



National Transportation Safety Board

Research Vessel Operators Committee
El Faro accident

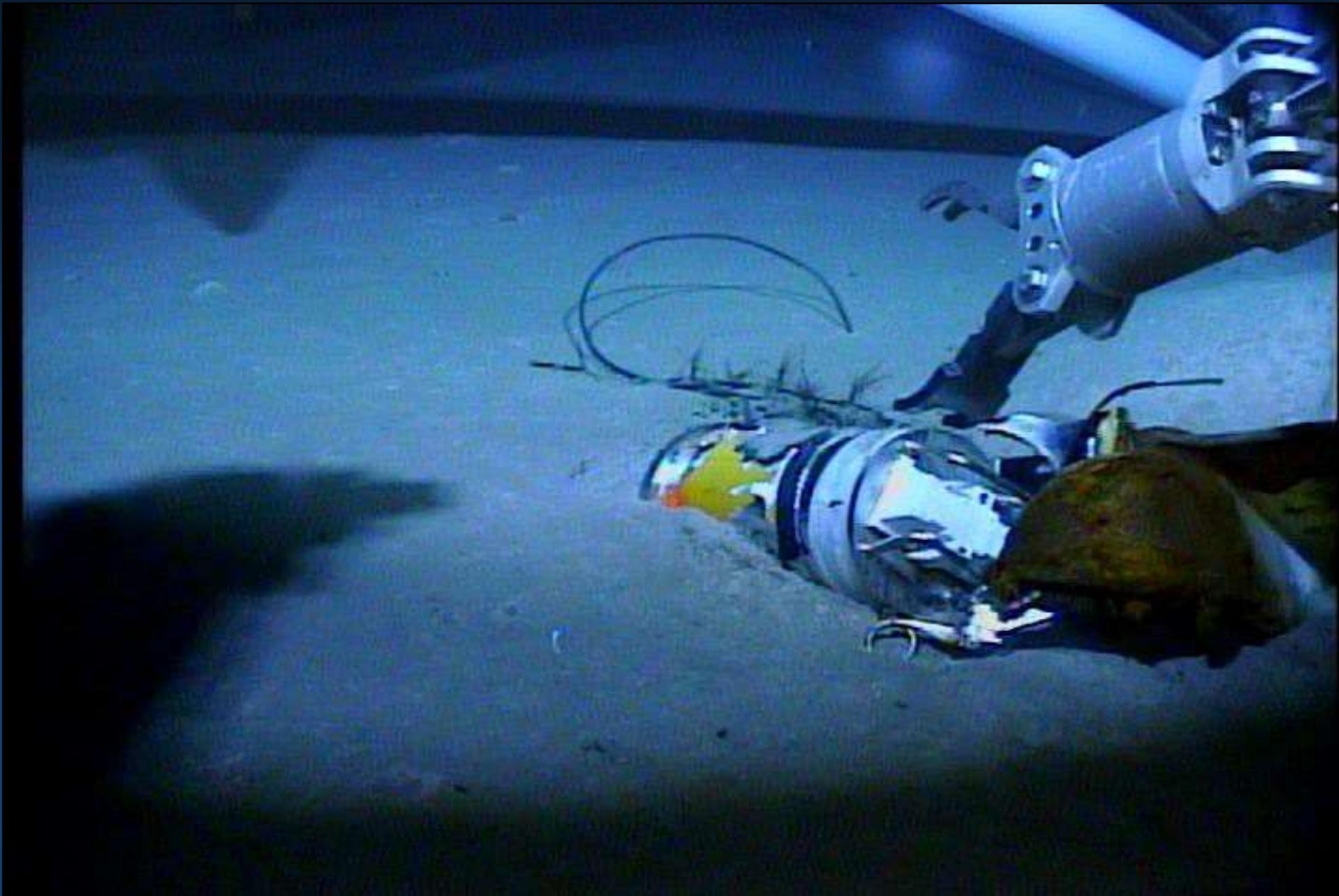
University of Rhode Island
April 17-19 2018

Dive 02
CURV 21
USN SUPSALV

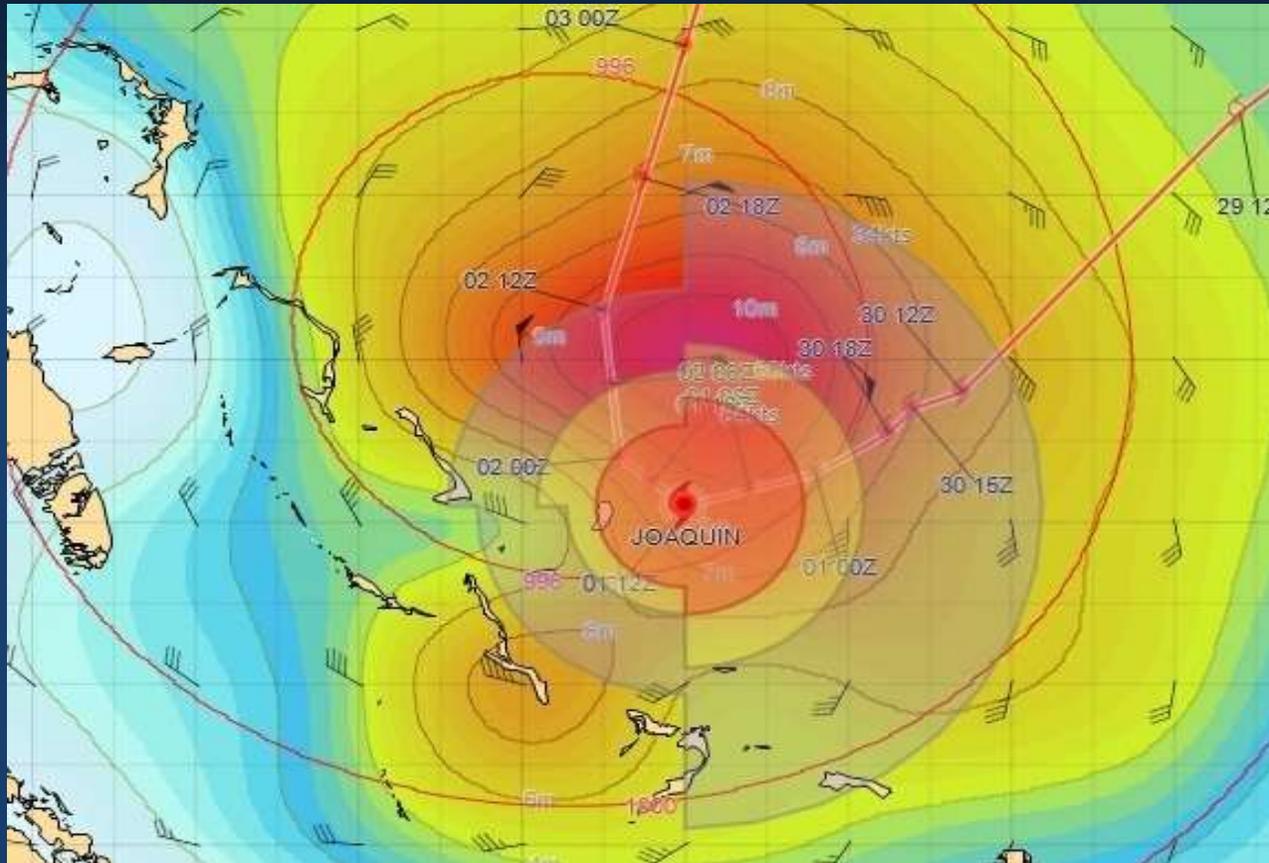








The Accident Voyage – September 30



URG Message --- MET Navarea Warning or MET Forecast ---
 Message Sequence No. : 12704
 ID : Vizada (NDR)
 Priority : Urgent
 Size : 2391 characters
 Receive Date & Time : 16-10-16 20:46 (UTC)
 TX: LES 16-OCT-2016 20:44:15 049791

INTZS KNHC 162043
 TCWTS AGW 2043

HURRICANE NUDGE FORECAST/ADVISORY NUMBER 51
 645 NATIONAL HURRICANE CENTER MIAMI FL AL132016
 2100 UTC 00N OCT 16 2016

THERE ARE NO COASTAL WATCHES OR WARNINGS IN EFFECT.

HURRICANE CENTER LOCATED NEAR 29.7N 45.6W AT 16/2100Z
 POSITION ACCURATE WITHIN 30 NM

PRESENT MOVEMENT TOWARD THE NORTHEAST OR 45 DEGREES AT 8 KT

ESTIMATED MINIMUM CENTRAL PRESSURE 960 MB

EYE DIAMETER 70 NM

MAX SUSTAINED WINDS 70 KT WITH GUSTS TO 85 KT.

14 KT.....60NM 80SE 80SW 70NW.

20 KT.....130NE 130SE 100SW 130NW.

24 KT.....200NE 230SE 230SW 200NW.

12 FT SEAS..400NE 600SE 900SW 700NW.

WINDS AND SEAS VARY GREATLY IN EACH QUADRANT. RADII IN NAUTICAL
 MILES ARE THE LARGEST RADII EXPECTED ANYWHERE IN THAT QUADRANT.

REPORT...CENTER LOCATED NEAR 29.7N 45.6W AT 16/2100Z

AT 16/1800Z CENTER WAS LOCATED NEAR 29.4N 45.9W

FORECAST VALID 17/0600Z 40.2N 44.5W

MAX WIND 65 KT...GUSTS 80 KT.

14 KT...60NE 80SE 80SW 70NW.

20 KT...130NE 130SE 100SW 130NW.

24 KT...400NE 300SE 300SW 400NW.

FORECAST VALID 17/1800Z 42.4N 42.5W

MAX WIND 65 KT...GUSTS 80 KT.

14 KT...80NE 70SE 70SW 60NW.

20 KT...130NE 130SE 140SW 110NW.

24 KT...400NE 400SE 300SW 400NW.

FORECAST VALID 18/0600Z 46.2N 39.6W...POST-TROP/EXTRATROP

MAX WIND 65 KT...GUSTS 80 KT.

14 KT...80NE 70SE 70SW 60NW.

20 KT...130NE 140SE 120SW 90NW.

24 KT...400NE 400SE 400SW 500NW.

FORECAST VALID 18/1800Z 51.2N 37.2W...POST-TROP/EXTRATROP

MAX WIND 65 KT...GUSTS 80 KT.

14 KT...130NE 140SE 80SW 60NW.

24 KT...400NE 510SE 430SW 600NW.

FORECAST VALID 19/0600Z 59.6N 32.7W...POST-TROP/EXTRATROP

MAX WIND 55 KT...GUSTS 65 KT.

14 KT...120NE 140SE 80SW 60NW.

24 KT...360NE 400SE 400SW 600NW.

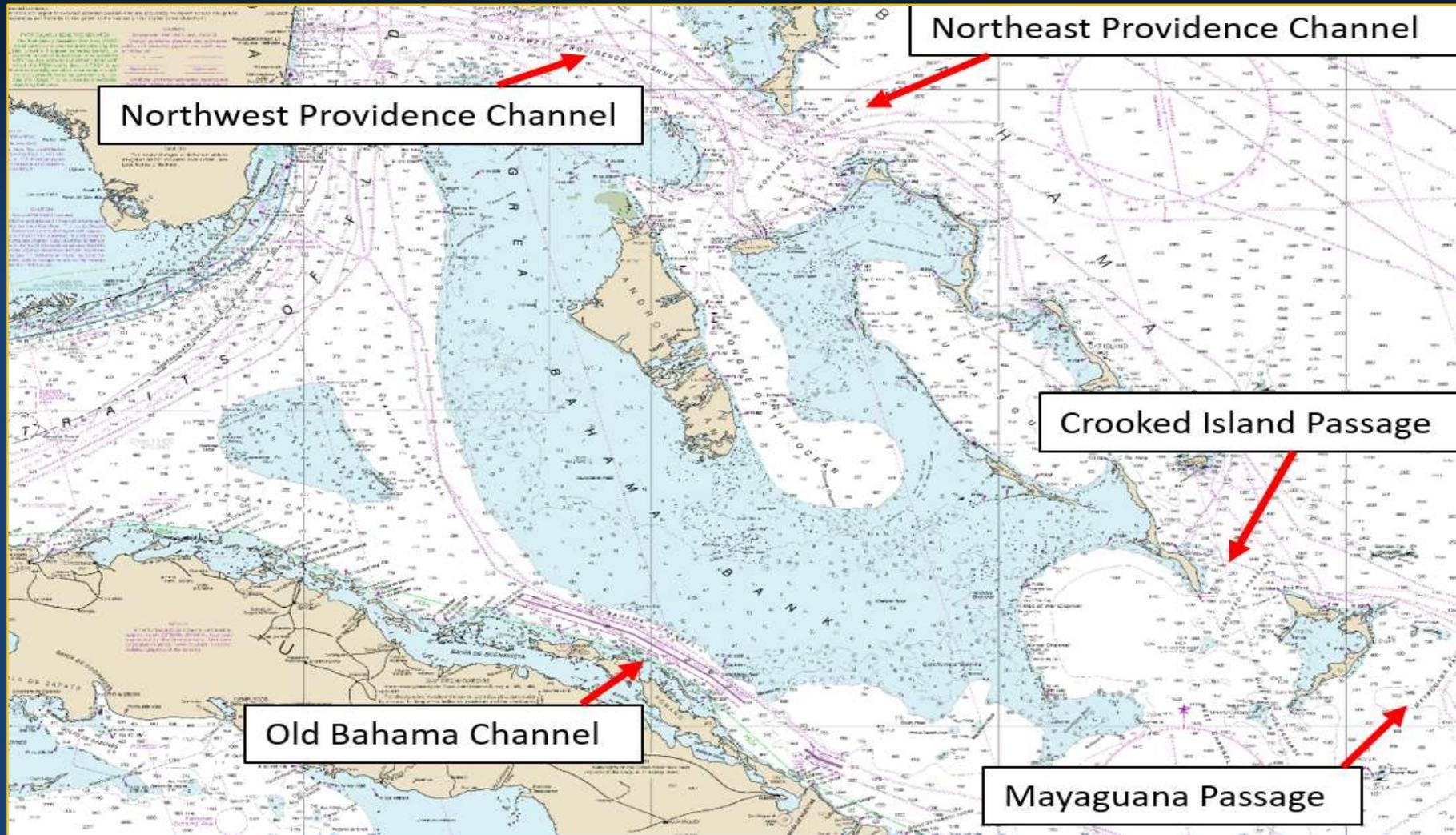
BVS

Sat-C

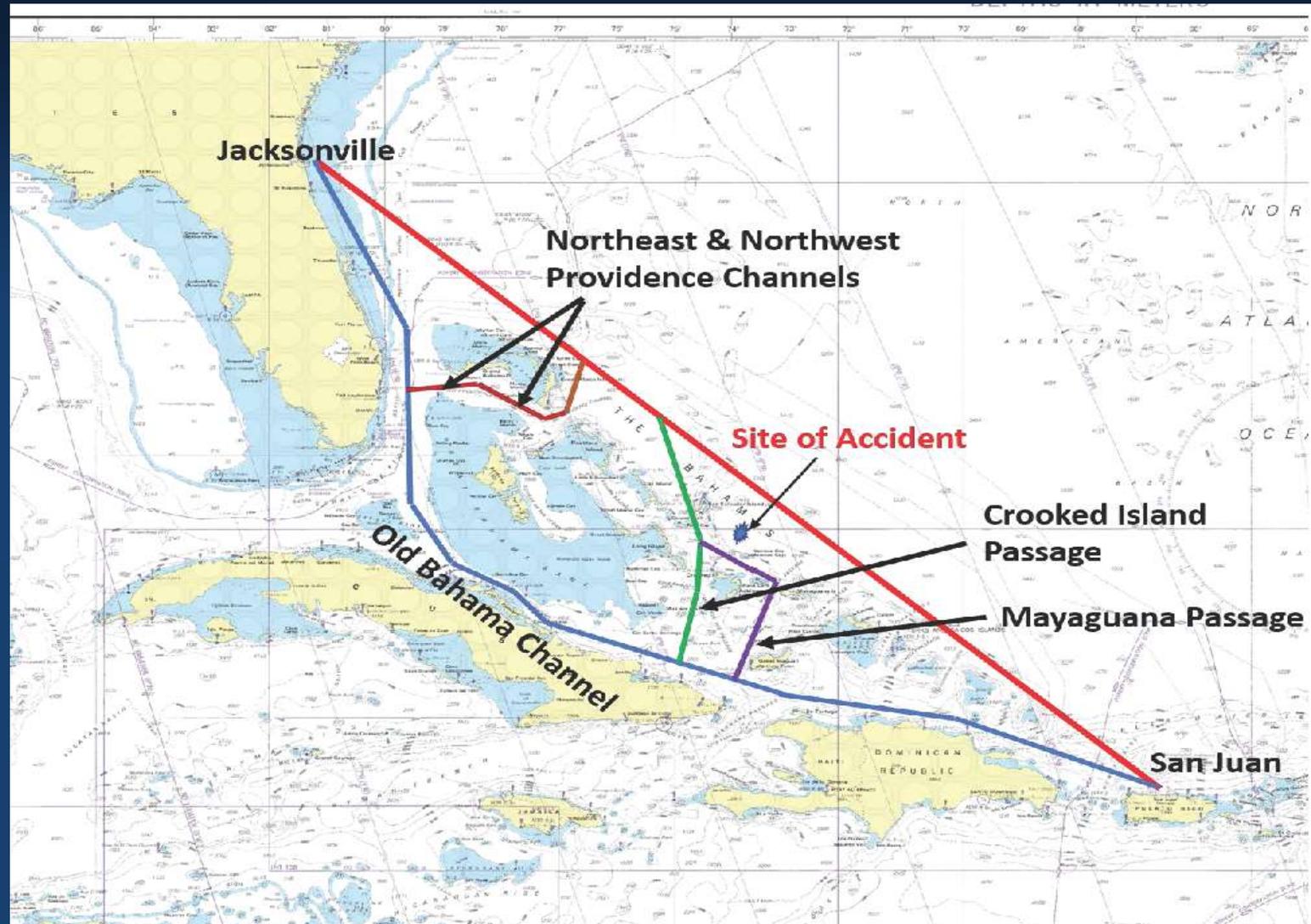
The Accident Voyage – September 30



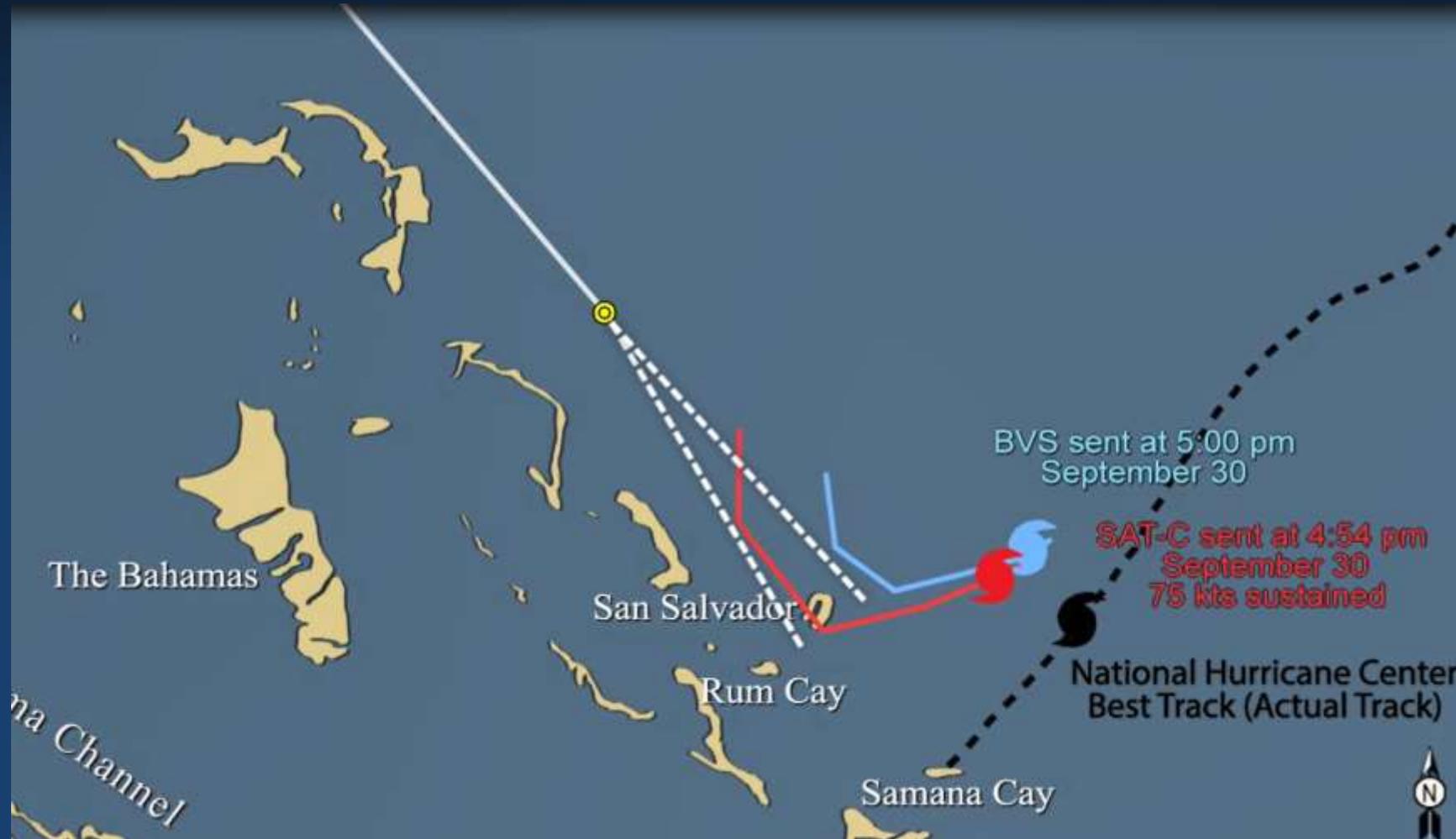
The Accident Voyage – September 30



Possible Routes between Jax and San Juan



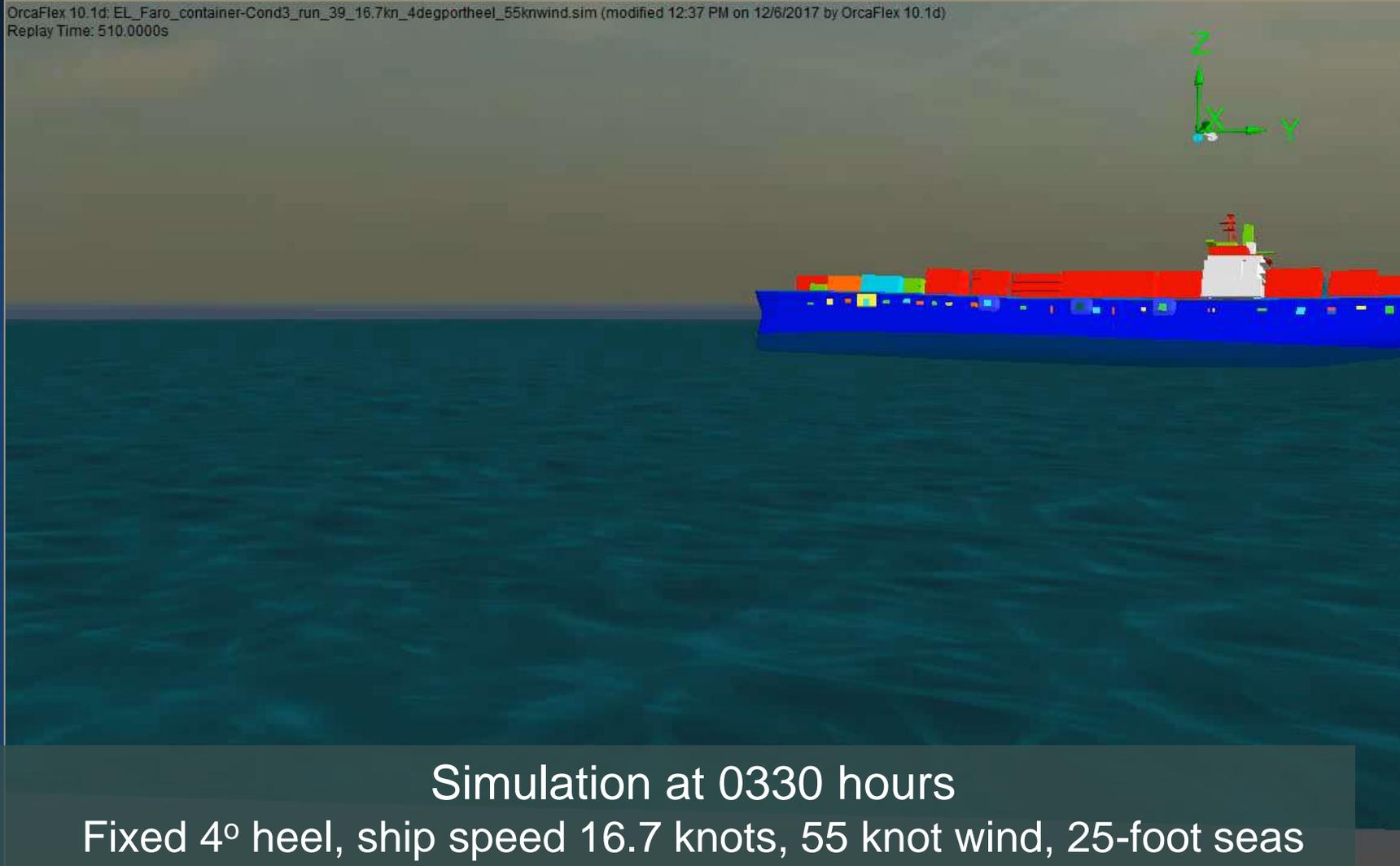
The Accident Voyage – September 30



The Accident Voyage – October 1



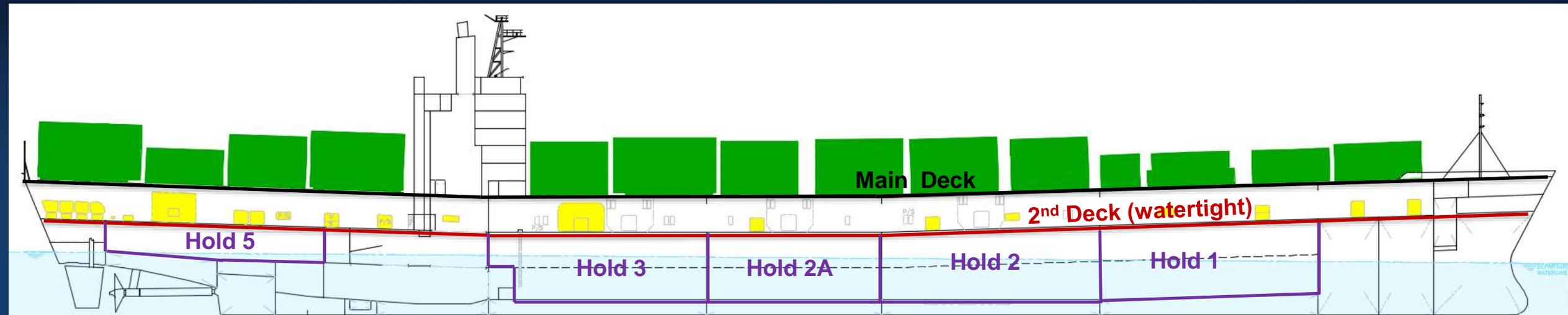
Dynamic Analysis



Downflooding from Watertight Scuttle (Deck Hatch)



Watertight Deck



- Boarding seas (green water) was known to enter onto 2nd deck in past
- Partially enclosed 2nd deck was watertight

Cargo Hold 3 Tanktop (4th Deck)

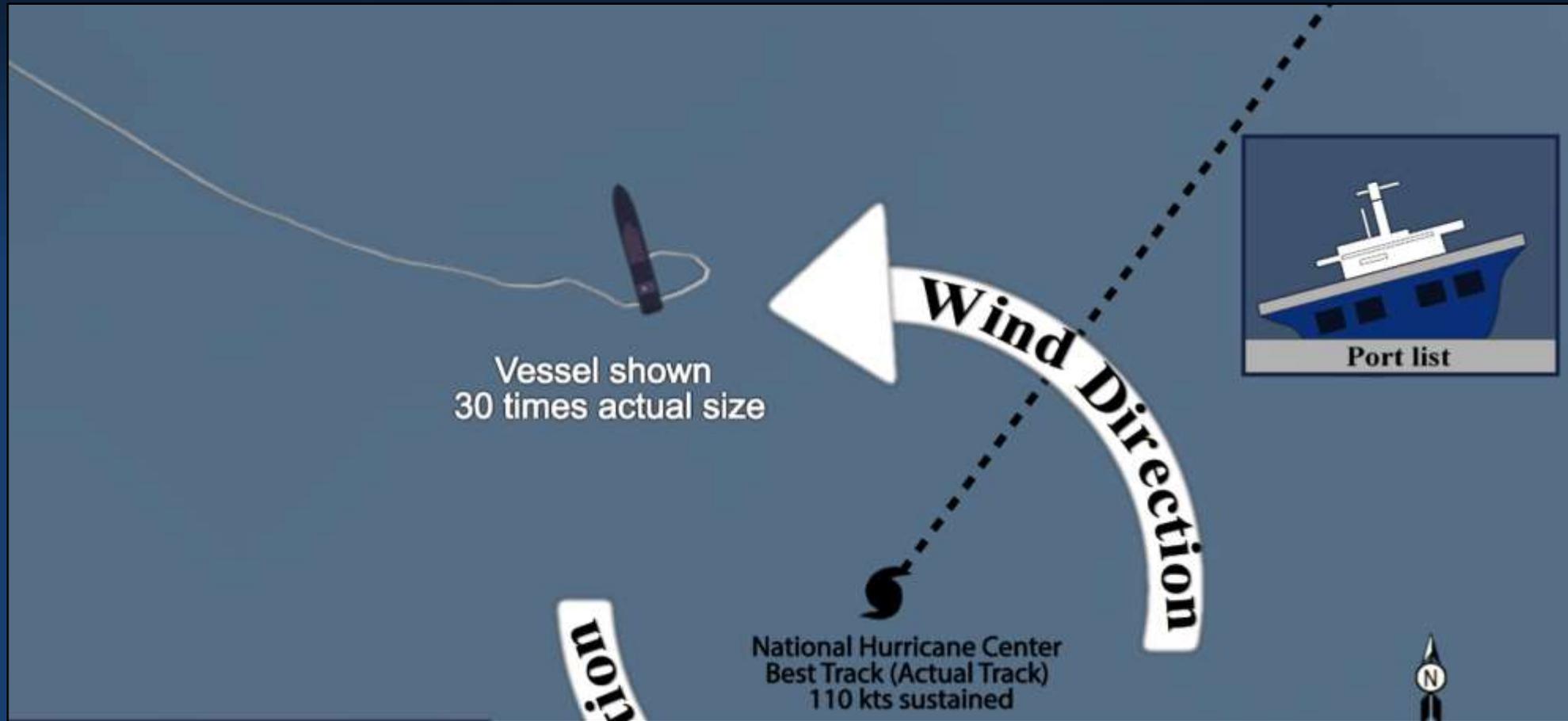


Supply Ventilation
Trunks (Upper)

Lower Supply
Ventilation Trunk

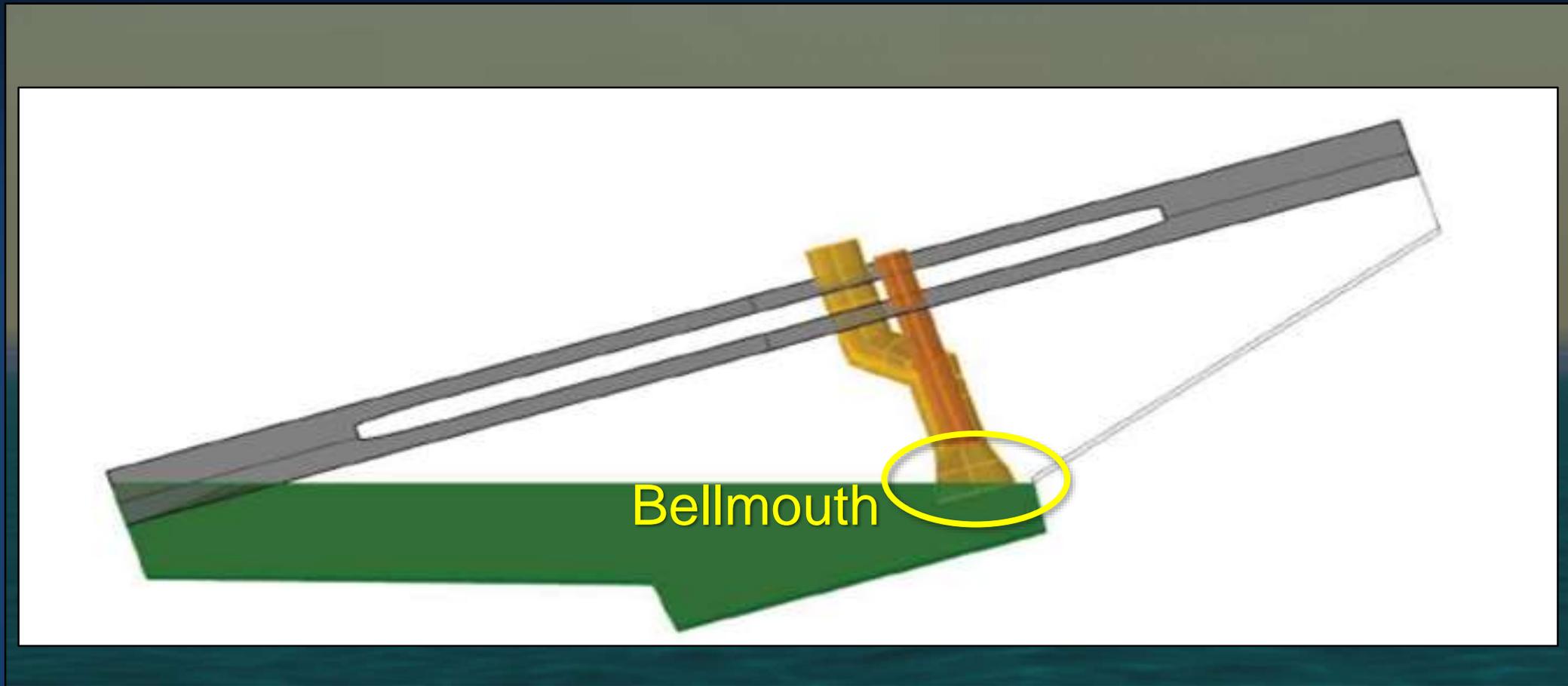
El Yunque Hold 3

The Accident Voyage – October 1



Extreme list to port

The Accident Voyage – October 1



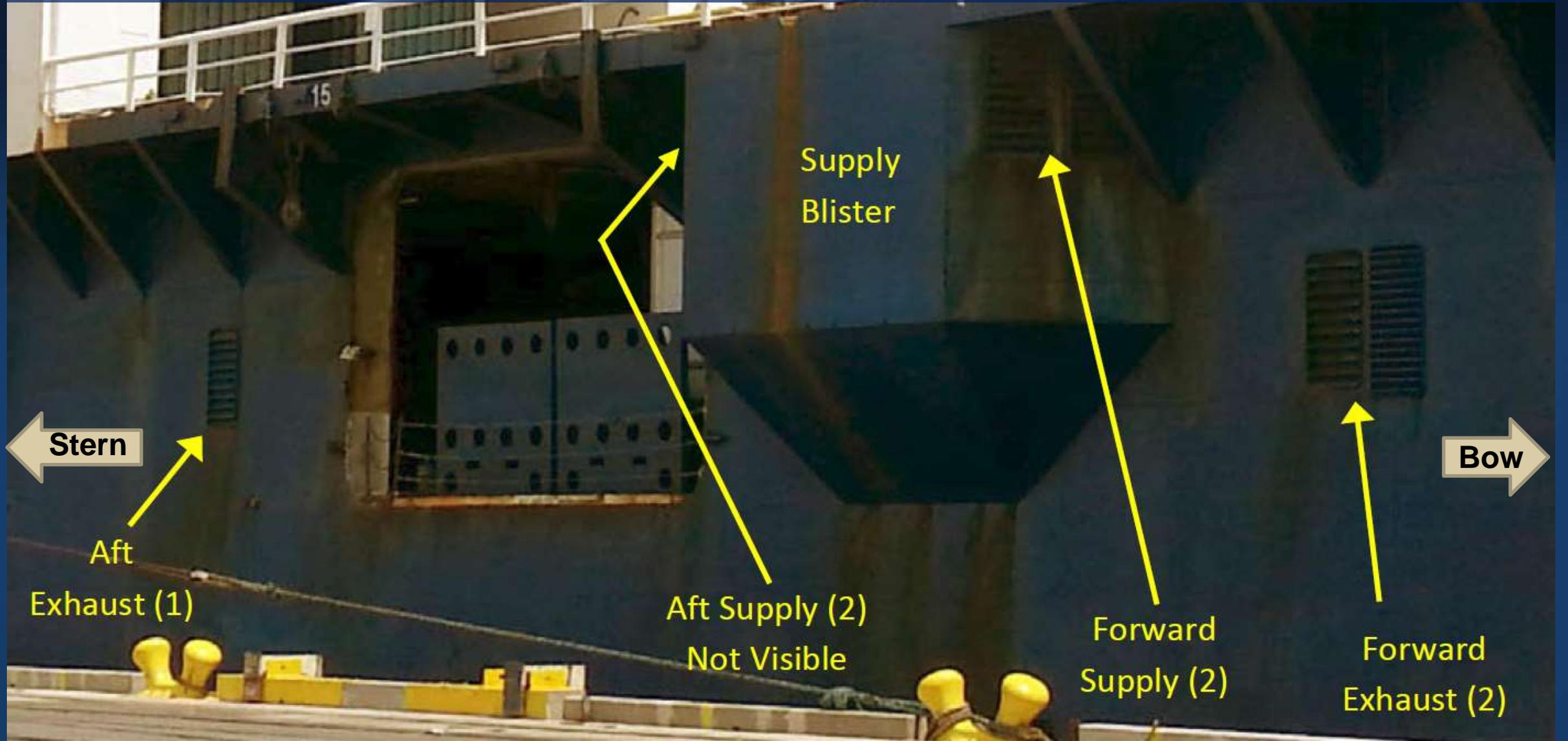
18° list to port – looking forward

The Accident Voyage – October 1

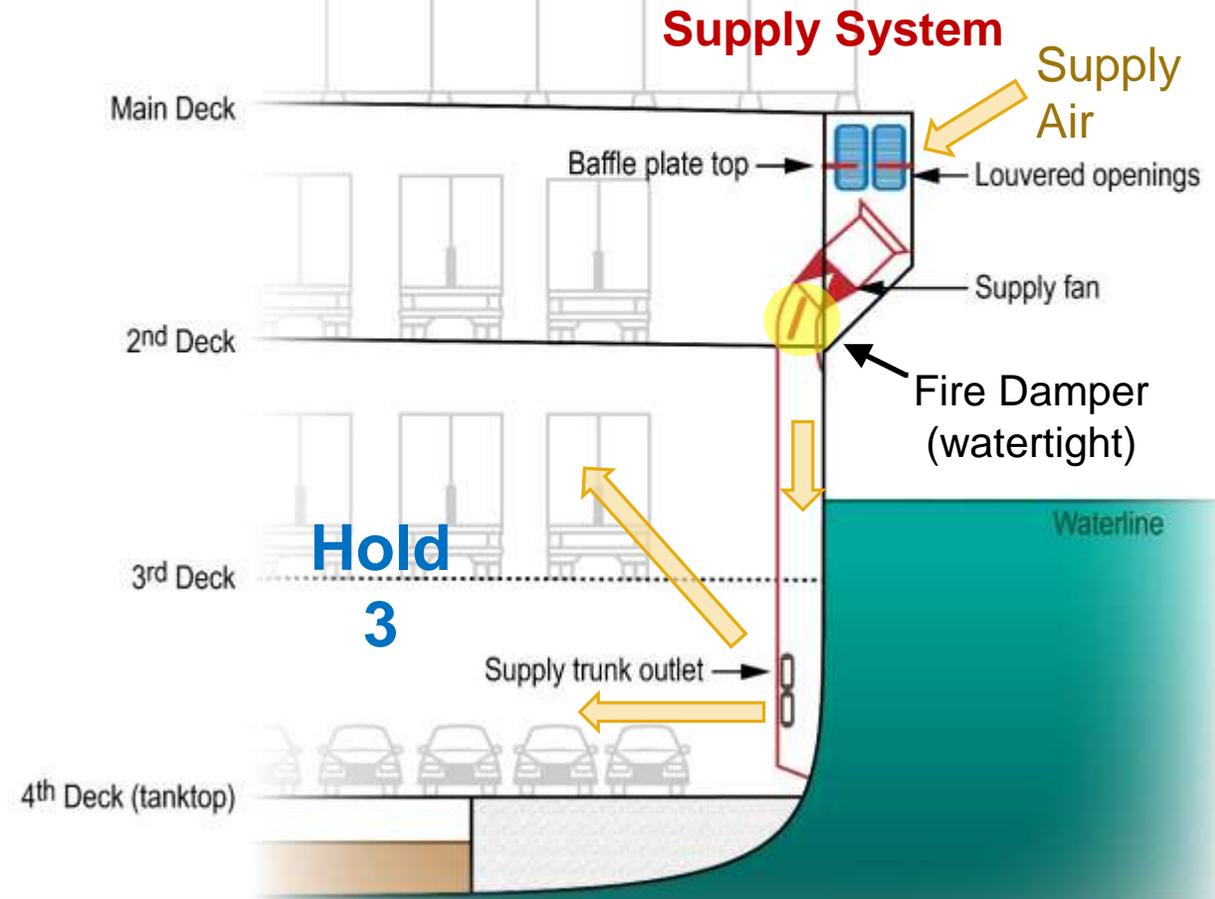
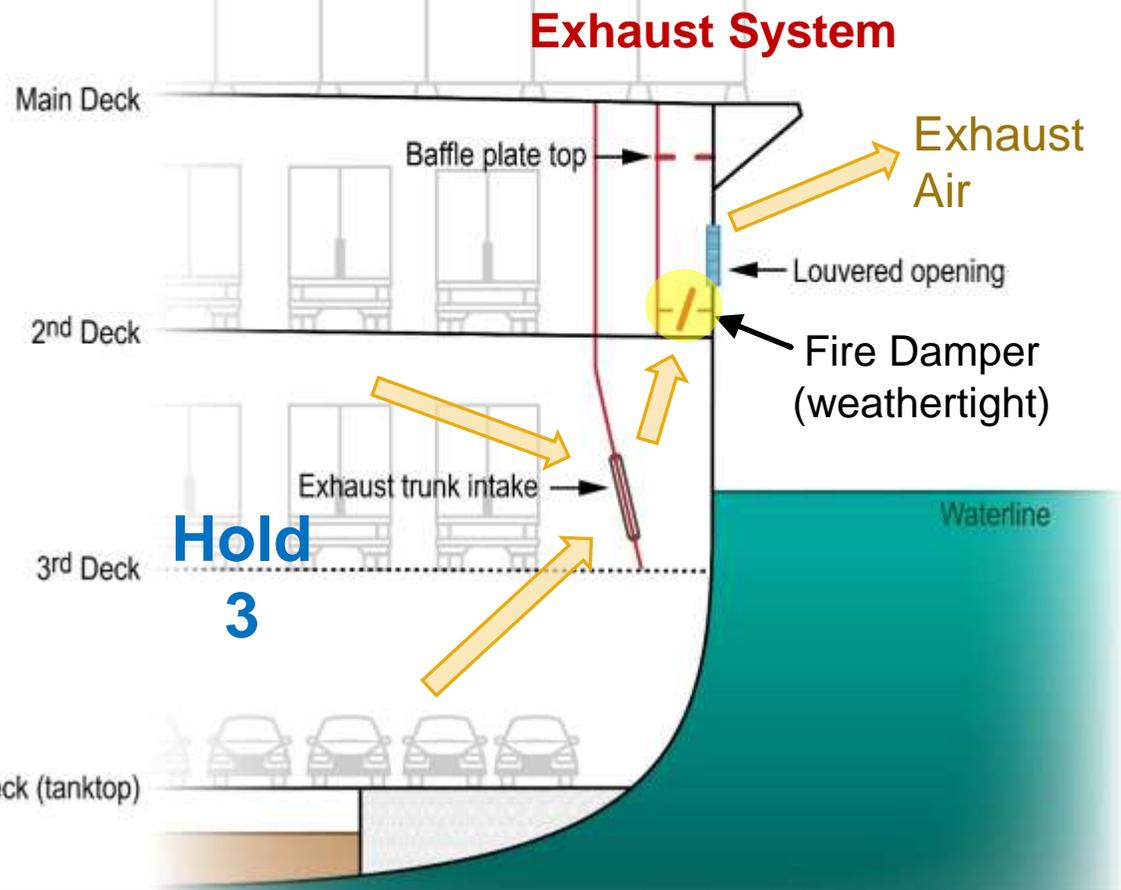


Extreme list to port

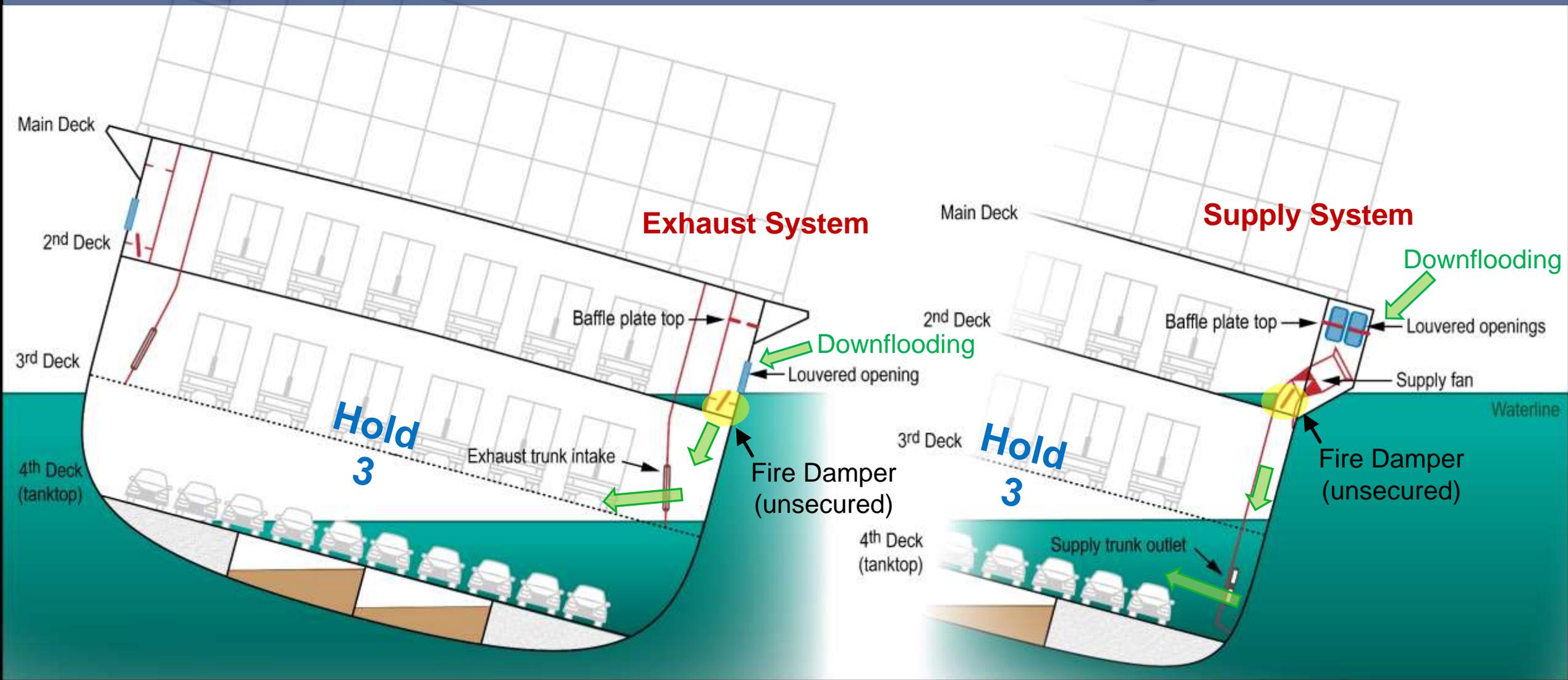
Cargo Hold Ventilation System



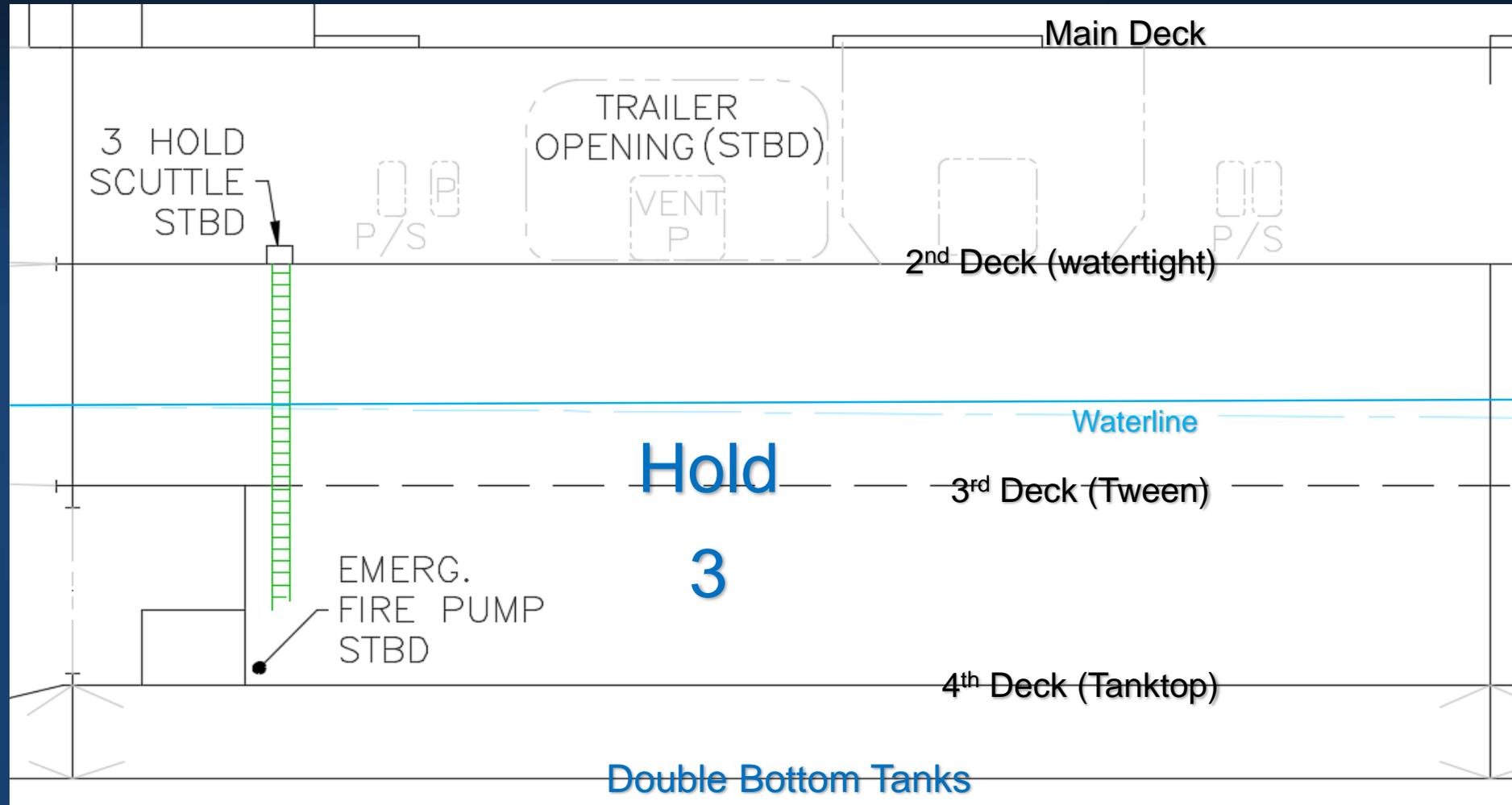
Cargo Hold 3



Cargo Hold Ventilation Downflooding



El Faro Cargo Hold 3



The Accident Voyage – October 1





Assets Utilized During Search Efforts



CG MH-60



CG HC-144



CG HC-130



CG MH-65



CGC NORTHLAND



CGC RESOLUTE



CGC CHARLES SEXTON



USAF HC-130



USN P-8



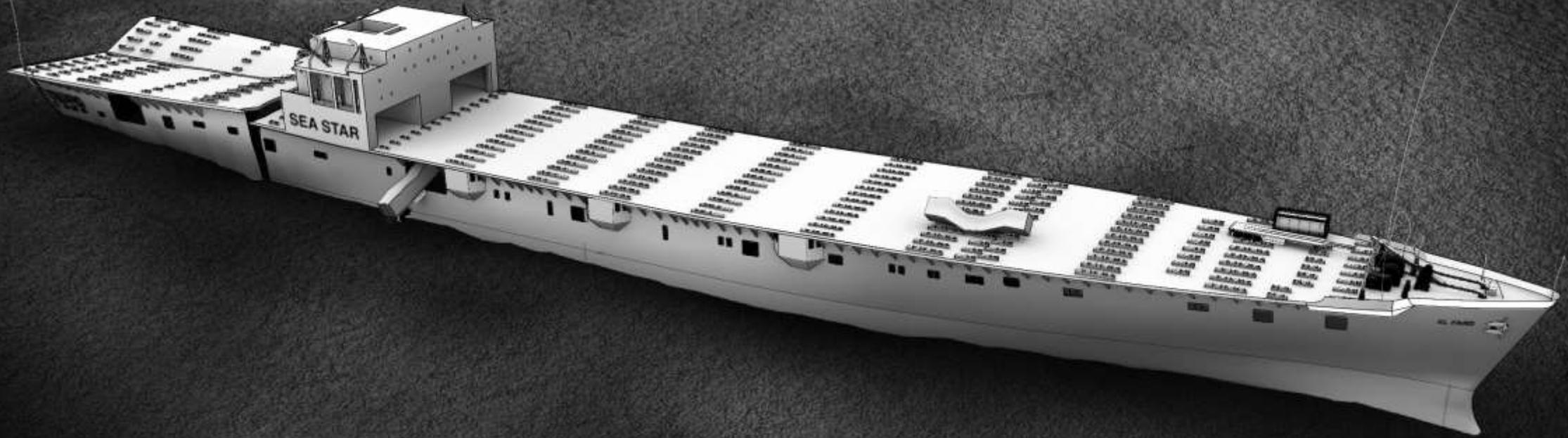
JSTARS



U.S. COAST GUARD



NTSB



NTSB

Safety Issues

- Loss of propulsion
- Flooding in cargo holds
- Downflooding through ventilation closures
- Need for damage control plan
- Lack of suitable survival craft
- Late decision to muster the crew

Safety Issues

- Inadequate company oversight
- Company's safety management system
- Ineffective bridge resource management
- Use of noncurrent weather information
- Captain's actions

Other Issues

- Alternate Compliance Program
- Voyage data recorders
- Expanded use of automatic identification system

Safety Recommendations

- USCG and ABS on Alternate Compliance program
- IACS, ABS, USCG on stability information
- NOAA on weather information to mariners
- NOAA on exploring the use of AIS for observations
- TOTE on Safety Management
- USCG on survival craft, use of PLBs
- FCC on old EPIRBS and AIS frequencies

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