

**Programme:** 100m LNG Dual-fuel Ro-Ro Passenger Ferry

**Programme Director:** [redacted]

**Review Period:** August 2022

<u>Name</u>	<u>Job Title</u>	
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	



- **Minutes from previous meeting**
- **HSE**
- **Programme**
- **Production**
- **Engineering**
- **Commissioning**
- **OOR's**
- **Risk Register comments (circulated for review)**
- **Variations to Contract**
- **CMAL Comments**
- **AOB**

# HSE Dashboard

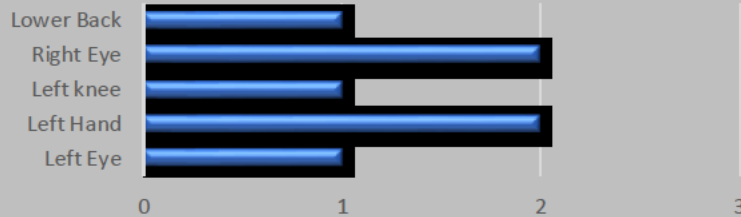
## August 2022



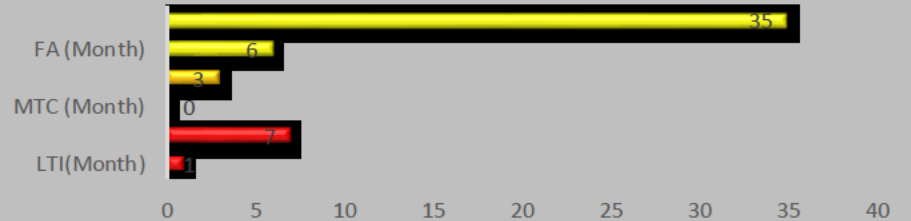
• Per 1,000,000 working hours  
• Estimated no. of hours worked

Incident Statistics	Target	Actual		Fatal	0	Fire	0	Proactive Statistics	Target		Actual	
	2022	Month	YTD						Month	2022	Month	YTD
Number of Hours Worked**	870,000	73200	334848	RIDDOR	0	Damage	0	Number of YSYD Cards	>50	>600	70	173
Number of Lost Time Incidents (>3 Days)	<9	1	7	LTI (>3days)	1	Environmental	0	Toolbox Talks Issued	2	24	2	8
Lost Time Incident Freq Rate*	<10.14	13.66	20.91	Medical Treatment (MTC)	0	Serious Near Miss	0	Housekeeping Inspections	4	48	4	13
Number of Recordable Injury Incidents	<30	1	11	First Aid	6	YSYD	70	Emergency Drills Completed	>4	>48	2	11
Total Recordable Injury Incident Rate*	<35.0	13.66	32.85	Total Injuries	7	TOTAL Incidents	7	Vessel Compliance Checks	30	420	20	100

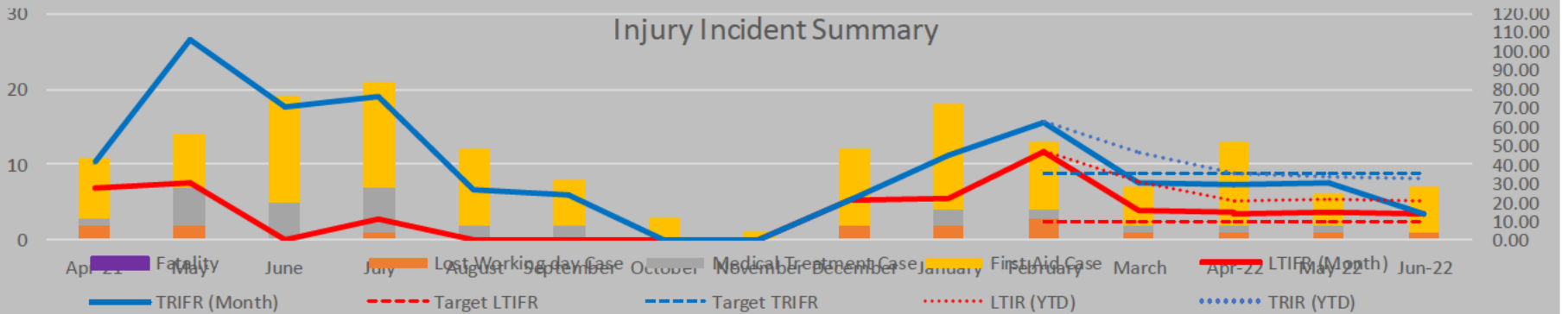
### Affected Area



### Incident Classification



### Injury Incident Summary



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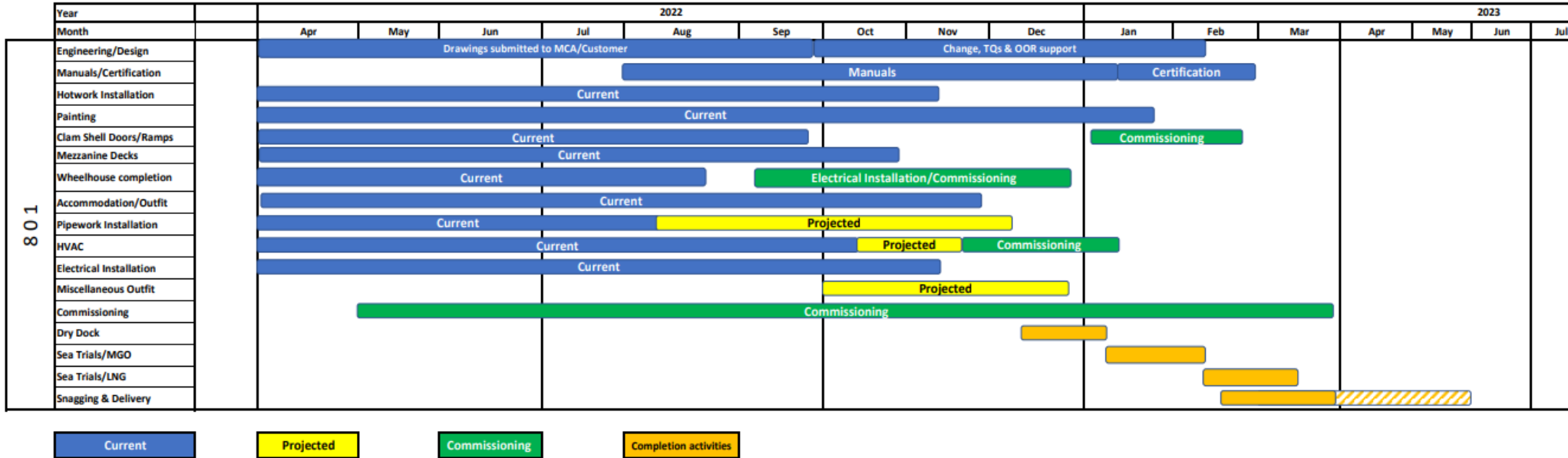
## Progress Update:

- Disappointing to have another LTI this month, again a RIDDOR due to time lost rather than severity of injury however it is apparent legacy work methods and poor work standards were contributing factors to the LTI.
- Excellent feedback from the presentation by [redacted] as the kickoff to our journey to improve the HSE ownership and performance at all levels.
- Continued increased safety presence on 801 and 802 to enforce the required standards from our workforce and contractor colleagues.
- Further operational reviews and focus on risk assessments will continue with multiple document reviews underway.
- Continued engagement with all parties and clear message from CEO that PPE noncompliance will not be tolerated.

# Level 0 Programme

## Level 0 - Programme

30/06/2022



## Area Completion Summary 01/07/2022

### Area Completion Summary 01/07/2022

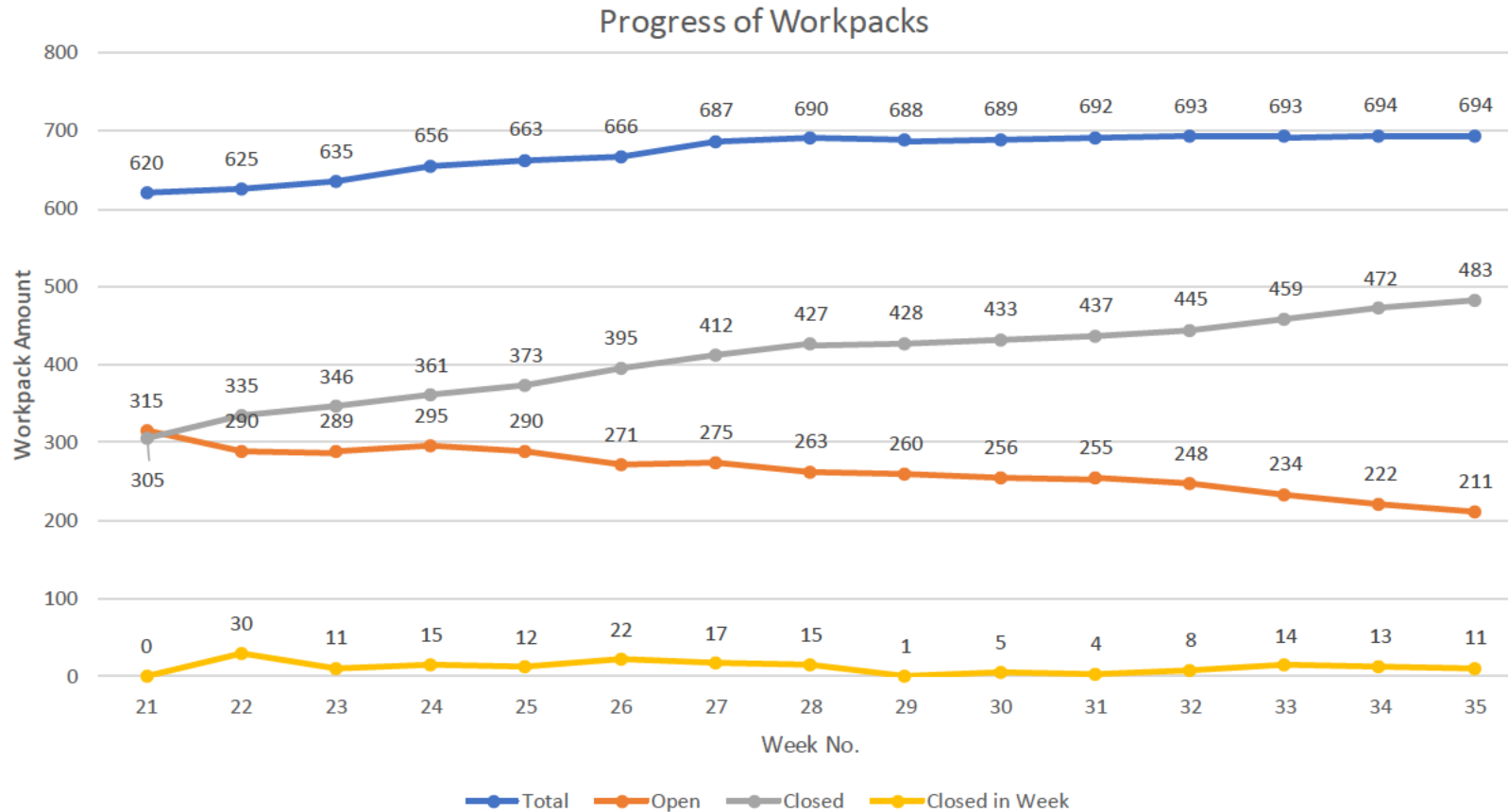
# Superseded

Vessel 801	Activity	Complete	
		May	June
1	Engineering & Design	70%	70%
2	Steelwork Main Structure	95%	93%
3	Piping Systems	60%	56%
4	Mechanical Equipment	90%	92%
5	Electrical Equipment	90%	90%
6	Electrical Cabling	5%	21%
7	Accommodation Outfit	20%	25%
8	Painting	40%	42%
9	Commissioning	10%	10%
10	Drydocking	66%	66%
11	Sea Trials	0%	0%
<b>Overall Completion</b>		<b>70%</b>	<b>70%</b>

Vessel 802	Activity	Complete	
		May	June
1	Engineering & Design	50%	50%
2	Steelwork Main Structure	60%	65%
3	Piping Systems	2%	4%
4	Mechanical Equipment	50%	50%
5	Electrical Equipment	50%	50%
6	Electrical Cabling	0%	0%
7	Accommodation Outfit	0%	0%
8	Painting	20%	20%
9	Commissioning	0%	0%
10	Drydocking	0%	0%
11	Sea Trials	0%	0%
<b>Overall Completion</b>		<b>45%</b>	<b>46%</b>

New focus has been placed on closing out all open work packs:

- Current total work packs to completion- 694
- Current number of closed work packs - 483 (70%)
- Current number of open Work packs – 211 (30%)
- July total work packs to completion- 689
- July number of closed work packs - 433 (62%)
- July number of open Work packs – 256 (38%)



# Pipework Installation

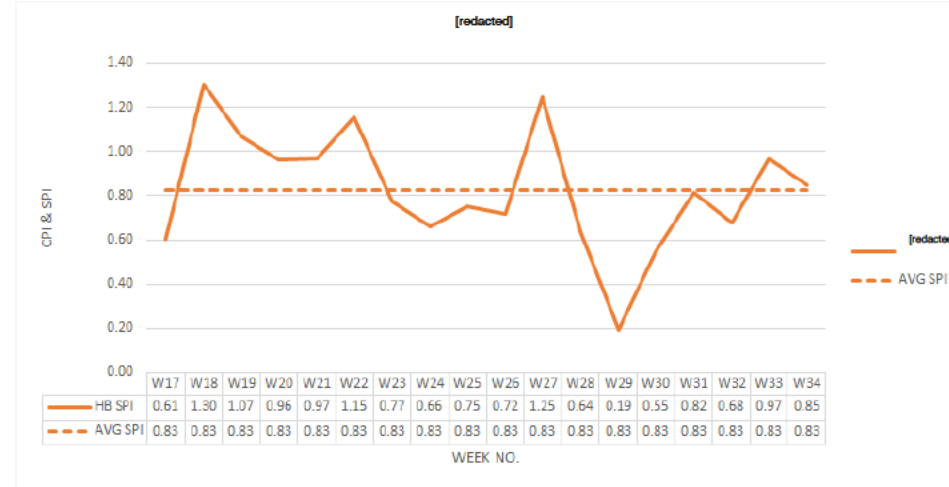


[redacted]

Drop off in performance is due to additional Modifications & Reworks [redacted] are supporting with.

Total planned spools: 4526

Week 34: Cumulative planned 2628 (58%)  
Cumulative installed 2175 (48%)





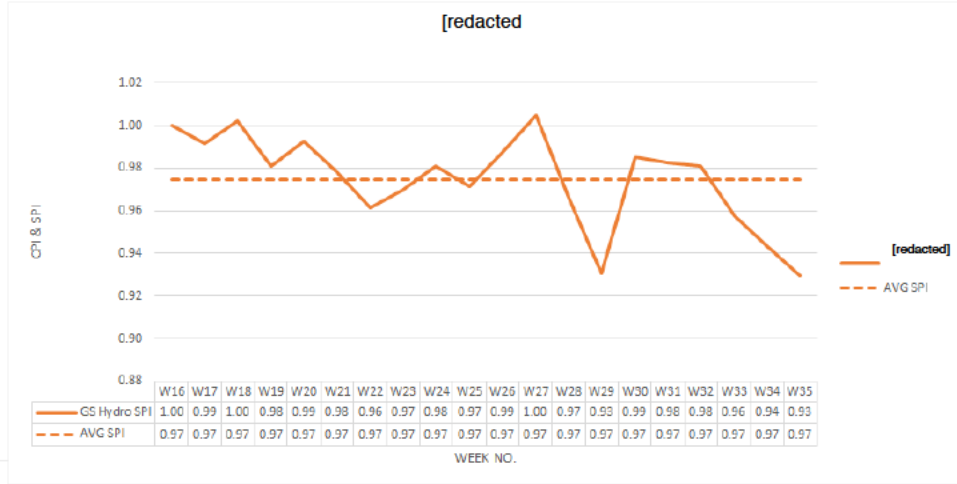
# Pipework Installation



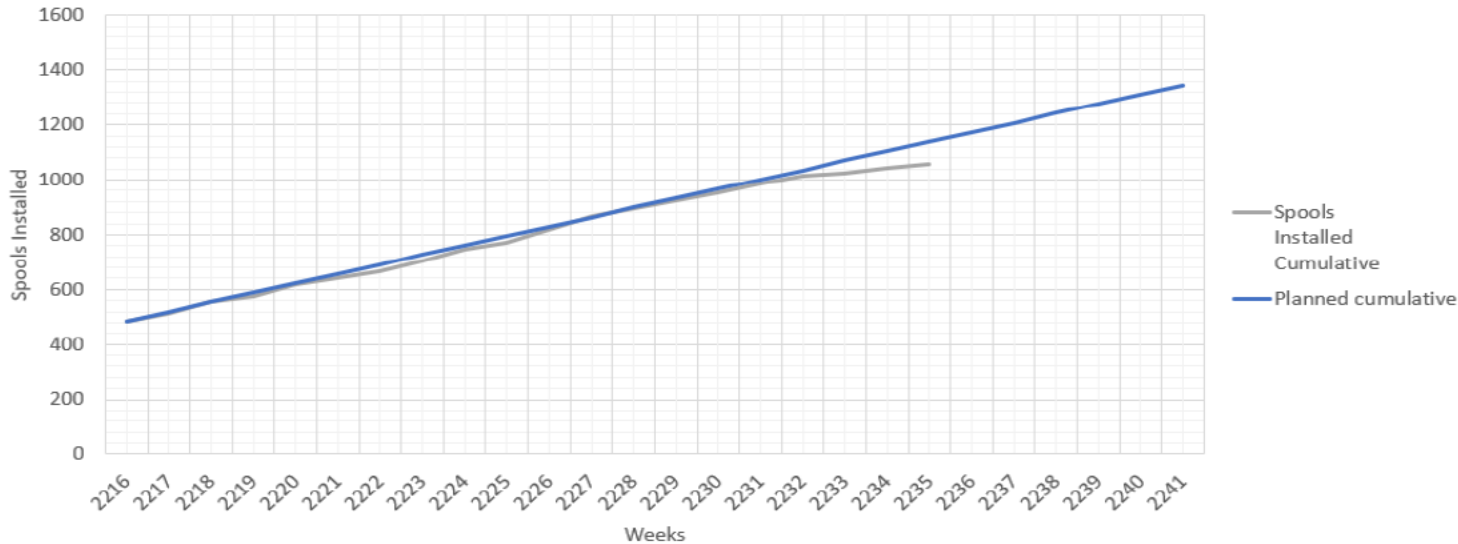
[redacted]

**Total Spools planned: 1346**

**Week : 34 Cumulative planned 1139 (84%)  
Cumulative installed 1059 (78%)**



[redacted] Install S-curve



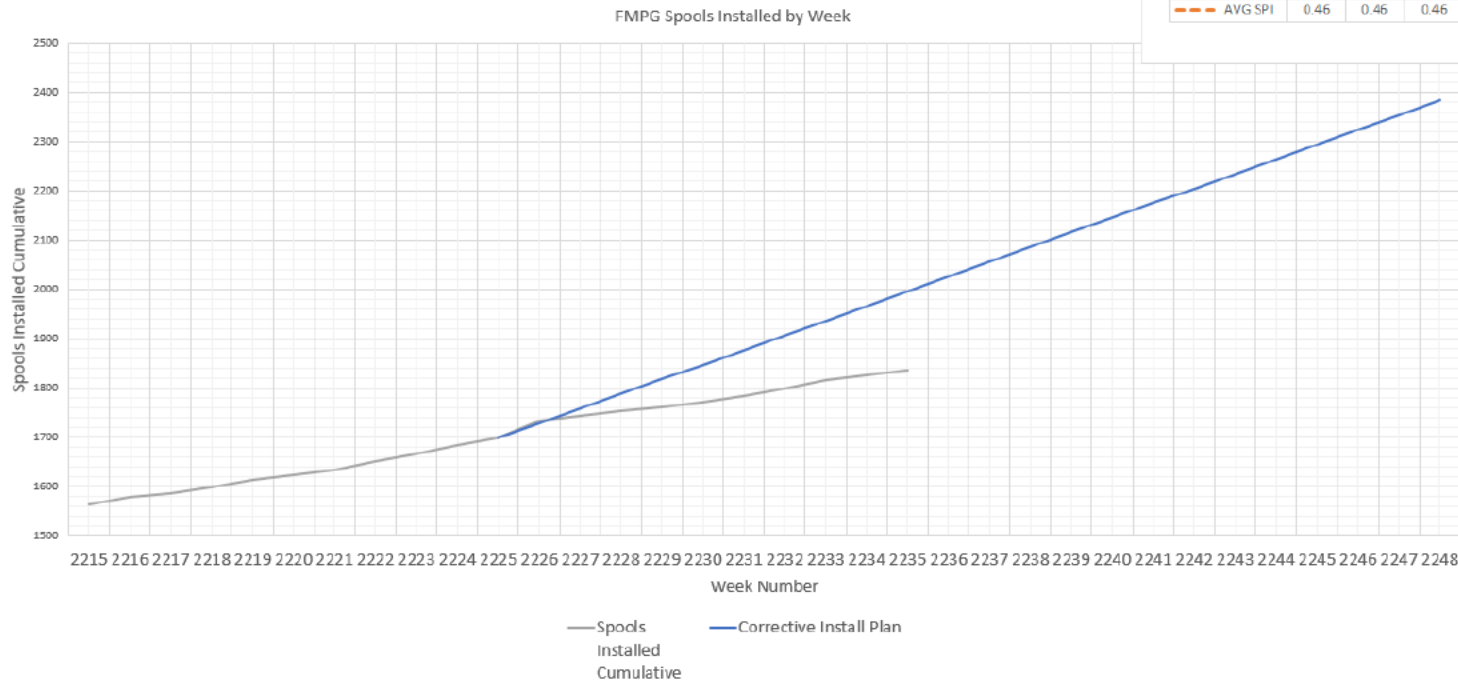
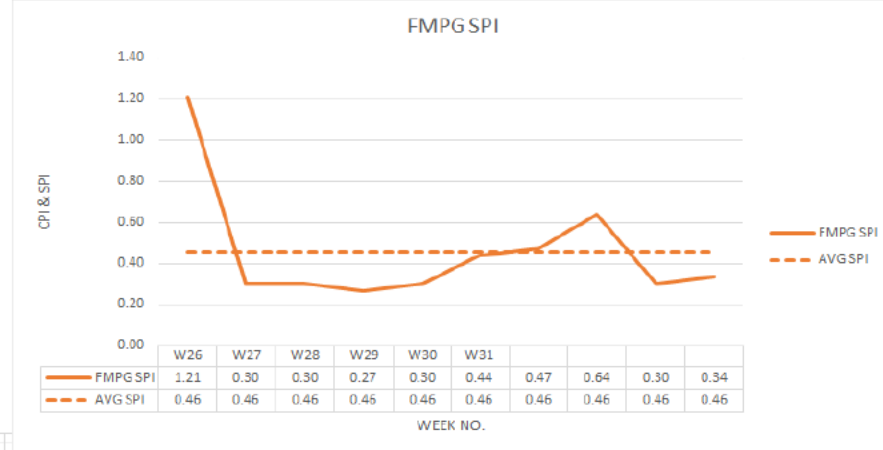
# Pipework Installation



## FMPG

**Total planned spoils: 2384**

**Week 34: Cumulative planned 1996 (83%)  
Cumulative actual 1836 (77%)**

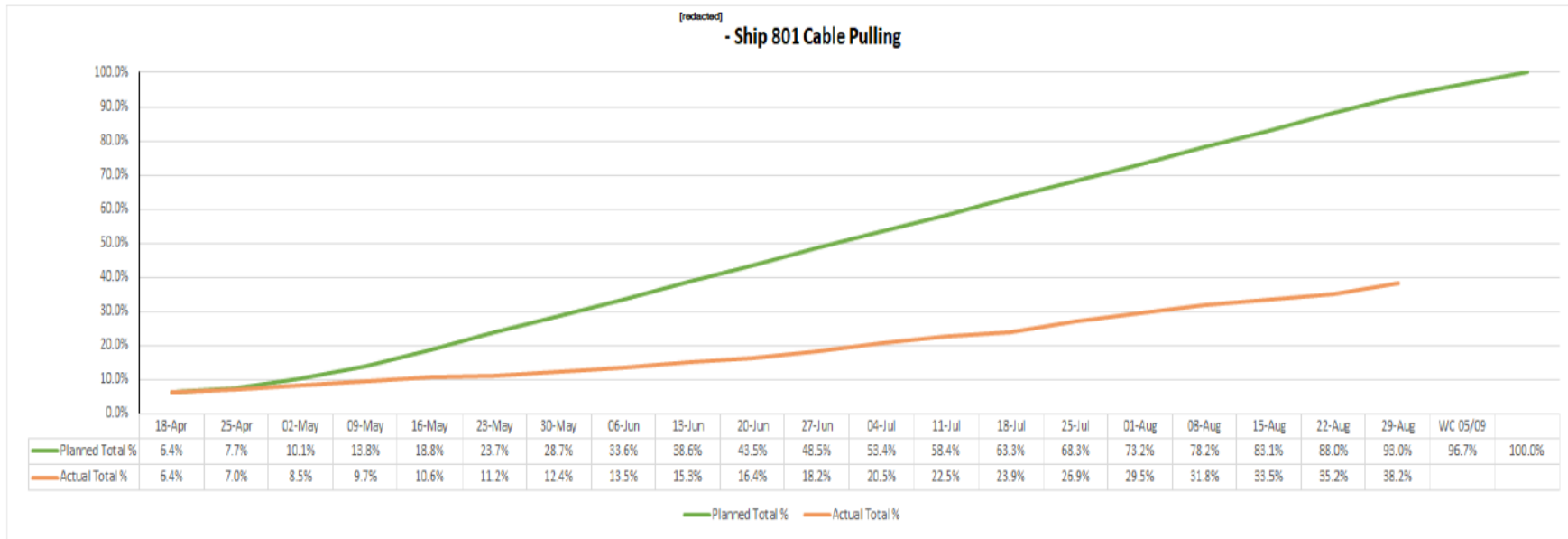
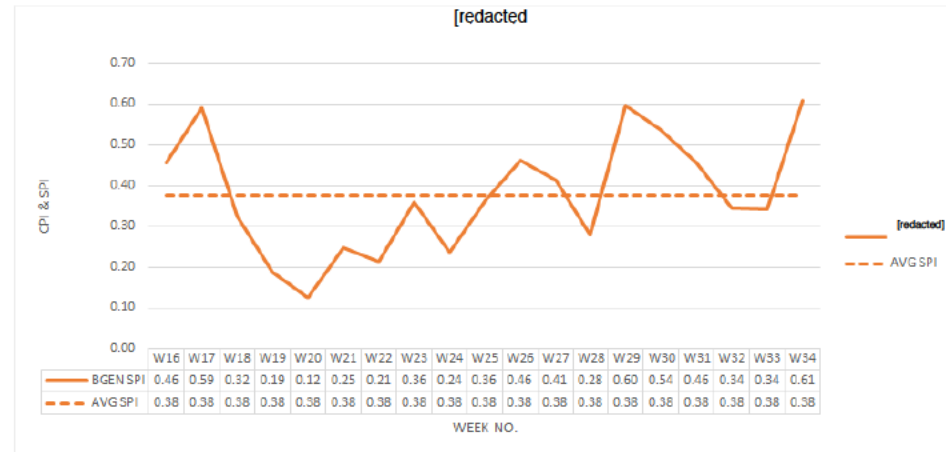


# Cable Install



As of week 35, [redacted] currently 38.2% cables pulled complete against planned 93%

Recovery plan was submitted from [redacted] 01/09 for review, meeting planned with [redacted] for full review and discussion around new plan 07/09.

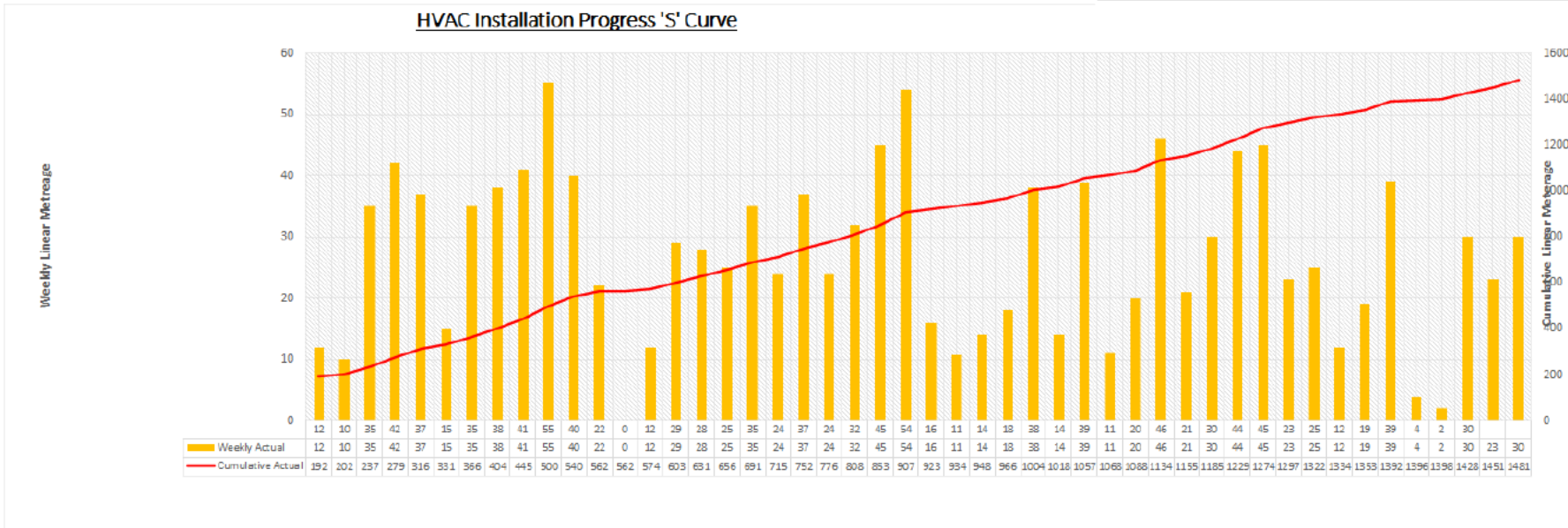


## HVAC installation progress:

Progressing in line with accommodation outfit.

Zone	Total Metreage	Installed Metreage	%age Complete
1	32	23	71.9%
2	35	26	74.3%
3	113	63	55.8%
4	94	60	63.8%
5	14	0	0.0%
6	378	63	16.7%
7	0	0	#DIV/0!
8	280	191	68.2%
9	1096	787	71.8%
10	198	175	88.4%
11	115	98	85.2%
<b>Totals</b>	<b>2355</b>	<b>1486</b>	<b>63.1%</b>

HVAC Installation Progress 'S' Curve



## Engineering & Steelwork

[redacted]

- Remaining scope for clam shell doors underway
- Scaffolding being reviewed to support last items for completion such as seals and breasthooks

## Steelwork

- Compartment completion focus for sub-contract handovers in accommodation areas and lower ship.
- Commissioning support for silencers, exhausts, collision chocks and piping systems; assisting towards first run.
- All hatches now installed on the car deck.
- Hotwork supporting equipment/piping for fuel oil system in generator and engine rooms complete.

## Specialist Subcontractors

- [redacted] / [redacted] – erected 95% of liquid phase pipework and preparing for gas phase pipework install
- Bonded windows - installation planned week commencing 19th September.
- [redacted] now completed insulation in wheelhouse.

## Electrical

- Deck 7 behind linings inspection nearing completion. Sample outfit cabin now being progressed to include bunk, desk and EL fittings etc.
- Work commenced in Emergency Generator Room cabling now complete.
- Cabling to Emergency Generator now complete.
- Ongoing work glanding terminating and testing in ECR.
- Cable install started in Aux Machine Space.
- Hold ups for completing main cable routes are painting which is being addressed slowly.
- Nightshift continuing to pull cables below 3 deck.
- Commissioning plan still being made priority.

## Pipework

- Fuel oil mod near completion.
- Installation of boiler pipework currently at 50%.
- Crankcase modifications spools fabricated and being installed.
- First Chemical Cleaning and Flushing Loop Completed and Approved by Class – EmDG FO Supply
- Week on Week Delivery of Piping Install Target of 200+ Spools
- Pipework Pressure Testing Scope Ramped Up With Further Planned Up-man to Increase Test Paths Completion.

- Issues

- Bonded windows structure rework.
- Turbo chargers to refurbish prior to running (circa 9 weeks for parts).
- Main propulsion OD boxes to be returned to [redacted] for refurb.

- Challenges

- Clam shell door external scaffold to be deigned.
- Fire main and accommodation to resolve.
- Level of change being managed.
- Material availability.
- Driving OORs to closure.
- Cable installation & termination.
- Production drawings closeout – design freeze.

- Successes

- Technical solution for black water system.
- Ran main air compressors.
- Charged starting air bottles to 30 bar.
- Solution in place for Fuel oil mod.

**No change to 802 programme at present. Overall programme under review by FMPG senior management team.**

**Level 0 - Programme**

Date: 23/03/2022

Year		2022										2023																
Month		Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
802	Structure	[Bar from Mar to Dec]																										
	Hotwork Installation		[Bar from Apr to Feb]																									
	Painting			[Bar from May to Apr]																								
	Pipework Installation			[Bar from Jun to May]																								
	HVAC					[Bar from Aug to Jun]																						
	Electrical Installation					[Bar from Sep to Jul]																						
	Insulation & Architecture					[Bar from Sep to Sep]																						
	Launch													[Bar]														
	Commissioning														[Bar from Mar to Sep]													
	Dry Dock																							[Bar]				
	Sea Trial																							[Bar from Sep to Oct]				
	Snagging & Delivery																							[Bar]	[Hatched Bar]			

## Manufacturing Sheds

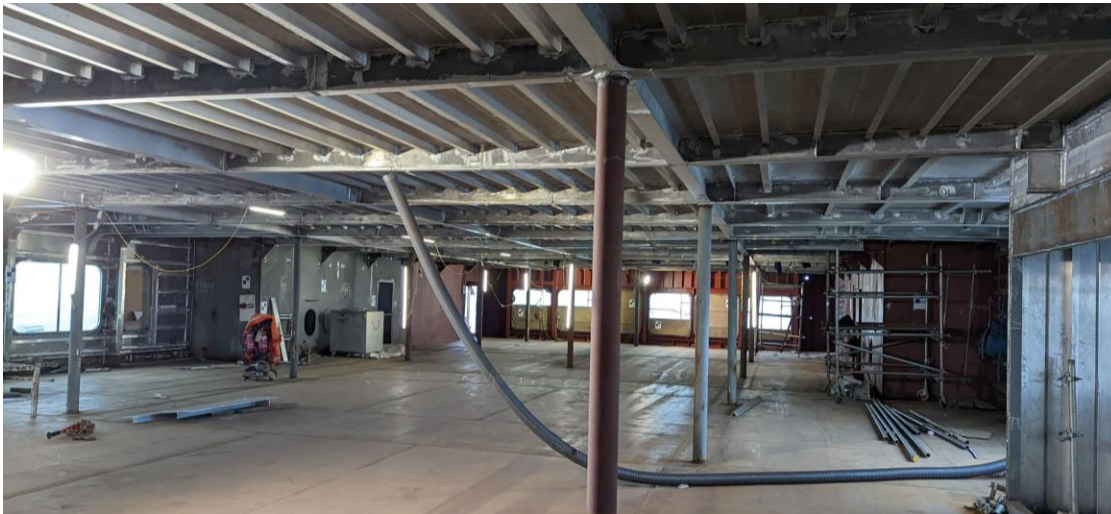
Manufacturing of 5 and 6 deck units underway.

- Fabrication of several units in progress: A11/5, A6/6, A7/6, A8/6, A9/6 and steel units 89 & 90.
- Units 85 and 86 on board.
- Unit A10/5 fully erected.

## Consolidation

Consolidation of 5 deck underway.

- Consolidation of several units in progress: A7/5, A8/5, A9/5 and A10/5.



## Outfitting

- Starboard embarkation doors fitted, to be welded.
- Steelwork ongoing in engineers workshop.

## Pipework Installation

[redacted] sign off of overboards is in progress, penetrations still being burned and fitted. Pipe fitting will commence after [redacted] sign off. 61 Penetrations in total; 57 burned; 12 back gouged and welded; 15 passed by CMAL; 15 passed with [redacted] 15 spigots fitted.

## Launch

- Launch preparation ongoing.
- Launch Date February 23rd, 2023.

## Electrical

- Contract to be re-tendered.

## HVAC

- Commencing September.

## Specialist Contractors

- Currently reviewing opportunities and finalizing plan with specialist contractors.



## Issues

- Unit outfit in manufacturing sheds is minimal due to the lack of clean drawings.
- Purchase requisition process for material/required services proving to be time consuming.

## Key Challenges for the Shipyard

Key known challenges for the shipyard to meet the programme:

- Manpower support.
- Change management.
- Material availability.
- Installation and termination of the ship's cables.
- Completion of pipework to meet commissioning dates, including addressing pipe clashes.
- Close out OOR's.
- Delivery and completion of production drawings and accuracy of production drawings.
- Shortage of experience trades and supervisors.
- Lack of familiarity with final stages of finishing the vessels, surveys, documentation and certification.

## Successes

- Crane in manufacturing shed fixed.
- Effective workforce – good progress for the limited manpower available.

## Weight & Stability

### • Stability

- Cross flooding pipe due to arrive in yard early June, with installation to follow thereafter.
- Previously, we were to find a semi-WT door solution for the aft lifts (P&S) doors to comply with Water on Deck (WoD) regulations. After multiple attempts to the lift companies including issuing a public procurement notice, neither [redacted] (OEM for lifts) nor [redacted] could provide a solution for semi-WT door provision as of Sep 2022. A buffer option was discussed with [redacted] and [redacted] against WoD requirement, such as implementing a 1.5m lightweight buffer in front of lift doors on deck 3 and deck 4 levels. Investigations are ongoing and to be discussed with [redacted]

### • Weight – [redacted] advised that weight margin had reduced from 20 tonnes to 5 tonnes. Further discussion required.

- Legacy weight list (handed over from former FMEL team) is frozen and kept as is for a reference.
  - predicted weight was 3556T with 44T contingency
  - Total validated amount was 3,449T, 97% of total
  - Remaining 3% validation was for foundations and supports.
- To validate the legacy weights list, as of mid-March a new weight study started. Overall [redacted] weights extracted from the 3D model.
  - This study has never been performed at any stage of initial or detail design. Model based study provided a better estimation covering the previous margin assumptions.
  - **All** 3D model items extracted for weight details and these items have provided a better reference for Centre of Gravity (CoG) values.
  - Current weight estimate is 3549.41t and 3.94t remained as margin. Contractual weight is 3553.35t
  - Weight updates and distribution is ongoing for longitudinal strength calculation. (Part of stability calcs for submission)
- Interim inclining experiment was undertaken to set the towing condition on 2<sup>nd</sup> July 2022. The validated condition along with towing condition calculation were conveyed to the insurer on 12<sup>th</sup> July before departure for drydock on 14<sup>th</sup> July. The warranty surveyor issued the towing certificate on 12<sup>th</sup> July. Currently, 3267.25t is available onboard including scaffoldings etc. This corresponds to 92% ship completion level. Interim inclining experiment's values will be used as a benchmark figure for the estimated figures in weight budget as well as forecast the trends until the final inclining experiment.

## Other docs to deliver

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- CMAL & FMPG have agreed (13/05/22) that FMEA is not required as a final deliverable document however a test pack will be created to show how the system recovers after failures. FMPG to propose a test pack format to CMAL.
- Machinery list (including serial numbers) is WIP. The commissioning team are producing and will also record last maintenance date where appropriate. This shall also cover the requirements for producing tallies. PO currently being raised.
- Operations Manual – This will be reviewed on an ongoing basis during commissioning and training of equipment.
- As built drawings for P&IDs and technical compartment arrangements have been agreed with CMAL. Other as built drawings to be agreed with CMAL

[redacted] plan approval update

[redacted]

Under Review with [redacted]	Date sent to [redacted]	Note
Anti Fouling Plan	15/09/2021	Part of the Eco notation, Shall be approved for ship completion hand over date as part of larger pack
Cargo Securing Manual	01/02/2022	[redacted] comments received, continue to work on this alongside CMAL and other priority tasks
Damage Control Plan	20/04/2022	Part of Stability book. To be released after stability book approval

[redacted]

Under Review with [redacted]	Date sent to [redacted]	Note
Emergency Towing Booklet	11/04/2022	Only for information but copy to be kept on board. (Not [redacted] scope) [redacted] examined the booklet on 04/07/2022. CMAL operator comments are to be incorporated and ongoing. (These comments are just operational comments and does not require any material or hardware changes.)
Accommodation Layouts	15/02/2022	
Accommodation Handrailing	31/01/2022	Will be finalised after Escape route approval
Crew Accommodation Plan	15/02/2022	
Fire Control Plan	20/04/2022	Updated in line with Structural Fire protection Plan, resubmitted on 29/06/2022
Structural Fire Protection Plan	20/04/2022	As of 26/06/22, bulkheads conditionally approved, deckheads rejected, a meeting requested to discuss LNG bunker insulation with MCA on 27/06/22.
Fixed Fire Extinguishing Syst. ECR & Pipes, Cables Transformer Room	04/11/2021	Provisionally agreed require new Type Approval Certificate from [redacted] for system as current cert is out of date.

To Be submitted to [redacted] (in Work)	Responsible	Note
Stability book	FMPG	Finalise after incline, Draft End Q4 2022
CALMAC Muster Lists (Mode 1-4)	CMAL	
CALMAC SAR Plan	CMAL	
801&802-LNGPac Operating & Maintenance Manual LNGPac-H149-D9	[redacted]	[redacted] Updating [redacted] to confirm requirement
Emergency Low level lighting	FMPG	Submit after escape routes update
Fire & Deck Wash System	FMPG	Updating due to removal of hose reels and replacement of Hydrants in Accommodation areas.

## CMAL Drawing Approval update

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- NO CHANGE due to other priorities as these drawings will be covered when as built drawings are produced for the final sign off.
- CMAL Outfit Drawing Approval update
  - 50 Total to approve
    - 7 now approved by CMAL
    - 14 under review & nearing approval.
    - 29 still to be submitted for approval

### P&IDs

- 9 Systems Approved (P&IDs)
- 23 Systems (P&IDs) to be approved by CMAL, currently these are being reviewed separately and then both parties. 4 Systems to be resubmitted to Southampton remainder will be resigned off locally

### Contract Specification

- There are various updates within the document which require to be internally reviewed and then presented to CMAL for agreement.

# Crew Training

## Training schedule (only soft booked)

### 1<sup>st</sup> vessel in Q1/2023

- 
- **Weeks 9-10: 27<sup>th</sup> February until 10<sup>th</sup> March 2023 (Engines at [redacted])**
- **Week 11: 13<sup>th</sup> until 17<sup>th</sup> March 2023 (Engine Control at [redacted])**
- **Week 12: 20<sup>th</sup> until 24<sup>th</sup> March 2023 (LNGPac at [redacted])**
- **Week 13: 27<sup>th</sup> until 31<sup>st</sup> March 2023 (Propulsion at [redacted] or on board)**

### 2<sup>nd</sup> vessel in Q1/2024

- **Week 8: 19<sup>th</sup> until 23<sup>rd</sup> February 2024 (Propulsion at [redacted] or on board)**
- **Weeks 9-10: 26<sup>th</sup> February until 8<sup>th</sup> March 2024 (Engines at [redacted])**
- **Week 11: 11<sup>th</sup> until 15<sup>th</sup> March 2024 (Engine Control at [redacted])**
- **Week 12: 18<sup>th</sup> until 22<sup>nd</sup> March 2024 (LNGPac at [redacted])**

## Still to confirm

**PMS and Alarm and Monitoring system Under discussion to arrange with [redacted]**

## 118 TECHNICAL TRAINING FOR CREW

The Builder will provide on board training in machinery and equipment for key staff. The Builder will also provide training as detailed in the Requirement Specification and Technical Schedule, and will include:

LNG Systems	Up to 10 people (3 courses)
Navigation and Communication Systems	6 people
Communications Systems	6 people
Generators & Prime Movers	Up to 10 people (3 courses)
Propeller Units	Up to 10 people (CPP)
Power Management System	6 people
Alarm, Monitoring & Control Systems,	6 people
Lifesaving Equipment	6 people

This will be done separately from the commissioning process.

The training is to be in English and held by specialist commissioning engineers from the Builder, or representatives from sub-contractors, prior to delivery and signed off by Buyers.

Specialist LNG training (approx. 1 week per ship) will be provided to ship's crew.

Training will also include Ship Specific ECDIS training for Deck Officers.

## The following has been achieved since the previous meeting.

- Shore supply connected on a daily basis to support commissioning.
- Both 415/230V transformers have been energised and connected to the 230V switchboard.
- 415/230V Emergency transformer have been energised and connected to the 230V Emergency switchboard.
- 2 off praxis UPS's have been energised and circa 50% of circuits checked.
- 2 off 24V DC UPS's have been energised circa 50% of circuits checked.
- Distribution board EP01 energised.
- Both starting air compressors have been run. Receivers have been pressed up to 30 Bar.
- Emergency generator fuel oil pipework has been pressure tested, chemical cleaned and flushed.
- Sea Water main pressure tested.

## Planned activities for the next 3 weeks.

- Alarm channel testing to commence.
- Commence bringing alarm system DPU's on-line.
- Sea Water system to be ran sea to sea.
- Load Test Emergency Generator.
- First run Harbour Generator (subject to Cummins availability)
- Fill HT/LT system
- Test Quick closing valves on fuel tanks



- Circulated for discussion.

### OOR status

	All categories	Category 1	Category 2	Category 3
Total Raised	605	368	224	13
Total Closed	464	275	183	6
Total committed	48	39	8	1
Total to close when work complete	49	39	8	2
Total still to resolve	44	15	25	4

Category 1 - Must be done before handover

Category 2 - General / Specification Issues to be done - may carry over to warranty period

Category 3 - Snagging

- 16 OOR’s closed in the month
- All remaining 97, “Committed” or “Closed when work complete” to be allocated to subzone/compartments and included within the work pack diary program. Dates with owners will be logged and tracked.

## Variations to Contract

<u>VTC's</u>	<u>Contract Section</u>	<u>Description</u>	<u>Date Requested</u>	<u>Impact</u>	<u>Comments</u>	<u>Status</u>
<a href="#">LNG-100-114</a>	<b>section 813:</b> Fire and Wash Deck System	A fresh water fire main, supplied from the vessel's domestic fresh water system, will be provided in the main accommodation area and small bore fire hoses, of nominal 25 mm diameter and not exceeding 15 m length, will be provided at sufficient locations on each deck level to reach all parts of the accommodation This requirement to be deleted	13/04/2020	Requirement to be removed from technical specification		[redacted]
<a href="#">LNG-100-119</a>	N/A	Provision of workshop tools		[redacted] to supply various tools/pieces of equipment for workshop		postponed
<a href="#">LNG-100-121</a>	<b>section 561 i)</b> passenger lifts	addition of weathertight door for passenger lift on 07 deck				costs to be determined
<a href="#">LNG-100-123</a>	<b>section 868:</b> shore supply	Addition of a shore supply connection box for 802 only				[redacted]
<a href="#">LNG-100-127</a>		Sanitary/Grey Water System		Re-routing of laundry discharges to grey water tank		under investigation
<a href="#">LNG-100-128</a>		Quick Release Hatches for shaft inspection in Workshop / Nitrogen spaces				under investigation
<a href="#">LNG-100-129</a>		Domestic Hot Water		The installation for the potable freshwater which within the contract is stipulated as copper piping. Agreement with CMAL to change to Mappress rather than copper. This is a suitable replacement that is easier to install and maintain and is suitable for use on domestic systems. We have engaged with [redacted] and they do not have any issue with this	Amend Technical specification	[redacted]