[redacted]

Date : 27 February 2023

From [redacted]

To : Whom It May Concern

Subject : Sequence of Events and Rectification of Main Engine Automation Issues

27 February 2023; engine plant readied for departure as normal procedure. Turning gear was pulled, air start lined up and engine slow turned prior to passing to bridge control. During the slow turn the following alarms came in. It was decided to pass control to the bridge and rescind if found necessary.

- EGS2200 Pickup Signals Error
- ME Tacho 2 Error
- EGS2200 Pickup 1 Error
- EGS2200 Pickup 2 Error
- EGS2200 Off-line

These alarms cleared as soon as engine control was taken out of Local and into ECR. Because the alarms cleared, I continued passing control to the bridge and observed the bridge control test. The list of alarms did not return, save ME Tacho 2 Error – this alarm came in and cleared in 12 seconds. Overall the engine test looked good; quick engine response with appropriate rpm and direction; air consumption was normal.

At first astern bell the engine started as normal; after the engine was running, a second admittance of start air was heard; approximately three blasts and then stopped; this happened a second time and I radioed the bridge to stop the engine. There was large loss of starting air, to 13.7 bar, and the low pressure alarm was triggered. No other alarms rang during this evolution. Uncertain of the cause, after the starting air recovered, we attempted a second start. I had a trend line visible for observation of bridge command and engine RPM. At this time I observed the oscillation of engine RPM from negative to positive, but with correct magnitude. We stopped engine operation and pushed back alongside the dock for troubleshooting. No alarms were triggered during either of these starts.

First point of investigation was the RPM pickups on the main engine flywheel. These were found to be covered in dirty and grease; the pickups were cleaned, found to have proper adjustment and were found to be giving proper output signals observed by the operating lights local to the pickups. Attempts were made to start the main engine; the same condition occurred – no alarms, correct engine rotation (astern), output to lyngso was displayed in correct magnitude but with oscillating astern/ahead and with these oscillations, addition starts were attempted causing high start air consumption.

Pickup signals were then traced and tested in the DMS2100 maneuvering cabinet. Signals were looking appropriate on TAM (tacho adapter card) and DZM401 Speed Relay Module. Signal voltage looked appropriate and RPM reading on DZM401 card was appropriate in both speed and direction.

After some consulting with the office and no further leads, it was decided to change the TAM card and test; after changing out the EGS TAM card the engine was tested astern. This test had the same results as previous. After further examining, it was decided to test the engine again; during this test, we observed correct engine speed and direction, engine run signal, and no additional start attempts after the engine began rotation. During this test the ME Tacho 2 Error alarm came in for 8 seconds and cleared – this alarmed after start command was given and cleared before stop command was given. Further tests were completed, both ahead and astern and with the monitoring system operating on both Pickup 1 and on Pickup 2. We completed 6 engine start tests without issue following the replacement of the EGS TAM card.