CHAPTER 3

GENERAL OPERATIONS AND PROCEDURES OF THE NATIONAL WEATHER SERVICE HURRICANE CENTERS

3.1. General. This chapter briefly describes the products, procedures, and communications headers used by the Tropical Prediction Center/National Hurricane Center (TPC/NHC) and the Central Pacific Hurricane Center (CPHC). See Appendix A for a description of local National Weather Service (NWS) office products which support the tropical cyclone forecast and warning program. Additional details of the products, including transmission times, can be found in National Weather Service Instruction 10-601, located at: http://www.weather.gov/directives.

3.2. Products.

3.2.1. Tropical Weather Outlook (TWO). TPC/NHC and CPHC prepare the TWO during their respective tropical cyclone seasons. The outlook covers tropical and subtropical waters and discusses areas of disturbed weather and the potential for tropical cyclone development during the next 48 hours.

3.2.2. Tropical Cyclone Public Advisories (TCP). The TCP is the primary tropical cyclone information product issued to the public. The TPC/NHC, the CPHC, and WFO Guam issue TCPs. The following pertains to the tropical storm/hurricane/typhoon watches and warnings contained in the TCP:

- TPC/NHC. TPC/NHC issues tropical storm/hurricane watches/warnings for the Atlantic, Pacific, and Gulf of Mexico coasts of the continental United States, the US Virgin Islands, and Puerto Rico. TPC/NHC issues watches when conditions along the coast are expected within 36 hours. TPC/NHC issues warnings when conditions along the coast are expected within 24 hours.

- CPHC and WFO Guam. CPHC and WFO Guam issues tropical storm/hurricane/typhoon watches/warnings for the islands of Hawaii, northwest Hawaiian Islands, Johnston Atoll, Guam, Northern Mariana Islands and selected points in the Micronesian countries. CPHC and WFO Guam issue watches when conditions along the coast are expected within 48 hours. CPHC and WFO Guam issue warnings when conditions are possible along the coast within 36 hours.

3.2.3. Tropical Cyclone Forecast/Advisories (TCM). NHC/TPC and CPHC will prepare TCMs for all tropical cyclones within their area of responsibility. See Section 4.3 for content and format of the advisories. The TCM provides critical tropical cyclone watch, warning, and forecast information for the protection of life and property.

Note: In the Western Pacific, tropical cyclone forecasts/advisories are issued by the JTWC. Appendix C provides a listing of the abbreviated communications headings and titles for JTWC products. Information on the broadcast of tropical cyclone information to coastal and high-seas shipping can be found in Chapter 9, Marine Weather Broadcasts.

3.2.4. Tropical Cyclone Discussions (TCD). NHC/TPC and CPHC issue TCDs to

explain forecaster's reasoning behind analysis and forecast of the tropical cyclone.

3.2.5. Tropical Cyclone Updates (TCU). The TCU is an event-driven product which provides users with timely, succinct information on significant changes to tropical cyclone conditions. TCUs are issued to inform users of unexpected changes in a tropical cyclone, such as to convey a significant change in the intensity, and/or to alert users a special advisory is about to be issued. The TCU may also be used to announce changes to international watches or warnings made by other countries, and to cancel U.S. watches or warnings. A TCU should only be used to issue a U.S. watch or warning if that TCU precedes a special advisory that will contain the same watch/warning information, and indicates the special advisory will be issued shortly.

3.2.6. Tropical Cyclone Position Estimates (TCE). This product ensures a continuous flow of information regarding the center location of a tropical cyclone when it nears the coast and thus provides up to date location information to emergency managers and other public officials. The TCE is a brief alphanumeric product containing information derived from WSR-88D radar or appropriate satellite data about tropical cyclone positions near coasts in latitude/longitude coordinates, distance, and direction from a well known point.

3.2.7. Graphical Tropical Cyclone Surface Wind Speed Probabilities. This graphical product portrays probabilistic surface wind speed information which will help users prepare for the potential of tropical storm or hurricane conditions. This product shows probabilities for three wind speed thresholds: 34, 50 and 64 knots. It provides cumulative probabilities through each 12 hour interval (e.g. 0 -12 hours, 0- 24 hours, etc.) from 0 through 120 hours. They are available in graphical forms in a static and an animated display. These wind speed probabilities are based on the track, intensity, and wind structure uncertainties in the official forecasts from the tropical cyclone centers.

3.2.8. Tropical Cyclone Surface Wind Speed Probabilities Text Product (PWS). This product portrays probabilistic wind speed information helping users prepare for the potential of tropical storm or hurricane conditions.

The probabilities in this product are statistically based on the errors in the official track and intensity forecasts issued during the past five years by TPC/NHC and CPHC. Variability in tropical cyclone wind structure is also incorporated. New probability values are computed for each new official forecast issued by TPC/NHC or CPHC.

The first section of the product provides categorical maximum wind speed (intensity) probabilities at standard forecast hours (12, 24, 36, 48, 72, 96, and 120) for various intensity stages (dissipated, tropical depression, tropical storm and hurricane) and for the five categories on the Saffir-Simpson Hurricane Scale. These probabilities apply to the maximum sustained surface wind associated with the cyclone, and not to winds that could occur at specific locations.

Probabilities for specific locations are provided in the second section for sustained wind speeds equal to or exceeding three wind speed thresholds: 34, 50 and 64 knots. Two types of probability values are provided in this table: individual period and cumulative. Individual period probabilities are provided for each of the following time intervals: 0-12 hours, 12-24 hours, 24-

36 hours, 36-48 hours, 48-72 hours, 72-96 hours, and 96-120 hours. These individual period probabilities indicate the chance that the particular wind speed will *start* during each individual period at each location. Cumulative probabilities are produced for the following time periods: 0-12 hours, 0-24 hours, 0-36 hours, 0-48 hours, 0-72 hours, 0-96 hours, and 0-120 hours. These cumulative probabilities indicate the overall chance the particular wind speed will occur at each location during the period between hour 0 and the forecast hour.

3.2.9. Tropical Cyclone Watch Warning Product (TCV). The TCV summarizes all new, continued, and cancelled tropical cyclone watches and warnings issued by the TPC/NHC for the U.S. Atlantic and Gulf coast, southern California coast, Puerto Rico, and U.S. Virgin Islands. The CPHC will issue a TCV for the main islands of the State of Hawaii. The product is issued each time a U. S. tropical cyclone watch and/or warning is issued, continued, or discontinued for all Atlantic, portions of the North East Pacific, and the North Central Pacific Ocean basin tropical cyclones.

3.2.10. Hydrometeorological Prediction Center (HPC) Public Advisories (TCP). The National Centers for Environmental Prediction's HPC issues public advisories after TPC/NHC discontinues its advisories on subtropical and tropical cyclones that have moved inland in the United States or Mexico, but still pose a threat of heavy rain and flash floods in the conterminous United States or Mexico. Content will refer to the decaying system's position, intensity, general forecast trends, highlight impacts which occurred and are expected to occur (usually in relation to heavy rain/flooding and tornadoes), and indicate when the next summary will be issued. A table at the end of the message will provide forecast latitude and longitude of the remnant low.

3.2.11. Other Tropical Cyclone Products. Several other tropical cyclone related products are issued to support the tropical cyclone forecast and warning program. Refer to NWS Instruction 10-601, located at http://www.weather.gov/directives, for further details on these products, which include:

- Satellite Interpretation Message (SIM).
- Tropical Weather Discussion (TWD).
- Tropical Weather Summary (TWS).
- Tropical Cyclone Summary – Fixes (TCS).
- Tropical Cyclone Danger Area Graphic
- Aviation Tropical Cyclone Advisory (TCA)
- Tropical Cyclone Reports (TCR)
- Tropical Cyclone Track and Watch/Warning Graphic
- Cumulative Wind Distribution
- Tropical Cyclone Wind Field Graphic
- Maximum Wind Speed Probability Table
- Tropical Cyclone Storm Surge Probabilities

3.3. Designation of Tropical and Subtropical Cyclones.

3.3.1. Numbering of Tropical and Subtropical Depressions. The hurricane centers are responsible for numbering tropical and subtropical depressions in their areas of responsibility. Tropical depressions shall be numbered consecutively beginning each season with the spelled out number "ONE." For ease in differentiation, tropical depression numbers shall include the suffix "E" for Eastern Pacific, "C" for Central Pacific, or "W" for Western Pacific, after the number. In both the Atlantic and Pacific, once the depression has reached tropical storm intensity, it shall be named and the depression number dropped. The depression number will not be used again until the following year. Give tropical cyclones a name in the first advisory after intensifying to 34 knots (39 mph) or greater. In the Western Pacific, WFO Guam will use the JTWC cyclone number for all non-named systems. For RSMC Tokyo named systems, WFO Guam will use the RSMC Tokyo name with the associated JTWC number in parentheses.

The following rules apply for tropical cyclones passing from one basin to another: Retain the name if a tropical cyclone passes from one basin into another basin as a tropical cyclone; i.e., advisories are continuous. An unnamed tropical depression will also retain its number (e.g. Tropical Depression Six-E remains Tropical Depression Six-E) if it crosses into another area of responsibility. For unnamed tropical depressions moving from west to east across 180°, CPHC will use the associated Joint Typhoon Warning Center's (JTWC) number and indicate JTWC in parentheses following the number. For named systems, CPHC will use the associated RSMC Tokyo name and provide the associated JTWC number in parentheses.

Within a basin, if the remnant of a tropical cyclone redevelops into a tropical cyclone, it is assigned its original number or name. If the remnants of a former tropical cyclone regenerate in a new basin, the regenerated tropical cyclone will be given a new designation.

3.3.1.1. Atlantic Basin. Depression numbers, ONE, TWO, THREE, will be assigned by the TPC/NHC after advising the Naval Atlantic Meteorology and Oceanography Center (NAVLANTMETOCCEN) Norfolk.

3.3.1.2. Pacific East of 140ºW. Depression numbers, with the suffix E, e.g., ONE-E, TWO-E, THREE-E, will be assigned by the TPC/NHC after advising JTWC, Pearl Harbor, HI. The assigned identifier shall be retained even if the depression passes into another warning area.

3.3.1.3. Pacific West of 140ºW and East of 180º. Depression numbers, with suffix C; e.g., ONE-C, TWO-C, THREE-C, will be assigned by the CPHC after advising JTWC.

3.3.1.4. Pacific West of 180º and North of 0º. Depression numbers, with suffix W; e.g., ONE-W, TWO-W, THREE-W, are assigned by JTWC.

3.3.1.5. Subtropical Depressions. A single list of numbers and names will be used for all tropical and subtropical cyclones. Therefore, numbering of subtropical depressions

will follow the same procedure as tropical depressions. For example, if the first subtropical depression follows the first tropical depression, the subtropical depression will be given the designation SUBTROPICAL DEPRESSION TWO. If a subtropical depression becomes a subtropical storm, it receives the next available name in the tropical cyclone naming sequence.

3.3.2. Numbering and Naming of Tropical and Subtropical Cyclones.

3.3.2.1. Numbering and Naming Tropical Cyclones. Tropical cyclone centers will number tropical depressions in their areas of responsibility. The centers will number tropical depressions consecutively beginning each season with the spelled out number "ONE." In the north Pacific, for ease in differentiation, tropical depression numbers, assigned by NHC or CPHC, will include the suffix "E" for eastern (east of 140°W longitude) or "C," for central (180° to 140°W longitude) respectively, after the number. In both the Atlantic and Pacific, once the depression reaches tropical storm intensity, name it and drop the depression number. The depression number will not be used again until the following year. Give tropical cyclones a name in the first advisory after intensifying to 34 knots (39 mph) or greater. In the Western Pacific, WFO Guam will use the JTWC cyclone number for all non-named systems. For RSMC Tokyo named systems, WFO Guam will use the RSMC Tokyo name with the associated JTWC number in parentheses.

The following rules apply for tropical cyclones passing from one basin to another: Retain the name if a tropical cyclone passes from one basin into another basin as a tropical cyclone; i.e. advisories are continuous. An unnamed tropical depression will also retain its number (e.g. Tropical Depression Six-E remains Tropical Depression Six-E) if it crosses into another area of responsibility. For unnamed tropical depressions moving from west to east across 180°, CPHC will use the associated Joint Typhoon Warning Center's (JTWC) number and indicate JTWC in parentheses following the number. For named systems, CPHC will use the RSMC Tokyo name and provide the associated JTWC number in parentheses.

Within a basin, if the remnant of a tropical cyclone redevelops into a tropical cyclone, it is assigned its original number or name. If the remnants of a former tropical cyclone regenerate in a new basin, the regenerated tropical cyclone will be given a new designation.

3.3.2.2. Numbering and Naming Subtropical Storms. A single list of numbers and names will be used for all tropical and subtropical cyclones. Therefore, numbering of subtropical depressions will follow the same procedure as tropical depressions. For example, if the first subtropical depression follows the first tropical depression, the subtropical depression will be given the designation SUBTROPICAL DEPRESSION TWO. If a subtropical depression becomes a subtropical storm, it receives the next available name in the tropical cyclone naming sequence.

3.3.2.3. Numbering Advisories and Tropical/Subtropical Cyclone Discussions. Tropical and subtropical cyclone advisories and discussions in the Atlantic and the Pacific will be numbered similarly. Number scheduled and special advisories and TCDs consecutively beginning with the number 1 (not spelled out) for each new tropical or subtropical cyclone, and continue through the duration of the cyclone. In situations where only TCMs and

TCDs are being written (tropical cyclones in the eastern Pacific not threatening land) and at a later time a public advisory is required, the public advisory number will match the corresponding TCM. In both the Atlantic and the Pacific, intermediate advisories and TCDs will retain the advisory number of the scheduled or special advisory they update and append an alphabetic designator (e.g., "HURRICANE ALLISON INTERMEDIATE ADVISORY NUMBER 20A").

3.4. Transfer of Warning Responsibility.

3.4.1. TPC/NHC to CPHC. When a tropical or subtropical cyclone approaches 140ºW, the coordinated transfer of warning responsibility from TPC/NHC to CPHC will be made and the appropriate advisory issued.

3.4.2. CPHC to JTWC/(RSMC, Tokyo)/WFO Guam. When a tropical or subtropical cyclone crosses 180º from east to west, the coordinated transfer of warning responsibility from CPHC to JTWC will be made and the appropriate advisory issued. At the same time, the CPHC will coordinate with the RSMC, Tokyo and WFO Guam so that they are aware that CPHC will be suspending the issuance of advisories.

3.4.3. JTWC/RSMC, Tokyo to CPHC. When a tropical or subtropical cyclone crosses 180º from west to east, the coordinated transfer of warning responsibility from JTWC to CPHC will be made. At the same time, the CPHC will coordinate with RSMC, Tokyo so that they are aware that CPHC will be assuming the issuance of advisories.

3.5. Alternate Warning Responsibilities.

3.5.1. Transfer to Alternate. In the event of impending or actual operational failure of a hurricane forecast center, tropical warning responsibilities will be transferred to an alternate facility in accordance with existing directives and retained there until resumption of responsibility can be made. Alternate facilities are as follows:

PRIMARY	ALTERNATE
TPC/NHC	National Centers for Environmental Prediction Hydrometeorological Prediction Center (HPC), Camp Springs, MD
CPHC	TPC/NHC
CARCAH	53rd Weather Reconnaissance Squadron (53 WRS)
JTWC	Fleet Numerical Meteorology and Oceanography Center (FLENUMETOCCEN), Monterey, CA
WFO Guam	CPHC

3.5.2. Notification. The NAVLANTMETOCCEN, Norfolk, and JTWC, Pearl Harbor, will be advised by TPC/NHC, CARCAH, and CPHC, as appropriate, of impending or actual transfer of responsibility by the most rapid means available. JTWC will advise CPHC, TPC/NHC, and WFO Guam of impending or actual transfer of JTWC responsibilities. In the event of a CARCAH operational failure, direct communication is authorized between the 53 WRS and the forecast facility. Contact 53 WRS at DSN 597-2409/228-377-2409 or through the Keesler AFB Command Post at DSN 597-4330/208-377-4330 (ask for the 53 WRS).

Table 3-1. Atlantic Tropical Cyclone Names

2009	2010	2011
ANA	ALEX	ARLENE
BILL	BONNIE	BRET
CLAUDETTE claw-DET	COLIN	CINDY
DANNY	DANIELLE dan-YELL	DON
ERIKA ERR-ree-ka	EARL	EMILY
FRED	FIONA	FRANKLIN
GRACE	GASTON	GERT
HENRI ahn-REE	HERMINE her-MEEN	HARVEY
IDA	IGOR e-GOR	IRENE
JOAQUIN	JULIA	JOSE ho-ZAY
KATE	KARL	KATIA ka-TEE-ah
LARRY	LISA LEE-sa	LEE
MINDY	MATTHEW	MARIA ma-REE-ah
NICHOLAS NIK-o-las	NICOLE ni-COLE	NATE
ODETTE o-DET	OTTO	OPHELIA o-FEEL-ya
PETER	PAULA	PHILIPPE fe-leep
ROSE	RICHARD RICH-erd	RINA
SAM	SHARY SHA-ree	STAN
TERESA te-REE-sa	TOMAS to-MAS	TAMMY
VICTOR VIC-ter	VIRGINIE vir-JIN-ee	VINCE
WANDA	WALTER	WHITNEY
2012	**2013**	**2014**
ALBERTO al-BAIR-toe	ANDREA	ARTHUR
BERYL BER-ril	BARRY	BERTHA BUR-tha
CHRIS	CHANTAL shan-TAHL	CRISTOBAL
DEBBY	DORIAN	DOLLY
ERNESTO er-NES-toe	ERIN AIR-in	EDOUARD eh-DWARD
FLORENCE	FERNAND	FAY
GORDON	GABRIELLE ga-bree-EL	GONZALO
HELENE he-LEEN	HUMBERTO oom-BAIR-to	HANNA
ISAAC EYE-zak	INGRID	ISAIAS
JOYCE	JERRY	JOSEPHINE JO-ze-feen
KIRK	KAREN	KYLE
LESLIE	LORENZO	LAURA
MICHAEL MIKE-el	MELISSA	MARCO
NADINE nay-DEEN	NESTOR	NANA
OSCAR	OLGA	OMAR
PATTY	PABLO PA-blow	PAULETTE
RAFAEL ra-fa-EL	REBEKAH	RENE re-NAY
SANDY	SEBASTIEN say-BAS-tyan	SALLY
TONY	TANYA TAHN-ya	TEDDY
VALERIE	VAN	VICKY
WILLIAM	WENDY	WILFRED

If over 21 tropical cyclones occur in a year, the Greek alphabet will be used following the W-named cyclone.

Table 3-2. Eastern Pacific Tropical Cyclone Names

2009	2010	2011
ANDRES ahn DRASE	AGATHA	ADRIAN
BLANCA BLAHN kah	BLAS	BEATRIZ BEE a triz
CARLOS	CELIA	CALVIN
DOLORES	DARBY	DORA
ENRIQUE anh REE kay	ESTELLE	EUGENE
FELICIA fa LEE sha	FRANK	FERNANDA fer NAN dah
GUILLERMO gee YER mo	GEORGETTE	GREG
HILDA	HOWARD	HILARY
IGNACIO eeg NAH cio	ISIS	IRWIN
JIMENA he MAY na	JAVIER	JOVA Ho vah
KEVIN	KAY	KENNETH
LINDA	LESTER	LIDIA
MARTY	MADELINE	MAX
NORA	NEWTON	NORMA
OLAF OH lahf	ORLENE	OTIS
PATRICIA	PAINE	PILAR
RICK	ROSLYN	RAMON rah MONE
SANDRA	SEYMOUR	SELMA
TERRY	TINA	TODD
VIVIAN	VIRGIL	VERONICA
WALDO	WINIFRED	WILEY
XINA ZEE nah	XAVIER	XINA ZEE nah
YORK	YOLANDA yo LAHN da	YORK
ZELDA ZEL dah	ZEKE	ZELDA ZEL dah
2012	**2013**	**2014**
ALETTA a LET ah	ALVIN	AMANDA
BUD	BARBARA	BORIS
CARLOTTA	COSME COS may	CRISTINA
DANIEL	DALILA	DOUGLAS
EMILIA ee MILL ya	ERICK	ELIDA ELL ee dah
FABIO FAH bee o	FLOSSIE	FAUSTO FOW sto
GILMA GIL mah	GIL	GENEVIEVE
HECTOR	HENRIETTE hen ree ETT	HERNAN her NAHN
ILEANA ill ay AH nah	IVO	ISELLE ee SELL
JOHN	JULIETTE	JULIO HOO lee o
KRISTY	KIKO KEE ko	KARINA
LANE	LORENA low RAY na	LOWELL
MIRIAM	MANUEL mahn WELL	MARIE
NORMAN	NARDA	NORBERT
OLIVIA	OCTAVE AHK tave	ODILE oh DEAL
PAUL	PRISCILLA	POLO
ROSA	RAYMOND	RACHEL
SERGIO SIR gee oh	SONIA SONE yah	SIMON
TARA	TICO TEE koh	TRUDY
VICENTE vee CEN tay	VELMA	VANCE
WILLA	WALLIS	WINNIE
XAVIER ZAY vier	XINA ZEE nah	XAVIER ZAY vier
YOLANDA yo LAHN da	YORK	YOLANDA yo LAHN da
ZEKE	ZELDA ZEL dah	ZEKE

Table 3-3. Central Pacific Tropical Cyclone Names

COLUMN 1		COLUMN 2	
Name	**Pronunciation**	**Name**	**Pronunciation**
AKONI	ah-KOH-nee	AKA	AH-kah
EMA	EH-mah	EKEKA	eh-KEH-kak
HONE	HOH-neh	HENE	HEH-neh
IONA	ee-OH-nah	IOLANA	ee-OH-lah-nah
KELI	KEH-lee	KEONI	keh-ON-nee
LALA	LAH-lah	LINO	LEE-noh
MOKE	MOH-keh	MELE	MEH-leh
NOLO	NOH-loh	NONA	NOH-nah
OLANA	Oh-LAH-nah	OLIWA	oh-LEE-vah
PENA	PEH-nah	PAMA	PAH-mah
ULANA	oo-LAH-nah	UPANA	oo-PAH-nah
WALE	WAH-leh	WENE	WEH-neh
COLUMN 3		**COLUMN 4**	
Name	**Pronunciation**	**Name**	**Pronunciation**
ALIKA	ah-LEE-kah	ANA	AH-nah
ELE	EH-leh	ELA	EH-lah
HUKO	HOO-koh	HALOLA	hah-LOH-lah
IOPA	ee-OH-pah	IUNE	ee-OO-neh
KIKA	KEE-kah	KILO	KEE-lo
LANA	LAH-nah	LOKE	LOH-keh
MAKA	MAH-kah	MALIA	mah-LEE-ah
NEKI	NEH-kee	NIALA	nee-AH-lah
OMEKA	oh-MEH-kah	OHO	OH-hoh
PEWA	PEH-vah	PALI	PAH-lee
UNALA	oo-NAH-lah	ULIKA	oo-LEE-kah
WALI	WAH-lee	WALAKA	wah-LAH-kah

NOTE: Use Column 1 list of names until exhausted before going to Column 2, etc. All letters in the Hawaiian language are pronounced, including double or triple vowels.

Table 3-4. International Tropical Cyclone Names for the Northwest Pacific and South China Sea

Contributor	I	II	III	IV	V
	NAME	NAME	NAME	NAME	NAME
Cambodia	Damrey	Kong-rey	Nakri	Krovanh	Sarika
China	Longwang	Yutu	Fengshen	Dujuan	Haima
DPR Korea	Kirogi	Toraji	Kalmaegi	Maemi	Meari
HK, China	Kai-tak	Man-yi	Fung-wong	Choi-wan	Ma-on
Japan	Tembin	Usagi	Kammuri	Koppu	Tokage
Lao PDR	Bolaven	Pabuk	Phanfone	Ketsana	Nock-ten
Macau	Chanchu	Wutip	Vongfong	Parma	Muifa
Malaysia	Jelawat	Sepat	Nuri	Melor	Merbok
Micronesia	Ewiniar	Fitow	Sinlaku	Nepartak	Nanmadol
Philippines	Bilis	Danas	Hagupit	Lupit	Talas
RO Korea	Kaemi	Nari	Changmi	Sudal	Noru
Thailand	Prapiroon	Wipha	Mekkhala	Nida	Kulap
U.S.A.	Maria	Francisco	Higos	Omais	Roke
Viet Nam	Saomai	Lekima	Bavi	Conson	Sonca
Cambodia	Bopha	Krosa	Maysak	Chanthu	Nesat
China	Wukong	Haiyan	Haishen	Dianmu	Haitang
DPR Korea	Sonamu	Podul	Pongsona	Mindulle	Nalgae
HK, China	Shanshan	Lingling	Yanyan	Tingting	Banyan
Japan	Yagi	Kajiki	Kujira	Kompasu	Washi
Lao PDR	Xangsane	Faxai	Chan-hom	Namtheun	Matsa
Macau	Bebinca	Peipan	Linfa	Malou	Sanvu
Malaysia	Rumbia	Tapah	Nangka	Meranti	Mawar
Micronesia	Soulik	Mitag	Soudelor	Rananim	Guchol
Philippines	Cimaron	Hagibis	Molave	Malakas	Talim
RO Korea	Chebi	Noguri	Koni	Megi	Nabi
Thailand	Durian	Rammasun	Morakot	Chaba	Khanun
U.S.A.	Utor	Matmo	Etau	Aere	Vicente
Viet Nam	Trami	Halong	Vamco	Songda	Saola

NOTE: The official international name list was effective January 1, 2000. Names will be assigned in rotation starting with Damrey for the first tropical cyclone of the year 2000 which is of tropical storm strength or greater. When the last name in column 5 (Saola) is used, the sequence will begin again with the first name in column 1.

3.6. <u>Abbreviated Communications Headings</u>. Abbreviated communications headings are assigned to advisories on tropical and subtropical cyclones and other advisories based on depression numbers or storm name and standard communications procedures governed by the World Meteorological Organization (WMO). An abbreviated heading consists of three groups with ONE space between each of the groups. The first group contains a data type indicator (e.g.,

WT for hurricane), a geographical indicator (e.g. NT for Atlantic Basin), and a number. The second group contains a location identifier of the message originator (e.g., KNHC for TPC/NHC). The third group is a date-time group in UTC. An example of a complete header is: WTNT61 KNHC 180400.

Table 3-5. Summary of Products and their Associated WMO Header

PRODUCT TITLE	WMO HEADER
Tropical Weather Outlook	
Atlantic Basin	ABNT20 KNHC
Eastern Pacific	ABPZ20 KNHC
Central Pacific	ACPN50 PHFO
Tropical Weather Discussion	
Atlantic Basin	AXNT20 KNHC
Eastern Pacific	AXPZ20 KNHC
Tropical/Subtropical Cyclone Public Advisory	
Atlantic Basin	WTNT31-35 KNHC
Eastern Pacific	WTPZ31-35 KNHC
Central Pacific	WTPA31-35 PHFO
Western Pacific	WTPQ31-35 PGUM
Tropical Cyclone Surface Wind Speed Probabilities Text Product	
Atlantic Basin	FONT11-15 KNHC
Eastern Pacific	FOPZ11-15 KNHC
Central Pacific	FOPA11-15 PHFO
Tropical/Subtropical Cyclone Forecast/Advisory	
Atlantic Basin	WTNT21-25 KNHC
Eastern Pacific	WTPZ21-25 KNHC
Central Pacific	WTPA21-25 PHFO
Tropical Cyclone Discussion	
Atlantic Basin	WTNT41-45 KNHC
Eastern Pacific	WTPZ41-45 KNHC
Central Pacific	WTPA41-45 PHFO
Tropical Cyclone Valid Time Event Code Product	
Atlantic Basin	WTNT81-85 KNHC
Eastern Pacific	WTPZ81-85 KNHC
Central Pacific	WTPA81-85 PHFO
Tropical Cyclone Position Estimate	
Atlantic Basin	WTNT51-55 KNHC
Eastern Pacific	WTPZ51-55 KNHC
Central Pacific	WTPA51-55 PHFO
Western North Pacific	WTPQ51-55 PGUM
Tropical Cyclone Update	
Atlantic Basin	WTNT61-65 KNHC
Eastern Pacific	WTPZ61-65 KNHC
Central Pacific	WTPA61-65 PHFO

Table 3-5 (continued). Summary of Products and their Associated WMO Header

PRODUCT TITLE	WMO HEADER
Tropical Weather Summary	
Atlantic Basin	ABNT30 KNHC
Eastern Pacific	ABPZ30 KNHC
Central Pacific	ACPN60 PHFO
Tropical Cyclone Position and Intensity from Satellite Data	
South Central Pacific 120W	TXPS40 PHFO
North Central Pacific 140W - 180	TXPN40 PHFO
Satellite Interpretation Message	
Hawaiian Islands	ATHW40 PHFO
West Pacific (Guam)	ATPQ40 PGUM
Satellite-Derived Rainfall	
Eastern Caribbean	TCCA21 KNHC
Central Caribbean	TCCA22 KNHC
Western Caribbean	TCCA23 KNHC
Aviation Tropical Cyclone Advisory Message	
Atlantic Basin	FKNT21-25 KNHC
Eastern Pacific	FKPZ21-25 KNHC
Central Pacific	FKPA21-25 PHFO
Tropical Cyclone Summary - Fixes	
South Central Pacific 120W	TXPS41-45 PHFO
North Central Pacific 140W - 180	TXPN41-45 PHFO

Note: Refer to Appendix C for abbreviated communications headers and titles for the products for which JTWC is responsible.

3.7. Hurricane Liaison Team (HLT).

3.7.1. National Weather Service (NWS) Responsibilities. The NWS supports the HLT through use of Tropical Prediction Center (TPC) meteorologists, Weather Forecast Office (WFO) personnel (typically warning coordination meteorologists and service hydrologists), and River Forecast Center (RFC) hydrologists. Eastern and Southern Region Headquarters will maintain a list of their available HLT candidates.

After HLT deactivation, the HPC will assume the briefing duties provided the remnants of the tropical cyclone remain a threat to inland areas. TPC and HPC will coordinate prior to the transfer. During the inland event HPC will coordinate with the appropriate WFOs and RFCs and when needed, hydrologists from the RFCs will provide hydrological briefings.

3.7.2. Activation. The HLT may be activated when a tropical cyclone in the Atlantic, Gulf of Mexico, Caribbean or eastern Pacific threatens the United States or its territories, and the Director or Deputy Director of TPC deems HLT assistance is required. TPC makes the request for activation by contacting the Federal Emergency Management Agency (FEMA) Operations Center (FOC). Upon FEMA's approval, the FOC will activate the HLT. The TPC Director or Deputy Director will contact the appropriate NWS Regional Director requesting meteorological and/or hydrologic support. NWS personnel should arrive at TPC within 24 hours. The HLT will

remain active until the hurricane threat has passed, at which time HLT operations will be terminated by FEMA. However, if the storm moves inland and if significant rainfall is expected, the HLT may remain activated.

If the HLT is deactivated, the HPC will assume the briefing duties provided the remnants of the tropical cyclone remain a threat to inland areas. TPC and HPC will coordinate prior to the transfer. During the inland event, HPC will coordinate with the appropriate WFOs and RFCs and, when needed, hydrologists from the RFCs will provide hydrological briefings.

3.7.3. Training. Completing NWS/FEMA's distance learning training module, Community Hurricane Preparedness, is required by HLT members. The module can be taken via the Internet at: http://meted.ucar.edu/hurrican/chp/index.htm. Other training opportunities are strongly encouraged. They are: FEMA's "Introduction to Hurricane Preparedness" conducted at TPC for emergency mangers and NWS personnel, and FEMA's annual HLT training session held at TPC.

3.7.4. Meteorological Duties. The HLT meteorologist will:

- Establish and maintain contact with the impacted WFOs, RFCs, and the HPC.
- Facilitate participation of the impacted NWS offices in conference calls, briefings, and in preparation and distribution of graphics.
- Provide meteorological interpretations on National Hurricane Center advisories (NHC), WFO hurricane local statements, HURREVAC products, and storm surge forecasts for federal, state and local agencies on request.
- Provide storm briefings via video/audio teleconferences for federal, state and local organizations.
- Respond to meteorology-related incoming calls from federal, state, and local emergency managers, and as appropriate, refer meteorologic inquires to the local WFO.

3.7.5. Hydrologic Duties. The HLT hydrologist will:

- Establish and maintain contact with the impacted local WFOs, RFCs, and the HPC.
- Facilitate participation of the impacted NWS offices in conference calls, briefings, and in preparation and distribution of graphics.
- Provide hydrologic interpretation on NHC advisories, WFO hurricane local statements, and WFO and RFC hydrologic products for federal, state and local agencies on request.
- Provide technical support for RFC lead during hydrologic portion of video teleconference. In absence of the RFC, lead the hydrologic portion of the video teleconference.

- Respond to hydrology-related incoming calls from federal, state, and local emergency managers and as appropriate, refer hydrologic inquires to the local WFO