From: Marc Matthews (5275)
To: Wisniewski Luke
Cc: Josef Bjurbäck; "Christopher Ryan Paiz"
Subject: SEASTREAK: NTSB questionnaire.02 Kongsberg Sept 2022.Answered.PDF
Date: Friday, September 23, 2022 5:02:28 PM
Attachments: NTSB questionnaire.02 Kongsberg Sept 2022.Answered.PDF

Luke,

Attached please find our responses to your second questionnaire to Kongsberg. I sent you the attachment in response to question no. 1 yesterday. I also sent you earlier this week the other two documents you had requested in redacted form. With this, I think we have provided you with everything you have asked for. If something's missing or you have further questions, please let us know.

Regarding your invitation for Kongsberg to submit proposed findings to you, Kongsberg respectfully declines the invitation.

As always, please let me know if there is anything you would like to discuss further or if you need further information from us.

Best,
Marc

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National Transportation Safety Board

Washington, D.C. 20594

Questionnaire No. 2

Subj: Questionnaire No. 2 / Information Request: NTSB investigation into the grounding of M/V *Commodore* at Bushwick Inlet, New York, on June 5, 2021.

Accident No.: DCA21FM029

To: Mr. Josef Bjurbäck
TPM Manager Controls
Kongsberg Maritime Sweden AB

Dear Mr. Bjurbäck,

Please find enclosed follow-up information request / questions based on responses on the first questionnaire on Wednesday, November 9th, 2021. These questionnaires are not for public release.

The second (no. 2) questionnaire is investigative information of the National Transportation Safety Board (NTSB) created as part of the NTSB's investigation into the grounding of M/V *Commodore* at Bushwick Inlet, New York, on June 5, 2021 (NTSB Accident No. DCA21FM029).

NTSB regulations prohibit the public release of investigative information prior to release by the NTSB without the permission of the NTSB Investigator in Charge (IIC). See 49 C.F.R. § 831.13(c). The IIC has not approved public release of this information at this time. Therefore, we request that you refrain from any further dissemination of this questionnaire.

Kindly review this questionnaire and provide response by **September 16, 2022.** Requests for an extension of this deadline must be in writing and received prior to the due date.

Thank you in advance for your attention to this matter. If you have any question regarding the process, please feel free to contact me.

I look forward to your response.

Best Regards,

Luke Wisniewski

Sr. Marine Investigator
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National Transportation Safety Board

Washington, D.C. 20594

Questionnaire No. 2

Background

On June 16, a service engineer from Kongsberg Maritime (the manufacturer of the CanMan Touch system) boarded the *Commodore* and extracted data from Secure Digital (SD) cards containing graphical user interface (GUI) log files from all display screens except main A (attempts to access the main Kongsberg reported that the GUI logs showed about 200,000 failure messages from June 1 to June 5. The log file section had reached maximum file size, which means that any older entries would have been overwritten.

On July 19 investigators along with parties and manufacture service engineer conducted verification tests of the emergency / back-up steering and propulsion controls.

Questions

1. Please provide NTSB/Coast Guard with a copy of the service / technical report that was developed from the July 19th, 2021 verification testing recorded onboard the *Commodore*.
2. Was the starboard water jets (Starboard Jet Inner no. 3, and Starboard Jet Outer no. 4) available to the operators after the jet alarm panel actuated, providing audio and visual (flashing light) indicators that "control failure" had occurred in both the Port Jet Outer no. 1 and Port Jet Inner no. 2 water jet systems at approximately 1607:09, while the vessel was transiting in a northerly direction in the East River, NY. According to the Captain, at roughly the same time, CanMan Touch display screen main A went blank.
3. After the CanMan Touch display screen main A went blank, was the port wing station available to the operators to control all water jets? If not, please indicate which of the water jets would be available to the operator?
4. After the CanMan Touch display screen main A went blank, was the starboard wing station available to the operators to control all water jets? If not, please indicate which of the water jets would be available to the operator?
5. Did the loss of the main A display screen also result in the loss of the primary controls (thrust lever, joystick, and steering tiller) for the port engines and water jets only?
    a. What about the STBD side?
6. On July 7, Kongsberg issued a service letter to its customers mandating a software update that would correct the issue that caused the *Commodore's* loss of main A display screen and portside controls. However, other intermittent alarms could produce similar writing to the SD card causing the failure. What changes has Kongsberg made to the hardware / software to improve the reliability of the system?
7. Monitor A was unable to boot after the accident. The manufacturer determined that before the accident their software system was generating an unprecedented number of error messages. A side effect of generating these error messages caused their software to write 2 large

configuration files to the attached SD Card every minute or so (LOG_RR1.dat and PAR_RR1.dat). The flash memory in the SD Card could only be written to a limited number of times before it would fail. The SD Card failed to the point that it refused to be written to, which caused the operating system to halt before starting up the controller software on that screen. There is typically a separate non-volatile memory available on a single board computer used in these application. If the memory was present it was not used in this application. If the system had booted read only from internal non-volatile memory would it still be able to function?

8. Did Kongsberg software engineers evaluate the feasibility of moving the root file system to the on-board memory and only log to the SD card?
9. Did Kongsberg software engineers evaluate the viability of "slimming down" the root file to fit onto the 1 GB disk of non-volatile onboard memory as previous responded to in questionnaire no. 1, answer 11. (a,b)?

Kongsberg Maritime Response

1. (Attached)

2.
Yes, the Starboard jets (Inner No. 3 and Outer No. 4) would still be operational since they are controlled by the Main B screen. The Port jets (Outer No. 1 and Inner No. 2) would still be possible to control using the Backup system controls for the Port jets found on the Main station.

3.
Yes, the Port wing station would still be available to the operator. However, the Port jets (Outer No. 1 and Inner No. 2) would not be controllable from the Port wing station since the Main A screen went blank. The Starboard jets (Inner No. 3 and Outer No. 4) would still be operational from the Port wing station since they are controlled by the Main B screen. The Port jets (Outer No. 1 and Inner No. 2) would still be possible to control using the Backup system controls for the Port jets found on the Main station.

4.
Yes, the Starboard wing station would still be available to the operator. However, the Port jets (Outer No. 1 and Inner No. 2) would not be controllable from the Starboard wing station since the Main A screen went blank. The Starboard jets (Inner No. 3 and Outer No. 4) would still be operational from the Starboard wing station since they are controlled by the Main B screen. The Port jets (Outer No. 1 and Inner No. 2) would still be possible to control using the Backup system controls for the Port jets found on the Main station.

5. Yes, the loss of the Main A screen resulted in the loss of the primary controls for the Port engines and waterjets. The Port engines and waterjets would still be possible to control using the Backup system controls for the Port jets found on the Main station.

a) The primary controls would still be able to control the Starboard engine and waterjets.

6. Kongsberg has corrected the software issue that caused the intermittent failure and excessive writing to the log file on the SD card. It is the responsibility of a vessel's operator to take action and report to Kongsberg if the control system indicates repeated failures in the way it did

onboard the Commodore. However, the Commodore's system was still operational from the Backup system controls found on the Main station. The Backup system controls, which are completely independent from the Main controls, are in place so that they can operate as the fallback safety system in case of a failure in the primary control system. For that reason, Kongsberg believes the software update is the only required action on the part of Kongsberg to prevent a recurrence.

7. Yes, if the software had been designed for and implemented on internal non-volatile flash memory it could have booted up as intended.

8. It´s most likely possible, but not confirmed. It´s being analyzed for possible future application on next generation touch screens.

9. We haven´t looked into this in detail, but it might be possible to slim down our software to less than 1gb. As to question 11 from NTSB questionnaire no.1, the answer would be yes if the system had been implemented according to question 7 above.

JOSEF BJURBÄCK
Printed Name of Person providing the above information

Signature of Person providing the above information
2022-09-20
Date