BY ORDER OF THE COMMANDER PACIFIC AIR FORCES

PACIFIC AIR FORCES INSTRUCTION 15-101

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Weather

WEATEHR SUPPORT FOR PACAF

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This instruction implements AFPD 15-1**,** *Weather Operations*; and is consistent with AFI 15-128, *Weather Force Structure;* AFMAN 15-129, *Air and Space Weather Operations;* USINDOPACOMINST 0539.1, *Tropical Cyclone Operations;* and USINDOPACOMINST 0539.2, *Meteorological and Oceanographic (METOC) Support to Joint Operations in U.S. Indo-Pacific Command (USINDOPACOM)*. This instruction provides basic responsibilities for weather support to Pacific Air Forces (PACAF) and forces from other commands operating in the PACAF area of responsibility (AOR), excluding Air Mobility Command (AMC) strategic airlift resources. Responsibilities for the Tropical Cyclone Reconnaissance Network (TCRN) for USINDOPACOM are included in this instruction. This publication applies to all PACAF weather units and other units maintaining PACAF systems supporting the TCRN. This publication applies to the Regular Air Force, the Air National Guard (ANG), and Air Force Reserve (when mobilized in support of PACAF). This publication does not apply to the United States Space Force (USSF). Ensure all records generated as a result of processes prescribed in this publication adhere to AFI 33-322, Records Management and Information Governance Program, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command. This publication may be supplemented at any level below HQ PACAF, but all direct supplements must be routed to the OPR of this publication for coordination prior to certification and approval. The authorities to waive wing/unit level requirements in this publication are identified with a tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See

Department of the Air Force Manual (DAFMAN) 90-161, *Publishing Processesand Procedures*, for a description of the authorities associated with the tier numbers. Submit requests for waivers through the chain of command to the appropriate tier waiver approval authority, or alternately, to the publication OPR for non-tiered compliance items. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force. See **Attachment 1** for a glossary of references and supporting information.

SUMMARY OF CHANGES

This document has been substantially revised and should be reviewed in its entirety. Many changes include equipment status reporting, all references to the current AFMAN 15-129, Incorporating Change 1, the realignment of Det 1, 1 WS under HQ PACAF/A318, Weather Operations Branch as OL-C, clarification of roles and responsibilities, and the designation of Army Weather Squadrons as Combat Weather Squadrons (CWS).

Chapter 1

BACKGROUND

1.1. General. HQ PACAF operates and maintains air forces in the Indo-Pacific, and other Air Force major commands dispatch forces to operate in the Indo-Pacific. PACAF weather units provide weather services to enhance safety of flight, increase flying training effectiveness, protect resources across the range of military operations, maximize supported units' operational effectiveness through timely exploitation of environmental intelligence, and facilitate the command and control of military operations. With a majority of the AOR consisting of ocean surface, tropical cyclone impacts to DoD installations are a significant threat in PACAF. Per the Program Action Directive (PAD) 14-03, dated 5 January 2015, 557th Weather Wing (557 WW) personnel performing duties at the Joint Typhoon Warning Center (JTWC) conduct tropical cyclone reconnaissance using data from satellite, radar, and other conventional sources to execute PACAF's Executive Agency Responsibility for Tropical Cyclone Reconnaissance. To ensure maximum exploitation of all USAF owned data sources across the AOR, HQ PACAF established the TCRN to provide a construct for effective management, coordination, and maintenance of systems and procedures supporting typhoon reconnaissance. The procedures, duties and responsibilities outlined in this instruction establish standards for consistent weather support throughout the command to include tropical cyclone operations.

Chapter 2

ROLES AND RESPONSIBILITIES

2.1. HQ PACAF/A318 (PACAF Weather Operations Branch) Responsibilities. HQ PACAF/A318 is responsible through the Operational Support Division (HQ PACAF/A31) to the Director of Air and Cyberspace Operations (HQ PACAF/A3/6) for all MAJCOM weather staff responsibilities enumerated in AFI 15-128, *Weather Force Structure*. The Weather Operations Branch advises the PACAF Commander, HQ PACAF Directors, and HQ PACAF Division Chiefs on all aspects of PACAF weather support and operations that affect PACAF or USINDOPACOM forces. The Weather Operations Branch also carries out these PACAF-unique responsibilities:

2.1.1. Provides C-MAJCOM staff support, and weather and environmental subject matter expertise (SME) to Battle staff (BS), AFFOR staff/command, Working Groups (WGs) and Operations Planning Groups/Teams (OPG/T) as required.

2.1.2. Augments the Pacific Air Forces Watch Center (PAFWC) and AFFOR Battle Staff in functional-area support positions during extended operations, if required, and execute 24/7 operations as tasked or battle-rostered. In this capacity, PACAF/A318 serves as a liaison between current operations units (613 AOC WST, OWSs, Joint Meteorological and Oceanographic (METOC) cells, etc.), and provides environmental subject matter expert (SME) capabilities for operational planning outside the Air Tasking Order (ATO) cycle.

2.1.3. Assists with issues concerning PACAF Programming Plan, OPLAN, CONPLAN and strategic vision.

2.1.4. Provides HQ PACAF weather functional coordination with USINDOPACOM, USARPAC, SOCPAC, and PACFLT.

2.1.5. Assists PACAF staff agencies and PACAF weather units in documenting weather support requirements and environmental sensitivities of emerging acquisition programs.

2.1.6. Evaluates technical requirements and arranges environmental support for PACAF projects, studies or programs.

2.1.7. Coordinates with appropriate agencies as necessary to help the USINDOPACOM Senior METOC Officer (SMO) and Joint METOC Officers (JMO) achieve theater sensing strategies within the AOR.

2.1.8. Develops and/or coordinates on environmental, communications, and other relevant sections of contingency plans, and METOC support concepts for INDOPACOM plans and supporting PACAF plans, most notably Annex Hs.

2.1.9. Develops, coordinates, and monitors weather support for exercises, crisis action responses, and contingencies involving various commands in the USINDOPACOM area of responsibility.

2.1.10. Monitors and updates the Unit Type Code (UTC) Availability Library to ensure comprehensive and effective resource and UTC posturing to meet theater crisis and contingency responses.

2.1.11. Using the Defense Readiness Reporting Systems (DRRS), manages Designed Operational Capabilities (DOC) statements for PACAF weather squadrons and coordinates on DOC Statements for Operations Support Squadrons (OSS) with weather forces assigned.

2.1.12. Monitors unit Air Force - Input Tool (AF-IT) and Mission Essential Tasks (METs) for resource and capability assessments within DRRS, and Deliberate and Crisis Action Planning and Execution Segments (DCAPES) UTC assessment tool for weather squadrons and weather flights assigned to an OSS. Provides guidance to unit leadership or unit readiness monitors to address reporting errors or inconsistencies.

2.1.13. Advises PACAF weather units of environmental effects in support systems development, employment concept and operations.

2.1.14. Determines MAJCOM unique standards for all levels of weather unit operations and procedures and informs PACAF weather personnel of new or updated higher headquarters procedures, policies, and operational directives.

2.1.15. Monitors, schedules, obtains training quotas, and manages weather training requirements for inbound and assigned MAJCOM personnel. All PACAF inbound 1W/15W personnel (SSgt and above) are required to complete the Tropical Weather Analysis and Forecasting Course prior to PCS into theater (PPC: TRO).

2.1.16. Incorporates PACAF weather requirements into the appropriate PACAF instructions, manuals, pamphlets, and supplements to higher headquarters directives.

2.1.17. Identifies PACAF environmental research and development or technique development requirements and forwards these to AF/A3W.

2.1.18. Serves as weather functional SME to PACAF/IG. Assists and augments as IG Augmentee. Conducts virtual and on-site Unit Effectiveness Inspections (UEIs).

2.1.19. Schedules, coordinates, and hosts the annual PACAF Weather Talks. The PACAF Weather Talks has a focus of AF and Army weather discussions, initiatives, and overall collaboration between PACAF weather units, with briefings from DAF, USINDOPACOM, ACC, and AFPC, among others. PACAF weather organizations/teams (WFs, AOCs, NAFs and CWSs with Det representatives if feasible) will make every effort to send at least one representative in-person or virtually. Most weather organizations receive TDY funds annually specifically to send at least one Airman to this event.

2.1.20. OL-C, A318. The OL-C Officer in Charge, Fort Shafter, HI, is the Staff Weather Officer (SWO) for US Army Pacific Command (USARPAC), to include the Main Command Post (MCP). In their capacity as a Combatant Command (CCMD), Army Service Component SWO, OL-C has many similar above the line responsibilities as a MAJCOM such as coordinating amongst the USARPAC staff and ensuring United States Army weather support needs are identified and captured in appropriate USINDOPACOM and subordinate command OPLANs and Time Phased Force and Deployment Data (TPFDD).

Chapter 3

AIR OPERATIONS CENTER (AOC) WEATHER SPECIALTY TEAM (WST) RESPONSIBILITIES

3.1. General Responsibilities. IAW DAFMAN 13-1AOCV3, the WST is a horizontally crosscutting capability integrated into all five AOC divisions to enable ATO mission planning and execution. The WST provides timely notification of METOC impacts affecting launch and recovery bases, active orbits or tracks, routes of flight, and other areas of operations, as directed. The WST also carries out the following AOC responsibilities:

3.1.1. Provides staff support and operational weather subject matter expertise (SME) to C/T/JFACC, AOC divisions, and other ATO-related functions as required.

3.1.2. Evaluates the impact of METOC and space environment effects on weapons systems and operations of both enemy and friendly forces across the geographically-aligned theater of operations and the spectrum of all mission profiles from wartime to humanitarian assistance/disaster response (HA/DR).

3.1.3. Supports all aspects of mission planning, including target area weather information, predictions of weather impacts on weapons effectiveness, and weather impacts to ISR sensors. Weather-effect decision aids, including electro-optical and space weather effects guidance, will be provided for determination of timing as well as weapons planned for use.

3.1.4. Provides briefings to the AOC Director and C/T/JFACC staff, with updates as required, on significant METOC impacts to strategic and operational-level planning and execution.

3.1.5. Orchestrates the flow of weather information via whatever means necessary and exercises functional control over all assigned weather personnel and equipment within the AOC.

3.1.6. Will conduct, at a minimum, semi-annual recurring training concentrating on forecast challenges and environmental impacts for the upcoming season. Training and certification will be documented in the official training record IAW **AFI 15-127** and the Career Field Education and Training Plan (CFETP).

Chapter 4

WEATHER SUPPORT DESIGNATIONS

4.1. Weather Support Designations. The Joint Forces Commander will appoint a JMO IAW Joint Publication 3-59 when required to support their operations. Habitually-aligned weather support, SWO, and typical JMO designations for PACAF assigned weather units for the USINDOPACOM AOR are as follows:

4.1.1. PACAF/A318. The PACAF/A318, Chief, Weather Operations Branch, Joint Base Pearl Harbor-Hickam, HI, is the JMO for JTF-SFA (Support Forces Antarctica).

4.1.2. OL-C, HQ PACAF/A318. The OIC of OL-C, Ft Shafter, HI is the SWO to the USARPAC Commander and typically assumes the JMO role for many of the theater Army-centric exercises and operations.

4.1.3. 1 CWS. The 1 CWS/CC, Joint Base Lewis-McChord (JBLM), WA, is the SWO for U.S. Army I Corps at JBLM.

4.1.4. 607 CWS. The 607 CWS/CC, USAG Humphreys, Korea, is the SWO for United States Forces Korea (USFK) and serves as JMO for operations and exercises focused on the Korean Peninsula. Duties require coordination with the Commander United Nations Command/Combined Forces Command (COMUNC/CFC) Combined METOC Officer (CMO), which is the commander of the Combined Weather Squadron, Republic of Korea Air Force (ROKAF). The 607 CWS/CC designates the SWO to the Commander, 8th Army.

4.1.5. 374 OSS/OSW. The 374 OSS/OSW weather flight commander and one additional officer, Yokota AB, Japan, are the habitually-aligned weather support to 5 AF and US Forces Japan (USFJ), and either one typically serves as JMO for operations and exercises within the Japan area of operations.

4.1.6. 7 AF. The 7 AF Chief of Weather Operations, Osan AB, Republic of Korea, is the SWO to the Commander, 7 AF, Air Forces Korea (AFKOR).

4.1.7. 611 AOC. The 611 AOC/Weather Specialty Team (WST) Chief, Joint Base Elmendorf-Richardson, AK, is the habitually-aligned weather support to the 11 AF/CC.

4.1.8. 613 AOC. The 613 AOC/WST, Joint Base Pearl Harbor-Hickam, HI, is the habitually-aligned weather support to the PACAF C/T/JFACC.

4.2. TCCOR Recommendation Authorities. Weather units that are subordinate to designated installation TCCOR authorities, including delegated authorities, will serve as the TCCOR recommendation authority to that TCCOR authority. **(T-2)**

Chapter 5

WEATHER SUPPORT EMPLOYMENT

5.1. Weather Support Employment. The effective employment of air forces requires consideration of weather factors from planning to execution. Weather information provided to the various organizational elements must support their decision-making processes and follow current regulatory guidance.

5.1.1. Sources of Weather Support. The OL, WF, Det, OWS, CWS and strategic centers such as the JTWC are the primary sources for operational weather support. Installation units and organizations are permitted to consult various host nation and/or civilian agencies and sources to obtain weather situational awareness, but are required to use DoD sources for their operations to the maximum extent possible following priorities established in AFH 11-203V2 and other relevant HHQ instructions.

5.1.2. Though direct contact between USAF-supported units and host nation and civilian agency weather personnel is permitted, supported units must realize that these weather personnel may not be able to provide all the support they require. Additionally, host nation and civilian agency weather personnel may not have access to U.S. forces' forecasts and other weather products produced specifically for DoD operations and may not be knowledgeable of mission-critical weather thresholds. There is also no mechanism available to enforce host nation weather support quality or arrangements unless formally documented in an official Memorandum of Understanding International (MOUI).

5.2. Designated Weather Support Unit. PACAF has unique challenges in determining the designated weather support unit to ensure appropriate weather support is provided per AFMAN 15-129.

5.2.1. Operational Weather Squadrons (OWSs) of the 557 WW are the designated weather support units for Air Mobility Division (AMD), 613th Air Operations Center (613 AOC) controlled intra-theater airlift and air refueling missions.

5.2.2. Combat Air Forces (CAF) theater aircraft Coronet movements are controlled by the ACC Air Operations Squadron (AOS) IAW AFI 11-207. The ACC AOC Weather Flight produces the controlling mission weather product. 618 AOC provides mission planning and execution support for all tanker aircraft involved with the movement. 618 AOC/WXD provides execution forecasts for the tankers.

5.2.3. Installation weather unit and 557 WW support to Integrated Flight Management (IFM) Missions. The 557 WW ensures Installation Data Pages (IDPs) with supported weather units that have IFM mission aircraft assigned to their installation (host or tenant unit) define whom the designated weather support unit is IAW AFMAN 15-129. The defined support should not require the host weather unit to extend their duty hours to provide this support unless acting in a backup capacity for the designated supporting OWS. Local weather units (typically WFs, Dets, OLs) with IFM mission aircraft assigned to their installation will also detail the designated weather support unit roles and responsibilities for IFM missions in their local Weather Support Document (WSD) or equivalent document. **Note:** IDPs may eventually migrate and be hosted in a cloud computing-based environment. Once operational and deemed

fully mission capable (FMC), WF/Dets will be vested with authorities to provide updates directly into the IDP database. **(T-2)**

Chapter 6

COMMANDER RESPONSIBILITIES

6.1. General Responsibilities. Commanders are responsible for ensuring the weather support requirements of the wing, tenant, and transient units, etc. are met.

6.1.1. Commanders of flying units deploying within or outside the USINDOPACOM AOR (or theater), working through their home station OSS weather flight, will ensure weather support requirements for their unit at its deployed location (to include exercises) are met. **(T-2)** The expected method is by bringing aligned weather personnel.

6.1.2. Commanders will take their aligned weather support personnel, as designated in the 3-series Strike Mission Design Series (MDS) Unit Type Codes (UTC), and will not delete both of their aligned weather support (AFSC 1W051) unless coordinated through the PACAF Weather Readiness Functional Area Manager (FAM). **(T-2)**

6.1.3. The initial approach will be weather Airmen deploying with their aligned units, but if assigned weather personnel cannot deploy, then the deployed unit's home weather unit will ensure the deployed forces receive weather support through a reach back capability to the home weather unit (for within USINDOPACOM AOR only), coordination with a weather unit at the deployed location, or the deployed location's supporting OWS. Any reach-back weather support must be coordinated by the home station weather unit before their aligned unit deploys. **(T-2)**

6.2. Other Responsibilities. Agencies requiring weather information will coordinate through their regularly supporting weather unit and clearly state their support requirements. **(T-2)** Agencies will state the mission requiring support, type of information needed, frequency of delivery, update frequency and meteorological criteria, format, media, and preferred delivery method. **(T-2)**

6.2.1. PACAF operational and tactical weather units will develop and administer weather indoctrination training for USAF (or DoD) Air Traffic Control (ATC) personnel IAW AFI 13-204V3 and AFMAN 15-111. This training will focus on the cooperative weather watch principle and provide a general overview of the types of weather, climatological summary of Visual Flight Rule/Instrument Flight Rule (VFR/IFR) conditions, types and location of weather equipment, basic and cooperative weather watch procedures, tower visibility, prevailing visibility and any observing limitations. **(T-2)**

Chapter 7

JOINT TYPHOON WARNING CENTER (JTWC)

7. JTWC Area of Responsibility. The Joint Typhoon Warning Center (JTWC), Joint Base Pearl Harbor-Hickam, HI, the Central Pacific Hurricane Center (CPHC), Honolulu, HI, and the National Hurricane Center (NHC), Miami, FL, issue tropical cyclone warnings and advisories. JTWC's area of responsibility (AOR) is from the East Coast of Africa to the West Coast of the Americas. CPHC issues civil tropical cyclone forecasts/advisories north of the equator between 180° and 140° W. NHC issues civil tropical cyclone forecasts/advisories north of the equator between 140° W and the West Coast of the Americas. JTWC retains responsibility for issuing its own tropical cyclone warnings if CPHC or NHC cannot issue warnings or if JTWC believes warnings from CPHC or NHC are not sufficiently accurate to protect DoD resources. In the CPHC and NHC AOR, JTWC will repackage the National Weather Service (NWS) forecasts as warnings for DoD installation application and utilization.

Chapter 8

SATELLITE ASSIGNMENT

8.1. MARK IVB Geostationary and Polar Orbiting Satellite Assignment. Each MARK IVB has assigned geostationary satellites, both in theater (**Table 8.1**) and outside of theater (**Table 8.2**). Andersen AFB and Joint Base Pearl Harbor-Hickam have two geostationary antennas, so they are assigned two primary satellites. This redundancy ensures JTWC has access to near real-time geostationary satellite data across the entire AOR. The MARK IVB METSAT Coordinator at each site (Kadena AB, Andersen AFB, Joint Base Elmendorf-Richardson, and Joint Base Pearl Harbor-Hickam) will dedicate their local geostationary antenna(s) to their assigned geostationary satellite(s), unless directed to change by JTWC. JTWC will coordinate with the field systems help desk to ensure critical operational mission support continuity before satellite changes are made.

Table 8.1. TCRN MARK IVB Geostationary Satellite Assignments within PACAF.

Base	Geostationary Satellite Assignment	Alternate Satellite Assignment
Joint Base Pearl Harbor-Hickam	Himawari Series (Japan) GOES West (US)	N/A
Joint Base Elmendorf-Richardson	GOES West (US)	N/A
Andersen AFB	Himawari Series (Japan) COMS-1 (Korea)	N/A

Table 8.2. MARK IVB Sites Outside of PACAF.

Base	Geostationary Satellites Available
Kapaun Air Station (Germany)	METEOSAT-7,8,9 DVB (EU)
Lajes AB (Azores)	GOES East (US) METEOSAT-9 (EU)
Ali Al Salem AB (Kuwait)	METEOSAT-7 (EU)
Note: These sites are listed as informational only to highlight the program's global nature. PACAF has no control or direction over these sites. However, JTWC can access imagery over the Indian Ocean from these sites.	

8.1.1. MARK IVB maintenance technicians at each site (Joint Base Pearl Harbor-Hickam, Joint Base Elmendorf-Richardson, Andersen AFB, and Kadena AB) are responsible for maintaining and moving the MARK IVB antenna only when requested to do so by the local MARK IVB METSAT Coordinator.

8.1.2. Any maintenance requiring movement of the geostationary antenna or a change in geostationary assignment for the antenna will be coordinated by the local MARK IVB Coordinator with the field systems help desk and JTWC. **(T-2)**

8.2. Alternate Solutions to Mission Conflict. The MARK IVB geostationary antennas may be programmed to alternate between the assigned primary and alternate satellites. Careful consideration must be given to the additional wear-and-tear on equipment caused by constant switching between geostationary satellites which can cause significant shortening of the antenna's life. The local MARK IVB METSAT Coordinator will coordinate this process with the field systems help desk and JTWC prior to programming. **(T-2)**

8.2.1. Polar orbiting satellite priorities are as follows: all Defense Meteorological Satellite Program (DMSP), Suomi National Polar-orbiting Partnership (Suomi-NPP), National Oceanic Atmospheric Administration (NOAA), Meteorological Operational satellite program (METOP), National Aeronautics and Space Administration (NASA) Aqua (EOS PM-1), and NASA Terra (EOS AM-1) polar passes between 1 hour before and 30 minutes after the tropical cyclone warning time (in the warning window).

8.2.2. Units will follow the direction of the field systems help desk or JTWC to temporarily modify this priority for special circumstances. **(T-2)**

8.3. MARK IVB Scheduled Outages. The local MARK IVB METSAT Coordinator at each MARK IVB site will:

8.3.1. Establish procedures with the local Base Network Control Center to ensure immediate notification of scheduled base network outages expected to impact external or internal access to their local MARK IVB server. **(T-2)**

8.3.2. Establish procedures with the local MARK IVB maintenance technicians to ensure JTWC is immediately notified of scheduled maintenance expected to impact external or internal access to their local MARK IVB server or the reception and processing of satellite data. **(T-2)**

8.3.3. Immediately notify the field systems help desk of any scheduled network service outage or scheduled maintenance affecting access to their local MARK IVB. **(T-2)**

8.4. JTWC will:

8.4.1. Weigh the impact of scheduled outages and make every possible effort to accommodate the requirements of each MARK IVB site. **(T-2)**

8.4.2. Coordinate between the system help desk and the local MARK IVB METSAT Coordinator to determine an estimated system down time and relate the impact of the outage for the purpose of aiding the Administrator in bringing the MARK IVB back into service. **(T-2)**

8.4.3. The local MARK IVB maintenance technicians will notify the local MARK IVB METSAT Coordinator and system help desk of any scheduled maintenance impacting internal or external access to the local server, or the reception and processing of satellite data. **(T-2)**

8.5. Unscheduled TCRN Service Outages. The MARK IVB METSAT Coordinator will report local MARK IVB outages to the system help desk. **(T-2)** The system help desks current procedure is to open an internal trouble ticket and then notify the appropriate base Job Control Center and

JTWC. The base Job Control Center will contact the local MARK IVB maintenance technician for repair of the system and provide updates to the local MARK IVB METSAT Coordinator upon request. **(T-2)**

8.5.1. Each team of MARK IVB technicians will maintain their systems to include repair actions, system administration, coordination on connectivity issues, and coordination with other work centers when necessary. **(T-2)**

8.5.2. MARK IVB maintenance technicians will perform preventative maintenance IAW the Mark IVB technical orders (TOs) and notify the local MARK IVB METSAT coordinator and system help desk of changes in system status, equipment status, and/or client access. **(T-2)**

Chapter 9

RADAR SUPPORT AND DATA COLLECTION

9.1. Radar Reconnaissance. The JTWC is responsible for completing radar analyses of tropical cyclones when they are within range of NEXRAD locations within USINDOPACOM. The purpose of these radar analyses is to ensure that timely, high quality radar observations are made available to accurately initialize storm location, thus ensuring the most accurate forecast track.

9.2. JTWC Responsibilities. JTWC Satellite Operations Flight will provide tropical cyclone position reports whenever a tropical cyclone in the western North Pacific is first detectable by a NWS or USAF-owned WSR-88D radar. These and subsequent reports are provided regardless of warning or condition of readiness status. Updates will be provided every 3 hours, or at the discretion of the Typhoon Duty Officer IAW established duty priorities, until the storm is no longer detected by the radar or drops below tropical depression strength. **(T-2)** The Typhoon Duty Officer may request more frequent radar fixes due to unusual circumstances and the satellite analyst will accommodate as much as practical following duty priorities. The JTWC Satellite Operations Flight ensures an appropriate number of personnel are knowledgeable of, and comply with, standard procedures for reporting tropical cyclones.

9.2.1. The JTWC Satellite Operations Flight will maintain the capability to archive, within Gibson Ridge software limits, the following radar products:

9.2.1.1. Base Reflectivity: .5-degree, 124 nm range, .54 nm resolution. **(T-2)**

9.2.1.2. Base Reflectivity: 1.5-degree, 124 nm range, .54 nm resolution. **(T-2)**

9.2.1.3. Base Velocity: .5-degree, 124 nm range, .54 nm resolution. **(T-2)**

9.2.1.4. Base Velocity: 1.5-degree, 124 nm range, .54 nm resolution. **(T-2)**

9.2.2. Local weather units (**Table 9.1**) with archive capability will maintain procedures to backup products listed in paragraphs **9.2.1.1 through 9.2.1.4,** as requested by JTWC, if JTWC is unable to archive for their location. **(T-2)**

Table 9.1. Active USAF Sites with Backup Archival Capability.

UNIT	LOCATION
1 CWS	Joint Base Lewis-McChord, Washington
Det 2, 1 CWS	Wheeler AAF, Hawaii
36 OSS/OSW	*Andersen AFB, Guam
18 OSS/OSW	*Kadena AB, Japan
8 OSS/OSW	*Kunsan AB, Korea
607 CWS	USAG Humphreys, Korea (actual radar is 40 miles NE)
OL-A, 607 CWS	K-16, Korea
51 OSS/OSW	Osan AB, Korea

UNIT	LOCATION
15 OSS/OSW	Joint Base Pearl Harbor-Hickam, Hawaii
17 OWS	Joint Base Pearl Harbor-Hickam, Hawaii
JTWC	Joint Base Pearl Harbor-Hickam, Hawaii
	* Location has RDA collocated

Chapter 10

TROPICAL CYCLONE (TC) REPORTING

10.1. Tropical Cyclone (TC) Reporting. When an approaching TC is forecast to impact an Air Force or Army installation that will result in a change to the installation's Tropical Cyclone Condition of Readiness (TCCOR), assigned weather reporting organizations will provide routine TC updates to their respective installations and include the PACAF/A318 Weather Operations Branch (**pacaf.a3txweather.1@us.af.mil**) on the messaging. **(T-2**) This may be accomplished A sample TC forecast product is provided in **Figure A2.1** and TCCOR criteria, IAW AFMAN 10-206, can be referenced in **Figure A3.1** Updates will be provided at the following intervals:

10.1.1. TCCOR 4, once every 24 hours

10.1.2. TCCOR 3, every 12 hours

10.1.3. TCCOR 1 or 2, every 6 hours

10.2. Additional Reporting Requirements. When a TC of tropical storm strength or greater passes within 150 nm of an Air Force or Army weather reporting organization, that organization will e-mail a TC summary report to the 613 AOC/WST (**613aoc.cod.wx@us.af.mil**), JTWC (**cdo.jtwc.fct@navy.mil**), and PACAF/A318 (**pacaf.a3txweather.1@us.af.mil**) within 24 hours of storm passage**. (T-2)** The message will include the following:

10.2.1. Name of tropical cyclone. **(T-2)**

10.2.2. Date and time of occurrence. **(T-2)**

10.2.3. Closest point of approach (azimuth and range of storm center) from the airfield/installation. **(T-2) Note:** This data may eventually be obtained by employing BIFROST (**https://afweather.mil**) GIS distance measuring application once the capability has been made available.

10.2.4. Maximum sustained wind at the airfield/installation. **(T-2)**

10.2.5. Peak gust at the airfield/installation. **(T-2)**

10.2.6. Minimum sea level pressure at the airfield/installation. **(T-2)**

10.3. TCCOR Authority. TCCOR authority is USINDOPACOMI 0539.1 *Tropical Cyclone Condition of Readiness Program*. Commander, USINDOPACOM has delegated the authority to set TCCOR to the following subordinate component and subordinate unified commanders for the U.S. military installations in the following USINDOPACOM regions:

10.3.1. Commander, U.S. Army Pacific – Hawaii, American Samoa, Kwajalein

10.3.2. Commander, U.S. Forces Japan – Japan (see 5th AF for current designation)

10.3.3. Commander, U.S. Forces Korea – Republic of Korea (see 607th CWS for current designation)

10.3.4. Commander, U.S. Pacific Air Forces – Wake Island

10.3.5. Commander, U.S. Pacific Fleet – Guam, Commonwealth of the Northern Mariana Islands, Diego Garcia. **Note:** Should an installation within the USINDOPACOM AOR not listed above require TCCOR setting actions, USINDOPACOM will determine the appropriate

subordinate component to delegate the requisite authorities. Commanders may further delegate TCCOR authority to subordinate units, as necessary.

Chapter 11

TROPICAL CYCLONE THREAT ASSESSMENT PRODUCT (TC-TAP)

11.1. General Requirements. Installation specific TC-TAP are generated by the 557 WW and accessible via automated methods. In the future, this capability may be made available via BIFROST using the TC-TAP Card. **Figure A4.1**. demonstrates one example of TC-TAP visualization. The following are PACAF-unique additions to TC-TAP.

11.1.1. Units will utilize TC-TAP as basis for local adjustments to the site forecast. **(T-2)**

11.1.2. Use the Mission Execution Forecast Process (MEFP) to tailor the official tropical cyclone forecasts into a mission specific forecast weather product for their supported units. Tailoring may include local effects of vegetation/ground cover, terrain, and position relative to the storm.

11.1.3. Each unit's Mission Execution Forecast will include crosswind thresholds of 15 knots and 25 knots, as well as sustained thresholds of 35 knots and 50 knots. **(T-2)**

11.1.4. Each unit's Mission Execution Forecast will include expected precipitation accumulation for each location. **(T-2)**

Chapter 12

SIGNIFICANT EVENT REPORTING

12.1. Significant Event Reporting. PACAF weather organizations will notify PACAF/A318 concurrently, or as soon as possible, via e-mail after reporting the following through local chain of command, regardless of day/time, upon learning of the following: **(T-2)**

12.1.1. Significant operational incident related to weather conditions or weather services within their areas of responsibility. A significant operational incident is one that is formally reported by a base/post/installation through their respective command channels via operational reports (such as OPREPs and BEELINEs), or one that is reported through command or weather functional channels via other means which is likely to receive senior officer attention because it contains critical comments regarding weather services (for example, an email to a MAJCOM weather functional or the Air Staff).

12.1.2. Significant adverse incident involving weather personnel likely to gain publicity or visibility with civil or military law enforcement officials, and likely to gain host-base wing commander or higher attention. For example, a base “blotter” entry represents a significant adverse personnel incident and should be reported, while a speeding ticket would not represent an incident applicable under this instruction.

12.1.3. AFMAN 15-129 requires active duty base/post weather flights to coordinate with OWSs when the flight learns of an operational incident. This coordination ensures a thorough and accurate account of weather conditions and weather services is provided to the host/parent unit submitting the report. OWSs are not expected to seek out or “shop for” potential incidents (OPREPs, etc.) solely based on the potential of an incident due to adverse weather conditions.

Chapter 13

TECHNICAL READINESS PROGRAM

13.1. Weather Technical Readiness Program. AFMAN 15-129 is the guiding reference for the PACAF weather technical readiness program with exception to those measures of performance (MOPs), indicated below, that are established as a PACAF-specific reporting requirement.

13.2. Weather Watch, Warning, and Advisory (WWA) Verification (WARNVER). Weather organizations (WFs/CWSs) will establish and maintain a WARNVER program and report metrics to PACAF/A318 monthly. **(T-2)** WARNVER metrics are automated and available through the Integrated Weather Warning Capability (IWWC) application on the Joint Environmental Toolkit (JET) Portal (**https://owsjet17.us.af.mil/**). All echelons within AFW with permissions can access these sites to download WARNVER metrics. **Note:** IWWC capabilities may eventually migrate to a cloud computing-based production environment and may replace current capabilities with an on-demand metrics capability. JET systems will be decommissioned once these capabilities are operational and deemed FMC.

13.3. Operational Verification (OPVER). Weather organizations (WFs/CWSs) that issue Weather Products (WP) will maintain an OPVER program. **Note:** Applications generating OPVER may eventually be fielded in a cloud computing-based production environment via an iterative development process. Units may migrate to these capabilities once operational and deemed FMC. As a minimum, the OPVER program will meet the following requirements:

13.3.1. For each mission segment (launch, recovery, drop zone, target engagements, etc.), and for each airframe/squadron supported, keep count of number of missions briefed GO (forecast weather conditions favorable based on mission critical thresholds). Next, determine how many of these GO forecasts were accurate (actual weather favorable based on mission critical thresholds, an observed GO), and how many were not accurate (actual weather unfavorable based on mission critical thresholds, an observed NO GO). Similarly, keep count of number of missions briefed NO GO (forecast conditions unfavorable based on mission critical thresholds). Determine how many NO GO forecasts were accurate (actual weather was unfavorable based on mission critical thresholds, an observed NO GO), and how many were not accurate (actual weather favorable based on mission critical thresholds, an observed GO).

13.3.2. A mission may consist of multiple aircraft if they receive a single WP and are debriefed as a single mission. For multi-unit missions, the Lead Weather Unit will conduct OPVER on the Controlling Weather Product (CWP). **(T-2).**

13.3.3. When determining if the observed weather was GO or NO GO, weather organizations will use information in the following priority: crew feedback, objective verification, subjective verification. **(T-2)** Objective and subjective verification methods will be consistently applied.

13.3.4. Weather organizations will coordinate with supported warfighters to determine metrics to be computed and tracked, and to determine the impact of WPs on mission success. Weather organizations will periodically inform their supported warfighters on the results of the OPVER program with emphasis on: **(T-2)**

13.3.4.1. Advising supported warfighters on the status of weather products/services provided.

13.3.4.2. Identifying limitations to parent/host operations that could be mitigated based on application of environmental information.

13.3.4.3. Identifying opportunities for improvement.

13.3.5. Weather organizations are encouraged to evaluate the impact of other mission weather products on the one or two most important supported warfighter decision points. This too will require coordination with supported warfighters to determine which decision points are the most important, and to collect the necessary feedback to evaluate the impact of the WPs on mission success.

13.4. TAF Verification (TAFVER). Organizations that produce operational TAFs will ensure their TAFs are verified. **(T-3)** Intent is for all organizations to use automated capabilities to perform TAFVER. Organizations without an automated capability to perform TAFVER may adjust or omit TAFVER procedures until an automated process is made available to them. Until automated capabilities are provided by AF/A3W, TAFVER will be maintained according to local flight policy. **Note:** Automated TAFVER applications may eventually be fielded in a cloud computing-based production environment. Units may migrate to these capabilities once operational and deemed FMC.

13.4.1. Weather organizations will forward to PACAF/A318, no later than the 15th of each month, the previous month's metrics for data collected under paragraphs **13.1, 13.2, and 13.3**. **(T-2)**

13.4.2. Army weather support squadrons may compile metrics data from their detachments/OLs, and send consolidated totals. PACAF/A318 will compile monthly metrics to assess technical performance of weather organizations to monitor trends and identify improvement areas within their command. **(T-2) Note:** Once automated metrics capabilities are fielded and deemed FMC, regular reporting by WF/Det or OL may no longer be required as later determined by PACAF/A318.

Chapter 14

WEATHER EQUIPMENT OUTAGE REPORTING

14.1. General Requirements. PACAF weather organizations report weather equipment and communications outages IAW **AFI 21-103.** Also notify the system help desk (**Figure A5.1**) for outages of AFW fielded systems IAW AFMAN 15-129. PACAF weather organizations will maintain an outage log using PACAF Form 416, Weather Equipment/Communications Service Record, or a locally developed outage log that contains the same information. **(T-2)** Regardless of the outage log used, the following guidelines apply:

14.1.1. Use a separate form or sheet for each piece of weather equipment.

14.1.2. Compute outage times by subtracting the time between initial report and time returned to duty. Adjust times to reflect only the hours the organization is open.

14.1.3. Use the remarks section of the outage form to briefly describe the reason or cause of the outage. Follow-up actions must also be noted to provide documentation if historical data or contractor response information is needed to resolve unique problems. At a minimum, daily updates should be logged and briefed during all shift changes and meteorological conferences (METCON).

14.1.4. For fixed weather sensing equipment outages at WFs/Dets that have airfield surface observing responsibility, log the time out and time in also on the AF Form 3803/AF Form 3813, Surface Weather Observations, Column 90.

14.1.5. Weather organizations will report all long-term or expected long-term Red – Non-Mission Capable (NMC) Outages (see AFI 21-103, paragraph 6.2) of more than 72 hours to PACAF/A318 (**pacaf.a3txweather.1@us.af.mil**), or DSN (315) 448-1479. **(T-2)** Additionally, organizations should report any other outages that merit higher headquarters involvement or awareness.

14.1.6. Provide sufficient information about the outage so that PACAF staff can adequately assist in outage resolution as required. This information should include the following: the point of contact's (POC) name, rank, e-mail address, organization, equipment or circuit description, date/time of outage, parts required/ordered, parts ordered Mission Capability (MICAP) (Y/N), Estimated Time in Completion (ETIC) and any other pertinent information.

14.1.7. Provide follow-up reports when there is a change in operational status, new information about the outage, or as requested by PACAF/A318. The final report should be sent when the outage has been resolved and should briefly describe the corrective action(s) taken.

14.1.8. Weather organizations document maintenance support procedures in a local weather support document or letter of agreement, as appropriate. When developing the support concept and procedures, ensure the following are included: a POC for logging circuits and equipment in/out, acceptable maintenance response times, specific mission impact statements for each piece of equipment the organization uses, and equipment repair priorities. Equipment and communications used to directly support flight operations should be given the highest repair priority and the shortest response time, followed by OPLAN tasked tactical equipment, followed by all other weather equipment.

Chapter 15

BACK-UP AND MANUAL OBSERVING EQUIPMENT/PROCEDURES

15.1. General Requirements. UTC-postured (deployable) AN/TMQ-53s are not meant to be used as the permanent base/post observing system. TMQ-53s may be used for short-term training, during exercises, or when required to back-up fixed base weather observing system (FBWOS). Weather units will notify PACAF/A318 when utilizing the TMQ-53 as a back-up to the FBWOS for more than 72 consecutive hours. **(T-2)**

15.1.1. UTC aligned weather equipment will not be loaned to another unit without prior coordination and approval from HQ PACAF/A318, as this could adversely impact UTC availability and unit readiness.

15.1.2. Weather units with an airfield services function or mobility requirement will have weather technicians practice backup/manual observing procedures at a minimum of one shift per quarter and document in individual training records. **(T-2)** Training may occur concurrently during operations required to validate AOL procedures. These exercises fulfill technical order (TO) requirements for weather technicians to perform operations checks of assigned deployable tactical meteorological equipment and ensure proficiency with the training and procedures used for alternate equipment/systems.

15.1.3. Weather technicians must be able to disseminate observations IAW AFMAN 15-111, using backup equipment and procedures. Additional local requirements may be evaluated as established in local procedures (e.g., requesting KQ identifier).

15.1.4. Do not “log out” the airfield observing equipment during training exercises unless the system is to be logged out for a real-world outage. The equipment and the Automated Distribution System (ADS) should remain in auto mode, transmitting under the airfield International Civil Aviation Organization (ICAO). Real-world augmentation of the airfield observing equipment always takes precedence over performing simulated back-up.

15.1.5. Any training or procedural trends noted by the assigned Unit Training Manager (UTM) or weather flight leadership, that could possibly be crossfed to other PACAF weather units to improve operations, should be transmitted to PACAF/A318 for consideration and further dissemination.

DAVID R. IVERSON
Major General, USAF
Director of Air and Cyberspace Operations

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

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Prescribed Forms

PACAF Form 416, *Weather Equipment/Communications Service Record,* 19 October 2005

Adopted Forms

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Abbreviations and Acronyms

ACC—Air Combat Command

AFI—Air Force Instruction

AF-IT—Air Force – Input Tool

AFKOR—Air Forces Korea

AFMAN—Air Force Manual

AFRC—Air Force Reserve Command

AFRIMS—Air Force Records Information Management System

AFW—Air Force Weather

AMC—Air Mobility Command

AMD—Air Mobility Division

ANG—Air National Guard

ANR—Alaskan NORAD Region

AOC—Air Operations Center

AOL—Alternate Operating Location

AOR—Area of Responsibility

AOS—Air Operations Squadron

ATC—Air Traffic Control

ATCR—Annual Tropical Cyclone Report

CAF—Combat Air Forces

CCMD—Combatant Command

CDC—Career Development Course

CFC—Combined Forces Command

CMO—Combined METOC Officer

COMUNC—Commander United Nations Command

CONPLAN—Concept Plan

CPA—Closest Point of Approach

CPHC—Central Pacific Hurricane Center

CWP—Controlling Weather Product

CWS—Combat Weather Squadron

DCAPES—Deliberate and Crisis Action Planning and Execution Segments

Det—Detachment

DMSP—Defense Meteorological Satellite Program

DOC—Designed Operational Capabilities

DoD—Department of Defense

DRRS—Defense Readiness Reporting System

FBWOS—Fixed Base Weather Observing System

FMC—Fully Mission Capable

GOES—Geostationary Operational Environmental Satellite

HAF—Headquarters, US Air Force

IAW—In Accordance With

ICAO—International Civil Aviation Organization

IDP—Installation Data Page

IFM—Integrated Flight Management

IFR—Instrument Flight Rules

JET—Joint Environmental Toolkit

JMO—Joint METOC Officer

JTF—Joint Task Force

JTWC—Joint Typhoon Warning Center

MAJCOM—Major Command

MCP—Main Command Post

METOC—Meteorological and Oceanographic

METSAT—Meteorological Satellite

MOA—Memorandum of Agreement

MOUI—Memorandum of Understanding International

MOU—Memorandum of Understanding

NASA—National Aeronautics and Space Administration

NCOIC—Non-Commissioned Officer in Charge

NESDIS—National Environmental Satellite, Data, and Information Service

NHC—National Hurricane Center

NIPRNET—Non-Classified Internet Protocol Router Network

NOAA—National Oceanic and Atmospheric Administration

NORAD—North American Aerospace Defense Command

NWS—National Weather Service

OIC—Officer in Charge

OI—Operating Instruction

OL—Operating Location

OPLAN—Operations Plan

OPREP—Operational Report

OPR—Office of Primary Responsibility

OPVER—Operational Verification

OSS—Operations Support Squadron

OSW—OSS Weather Flight

OWS—Operational Weather Squadron

PACAF—Pacific Air Forces

PACFLT—Pacific Fleet

PIREP—Pilot Report

PPC—Personnel Processing Code

QTP—Qualification Training Package

ROKAF—Republic of Korea Air Force

SATOPS—Satellite Operations

SFA—Support Forces Antarctica

SMO—Senior METOC Officer

SNCO—Senior Non-Commissioned Officer

Suomi-NPP—Suomi-National Polar-orbiting Partnership

SWO—Staff Weather Officer

TAF—Terminal Aerodrome Forecast

TAFVER—Terminal Aerodrome Forecast Verification

TCCOR—Tropical Cyclone Condition of Readiness

TCRN—Tropical Cyclone Reconnaissance Network

TC-TAP—-Tropical Cyclone – Threat Assessment Product

TC—Tropical Cyclone

TO—Technical Order

TPFDD—Time Phased Force and Deployment Data

USAF—United States Air Force

USAG—US Army Garrison

USARPAC—United States Army Pacific

USA—United States Army

USFJ—United States Forces Japan

USFK—United States Forces Korea

USINDOPACOM—United States Indo-Pacific Command

UTC—Unit Type Code

VFR—Visual Flight Rules

WARNVER—Warning/Advisory Verification

WF—Weather Flight

WP—Weather Products

WSD—Weather Support Document

WST—Weather Specialty Team

WS—Weather Squadron

Terms

None.

Attachment 2

SAMPLE TROPICAL CYCLONE (TC) FORECAST UPDATE PRODUCT

Figure A2.1. Sample TC Forecast Update Product.

TROPICAL STORM LUPIT (13W)

NOTE: WIND SPEEDS ARE SUSTAINED EXCEPT FOR MAX
EXPECTED & XWNDS WHICH ARE BASED ON GUST POTENTIAL

Okinawa TCCOR
TCCOR 4

Current as of 08/0600L

Location	CPA	RWY Wet	Max Winds	Precip Start	Max Precip
Kadena AB	140 @ 08/0400L	08/0300L - 08/1500L	20G30KT	08/0300L	1-3 INCHES

JTWC Storm Center Winds

Time (Zulu = Local - 9 hrs)		Wind Speed	Wind Gust
UTC (Z)	JST (Local)	kts (mph)	kts (mph)
07/18	08/03	35 (40)	45 (52)
08/06	08/15	40 (46)	50 (58)
08/18	09/03	45 (52)	55 (63)
09/06	09/15	50 (58)	65 (75)
09/18	10/03	50 (58)	65 (75)
10/18	11/03	45 (52)	55 (63)

Okinawa Storm Effects Timeline

Storm Onset	15KT XWND (KADENA)	NOW	NOW
	25KT XWND (KADENA)	OCCURRED	OCCURRED
	SUSTAINED WINDS ≥ 35KT	N/A	N/A
	SUSTAINED WINDS ≥ 50KT	N/A	N/A
OKINAWA MAX: 32G53KT		08/0345L	07/1845Z
Storm Offset	SUSTAINED WINDS < 50KT	N/A	N/A
	SUSTAINED WINDS < 35KT	N/A	N/A
	<25KT XWND (KADENA)	OCCURRED	OCCURRED
	<15KT XWND (KADENA)	08/1200L	08/0300Z

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Attachment 3

TROPICAL CYCLONE CONDITIONS OF READINESS (TCCOR)

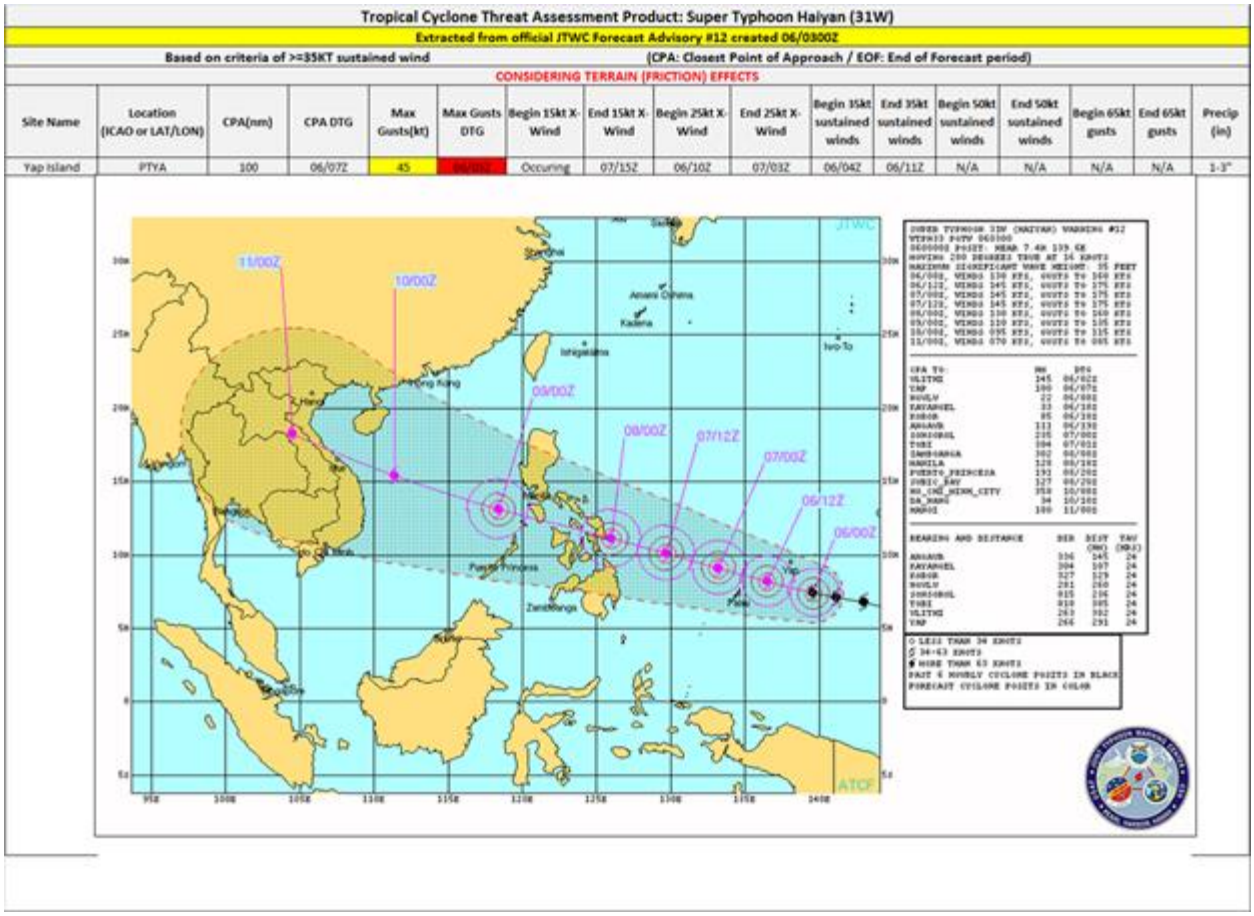
Figure A3.1. TCCOR.

HURCON/TCCOR	Criteria
5	Destructive winds are possible within 96 hours. (2)
4	Destructive winds are possible within 72 hours.
3	Destructive winds are possible within 48 hours.
2	Destructive winds anticipated within 24 hours.
1	Destructive winds anticipated within 12 hours.
1C	Caution: Winds of 40-57 mph/35-49 knots sustained are occurring.
1E	Emergency: Winds of 58 mph/50 knots sustained and/or gusts of 69 mph/60 knots or greater are occurring.
1R	Recovery: Destructive winds have subsided and are no longer forecast to occur; survey and work crews are permitted to determine the extent of the damage and to establish safe zones around hazards (e.g. downed power lines, unstable structures). Non-essential personnel are asked to remain. indoors.

Attachment 4

SAMPLE TC-TAP

Figure A4.1. Sample TC-TAP.



Tropical Cyclone Threat Assessment Product: Super Typhoon Haiyan (31W)

Extracted from official JTWC Forecast Advisory #12 created 06/0300Z

Based on criteria of >=35KT sustained wind (CPA: Closest Point of Approach / EOF: End of Forecast period)

CONSIDERING TERRAIN (FRICTION) EFFECTS

Site Name	Location (ICAO or LAT/LON)	CPA(nm)	CPA DTG	Max Gusts(kt)	Max Gusts DTG	Begin 15kt X-Wind	End 15kt X-Wind	Begin 25kt X-Wind	End 25kt X-Wind	Begin 35kt sustained winds	End 35kt sustained winds	Begin 50kt sustained winds	End 50kt sustained winds	Begin 65kt gusts	End 65kt gusts	Precip (in)
Yap Island	PTYA	100	06/07Z	45	[illegible]	Occuring	07/15Z	06/10Z	07/03Z	06/04Z	06/11Z	N/A	N/A	N/A	N/A	1-3"

Attachment 5

WEATHER SYSTEMS HELP DESK INFO

Figure A5.1. Fielded System Help Desk Contact Information.

System	Duty Hours	Phone #	E-mail	After Hours Instructions	Remarks
TMQ-53	0500 - 1900 Pacific Time Mon. - Fri.	Toll Free: 1-(888)-379-0509 Option 1	tmoshelpdesk@haightbey.com	User leaves voice message or sends e-mail to reach helpdesk off-hour support.	Vendor: Haight Bey and Associates
FMQ-19/22/23	0600 - 1800 Pacific Time Mon. - Fri.	Toll Free: 1-(800)-637-6832 Commercial: (916) 368-2020	fmq19@mesotech.com fmq22@mesotech.com fmq23@mesotech.com	Use listed contact info. Vendror will response within 12 hours	Vendor: Mesotech
PDR	0800 - 1700 Central Time Mon. - Fri.	Commercial: (314) 821-1022 - Ext. 116 for hardware assistance - Ext. 123 for software assistance - Ext. 126 for all other inquiries	Primary E-mail: support@ewradar.com Secondary E-mail: bwilliams@ewradar.com	Toll Free: 1-800-436-1337 Commercial: (651) 229-3171 Connects to EWR's after-hours answering service that rings the on-call EWR employee.	Vendor: EWR EWR has added a laminated 7x5" card to all PDR containers with the appropriate contact phone numbers for assistance.
JET	24/7 (except major holidays)	DSN: 312-272-2785 Commercial: (402) 232-2875 Toll Free: 1-(888)-538-5384	helpdesk@jetisre.com	N/A	Vendor: Raytheon
MARK IV-B	0800 - 1700 Eastern Time Mon. - Fri.	Toll-Free: 1-(800) 541-7183	markivb.support@lmco.com	- For emergencies, call the 800 number to reach the on-call LM employee. - Otherwise, use e-mail for non-emergency.	Vendor: Lockheed Martin
Ionospheric Ground System (ISTO/NEXION)	0800 - 1700 Mountain Time Mon. - Fri.	PM Phone #: DSN: 834-2217 Commercial: (719) 556-2217	ngms.jgs.24-7@ngc.com	None. Use e-mail address provided. When NG gets into the office, they address issues during normal business hours.	Vendor: Northrop-Grumman (NG) E-mail preferred for all issues. NG does not take phone calls, but there is a placard at all sites that lists the PM's phone # to call during duty hours.
TAWS	N/A	N/A	hill.mpssfa@us.af.mil	N/A	Non-weather entity that serves as the contact/lead for passphrase/decryption key issues. The latest version of the TAWS software can be obtained through your TODO account.

Notes:
(1) DSN-to-commercial access: From a DSN class "A" line, use DSN toll free dialing (94+ toll free number). If a DSN class "A" line is not available, users can call a CONUS AFB operator from a DSN class "B" line and ask to transfer to the listed toll free or commercial number. Alternatively, OCONUS users can follow local procedures to access the listed toll free and/or commercial numbers.
(2) After duty hours, follow the "After Hours Instructions" for the affected systems.
(3) POCs for updates/corrections to this spreadsheet: HQ ACC/A5WF, Mr. Brad Green (bradford.green.4@us.af.mil) and Mr. Phil Reding (philip.reding.1@us.af.mil).