

NOPSEMA Inspection of Northern Endeavour Facility

Inspection details

Duty holder inspected		
Operator	Petrofac Facilities Management L	imited
Entity inspected		NOPSEMA Inspection No.
Facility	Northern Endeavour	3746
Permissioning document		·
Safety Case		
	dated 31 March 2	2023.
Inspection dates		
Offshore	08/09/2023 - 10/09/2023	
Inspection team		
Lead Inspector		
Inspection Team		
Duty holder contacts		
Operator representative		

Report distribution

Position	Company	
Records management	NOPSEMA	
	Petrofac Facilities Management Limited	

Revision status

Rev	Date	Description	Prepared by	Approved by
Α	20-SEP-23	Internal draft		
В	21-SEP-23	Draft for discussion with duty holders		
0	27-SEP-23	Final		



Table of Contents

ınspe	ction de	talis		<u> </u>
•				
Revis	ion statu	S		1
Table	of Conte	ents		2
1.	Insped	ction legi	slative framework and methodology	3
	1.1.	Legisla	tive framework	3
	1.2.	Inspec	tion objective and scope	3
	1.3.	Prepar	ration and conduct of the inspection	3
2.	Insped	ction resu	ults	4
	2.1.	•	tional context	
	2.2.	Consul	ltation with Health $\&$ Safety Representatives and members of the workforce \ldots	5
	2.3.	Vessel	Collision – Focus on SIMOPS	_
		2.3.1.	Objective and summary of requirements	5
		2.3.2.	Observations and findings	5
			Conclusion	
	2.4.	Inspec	tion, Maintenance and Repair (IMR) – Focus on phase back/switch off of IMR	7
		2.4.1.		
		2.4.2.	Observations and findings	8
		2.4.3.		
	2.5.	Genera	al Items	9
		2.5.1.	Facility Inductions	9
		2.5.2.	Helicopter Life Jackets	
		2.5.3.	Subsea Flushing Package	
		2.5.4.		
		2.5.5.	Structural/Potential Dropped Objects (PDO) Inspection	
		2.5.6.		
	2.6.		of responses to previous conclusions and actions	
		-	and abbreviations used in this report	
Appe		•	of meeting attendance	
		•	ction Meeting	
		,	eetings	
	B.3: P	ost-inspe	ection Meeting	14



1. Inspection legislative framework and methodology

1.1. Legislative framework

NOPSEMA conducts inspections as part of its legislated function to implement an effective compliance monitoring strategy to ensure compliance with NOPSEMA listed laws¹. Inspections are undertaken by NOPSEMA inspectors appointed by NOPSEMA under Section 602 of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGSA).

This report has been prepared as required by the OPGGSA² and includes the Inspectors' conclusions from the inspection and the reasons for those conclusions. Where those conclusions indicate that there is non-compliance with the requirements of the OPGGSA, and/or commitments in permissioning document(s), resulting in a risk or potential risk to safety, the Inspectors have provided advice regarding the action(s) or outcomes recommended to address these conclusions.

A list of acronyms and abbreviations used in this report are provided in Appendix A.

1.2. Inspection objective and scope

The objectives of this inspection are to ascertain, for the scopes stipulated below, whether risks to safety are being managed by the duty holder as required by their duties under the OPGGSA and in accordance with accepted permissioning document(s); and that the controls described in those documents are effective in reducing these risks to ALARP.

The planned scope of this inspection was:

- Vessel Collision Focus on SIMOPS, Hazard Management and Emergency Management.
- Inspection, Maintenance and Repair (IMR) Focus on phase back/switch off of IMR.

In addition to the planned scope, other issues arose during the course of the inspection and as a result the following items were also considered:

• General Items.

In addition to the scopes above, the Inspectors also took the opportunity to meet with the Health and Safety Representatives (HSRs) on the facility in order to seek their views and perspective on health and safety management of the facility, the efficacy of workplace arrangements and provide an opportunity to explain the scope of NOPSEMA's inspection and answer any questions.

1.3. Preparation and conduct of the inspection

The inspection team prepared a planned inspection brief, including a list of documentation required prior to the inspection and proposed inspection itinerary and scope, and issued it to Petrofac Facilities Management Limited on 13 July 2023. The documentation requested was received on 18 August 2023 and reviewed by the inspection team prior to arriving at the duty holder's facility.

On arrival at the facility, an entry meeting was held to communicate the purpose of NOPSEMA's inspection, the powers of the Inspectors under the OPGGSA and to provide an opportunity to discuss and clarify the

 $^{^{\}rm 1}$ NOPSEMA listed laws are defined in Section 601 of the OPGGSA.

² Under Part 4, Division 4 of Schedule 3.



inspection brief (including the scope of the inspection and proposed itinerary). A list of persons present at this meeting is included in Appendix B:.

During the inspection, NOPSEMA Inspectors met with HSRs and other members of the workforce. The outcomes of these discussions are described in Section 2.2 below.

NOPSEMA Inspectors reviewed the documentation requested, held an onshore meeting with Petrofac management and supervision to progress the inspection topics, held meetings with offshore management and supervision and had discussions with the offshore workforce to progress the inspection topics. In addition, a facility walk around was undertaken to assess the general condition of the facility and assess how the temporary equipment for the subsea flushing work had been installed.

The Inspectors collected documents in order to aide in their consideration of the topics and to obtain supporting information for their findings and conclusions.

As per NOPSEMA's inspection policy, a sampled approach was taken to assess the inspection scope and to arrive at the conclusions in this report. The findings and observations in this report provide the basis for the conclusions and compliance advice (where applicable) but are neither exhaustive nor definitive.

Before leaving the facility, the inspection team prepared an Inspection Exit Brief, which was provided to and discussed with key offshore personnel during an exit meeting. A list of persons present at this meeting is included in Appendix B:.

Subsequently, a meeting was held with key onshore personnel of the operating company, to discuss key findings from the inspection. Significant details of this meeting are provided in Appendix B:.

2. Inspection results

The following sections contain the detailed observations, findings and conclusions for the topics covered in this inspection.

To ensure compliance with their duties under the OPGGSA and/or the requirements of relevant permissioning document(s), NOPSEMA expects the duty holder to consider the conclusions, and the reasons for those conclusions, and undertake sufficient investigation/action to both fully understand the conclusions presented and to take action to:

- Reduce the risks and impacts to ALARP
- Ensure compliance with their duties under the OPGGSA and/or the commitments made in the safety case.

Compliance advice, in the form of recommendations, has been provided to assist the duty holder in their consideration of the conclusions and the actions they may need to take to address those conclusions. This advice indicates the actions, outcomes or considerations that should be taken into account when determining how Petrofac Facilities Management Limited will address any identified risk gaps and return to compliance. The considerations may indicate better practice actions or outcomes that should be reviewed for implementation and/or provide a warning regarding potential future non-compliance. The management of risk will however always remain the responsibility of the duty holder.

2.1. Operational context

At the time of the inspection, in addition to routine maintenance activities taking place, on-going structural/potential dropped object inspections were being undertaken and the flushing of the subsea



infrastructure was taking place with the assistance of the IMR vessel Fugro Etive which was providing Remotely Operated Vehicle (ROV) duties.

Due to the additional work being undertaken on the facility the persons-on-board (POB) was at the maximum of 60.

2.2. Consultation with Health & Safety Representatives and members of the workforce

There were health and safety representatives (HSR's) who were available to attend the meeting and they reported that the HSR process is working well on the facility.

The HSR's advised that they are pro-actively encouraging the workforce to raise any health and safety issues with them so that they can progress and resolve them with Petrofac management.

The HSR's advised that there was good use of the Observation Card System by the workforce for raising health and safety issues.

The HSR's advised that Petrofac very responsive to addressing, health, safety and welfare issues.

The HSR's also advised that morale on the facility was very good and that a good safety culture was in place on the facility.

The HSR's reported that higher risk activities were well communicated and discussed with the workforce prior to work execution to ensure safe implementation of activities e.g. Subsea Flushing.

2.3. Vessel Collision – Focus on SIMOPS

2.3.1. Objective and summary of requirements

The objective of this scope was to evaluate Petrofac's ability to manage multiple vessels during SIMOPS activities for the planned Light Well Intervention Vessel (LWIV) work scope and in addition to disconnection of the Risers and Moorings in preparation for tow from location. Ongoing 'Flushing and Decalcification' activities were being conducted by the Fugro Etive at the time of inspection in addition to cargo transfer operations from the Skandi Atlantic to NE, presented the opportunity to witness SIMOPS firsthand.

SIMOPS Procedures, Emergency Communications and Permit to Work Controls and Drills were tested in the inspection that are used to manage the risk(s) in question.

2.3.2. Observations and findings

Petrofac provided copies of the following documents:

dated 8th Aug. 2023 and

dated 10th August 2023. Whilst both

documents were presented as 'Accepted' and 'Approved for Use', several 'Hold' points were noted in the Bridging Document, and 'Unauthorised Boarding' omitted from the ERP, based on which it was understood that both documents are still in draft and currently under compilation, with final copies to be made available once approved for use.

Petrofac provided a copy of thei

dated 1st September 2023,

'Issued for Comment', which contained a SIMOPS / CONOPS Matrix for all Phase 1 activities. The workshop



attendance register provided a comprehensive list of representatives which included Petrofac, various vessel operators and third-party contractors who are currently, or who will be involved in the simultaneous and concurrent operations, however, whilst the EXPRO LWIV ERP mentioned above states 'V. Ships is the nominated operator of the Safety Case for this project. The as V. Ships nominated offshore representative is overall responsible and accountable for the day-to-day operations and health and safety of all personnel on board', it was noted that no one from V. Ships was in attendance. Petrofac agreed to extend the review and comment of the SIMOPS workshop report to V. Ships prior to the report being 'issued for use'.
The above SIMOPS / CONOPS report also contained a reference to Document No.
and it was noted a copy of the SIMOPS and CONOPS Matrices from the Manual are actively in use onboard Northern Endeavour during their daily Permit to Work meetings. Petrofac have stated that copies of the enhanced SIMOPS and CONOPS Matrices from the recent workshop will be issued for use on completion of the final review.
Petrofac provided a copy of
dated 9th August 2023 for the ongoing flushing and decalcification activities by their Flushing Support Vessel (FSV). Petrofac also provided a copy of dated 26th July 2023 as referenced in their HSSE Management Plan. It was noted that whilst 'Piracy' and 'Terrorism' were included in the documents, the risk of 'Unauthorised Boarding' was not covered, being particularly relevant due to regular sightings of Indonesian and Timorese fishing vessels near the work location. Further to a recent encounter with a small fishing vessel, highlighted during the onboarding induction, Petrofac confirmed that all sightings of fishing
boats and other unauthorised vessels are reported directly to the FSV via radio and/or telephone communications as soon as they occur.
Emergency communications with the FSV were satisfactorily covered under dated 26th July 2023, which was also referenced in the ERP.
Petrofac provided a copy of the
dated 6th April 2023, in which it was noted that
important information was missing from several sections i.e., however those 'limits' were not specified and the table under was empty with no equipment details provided. Petrofac have stated this document along with the and are currently in draft and still being compiled, final copies will be issued for use.
SIMOPS Management
A will be available onboard the Northern Endeavour to support the during the riser and mooring disconnection and associated activities/SIMOPS i.e., ISV, HBT and SKT's.
Daily reporting between the Northern Endeavour (NE) and Fugro Etive was conducted on a twice daily basis during the flushing and decalcification activities in addition to an 'as required' basis during valve testing

activities.

operations. This reporting requirement will be applied to the LWIV, Riser and Mooring disconnection



The Permit to Work (PTW) hierarchy was established between NE and the Fugro Etive as per the ROV Intervention / Valve Operations 'approved' procedures, with the LamCor Wells remaining under NE control via a 'Cold' Permit to Work (PTW) being issued by NE for the FSV working inside the NE 500m zone which was extended to cover the FSV working inside the LamCor 500m zones for control of ROV intervention work. A Level 2 Risk Assessment was conducted prior to commencement of work and the PTW revalidated at each shift change. Any deviation from the subsea flushing procedures was conducted via Petrofac's

Petrofac advised 'Starlink' internet access had recently been installed on NE, allowing for effective communications between the NE Control Room and the Fugro Etive via MS Teams, which also allowed for a 'live' video feed from the ROV during flushing operations. Communications via VHF Channel 12 were only available to the FSV bridge, and not to the Client office.

On completion of Phase 1 and under the current plan, Northern Endeavour will be completely unmanned with all systems isolated and shutdown. Petrofac have confirmed that solar / battery powered, temporary navigation lighting will be installed onboard NE prior to tow, and they have already commenced communications with AMSA regarding requirements for the tow from location.

Drills

In order to ensure full awareness and understanding regarding permit to work systems, smoking on deck, mustering etc., Petrofac confirmed that a full crew briefing will be held onboard prior to any vessel entering the NE 500m zone.

In accordance with the Northern Endeavour Drill schedule, a 'Vessel Collision / Loss of Hull Integrity' drill will be conducted prior to commencing SIMOPS with the ISV / HBT / SKT's for the riser and mooring disconnection activities. Regular drills are conducted onboard NE as per the drill schedule which was available in Confice (Checked at time of previous inspection ID #3640).

2.3.3. Conclusion

Conclusion [3746-C01]

Due to the slippage in schedule and resultant delay in disconnect, many of the documents provided were still in draft and under compilation. However, based on the flushing and decalcification activities being conducted at the time of inspection, combined with existing procedures and documentation, it is concluded that Petrofac were able to actively demonstrate good (global) communications and control of the work (SIMOPS) via their PTW system, in addition to proactively managing changes in procedures via their Engineering Query (EQ) and Management of Change (MoC) Process.

2.4. Inspection, Maintenance and Repair (IMR) – Focus on phase back/switch off of IMR

2.4.1. Objective and summary of requirements

The objective of this scope was to evaluate the methodology that was being used to systematically phase back and then switch off the maintenance, inspection and repair activities that are automatically generated from Maximo, the computerised maintenance management system (CMMS).



In addition, the process of IMR switch off and subsequent systems and equipment isolation to fully decommission it and make it safe was also reviewed.

2.4.2. Observations and findings

Petrofac have in place a Late Life Asset Management Assessment (LLAMA) process for the facility which describes the methodology for changes to the maintenance programme for decommissioning of equipment.

The LLAMA is supported by CMMS Planned Maintenance Assurance (PMA) and Planned Maintenance (PM) IMR task reviews of equipment by System/Equipment Functional Location to identify the optimal transition phases (Run Down) of IMR activities.

A draft Operations and Maintenance Rundown Plan is in place and being reviewed by DISR, this appears to be currently a "High Level" Transition Out Plan rather than a fully detailed "maintenance" rundown plan. Within this current draft plan, Readiness Indicator 02 – Onshore Readiness is the key focus area for maintenance rundown of systems and equipment.

Petrofac advised that the LLAMA/Run Down Plan is to be expanded into a fully developed Run Down Plan detailing the order of equipment switch-off.

The is currently reviewing the LLAMA/Run Down Plan Spreadsheets for to identify systems and equipment that can have maintenance switched-off as soon as possible e.g. Gas Lift System. The onshore Integrity Management / Supervision are reviewing / endorsing the PM switch-off recommendations from the and when agreed, a list of the PM's will be sent to the CMMS Focal Point to effect the switch-off of IMR activities.

The process and timing of when systems and equipment can be isolated and made safe following CMMS PM switch-off is being finalised, with input from the

Petrofac advised that the "fully detailed" Operations and Maintenance Rundown Plan will be supported by individual procedures for systems and equipment decommissioning which will be managed by system and equipment workpacks.

Petrofac provided some previous examples of Decommissioning Procedures that are available to support the development of Northern Endeavour Decommissioning Procedures.

2.4.3. Conclusion

Conclusion [3746-C02]

The IMR phase back and switch-off process is in its early stages, as the timing of the facility disconnect has been further delayed, thus impacting the timing of IMR switch-off. However, the inspectors find that Petrofac have in place a suitable methodology to switch-off IMR activities in a phased manner.

The process and timing of systems and equipment isolation to make it safe following CMMS IMR switchoff is being finalised at the time of this inspection.



2.5. General Items

2.5.1. Facility Inductions

The onshore pre-mobilisation safety, environmental, and PTW inductions were to a high standard and this induction approach is a considerable improvement to the previous arrangement of doing these on initial arrival offshore – observed by NOPSEMA inspectors during previous planned inspections.

2.5.2. Helicopter Life Jackets

It was observed that the helicopter life jackets were not fitted with Compressed Air-Emergency Breathing System (CA-EBS). The use of CA-EBS on life jackets is becoming the norm for many offshore operator's and Petrofac advised that these will be implemented shortly in conjunction with Jadestone Energy, who Petrofac share the helicopter service provider with.

2.5.3. Subsea Flushing Package

The subsea flushing package was onboard and in use on the facility at the time of the inspection.

The placement and hook-up of the flushing equipment was observed to be well managed with good access/egress capability and safety barriers in place to protect the workforce.

It was established that the offshore personnel were not using Petrofac's Temporary Equipment Procedure and associated Checklists to ensure that temporary equipment is fit for service and installed correctly prior to use on the facility.

Petrofac management undertook to ensure that their Temporary Equipment Procedure would be made available to the offshore personnel as soon as possible.

2.5.4. Onshore Repairs

During discussions with offshore personnel, it was established that recently a heat exchanger that was sent onshore for repair had returned to the facility and was found to be defective. As the Quality Assurance/Quality Control (QA/QC) process for this onshore equipment repair had failed, it may be prudent to review and strengthen the onshore QA/QC process associated with equipment repairs.

2.5.5. Structural/Potential Dropped Objects (PDO) Inspection

It was observed that the offshore workforce are being very vigilant identifying PDO's and reporting these via the Observation Card System.

As there are now further delays with the timing of the facility disconnection, it is considered prudent to review and where appropriate enhance the Structural Integrity/PDO Management System originally developed for the facility when Petrofac commenced as operator in September 2022.

2.5.6. General Housekeeping

The general housekeeping on the facility was observed to be good and has been improved since the last NOPSEMA inspection in November 2022.

Significant rust debris was observed on the decks in many places following recent wash down activities and this could cause eye injuries if not kept under control, especially with the upcoming Cyclone Season.



2.6. Status of responses to previous conclusions and actions

The two actions from the previous inspection, number 3640 undertaken in November 2022, have been satisfactorily closed out.



Appendix A: Acronyms and abbreviations used in this report

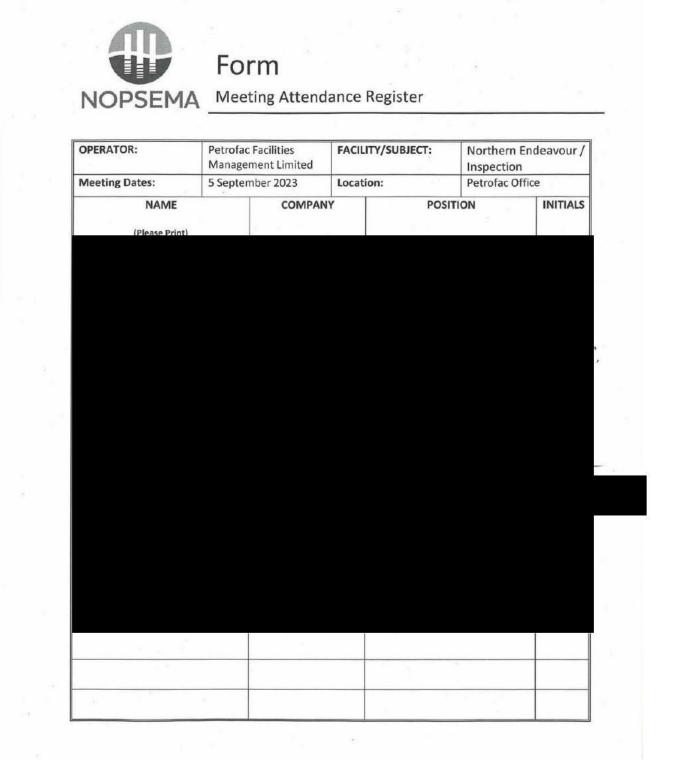
Acronym or abbreviation	Definition
ALARP	As Low As Reasonably Practicable
CA-EBS	Compressed Air-Emergency Breathing System
CMMS	Computerised Maintenance Management System
CONOPS	Concurrent Operations
ENC	Emergency Notification Chart
EQ	Engineering Query
FSV	Flushing Support Vessel
нвт	Hold Back Tug
HSR	Health and Safety Representative
HSSE	Health, Safety, Security and Environment
IMR	Inspection, Maintenance and Repair
ISV	Installation Support Vessel
LLAMA	Late Life Asset Management Assessment
MoC	Management of Change
NE	Northern Endeavour
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
OPGGSA	Offshore Petroleum and Greenhouse Gas Storage Act 2006
PDO	Potential Dropped Object
PM	Planned Maintenance
PMA	Planned Maintenance Assurance
РОВ	Persons On Board
PTW	Permit to Work
QA/QC	Quality Assurance/Quality Control
ROV	Remotely Operated Vehicle
SIMOPS	Simultaneous Operations
SKT	Station Keeping Tug
SME	Subject Matter Expert
·	



Appendix B: Summary of meeting attendance

B.1: Pre-Inspection Meeting

The pre-inspection meeting was held on 5th September 2023 in order to discuss the proposed inspection scope and logistic arrangements and commence the inspection by progressing the inspection topics with Petrofac onshore management and supervisory personnel.





B.2: Facility Meetings

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

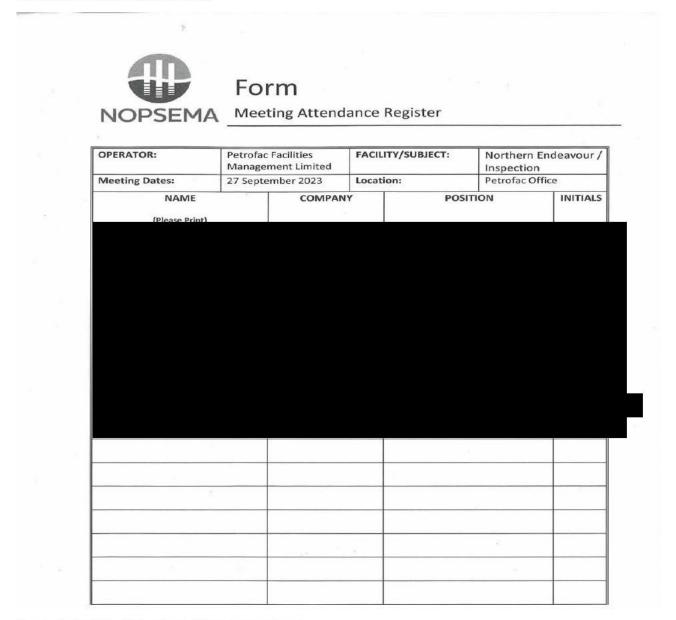
A list of personnel at the entry and exit meetings is included below:

	SEMA	9.07			FORM
Australia's offshor	re energy regulator				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Entry and Ex	it Meeting	Register	and Notificat	ion of	Entry
Document No: Date: 27/0	08/2020				
	e entry meeting a e 50(2) - OHS insp deum and Greenh	attendees of the ections ouse Gas Store			
Operator:	Petrofac Facil Management		Facility:	Norther	n Endeavour
Entry meeting date:	08 00	1/23	Exit meeting date:	101	09 23
Name (please print)		Company	Position		Entry Exit
(please print)	V.,		-		(please initial)



B.3: Post-inspection Meeting

A meeting was also held on 27 September 2023 in order to discuss the inspection findings. People present at that meeting are listed below:



The main points arising from this meeting were:

- Inspection findings presented and clarifications provided.
- Third Party Equipment management process has been improved.
- An annual PDO Survey would be conducted using Rope Access.
- The Structural Integrity Management Program would be reviewed due to extended time to disconnect.
- Hull/Tanks FMECA now being undertaken for 24 Month Life Expectancy.
- Asset Integrity Management Program would be reviewed due to extended time to disconnect.