RECORD OF EMAIL

Samantha Link
Aviation Accident Investigator
Western Pacific Region

Date: May 7, 2018
Person Contacted: Mr. Donald Eick
NTSB Accident Number: WPR16LA175

Narrative:

Weather data related to helicopter accident on Diamond Head, HI on September 2, 2016

Synoptic conditions – The NWS Surface Analysis Chart for 0600 HST (1600Z) depicted the Pacific High pressure system north-northeast of the Hawaiian Islands at 1030-hectopascals (hPa) with the tropical easterly trade winds over the region. Hurricane Lester was located east of the Hawaiian Islands moving west-northwest and expected to pass north of the islands with maximum sustained winds of 95 knots with gusts to 115 knots. (Hurricane Lester was a long-lived hurricane over the eastern North Pacific basin which developed on August 24, 2016 and reached category 4 strength of 125 KT, and eventually impacted the Hawaiian Islands as a Category 1 storm on September 3-4th before dissipating on September 8th).

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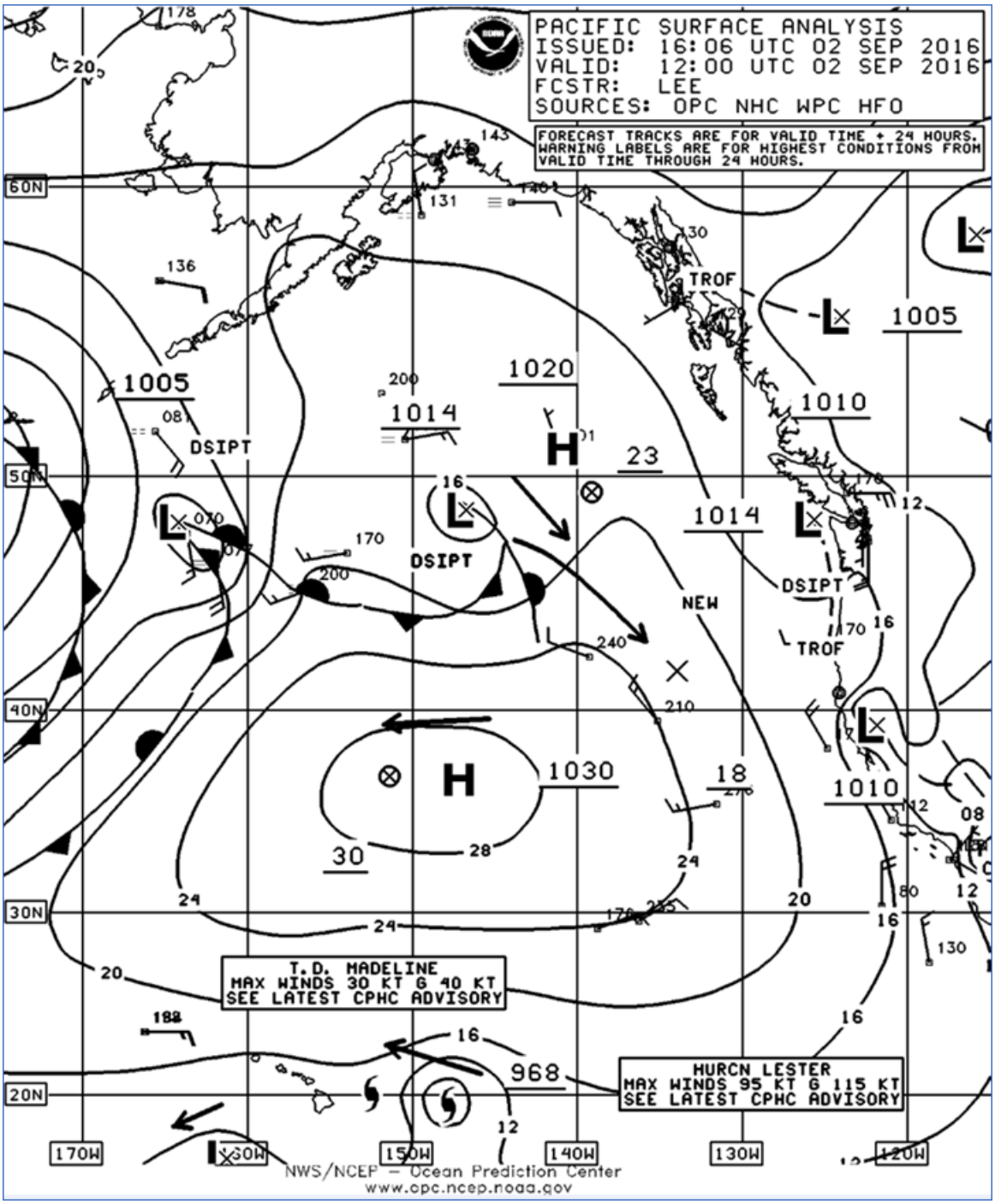
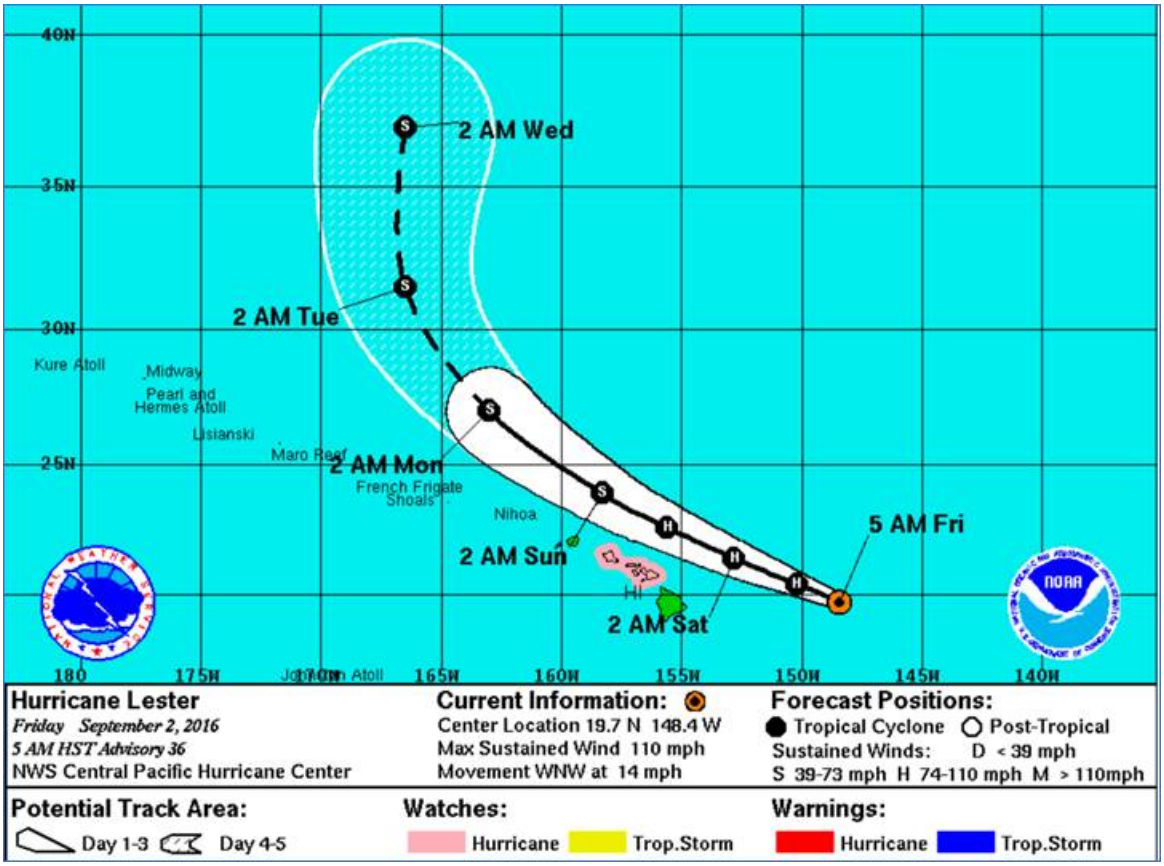


At 0800 HST on September 2, 2016, Hurricane Lester was located at 19.8° N, 149.1° W or about 580 miles east of Honolulu, with maximum sustained winds of 100 KT, moving WNW or towards 295° at 12 KT. The estimated central pressure of the storm was 971-hPa or 28.67 inches. Hurricane Watches were in effect for the Hawaiian Islands, included Oahu. A watch indicated that hurricane conditions were possible in the next 18 to 36 hours. The hurricane was expected to bring high winds, heavy rain, and high surf to the area.



Observations – The closest official weather reporting site to the accident site was from **Daniel K. Inouye International Airport (PHNL), Honolulu, HI**, located 7 ½ miles northwest of the accident site at an elevation of 13 feet. The airport had an Automated Surface Observation System (ASOS) installed and was augmented by certified weather observers, and reported a magnetic variation of 10° W. The following conditions were reported surrounding the time of the accident:

METAR PHNL 021653Z 06015G21KT 10SM FEW025 SCT045 SCT065 26/19 A2999 RMK AO2 SLP154 T02610194
METAR PHNL 021753Z 06013G21KT 10SM FEW025 SCT045 SCT065 27/19 A3001 RMK AO2 SLP161 VCSH NE-E 60000 T02670194 10272 20256 53012
METAR PHNL 021853Z 05014G25KT 10SM FEW025 SCT047 BKN065 28/19 A3002 RMK AO2 PK WND 05026/1834 SLP164 VCSH E T02830194
Accident 1945Z
METAR PHNL 021953Z 05015KT 10SM FEW025 SCT039 BKN048 29/19 A3002 RMK AO2 PK WND 07027/1858 SLP164 VCSH N-E-SE T02890194
METAR PHNL 022053Z 03017G23KT 10SM FEW025 SCT039 BKN049 29/19 A3002 RMK AO2 SLP164 VCSH N-E T02940194 50003
METAR PHNL 022153Z 07020G24KT 10SM FEW025 SCT035 SCT050 BKN140 BKN250 31/19 A3000 RMK AO2 PK WND 08026/2113 SLP158 VCSH NE T03060194
METAR PHNL 022253Z 06021G28KT 10SM FEW025 SCT037 SCT050 BKN140 31/19 A2999 RMK AO2 PK WND 06028/2253 SLP155 T03060189
METAR PHNL 022353Z 03019G25KT 10SM FEW028 SCT043 BKN140 BKN250 31/19 A2997 RMK AO2 PK WND 07029/2336 SLP150 T03060189 10311 20267 56014

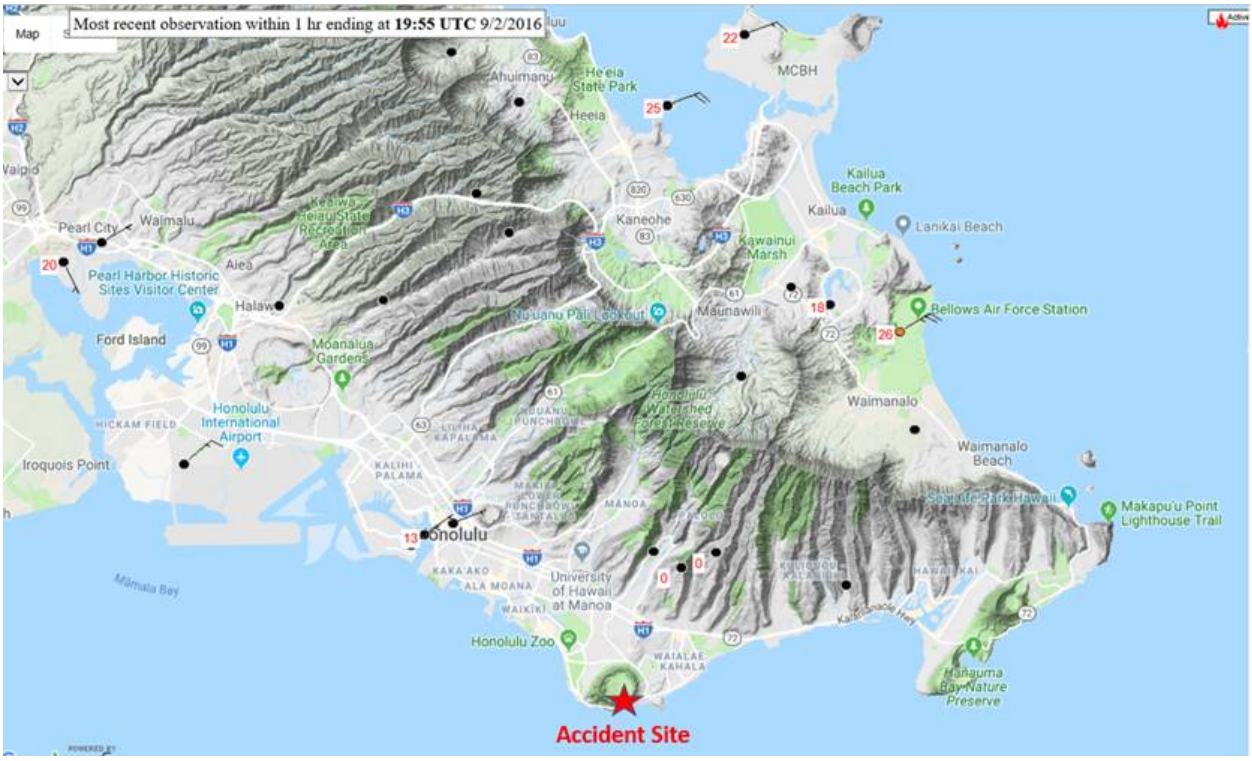
The PHNL reported NE winds 14-15 knots with gusts to 27 knots immediately surrounding the period.

Bellows Air Force Station at Waimanalo located 7 ½ miles northeast of the accident site had an unofficial observation site and reported the following conditions during the period:

Time	Wind	PEAK
1845Z	065° 18KT	G 24 KT
1900Z	067° 19 KT	G 24 KT
1915Z	067° 17 KT	G 20 KT
1930Z	063° 18 KT	G 23 KT
1945Z	**062° 20 KT**	**G 23 KT**
2000Z	059° 20 KT	G 24 KT
2015Z	060° 19 KT	G 24 KT
2030Z	059° 18 KT	G 22 KT

The station reported NE winds sustained from 17 to 20 knots with peak gusts to 24 knots.

MesoWest Analysis at the time of the accident is included below and depicted NE winds prevailing over the area.



Terminal Aerodrome Forecast (TAF) for PHNL current at the time of the accident was as follows:

TAF PHNL 021741Z 0218/0324 ***06014G22KT*** *P6SM FEW025 SCT040*
FM022000 06012G20KT P6SM FEW025 SCT040
FM031500 36020G30KT P6SM SCT025 BKN040=

Area Forecast Discussion (AFD) – for the area:

FXHW60 PHFO 021930
AFDHFO
Area Forecast Discussion
National Weather Service Honolulu HI
930 AM HST FRI SEP 2 2016

.SYNOPSIS...
A breezy trade wind weather pattern can be expected today with clouds and passing showers over windward and mauka areas.
Hurricane Lester is forecast to pass by just north of the state Saturday and Sunday bringing the potential for hazardous weather
across the area. *High pressure will build back in north of the area after the departure of Lester, with a trade wind weather*
pattern returning early next week.

.DISCUSSION...
High pressure far north northeast of the area is causing a rather breezy trade wind weather pattern across the area. Moisture
embedded in the trades is causing for clouds and a few passing showers over windward and mauka areas.

Hurricane Lester is forecast to move parallel to the island chain and pass by just to the north of the islands Saturday and Sunday.
Depending on the track, intensity, and size of the system, weather conditions will be highly variable from one location to another.
The potential for strong winds and heavy rains exists across the area. Very high surf along east facing shores may also cause some
inundation problems along low lying areas, especially at times of high tide.

As Lester moves away from the area on Monday, high pressure far to the north northeast of the area will place the islands in a
moderate trade wind environment. Clouds and passing showers will favor windward and mauka areas. An upper level trough is forecast
to be in the island vicinity toward the middle and later half of next week. This could cause an uptick in trade wind showers as
well as an increase in upslope showers over the leeward Big Island slopes.

.AVIATION...
Hurricane Lester continues to move closer to the islands today, and is expected to continue to parallel the islands over the next
24 to 48 hours. Lester's track will dictate the impact on the islands, but certainly stronger winds are expected as the pressure
gradient between Lester and a high pressure to the north of the islands will tighten. Northeasterly flow today is expected to
become more northerly by tomorrow mid day as Lester approaches.

AIRMET TANGO continues for low level mechanical turbulence to the lee of the mountains. An additional AIRMET for surface winds will
likely be needed as winds increase as early as late tonight.

VFR conditions will prevail across most of the islands today, except for some MVFR conditions in trade wind showers. Depending
on the track of Lester, MVFR and IFR conditions may be possible in some locations Saturday through Sunday, and may require the
posting of an AIRMET for IFR and/or mountain obscuration, however the current forecast track should keep the worst of the weather
offshore.

.HFO WATCHES/WARNINGS/ADVISORIES...
Hurricane Watch for Oahu-Molokai-Lanai-Kahoolawe-Maui.

High Surf Advisory until 6 AM HST Saturday for Kauai Windward-Oahu Koolau-Olomana.

High Surf Advisory until 6 PM HST this evening for Molokai
Windward-Maui Windward West-Windward Haleakala-South Big Island-Big Island North and East.

High Surf Warning from 6 PM this evening to 6 PM HST Saturday
for Molokai Windward-Maui Windward West-Windward Haleakala-South
Big Island-Big Island North and East.

Hurricane Watch for Oahu Windward Waters-Kaiwi Channel-Maui
County Windward Waters-Maui County Leeward Waters-Maalaea Bay-
Pailolo Channel-Alenuihaha Channel.

Small Craft Advisory until 6 PM HST this evening for all Hawaiian waters-

Area Forecast (FA) for the regions:

FAHW31 PHFO 021543
FA0HI

HNLC FA 021535
SYNOPSIS AND VFR CLD/WX
SYNOPSIS VALID UNTIL 031000
CLD/WX VALID UNTIL 030400...OUTLOOK VALID 030400-031000
.
SEE AIRMET SIERRA FOR IFR CLD AND MTN OBSC.
TS IMPLY SEV OR GREATER TURB SEV ICE LOW LEVEL WS AND IFR COND.
NON MSL HGT INDICATED BY AGL OR CEILING.
.
SYNOPSIS...A TIGHTENED PRESSURE GRADIENT BETWEEN HIGH PRESSURE TO THE NORTH AND LESTER TO THE EAST WILL BRING
NORTHEASTERLY GUSTY TRADE WINDS WITH WINDWARD AND MOUNTAIN MVFR SHOWERS.
.
BIG ISLAND LOWER SLOPES...COAST...FROM UPOLU POINT TO CAPE KUMUKAHI TO APUA POINT.
SCT025 BKN050 TOPS 100 ISOL BKN025 3-5SM BR SHRA. OUTLOOK...VFR.
.
BIG ISLAND ADJ WATERS FROM UPOLU POINT TO CAPE KUMUKAHI TO APUA POINT.
FEW-SCT025 BKN-OVC050 TOPS 100 ISOL BKN025 TOPS 150 3-5SM SHRA BR.
03Z SCT-BKN025 BKN-OVC 050 TOPS 150 NNW WIND 25-30KT. OUTLOOK...VFR.

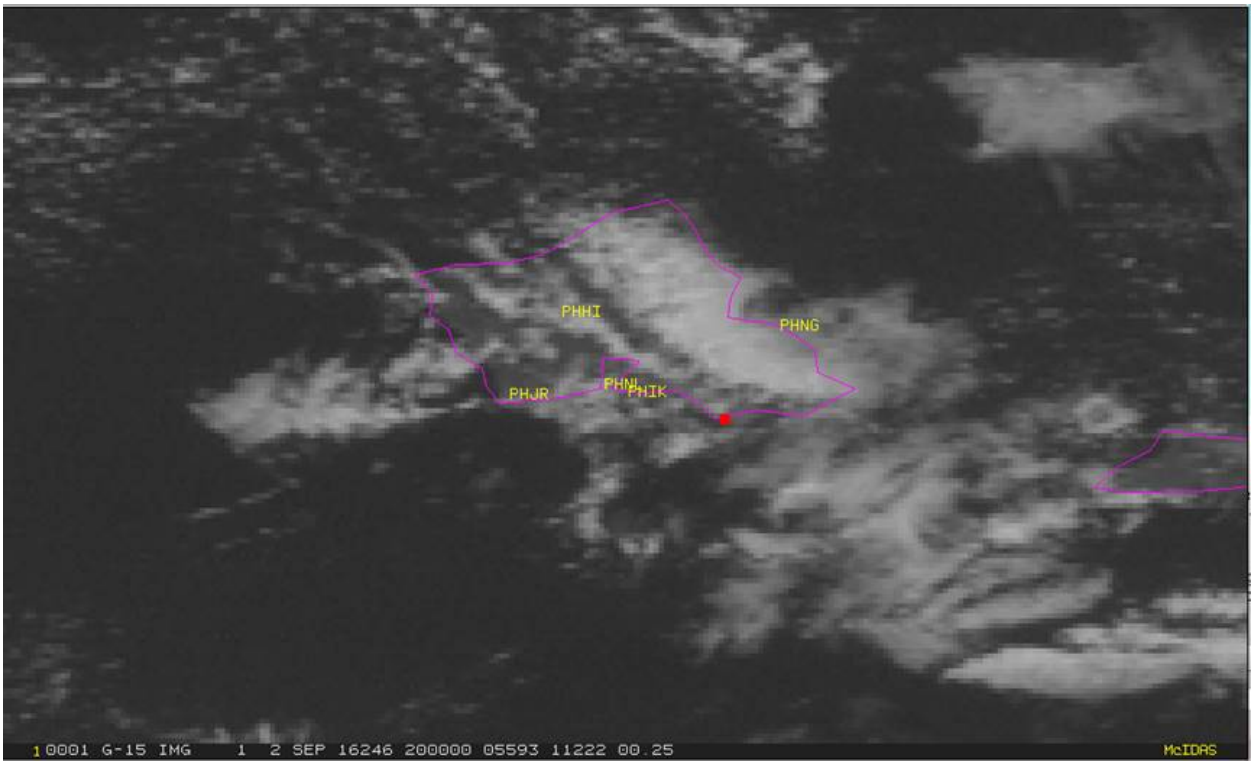
BIG ISLAND LOWER SLOPES...COAST...AND ADJ WATERS FROM APUA POINT TO SOUTH CAPE TO 15 NM NE PHKO.
FEW-SCT025 BKN-OVC050 TOPS 100 ISOL BKN025 TOPS 150 3-5SM SHRA BR. OUTLOOK...VFR.
.
BIG ISLAND LOWER SLOPES AND COAST FROM 15 NM NE PHKO TO UPOLO POINT.
SCT025 BKN040 TOPS 100 ISOL BKN-OVC035 TOPS 100 3-5SM -SHRA BR. OUTLOOK...VFR.
.
MTN...AND N THRU E SECTIONS OF MAUI LANAI MOLOKAI OAHU KAUAI AND ADJ WATERS.
SCT015 BKN035-050 TOPS 100 ISOL BKN025 TOPS 100 VIS 3-5SM SHRA BR. OUTLOOK...VFR.
.
REST OF AREA.
FEW020 SCT040 ISOL VIS 3-5SM SHRA BKN030 TOPS 100. OUTLOOK...VFR.

Inflight weather Advisories for the area – the NWS had AIRMET Tango current for moderate turbulence to the lee or downslope of higher terrain:

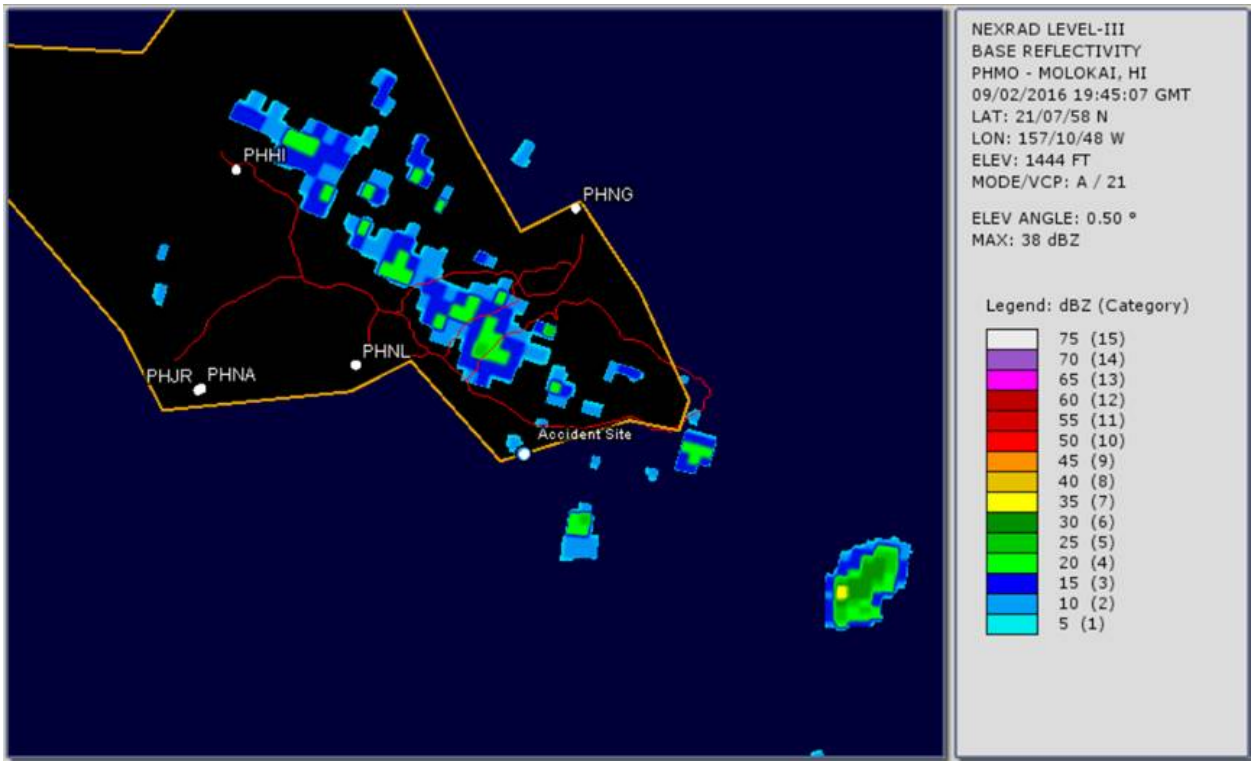
WAHW31 PHFO 021503
WA0HI

HNLS WA 021600
AIRMET SIERRA UPDATE 2 FOR IFR VALID UNTIL 022200
.
NO SIGNIFICANT IFR EXP.
.
=HNLT WA 021600
AIRMET TANGO UPDATE 2 FOR TURB VALID UNTIL 022200
.
AIRMET TURB...HI
OVER AND IMT S THRU W OF MTN.
TEMPO MOD TURB EXP BLW 100. COND CONT BEYOND 2200Z.
.
=HNLZ WA 021600
AIRMET ZULU UPDATE 2 FOR ICE AND FZLVL VALID UNTIL 022200
.
NO SIGNIFICANT ICE EXP.
.
FZLVL...148-153.

Satellite Imagery – the GOES-15 visible satellite image at 1000 HST (2000Z) is included below and depicted significant cloud cover over the northeastern section of the island, with scattered to broken skies over the south-side of the island in the vicinity of the accident site.



Weather Radar Imagery – the NWS Molokai, HI (PHMO) WSR-88D for 0945 HST depicted a band of echoes moving eastward across Oahu, with a cell of 5 to 15-dBZ in the vicinity of the helicopter accident.



Sounding – no archive model data was available for review during the period. The closest upper air observation from Lihue approximately 95 miles west of the accident site is included for 0800 HST. The sounding wind profile indicated a similar NE surface wind from 060 at 15 knots gusting to 25 knots, with the wind profile indicating little directional change with height with winds speeds increasing to 30 knots above 3,000 to 7,000 feet. The winds would have been downslope over the Diamond Head southern slopes.

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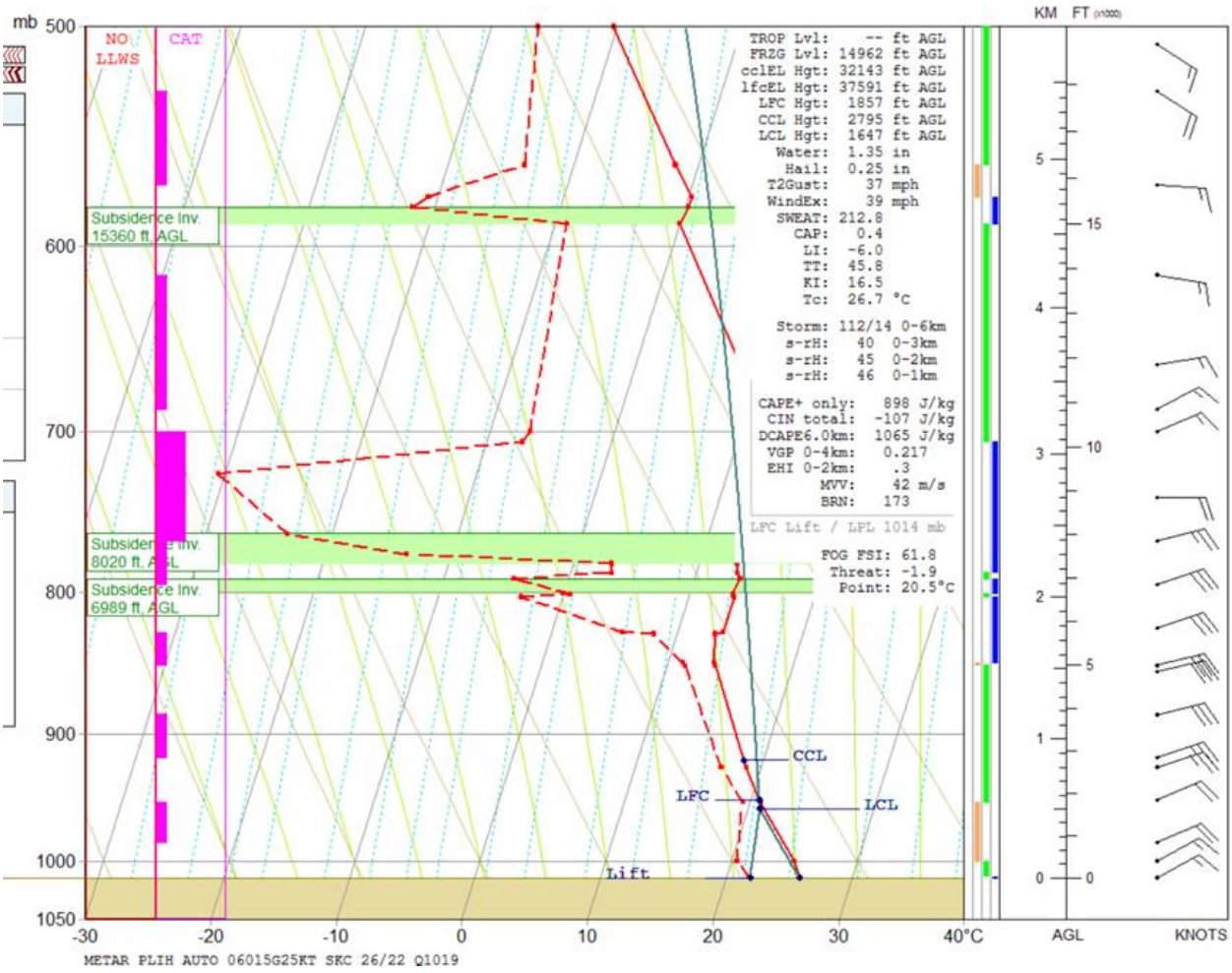

Summary – The Hawaiian Islands were under the influence of the tropical easterly winds during the period and under a Hurricane Watch. The surface observations indicated NE winds of 14-20 knots with peak gusts of 28 knots during the period. The NE winds would produce downslope conditions and unfavorable conditions in the Diamond Head area. The NWS had an AIRMET for moderate turbulence below 10,000 feet to the lee of higher terrain due to the stronger winds.

The closest upper air sounding taken in the hour indicated little change in wind direction with height with winds speeds of 30 knots immediately above the surface; while no stronger vertical wind shears were identified for significant turbulence the NWS had an advisory current.

Don Eick
NTSB Senior Meteorologist

END.

Submitted by: Samantha Link