Research Vessel Operators Committee
El Faro accident

University of Rhode Island
April 17-19 2018
The Accident Voyage – September 30

BVS

Sat-C
The Accident Voyage – September 30

- Jacksonville
- Florida
- The Bahamas
- Old Bahama Channel
- Cuba
- San Salvador
- Rum Cay
- Samana Cay

BVS sent at 5:00 am
September 30
55 kts sustained
The Accident Voyage – September 30
Possible Routes between Jax and San Juan
The Accident Voyage – September 30

- Map showing the voyage paths and positions.
- Key locations: San Salvador, Rum Cay, Samana Cay, The Bahamas.
- Event markers: BVS sent at 5:00 pm September 30, SAT-C sent at 4:54 pm September 30, 75 kts sustained.
- National Hurricane Center Best Track (Actual Track).
The Accident Voyage – October 1

El Faro position at 2:00am, October 1

San Salvador
Rum Cay
Samana Cay

BVS sent at 5:00 pm September 30
SAT-C sent at 10:53 pm September 30 100 kts sustained

National Hurricane Center
Best Track (Actual Track)
Dynamic Analysis

Simulation at 0330 hours
Fixed 4° heel, ship speed 16.7 knots, 55 knot wind, 25-foot seas
Downflooding from Watertight Scuttle (Deck Hatch)

Hold 3 Access Hatch (Scuttle)

El Faro 2nd Deck
• Boarding seas (green water) was known to enter onto 2\textsuperscript{nd} deck in past
• Partially enclosed 2\textsuperscript{nd} 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

Bellmouth
The Accident Voyage – October 1

Extreme list to port
Cargo Hold Ventilation System

- Supply Blister
- Aft Supply (2) Not Visible
- Forward Supply (2)
- Forward Exhaust (2)
- Aft Exhaust (1)
- Stern
- Bow
Cargo Hold 3

Exhaust System

- Exhaust Air
- Louvered opening
- Fire Damper (weathertight)

Supply System

- Supply Air
- Louvered openings
- Fire Damper (watertight)

Schematics based on Coast Guard Marine Safety Center Analysis
Cargo Hold Ventilation Downflooding

Schematics based on Coast Guard Marine Safety Center Analysis
El Faro Cargo Hold 3

Main Deck

2nd Deck (watertight)

3rd Deck (Tween)

4th Deck (Tanktop)

Double Bottom Tanks

Hold 3

EMERG. FIRE PUMP STBD

3rd HOLD SCUTTLE STBD

TRAILER OPENING (STBD)

1st Deck (Tanktop)

2nd Deck (Tween)

Main Deck

NTSB
The Accident Voyage – October 1
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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