National Transportation Safety Board

Sinking of Cargo Vessel *El Faro* Atlantic Ocean, Northeast of Acklins and Crooked Island, Bahamas October 1, 2015

Brian Young
Investigator-in-Charge

National Transportation Safety Board

Engineering Factors

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Investigator-in-Charge

Overview – Engineering Factors

- Vessel history
- Major conversion
- Inspections
- Exclusions
- Loss of propulsion

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Vessel History

Brian Young
Engineering Group Chairman

El Faro

Major Conversion Determination

- Major vessel conversions:
  - Substantially alter stability characteristics, dimensions, or carrying capacity of vessel
  - Change the type of vessel
  - Substantially prolong the vessel's service life

- Major conversions require the vessel to be updated to current safety standards

Major Conversion Determination

- *El Faro's* lengthening in 1993 was a major conversion
  - Added 90-foot mid-body section
- *El Faro's* conversion from Ro/Ro to Ro/Con in 2005-2006
  - Added capacity for 1,414 containers
  - Increased draft/lowered freeboard over 2 feet
- After request for reconsideration from company, Ro/Con modification not designated as a major conversion

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Alternate Compliance Program

Brian Young
Engineering Group Chairman

Alternate Compliance Program

- *El Faro* enrolled in ACP since 2006
- ACP avoids redundancies in Coast Guard and authorized classification society (ACS) inspections and surveys
- Coast Guard issues Certificate of Inspection (COI) after ACS verifies compliance with applicable standards
- “US supplement” bridges gap between Coast Guard and ACS standards
- Annual Coast Guard oversight examinations of ACP vessels to confirm ACSs are enforcing compliance

Alternate Compliance Program

- No qualification level required and no formal training program for the Coast Guard ACP examiners
- Communications between Coast Guard and ACSs lacking
- Lack of resources to complete “US supplement” reviews
- Review of targeted ACP vessels that had successfully completed ACS surveys found safety deficiencies; lacked deficiency records

Exclusions

Brian Young
Engineering Group Chairman

Exclusions

- Not factors in accident:
  - Boilers, steering, and electrical systems
  - Riding gang
  - Medical conditions and medication use
  - Structural failure
  - Rogue wave

Exclusions

- Not factors in initial list of vessel:
  - Lashing failure
  - Cargo shift

- Insufficient evidence to determine:
  - Fatigue
  - Drug or alcohol use

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Loss of Propulsion

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Engineering Group Chairman

Loss of Propulsion

0440/0513 – Chief Engineer reported oil levels affected by list

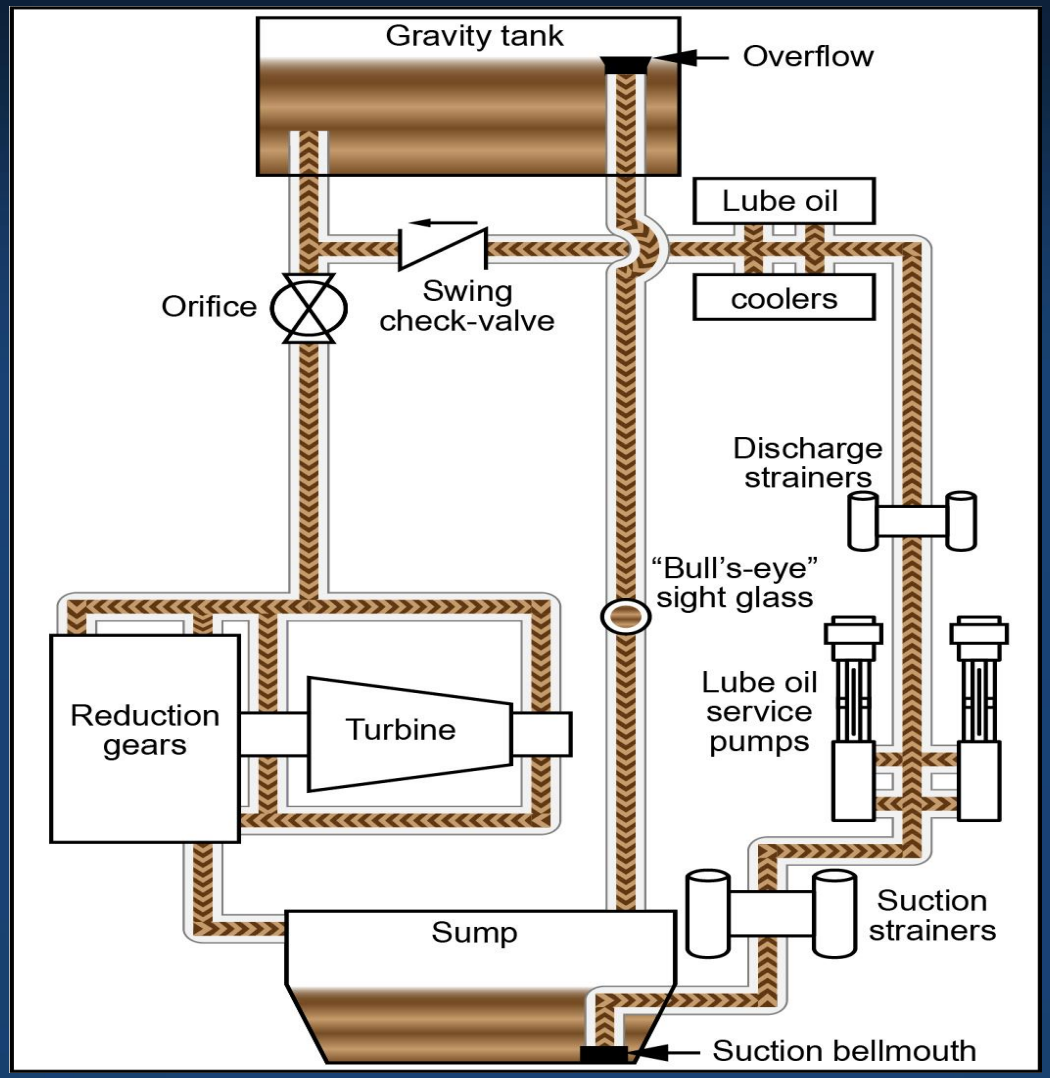
0554 – Captain turned *El Faro* to port

After 0600 – Vessel began losing speed

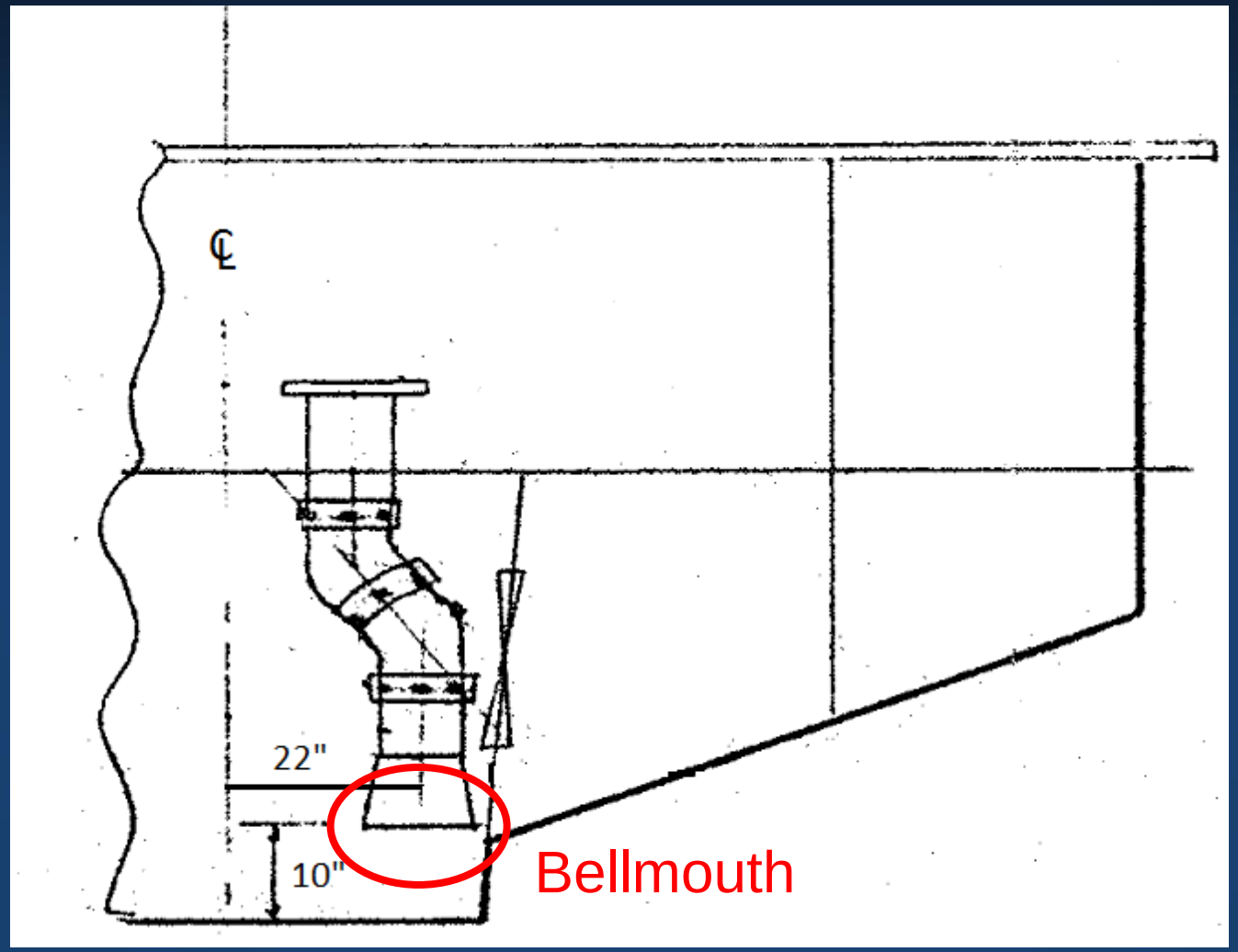
0616 – Bridge notified of loss of propulsion

Lube Oil System

Lube Oil System



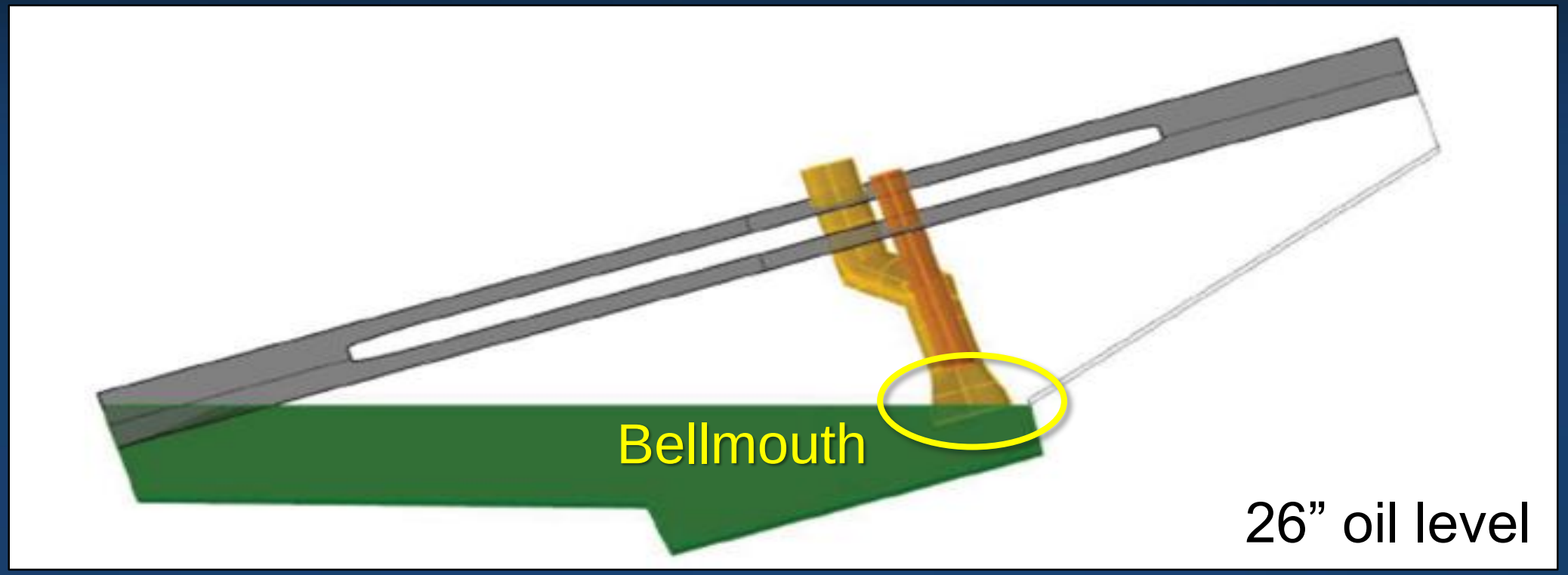
Lube Oil System



Design Standards

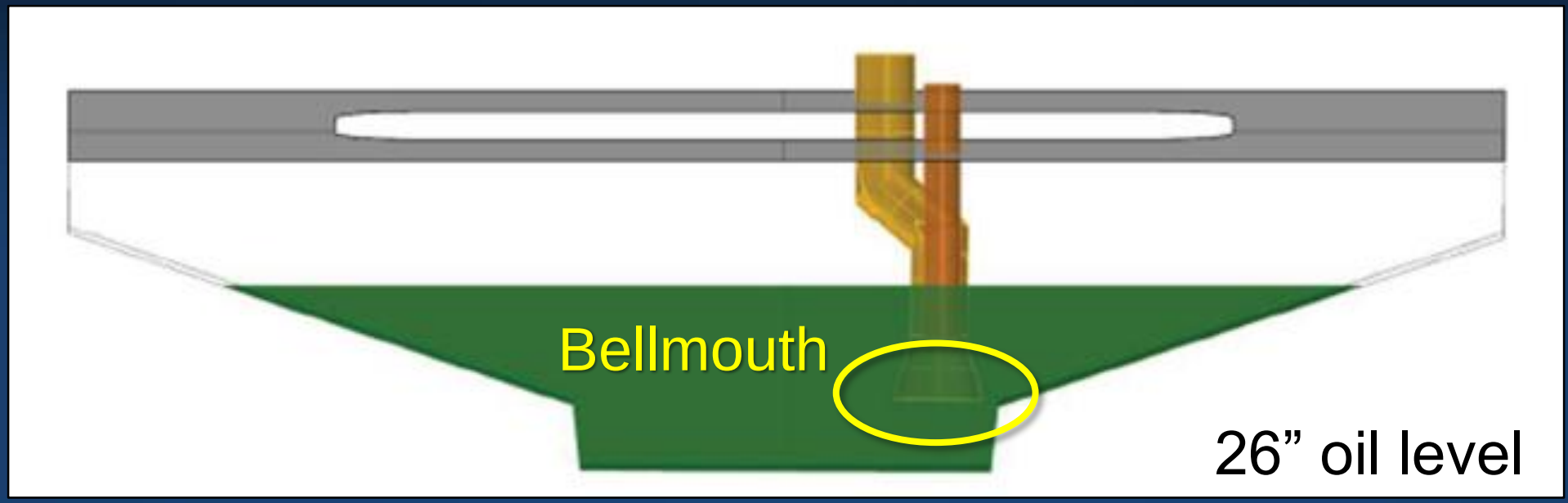
Extreme list to port

Design Standards



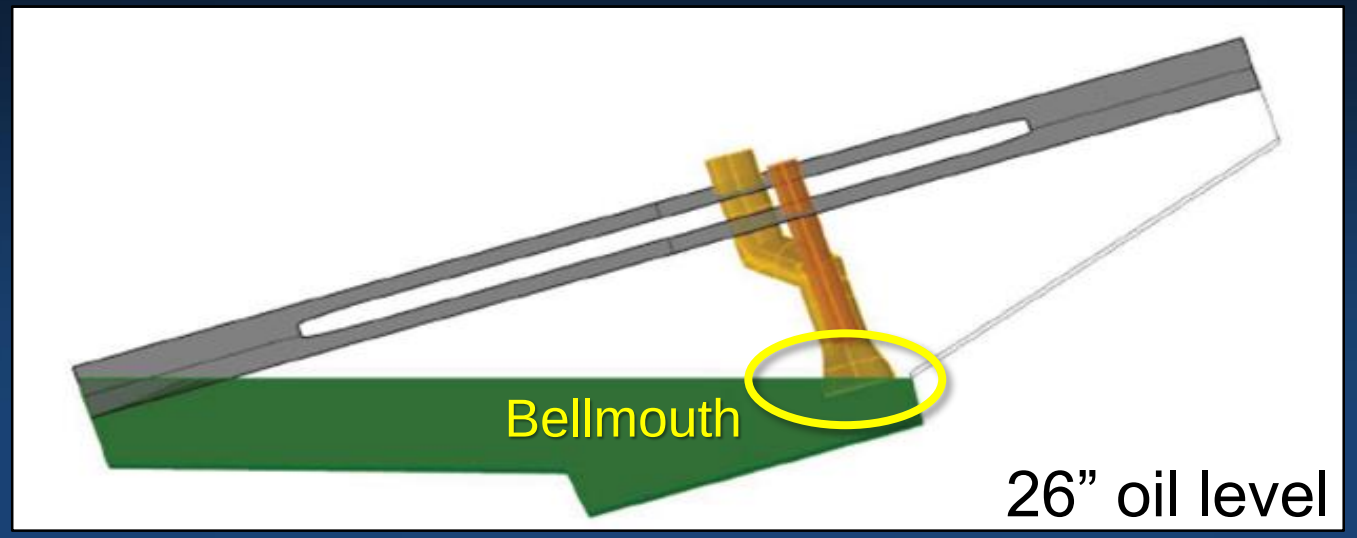
18° list to port – looking forward

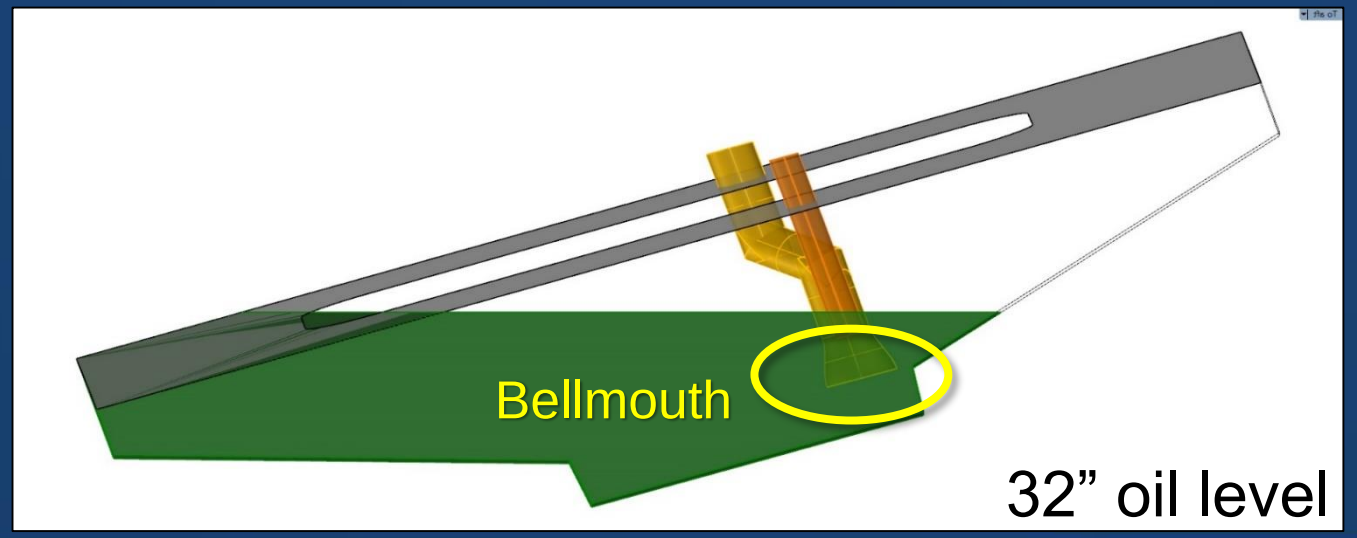
Oil Level in Sump



25” = 1,255 gallons
26” = 1,346 gallons
27” = 1,436 gallons

18° List to Port





Summary – Engineering Factors

- Findings
- Recommendations