

Glen Sannox & Hull 802 Monthly Report – [October 2022]

1.0 General

Executive Summary

This assessment of the overall progress for each vessel is made against the programme dates and building sequence set out within the FMPG letter to the NZET committee on the 28th of September 2022 and the FMPG update given on the 28th of October regarding the LNG system, advising a 36-week lead time for the delivery of vacuum sensors for 801, which will delay the commissioning of the LNG system. The target for completion of 801, (without the LNG system) is end of May 2023 and a target handover date in Q1/2024 for 802. Further discussion is required to determine the approach for commissioning of LNG for 801. Hull 802 programme is currently under ongoing review to align with launch dates and allocation of labour.

For Glen Sannox (Hull 801) the main drive for work onboard is hotwork completion and commissioning. For hotwork, the teams are working to close out below 3-deck from aft to forward and in outfit areas from 7-deck down to 5-deck, which is customary practice in shipbuilding. This sequence seems logical and in line with system/areas completion in preparation of commissioning activities. The level of rework and legacy issues, due to poor legacy Engineering Design and legacy workmanship issues adding increasing amounts of scope to the hot working and outfitting teams. Production is attempting to deal with these problems daily rather than revert to the change request process which results in an inordinate amount of time to deal with the most basic of issues. The result of this being the risk that continuing rectification and redesign will result in significant impact to the programme as currently presented.

The capacity for main equipment suppliers to mobilise resources to meet the yard planning dates for commissioning activities is on the critical path. The situation is being closely monitored by the yard's commissioning department. However as highlighted above the impact of design rectification, will also directly impact on commissioning.

Outstanding owners' observation issues, weekly defect report, technical design office queries as well as change notices remain under the scrutiny of senior management. There are still a significant number OORs to resolve at this stage in the build. Timescales and dates for carrying out the works have still to be established and how execution of the works fit in with the rest of the build activities, particularly in the Engine Room and Generator Room where commissioning activities are priority.

A number of major sub-contractors are due onsite next month, all carrying out critical works in already congested areas on the ship. This has been highlighted as major risk going forward by both CMAL and FM. Ferguson's senior management team will keep a close track of all works ongoing and schedule the work to the best possible work pattern.

Key Challenges for the Shipyard

Hull 801 - Key known Challenges for the shipyard to meet the programme:

- Installation and termination of the ship's cables. Particularly to align with the commissioning plan.
- Completion of pipework to meet commissioning dates, including addressing pipe clashes.
- Close out of OORs.
- Closure of design gaps.
- Unknown and emerging rework.
- Delivery and completion of production drawings and accuracy of production drawings.
- Availability of experienced supervisors and managers.
- Shortage of experience trades.
- Availability of OEM for commissioning engineers.
- Coordination of multiple activities in busy compartments such as the engine room.
- Verify Hull 801 Deadweight.
- Commissioning of LNG System.
- Lack of familiarity with final stages of finishing the vessels, surveys, documentation, certification.

Owners Observation Reports 801

The information below has been updated in conjunction with FMPG to reflect the joint review conducted during this reporting period. Significant efforts have been made to ensure that the scope of all issues, as well as the cost of implementation and the impact on the programme are fully understood.

	All Categories	Category 1	Category 2	Category 3
Total Raised	608	366	228	14
Total Closed	473	280	187	6
Total Committed	48	39	8	1
Total to close when work complete	49	38	9	2
Total still to resolve	38	9	24	5

Reference – Updated ORR Summary by Yard 4th October 2022

At end October 2022:

- 97 are categorised as will be done at ship and are still to be done at ship.
- 38 still have no identified solution
- There are also 60 other observations, which we have agreed not to add as OORs, which are captured in an email log.

Cat 1 - Items, which relate to Safety, Quality, Maintainability and Specification requirements.

Cat 2 – Item, which relate to poor design, quality or production.

Cat 3 – General snagging and workmanship

CMAL have instigated a number of meetings with Fergusons to discuss the closing of OORs. Since June FM have only closed out 28 OORs, leaving 135 still to be completed. Some of which are major works to correct. We have also started a process of highlighting onboard defects through joint CMAL/FM weekly inspection. The details of those are listed below.

	Raised	Closed	Ongoing / Monitoring
Outfit	17	9	1

Pipework / Mechanical	29	6	1
Steelwork / Paint	16	7	
Electrical	15	7	
Totals	77	29	2

Reference – Updated Weekly inspection defect summary by Yard 4th October 2022

2.0 Changes to Site Supervision Team

The core head count remains the same.

3.0 Design Changes Approved

Ongoing design changes and legacy issues are still affecting the constructability of the vessels. CMAL are now daily assisting the design process due to poor legacy design. Assistance is also being given to Fergusons in meeting criteria to gain approval from class and [Redacted]. Closure of final design gaps is needed, which at this late stage of the project remains a significant risk to the project.

4.0 Agreed Changes to Delivery Date

Updated programme delivery dates are set out in section eight below.

5.0 Agreed Changes to Price

(Note of changes; changes to be authorised & recorded in Contract Variation Register)

6.0 Changes Awaiting the Owner's Approval

(Note of changes outstanding for approval by the Owner in excess of Buyer's Representative authority as stated in Consultancy Agreement Cl. 3.4)

7.0 Surveys / Inspections

Verification surveys of the as-built standard are listed below.

	Week 40	
19	801 Part areas surveys for both Fire and Thermal insulation on 05/06k areas.	Accepted
20	801 Part structural survey at [Redacted] to assist [Redacted] with their progress.	Accepted
21	801 Hyd pressure test and Instalation checks of Fwd Port Mezz-dk from 03dk Valve-block to 04dk L11 transition to Mezz-dks.	Accepted
22	802 Side shell OBD shell pipe penetrations set up before welding continues and witnessed by [Redacted].	Accepted
23	802 Unit A6-6 survey with [Redacted] and ourselves.	Accepted
	Week 41	
24	801 General survey of Z1 St/gear area to access where we are and what is required to complete	Accepted
25	801 Further part surveys iwo of equipment for both Fire and Thermal insulation on 05/06k areas.	Accepted
27	801 Hyd pressure test and Instalation checks of Eng-rm Hyd-hatch piping.	Accepted
28	802 Side shell OBD shell pipe penetrations set up before welding continues (internal of the vessel only) and witnessed by [Redacted].	Accepted
29	802 Unit A6-6 survey with [Redacted] and ourselves.	Accepted
	Week 42	
30	801 Full OOR survey with CMAL team to determine outstanding issues.	N/A
31	801 General survey of Z1 St/gear area continues and progress is being made.	Accepted
32	801 Unit A9/6 Centre and Stbd units surveyed with Port due next week.	Accepted
33	801 Unit A7-6 Centre and Stbd units surveyed with Port due next week.	Accepted
34	802 Presure test on stand alone St/gear Hyd Tk and Harb-Gen FO Float tk by [Redacted] and ourselves.	Accepted
	Week 43	
35	801 Part structural survey at [Redacted] to assist [Redacted] with their progress.	Accepted
36	801 Part surveys (at last) of L11 areas 03/04dk. And will continue in Wk44.	Accepted
37	801 New observations reconcile onbaord to confrim outstanding issues.	N/A
38	801 Quikc closing partial survey and advice given on how to complete.	Accepted
39	802 Unit A8/6 Port/Centre/Stbd units surveyed by [Redacted] and ourselves.	Accepted
40	802 Unit A7-6 Centre and Stbd units surveyed with Port due week44.	Accepted

Reference – Updated CMAL Surveys by week number.

Hull 801 Pipe Spool Installation

Installation of pipework spools is now back on schedule due to the projected dates now added to 801s Level 0 programme. FMPG and its subcontractor's pipefitting rate is down in general due to rework on systems previously fitted. Attributed to the necessary alterations to previous systems to allow commissioning to take place. The yard now shows confidence in meeting the new week 8 deadline of completion all pipework including rework.

Week Number	Spools Fitted	Spools Fitted Running Total
2240	108	10686
2241	84	10770
2242	71	10841
2243	71	10912

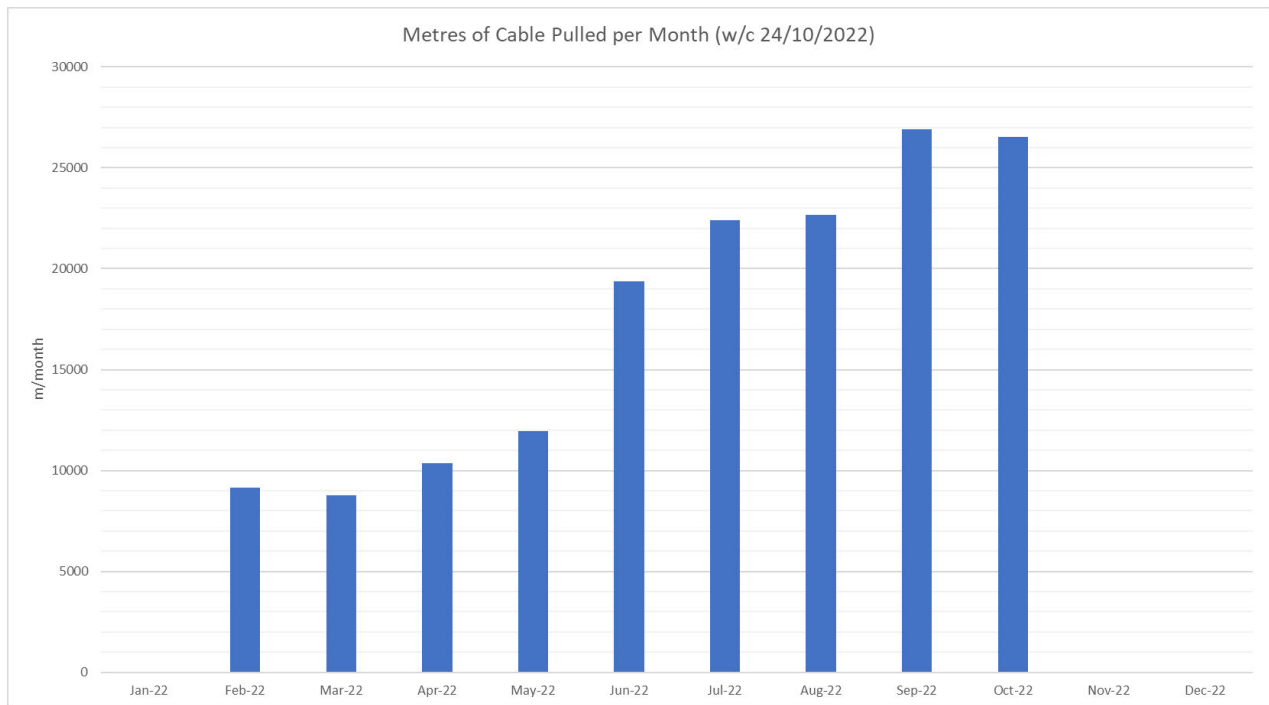
Reference – October update on CMALs records.

Hull 801 Electrical Works

Cable pulling has continued throughout the vessel in both the machinery and passenger accommodation areas. Additional labour has been brought onsite as part of the effort to meet the schedule. Exact numbers of cables required and cables installed onboard to date has gone through a further rigorous reconcile period and FMPG are now in agreeance with the cabling contractor in regard to the reported numbers. As of October, the shipyard reports that **65.2%** of all ships cabled have now been pulled in with a total metreage of 160,972m. The average installed per month since May has been just over 21,000m. Following this trend all remaining cables will be installed by wk. 5 2023. Termination of cables is sitting at **18.7%**. Installed cables currently tested is sitting at **15.8%**.

The previous slippage in the electrical programme to meet priority dates for main commissioning activities has been reported this month as back on track.

CMAL have also observed a change in previously reported figures with monthly totals changing month to month. This has been highlighted to the yard who in turn have been reassured by the contractor that it was issues with reporting meaning previously installed cables weren't correctly being reported. CMAL will continue to monitor this going forward.



Reference – October update on CMALs records.

Hull 801 Clam Shell Doors

Renewed focus has been put on the clam shell doors and all TTS equipment onboard. Work on the doors now awaits specialist scaffolding contractors to come onsite and install a working platform. Slippage in completion date is expected but this is being monitored and should not effect the commissioning of the system as a whole in early 2023.

Hull 801 Lifts install

Lift contactor, [Redacted], are due onsite as of 09/11/22 to commence all lifts install work. Commencing with the galley lift to align with outfitting of that area, then moving onto the passenger lifts throughout the ship. This will be monitored through a small working group like many of the other 'small projects' on the ship.

Hull 801 LNG System

In line with other small projects onboard, for the LNG system install, integration and commissioning a composite project team has been appointed. The team includes the main stakeholders: FM, CMAL and [Redacted] and [Redacted]. The main sub-contractor is due onsite to begin their aspect of the installation in early December. Ferguson pipe sections to be install after pre commissioning activities of engines and generators, this will likely put the completion date into the new year.

Hull 801 Commissioning

- Emergency Generator load testing complete and presented to [Redacted] / CMAL.
- First run of Harbour Generator and shutdowns witnessed by [Redacted] / CMAL.
- Alarm channel testing underway. 415V Switchboard controls and indication checked as far as possible.
- Automation UPS's No 1 & No 2 now operational.

- HT/LT system filled to support running generators.
- 1/3 of alarms channels tested and witness.

Hull 801 - Accommodation Outfitting

- Background/Deckhead insulation works in bridge area now complete
- Joiner's linings framework is nearing completion in the bridge
- 07dk & 06dk – Ceiling perimeters in cabins and passageways now complete.
- 06dk – Crew mess, recreation room and fwd toilets nearing completion
- 05dk – Fwd passenger lounge perimeters install has commenced.
- 05dk – Aft passenger toilets and kids' area linings install underway.
- 05dk – Galley work commencing prior to specialist subcontractor coming to fit out galley in early December.

Hull 801 HVAC Installation

Contractor performing okay, the standard of installation remains satisfactory. Issues with sequencing and finishing details occurring due to lack of information. Below 3 deck works continuing where possible certain areas await outfitting and commissioning of major machinery before HVAC can be installed. Outstanding HVAC control panels and AHU plants being delivered this month in line with install dates.

Hull 802 Block Fabrication and Erection

- Consolidation work to complete erection joints of Bow Units 49/50/51 nearing completion.
- A11-5 now erected. All 5 deck units now onboard with unit link-ups well underway.
- Bridge unit A10-7 due to commence this month with advancements in outfitting expected compared to 801.
- Emergency. Generator room unit A4-7 additional outfit works being carried out prior to erection onboard.
- Units A7-6, A8-6, A9-6 and A10-6 fabrication progressing well.

Hull 802 Hot Works

Structural Works Continue in the following areas:

- Sub-assemblies have been put on hold whilst final design review process takes place with the principal design contractor.
- Ongoing modifications to bulkhead L11 are in progress.
- Pipe pens and routes being progressed to prepare for pipe install commencing.
- Walkways installed located in LNG, HPU and STP place have commenced.

9.0 Next Stage Payment Due

N/A

10.0 Forthcoming Period Events

N/A

11.0 Tests & Trials Due

Hull 801

- Demonstrate Start Air system automatics.
- Energise the 690V switchboard via the Harbour generator.
- Continue with alarm channel testing. 240V & 690V Switchboard & MCC controls and indication.
- Fuel supply to Aux/Main engines to pressure test and flush.
- Gearbox flushing.
- Ensure pre-requisites are complete to allow [Redacted] to attend site for Aux Gen first runs.
- Test Quick Closing valves on fuel tanks and at engines.

12.0 Risk Register Update

CMAL attended the shipyard monthly project risk review meeting on Monday 07 November.

13.0 Safety & Environmental

No issue to report this period

Print Name: [Redacted]

Signature: **[Redacted]**

Date: [11 November 2022]