5°; we round this to +10° for airfield operations, and there is -8 hours difference between local standard time and GMT (-7 hours during Daylight Savings Time).

Basic Weather Watch—Conducted from the weather unit by weather personnel who, because of other weather operations duties, cannot monitor the weather continuously. Due to these other weather duties, weather personnel on duty may not detect and report all weather changes as they occur. The BWW observing program has been implemented to establish the minimum requirements needed to ensure the proper level of weather watch is maintained. During a BWW, weather personnel will recheck weather conditions, at intervals not to exceed 20 minutes since the last observation/recheck, to determine the need for a SPECI or LOCAL observation, when any of the following conditions are observed to be occurring or are forecast to occur within 1 hour: ceiling forms below or decreases to less than 1,500 feet; ceiling dissipates, or increases to equal or exceed 1,500 feet; visibility decreases to less than 3 miles (4800 meters); visibility increases to equal or exceed 3 miles (4800 meters); precipitation (any form) and fog. In addition to the above minimum requirements, weather personnel will remain alert for any other changes in weather conditions that will require a SPECI or LOCAL observation. Weather personnel will also monitor local area observational and forecast products as often as necessary to keep abreast of changes expected to affect their area of responsibility.

Ceiling—In aviation forecast code, the ceiling is equal to the height above the earth's surface of the lowest broken (5/8ths coverage or more) or overcast (8/8ths coverage) layer of clouds or the vertical

visibility into an indefinite ceiling.

Chemical Downwind Message—A chemical downwind message (CDM) contains wind, stability, temperature, relative humidity, weather, and cloud data, valid for a 6-hour period, used to calculate chemical downwind hazards.

Continuous Weather Watch—Conducted by weather personnel on a continuous basis performing no other significant duties.

Desired Lead Time—The amount of advance notice an agency requires prior to the onset of a particular weather phenomenon.

Indefinite Ceiling—The vertical visibility, measured in feet, into a surface based total obscuration which hides the celestial dome (8/8ths coverage).

Main Base—The main base is located near the windward side of the Santa Lucia Range. This would include the cantonment area of the base, the airfield to the west, and the Lompoc Gate to the south.

METWATCH—Meteorological Watch. The process of monitoring the weather and informing designated agencies when certain weather conditions could impact operations or pose a hazard to property or life.

Missile Mishap—A term used to denote the occurrence of a missile accident or incident.

North VAFB—North of the Santa Ynez River (Highway 246) is the main base complex, airfield, WOC, ROS, and the majority of base facilities. This area is generally flat; however, there are numerous deep ravines formed by the San Antonio Creek and its tributaries. NVAFB starts at sea level along the beaches and rises very steeply ½ mile inland to about 350 ft and levels off. It rises again about 3-4 miles inland to heights of over 1,500 ft.

Severe Thunderstorm—Thunderstorms with wind speed greater than or equal to 50 knots and/or hail stones greater than or equal to 3/4 inch in diameter.

Severe Weather—High winds ≥ 50 kt; hail $\geq 1/4$ inch in diameter; rain ≥ 2 inches in 12 hours; and lightning within 10 NM.

South VAFB—South Vandenberg lies entirely in the Santa Ynez mountains. These mountains extend west to east from the Pacific Ocean to just east of Santa Barbara. The Pacific Ocean and Santa Ynez Valley border SVAFB on the west and south. The area is mountainous and rises from the beaches to over 2,000 ft. Tranquillon Peak is the highest point on SVAFB with an elevation of 2,159 ft.

Weather Advisory—A special notice to supported agencies giving them notification of mission-limiting, non-severe weather conditions that could affect their operation are occurring.

Weather Warning—A special notice to supported agencies giving them notification of weather conditions of intensity to pose a hazard to life or property.

Weather Watch—A special notice to supported agencies alerting them of the potential for weather conditions of intensity to pose a hazard to life or property.

Attachment 2**DUTY PRIORITIES****A2.1. Observer Duty Priorities:**

- A2.1.1. Complete Emergency War Orders Taskings (EWO)
- A2.1.2. Respond to aircraft/missile/ground emergencies.
- A2.1.3. Perform launch upper air observations
- A2.1.4. Disseminate airfield surface observations locally as required.
- A2.1.5. Respond to LWO/WRCC/Ops calls during launch operations.
- A2.1.6. Perform synoptic upper air observations
- A2.1.7. Transmit airfield surface observations longline as required.
- A2.1.8. Provide other briefings.
- A2.1.9. Perform other duties.

A2.2. Range Weather Forecaster Duty Priorities:

- A2.2.1. Complete Emergency War Orders Taskings (EWO).
- A2.2.2. Respond to aircraft/missile/ground emergencies (to include OHZs).
- A2.2.3. Disseminate airfield surface observations locally as required.
- A2.2.4. Respond to pilot-to-metro-service (PMSV) calls.
- A2.2.5. Issue weather warnings and advisories locally.
- A2.2.6. Respond to LWO/WRCC/Ops calls during launch operations.
- A2.2.7. Issue Potential Hazard Zone (PHZ) and Emission Hazard Zone (EHZ) forecasts.
- A2.2.8. Perform WSR-88D Unit Control Position (U) functions.
- A2.2.9. Transmit pilot reports (PIREP) locally.
- A2.2.10. Transmit airfield surface observations and PIREPs long line as required.
- A2.2.11. Prepare and disseminate terminal aerodrome forecasts (TAF).
- A2.2.12. Provide flight weather briefings.
- A2.2.13. Provide other briefings.
- A2.2.14. Perform other duties.

Attachment 3

WEATHER DISSEMINATION FORMATS

A3.1. Observation Format.

A3.1.1. Station Identifier.

A3.1.1.1. KVVG METAR 1055Z 19012G25KT 1-1/2 -TSRA SCT015CB OVC030 85/63 ALSTG 29.80 RMK PK WND 18031/33 FQT LTGICCCCG TS ALQDS MOV E

A3.1.2. Type and Time of Observation.

A3.1.2.1. KVVG METAR 1055Z 19012G25KT 1-1/2 -TSRA SCT015CB OVC030 85/63 ALSTG 29.80 RMK PK WND 18031/33 FQT LTGICCCCG TS ALQDS MOV E

A3.1.2.2. METAR observations are regularly scheduled “hourly” observations, which are taken between 55 and 59 minutes after every hour. The time of a METAR is the time the last element was observed.

A3.1.2.3. SPECI observations are “special” observations taken when any of the criteria listed in [Attachment 7, Table A7.1](#) is observed to occur. The time of the SPECI is the time the criteria are first observed. A single-element SPECI may be taken to quickly transmit a tornadic observation.

A3.1.2.4. Local observations are taken when any of the criteria listed in [Table A8.1](#) is observed to occur. The time of the local is the time the criteria occurs. NOTE: Locals taken for runway changes are taken several minutes after notification to allow for stabilization of meteorological instruments on the newly activated runway.

A3.1.3. Wind.

A3.1.3.1. KVVG METAR 1055Z 19012G25KT 1-1/2 -TSRA SCT015CB OVC030 85/63 ALSTG 29.80 RMK TS ALQDS MOV E FQT LTGICCCCG PK WND 18031/33

A3.1.3.2. Direction (magnetic) from which the wind is blowing. Reported in tens of degrees using three digits. In the example above, the wind is blowing from 190 degrees.

A3.1.3.3. Speed is encoded in two digits (or three for winds of 100 knots or more). In the example above, the wind speed is 12 knots.

A3.1.3.4. Gusts are encoded in two digits (three for gusts of 100 knots or more). In the example above, the wind has gusted to 25 knots during the period of observation (10 minutes).

A3.1.4. Visibility.

A3.1.4.1. KVVG METAR 1055Z 19012G25KT 1-1/2 -TSRA SCT015CB OVC030 85/63 ALSTG 29.80 RMK TS ALQDS MOV E FQT LTGICCCCG PK WND 18031/33

A3.1.4.2. Visibility is reported in statute miles and fractions thereof.

A3.1.5. Present Weather.

A3.1.5.1. KVVG METAR 1055Z 19012G25KT 1-1/2 -TSRA SCT015CB OVC030 85/63 ALSTG 29.80 RMK TS ALQDS MOV E FQT LTGICCCCG PK WND 18031/33.

A3.1.5.2. Weather or obscuring phenomena occurring at the station is encoded in the body of the observation (as indicated in the example above).

A3.1.5.3. Weather observed at a distance, but not occurring at the station is encoded in the remarks (RMK) section of the observation.

A3.1.5.4. See [Table A4.1](#) for a breakdown of present weather codes.

A3.1.6. Sky Condition.

A3.1.6.1. KVBG METAR 1055Z 19012G25KT 1-1/2 -TSRA SCT015CB OVC030 85/63
ALSTG 29.80 RMK TS ALQDS MOV E FQT LTGICCCCG PK WND 18031/33.

A3.1.6.2. Layer amounts are reported in octas; SKC=Clear, FEW=1/8 to 2/8ths, SCT=3/8 to 4/8ths, BKN=5/8 to 7/8ths, OVC=8/8ths.

A3.1.6.3. Encoded in ascending order up to the lowest overcast layer.

A3.1.6.4. "VV" indicates vertical visibility when a surface-based obscuring phenomenon (e.g., dense fog) obscures the entire sky.

A3.1.6.5. Heights are given in hundreds of feet using three digits.

A3.1.6.6. A ceiling is considered as the height of the lowest BKN or OVC layer aloft, or the vertical visibility (VV) into a surface-based obstruction.

A3.1.6.7. A cloud layer followed by "CB" indicates cumulonimbus.

A3.1.7. Temperature and Dew Point.

A3.1.7.1. KVBG METAR 1055Z 19012G25KT 1-1/2 -TSRA SCT015CB OVC030 85/63
ALSTG 29.80 RMK TS ALQDS MOV E FQT LTGICCCCG PK WND 18031/33

A3.1.7.2. Reported in degrees Fahrenheit.

A3.1.7.3. A solidus separates temperature and dew point.

A3.1.8. Altimeter Setting.

A3.1.8.1. KVBG METAR 1055Z 19012G25KT 1-1/2 -TSRA SCT015CB OVC030 85/63
ALSTG 29.80 RMK TS ALQDS MOV E FQT LTGICCCCG PK WND 18031/33

A3.1.8.2. Altimeter is in reference to inches of mercury (Hg).

A3.1.9. Remarks.

A3.1.9.1. KVBG METAR 1055Z 19012G25KT 1-1/2 -TSRA SCT015CB OVC030 85/63
ALSTG 29.80 RMK TS ALQDS MOV E FQT LTGICCCCG PK WND 18031/33

A3.1.9.2. Remarks are included to expand upon elements in the body of the observation. Remarks follow the remark (RMK) indicator.

A3.1.9.3. Movement of significant features will be indicated by the contraction "MOV," followed by the direction towards which the feature is moving.

A3.1.9.4. Distances (from the station) of significant features are in statute miles.

A3.1.9.5. In the example above; a thunderstorm is observed in all quadrants (ALQDS-every direction in relation to the station) and is moving towards the east. Frequent lightning (FQT LTG)

is observed in-cloud (IC), cloud-to-cloud (CC), and cloud-to-ground (CG); and the peak wind (PK WND) during the preceding hour was from 180 degrees, was 31 knots, and occurred at 33 minutes past the hour.

Table A3.1. Weather Phenomena Code Table.

| QUALIFIER | | WEATHER PHENOMENA | | |
|-------------|-----------------|----------------------------------|-----------------|--|
| Intensity | Descriptor | Precipitation | Obscuration | Other |
| - Light | MI Shallow | DZ Drizzle | BR Mist | PO Well Developed Dust/Sand Whirls |
| Moderate | PR Partial | RA Rain | FG Fog | SQ Squall |
| + Heavy | BC Patches | SN Snow | FU Smoke | FC Funnel Cloud, Tornado, or Water Spout |
| VC Vicinity | DR Low Drifting | SG Snow Grains | VA Volcanic Ash | SS Sand Storm |
| | BL Blowing | IC Ice Crystals | DU Dust | DS Dust Storm |
| | SH Showers | PL Ice Pellets | SA Sand | |
| | TS Thunderstorm | GR Hail | HZ Haze | |
| | FZ Freezing | GS Small Hail or Snow Pellets | PY Spray | |
| | | UP Unknown Pre- cipitation | | |

A3.2. Terminal Aerodrome Forecast (TAF) Format.

A3.2.1. Station and Forecast Identifiers.

A3.2.1.1. KVBG FCST 12-12 15012G25KT 5 -RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS TEMP 30C 2100Z TEMP 22C AT 1100Z TEMPO 16-02 1 +SHRA BKN025 OVC050 BECMG 02-03 18012G22KT 7 SKC ALSTG 30.05INS

A3.2.2. Valid Time Period.

A3.2.2.1. KVBG FCST 12-12 15012G25KT 5 -RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS

A3.2.2.2. Time is in reference to Zulu.

A3.2.2.3. Forecast period is 24 hours, except for amendments. Amendments are valid from the whole hour during which the amendment is issued, until the end of the regular forecast period. In the example above, if an amendment is issued at 1515Z, the valid time of the amended forecast would read "15-12."

A3.2.3. Wind.

A3.2.3.1. KVBG FCST 12-12 15012G25KT 5 –RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS

A3.2.3.2. Direction (magnetic) from which the wind is expected to blow. Reported in tens of degrees using three digits. In the example above, the wind is forecast to blow from 150 degrees.

A3.2.3.3. Speed is encoded in two digits (or three for winds of 100 knots or more). In the example above, the forecast wind speed is 12 knots.

A3.2.3.4. Gusts are encoded in two digits (three for gusts of 100 knots or more). In the example above, wind gusts of 25 knots are forecast.

A3.2.4. **Visibility.**

A3.2.4.1. KVBG FCST 12-12 15012G25KT 5 –RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS

A3.2.4.2. Visibility is reported in statute miles and fractions thereof.

A3.2.5. **Forecast Weather.**

A3.2.5.1. KVBG FCST 12-12 15012G25KT 5 –RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS

A3.2.5.2. ‘NSW’ (no significant weather) will be used to specify the termination of all obstructions and/ or predominant weather for the period of the forecast.

A3.2.6. **Sky Condition.**

A3.2.6.1. KVBG FCST 12-12 15012G25KT 5 –RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS

A3.2.6.2. Layer amounts are reported in octas; SKC=Clear, FEW=1/8 to 2/8ths, SCT=3/8 to 4/8ths, BKN=5/8 to 7/8ths, OVC=8/8ths.

A3.2.6.3. Encoded in ascending order to report all forecast cloud (or obscuring phenomena aloft layers).

A3.2.6.4. “VV” indicates vertical visibility when a surface-based obscuring phenomenon (e.g., dense fog) is expected to obscure the entire sky.

A3.2.6.5. Heights are given in hundreds of feet using three digits.

A3.2.6.6. A ceiling is considered as the height of the lowest BKN or OVC layer aloft, or the vertical visibility (VV) into a surface-based obscuration.

A3.2.7. **Icing.**

A3.2.7.1. KVBG FCST 12-12 15012G25KT 5 –RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS

A3.2.7.2. Intensity and type of icing is established by AFMAN 15-124, and is required in forecasts when icing is expected below 10,000 feet above ground level. Intensities are reported as: LGT = Light, MOD = Moderate, SVR = Severe. Type is reported as RIME = Rime, MXD = Mixed, CLR = Clear. The example shows light rime icing.

A3.2.7.3. Bases and tops of icing are encoded in ascending order in three digits using thousands of feet. The example shows the base of the icing begins at the 2,000 feet above the surface and extends to 8,000 feet above the surface.

A3.2.8. **Turbulence.**

A3.2.8.1. KVBG FCST 12-12 15012G25KT 5 –RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS.

A3.2.8.2. Intensity of turbulence is established by AFMAN 15-124 and requires turbulence be specified for Category II type aircraft in the forecast below 10,000 feet above ground level.

A3.2.8.3. Encoded in ascending order to report all forecast turbulence below 10,000 forecast turbulence below 10,000 feet above ground level.

A3.2.8.4. Bases and tops of turbulence are encoded in three digits using thousands of feet. The example shows the base of the turbulence begins at the surface and extends to 5,000 feet above the surface

A3.2.9. **Minimum Altimeter Setting.**

A3.2.9.1. KVBG FCST 12-12 15012G25KT 5 –RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS.

A3.2.9.2. Altimeter is in reference to inches of mercury (Hg).

A3.2.9.3. Forecasted value is the minimum altimeter expected for the time covered in the applicable forecast group.

A3.2.10. **Remarks.**

A3.2.10.1. KVBG FCST 12-12 15012G25KT 5 –RA SCT090 BKN140 OVC250 LGT RIME ICG 020-080 LGT TURBC SFC-050 ALSTG29.97INS T25/21Z T05/11Z.

A3.2.10.1.1. Remarks (if any) are always the last entries for each forecast group.

A3.2.10.1.2. Forecast maximum and minimum temperatures in Celsius, and projected hour of occurrence are included on the first line of the forecast.

A3.2.11. **Temporary Condition Groups. (TEMPO).**

A3.2.11.1. TEMPO 16-02 1 +SHRA BKN025 OVC050.

A3.2.11.2. Indicates a temporary fluctuation to forecast conditions (e.g., intermittent rain).

A3.2.11.3. May contain all, some, or just one of the elements (excluding altimeter setting) listed in the above paragraphs.

A3.2.11.4. When used, the valid time for the forecast intermittent conditions is from whole hour to whole hour as listed immediately after the TEMPO identifier. In the example above, the intermittent conditions are expected to occur from 16Z until 02Z.

A3.2.12. **Change Groups (BECMG).**

A3.2.12.1. BECMG 02-03 18012G22KT 7 SKC ALSTG 30.05INS TEMP 30C 2100Z TEMP 22C AT 1100Z.

A3.2.12.2. Used to indicate a change in forecast conditions expected to occur within a specified time period.

A3.2.12.3. The specified time period will normally be 1 hour and will never exceed 2 hours.

A3.2.12.4. BECMG groups will contain all elements.

A3.2.12.5. The valid time of this group will be from the end time of the change, to the ending time of either forecast period or until the ending time of a subsequent BECMG group. In the example above, the change is forecast to begin after 02Z and end at 03Z. Therefore, the valid time for the conditions within the BECMG group would be from 03Z until the end of the forecast (12Z) since there are no subsequent BECMG groups.

A3.3. Weather Watch, Warning, and Advisory Formats.

A3.3.1. Statement Type and Number.

A3.3.1.1. WEATHER WATCH (warning or advisory) 07-002.

A3.3.1.2. 03/1700Z (03/1000L) TO 03/2300Z (03/0600L)

A3.3.1.3. THE POTENTIAL EXISTS FOR LIGHTNING/THUNDERSTORMS WITHIN 10 NM OF THE VANDENBERG AFB BOUNDARY. A WARNING WILL BE ISSUED IF REQUIRED.

A3.3.1.4. 13/GNH

A3.3.1.5. Numbered sequentially in five digits. The first two digits represent the month in which the watch was issued, while the last three digits represent the sequential number for the watch. In the example above, the watch is the second (002) weather watch to be issued during the month of July (07).

A3.3.1.6. Watches, warnings, and advisories are all numbered independently of one another (e.g., the first watch in July will be numbered 07-001, as will the first warning and first advisory).

A3.3.2. Valid Period.

A3.3.2.1. WEATHER WATCH (warning or advisory) 07-002

A3.3.2.2. 03/1700Z (03/1000L) TO 03/2300Z (03/0600L)

A3.3.2.3. THE POTENTIAL EXISTS FOR LIGHTNING/THUNDERSTORMS WITHIN 10 NM OF THE VANDENBERG AFB BOUNDARY. A WARNING WILL BE ISSUED IF REQUIRED.

A3.3.2.4. 13/GNH

A3.3.2.5. The first two digits represent the date and four digits following solidus represent the time, first in Zulu, then local (in parentheses).

A3.3.3. Message Text.

A3.3.3.1. WEATHER WATCH (warning or advisory) 07-002

A3.3.3.2. 03/1700Z (03/1000L) TO 03/2300Z (03/0600L)

A3.3.3.3. THE POTENTIAL EXISTS FOR LIGHTNING/THUNDERSTORMS WITHIN 10 NM OF THE VANDENBERG AFB BOUNDARY. A WARNING WILL BE ISSUED IF REQUIRED.

A3.3.3.4. 13/GNH

A3.3.3.5. The text is self-explanatory and will describe the conditions expected.

A3.4. PIREP Format.

A3.4.1. Station and Product Identifier.

A3.4.1.1. KVBG PIREP TIME 0240 KVBG090045 FL330 TP LJ35 SK SCT250-TOPS300 TA M45 WND 22055KT TURBC LGT CHOP.

A3.4.2. Time.

A3.4.2.1. KVBG PIREP TIME 0240 KVBG090045 FL330 TP LJ35 SK SCT250-TOPS300 TA M45 WND 22055KT TURBC LGT CHOP.

A3.4.2.2. All times are Zulu.

A3.4.3. Aircraft Location.

A3.4.3.1. KVBG PIREP TIME 0240 KVBG090045 FL330 TP LJ35 SK SCT250-TOPS300 TA M45 WND 22055KT TURBC LGT CHOP.

A3.4.3.2. Nearest very high frequency navigational aid (VHF NAVAID) or airport followed by the direction and distance from the VHF NAVAID. In the above example, the aircraft location is 45 miles east (090 degrees) of Vandenberg (KVBG).

A3.4.4. Aircraft Flight Level.

A3.4.4.1. KVBG PIREP TIME 0240 KVBG090045 FL330 TP LJ35 SK SCT250-TOPS300 TA M45 WND 22055KT TURBC LGT CHOP.

A3.4.4.2. "FL" indicates flight level.

A3.4.4.3. Flight level is in hundreds of feet above mean sea level (MSL). In the example above, the flight level is 33,000 feet.

A3.4.5. Aircraft Type.

A3.4.5.1. KVBG PIREP TIME 0240 KVBG090045 FL330 TP LJ35 SK SCT250-TOPS300 TA M45 WND 22055KT TURBC LGT CHOP.

A3.4.5.2. "TP" indicates aircraft type. This example is a Lear Jet 35.

A3.4.6. Sky Cover.

A3.4.6.1. KVBG PIREP TIME 0240 KVBG090045 FL330 TP LJ35 SK SCT250-TOPS300 TA -45 WND 22055KT TURBC LGT CHOP.

A3.4.6.2. "SK" indicates sky condition.

A3.4.6.3. Layer amounts are reported in octas; SKC=Clear, FEW=1/8 to 2/8ths, SCT=3/8 to 4/8ths, BKN=5/8 to 7/8ths, OVC=8/8ths.

A3.4.6.4. Encoded in ascending order.

A3.4.6.5. Multiple cloud layers are separated by a solidus “/.”

A3.4.6.6. Heights are given in hundreds of feet using three digits. In this example the aircrew is reporting scattered clouds with bases at 25,000 ft and tops at 30,000 ft.

A3.4.6.7. This field may be omitted if the pilot does not report sky condition.

A3.4.7. **Air Temperature at Flight Level.**

A3.4.7.1. KVBG PIREP TIME 0240 KVBG090045 FL330 TP LJ35 SK SCT250-TOPS300 TA M45 WND 22055KT TURBC LGT CHOP.

A3.4.7.2. “TA” indicates temperature in Celsius.

A3.4.7.3. Subzero temperatures are prefixed with “M” (minus).

A3.4.7.4. This field may be omitted if the pilot does not report the temperature.

A3.4.8. **Wind.**

A3.4.8.1. KVBG PIREP TIME 0240 KVBG090045 FL330 TP LJ35 SK SCT250-TOPS300 TA M45 WND 22055KT TURBC LGT CHOP.

A3.4.8.2. “WND” indicates wind.

A3.4.8.3. Wind direction is in reference to the direction from which the wind is blowing and is indicated by the first three digits. In the example above, the wind is blowing from 220 degrees (southwesterly).

A3.4.8.4. Wind speed is in whole knots and follows the direction.

A3.4.8.5. Speeds less than 100 knots are encoded in two digits. In the example above, the wind speed is 55 knots.

A3.4.8.6. Speeds of 100 knots or more are encoded in three digits.

A3.4.8.7. The wind field may be omitted if the pilot does not report wind.

A3.4.9. **Turbulence and/or Icing.**

A3.4.9.1. KVBG PIREP TIME 0240 KVBG090045 FL330 SK SCT250-TOPS300 TP LJ35 TA M45 WND 22055KT TURBC LGT CHOP.

A3.4.9.2. “TURBC” indicates turbulence. This example is an aircraft experiencing light chop.

A3.4.9.3. “ICG” indicates icing.

A3.4.9.4. These fields may be omitted if not reported by the pilot.

A3.4.10. **Remarks.**

A3.4.10.1. “RMK” indicates remarks.

A3.4.10.2. Plain language (using contractions whenever possible) remarks as received from the pilot. Comments expand upon elements reported in the body of the PIREP.

Attachment 4

TAF SPECIFICATION AND AMENDMENT CRITERIA

A4.1. TAF Specifications. The following are weather conditions which, when expected, are detailed in the TAF

Table A4.1. TAF Specification Criteria.

| TAF SPECIFICATION CRITERIA | |
|--|--|
| Forecast Element/Occurrence | Specification Criteria |
| Ceiling observed or later expected to decrease to less than, or if below, increase to equal or exceed: | 3,000 feet 1,000 feet 700 feet 500 feet 200 feet (airfield min) |
| Prevailing visibility observed or later expected to decrease to less than, or if below, increase to equal or exceed: | 3 statute miles 2 statute miles 1 statute mile ½ statute mile (airfield min) |
| Surface Winds: | The difference between the predominant wind speed and the forecast wind speed is ≥ 10 knots and/or the difference between the observed gust is ≥ 10 knots from the forecast gust. Direction change >30 degrees when the predominant wind speed or gusts are expected to be over 15 knots. |
| Precipitation | Onset, duration, type, and intensity. |
| Thunderstorm | Onset, duration, type, and intensity |
| Icing, not associated with thunderstorms, from the surface to 10,000 feet AGL: | The beginning or ending of icing first meets, exceeds, or decreases below moderate or greater thresholds and was not specified in the forecast. |
| Turbulence (for Cat II aircraft), not associated with thunderstorms, from the surface to 10,000 feet AGL: | The beginning or ending of turbulence first meets, exceeds, or decreases below moderate or greater thresholds and was not specified in the forecast. |
| Non-convective low level wind shear | Onset, duration, type, and intensity |
| Locally established criteria for the airfield weather warnings | Onset, duration, type, and intensity |

A4.2. TAF Amendment Criteria. The duty forecaster may amend the TAF any time it is considered unrepresentative of the local weather conditions. The following criteria require TAF amendment when the condition is occurring or is expected to occur for more than 30 minutes and is not correctly forecasted by the next whole hour. A TAF amendment is also required anytime one of the following criteria is forecasted to occur but does not occur by the specified hour and is no longer expected to occur within the next 30 minutes.

Table A4.2. TAF Amendment Criteria.

| TAF AMENDMENT CRITERIA | |
|--|--|
| Forecast Element/Occurrence | Amendment Criteria |
| Ceiling observed or later expected to decrease to less than, or if below, increase to equal or exceed: | 3,000 feet 1,000 feet 700 feet 500 feet 200 feet (airfield min) |
| Prevailing visibility observed or later expected to decrease to less than, or if below, increase to equal or exceed: | 3 statute miles 2 statute miles 1 statute mile ½ statute mile (airfield min) |
| Surface Winds: | The difference between the predominant wind speed and the forecast wind speed is ≥ 10 knots and/or the difference between the observed gust is ≥ 10 knots from the forecast gust. Direction change >30 degrees when the predominant wind speed or gusts are expected to be over 15 knots. |
| Precipitation | Freezing precipitation begins or ends. |
| Icing, not associated with thunderstorms, from the surface to 10,000 feet AGL: | The beginning or ending of icing first meets, exceeds, or decreases below moderate or greater thresholds and was not specified in the forecast. |
| Turbulence (for Cat II aircraft), not associated with thunderstorms, from the surface to 10,000 feet AGL: | The beginning or ending of turbulence first meets, exceeds, or decreases below moderate or greater thresholds and was not specified in the forecast. |
| Non-convective low level wind shear | Is occurring and is expected to continue, or is expected to begin, but is not specified in the forecast. Is forecast in the TAF, but is no longer expected to occur during the forecast period. |
| Weather warning and or TAF amendable weather advisory criteria | Is occurring and is expected to continue, or is expected to begin, but is not specified in the forecast. Is forecast in the TAF, but is no longer expected to occur during the forecast period |
| Thunderstorms | Is occurring and is expected to continue, or is expected to begin, but is not specified in the forecast. Is forecast in the TAF, but is no longer expected to occur during the forecast period. |
| Representative Conditions | Anytime the forecaster considers it advisable in the interest of safety, efficiency of aircraft operations, flight planning, operational control, or in-flight assistance to aircraft. |

Attachment 5

SAMPLE WESTERN RANGE LAUNCH WEATHER FORECAST

Figure A5.1. Sample Forecast.

| | | | |
|--|---|------------------------|-----------------------|
|  | L-1 Day Forecast Western Range Launch Operation Forecast W1234 Issued: DDMMYY HHMMZ Valid: DDMMYY HHMMZ | | |
| Vehicle/Payload: Minuteman III GT-123 A | | | |
| Location: VAFB LF-26 | | | |
| Launch Weather Officer: Capt John Doe DSN: 276-xxxx; Comm: 805-606-xxxx | | | |
| LAUNCH FORECAST: Synoptic Discussion: High pressure dominates the western coast of the US. The storm track is well to the north of California and extends across the Washington-Oregon border, through the Pacific Northwest, then dips south along the eastern edge of the Rocky Mountains. | | | |
| <u>Clouds:</u> Stratus | <u>Coverage</u> Scattered 3/8ths | <u>Bases</u> 500 ft | <u>Tops</u> 900 ft |
| Visibility: 7+ Miles Wind: 330° 15 G 25 Kt Temperature: 45 - 49°F Weather: No Significant Weather | | | |
| Overall probability of violating weather constraints: 20% Area of concern: Surface winds | | | |
| Overall probability of violating weather constraints for 24 Hour Delay: 70% Area of concern: Layered Clouds and Upper level winds | | | |
| Next Forecast To Be Issued: DDMMYY HHMMZ | | | |

Attachment 6

TOXIC HAZARD ZONE FORECASTS

A6.1. Potential Hazard Zone (PHZ): The PHZ is established for an operation should an accidental spill or unplanned emission occur. A PHZ has Zone 2 and 3 based upon the current allowable exposure criteria. PHZs issued for N₂O₄ will also have a Zone 1 calculated, however not disseminated unless requested. A PHZ is also issued for the transport of non-rocket propellant, toxic commodities. In this case, only one downwind distance, taken from DoT Pamphlet 5800.5, is given.

A6.2. Emission Hazard Zone (EHZ): The EHZ is established prior to the planned emission of toxic propellants into the atmosphere (e.g., tank venting). EHZs are based upon the exposure criteria values listed in Table 1 of 30 SWI 91-106.

A6.3. Operational Hazard Zone (OHZ): This THZ is established following the accidental or unplanned release of a toxic commodity to the environment. If a PHZ was previously in effect, the PHZ becomes the OHZ until a new OHZ can be calculated based upon exactly how much was released to the environment and predicted weather conditions. OHZs are based upon the Zone 1, 2 and 3 concentration levels, with Zone 1 being the maximum allowable for sensitive individuals. OHZs are issued at 15 minute intervals for as long as the accident or exercise scenario exists. Dissemination is via NTFS and other communication systems. For more detailed information on hazardous material emergency response, see 30 SW Plan 32-4002, *Hazardous Materials (HAZMAT) Emergency Response Plan*. NOTE: All wind directions are with respect to true North.

A6.4. THZs are amended when:

A6.4.1. Initial distance of either Tier 3 or 2 is more than 500 feet and the 45/90 minute distance exceeds the initial distance by 500 feet or 10%, whichever is greater.

A6.4.2. Initial distance of either Tier 3 or 2 is 500 feet or less and the 45/90 minute distance exceeds the initial distance by 50 feet or 20%, whichever is greater.

A6.4.3. Observed wind speed is less than 4 knots and initial PHZ/EHZ forecast azimuth was not circular.

A6.4.4. Observed wind speed is 4 knots or greater and initial PHZ/EHZ forecast azimuth was circular.

A6.4.5. Observed standard deviation is two or more times the initial standard deviation.

A6.4.6. Observed wind direction differs from the initial wind direction by plus or minus twice the initial standard deviation or more.

A6.5. Sample Potential Hazard Zone (as disseminated over NTFS)

WEATHER MESSAGE 01-001

VALID 17 / 1700Z (17 / 0900L) TO 17 / 1900Z (17 / 1100L)

SITE: SLC-4E

DELTA T: -1.8 DEG F

WIND: 280 DEG AT 4 KTS

DIR DEV: 44 DEG

AZIMUTH: 040 DEG CW TO 140 DEG

CHEMICAL: N2O4

SOURCE STRENGTH: 100 SQ / FT

ZONE 3 DISTANCE: 1048 FT

ZONE 2 DISTANCE: 3332 FT

ZONE 1 DISTANCE: XXXX FT [calculated only for N2O4/disseminated if requested]

REMARKS: NONE

TIME / INIT: 56 / JJ

Table A6.1. References and Decoded Information.

| PHZ REFERENCE | DECODED INFORMATION |
|--|---|
| 01-001 | Month - Running number of PHZs issued |
| VALID 17 / 1700Z (17 / 0900L) TO 17 / 1900Z (17 / 1100L) | Date/Valid time (Zulu and Local) |
| SITE: SLC-4E | Location of operations |
| DELTA T: -1.8 DEG F | Change in temperature between 12' and 54' levels of wind tower nearest site |
| WIND: 280 DEG AT 4 KTS | Wind direction and speed |
| DIR DEV: 44 DEG | Variability of wind direction (+ or - 22 deg of 280) |
| AZIMUTH: 040 DEG CW TO 140 DEG | Area downwind of spill (CW = clockwise) |
| CHEMICAL: N204 | Chemical type |
| SOURCE STRENGTH: 100 SQ / FT | Wetted area for potential spill |
| ZONE 3 DISTANCE: 1048 FT | End distance of highest concentration of chemical from release point |
| ZONE 2 DISTANCE: 3332 FT | End distance of second highest concentration of chemical from release point |
| ZONE 1 DISTANCE: XXXXXFT | End distance of lowest concentration of chemical from release point |
| TIME / INIT: 56 / JJ | Issue time in minutes prior to the valid time (17 / 1656Z) and initials of range forecaster |

Attachment 7

SPECIAL OBSERVATION (SPECI) CRITERIA

Table A7.1. Special Observation Criteria.

| DEFINITION | CRITERION |
|--------------------------------------|---|
| Ceiling | Ceiling is observed to form below, decrease to less than or, if below, increase to equal or exceed the following values: 3000, 1500, 1000, 700, 500 feet and all published landing minima per current DoD Flight Information Publication (FLIP). |
| Sky Condition | A layer of clouds or obscuring phenomena aloft is observed below 600 feet and no layer aloft was reported below this height in the previous observation. |
| Visibility | Prevailing visibility is observed to decrease to less than, or, if below, increase to equal or exceed the following values: 3, 2, 1 statute miles and all published landing minima per current DoD Flight Information Publication (FLIP). |
| Tornado, Water Spout or Funnel Cloud | Phenomena observed, disappears from sight. |
| Thunderstorm | Thunderstorm begins (a SPECI is not required to report the beginning of a new thunderstorm if one is currently reported as in progress at the station), or ends (15 minutes after last occurrence of criteria for a thunderstorm). |
| Precipitation | Hail begins or ends. Freezing precipitation or ice pellets begin, end, or change intensity. Any other precipitation type begins or ends. |
| Wind Shift | Wind direction changes by 45 degrees or more in less than 15 minutes with sustained winds of 10 knots or more throughout the wind shift. |
| Tower Visibility | Upon receipt of a reportable tower prevailing visibility value, when either the weather observing site or tower prevailing visibility is less than 4 miles (6000 meters) and the tower prevailing visibility differs from the weather observing site visibility by a reportable value, transmit a SPECI with the tower visibility as a remark. |
| Runway Conditions | Upon receipt (with exception of a receipt of a dry runway report), transmit runway condition readings as a SPECI or append to a METAR or SPECI being taken at the time of notification. This is non-weather criteria and is treated as a SPECI only for purposes of timely longline reporting. When appended to any observation, the report is considered as additional data and not as SPECI criteria. |
| Nuclear Accident | When notified of a real-world nuclear accident. |
| Volcanic Ash | When first observed |
| Miscellaneous | Any other meteorological situation, in which, in the opinion of the observer, is significant to safety of aircraft operations or resource protection. |

Attachment 8

LOCAL OBSERVATION CRITERIA

Table A8.1. Local Observation Criteria.

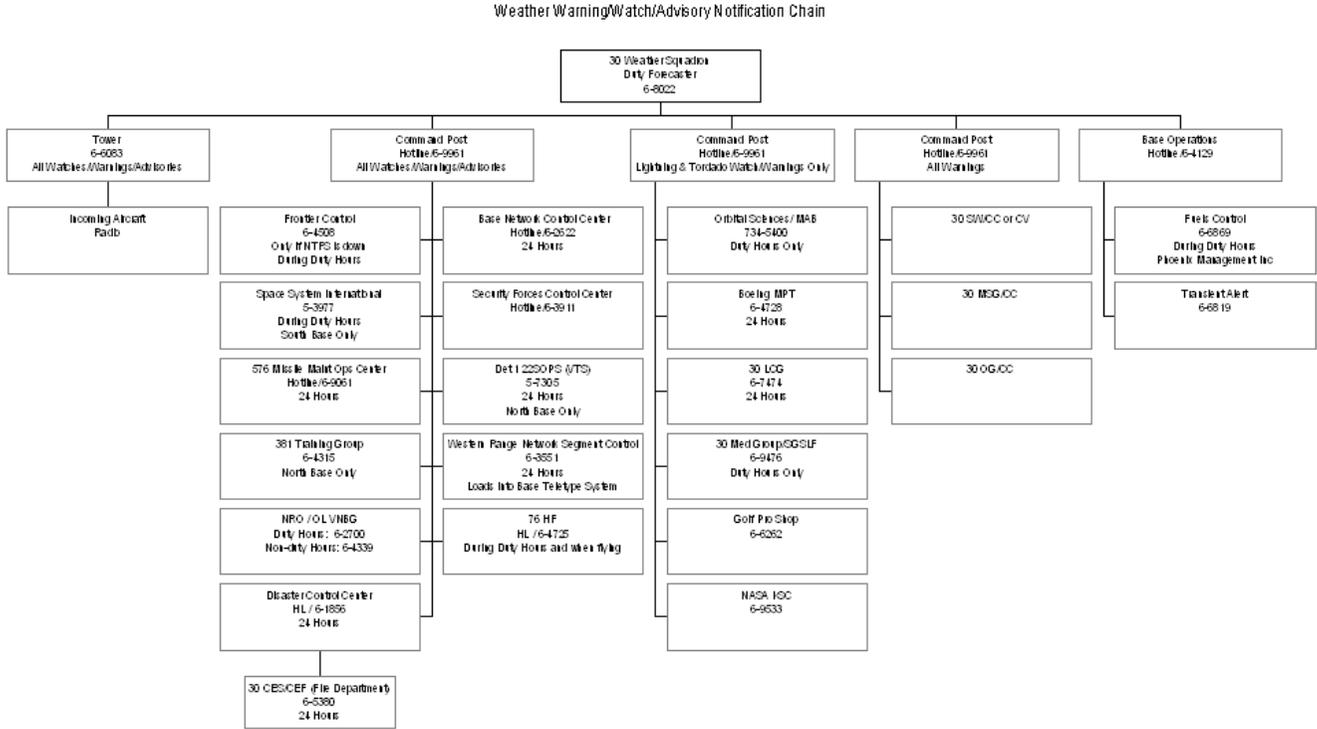
| DEFINITION | CRITERION |
|----------------------------|--|
| Aircraft or Missile Mishap | Immediately upon notification or observation of a mishap, accident or incident. Locals are not required for in-flight emergencies. |
| Missile Launch | Immediately upon notification of a launch. |
| Active Runway Change | Whenever notified of change in active runway. |
| Wind | Mean or maximum wind speed first exceeds 35 knots, 50 knots, or 65 knots. Gust spread of 20 knots or greater. |
| Altimeter Setting | At a frequency not to exceed 35 minutes when there has been a change of 0.01 inches since the last locally disseminated value. |
| Miscellaneous | For any other meteorological situation which, in the opinion of the observer, is significant to local operations. |

NOTE: Unless otherwise specifically identified in the text of a message, all times are UTC, temperatures are degrees Fahrenheit, and all surface winds are magnetic.

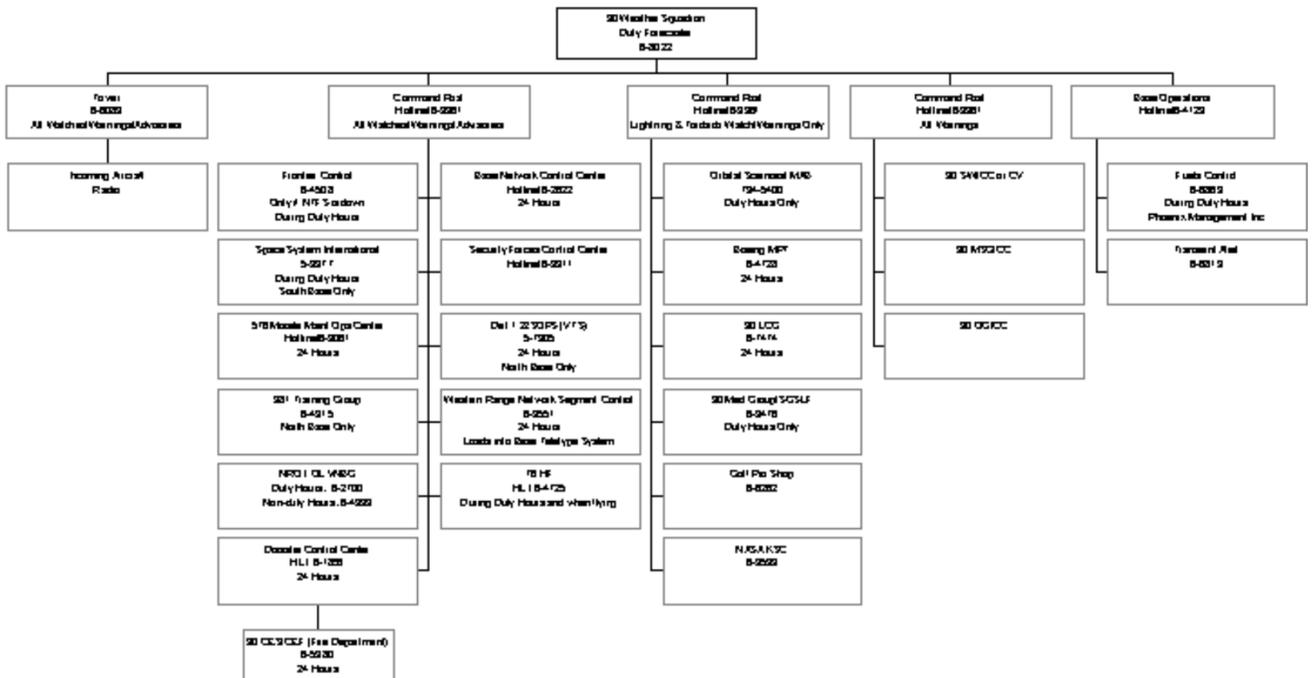
Attachment 9

WEATHER WARNING/WATCH/ADVISORY NOTIFICATION CHAIN

Figure A9.1. Weather Warning/Watch/Advisory Notification Chain.



Weather Warning/Watch/Advisory Notification Chain



Attachment 10

WEATHER EQUIPMENT

A10.1. Definitions of Restoral Priorities

Table A10.1. Weather Equipment maintained by 30 RMS/RMQ (via 30 SW Mission Support Contracts)

| EQUIPMENT | QUANTITY | LOCATION | RESTORAL PRIORITY |
|--|----------|---------------------------|-------------------|
| Automated Surface Observing System (ASOS) | 3 | Airfield, SLC-4, LF-03 | 1 or 2 |
| Automated Weather Interactive Processing System (AWIPS) | 1 | 21150 | 1 or 2 |
| Back-up generators | 2 | 21150, 1764 | 2 |
| Closed Circuit TV | 1 | 21150 and ROS | 2 |
| Doppler Acoustic Sounding System (DASS) | 2 | 1764, LF-03 | 1 or 2 |
| Lightning Locator and Protection System (LLPS) | 1 | 21150 | 3 |
| Meteorological and Range Safety Support System (MARSSS) | 2 | 21150 | 1 or 2 |
| Meteorological Interactive Data Display System –Vandenberg (MIDDS-V) | 1 | 21150 | 1 or 2 |
| Automated Meteorological Profiling System (AMPS) | 2 | 1764 | 1 |
| Portable Remote Automated Weather System (PRAWS) | 1 | VAFB | 1 or 2 |
| Real Time Automated Meteorological Profiling System (RTAMPS) | 2 | 1764 | 1 |
| Uninterruptible Power Supplies | 3 | 21150, 1764 | 3 |
| WIND Towers | 24 | VAFB | 1 or 2 |
| Central Data Analysis Processing System | 1 | Bldg 21150 | 1 |

Table A10.2. Weather Equipment maintained by 30 SCS

| EQUIPMENT | QUANTITY | LOCATION | RESTORAL PRIORITY |
|--------------------------------------|-----------------|-----------------|--------------------------|
| FMQ-8 (Temp/Dew Pt) | 1 | Airfield | 2 |
| FMQ-13 (Digital Wind System) | 1 | Airfield | 2 |
| FMQ-12 (Digital Ionospheric Sounder) | 1 | 21150 | 3 |
| GMQ-32 (Transmissometer Set) | 1 | Airfield | 2 |
| GMQ-34 (Laser Ceilometer) | 1 | Airfield | 2 |
| ML-17 (Rain Gauge) | 1 | 21150 | 2 |
| ML-102 (Aneroid Barometer) | 2 | 1764, 1746 | 2 |
| ML-658 (Digital Barometer) | 3 | 1764, 1746 | 2 |
| PMSV (Pilot-to-Metro Service) | 1 | 21150 | 1 |
| WSR-88D (Weather Surveillance Radar) | 1 | Bldg 1, Orcutt | 1 or 2 |
| Principle User Processor (PUP) | 1 | 21150 | 1 or 2 |

A10.1.1. **Priority One (1): Mission Critical.** Response is immediate and will continue until completed. Assigned to weather equipment that is listed as mandatory or required in the Range Safety Operations Requirements (RSOR) document and/or launch operation specific documentation and IS supporting a current operation/launch at Vandenberg. Also assigned to weather equipment needed for safe flying operations. P1 outages can be downgraded to lower priority levels at the discretion of 30 WS Commander or Operations Officer.

A10.1.2. **Priority Two (2): Mission Essential.** Response is required within 24 hours. Repair work will be conducted during normal duty hours until completed. Assigned to weather equipment that is listed as mandatory or required in the RSOR and/or launch operation specific documentation and IS NOT supporting a current operation/launch at Vandenberg. Also assigned to weather equipment backing up priority one equipment.

A10.1.3. **Priority Three (3): Minimal Mission Impact.** Response is required within 48 hours. Repair work will be conducted during normal duty hours until completed. Assigned to weather equipment that plays only a supporting role in Vandenberg weather operations, whose failure only moderately or slightly impairs customer's mission.