Report

Inspection

Facility:	POSH Arcadia
Operator:	POSH Fleet Services Pte Ltd
Offshore Inspection Dates:	21/11/2018 – 21/11/2018

Lead inspector	[redacted]
Inspection Team	
Report Number	1907

REPORT DISTRIBUTION

Position	Company
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REVISION STATUS

Rev:	Date:	Description:	Prepared by:	Approved by:
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1 Abbreviations

NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
OEM	Original Equipment Manufacturer

2 Inspection Method

The proposed scope for this inspection was to conduct a Non-Major Investigation of the following at the Posh Arcadia facility:

- Follow-up of information received – NOPSEMA ID 5669 – Potential issues with facility cranes; and
- Meeting with Health and Safety Representatives and members of the workforce.

The inspectors were conducting an inspection at the Prelude FLNG facility from 19 to 23 November 2018. Since the POSH Arcadia facility was connected by gangway to the Prelude FLNG facility, a decision was made by NOPSEMA to conduct the inspection unannounced on 21 November 2018.

On arrival at the facility, an entry meeting was held to present the plan to the offshore personnel. At the conclusion of the inspection, the inspectors described their preliminary findings to the operator which was discussed with key offshore personnel during an exit meeting. An attendance list for both the offshore entry and exit meetings is included in Attachment A.

The goals of the Non-Major Investigation were, firstly, to establish whether, in the opinion of the inspectors, there was an immediate threat to the health and safety of personnel at the facility that would warrant an immediate response from NOPSEMA to reduce or eliminate the threat; and, secondly, to determine whether root causes for the dangerous occurrence reported in the information provided had been established in order to mitigate the likelihood of a similar event in future.

3 Follow-up of information received – NOPSEMA ID 5669 - Potential issues with facility cranes

The following information (*in blue italics*) was received by NOPSEMA on 6 November 2018. The inspectors sought to verify relevant issues in the provided information during the inspection. Verified information has been documented after each line item provided by the informant below.

1/Incident - Starboard 100T Leibherr crane - 7-8th April
42mm Luffing wire fell 25m + from the crane boom when a Chinese finger failed. The new wire (New wire end to be attached to the luffing winch) hit the main deck directly under the crane boom on a designated walk way outside the Dirty mess room and a Deck workshop. The damaged old wire ricocheted through the boom narrowly missing an adjacent out door gym area and came to rest hanging out of the boom also. Rope access technicians were called in from FLNG Prelude to secure the site due to the precarious nature of the two wire ends. Photo attached (wire position after the fall).

It is noted that a Chinese finger provides a quick and fast means of terminating different kinds of steel wire rope. The grips can be used for reeving and pulling of steel wire rope onto blocks or cranes. They are made from woven mesh galvanized steel wires leading to a very flexible and easy to handle termination.

The inspectors sighted copies of the rope change out risk assessment (#PFS-01-IMS-03A-002) and Original Equipment Manufacturer (OEM) procedure (BOS 2600 – 14000). Copies of the permit to work, records of tool-box talks, barricading and spotters deck plan, three witness statements and the Chinese finger test certificate were also sighted.

It is noted that the wire fell to the deck as a result of the failed Chinese finger in the barricaded area and personnel were not at risk since the controls (barricaded area) implemented as a result of the risk assessment had been effective.

The inspectors noted that this dangerous occurrence had not been reported to NOPSEMA. NOPSEMA guidance note N-03000-GN0099 July 2013 states:

"Operators must also notify and provide a report to NOPSEMA regarding dangerous occurrences at or near a facility. These occurrences are, amongst others:

- damage to safety critical equipment;
- any other occurrence that a reasonable operator would consider to require an immediate investigation.''

Recommendation 1907-1
Operator to ensure that NOPSEMA is notified of accidents and dangerous occurrences in accordance with Clause 82 of Schedule 3 of the Offshore Petroleum and Greenhouse Gas Storage Act 2006.

Unsafe conditions relevant to Starboard 100T crane

(a) At the luffing winch a keeper plate for the bitter end of the wire is missing, it was torn off during the wire change operation, the wire is not secure as per Liebherr specifications.

The [redacted] at the facility stated that seven out of eight keeper plates were installed. One keeper plate could not be installed since the attachment for the same had been damaged. It was also stated that at the lowest position of the jib, there were more than three turns of wire remaining on the drum as required by the OEM and that the crane specialist vendor, Enermech, had verbally stated that the single missing keeper plate did not affect the integrity of the crane. However, there was no documentation to verify this statement from Enermech or the OEM.

Recommendation 1907-2
Operator to ensure that all eight keeper plates on the luffing wire winch drum are installed and that the crane is operated in accordance with original design constraints set by the original equipment manufacturer.

(b) The Luffing wire length appears to be in excess of Liebherr recommendations, by some 20-30m.

The OEM parts list and the part number on the new wire were verified. The inspectors confirmed that the correct part as recommended by the OEM has been installed.

(c) Due to previous (b) excess wire upon the grooved drum is causing crushing and distortion to the luffing wire when the crane exits the rest, Liebherr recommends several turns of the grooved drum be free of wire
when the boom is in the rest position, this is not the case with this winch, there are approx 4 overlaying turns.

This does not appear to be a correct statement since the OEM technical description does not mention it and all part numbers have been verified.

(d) Swarfing damage of the wire is ongoing, needle like shards are being ground off the wire and have been reported as having been produced at the luffing winch area.

This statement could not be verified. The [redacted] confirmed that during his daily and weekly checks no damage of the new luffing wire had been noted. The crane daily and weekly logs were sighted.

(e) The Luffing (previous) winch wire experienced catastrophic damage which required the crane to be taken out of service, no report nor enquiry was conducted to ascertain the reason for the damage and the original cause not identified a new wire was installed and the unsafe condition continues.

The [redacted] confirmed that the root cause of the wire damage had not yet been determined. However, the daily pre-use checklist now included a full visual check of the luffing wire until the root cause was determined. The updated daily pre-use checklist was sighted.

Recommendation 1907-3
Operator to ensure that the root cause of the luffing wire failure is determined in order to prevent recurrence of luffing wire failure.

(f) Limit switch activation is not correct as per specification due to (b) it appears that (possibly) loose turns are produced at the drum when the wire down limit is activated, a riding turn and subsequent overlay could be the cause of the wire damage which caused the initial catastrophic wire damage.

The statement appears incorrect. The [redacted] confirmed that the limits were correctly set and were used every time when the crane was required to be parked in its cradle. The limit prevents the jib from being lowered beyond a certain point and the [redacted] confirmed that this limit had to be bypassed for parking the jib in accordance with the operator's procedures.

(g) There are no cameras providing winch/wire condition feedback to the [redacted].

It was confirmed that there are no cameras installed on the crane. However, the crane is designed and built the API RP 2C standards which do not require the installation for safe operation of the crane.

(h) Until my departure from the vessel, multiple un-accounted for "joy stick" error alarms revolving around a 24v supply issue saw dead joysticks on multiple start ups control panel X25 "main switch" error light continuously illuminated, reported and logged in crane log book.

Recent crane log book records were sighted which did not indicate the above condition. The [redacted] interviewed also did not report this condition.

(i) Main winch inoperable.

This is not an issue since the main winch is not being utilised nor planned to be utilised. The [redacted] stated that the main winch was not required for safe operation of the facility.

2/ Incident

Over load Port crane 150T Liebherr, on or about February 23rd? (refer to crane log book)

Down loaded crane data suggests a load in excess of 26400kg was applied to the crane auxiliary block, which has a 25000kg WLL, I did not view data prior to this incident as I wanted to confirm the overload and ensure non-recurrence and to consult with management to ensure action was taken to prevent any further incidents

Crane log book entry shows 23.7T concern raised for this incident by [redacted] on the day, no action taken to prevent recurrence

Dynamic forces applied to the crane would see expected overload condition.

Crew report "hearing alarms"

API 2C Load chart for crane gives Maximum static heel/trim values of 1.5 degrees respectively. In reality it is almost impossible to operate the crane within these parameters, subsequently the crane operates in an alarm state Particularly during heavy lifts outboard to supply vessels. Is the correct load chart operational on the user display?

FGRU 2000 32 3, a bulk liquid TEU has been routinely deployed to vessel for purpose of engine room waste carriage ashore (the cause of the above incident and possibly others not yet identified).

The above incident could not be confirmed. The [redacted] did not report hearing alarms and also did not report any overloaded condition. The crane logs did not indicate any loads in excess of design limits. The operational load charts were sighted.

Failure to adhere to Posh IMS relevant to (PFS-01-IMS-000) 16.1 and 16.2 complex and complicated lift Guidelines saw months of lifting operations conducted outside of best practice global guidelines and in fact POSH permit to work system. A hazard observation card was raised re the above issue (attached) no measures put in place to remedy the potential for recurrence, even though it was suggested that we use two smaller vessels in future, this was ruled out as being "logistically out of the question" and "cost prohibitive"

The statement above could not be verified. Samples of previous complex lifts were sighted.

Many issues are duplicated on the Port 150T crane that exist on the Starboard 100T crane.

This has been addressed in earlier sections of this report where starboard crane issues have been discussed.

(b) The Luffing wire length appears to be in excess of Liebherr recommendations, by some 20-30m.

This has been addressed in earlier sections of this report where starboard crane issues have been discussed.

(f) Limit switch activation is not correct as per specification due to (b) it appears that loose turns are produced at the drum when the wire down limit is activated, a riding turn and subsequent overlay could be the cause of the wire damage which caused the initial catastrophic wire damage.

This has been addressed in earlier sections of this report where starboard crane issues have been discussed.

(i) Main winch inoperable.

This has been addressed in earlier sections of this report where starboard crane issues have been discussed.

Crane log book will show a record of many of the above reported issues.

The crane log book was sighted and the statement above could not be verified.

No independent third party evaluation of the catastrophic luffing wire damage was or has been undertaken and the cause unidentified and so the condition which caused it persists-unexplained.

Had the luffing wire completely failed and the entire 60m boom of the crane collapsed to deck we may well be having a different conversation today.

This has been addressed in earlier sections of this report where starboard crane issues have been discussed. A recommendation has been raised to address this.

A poorly orchestrated ad lib approach was taken to the "running off" and "running on" of old and new Luffing wires. Posh insistence that the task would be completed in 24hrs based on a recent task of the same nature having been completed on a sister vessel Posh Xanadu filled management with such confidence that they ignored advise from Liebherr that a Liebherr crane technician should be present for the intended work scope (as shown in crane issues correspondence, attached).

At the start of the task to run the wire off it was apparent that multiple safety systems (lower wire limits) needed to be disengaged or over ridden with no knowledge as to what was to happen, when the luffing winch taco (pulse encoder) was disconnected the winch operated in a reverse state to all inputs by the [redacted] through the joy stick, this lead to days of delays due to unexpected movements of the winch.

This statement could not be verified. The OEM recommended wire change-out procedure used for the operation and related permits were sighted.

What was to have been a "routine task" estimated to take no longer than 24hrs took 6 weeks, saw the tail end of a 6.7T Luffing wire free fall out of the boom impacting a walkway, with high potential for serious injury/fatality.

This has been addressed in earlier sections of this report where starboard crane issues have been discussed. The OEM recommended wire change-out procedure used for the operation and related permits were sighted

4 Attachments

Attachment A – Facility Meeting

The facility Entry Meeting provided an opportunity for NOPSEMA to provide an overview of the inspection programme and confirm the itinerary. The facility Exit Meeting provided an opportunity for NOPSEMA to present the interim observations and conclusions from the inspection and for the facility's workforce to give their views.

A list of personnel at the entry and exit meetings is attached below:

NOPSEMA

Form

Entry and Exit Meeting Register and Notification of Entry

By initialling the 'Entry' column of the form below, I hereby acknowledge that on entering the facility the inspectors notified the entry meeting attendees of the purpose of entering the facility in accordance with Clause 50 (2): "Notification of entry" of Part 4 (OHS Inspections), Division 2 of Schedule 3 to the Offshore Petroleum and Greenhouse Gas Storage Act 2006 (OPGGSA).

Note: Page two of this form contains NOPSEMA Privacy Notice

OPERATOR:	POSH Fleet Services Pte Ltd	**FACILITY:**	Posh Arcadia
Entry meeting date:	21/11/2018	**Exit meeting date:**	

NAME (Please Print)	COMPANY	POSITION	Entry (Please Initial)*	Exit
[redacted]				

Revision: 3
Revision Date: 1 October2014
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Reference: N-02100-FM0042
Objective ID: A15392
National Offshore Petroleum Safety and Environmental Management Authority

Attachment B – Detailed Recommendations from this Inspection

ID	1907-1
Recommendation	Operator to ensure that NOPSEMA is notified of accidents and dangerous occurrences in accordance with Clause 82 of Schedule 3 of the Offshore Petroleum and Greenhouse Gas Storage Act 2006.

ID	1907-2
Recommendation	Operator to ensure that all eight keeper plates on the luffing wire winch drum are installed and that the crane is operated in accordance with original design constraints set by the original equipment manufacturer.

ID	1907-3
Recommendation	Operator to ensure that the root cause of the luffing wire failure is determined in order to prevent recurrence of luffing wire failure.