Party Comments by email/letter dated: USCG e-mail dated 8/3/2017 from Jeffrey Stettler (USCG) to Eric Stolzenberg (NTSB)

NTSB Draft Factual Report for Tech. Review

Page/Line	USCG COMMENTS	NTSB – Disposition of Party Comments (9/2017)
5 / 6-7	It should be noted here that the EL FARO wreck was located/confirmed and the VDR recovered using the Navy unmanned submersible CURV operated aboard the Navy vessel USNS Apache.	Agree. Added text.
8 / 6	"other three" should be "final three vessels of the class"	Agree. Modified text.
8 / 16	The company was called Atlantic Marine Inc. at this point. Perhaps a clarification on company names is required here.	Agree. Modified text.
10 / 9	"enclosed" should be "semi-enclosed" or "partially-exposed" since it is not a fully enclosed deck	Agree. Modified text to “semi-enclosed.” Added “semi” elsewhere in report.
10 / 15	Recommend providing a more specific cite than "MARAD"	Agree. Added text in footnote indicating schematic was emailed to NTSB by MARAD in April, 2016.
11 / 5	"draft" should be "maximum draft" or "full load draft" or "load line draft"	Agree. Added text for “full-load.”
11 / 9-10	"1982 general arrangement drawing" should be "1982 preliminary general arrangement drawing"	Agree. Revised text.
15 / 1	Table 2: "Draft, full load" should be "Draft, load line" or "Draft, full load (load line)"	Agree in part. Added “extreme” per ABS comment.
16 / 3	Typographical error, extra right parentheses	Agree. Removed.
16 /16	Footnote: Need a more specific cite, including originator, receiver, and date.	Agree in part. Added originator and receiver.
18 / 19-20	Need a cite for the statement "According to the Coast Guard, either the 1973 or the 1974 CFRs or both most likely applied."	Agree. Determination was made through ongoing discussions with CG of build date. Removed text “according to Coast Guard” and added “based on build date.”

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19 / 1-4	Coast Guard policy on "major conversions" provides the "reasonable and practicable" criteria which the OCMI must use to determine which standards should be applicable. The statements here were not explicitly stated in the available documentations from the Coast Guard for the 1992-1993 conversion.	Agree. Modified paragraph to include "reasonable and practicable" removed "selectively" in consultation with ABS and CG.
19 / 7-9	The first sentence of this paragraph does not seem to make sense. It apparently applies to the Ro/Con conversion in 2005-2006, but its meaning is not clear.	Agree. Revised first part of sentence.
19 / 14-16	The statement about ACP enrollment date is not correct. EL FARO was enrolled in ACP on February 27, 2006, as indicated on the Certificate of Inspection, after ACP handover exam to ABS in Mobile, AL. Every Coast Guard exam after this date was considered ACP oversight; enrollment did not delay until 2010. It is likely that the source of the confusion is the comments for owner in EL FARO's ABS survey status.	Agree in part. Modified first sentence and added additional sentences to clarify paragraph in consultation with ABS and CG.
21 / 6	Footnote 35: This (MBI Exhibit 058) was not the final CargoMax printout for the accident voyage. See MBI Exhibit 059, CargoMax printout dated October 1, 2015 at 11:48. Corrections were made to the fuel oil and lube oil loading.	Agree in part. The Ro/Ro cargo totals are the same for both printouts, which is what the table describes. Revised footnote to state exhibit 59 is similar.
24 / 5-6	"Spinnaker" (software) only includes Lo/Lo containers (loaded on the main deck), not Ro/Ro cargo. Ro/Ro cargo is accounted for separately by hand notations and calculations on a worksheet (see MBI Exhibit 069, pages 16-30). This was explained by the Marine Operations Manager in his NTSB interviews and MBI testimony. Ro/Ro cargo is incorrectly referred to as being included as part of "Spinnaker" in other sections of this Factual Report as well.	Agree. Clarified paragraph by noting Spinnaker was used by PORTUS for Lo/Lo cargo and Ro/Ro cargo was accounted for through a separate hand-written stow plan by PORTUS. Revised footnote.
24 / 6-12	Correction required. For most holds, CargoMax had three inputs per cargo hold for each category of Ro/Ro cargo (TRLRS, AUTOS, OTHER); this included Port (P), Center (C) and Starboard (S).	Agree. Clarified paragraph with additional text and deleted inaccurate text.

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24 / 13-14	In interviews and testimony, water density or specific gravity was sometimes loosely, but incorrectly, referred to as "salinity". For this Factual Report, the correct term (specific gravity) should be used, or the use of "salinity" should be footnoted as technically incorrect.	Agree. Include parentheses that often specific gravity is used interchangeably by crew with salinity. Changed other references to salinity to specific gravity used in this regard.
25 / 2	"…in conjunction with the actual recorded drafts" should be "...in conjunction with actual recorded drafts and measured specific gravity"	Agree. Revised per CG text.
25 / 5	"salinity" should be "specific gravity"	Agree. Revised text.
26 / 6	"ABS approved the test on March 22, 2006" should be "ABS approved the stability test report on March 22, 2006."	Agree. Revised text.
27 / 3	"AB- approved" should be "ABS-approved"	Agree. Revised text.
29 / 5	"According to the ACP supplement all recommendary—recommendations…" should be "According to the ACP supplement all recommendations…"	Disagree. Transcript per interview.
29 / 17-19 to 30 / 1-5	Correction required. The stability booklet provides required GM curves which account for wind heel for different numbers (heights) of container tiers (not just the maximum/full load), but does not specifically permit interpolating intermediate loading conditions where partial or mixed tier heights may exist. The CargoMax software, using the "auto windheel" feature, calculates minimum required GM directly using the 46 CFR 170.170 criteria for the actual container loading profile. While the CargoMax calculation is less conservative, it does meet the requirements for calculation of minimum required GM specified in 46 CFR 170.170.	Agree. Substantial modification of text and additional text to reflect comment.
30 / 13-14	The first sentence should be reworded to: "For El Faro and its sister vessels, vessel drafts, trim, stability and longitudinal strength were assessed using the CargoMax software."	Agree. Added text.

30 / 15-17	This statement is misleading. The version of CargoMax used ashore was the same exact software as used onboard. Therefore it was reviewed by ABS; it was simply not approved for shore-side use (i.e. the ABS letter states specifically that it was approved for onboard use).	Agree. Added text to reflect it was the same software.
32 / 9-15	This paragraph (section) crosses the boundary between "factual" and "analysis." Any assessment of the CargoMax damage stability module requires careful consideration of what is input into the program (by the investigators) in order to obtain the output shown in Figure 7 and in Appendix A, and discussed in this paragraph. There are many details associated with program user input, including downflooding points and wind speed, which should be specified and justified. Additionally, the program has numerous default values which must be acknowledged and noted in order for this to be considered "factual". It is highly recommended that this paragraph and accompanying figure and Appendix A be removed from this Factual Report.	Noted. Added footnote: “Assessment did not include verifying that default values or details associated with the program used by investigators matched similar damage module aboard El Faro.”
33 / 12	Footnote 84: Correct cite is: Annex 2 of Resolution MSC.267(85), "Adoption of the International Code on Intact Stability, 2008" (2008 IS Code), Adopted December 4, 2008, IMO.	Agree in part. Changed footnote to reflect third edition is 2009.
38 / 20	“in its stead” should be "on its behalf”	Agree. Changed per comment.
39 / 3-7	It should be noted that sister vessels El Yunque and El Morro were not subject to the same damage stability criteria as El Faro (SOLAS probabilistic damage). Only El Faro was subject to the SOLAS probabilistic damage stability standards, based on the major conversion in 1992-1993.	Agree. Added sentence “Neither the El Morro or the El Yunque were subject to any statutory damaged stability criteria.”
40 / 1	"SOLAS intact stability criteria" should be "IMO intact stability criteria"	Agree. Changed per comment.
40 / 3-4	"SOLAS intact stability criteria" should be "IMO intact stability criteria"	Agree. Changed per comment.

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44 / 4-5	Correction required. The required subdivision index "R" (capital) and attained subdivision index "A" (capital) are defined in SOLAS.	Agree. Modified and added additional text to reflect comment.
44 / 15	"...there were no damage standards at all for those vessels" should be "...there were no damage standards applicable for all cargo vessels".	Agree. Changed to "there were no damaged stability standards applicable for all cargo vessels."
44 / 21	Footnotes 28 and 29: Technically the interview was with the President of Herbert Engineering Corporation (HEC) and the Vice President of Herbert-ABS Software Solutions, Inc., the latter being a joint venture between HEC and ABS.	Agree. Changed footnotes to "President, HEC and Vice President, Herbert-ABS Software Solutions."
46 / 11-17	This paragraph as written is technically correct. However, there is an important reason for the differences between the ABS and MSC results. MSC has discovered significant errors or bugs with different versions of the GHS software damage stability algorithms which lead to differences in results. MSC is currently working with the software vendor to assess the impacts of this for all ships and will address separately within the Coast Guard and with class societies including ABS. See MBI Exhibit 419 (MSC comments on the PII Joint Response to the MSC Technical Report) for more explanation.	Agree. This is an important note. Added as footnote in entirety.
48 / 5-6	It should be noted that the value of permeability for cargo holds is prescribed in the applicable 1990 SOLAS damage stability standard to be 0.7, so this was the value applied by both MSC and ABS in their respective analyses using the 1990 SOLAS standards.	Agree. Modified and added text to reflect comment.
51 / 9-11	This statement/example is not correct. The Trim and Stability Booklet includes separate minimum required GM curves for different tier heights (including two high and three high tiers).	Agree. Modified text to reflect comment.

56 / 10-11	"The Coast Guard's load line technical manual states that closing appliances must be "deemed weathertight to the satisfaction of the assigning authority." The assigning authority for *El Faro* was ABS." While this statement is true, it is misleading since ABS did not make the expected determination based on available guidance. The Load Line Technical Manual states, with regard to ventilator closures for positions 1 and 2, "fire dampers of the normal type are not considered as meeting the minimum requirement unless they are strongly constructed, gasketed, and capable of being secured weathertight." Additionally, ABS New York Office provided a Circular of Instruction to all exclusive and non-exclusive surveyors on 22 November 1982 with a subject "Survey for Load Lines, Form LL-11-D Record of Conditions of Assignment." (MBI Exhibit 342). The document stresses that "when completing this form the freeboard deck…must be maintained weathertight. Weathertight means that in any sea condition water will not enter into the ship. A practical test for weathertightness is hose testing." The circular explains that page 1 of the LL-11-D form includes a blank for "Date of Build (Conversion)". The Circular specifically mentions "…it should be pointed out that a fire damper alone generally does not suffice as a weathertight closing appliance."	Noted.
60 / 9	"static" should be "hydrostatic"	Agree in part. Deleted "static."
64 / 3	Reference should first be made to SOLAS 1990 (rather than SOLAS 2004) which first included the requirements for dry cargo ships constructed after February 1, 1992.	Agree. Modified text.
71 / 3-4	This is actually not what the October letter stated. The October letter from Tote stated that a decrease in "tonnage" could be calculated, but not that the vessel would carry less cargo by weight. Tonnage is a regulatory volumetric measure, not weight. In any event, Tote's calculation of a decrease in "tonnage" mentioned in the October letter was not available in the documentation and cannot be verified.	Disagree. Although the letter does use the term "tonnange" the letter is clearly using that term to indicate weight, not volume. Added clarifying text stating the company stated that the vessel would carry less cargo by weight.

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75 / 1-2	In the interview transcript, it is further stated that this is rare, and is only the case if the CargoMax model is developed using the same computer model used to develop the ABS RRDA HECSALV model.	Agree. Modified text to reflect comment.
75 / 7	“HECSALVE-compatible” should be "HECSALV-compatible"	Agree. Modified text.
76 / 14-15	“(originally showed 246 LT each, corrected to 429 LT each)” should be "(originally showed 346 LT each, corrected to 246 LT each)"	Agree. Modified text.
76 / 16	"load cases" should be "condition analyses" or “damage conditions”	Agree in part. Email says, “load cases,” but added parentheses with “condition analyses.”
115 / 12	"portside" should be "starboard side"	Agree. Modified text.
126 / 8	“tmosty” should be “most”	Agree. Modified text.
129 / 17 to 130 / 2	It should be noted that the ABS Assistant Chief Surveyor’s comments are not in accordance with the applicable 1966 load line convention and its application to EL FARO via the LL-11C. The dampers were in exposed positions on the freeboard deck based on LL-11C (position 1).	Agree. Deleted following sentence: “The ABS assistant chief surveyor for the Americas Division stated that he did not consider the cargo hold exhaust and supply fire dampers to be “exposed” or “external” dampers because they were not on the exterior of the shell where run-up from seas or rain would directly contact the damper.”
159 / 17	"asses" should be "assess"	Agree. Modified text.
160 / 15-17	“…angle of heel to starboard than port” should be “…angle of heel to port than starboard”	Agree. Modified text.
165 / 2	The references (cites) of these "Simplified El Faro Profile and Deck Plan Drawings" should be provided.	Noted. Added they were compiled from GA and Capacity Plans.

173-210	General comment regarding Appendix C: The statements made in this appendix in green text ("Event summary at time in green text") are interpretations of the VDR transcript and require some level of analysis and/or speculation to arrive at the statements provided. Much of the cited transcript text is questionable (i.e. it is in parentheses in the transcript). Therefore this green text should not be considered "factual" and should be removed from this Factual Report. These interpretations should be reserved for a subsequent analysis and the Report of Investigation.	Noted.
190	Time 0544: The quotation "We got cars loose. Yeah" is not on the VDR Transcript at 0544.	Disagree. Found in VDR addendum.
204	Time 0714: The interpretation that "Statement that the fire main is damaged from something hitting it, possibly damaged between sea suction and hull" is not factual but is an interpretation of the line "first the chief said something hit the fire main. got it ruptured. Hard." There could be other interpretations of this VDR transcript passage, since part of the conversation is not known, and the full context cannot be known from the transcript. This interpretation is speculative and not factual.	Agree in part. Deleted "Statement that fire main is damaged from something hitting it, possibly damaged between sea suction and hull." Modified to "Statement that pumping is ongoing. Captain is getting information on water level in hold (3) from chief mate over phone, who states water level is rising. Discussion of securing fire main and mention of sea suction and hull."
205	Time 0717: The interpretation that "Chief mate states that securing watertight door was only way he knew to stop flooding (from progressing beyond flooding hold 3)" is not actually what was stated in the cited transcript text. The provided interpretation is speculative without the full context and is not factual.	Agree. Changed to "Chief mate states he secured (watertight) door."
209	Time 0730: The interpretation "Indication that vessel's bow begins to visibly submerge" is not the only interpretation of the utterance "bow is down". There could be a number of different interpretations, including the foredeck (port side) is submerging as the vessel is capsizing. The provided interpretation is speculative without the full context and is not factual.	Agree. Changed text to "Captain states vessel's bow is down (visibly lower)."

Review of Draft Factual Reports: American Bureau of Shipping

Party Comments by email/letter dated: August 9, 2017 / Naval Architecture Group

NTSB Draft Factual Report for Tech. Review (Pages 1-50)

Page/Line	ABS	NTSB – Disposition of Party Comments (9/2017)
2	Formal name and correct title – Thomas M. Gruber, Chief Engineer, Statutes	Agree. Revised.
3l. /9	**Comment:** Master did not say free communications with the 3 hold.	Agree. Revised to say "…water entering down into the 3 hold."
6/Table 1	**Comment:** Full load Draft shown is the extreme draft.	Agree. Revised text and added footnote describing extreme draft.
7	**Comment:** Tank top Ro/Ro and Auto capacity doesn't match t&s booklet. Report uses an unstamped Capacity Plan in lieu of the stamped t&s booklet.	Noted. Report used Capacity Plan as reference for this section and will use Auto capacity through section per Capacity Plan referenced so as to not be confusing.
10/l. 4	delete "to"	Agree. Revised.
11/l. 5	**Comment:** The correct draft increase is 2'-1/16".	Noted, no change. No evidence in stability letters for El Faro of extreme/keel draft. Only evidence is Ponce Hull 674 which was 28'-1 1/8" per Table 2 in report. Therefore draft increase is correct.
11/l. 13	"ship be so altered" should be "ship to be so altered"	Agree. Added "to."
12/FN 13	"t QCM" should just be "QCM"	Agree. Deleted "t".

13/l. 2	Correct draft increase is 2'-1/16".	Disagree. But changed to 2'-1 5/16" increase in draft, not 2'- 1/16". See Comment 15/Table 2 below.
14/l. 5	#3 "Outboard" tanks.	Agree. Added text.
14/l. 13	Correct draft increase is 2'-1-5/16".	Agree. Considering 1993 ABS stability letter instead of the 1993 stability booklet value for full load draft, the draft increase would be 2'-1 5/16" (per new footnote for table 2).
15/Table 2	Full Load Draft shown is the extreme draft Draft for NORTHERN LIGHTS should be 28'-1-1/16" EL FARO - # of Autos/trailers differ between Principal Characteristics and Capacity Plan	Agree in part, as the 1993 stability book does not match 1993 stability letter. The 1993 stability booklet gives 28'-1 1/8 "for draft, but the 1993 stability letter gives 28'-1 1/16". Revised text and added footnote on discrepancy. Considering letter as accurate. However, this make a 2'-5/16" increase in draft, not 2'-1 1/16". Noted discrepancy in autos between Capacity Plan and Principal Characteristics. However, reference sources clearly given in report.
16/1. 3	delete first ")"	Agree. Deleted.
17/Table 3	Draft at FP for Hull 670 should be 30.39.	Agree. Modified value.
18/1. 3	suggest "Code of Federal Regulations (CFR)" in place "CFRs"	Noted. Defer to NTSB editing style throughout report for abbreviation.
18/1. 13	replace "Sun Ship website" with "Sun Ship Historical Society website"	Agree. Modified text.

18/1. 16	suggest “provisions of the CFR” in place of “CFRs”	Noted. Defer to NTSB editing style throughout report for abbreviation.

18/1. 8	Separate USCG and Class responsibilities for when mods are made.	Agree. Modified paragraph to separate CG and Class responsibilities in consultation with ABS and CG.
19/1. 12	Separate USCG and Class responsibilities for when mods are made.	Agree. Modified paragraph to separate CG and Class responsibilities in consultation with ABS and CG.
19-20/ll. 14-19 and 1-4	**Comment:** How can requirements/rule sets be retroactively applied? See MBI Ex. 362, USCG letter dated December 21, 2010, stating effective date of ACP enrollment was February 27, 2006. ABS disagrees that EL FARO entered ACP in 2006.	Agree in part. Clarified paragraph with text deletion and additions.
20/l. 5	Insert, “ The Revised MSC Technical Report and the testimony of USCG representatives seem to have overlooked and failed to mention the following: (1) The USCG was also responsible for the structural inspections for EL FARO from its construction in the 1970s to 2010, at which time the vessel entered into the Alternate Compliance Program. (2) The USCG considered the stability aspects for EL FARO and had oversight authority for any changes. The USCG had the authority to change the stability requirements from 46 CFR § 170.170, to implement updates or changes to the requirements for inclining experiments or the ASTM standards governing	Noted. Agree in part this is relevant in this section of report. Added text regarding: ABS comment in the USCG’s 2010 letter stating a retroactive effective ACP enrollment date of February 27, 2006, should not be taken to mean that ABS was responsible for conducting ACP surveys of the vessel beginning in 2006. (ABS issued all statutory certificates for the EL FARO beginning in February 2006.) Added text regarding: USCG was also responsible for the structural inspections for EL FARO from its construction in the 1970s to 2010, at which time the vessel entered into the Alternate Compliance Program.

	same, and to require EL FARO to change its lifesaving gear, but NEVER elected to do so. ABS' role was to conduct ACP surveys, plan and stability reviews subject to the USCG's oversight and regulatory authority. ABS did so, without any exception taken by the USCG. F-2 The EL FARO entered into the Alternate Compliance Program (ACP) in December 2010. By letter dated December 21, 2010, the USCG advised that the EL FARO had successfully completed a joint USCG/ABS hand-over survey meeting all of the necessary steps for enrollment in the ACP. (MBI Ex. 362.) As of December 22, 2010, the comments in ABS' Survey Manager reflect that the Vessel was enrolled in ACP. (MBI Ex. 184; Draft Gruber Transcript, May 20, 2016, at p. 9.) The comment in the USCG's 2010 letter stating a retroactive effective ACP enrollment date of February 27, 2006, should not be taken to mean that ABS was responsible for conducting ACP surveys of the vessel beginning in 2006. (ABS issued all statutory certificates for the EL FARO beginning in February 2006.) (See MBI Exh. 418, PIIs' Joint Submission, at Appendix F, ¶ 's F1 & F2.)	See above.
21/Table 4	Second and third column titles – suggest changing "29 Sept. 15" to "29 Sept. 2015".	Agree. Modified text.
22/l. 4	**Comment:** The GM margin is not a statutory requirement.	Agree. To make clear, modified text to "owner-required" and "GM margin is not a statutory requirement."

22/ll. 8-9	Do not believe it is accurate to state that a 0.5 ft GM margin was "incorporated in the CargoMax software". Replace "0.5-foot GM margin was incorporated in the CargoMax software" with "owner-required 0.5-foot GM margin."	Agree. Modified text to "owner-applied" and deleted text it was incorporated into CargoMax.
22/1. 14	Delete second period.	Agree. Deleted.
22, ll. 18-29	"…CargoMax had incorrectly entered…" This should be re-worded to make clear that this was an issue with fuel quantity data that was manually entered, not an error in the CargoMax software for the EL FARO.	Agree. Modified text to reflect this.
25/ll. 17-19	Class Rules do not cover training of personnel, onboard or ashore.	Agree. Added text to reflect ABS does not require training of onboard crew.
26/1. 9	should "at" be "all"? Add "or a simplified stability letter" after "stability booklet"	Agree with both. Added text to reflect "simplified stability letter).
26/1. 9	suggest replacing "T&S" with "Trim & Stability ('T&S")"	Noted. Acronym already described earlier in report.
27/1. 3	replace "AB-approved" with "ABS-approved"	Agree. Replaced text.
27/ll. 4-5	Type 2 programs calculate the intact stability and evaluate damage based on limiting curves.	Agree. Revised text to remove "GM" so it reads "… based on limiting curves." Added text that shoreside programs are not required to be approved or undergo annual verification by Surveyor.

	Should mention shoreside programs are not required to be approved or undergo annual verification by Surveyor.	Agree.
Footnotes 58, 66, 69, 70, 74-76, 78, 89, 91, 129	"statues" should be "statutes"	Agree. Changed all instances.
29/1. 3	suggest replacing "an ABS chief engineer" with "ABS' Chief Engineer for Statutes". As written, somewhat confusing in the context of discussions of shipboard chief engineer.	Agree. Changed.
29/1. 5	suggest "ISO code" quoting Gruber testimony should be "IS code". This is an error in the transcript.	Agree. Bracketed an extra O to reflect edit.
29/ Footnotes 66 and 69	"statues" should be "statutes"	Agree. Changed.
30/l. 8	There was no requirement for the strength portion of the program to be reviewed.	Agree. Added text "and there was no requirement to do so."
31/ll. 11-14	This is a recommendation going forward, not a current requirement.	Agree. Revised text to reflect class approval is not currently required and that Mr. Gruber recommended this be considered in the future.
31/ll. 14	Quoting Gruber interview for proposition that class should approve and verify shoreside loading instruments. Report should clarify that this was not required in 2015 or currently, but a proposal for the future.	Agree. Revised text to reflect class approval is not currently required and that Mr. Gruber recommended this be considered in the future.

35/1. 9	delete duplicate quotation marks	Agree. Deleted.
35/1l. 15 and Footnotes 88 (also Footnotes 126 and 130)	"Navigation and Inspection Circular" should be "Navigation and Vessel Inspection Circular"	Agree. Added text.
35/Section 7.6.1	Need to distinguish between NVIC 3-84 Change 1 and NVIC 3-97.	Agree. Added text "under NVIC 3-84 Change 1).
36/ll. 3-4	**Comment:** NVIC 3-97 applied irregardless of ACP. ACP letter was issued in 2010 with a 2006 application date. There is no policy how to apply ACP requirements on reviews conducted 4 years prior to 2010 letter.	Agree. Modified and added text to reflect comment.
36/l. 7	NVIC 3-84 Change 1.	Agree. Added text.
36/1. 4	**Comment:** ABS disagrees that EL FARO entered ACP in 2006. USCG letter not issued until 2010. This was more accurately explained earlier in the report. (see p. 19, section 6.1 of this report and MBI Ex. 362.)	Agree in part. Modified text earlier in report.

36/1. 20	"is" should be "it"	Agree. Changed.
37/l. 14	Change "reviewed" to "oversighted".	Agree. Modified "reviewed" to "performed an oversight review."
	NVIC 3-84 Change 1	Agree. Changed per comment.
40/l. 3	Replace SOLAS with IMO	Agree. Changed per comment.
40/l. 7	Replace (ventilation) with (intake)	Agree. Added "intake (supply)" text after ventilation.
41/l. 18	Replace postaccident with post-accident	Noted. NTSB editing style.
42/l. 1	Replace postaccident with post-accident	Noted. NTSB editing style.
42/II. 9-13	Point out that the most recent form LL-11-D would have been kept on board EL FARO	Agree. Although stated later. Added sentence "The most recent form is found aboard the vessel (not available for *El Faro*)."
44/II. 4-5	suggest this sentence may require correction. The attained subdivision index is "A", and the required subdivision index is "R" (capitalized).	Agree. Modified and added additional text to reflect comment.
45/l. 4	Damage calculations are not required to be on board the vessel.	Agree. Modified and added text to reflect comment.

45/l. 12	Replace ABS with industry.	Agree. Replaced with "marine industry."
45/l. 18 - 46/l. 1	Remove the sentence "He was aware the onboard…he had not reviewed them". Mr. Gruber did not state this in the interview.	Noted. Added additional text to clarify interview as follows "…after specific damage scenarios input by the user…"
46/l. 2	Change, " capability, ABS did not review it for that purpose." To, "It was not presented to ABS to review for that purpose."	Agree in part. Added text to clarify it was not presented in addition to not being reviewed.
46/l. 5	Replace postaccident with post-accident.	Noted. NTSB editing style.
47/l. 11	To which does the words "the ship" refer to, the EL FARO or another PONCE class ship?	Agree. Added text for "El Faro (hull 670)."
48/l. 6	SOLAS, 1992 edition, states that the permeability for dry cargo spaces is to be 0.7.	Agree. Modified and added text to reflect comment.
48/l. 10-13	**Comment:** As Design Letter No. 3 was not a statutory requirement, it was not taken into account in statutory reviews nor were the results included in the stability booklet. Further, it should be clarified when the loans were satisfied, this owner's requirement is nullified.	Agree in part. Modified and added text to reflect comment. Added additional footnote for MBI166. No evidence presented that MARAD loan payment relieved owner of Design Letter No. 3 requirement. As vessel was required to meet SOLAS probabilistic in 1993, investigation did not clarify this.

49/l. 1	Replace static with intact.	Agree. Replaced.
49/ll. 3-4	**COMMENT:** ABS did not review the damage stability requirements of Design Letter No. 3 because it was not a statutory requirement. It was a financing requirement between the owner and MARAD. The sentence is misleading, as whether or not the DL3 exceeded US requirements depends entirely upon when the vessel was built or underwent a major modification.	Agree. Modified and added text to reflect comment.
50/ll. 6-9	46 CFR 170.170(a) actually states: "Except as provided in paragraph (e) of this section, a stability booklet must be prepared for each vessel,". This allows for the issuance of simplified stability letters to certain vessels. Further, at the time of the stability reviews by ABS, 170.110(b) stated: Each stability booklet must be approved by the Coast Guard Marine Safety Center or the ABS. According to Enclosure 2 to NVIC 3-97, "Stability related reviews by the ABS may encompass the following tasks: j. Approval of Trim and Stability Booklets or other stability information for operating personnel.	Agree. Added text and deleted text that stated all vessels must have a stability booklet.
50 / l. 7	Replace ACP with NVIC 3-97.	Agree. Replaced.
50/l. 19	**COMMENT:** States that the wind or other heeling lever curves are to be superimposed on the (GZ) diagram as appropriate. As the required weather criteria is a straight calculation of GM and does not require	Agree. Modified and added text to reflect ABS comment that wind/other heeling not required and therefore not appropriate to include in report.

	the evaluation of the GZ Curve, it is not appropriate to include this information in the stability booklet. The 1993 stability booklet was reviewed by the USCG without comment, confirming that the wind speed was not required to be included. Therefore, the wind speed was not included in any of the following stability booklets. Further, the past practice and policy of the USCG MSC of including the wind speed in stability booklets/simplified stability letter should be confirmed in writing. If they require the wind speed to be included, an example of this should be provided.	Agree in part. Added text on 1993 Coast Guard review of stability booklet. Added footnote referencing this comment as source. Paragraph already stated that wind speed was not in booklets for El Faro.

NTSB Draft Factual Report for Tech. Review (Pages 51-100)

Page/Sec.	ABS	NTSB – Disposition of Party Comments (9/2017)
50/51	Section 7.10.2 NVIC Guidance.	Disagree. This is unclear. No change.
51/ll. 9-11	Suggest rewording "would lower the required" to "would result in a lower required". In the context of this discussion, it should be stated again that the CargoMax auto windheel calculation would more accurately compute windheel for various container-loading arrangements and their associated profiles. (see reports p. 29/1.19 through 30/1.2.) The auto-windheel would calculate the required GM based upon the wind profile of the actual container load. As this profile would differ from the homogeneous wind profiles considered in the stability booklet, the resulting required GM would be different. The wording "lower the Required GM" incorrectly implies a lessening of the requirement. The requirement is compliance with 46 CFR 170.170. As stated in the USCG MSC Report on page 29: "As the calculation method provides a direct calculation of the minimum required GM based on the explicit formula provided in 46 CFR 170.170 with lateral wind area based on the actual loading condition, it meets the necessary requirements for calculation of minimum required GM. The accuracy of the CargoMax calculations can be considered as good (or better) than the tabular form calculation performed by hand using the T&S Booklet."	Agree. Modified and added text to reflect comments.

51/1. 18	Remove stray superscript comma at end of formula	Agree. Removed.

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54/ll. 1-2	The freeboard is lower on a Type A vessel due to these vessels having the following features: 1) The decks have only small access openings with a watertight closing arrangements. 2) The decks have a higher degree of integrity. 3) There is a higher degree of safety against flooding due to a lower cargo permeability. Many Type B ships will carry deck cargo (which Type A ships cannot do), requiring the deck strength to be increased to support the loads.	Agree. Deleted confusing text and statement from Load Line Manager. Added and modified text to reflect comment.
54/l. 8	The LLTM was published in 1990. There is an annotated copy available on the USCG C-ENG2 website that was produced in 2008 to account for the 2005 amendments to the 1966 ICLL.	Agree. Modified and added text to reflect comment.
57/l. 4	The form is designated as the LL-11. The final letter, LL-11-D, is the revision number.	Agree. Modified and added text to reflect comment.
59/Section 8.3 – Per 6.a.1	The CG Load Line Policy Notes Section 6, Enforcement of Load Line Regulations – "The enforcement of the load line regulations is the joint responsibility of the Coast Guard district commander and the district director of U.S. Customs." This guidance is not for the issuing authority (in this case, ABS).	Agree. Modified and added text to reflect comment.

64/ll. 16-17	As the USCG reversed its decision to deem the 2005 modifications to be a major modification, the requirements of SOLAS 2004 would not have applied unless specifically required by the USCG.	Agree. Modified and added text to reflect comment.

65/ll. 1-5	Remove "class" from line 2. Review of SOLAS requirements is done on behalf of the Administration. Further, in one of our first Nav Arch Group meetings, it was CDR Venturella who stated the placement of the Damage Control Plan was the responsibility of USCG OCMI.	Agree. Modified text.
66/ll. 5-7	According to the VDR transcript, the Captain indicated the stability booklet was in the chief's office at 07:23.32.	Agree in part. No reference to stability book is specifically made. Added text ((potentially regarding a document or item to reference the downflooding angle, that was located in the chief engineers office).
68/ Footnote 171	"Cost" should be "Coast"	Agree. Modified text.
75/1.7	"HECSALVE" should be "HECSALV"	Agree. Modified text.
76/1.7	1000 EDT is not the same as 1100 CDT. This appears to be an incorrect conversion of time zone. 1100 CDT would be 1200 EDT. If the conversion error carries through the subsequent discussion, the times should be corrected.	Agree. Modified text.
76/ll. 13-15	"originally showed 246 LT each, corrected to 429 LT each" should be "originally showed 346 LT each, corrected to 246 LT each". As written, the fuel tank load information does not appear to be correct and is inconsistent with the statement made earlier in the report. (see p. 22, l.17 through p. 23, l.1.) 429 LT was the capacity of each tank, not the fuel load in each tank.	Agree. Modified text.
86/ll. 1718	Perhaps "raised hinged watertight (RHWT)" should be changed to "raised watertight hatch (RWTH)" to match the acronym used on page 3 of MBI Exhibit 7 (see figure 8 of this factual report), and also the use of "RWTH" at page 89, l.2 of this factual report.	Agree in part. Modified text to reflect that the acronym is spelled differently on the same drawing. Clarified.

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93/ll.4-8 94/ll.4-14	to the extent that the vessel was "not fitted with containers on the main deck" at the time the former chief engineer was talking about, it appears that his comments about green water on second deck during "rough weather" do not refer to the Puerto Rico run but instead to the Alaska run or some other prior route the vessel sailed. The route being discussed should be specified in the factual report; as written, the reader may be misled into thinking that prior to the accident voyage, the EL FARO encountered "heavy weather" and had "green water on second deck" regularly on the Puerto Rico run – which is contrary to the testimony of other witnesses.	Disagree. The engineer sailed for over a decade on the three Seastar vessels predominantly on the Jacksonville to Puerto Rico run. Added text to note he sailed on that run. Not Alaska. Deleted confusing/error sentence that vessel was not fitted with containers.
96	The VDR transcript does not have the Captain making comments about loose cars at this timeframe.	Disagree. Amended VDR factual has this statement.
100/ll. 1011	Figure 15 caption should read "EL FARO" emergency fire pump (located at starboard frame 164), viewed…	Agree. Modified caption.

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NTSB Draft Factual Report for Tech. Review (Pages 101- 150)

Page/Sec.	ABS Comments	NTSB – Disposition of Party Comments (9/2017)
103/l.5	ABS performed its Special Periodical Survey – Hull 7 in January, 2011(Exh.404) and ultrasonic gaugings were taken to determine plate thicknesses in accordance with ABS Rules. Repairs/renewals were performed at bulkhead 169 (ladderway between second/main deck), on the spool piece for the forward fire pump sea chest at frames 169/170 starboard, at the after fire pump sea chest frame 181 -183 starboard, main low sea suction sea chest frame 185 – 189 starboard, at the emergency circulating pump sea chest at frames 192 -193 and the fire pump overboard discharge valve at frame 185 starboard side. Neither the Special Periodical Survey (Exh.404) or the Intermediate Survey which was conducted in 2013 have any indication of any structural issues being found at frame 164 starboard where the emergency fire pump was located.	Agree. Added text to reflect comment.
105/ll. 14	Insert, "The fire pump was run and its discharge pressure observed by the attending surveyor who noted no deficiencies in its operation. (Draft [redacted] p. 89 ll. 18 -22) No deficiencies were noted by the surveyor or by in the ABS survey reports. (See, Jacksonville, FL report JS2920963, dated 16 Jun 2015)	Agree. Added text.
124/l.8	It appears that the reference to "figure 33" sh*ould be changed to "figure 32."*	Agree. Modified remaining figure numbers.
126/l.8	appears "tmostly" should be "most"	Agree. Modified text.
126/l.14	appears the reference to "figures 34, 35, and 36" should be changed to "figures 33, 34, and 35."	Agree. Modified remaining figure numbers.
127/ll. 5-7	Add: The section of the trunk depicted in the photo has no effect on the baffle arrangement.	Agree. Added following text in captions for figures 34 and 35: "The holed plate depicted allows communication only between adjacent trunks to sideshell louver openings. It is not through a baffle plate and does not permit water ingress directly to exhaust ventilation trunks into the cargo hold."

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128/ll. 611	While the USCG Inspector elected to close these openings, damage stability calculations did not apply to the EL YUNQUE and ABS advised that the baffles with the openings were in compliance with the ICLL Regulations.	Agree. Added text: Although Coast Guard inspectors elected to close the opening around the longitudinal, damage stability requirements did not apply to El Yunque as they did El Faro, and the baffle height did not need to match El Faro's 12-foot height for damage stability (see Section 7.7.1 Downflooding Point). ABS advised that the 8-foot high baffle arrangement exceeded El Yunque's (and similarly El Faro's) load line requirement of 35½ inches.
129 /ll. 12 -14	Correction: "If during an annual inspection, a surveyor saw something deficient or suspect inside the trunks, he or she could expand the scope of the survey and access the trunks."	Agree. Modified text.
130/l.3	appear to be missing a period at the end of line 3.	Agree. Deleted.

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130 / l. 7	**Insert**: The USCG MISLE inspection records for EL FARO (480 pages in MBI Ex. 127) describe attendances, oversight, and repairs, without any record of complaints concerning the condition of the exhaust ventilation trunks. The MBI exhibits include no USCG inspection records for the EL YUNQUE pre-dating the loss of the EL FARO describing complaints concerning the condition of the EL YUNQUE's ventilation system. After the loss of EL FARO, On November 9, 2015, a team of USCG inspectors was charged with attending an internal structural examination of the EL YUNQUE. The team included: 1. LCDR [redacted], HQ Office of Commercial Vessel Compliance Domestic Compliance Div (CG-CVC-1); 2. LCDR [redacted], Commandant (CG-5P-T1); 3. CWO [redacted], Marine Inspector, Sector Jacksonville; 4. CWO4 [redacted], Senior Marine Inspector, Atlantic Beach, Florida; 5. LCDR [redacted], Chief, Inspections Division, Sector San Juan; and 6 [redacted], Marine Inspector Trainee, Sector Jacksonville. It is noted that LCDR [redacted] was formerly an instructor at the USCG Marine Inspection and Investigation School.	Agree in part. Added following text: "Coast Guard MISLE inspection records from year 2005 forward, describe attendances, oversight, and repairs of El Faro. Review of the records showed no noted concern or deficiencies regarding the condition of exhaust ventilation trunks. In addition to Coast Guard inspection of El Yunque in 2016, a team of Coast Guard inspectors attended El Yunque in November 2015 to focus on the area of the mid body extension, all available voids, cofferdams, and ballast tanks (possible to examine) to get a sound assessment of the vessel's condition. After the inspection, the Coast Guard Sector San Juan emailed ABS stating they were satisfied with the current condition of the vessel. Investigators found no recorded deficiencies for the ventilation trunks from the USCG oversight exams, until a joint ABS Intermediate Survey and USCG expanded oversight exams of El Yunque were commenced in Seattle, Washington on/about April 5, 2016. The ABS survey was not completed because the owner decided to scrap the vessel for business considerations. ABS closed out its survey(s) for El Yunque in October, 2016."

	2) A letter from CAPT [redacted], Acting OCMI, Sector San Juan, to Tote Maritime Puerto Rico dated October 28, 2015, states that: > This internal structural exam will focus on the area of the mid body extension, all available voids, cofferdams, and ballast tanks possible in order to get a **sound assessment of the vessel's condition**. (MBI Ex. 376 (emphasis added).) After the inspection, LCDR [redacted] sent an e-mail to ABS' [redacted] and [redacted] dated November 13, 2015, stating: > Thank you for all of your flexibility and hard work in **ensuring that all is sound with the EL YUNQUE's stability and structure** over the last few weeks. **I am satisfied with the current condition of the vessel …** (emphasis added). As far as the CG oversight exams of El FARO and El YUNQUE, there are no recorded deficiencies for the ventilation trunks, until the Intermediate Survey of EL YUNQUE was commenced in Seattle, Washington on/about April 5, 2016. The survey was not completed because the Owner decided to scrap the vessel for business considerations. ABS closed out its survey(s) for EL YUNQUE in October, 2016.	See above.

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131/l.16	"figure 37" should be "figure 36" **NOTE: It appears that many or all subsequent figures are misnumbered in the text.**	Agree. Modified remaining figure numbers.
131, Section 15-3	Why did the USCG COI refer to drawings for vessels other than the one the COI was issued to? The ICLL Regulations for ventilators did not include requirements similar to 46 CFR 90.10.28. Review compliance with the CFR cite was done by the USCG independent of the ABS review. Note 2 on the drawing requires the presence of closures for penetrations on the 2nd deck, which would imply that there were conditions (emergencies) where they were expected to be used, in conjunction with the everyday requirements noted in Note 5 on the drawings.	Agree- regarding comment "what vessel was COI referring to." Added sentence "This blueprint was for hull 663, the Ponce class vessel Fortaleza." Agree in part- regarding ICLL regulations comment, added sentence "According to ABS, the ICLL Regulations for ventilators did not include requirements similar to 46 CFR 90.10.38. Review of compliance to the CFR cite would have been done by the Coast Guard independent of the ABS review." Disagree- regarding Note 2 comment (appears to be Note 3 on drawing). Note 3 does not provide or imply conditions of use. Only that penetrations are to have "… W.T. Closures and USCG Approved Fire Dampers." Note 3 already discussed in factual report.

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134/ll. 1-7	The Unified Interpretation referenced in Line 5-7 should be identified as LL80, which is only applicable to the Load Line damage in ICLL Reg. 27. The interpretation states as follows: **ICLL Regulation 27(13)(e)** **Subdivision and Damage stability** When any part of the deck outside the compartment assumed flooded in a particular case of damage is immersed, or in any case where the margin of stability in the flooded condition may be considered doubtful, the residual stability is to be investigated. It may be regarded as sufficient if the righting lever curve has a minimum range of 20° beyond the position of equilibrium with a maximum righting lever of at least 0.1 m within this range. The area under the righting lever curve within this range shall be not less than 0.0175 m.rad. The Administration shall give consideration to the potential hazard presented by protected or **unprotected openings** which may become temporarily immersed within the range of residual stability. **Interpretation** Unprotected openings include ventilators (complying with ILLC 19(4) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship. (italics added) As such, this Unified Interpretation has no impact on ventilators for cargo holds, nor does apply to any other stability criteria outside of ICLL Regulation 27.	Agree in part. Modified text in lines 5-7 to reflect "only applicable to Load Line damage." Added direct text from ICLL Reg. 27(13)(e). as follows: "ICLL Regulation 27(13)(e) Subdivision and Damage stability When any part of the deck outside the compartment assumed flooded in a particular case of damage is immersed, or in any case where the margin of stability in the flooded condition may be considered doubtful, the residual stability is to be investigated. It may be regarded as sufficient if the righting lever curve has a minimum range of 20° beyond the position of equilibrium with a maximum righting lever of at least 0.1 m within this range. The area under the righting lever curve within this range shall be not less than 0.0175 m.rad. The Administration shall give consideration to the potential hazard presented by protected or unprotected openings which may become temporarily immersed within the range of residual stability. Interpretation Unprotected openings include ventilators (complying with ILLC 19(4) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading below) for the effective operation of the ship."

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	As IACS Recommendation is not the same as a United Interpretation (UI) or Requirement (UR). It is non-mandatory information/guidance/advice on topics that may be of interest to industry. As the only applicable intact stability requirement (USCG Weather criteria in 46 CFR 170.170) did not have a downflood angle requirement, this interpretation would have no effect on the stability review of the EL FARO. In the damage stability review performed by ABS in 1993 and postaccident calculations performed by both the USCG and ABS, the ventilator opening were considered as downflooding points (disregarding the weathertight covers) in lieu of the supply openings because as the vessel heeled to each side, the exhaust openings were submerged prior to the supply openings.	Other comments regarding UR, applicable stability requirements for downflooding and damage reviews are noted.
135/ Footnote 290	Footnote left blank.	Agree. Added "NTSB Interview, previous Chief Engineer El Faro, El Yunque & El Morro, pg. 49, 27 December 2016."
138	If the anemometer reportedly did not work, how did the VDR get this data?	Noted. Factual report does not provide analysis.
140/l.16	appears "CURVE" should be "CURV"	Agree. Modified text.
144/1.7	"2016" should be "2017"	Agree. Modify text.

NTSB Draft Factual Report for Tech. Review (Pages 151-210)

Page/Sec.	ABS	NTSB – Disposition of Party Comments (9/2017)
158/l.20	appears "general" should be "generally"	Agree. Modified text.
159 ll. 18-22	**COMMENT**: To the extent that the USCG-MSC provided hull models, static analysis, and/or data from its own analysis, ABS would be interested to see if such models or data was updated based on the PIIs' Joint Response (MBI Exh. 418) to the USCG-MSC reports so that any errors in the MSC's analyses may be corrected. Moreover, to the extent that CSRA provides any dynamic analysis, it would be of interest to ABS to review its data and results.	Noted. Draft report available to parties September 2017.
160/ll. 15 -17	**Correction:** sentence should read – "This exercise revealed that the starboard offset of the lube oil pump's suction bellmouth would likely result in a loss of suction at a smaller angle of heel to **port than to starboard**."	Agree. Modified text.

	Comment: Insert at line 7, " … sounding table. The vessel's logs indicate that the sump level may have been less than 26 inches."	Agree. Added footnote as follows: "The Engineering Factual Group report for this accident (NTSB No. DCA16MM001) notes that available engine logs, for the year preceding the accident voyage, show that: (1) lube oil levels predominantly range from about 23 inches to 28 inches (2) About 9 soundings, out of about 1800 recorded entries (soundings), noted the level was 29 inches (3) No record of a soundings more than 29 inches were observed. The last known lube oil tank sounding level, from the engine log for September 1, 2015, was shown to be 26 inches."
161/ll. 1-7	**Comment**: Insert at line 13, " ABS reviewed the design considerations and approvals for the lube oil system, including the approved drawing and advised the USCG-MSC in the PIIs' Joint Submission (MBI Exh. 418)**,** that – (1) ABS approved the lube oil system based on the 1973 ABS Steel Vessel Rules ("SVRs"); (2) that the nominal level for the sump according to the approval for EL YUNQUE was 27 inches or 1,426 gallons of innage; (3) that ABS' approval of the lube oil system does not guarantee that the vessel can conduct sustained operations in the extreme dynamic environment experienced, and most importantly; (4) that EL FARO's lube oil system's approval was proper and in accordance with the ABS SVRs. (see MBI Exh. 418, PIIs' Joint Submission at §§ E-4, E-5 &	Agree. Added text as follows: "ABS reviewed the design considerations and approvals for the lube oil system, including the approved drawing and advised the Coast Guard MSC, that: (1) ABS approved the lube oil system based on the 1973 ABS Steel Vessel Rules (SVR); (2) the nominal level for the sump according to the approval for El Yunque was 27 inches or 1,426 gallons of innage; (3) that ABS approval of the lube oil system does not guarantee that the vessel can conduct sustained operations in the extreme dynamic environment experienced; (4) El Faro's lube oil system's approval was proper and in accordance with the ABS SVRs."

	E-6) ABS provided its own calculation model to demonstrate that the lube oil system meets the criteria set forth by the SVRs and it is applied to the normal operating level of 1,426 gallons. Moreover, the SVRs do not require the lube oil system to function with both the worst case angle of inclination based on 15 degrees athwartship and 5 degrees fore and aft and the sump oil level so low that it triggers the low level alarm. The SVRs do not require the application of additive faults. The system and its approval were found to be compliant with ABS Rules." **Comment**: Insert, "There were no modifications to the lube oil sump in 1993 or 2006, or any request by USCG-OCMI to apply any other requirements under the CFR or ABS SVRs. During this timeframe, the USCG still performed all statutory inspections until the vessel was retroactively admitted into the ACP program by USCG letter dated December 21, 2010. (See, §6.1 Applicable Rules for Alternate Compliance Program.) ABS determined the lube oil sump to be compliant with the 1973 SVR's when it was first approved and confirmed such compliance in the PII's Joint Submission."	Agree in part. Added factual text as follows: "Post-accident, ABS provided its own calculation model to demonstrate that the lube oil system met the criteria set forth by the SVRs, applied to an operating level of 1,426 gallons (ABS stated normal operating level)." Agree in part. Added factual text as follows: "Investigators found no evidence of modifications to the lube oil sump in 1993, 2006 or through the life of the vessel."
163/l.9	in caption, appears "1 1/5" should be "1 ½"	Agree. Modified text.
180	Entry for 0347, green text: "difficultly" should be corrected to "difficulty"	Agree. Modified text.
189	Entry to 0518, font color should be changed to green for the summary text, "Captain expects wind to shift to the north, that they should be on the back side of the storm soon"	Agree. Modified text.
196	Entry for 609, change "mte" to "mate"	Agree. Modified text.

Technical Review of Draft Factual Reports: Herbert Engineering Corp.

Party Comments by email/letter dated: email 8/7/17

NTSB Draft Factual Report for Tech. Review

Page/Line	Herbert Engineering COMMENTS	NTSB – Disposition of Party Comments (9/2017)
P22 / L8	accident voyage.[40] The required sailing GM was 3.655 feet. Therefore, the corrected GM was 0.8 foot above the required GM and 0.3 foot more than the 0.5-foot minimum GM margin incorporated in the CargoMax software.[41] The 0.5 ft min GM margin was not 'incorporated in the CargoMax software', but rather applied/monitored by the crew. The required GM in CargoMax was the value derived directly from the CFR req't and did not contain this operator selected margin. "	Agree. To make clear, modified text to "owner-required" and "GM margin is not a statutory requirement." Additionally changed text on pg. 24 to reflect HEC email stating GM margin was "owner-applied."
P29 / L30 Footnotes 66 and 69, 70	"statuTes"	Agree. Modified to "statutes"
P75/L7	HECSALV~~E~~	Agree. Changed.
P89 / L2	"RTWHs" should be "RWTH" as indicated on Fig 8. ?	Agree. Changed text on page 89 to RWTH. Also, text added to page 86 as follows: The General Arrangement drawing abbreviations table notes "RHWT" as "raised hinged watertight." However, the drawing shows an abbreviation of "RWTH" for seven raised watertight hatches "raised hinged watertight (RHWT)" accesses on the second deck providing access to the cargo holds below (not RHWT per the abbreviations table).

Technical Review of Draft Factual Reports: TOTE, Inc.

Party Comments by email/letter dated: August 7, 2017

NTSB Draft Factual Report for Tech. Review

Page/Line	TOTE PARTY COMMENTS	NTSB Disposition of Party Comments (9/2017)
P7, Table 1	We are not aware of any specific document that specifies a design speed of 24.5 knots. The EL FARO's maximum service speed for the Puerto Rico run was approximately 20 knots, as set forth on page 4 of the nautical operations group factual report.	Agree. 24.5 taken from data that may have been for 700-foot vessel. Modified table text and value to reflect 20 knot service speed as El Faro.
P8 L5-8	We believe the Ponce class history is inaccurate. The draft language states that Hulls 673, 674, and 675 were all built to 790 feet. However, hull 673 (Great Land) was stretched after construction; hull 674 was first named the Saudi Bear before changing to Atlantic Bear; finally, our info says Hull 674 was originally launched as the first Westward Venture and was operated in the Alaska trade for a few months, before being replaced by the Westward Venture (Hull 675)."	Agree in part. Added clarifying text for hull 674 name. Hull 673, per TOTE attorney correspondence letter to MSC in 1 February 2002, states that "The GREAT LAND was built to plans for a shorter vessel but lengthened to its current size before leaving the Sun shipyard in 1975." Added sentence to reflect this.
P11 L13	- add "to" in "last Ponce-class ship to be so altered."	Agree. Modified text.
P16 L3	delete ")" after "oil"	Agree. Deleted.
P19 L2-6 P19 L10-12	In regard to the applicable regulations after a major conversion, the draft language uses the phrase "selectively applied." We believe this is subject to various interpretations, is potentially misleading, and needs to be more clear. In these sections, we recommend alternative language, such as: "…new regulations were applied to the extent deemed 'reasonable and practicable' to do so by the Coast Guard…."	Agree. Modified paragraph. Deleted "selectively" and added "as reasonable and practicable."
P20 L1-3	To make it clear that the enrollment date - whether it be 2006 or 2010 - does not affect which ACP Supplement applies. The current wording suggests a different ACP Supplement might apply depending on whether enrollment was 2006 vs 2010. For clarity, we recommend the following language be added to clarify this: "Whether the enrollment date was 2006 or 2010, the 2003 Supplement would be the most recent, and therefore, the applicable Supplement.").	Agree. Modified paragraph and added sentence stating "The 2003 supplement would have been used for either a 2006 or 2010 ACP enrollment date."

P20 L10-12 P21 table 4, footnote 36	Please note that table 4 refers to the "Spinnaker Print," and in the footnote refers to MBI exhibit 069. MBI exhibit 069 is the stow plan, but this document includes (a) the spinnaker printout for (lo-lo cargo) and (b) a handwritten stow plan for the ro-ro cargo. Thus, the draft report suggests that "Spinnaker" program was used for both lo-lo and ro-ro cargo, but it was not. The spinnaker printout in MBI Exhibit 39. The testimony which supports this is as follows: PORTUS utilized the computer program Spinnaker to prepare the stow plan for the Lo-Lo operations. [redacted], MBI 02/20/16, pp.13-14). For the Ro-Ro operations, PORTUS used a handwritten stow plan. ([redacted], MBI 02/20/16, p.14). We ask that the draft report be clarified. Also, it is more accurate to say that PORTUS terminal/stevedore personnel used Spinnaker, rather "shoreside TOTE terminal managers in JAX" used Spinnaker to load the vessel. See MBI testimony cited above. We ask that this be made clear.	Agree. Clarified paragraph by noting Spinnaker was used by PORTUS for Lo/Lo cargo and Ro/Ro cargo was accounted for through a separate hand-written stow plan by PORTUS. Revised footnote. Kept that TOTE terminal personnel inputted both Lo/Lo and Ro/Ro cargo values manually to CargoMax.
P22 L8-9	The minimum GM margin was not "incorporated into the CargoMax software." For accuracy, we recommend this part of the sentence be removed.	Agree. Removed text.
P22 L10	The language states that "TOTE required…" and supports this assertion with testimony of TMPR personnel (rather than TSI personnel). In this regard, the language conflates the roles and responsibilities of TOTE (TSI) and TMPR. We ask that what TOTE "required" be made clear. As an initial matter, there was no requirement - by Tote or TMPR - that the vessel have a trim 3 to 4 feet by the stern and no formal requirement that the available deadweight be a minimum of 100 LT:	Agree in part. Added SOP Section 3 and 4.1.7 to report in new paragraph for clarification. Added SMS paragraph.

	TMPR's policy states: "4.1.7 Safe, acceptable sailing conditions for each vessel, at a minimum, are .50 or greater GM margin, positive available deadweight, a list of no more than 2 degrees (preferably no list), and the stern down for trim." See MBI Exhibit 091 at p. 2. We also ask that the language also better describe the proper role of TMPR personnel, in regard to stability, by citing the following language from MBI 091: 3.3The Vessel Master is the final authority for approving/resolving any stowage issues. The Marine Operations Department will insure that the appropriate Terminal Operations Department will stow the vessel in accordance with the Vessel Master's decision(s). 4.1.5 Marine Operations will advise/coordinate with the Vessel Master/Chief Mate throughout the loading operation as to ballasting requirements to ensure safe and optimum trim and stability. TOTE's policy (SMS) is essentially set forth in OMV section 5.7: It states that the Master is responsible for the stability of the vessel, and shall ensure that the vessel is at all times maintained within the allowable stability limits. On board (approved) computer programs and loading computers shall be used to help determine the vessel status with respect to stability. The Chief Mate is responsible for the calculations and will submit a report to the Master on the vessel's stability prior to departure. Approximate limits on uncorrectable list and trim are set forth as follows: no > than 2 degrees list; no > 2' trim by the head or >10' by the stern. See OMV Sections 5.1.2 and 10.13.7.3.	Revised "TOTE required" to "the TOTE Maritime Puerto Rico terminal manager who inputted PORTUS Lo/Lo and Ro/Ro loading information into CargoMax for El Faro stated that for departure he looked to have…" Note that in the interview of TMPR terminal manager, he stated that El Faro was loaded to keep 0.5 feet GM and 100 LT available deadweight and 2 to 3 feet trim.
P22 L13	We believe that the written language in the printout reads "AWT" (Available Weight). We request that this be corrected.	Agree in part, as handwritten symbol is unclear. Added text to include "or "AWT=478"

P24 L2	For clarity, we recommend that the language "while Ro/Ro cargo trailers included a chassis" be replaced with "while for Ro/Ro cargo trailers that would also include the weight of the chassis"	Agree. Changed to match suggested text.
P24 L5 L8	See comment above regarding Spinnaker; it was not used to load ro-ro cargo.	Agree. Modified text. Additionally, added sentences to paragraph to reflect more detail on loading procedure.
P24 L6-12	It is incorrect to say that there were only two input values per cargo hold (port and starboard). Only a few of the holds had just two locations, while most of them had three (port, center, and starboard). See, e.g., CargoMax MBI Ex 59, p.5, which shows three inputs for holds 2B, 2C, and 2D; see also the final stow plan, MBI Ex. 69, which shows the few holds that have two inputs versus the vast majority that have three inputs. We ask that this language be clarified.	Agree. Modified paragraph.
P24 L15-16	The draft factual report states: "About an hour before departure, the shoreside loading manager met with the chief mate on the vessel." As a general matter, we request that the term "loading manager" (also at P.24, l.7) more properly refer to this person ([redacted]) as the "terminal Marine Operations Manager." Furthermore, the description of the process is incomplete. Specifically, there is no discussion of the ongoing dialogue and discussion between the terminal Marine Operations Manager and the Master/Chief mate, leading up to the Chief Mate's review of the stability information. There are no citations to evidence in this section of the report, so it is difficult to determine basis for certain language. More accurately, and as supported by the cited testimony below, we ask that this sentence be replaced by the following language: According to the terminal Marine Operations Manager (as well as the Terminal Manager if he was filling in for him), there was typically continuous, ongoing discussions with the Master and Chief Mate, after cargo operations began and throughout the day up to the point of the vessel's departure, regarding the loading of the vessel, the GM of the vessel, and the available deadweight (i.e.	Agree in part. Left "About an hour before departure." Changed title of "loading manager" to "terminal Marine Operations Manager." Added several additional sentences with citations per TOTE suggested language per review of MBI testimony to further detail loading.

	amount of additional cargo that could be loaded within allowable limits). *See* MBI [redacted]s, 2/20/2016, pp. 197-198; pp. 176-177. *See also* NTSB [redacted], 10/13/2015, 15, 16, and 22. At the conclusion of cargo operations, the terminal Marine Operations Manager (or Terminal Manager if filling in) would deliver the CargoMax printout, with a flash drive containing the final CargoMax loadcase. *See* MBI [redacted], 2/20/2016, p. 178. The Chief Mate would initially conduct a brief review of the CargoMax printout. *See* MBI [redacted], 2/20/2016, p. 178. See also MBI R[redacted], 2/20/2016, at p. 128. The purpose of the ongoing dialogue described above was to ensure there were no surprises for the Chief Mate and/or Master, when these final stability documents were delivered to the vessel at the conclusion of cargo operations. See MBI [redacted], 2/20/2016, p. 197. After the Chief Mate received the CargoMax loadcase, the Chief Mate would typically return to the vessel to review the stability information, including review of the loadcase using CargoMax onboard the vessel, prior to departure and make a report to the captain. MBI [redacted], 2/25/2016, at p. 137-138. We do not believe there is evidence to suggest that the terminal operations manager opened and reviewed the CargoMax load case "with the shoreside loading manager", as suggested in lines 18 and 19. However, the testimony does indicate that the CargoMax *printout* was typically reviewed in the presence of the terminal Operations Manager.	See above.
P24 L17-18	For clarity, recommend final language replace "(case)" with "(load case)" and "loading case" with "load case" in two locations	Agree. Revised text.
P26 L6	For clarity, we ask that the language be revised to state that "…ABS approved the stability test results on March 22, 2006."	Agree. Revised text.
P26 L9	The word "at" appears to be included in error. We also note that 46 CFR Subchapter S does not require *all* vessels to have a T&S booklet or stability booklet onboard; but it is accurate to say that Subchapter S required the EL FARO to have a Trim and Stability Booklet onboard.	Regarding "at," agree, revised text. Regard Sub. S, modified text to reflect that a simplified stability letter may suffice.

P27 L1-4	The language addressing the versions of CargoMax at lines 1-5 on page 27 is incomplete and, as a result, potentially misleading. The language might imply that there was a material difference - which would lead to different stability calculation results - between versions 1.21.162 and 1.21.203. However, the evidence shows that this is not the case; instead, there is no material difference between these versions of the programs, according to the testimony. In addition, the language suggests that the software used on the EL FARO (version 1.21.203) was "not ABS-approved" - that is not complete or accurate. (Note also the typo - it should read "ABS"). There was no legal requirement - or even an expectation - that the software be re-approved after issuance of version 1.21.203, and, in fact, the software supplier advised the vessel owner that version 1.21.203 need not be re-approved. Accordingly, we ask that the following evidence be noted in the report. 1. During an interview with the USCG (and NTSB), on April 18, 2016, Herbert Engineering Corporation (Mr. [redacted]) confirmed that the 2007 version (1.21.0162) used on the EL FARO was approved by ABS and employed the same basic methodology and code as the version used for the EL FARO (and shoreside staff) (1.21.0203) through 2015. In other words, all versions of CargoMax used by the EL FARO since the 2007 ABS approval would produce the same resulting stability calculations. 2. During his MBI testimony, Mr. [redacted] further confirmed: "So when we look at our software in the case of the El Faro we have version 1.21 and then there's a third build number of point, I forget what the exact number is. That last build number would be implemented. So at the time the software philosophy was the major version is the number 1, that doesn't change except for major, major version enhancements. The second digit, the minor revision number indicates a change to the program that would cause calculated numbers to change. …[a]nd so the idea there is that if I had a CargoMax that was in 1.15 and then I gave it,	Agree. Added text reflecting that although versions were different the CargoMax Product Manager stated that he expected the same calculated results. Added text that El Faro's 2/2008 version was clearly class-approved. Added text reflecting CargoMax Product Manager did not believe minor version changes required contacting ABS and inquiring for re-approval of software. Added text reflecting CargoMax Product Manager was confident that in 2/2008 the shoreside had the same version as on the ship.

	CargoMax 1.21 I did not have a guarantee that those would give me the same exact numbers.…[a]nd then finally that last build version is basically any change that was either in addition of a new feature or a fix to a user interface issue that would not cause any values to change. And so the expectation was that if [for example] I had a ship with version 1.21.100 and I gave it version 1.21.105 the numbers of the calculated results and my results in my printouts would be identical." See MBI 5/23/2016, pp. 138-139. 3. Mr. [redacted] further confirmed in his MBI testimony that the differences between version 1.21.162 and 1.21.203 did not warrant a re-approval of the software by ABS. ("At the time the assumption was made and this was presented by myself to SeaStar at the time that I did not feel that this would warrant a re-approval or a resubmittal to ABS in a re-approval process.") MBI 5/23/2016, In his NTSB interview, Mr. [redacted] again confirmed: 4. "Specifically for the El Faro we delivered and we had, we received ABS approval in February of 2008. And we delivered the software and I am confident that the guys using the software on the shore were using the same version that was used on the vessel. In subsequent updates of which we provided two to my knowledge, those changes did not have any direct effect on any calculated numbers within the program. So, I think that SeaStar was in a position to make sure that their programs were the same both on the shore and on the ship even with these updates. And even if they weren't the results of the calculations if one version was out of sync with the other, there should have been no appreciable difference in what their programs were calculating." We request that the above testimony be cited and discussed, to ensure there is clarity that there is no material difference, affecting the calculations, between versions 1.21.162 and 1.21.203.	See above.

P28 L13-18	To be accurate and complete, this section should note that, although the USCG COI was not updated to reflect the proper version of the approved T&S booklet, the USCG was in fact notified of the approval in 2007 by ABS, and was provided a copy of the most up-to-date T&S Booklet. See MBI Exhibit 253, at p. 2.	Agree. Added text.
P29 L1-6	We believe this language is misleading, in several respects, in that it suggests there was a blanket legal requirement that "recommendations in the IS[O] code are to be considered as requirements." The language, as written, fails to acknowledge that the 2003 ACP Supplement states that vessels could satisfy either 46 CFR Subchapter S, or, as an equivalency, the Code on Intact Stability (IS Code), as reflected in IMO Resolution 749 (18). The EL FARO was not, by contrast, required to satisfy both. Since the EL FARO satisfied 46 CFR Subchapter S, the IS code provisions - including the recommendations in the IS Code - are irrelevant. 46 CFR 170.110 does not by its terms require approval of stability software, but merely authorizes the use of "on board electronic stability computers". We ask that this section more accurately describe the legal requirements with respect to the use of stability software.	Agree in part. Added text to reflect 2003 ACP that vessel could satisfy either. Analysis of ACP supplements and legal requirements noted. Added text stating 46 CFR does not require approval of software.
P29 fn69	Recommend fixing typo - replace "statues" with "statutes".	Agree.
P30 L6-8	For clarity and accuracy, we request the word "help" be placed in front of "meet." In addition, there was nothing unusual about the manner in which the EL FARO's officers used the stability booklet in relation to the onboard stability software. To present a fair and complete statement of the evidence, we further ask that the following sentence be added to line 8 at the end of the sentence:	Agree. Added "help." Agree. Added text and reference.

	The Vice President of Herbert-ABS Software Solutions, LLC testified that use of CargoMax in this manner was "extremely normal" in the maritime industry. See NTSB [redacted], 2/8/2016, p. 41. Since its inception, CargoMax has been installed and used on over four thousand vessels worldwide. Today, CargoMax is used by most U.S. operators of commercial cargo vessels. ([redacted], MBI 05/23/16, p.28).	Agree. Added text and reference.
P30 L8-9	The language states that "ABS had not approved that module", referring to the strength features of cargo max. This language is incomplete and erroneously implies that Tote should not have been using the program to evaluate the vessel's stresses and bending moments, when in fact there is, in the first instance, no requirement applicable to the EL FARO to calculate and evaluate stresses and bending moments. We ask that the language clarify certain issues which are not in dispute. As an initial matter, the EL FARO was not required to have a loading manual, and therefore a loading instrument (such as the strength module of CargoMax) was also not required on board the vessel. MBI [redacted] 5/20/2016, at 181 and 186. When no loading manual or loading instrument is required, such as in the case of the EL FARO, often the loading conditions are fairly uniform throughout the structure and therefore ABS does not require or give any operational guidelines to address loading the vessel to stay within the vessel's structural limitations. MBI [redacted], 5/20/2016, at 181 and 186. In other words, there was no legal or class requirement for the EL FARO's personnel to calculate stresses or bending moments, either with a loading manual or loading instrument. Though not legally required to calculate those bending moments and stresses, the mates and Master onboard EL FARO did so, and used the best resources available (CargoMax strength module). Put differently, had Tote not calculated bending moments and stresses at all, it would have still satisfied all regulatory requirements. It is hard to understand why it would be improper for Tote's personnel to exceed regulatory requirements, by using CargoMax for this purpose on the EL FARO, when they are not required to makes such assessments and calculations in the first instance. We request that the above facts/citations to evidence be appropriately cited, and the discussion regarding the absence of ABS approval be placed in more fair and accurate context.	Agree. Added text to reflect that the vessel did not have statutory requirement for loading manual and therefore CargoMax strength module was not required. Added text that installing and using strength module was in excess of requirements.

P30 L3-14	The language regarding the loading of the vessel is incomplete. It fails to reflect that, under TOTE's SMS and under applicable law, the authority and responsibility for loading the vessel rested with the Master and Chief mate, and that shoreside personnel performed their functions under the direction of the vessel's personnel. See OMV 13.2. Accordingly, to be fair and accurate, we request that the following language be added at line 14: "…CargoMax software, at the direction of the Master, Chief Mate, and those mates standing in port cargo watch."	Agree in part. Language regarding CargoMax software "at the directions of…" is not found in OMV Rev. 18 9/12. Added text to reflect that OMV 13.2 states master and chief mater responsible for stowage and stability.
P.30, ll14-16	The draft language notes that shoreside personnel used CargoMax ashore, but that the program was never witnessed by an ABS surveyor, never received annual checks, and was "not approved by ABS." This is an incomplete and misleading statement in several respects. To be more accurate and complete, we ask that this sentence be revised, in accordance with the underlined: The shoreside software version of the program was the same as the software used aboard *El Faro*. The ~~shore side~~ CargoMax program installed on computers ashore was never required to be separately witnessed by an ABS surveyor, never required to receive~~d~~ annual checks similar to class requirements for the onboard program, and was not required to be separately approved by ABS. According to Herbert-ABS Software Solutions, LLC, companies were permitted by them to install CargoMax on shoreside computers (in addition to being installed on the vessels); he further testified that there was not an issue or problem with shoreside personnel using the program ashore (and it not being subject to a separate approval/annual survey), so long as it is the same, approved version of the software being used on the vessels. See NTSB [redacted], 2/8/2016, pp. 41-43. In the case of the EL FARO, the Vice President of Herbert-ABS Software Solutions, LLC testified that he regularly interacted with shoreside personnel from the company, sent the	Agree in part. Added text to reflect that installation of same version ashore on computers was permitted by Herbert-ABS Software Solutions. Text that shoreside version was same as shipboard version previously added per TOTE comment P27 L1-4. Added text that shoreside program was not found to require ABS survey, checks and approval. Added text to pg. 27 of report reflecting that parties to this investigation (Herbert Engineering, ABS, and TOTE) agreed that the manner in which CargoMax was approved and used on board the EL FARO, was typical of existing maritime industry practice. "

	approved software to shoreside personnel, and that he was confident that the company was using the same approved version ashore as was being used on the vessels. See NTSB [redacted] Interview, 2/8/2016, pp. 43-45. Moreover, various parties to this investigation (Herbert Engineering, ABS, and TOTE) agreed that the manner in which CargoMax was approved, and the manner in which it was used on board the EL FARO in practice, was typical of existing maritime industry practice. See Joint PII Submission to MBI, transmitted to the NTSB by letter dated May 4, 2017, at par. C-2, p. 24. To be fair, accurate and complete, we ask that the evidence cited above be incorporated into the factual report, as drafted above.	See above.
P31 L8	The draft language appears to assert that the electronic CargoMax loadcase file and other stability information was provided to the Chief Mate "about ten minutes" prior to the EL FARO's departure. We strongly believe this is a misinterpretation of the transcript, and, in addition, the draft report fails to acknowledge other objective evidence which shows that the stability information was provided well earlier than the "ten minutes" before the vessel departed. First, the transcript cited in the draft report indicates that the question posed to Mr. [redacted] was: "what time do you meet with the chief mate at the dock when you come to the dock and he comes down and takes the, I think you said he took the drafts --" Mr. [redacted] responds "About ten minutes before he depart." Then when asked what time of the day is that approximately, Mr. [redacted] replied "[i]t's about 1900, 1950,(inaudible)." See NTSB (uncorrected), 12/4/2015, p. 11.	Agree. Deleted reference to "10 minutes." Added text with objective time evidence and note that between 1854 and 1915 was the meeting. Added text to reflect "30 to 45 minutes" as the time of delivery and text to completion of cargo times with references. Revised text to reflect ABS interview that "less than an hour," not "10 minutes" was not enough time to review in his opinion.

	It is far from clear what the above testimony really means, and the draft factual report should not suggest otherwise. In fact, the question itself is somewhat ambiguous. Mr. [redacted] use of the words "before he depart" suggests he was not referring to the the vessel's departure, but instead the chief Mate's departure from the dock onto the vessel. In other words, we believe Mr. [redacted] is stating in his testimony that be believes the Chief Mate took the drafts about ten minutes before "he" - the Chief Mate - departed the dock and went aboard the vessel. We have conferred with Mr. [redacted] regarding this testimony and he has confirmed our understanding is correct. In addition, we have confirmed with him that the time frame he states "1900, 1950,(inaudible)" was intended to convey (based on his memory) the approximate time frame between when he met the Chief Mate and the vessel departed. Second, and perhaps more importantly, the draft report fails to include other significant evidence (testimony and cargo documentation) which shows that the stability information was provided to the Chief Mate far earlier than the "ten minutes" prior to departure, as is suggested in the draft report. • Mr. [redacted] was directly asked: "Approximately how much time did the Chief Mate spend with you reviewing the CargoMax printout?" to which Mr. [redacted] responded "[a]bout five to ten minutes." See MBI 2/20/2016, at p. 127. • At the MBI, he was also more clearly asked "how many minutes before the vessel departed did you meet with the Chief Mate?" Mr. [redacted] responded "I can guess in about, you know, the time that we had the vessel and the vessel depart about 30 to 45 minutes." See MBI 2/20/2016, at p. 127. To be complete and fair, this testimony must be included in the draft	See above.

	factual report. In addition, Mr. [redacted] testimony merely reflects his best recollection of the time period, prior to departure, in which he delivered the stability information to the Chief Mate The draft report has not addressed or included other objective evidence, that is far more probative of the facts and timeline. We ask that this section of the factual report include and address following additional corroborating evidence: • At the conclusion of cargo operations, Mr. [redacted] (or his stand-in) delivered a hard copy of the stow plans (Ro-Ro and Lo-Lo), the reefer manifest, the dangerous cargo manifest, a hard copy of the CargoMax summary printout, and a flash drive with the current loadcase to the vessel's Chief Mate. ([redacted], MBI 02/20/16, p.21); ([redacted], NTSB 12/06/15, p.24); [redacted], MBI 02/18/15, p.29); ([redacted], NTSB 11/03/15, pp.90-91); ([redacted], MBI 05/16/16, pp.40-41);([redacted], NTSB 03/30/16, p.324). • On September 29, 2015, Ro-Ro cargo operations concluded at 1830 (6:30 PM) and Lo-Lo cargo operations concluded at 1854 (6:54 PM). *See* MBI Exhibit 4, at p.93. • As a matter of procedure, once the Chief Mate reviews the cargo documentation and stability printout with shoreside staff, the Chief Mate signs the dangerous cargo manifest. In the case of the EL FARO's last voyage, that documentation, with the Chief Mate's signature, was scanned into the computer by Mr. [redacted] at approximately 7:15 PM. See email from KM2204@seastarline.com at 7:15 PM on September 29, 2015. The Chief Mate's signature is on this document on page 21/21 of the dangerous cargo manifest (and page 34 of 65 of the PDF attached to his email). The Chief Mate must have signed this document before 7:15 PM on September 29, 2015..	See above.

	• The above referenced documentation shows that the Chief Mate was provided the cargo and stability information packet by Mr. [redacted], and signed the documentation, between 6:54 PM, but not later than 7:15 PM (when his signature page was scanned). • The EL FARO departed its berth (last line) at 2007 (8:07 PM) on September 29, 2015. MBI Exhibit 4, p. 93. This evidence further corroborates Mr. [redacted] recollection and testimony that he met with the Chief Mate and provided the stability and cargo documentation "about 30 to 45 minutes" before the EL FARO departed, and the time frame between when he met the Chief Mate and when the vessel departed was between "1900" and "1950." See MBI 2/20/2016, at p. 127 and NTSB (uncorrected), 12/4/2015, p. 11. In fact, the objective evidence and documentation described above suggest that Mr. [redacted] met with Chief Mate possibly as much as an hour before departure on the accident voyage. We ask that the above facts be included in the draft factual report.	See above.
P.33, l.9	For accuracy and clarity, recommend replacing "in calm conditions" with "in static sea conditions, assuming no wind and wave action."	Agree in part. Added suggested text and left existing text.
P.34, L.19	For clarity, recommend replacing the phrase "improve the robustness" with "enhance the stability characteristics".	Agree. Deleted and added text.
P36 L20	"Is" should read "It".	Agree. Modified.
P39 L14-15	For clarity, recommend removing "Ro/Con" and replacing with "satisfaction of", and inserting the word "requirements" after the word "stability."	Agree in part. 1) removed Ro/con for clarity per comment. 2) text "satisfaction of" and "requirements" not found in sentence. Therefore, no change.
P40 L7	For clarity, recommend replacing "(ventilation)" with "(intake)".	Agree. Added "intake (supply)" text after
P~~51~~ 41 L5	Replace "seperating" with "separating"	Agree. Fixed typo.
P41 L18	Replace "assesment" with "assessment"	Agree. Fixed typo.
P.45 L4	The language as written suggests that damage stability calculations are required to be kept on board the vessel. We are not familiar with such a requirement. We ask that the draft factual report provide a citation, if this is the intention, or the language be clarified.	Agree. Modified and added text to reflect comment that they are not required to be on board.

P.45 L11	The language implies that a damage control plan was required for the EL FARO. SOLAS Chapter II, Part A, Reg 1, and Part B-4, Regulation 19, the requirements pertaining to damage control plans apply to dry cargo vessels built constructed on or after 1 February 1992, as the draft report correctly states on page 54 line 4. Therefore, the regulation requiring a damage control plan does not apply to the EL FARO due to the vessel's construction date. We are not aware of any evidence which suggest ABS and/or the Coast Guard attempted to apply this	Noted. The factual report says to (see section 10) for information on requirements for damage control plans. Added text and link to section 10.
P48 L15-16	The word "that" is repeated at the end of line 15.	Agree. Deleted extra "that."
P50 L6	The language suggests a "stability booklet" is required for all vessels. That is not the case. For clarity, recommend clarifying that a stability booklet was required for the EL FARO, and provide relevant citation.	Noted. This section is CFR for stability booklets in general, not for El Faro specifically.
P54 L13-16	The definitions of watertight and weathertight appear to be repeated from page 53. Recommend this not be repeated unless there is a reason for including these twice.	Disagree. One definition from USCG Policy Notes, other from ABS Load Line Technical Manual.
P61 L5	The language appears to be missing the words "table of" before the word "contents." In addition, revision date in the graphic appears different than the text. It is unclear what is being said here; request this be made clearer.	Agree. Modified and added text to clarify that 5.10 had a revision date of 3/96, while section 5 overall had revision date of 8/05.
P61 L8	The draft report states that the Emergency Preparedness Manual current at the time of the loss of the EL FARO was rev. 0 3/96. This is not correct. The version in effect at the time of the loss of the EL FARO was Rev. 13 dated 4/14.	Agree. Modified text.
P61 fn161	LOC should read "TOC".	Agree. Modified text.
P62-65	This language discusses in detail the requirements for damage control plans. It implicitly concludes on page 64 and 65 that a damage control plan was required for the EL FARO, and one was requested by investigators but one was not provided. The draft language implied that the EL FARO was legally required to have a damage control plan, but didn't. We disagree. As correctly stated on page 64 line 4 of the draft report, SOLAS Chapter II-1, Part A, Reg 1, and Part B-4, Regulation 19, the requirements	Noted, and agree in part- Regarding discussion of requirement of Damage Control Plan: Added text stating there was no evidence that the Coast Guard required a DC Plan for El Faro.

	pertaining to damage control plans apply to dry cargo vessels built constructed on or after 1 February 1992. The apparent asserted basis for concluding that this regulation did apply to the EL FARO is that there were "substantial modifications" to the vessel in 1993 and 2005. We assume the intent of the draft language was to refer to the term "major modification" as defined in 46 U.S.C. 2101 (14a). The modifications to the vessel in 1992 (lengthening) were deemed a "major conversion" by the Coast Guard, and the modifications in 2006 (ro/con configuration changes) were not deemed a "major conversion."[1] See MBI Exhibits 422 and 13, respectively. With respect the application of SOLAS Chapter II-1 to existing cargo ships constructed prior to 1992, which undergo a major conversion, application of new standards is limited only to those "repairs", "alterations", "modifications" being performed and associated "outfitting," and only if the flag administration [in this case the Coast Guard] determines it is "reasonable and practicable" to do so. *See* SOLAS Chapter II-1, Regulations 1, par. 1.3.4 and par. 3. This is consistent with the Coast Guard's determination at the time of the major conversion determination, in which it stated "all aspects of the vessel not being modified may remain as is." See MBI Exhibit 422 at p.2. There is no language in the SOLAS regulations, or any regulation, policy, or determination issued by the Coast Guard that we are aware of, that would broadly extend application of new regulations and standards to operational plans or requirements, such as a damage control plan. It appears that this section of the draft factual report is focused on the information and guidance that a damage control plan, if one would have been required, may have provided to the Master of the EL FARO, in terms of the location of watertight closures and other openings affecting	See above.

[1] When modifications (a) substantially change the dimensions or carrying capacity of the vessel; (b) changes the type of the vessel; (c) substantially prolongs the life of the vessel; or (d) so changes the vessel that it is essentially a new vessel, then the modifications are considered a "major conversion" under U.S. law. See 46 U.S.C. 2101 (14a). Under the applicable law, these determinations are made the Coast Guard.

	the watertight integrity of the vessel. However, much of the information contained in a damage control plan was, in fact, readily available on the vessel, as part of TOTE's operational and emergency procedures. The draft factual report does not address this, but in our view it is relevant. Accordingly, we ask that the following facts be added to the factual report: 1. The EL FARO had onboard a Fire Control & Safety Plan the vessel posted in close proximity of the pilot house, similar to the plan used on the EL YUNQUE, as required of all TOTE managed ships under TOTE's operational and emergency procedures (i.e. TOTE's SMS). See OMV 9.4 and EPMV 2.6.1. See MBI Exhibit 134 (SS EL FARO Fire Control & Safety Plan). 2. The Fire Control & Safety Plan contained information regarding the location and operation of various fittings, systems and equipment on the vessel, including but not limited to: watertight doors, scuttles, hatches, cargo hold and engine room ventilation openings and closures (exhaust & intakes), fire dampers, bilge/ballast pumps, emergency generator, and a variety of remote shutdowns/controls (e.g. for ventilation systems, emergency fire pumps, general alarm, etc.).	Regarding comment on Fire Control and Safety Plan: Agree. Added paragraph describing plan per comment and additional sentences on investigator review of plan regarding cargo hold ventilation and scuttles. Added reference to plan.
P65 L6-10	With regard to sections 10.1.2, 10.1.3, and 10.1.4, we request that it be made clear and emphasized that the VDR transcript only recorded those discussions on the bridge which were audible (much was inaudible), and the VDR does not capture conversations which occurred elsewhere on the vessel. One cannot say definitively whether the crew consulted onboard stability resources.	Agree in part. Added footnote describing VDR recording specific to bridge. Modified text to be specific to "officers on the bridge" regarding evidence of using stability resources.
P67	With regard to the discussion of NVIC 10-81, we request that the date of this policy guidance be included in the draft factual report (October 5, 1981).	Agree. Added in footnote.

P70 fn177and 178. P71 fn 179 and 180	We have not been provided a copy of the documents from the Coast Guard, referenced in the footnotes. We request that these documents be provided to us, so that we may determine whether additional comment is warranted.	Noted.
P76 L6	The term "naval architect" should state "port engineer". Mr. [redacted] served as a port engineer for Tote and communicated with the RRDA.	Agree. Modified text.
P 76 L14-15	This is not accurate. It should state: "(originally showed 346 LT each, corrected to 246 LT each)."	Agree. Modified text.
P76 L16-19	To be more accurate, we request that the language "at the time of the sinking" be replaced with "at the time of the reported incident".	Agree. Modified text as follows: "… at the time of the reported incident (later found to be near the sinking time)."
P9 L5	The discussion of lube oil sump operating levels is incomplete and misleading. The draft report appears to rely on the testimony and recollection of two previous chief engineers (Mr. [redacted] & Mr. [redacted]) in regard to the normal operating lube oil sump operating levels. To some extent their recollections conflict, but the draft factual report does not address the standard operating procedures set forth in the main engine operating manual, related procedures defined by the manufacturer, the vessel's approved plans, and the operating records (i.e. engine logs). The addendum also fails to point out that Mr. [redacted] recollection of standard operating procedures, with respect to normal operating levels, was based on his experience on the EL FARO from 5 years earlier and is, in any event, inconsistent with the engine logs and operating manuals. The factual report fails to focus on the approved operational procedures of the system by the manufacturer, which is corroborated by the available records (engine logs), the approved plans, and the testimony of engineers with more current operational history than Mr. [redacted]. (e.g. Mr. [redacted]) Accordingly, we ask that the addendum be revised to reflect the following undisputed facts: 1. The engineer who testified on February 8, 2017, regarding standard operating procedures for maintaining lube oil levels (i.e. 28	Noted. 1) TOTE comments are to page 9, the Naval Architectural factual regarding operation of El Faro and similar vessels begins on pg. 79. TOTE comments speak to an "addendum." It appears comments are to another factual report, the engineering report. 2) Section beginning pg. 79 was to ascertain what heel and roll angles previous engineers recall, and what difficulties they might have had at those angels, and what lube oil levels they might recall at that time. It is not to describe the operating levels typically run in oil sump. 3) Added footnote: "For details on main engine lube oil sump levels and operations see the engineering factual report."

	to 32 inches), was testifying from memory and had last served onboard the Ponce Class vessels in 2012. 2. The operating instructions for the main engine lube oil system on board the EL FARO states as follows: "When necessary, add lube oil from the storage settling tank to the sump via purifier to maintain a normal level at 27 inches. Record the amount added in the 12 logbook." See MBI Exhibit 384. 3. The USCG/ABS approved drawings, as well as the main engine operating instructions (MBI Exhibit 320) indicate the following levels: High 2020 Gallons Operating 1476 Gallons Low 724 Gallons 4. The main engine lube oil soundings table (MBI Exhibit 350) indicates the above levels correspond to the following approximate soundings: Level Amount Sounding High 2020 Gallons 33 inches Operating 1476 Gallons 26.9 inches Low 724 Gallons 18 inches 5. The off duty Chief Engineer from the EL FARO, who departed the vessel on August 11, 2015, began serving as Chief Engineer on the EL FARO in 2006. See NTSB Testimony pp. 5-6. The off duty Chief Engineer also testified that the main engine lube oil system was normally run at a level of around 27 inches. MBI, 2/23/16 at p. 97. 6. According to the Machine Operating Manual for the EL FARO,	See above.

	the lube oil sump had a low level alarm set at 18 inches and the high level alarm was set at 33 inches. See MBI Ex. 320, p. 3. 7. The available engine logs, for the year preceding the accident voyage, reveal that the lube oil levels for the main engine predominantly range from approximately 23 inches to 28 inches. On approximately 9 occasions, out of approximately 1800 soundings, the level recorded was 29 inches. No soundings more than 29 inches were observed in the any of the records available for the year preceding the accident voyage. 8. The last known lube oil tank sounding level, from the engine log for September 1, 2015, was shown to be 26 inches. 9. The pipe used to fill the main lube oil sump directly from the lube oil storage tank, which can be used to bypass the lube oil purifier, is approximately 1 inch in diameter.	See above.
P79-P83	The order of presentation appears to not be in chronological order. Consider re-ordering for clarity.	Disagree. Coast Guard rules in recent to old, then ABS from recent to old presented chronologically.
P85 L12-15	Consider including information on the standard applicable to EL FARO.	Noted. Added text in footnote to see Survival Factors report for detail on El Faro's lifeboats and applicable standards.
P88 L16	The reference to and discussion of the leaking knife edge to watertight door number 2 is incomplete. Without further explanation, one might mistakenly infer that this condition could have possibly been a contributing source of water into the cargo hold number 3. We ask that the factual report make clear that watertight door number 2 leads to cargo hold number 5 only. See MBI Exhibit 7.	Agree. Added text to reflect comment.
P9 L18-18; P96 L.	The draft factual report asserts that the captain stated "we got cars loose" at 0544. This statement is not in the original transcript and therefore we are unable to verify this quote; we have access only to the original VDR	Disagree. VDR addendum contains this.

	transcript and not any changes or additions that have been made. At approximately 6:05 AM, the captain asked the chief mate after he returned from securing the scuttle: "see any cars that broke free or anything like that?", to which the chief mate replied, "not that I can see just lookin' from third deck". Request that this statement, and the time, be stated in this section of the factual report and that any such statements be listed in chronological order.	
P96, L9	We believe this NCB's report was conceived and carried out in a fundamentally flawed and biased manner, because the NCB was provided with very limited information and assumptions, much of which was erroneous, and the NCB has never, to this day, reviewed or considered the most critical evidence in this case. Accordingly, we do not believe the NCB's analysis can be credibly relied on. The suggestion in the draft factual report that "progressive lashing failure with potentially catastrophic cargo should could be expected" is inflammatory, but worse than that, it is bald speculation and not factual. Accordingly, if the intention of investigators is to reference and rely on the NCB reports as set forth in the draft factual report, then we ask that the following additional undisputed facts be added after line 13. "In regard to their reports and analysis in this matter, the NCB testified that (a) they did not review or rely on the VDR transcript (MBI 2/9/2017, p. 732); (b) they did not review any MBI or NTSB testimony, including testimony of all witnesses who lashed cargo or testimony of those mates who were responsible for supervising the lashing of cargo on board the EL FARO (MBI 2/9/2017, p. 733); and (c) in the NCB's first report, dated August 4, 2016, they did not review the EL Class Lashing Guidance, which various witnesses testified was the standard heavy weather lashing profile used for all lo-lo and ro-ro cargo stowed onboard the EL FARO during the accident voyage (MBI 2/9/2017, p. 733)."	Agree in part. Modified sentence regarding NCB conclusion of "catastrophic shift of cargo could be expected" to make clear this was *if* some cargo lashings were to fail in the first place. The intent of including this statement was to note NCB's opinion of how the initial failure of some ro/ro lashings might have a follow-on effect to other lashed cargo in the same space, or progressive lashing failure (Not to state that the lashings on El Faro failed on the accident voyage). Added text reflecting comments regarding NCB testimony at MBI's. Intent of section is to provide background information that friction coefficient increases have a positive effect on meeting industry standard lashing requirements.

	We ask that the following additional facts be added at the end of line 18: "On September 16, 2016, TOTE issued a response to the NCB report in which it challenged many of the assumptions and technical findings of the NCB's report. NCB issued a supplemental report on November 18, 2016. After having reviewed the EL Class Lashing guidance and other aspects of TOTE's response, and issuing its supplemental report, the NCB testified before the MBI on February 8th and 9th 2017. At the end of its testimony, the NCB addressed the possibility of cargo shift occurring on the EL FARO as follows: "Depending upon circumstances, cargo shift, if it occurred, may have contributed towards the incident or it may have occurred as a result of the incident. We cannot make that determination." MBI 2/8/2017 at pp. 580-581. Further, NCB testified that (a) it found no evidence that any excessive lashing angles or inadequate security points had been used on board the EL FARO, and (b) that precise breaking or failure points for lashings could not be determined. MBI 2/9/2017 pp. 752-753."	See above.
P98, L14.	To be complete and fair, we request the following additional evidence be noted at line 14: "During testimony before the MBI, the NCB testified that some ro-ro vessels have approved Cargo Securing Manuals that allow automobiles to be stowed with no lashing at all. See MBI 2/9/2017 at p. 750. The example given in the testimony by the NCB was the MATSONIA, a vessel "similar in class to the *El Yunque* and *El Faro* in design". See MBI 2/8/2017 at p. 586. On the MATSONIA, no lashing was required for carrying automobiles, unless the automobile was stowed on a ramp. See MBI 2/8/2017 at p. 587.	Agree in part. Will add text reflecting Matsonia was known by NCB to not have auto lashings required by Cargo securing Manual. Will add text reflecting NCB statement that Cargo Securing Manual is generally for North Atlantic conditions, but if the route is less severe and the manual notes the conditions, lashing requirements can be less.

P105 L16	The draft report states that the "captain mentioned" a report of water in cargo hold 3. It is more complete and accurate to say that "…sinking, at approximately 0543, the engine room reported to the captain on the bridge that water was detected in cargo hold number 3." We ask that this alternative, more accurate language be used.	Agree. Modified sentence to: "Before the vessel lost propulsion on the morning of the sinking, at 0543, the engine room reported to the captain on the bridge (over the phone) that water was detected in cargo hold 3."
P109 L11	The word "that" is repeated.	Agree. Deleted.
P110 L4 and P111 L1	For clarity, recommend using the term "bilge well" or "rosebox" rather than "sump." Comment also applicable to P111, L.1.	Agree. Added text and changed text.
P111 L13-14	The language as drafted states that the former chief engineer testified that the bilge float for the bilge alarm was located "inside" the rosebox. We do not believe that is a fully accurate description of the former chief engineer's testimony. The testimony cited in footnote 254 does not provide a page number. The previous chief engineer stated at page 508, when asked a follow-up clarifying question about the location of the bilge float, and whether it was "inside" the rosebox, he stated "I guess technically it would have been just above the rose box, above the deck." We ask that this testimony be accurately characterized and quoted.	Agree in part. Note that the previous chief engineer stated on pg. 508: "The floats which is for 3 cargo hold would have been in the bilge wells themselves." When asked next if float switch was in the rosebox he stated "Yes, that's correct. That should have been just at the very top of that rose box." When next asked if it was above deck or in the rosebox he stated "I guess technically it would have been just above the rose box, above the deck. On pg. 532 he estimates the gallons or water to set off alarm in hold 3. This indicates the float was positioned at the rosebox, not to the side or away from the rosebox per El Yunque. Modified text as follows: "The same chief engineer indicated the float switch was positioned at the rosebox, and stated the float was "just above the rose box, above the deck. When questioned how much water might be needed to activate the hold 3 bilge alarm in heavy weather, he stated that with the ship having a starboard list, "it wouldn't take much water" and estimated that "maybe 50 gallons of water could possibly – all the list to that spot could trigger the alarm."

Party Comments by email/letter dated: August 7, 2017

P115 L12	This should say starboard side, not port.	Agree. Modified text.
P.120-121	There are two figure 27's -- the numbering is incorrect as there are two Figure 27s, numbering of figures from here to the end is not correct.	Agree. Modified remaining figure numbers.
P.126, l.8	replace "tmosty" with "most"	Agree. Modified text.
P.128, figures 34 and 35.	The "corrosion and holes" in the bulkhead at frame 135 (on figure 35), and the interior bulkhead of the ventilation trunk "holed from corrosion" at frame 34 (figure 34) should not be portrayed as playing any material role in the vessel's watertight integrity. The photo and language as written gives this misimpression, and we ask that the language be made more fair and accurate. The bulkheads at frame 135 and at frame 123 merely provides a separation of the aft and forward trunks. Both the aft and forward ventilation trunks are exposed to water ingress through the louvers; seawater water, once entering the louvers, must still go over the 8 foot baffle in order to enter the cargo hold, regardless of the condition of the bulkheads at frames 123 and 138. We ask that the following sentence be added to the captions to both figures 34 and 35(or in a footnote). For figure 34. "The corrosion and holes shown in the bulkhead at frame 123 do not create an avenue for the potential water ingress into the cargo hold, since this bulkhead merely separates the aft and forward ventilation trunks. In other words, regardless of the holes, water would still need to flow over the baffle plate in order to advance into cargo hold 3." For figure 35: "The corrosion and holes shown in the bulkhead at frame 123 do not create an avenue for the potential water ingress into the cargo hold, since this bulkhead merely separates the aft and forward ventilation trunks. It plays no material role in the watertight integrity of the vessel. In other words, regardless of the holes, water would still need to flow over the baffle plate in order to advance into cargo hold 2A."	Agree in part. Will add language to reflect comment. For Figure 34, added text to caption: "The holed plate depicted allows communication only between adjacent trunks to sideshell louver openings. It is not through a baffle plate and does not permit water ingress directly to exhaust ventilation trunks or into the cargo hold below." For figure 35, added text to caption: "The holed plate at frame 135 allows communication only between adjacent trunks to sideshell louver openings. It is not through the baffle plate at frame 133 and does not permit water ingress directly to exhaust ventilation trunks or into the cargo hold below."

P.131, l.7	The regulation is cited incorrectly; it should read "90.10-38".	Agree. Modified text.
P132, ll.7-9.	To be consistent with the applicable regulatory language, we request that the word "continuous" be inserted before the word "positive" at line 7. The regulation cited at line 9 should also cite paragraph (e)(electrical requirements). For clarity, we also ask that the following sentence be inserted at line 90. "Under paragraph (d) of this regulation, cargo hold 3 and other holds in which vehicles were carried were required to be subject to "continuous pressure-positive ventilation" while the vessel was at sea."	Agree. Added additional text to reflect comment and added additional text from CFR.
P135 L8	For accuracy, we request the word "drill" be replaced with "routine testing and preventive maintenance."	Agree in part. Added text for "routine testing" as synonymous with "drills." Added text to reflect they were exercised for "preventive maintenance." Intent of paragraph is to establish typical position or use of dampers in heavy weather.
P135 fn290	There appears to be a citation missing.	Agree. Added citation for chief engineer interview with NTSB on 27 December 2016.
P139 and 140	In section 17.2, the draft language states that the antenna position was based "on AutoCAD drawings." It is unclear what this means, and we have not been provided such drawings. In order to provide meaningful input, we ask that the drawings be provided for our comment and that further clarification be provided. Figure 39 is also very difficult to read and its relevance is not clear. We request this section of the draft factual report be clarified or deleted.	Agree in part. 1) Provided footnote references for drawings used in location dimensions. 2) Updated figure 40 with white background for clarity. 3) Section is relevant. Height of the vessel's anemometer is critical when comparing wind speeds from various sources (with altitude components in wind estimates/ measurements). GPS location used for positioning vessel relative to it and for comparison to recorded VDR parameter for GPS antenna height. Study of GPS height later in report relies on GPS position relative to vessel.

P156 L7	The draft language references a summary report. In order to provide meaningful comment, we request that this summary report be made available.	Noted. Report available to parties as of September 2017.
P.160 L17	We believe that words "port" and "starboard" should be reversed. A loss of lube oil would occur at smaller angles when heeled to port, due to the starboard offset of the suction line.	Agree. Modified text.
P161 L5	We believe it is incorrect to state that lube oil sump levels were not available for the EL FARO. See comments above pertaining to P.79, l.5. We request that the facts provided above be appropriately incorporated into the draft factual report.	Noted. See disposition of comments to P. 79, 1.5.
P163 L307	The draft factual report references a study of ship dynamics from VDR data performed as part of the investigation, which in part is the basis for figure 59. In order to meaningfully comment on figure 59 and the discussion, we request a copy of the study.	Noted. Report available to parties as of September 2017.
P161 L8-12	The use of the CargoMax printout, as a basis for determining the volume in the lube oil sump, is, in our view, far less reliable that using the last available sounding. Soundings of fluids for operating equipment (in this case the main engine lube oil sump) are generally taken and recorded with care, and in the case of lube oil levels, every four hours. See EL FARO Engine Logs. These records are likely maintained accurately. Given the tedious nature of performing stability calculations, and the immaterial role that the weight of the lube oil played in the vessel's stability, it is likely that this CargoMax record was not maintained with the same level of diligence and accuracy as the manual operational soundings.	Agree. Intent of paragraph is to describe Coast Guard MSC results, not to describe methodology which can be found in referenced report. Added factual only, no analysis footnote stating: "Lube oil weight in CargoMax was a relatively insignificant portion of weight in comparison to cargo and fuel. Engine room logs of lube oil level for the main engine are observed and recorded every four hours (per each watch rotation).
P162, fig58	For clarity, we request that the figure be annotated to make clear the view shown is looking aft.	Agree. Added text per comment.
P162 L10	The number "61" is hanging; this appears to be referring to a figure.	Agree. Modified text.
P164 L4	The draft report references a post-accident procedure employed on the EL YUNQUE. This policy was a ship-specific procedure implemented	Agree. Modified text.

	onboard the EL YUNQUE, not a policy implemented on other vessels. Reference to "a Ponce-class ship" should be replaced with "EL YUNQUE" for clarity. Also, the date in footnote 308 is incorrect. It should be December 12, 2015.	Agree. Modified footnote.
P175, 1st 0136 entry	It is speculative to suggest "get a little ro- or something" means they were stating the "unknown event did not result in greater roll to vessel."	Agree. Modified text to "Statement regarding boat (vessel) rock."
P175, 0211-0212 entry	The quoted language does not mention a "swell on bow," and so to it is more accurate to say that there was a "Statement regarding visible green water in the vicinity of the bow."	Agree. Modified text to "Statement regarding visible green water in the vicinity of the bow."
P176, 0247-0248 entry	It would be more accurate to state "Discussion regarding ~~of~~ large waves and unknown swell direction"	Agree. Modified text to "Discussion regarding of large waves and unknown swell direction."
P179, 0340 entry	Given the uncertainty in the transcription (that is, the words in parenthesis were considered "questionable" and could not be confirmed), one cannot conclude the second mate used the word "set" to refer to a "large wave set" -- use of this word could equally suggest the vessel was being "set," a term used in navigation to mean that the vessel's intended course over ground was adversely impacted by currents or wind.	Agree. Modified text to "Statement noting "set" and 2nd mate alters course to 110."
P179, 2nd 0346 entry	Given the uncertainty in the transcription (that is, the words in parenthesis were considered "questionable" and could not be confirmed), it is speculative to say this was a statement about "list," particularly since none of the conversation in the transcript just before or just after this discussion is in any way related to list.	Agree. Modified text to "Statement regarding soot blowing."
P182, 0405 entry	Given the uncertainty in the transcription (that is, the words in parenthesis were considered "questionable" and could not be confirmed), it is speculative to assume that this statement was that "there is no means to gauge wind speed" In addition, at most the CM is talking about instruments, and there are always other means to gauge wind speed, such as by visual observation	Agree. Modified text to "Discussion regarding gusts and measurement."

P183, 0413 entry	We do not believe there is any basis to include the third sentence, stating that the "Captain and chief mate consider another source of vessel heel." The Captain could have been saying that filling up the port ramp tank is the "only thing I can conjure up" to address the list. Either interpretation is possible, and selecting one interpretation over the other is arbitrary and speculative.	Agree. Deleted text "Captain and chief mate consider another source of vessel heel."
P185, 0437 entry	It is not appropriate to say "first indication [ ] is awake". If such a comment is included, it should say this is the first transcription noting that the Chief Engineer was in the engine room.	Agree. Modified text to " First transcription noting chief engineer is in the engine room. First transcription chief engineer is aware of heel."
P185, 1st 0440	Given the uncertainty in the transcription (that is, the words in parenthesis were considered "questionable" and could not be confirmed), there is no basis to conclude the CM is trying to use the inclinometer, based on this unconfirmed transcription. Even if the word "bubble" or "level" were stated, which it cannot be confirmed, it is at least equally likely that the chief mate was referring to lube oil levels or lube oil sight glass in the engine room (the chief mate had just had a phone call with the engine room)..	Agree. Deleted all green text.
P187, 0511-0512	This language states "Riding crew chief believes the loss of one container stack is not enough to produce the list being experienced." We believe this is an inaccurate and unsubstantiated interpretation of the actual statement, which was "you gotta be takin' more than a container stack" -- the more likely interpretation of this is that the vessel is heeling enough that the top of the container stacks has "displaced" or moved one stack width to the starboard or port side - as created by a list or wind heel. That is a more plausible interpretation of that comment than to conclude that a container stack has been lost. Further, if at this point any stacks had fallen and containers were over the side, it is all but certain that there would have been comments on the VDR recording to that effect, but no such comments were recorded. The only mention of fallen containers and loss of cargo on the transcript occurred roughly two hours later, at	Agree. Deleted all green text and left only "Discussion between riding crew chief and captain about low oil pressure alarm to engine (main propulsion turbine), the vessel's list/heel, and container stacks and sail area."

	approximately 0729, just before the loss of the vessel (and that language there could not be agreed upon by investigators and the parties listening to the audio, or it was otherwise questionable, because it is in parentheses). This language also states "Indication that low pressure lube oil alarm on main engine has sounded" This is not accurate. Based on the transcript, the Captain and Mr. [redacted] were engaged in a conversation on the bridge about the effects, generally, of list on operations. (Capt: "How does that affect below your operations as far as lube oil..", then Mr. [redacted] explains that it may result in a low lube oil pressure alarm. There is no evidence, at that time, that a low lube oil pressure alarm sounded on the EL FARO. We ask that such assertion be removed because it is not supported by the evidence.	See above.
P188, 1st 0512 entry	This should more accurately say "discussion of vessel not pounding"	Agree. Changed to "not pounding."
P188, 0518 entry	Given the uncertainty in the transcription (that is, the words in parenthesis were considered "questionable" and could not be confirmed), it is more accurate to simple state "The Chief Mate mentions the list of the vessel."	Agree. Changed to "The Chief Mate mentions the list of the vessel."
P189, 0529 entry	Given the uncertainty in the transcription (that is, the words in parenthesis were considered "questionable" and could not be confirmed), and the choppy nature of what was transcribed, it is not accurate to suggest the captain discussed "potential for cargo to shift to starboard" It is particularly unlikely that there would be a discussion of cargo shift in the same sentence as a discussion of "machinery just in front of the boiler" Given the inaudible nature of the sentence, and the lack of context just before or after this point in the transcript, this part of the transcript is more accurately and fairly described as the Captain engaging in an indiscernible discussion of machinery and the boiler.	Agree. Changed text to "Captain engaging in an indiscernible discussion of machinery and the boiler."
P194, 0601 entry	It is not appropriate to say a radar "malfunctioned"; it would be more appropriate to say "discussion regarding bringing a radar 'back up' that had apparently shut down for an undisclosed reason"	Agree. Modify test to "Discussion regarding brining radar back up, that had shut down (apparently) at unrecorded time or reason."
P195, 0604 entry	For clarity, first sentence should read "chief mate" and not just "chief".	Agree. Added "mate."

P199, 0633-0634 entry	It is more accurate to say "captain states" "they're gunna get that boiler back up online". What the captain was told, by someone in the engine room, was not heard on the transcript.	Agree. Changed text to "Captain states the (engine room) is getting boiler back up and lube oil pressure up."
P714, 0714 entry	This is inaccurate. The "Captain" is getting information from the Chief Mate, after he hung up with the Chief Engineer. The Chief Engineer is not getting information from the Chief Mate. Also, for accuracy, the green language should acknowledge that the Chief Mate says "anything I say is a guess."	Agree in part. Deleted "Statement that fire main is damaged from something hitting it, possibly damaged between sea suction and hull."
P206, 0718 entry	There is no basis to say "floodwater in hold 3 is over the tops of the cars" -- the transcript reads "the cars that are floating in three hold' and "I saw the cars bobbing around" which means they were at least partially above the water line.	Agree. Changed to "Statement implying that floodwater in hold 3 is high enough to float cars."
P208, 0723	Given the uncertainty in the transcription (that is, the words in parenthesis were considered "questionable" and could not be confirmed), it is not accurate or credible to say that the decision was made to ring the general alarm and "wake crew." The "everybody up" language, could also mean that the Captain wanted everybody up to their appropriate muster stations, as the Captain stated 3 minutes later at 0726 when he announced he would sound the general alarm.	Agree. Changed to "Captain states he will ring general alarm."