# 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 forecasting 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. The outlook will mention tropical cyclones and subtropical cyclones, including the system's location (in either general terms or map coordinates), status, and change in status.

**3.2.2. Tropical Cyclone Public Advisories (TCP).** The TCP is the primary tropical cyclone information product issued to the public. The TCP comprises five sections: Summary, Watches and Warnings, Discussion and Outlook, Hazards, and Next Advisory. 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 *possible* within 48 hours. TPC/NHC issues warnings when conditions along the coast are *expected* within 36 hours.

NOTE: Because hurricane preparedness activities become difficult once winds reach tropical storm force, TPC/NHC issues the hurricane/typhoon watches *48 hours in advance of the anticipated onset of tropical-storm-force winds*.

- 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 *possible* within 48 hours. CPHC and WFO Guam issue warnings when conditions are *expected* along the coast within 36 hours.

NOTE: Because hurricane/typhoon preparedness activities become difficult

once winds reach tropical storm force, CPHC and WFO Guam issue the hurricane/typhoon watches *48 hours in advance of the anticipated onset of tropical-storm-force winds*.

**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).** The TCD is a primary tropical cyclone product explaining forecaster's reasoning behind analysis and the forecast for a tropical cyclone. It also provides coordinated 12-, 24-, 36-, 48-, 72-, 96-, and 120-hour tropical cyclone forecast positions and maximum sustained wind speed forecasts; other meteorological decisions; and plans for watches and warnings.

**3.2.5. Tropical Cyclone Updates (TCU)**. 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.

When a TCU is issued to change the status of a tropical cyclone (e.g., from a tropical storm to a hurricane), or to update storm intensity, location, or motion information, the TCU will include a storm summary section identical in format to the storm summary section found in the TCP. A TCU may be issued without a storm summary section to provide advance notice that significant changes to storm information will be conveyed shortly, either through a subsequent TCU or through a Special Advisory. TCUs issued to convey changes to watches or warnings will not require a storm summary section.

**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 Wind 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 conterminous United States or Mexico, but still pose a threat of heavy rain and flash floods in the conterminous United States or Mexico. The last TPC/NHC advisory will normally be issued when winds in an inland tropical cyclone drop below tropical storm strength, and the tropical depression is not forecast to regain tropical storm intensity or re-emerge over water. Therefore HPC will only handle tropical depressions or remnants. HPC advisories will terminate when the threat of flash flooding has ended.

**3.2.11. Other Tropical Cyclone Products.** Several other tropical cyclone related products are issued to support the tropical cyclone forecasting 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 Surface Wind Field Graphic
- Maximum Wind Speed Probability Table
- Tropical Cyclone Storm Surge Probabilities

**3.3. Numbering of Tropical and Subtropical Cyclones**. The hurricane centers will number tropical depressions in their areas of responsibility. Depression numbers are always spelled out (e.g., "ONE," "TWO," "THREE," etc.). Depression numbers are assigned to match the seasonal cyclone number, even if a previous cyclone has bypassed the depression stage. For example, if the first tropical cyclone of the season forms directly as a storm (e.g., a fast-moving tropical wave becomes a tropical storm without ever becoming a depression), then the depression number "ONE" would simply be skipped and not used until the following year. 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. 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.

**3.3.2. 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.

**3.3.3. 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.

**3.3.4. 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.

**3.3.5. 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.

## 3.4. 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 597-4330/228-377-4181 (ask for the 53 WRS).

## Table 3-1. Atlantic Tropical Cyclone Names

| 2010 | 2011 | 2012 |
|---|---|---|
| ALEX | ARLENE | ALBERTO al-BAIR-toe |
| BONNIE | BRET | BERYL BER-ril |
| COLIN | CINDY | CHRIS |
| DANIELLE dan-YELL | DON | DEBBY |
| EARL | EMILY | ERNESTO er-NES-toe |
| FIONA | FRANKLIN | FLORENCE |
| GASTON | GERT | GORDON |
| HERMINE her-MEEN | HARVEY | HELENE he-LEEN |
| IGOR EE-gor | IRENE | ISAAC EYE-zak |
| JULIA | JOSE ho-ZAY | JOYCE |
| KARL | KATIA ka-TEE-ah | KIRK |
| LISA LEE-sa | LEE | LESLIE |
| MATTHEW | MARIA ma-REE-ah | MICHAEL MIKE-el |
| NICOLE ni-COLE | NATE | NADINE nay-DEEN |
| OTTO | OPHELIA o-FEEL-ya | OSCAR |
| PAULA | PHILIPPE fe-leep | PATTY |
| RICHARD RICH-erd | RINA | RAFAEL ra-fa-EL |
| SHARY SHA-ree | STAN | SANDY |
| TOMAS to-MAS | TAMMY | TONY |
| VIRGINIE vir-JIN-ee | VINCE | VALERIE |
| WALTER | WHITNEY | WILLIAM |
| **2013** | **2014** | **2015** |
| ANDREA | ARTHUR | ANA |
| BARRY | BERTHA BUR-tha | BILL |
| CHANTAL shan-TAHL | CRISTOBAL | CLAUDETTE claw-DET |
| DORIAN | DOLLY | DANNY |
| ERIN AIR-in | EDOUARD eh-DWARD | ERIKA ERR-ree-ka |
| FERNAND | FAY | FRED |
| GABRIELLE ga-bree-EL | GONZALO | GRACE |
| HUMBERTO oom-BAIR-to | HANNA | HENRI ahn-REE |
| INGRID | ISAIAS | IDA |
| JERRY | JOSEPHINE JO-ze-feen | JOAQUIN |
| KAREN | KYLE | KATE |
| LORENZO | LAURA | LARRY |
| MELISSA | MARCO | MINDY |
| NESTOR | NANA | NICHOLAS NIK-o-las |
| OLGA | OMAR | ODETTE o-DET |
| PABLO PA-blow | PAULETTE | PETER |
| REBEKAH | RENE re-NAY | ROSE |
| SEBASTIEN say-BAS-tyan | SALLY | SAM |
| TANYA TAHN-ya | TEDDY | TERESA te-REE-sa |
| VAN | VICKY | VICTOR VIC-ter |
| WENDY | WILFRED | WANDA |

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

| 2010 | 2011 | 2012 |
|---|---|---|
| AGATHA | ADRIAN | ALETTA a LET ah |
| BLAS | BEATRIZ BEE a triz | BUD |
| CELIA | CALVIN | CARLOTTA |
| DARBY | DORA | DANIEL |
| ESTELLE | EUGENE | EMILIA ee MILL ya |
| FRANK | FERNANDA fer NAN dah | FABIO FAH bee o |
| GEORGETTE | GREG | GILMA GIL mah |
| HOWARD | HILARY | HECTOR |
| ISIS | IRWIN | ILEANA ill ay AH nah |
| JAVIER | JOVA Ho vah | JOHN |
| KAY | KENNETH | KRISTY |
| LESTER | LIDIA | LANE |
| MADELINE | MAX | MIRIAM |
| NEWTON | NORMA | NORMAN |
| ORLENE | OTIS | OLIVIA |
| PAINE | PILAR | PAUL |
| ROSLYN | RAMON rah MONE | ROSA |
| SEYMOUR | SELMA | SERGIO SIR gee oh |
| TINA | TODD | TARA |
| VIRGIL | VERONICA | VICENTE vee CEN tay |
| WINIFRED | WILEY | WILLA |
| XAVIER | XINA ZEE nah | XAVIER ex ZAY vier |
| YOLANDA yo LAHN da | YORK | YOLANDA yo LAHN da |
| ZEKE | ZELDA ZEL dah | ZEKE |

| 2013 | 2014 | 2015 |
|---|---|---|
| ALVIN | AMANDA | ANDRES ahn DRASE |
| BARBARA | BORIS | BLANCA BLAHN kah |
| COSME COS may | CRISTINA | CARLOS |
| DALILA | DOUGLAS | DOLORES |
| ERICK | ELIDA ELL ee dah | ENRIQUE anh REE kay |
| FLOSSIE | FAUSTO FOW sto | FELICIA fa LEE sha |
| GIL | GENEVIEVE | GUILLERMO gee YER mo |
| HENRIETTE hen ree ETT | HERNAN her NAHN | HILDA |
| IVO | ISELLE ee SELL | IGNACIO eeg NAH cio |
| JULIETTE | JULIO HOO lee o | JIMENA he MAY na |
| KIKO KEE ko | KARINA | KEVIN |
| LORENA low RAY na | LOWELL | LINDA |
| MANUEL mahn WELL | MARIE | MARTY |
| NARDA | NORBERT | NORA |
| OCTAVE AHK tave | ODILE oh DEAL | OLAF OH lahf |
| PRISCILLA | POLO | PATRICIA |
| RAYMOND | RACHEL | RICK |
| SONIA SONE yah | SIMON | SANDRA |
| TICO TEE koh | TRUDY | TERRY |
| VELMA | VANCE | VIVIAN |
| WALLIS | WINNIE | WALDO |
| XINA ZEE nah | XAVIER ZAY vier | XINA ZEE nah |
| YORK | YOLANDA yo LAHN da | YORK |
| ZELDA ZEL dah | ZEKE | ZELDA ZEL dah |

**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).** The HLT is a Department of Homeland Security's Federal Emergency Management Agency (FEMA)-sponsored team made up of federal, state, and local emergency managers who have extensive hurricane operational experience. Team members function as a bridge between scientists, meteorologists and the emergency managers who respond if the storm threatens the United States or its territories. Team members provide immediate and critical storm information to government agency decision makers at all levels to help them prepare for their response operations, which may include evacuations, sheltering, and mobilizing equipment. State and/or local officials, not the HLT, make decisions concerning evacuations.

**3.7.1. National Weather Service (NWS) Responsibilities.** The NWS supports the HLT through use of TPC/NHC 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.

**3.7.2. Activation/Deployment.** On June 1st, or earlier if necessary, the TPC/NHC Director will request that the FEMA activate the HLT by contacting the Disaster Operations Directorate. The HLT will remain active throughout the season. When a tropical cyclone in the Atlantic or eastern North Pacific basins threatens the United States or its territories, the Director or Deputy Director of TPC may request NWS meteorological and/or hydrological support by

contacting the appropriate NWS Regional Director. NWS personnel should deploy to TPC/NHC within 24 hours of the request for assistance.

NWS personnel will remain deployed at the HLT until the hurricane threat has passed. However, if a significant rainfall threat is expected to persist after landfall, the HLT will remain staffed by the FEMA to facilitate coordination with the Hydrometeorological Prediction Center (HPC), who will assume briefing responsibilities until the rainfall threat has passed. TPC and HPC will coordinate the transfer of briefing responsibilities. During the inland event the HLT and HPC will coordinate with the appropriate WFOs and RFCs, and when needed, hydrologists from the RFCs will provide hydrological briefings.

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/NHC for emergency mangers and NWS personnel, and FEMA's annual HLT training session held at TPC/NHC.

**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 TPC/NHC advisories, 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. Refer callers to the appropriate WFO for responses to localized special questions and issues.

**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. Refer callers to the appropriate WFO for responses to localized special questions and issues.