

NATIONAL TRANSPORTATION SAFETY BOARD

Vehicle Recorder Division
Washington, D.C. 20594

March 12, 2021

Voyage Data Recorder

Specialist's Factual Report

By Nicholas Swann

1. EVENT SUMMARY

Location: Jekyll Island, GA
Date: September 8, 2019
Ship: Vehicle Carrier
Registration: 9775816
Vessel Name: Golden Ray
NTSB Number: DCA19FM048

2. GROUP

A group was not convened for the data analysis of the Voyage Data Recorder (VDR).

3. DETAILS OF INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following voyage data recorder:

Device Manufacturer/Model:	Totem Plus
Serial Number:	Unknown

3.1. Data Recovery

The data from the VDR was sent to the NTSB Vehicle Recorder Division as a series of file structures. The .dat files that were sent contained sentences in an NMEA 0183 structure and were converted using lab software. Additionally, included in this report are data extracted from the Totem Plus Integrated Monitoring, Alarm and Control Systems (IMACS). This system recorded the list of the vessel using an inclinometer, a parameter not recorded by the VDR. The data from the IMACS was converted for the NTSB by the manufacturer.

3.2. Time Correlation

The extracted data was recorded in coordinated universal time (UTC) and will be displayed in UTC for this report. Data recorded by the IMACS and the VDR were in different time bases. The data from the IMACS were aligned to the data from the VDR

using the common parameter of main engine RPM. This resulted in the data from the IMACS being shifted 338 seconds forward.

3.3. Data Description

The extracted data included approximately 48 hours of parametric data, beginning on September 6, 2019, at 0948 UTC and going to September 8, 2019, at 1006 UTC. The accident occurred roughly at 0537 UTC on September 8, 2019. The data from the previous voyage into Brunswick and the data from the accident voyage out of Brunswick were determined to be of interest. The voyage into Brunswick includes data from the times 1900 UTC to 2100 UTC on September 7, 2019. The data for the accident voyage out of Brunswick is from times 0450 UTC to 0550 UTC on September 8, 2019. Tabular data used in this report are included as attachments 1 and 2 for the accident voyage data and the previous day's voyage data, respectively.

3.4. Graphical Data

The rudder angle sign notation is such that a negative rudder angle signifies a turn to port. A positive rudder angle signifies a turn to starboard. A negative angle on the inclinometer signifies a lean to port while a positive angle signifies a lean to starboard. A negative value for the rate of turn parameter indicates a turning motion to port while a positive value for the rate of turn indicates a turning motion to starboard. A negative value of Engine RPM signifies engine power to move the ship astern while a positive value signified engine power to move the ship forward.

Figure 1 shows the data from the VDR and IMAC system for the entire accident voyage.

Figure 2 shows the data from the VDR and IMAC system for a closer time period surrounding the accident.

Figures 3 and 4 are Google Earth overlays from the accident voyage. The data points show both the time the vessel was at that position and the ship's list in degrees. Weather and lighting conditions shown in the Google Earth overlay is not indicative of weather and lighting conditions during the accident.

Data from the previous voyage into Brunswick is shown in figures 5 and 6. The VDR had several recording gaps in the data from the previous voyage. One period without a gap was taken in the same location as the accident. An attempt was made to get the inclinometer data from this part of the previous voyage, but during this period the IMAC system only recorded 10 data points and therefore is a limited representation of the ship's behavior.

Figure 5 is a Google Earth overlay of the previous voyage into Brunswick at the location of the accident. The data points show both the time the vessel was at that position and the ship's speed over ground in knots.

Figure 6 shows the data from the VDR for the previous voyage into Brunswick at the location of the accident.

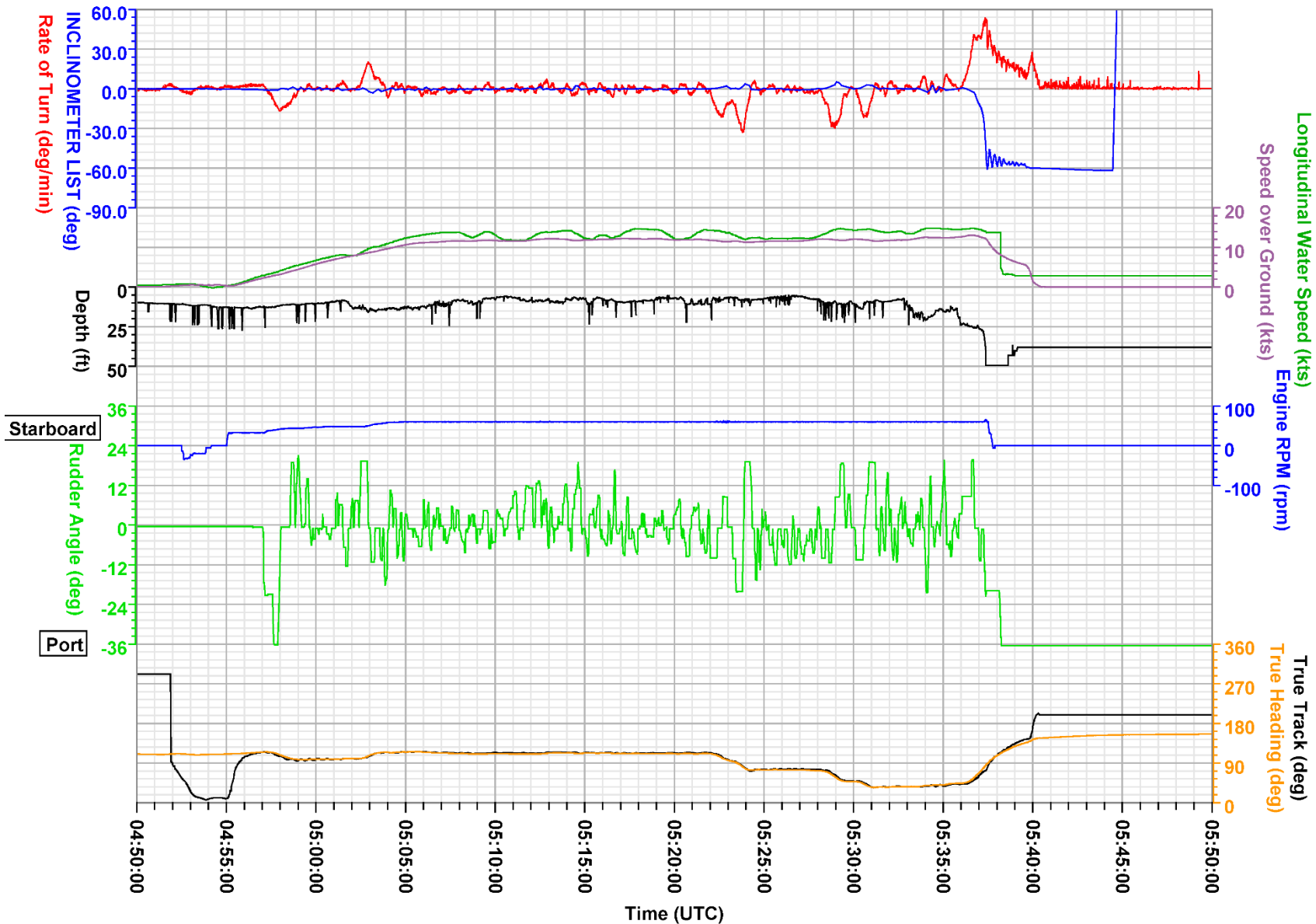


Figure 1. An overview of the data from an accident voyage leaving Brunswick.

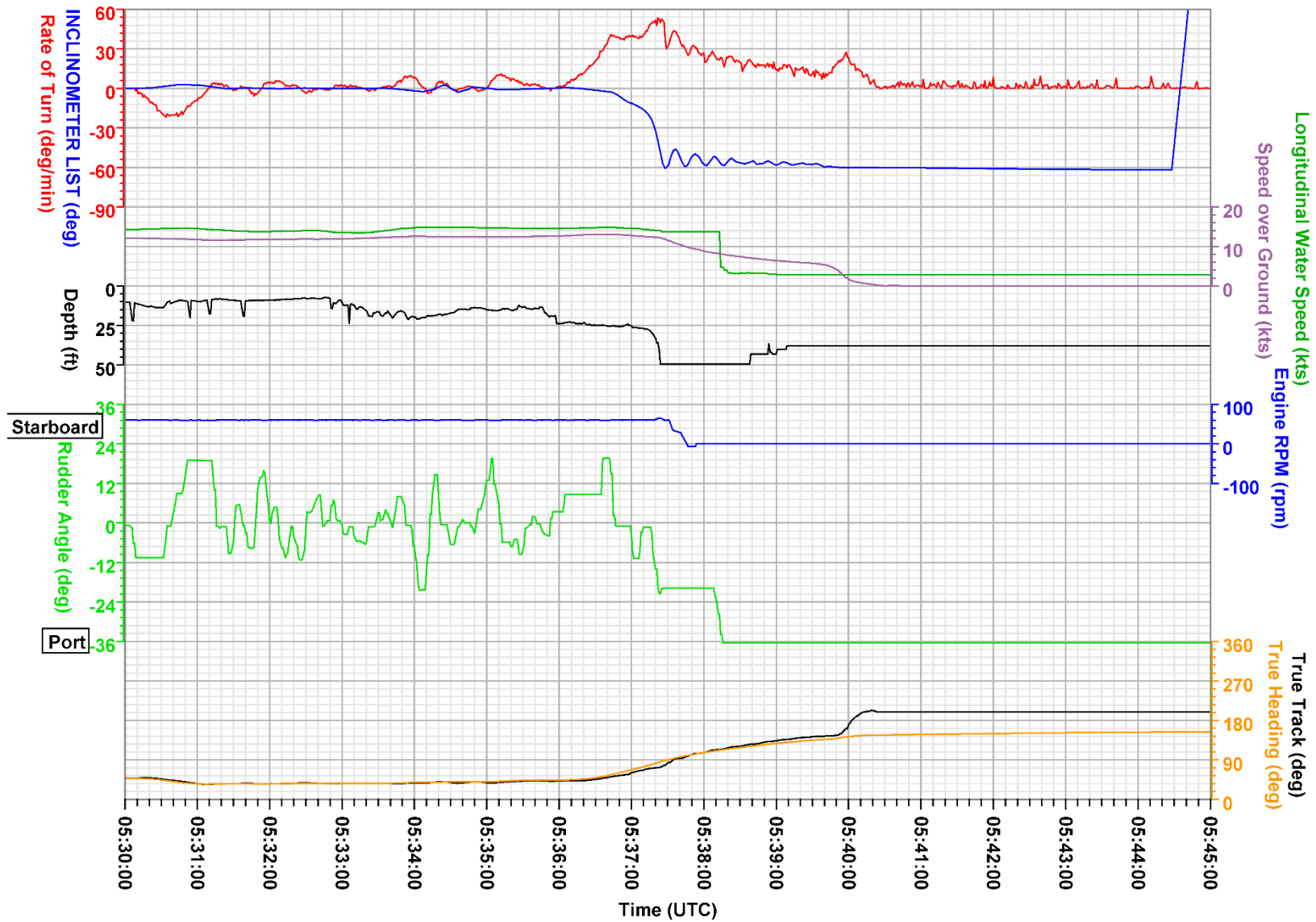


Figure 2. A detailed view of data surrounding the accident.

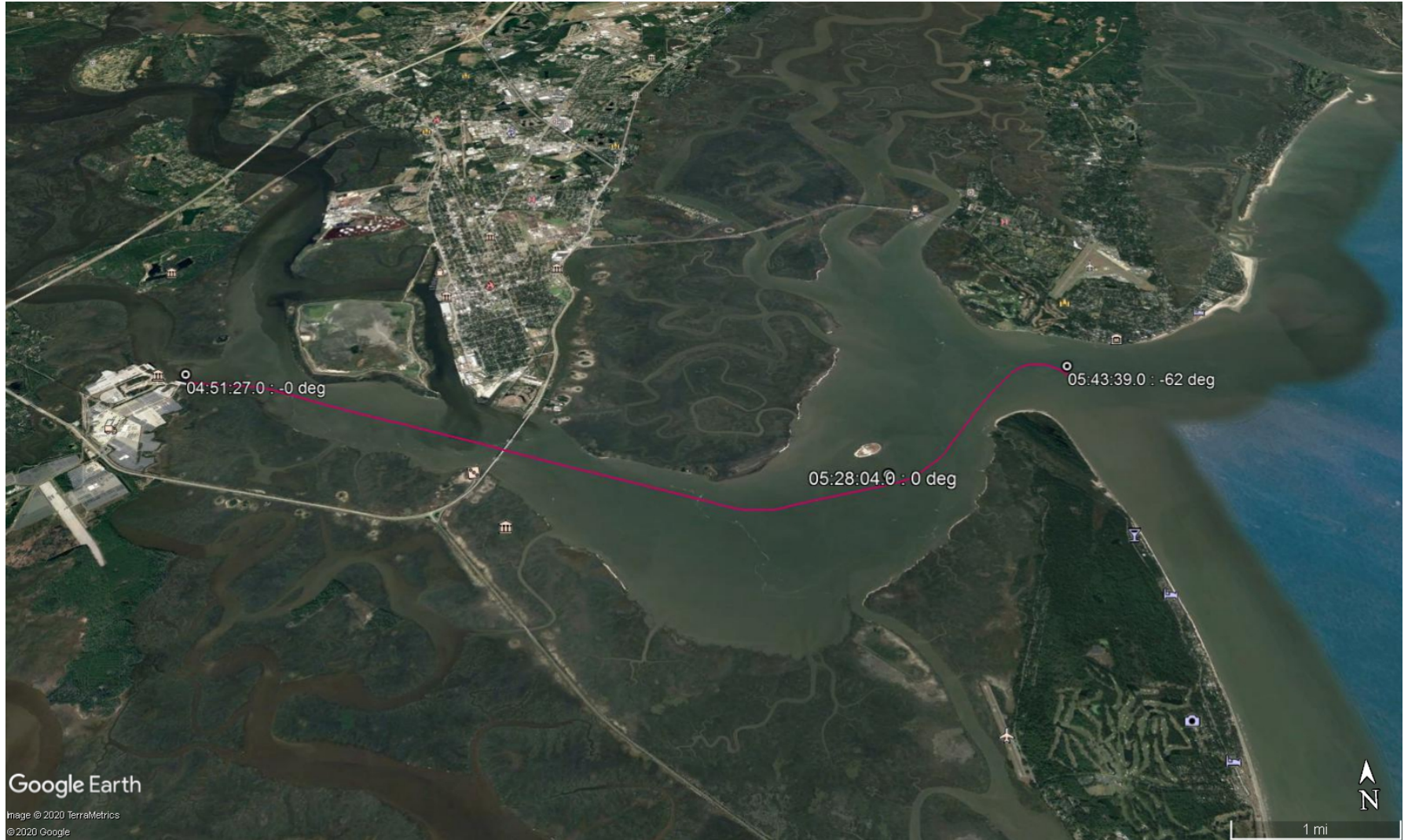


Figure 3. A Google Earth overlay of the accident voyage leaving Brunswick.



Figure 4. A Google Earth overlay surrounding the accident.



Figure 5. Google Earth overlay of the previous voyage into Brunswick.

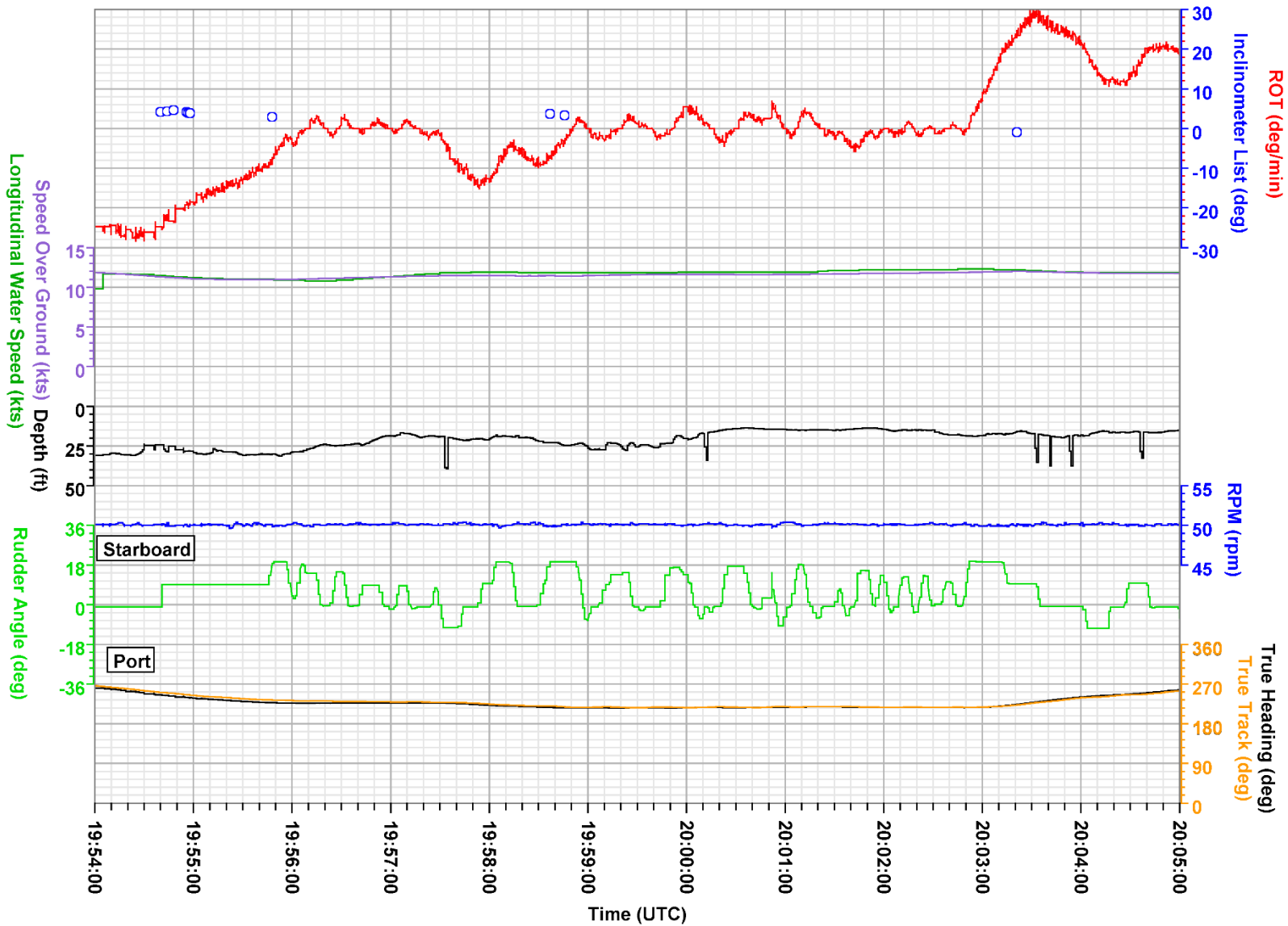


Figure 6. A detailed view of parametric data from the previous voyage into Brunswick.