



**NOPSEMA**

# Report

Planned Inspection

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Facility: Northern Endeavour  
Operator: Woodside Energy Ltd  
Offshore Inspection Dates: 25 April – 30 April 2014

Lead inspector [REDACTED]

Inspection Team [REDACTED]

Report Number 982

## REPORT DISTRIBUTION

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## 1 Abbreviations

POB	Personnel on Board
COT	Crude Oil tank
WEL	Woodside Energy Limited
CMMS (SAP)	Computerised maintenance management system
HSR	Health & Safety Representatives
RRC	Registered Routine change
TI	Technical Integrity
TQ	Technical Query
TEMPSC	Totally Enclosed Motor Propelled Survival Craft
CCR	Central Control Room
FRC	Fast rescue Craft
SBC	Small Bore Connection
ELSA	Emergency Life Support Apparatus
ICR	Information Change Request
CSE	Confined Space Entry
MAE	Major Accident Event
IMO	International Marine Organisation
KPI	Key performance Indicator
NE	Northern Endeavour
OHS	Occupational Health and Safety
NOPSEMA	National Offshore Petroleum and Environmental Safety Authority
ALARP	As Low As Reasonably Practicable

## 2 Inspection Method

The inspection team prepared a planned inspection brief and discussed this with the operator prior to the inspection. The brief set out the proposed inspection itinerary and scope. A list of persons present at this pre-inspection meeting is included in Attachment A.

The proposed scope for this inspection included:

- Verification of commitments and status regarding the recommendations from previous inspections
- Consultation with Health & Safety Representatives and members of the workforce
- Management of Change
- Inspection Maintenance and Repair
- Lifeboat Operations
- Confined Space Entry

Other issues arose during the course of the inspection and, as a result, were added to the scope. These additional items were:

- Corrosion

On arrival at the facility, an entry meeting was held so as to present the plan to the offshore personnel. Before leaving the facility, the inspection team prepared an Inspection Exit Brief, 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.

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 Attachment A.

### **3 Conclusions and Recommendations**

At the time of the inspection the facility had Personnel on Board (POB) of 37 and was producing at a steady state. Crude Oil tank (COT) 5 cargo tank was isolated and was being cleaned by a contractor under a confined space entry permit.

Detailed findings are provided in the following sub-sections, which highlight any particular areas where non-compliance or opportunities for improvement have been identified. The inspectors' detailed recommendations are included in the following sub-sections and are repeated in the Recommendations and Follow-up List in Attachment B.

### 3.1 Previous recommendations

A review of the previous recommendations was completed and the following recommendations are now closed:

- Recommendation 854-16 Closed – New supports have been installed on Lines WS4075 and WS4076 near Gas Turbine C (GT7030).
- Recommendation 854-18 Closed – A new flammable liquid storage box has been installed in the production tech container to replace the old corroded one.
- Recommendation 854-19 Closed – Repairs and spool replacements have occurred on the IG lines. The pipe spools with temporary wraps that led to the recommendation have been replaced with new pipe.
- Recommendation 854-24 Closed. The vent house step has now been repaired.
- Recommendation 854-28 Closed – Escape way next to GT-7010 has been replaced.
- Recommendation 854-30 – Closed A deck Fitness for service review was completed and email evidence sighted that deck penetrations were deemed by WEL not to be a hazard for forklift operations.
- Recommendation 854-34 Closed – Passive fire protection has been inspected and dropped object potential issues have been removed.
- Recommendation 854-35 Closed – Container stated by WEL to now be adequately secured.
- Recommendation 854-36 Closed - escape way cleared of obstructions near fire water monitor tower.
- Recommendation 694-02 – Closed. Work order completed for lighting repairs
- Recommendation 694-04 – Closed annual review by WEL completed on electrical equipment.
- Recommendation 694-06 – Closed SAP now generates an automatic Ex I99 inspection requirement for any other work on equipment as required by section 2.4 of Procedure W1000SE290002 rev3.
- Recommendation 694-13 – Closed as per WEL response detailing that moisture in the refrigeration pipework is from condensation.
- Recommendation 694-15 – Closed. An SAP review has now been completed to ensure no other further equipment had been missed during the new SAP transition project.
- Recommendation 694-16 – Closed. Non slip flooring has been painted in areas with moisture on the floor to prevent slipping.

The following previous recommendations remain open, some of which are overdue:

- 854-01 due date 31/12/14
- 854-02 due date 31/12/14
- 854-03 due date 30/6/14
- 854-04 due date 31/12/14
- 854-05 due date 31/12/14
- 854-06 due date 31/10/14
- 854-07 due date 30/6/14
- 854-08 due date 30/6/14
- 854-09 due date 31/12/14
- 854-10 due date 30/6/14
- 854-11 due date 30/6/14
- 854-27 – Partial completion, supports still require repairing starboard side forward of the generators (2100123099). Due date 31/07/14.
- 854-29 –due date 31/07/14
- 854-31 –due date 30/11/14. Some of the handrail repairs have been completed. Starboard railing forward of the generators has been repaired. Repair work is ongoing. Due date 30/11/14
- 854-32 –due date 30/11/14
- 854-33 –due date 30/11/14
- 694-19 – due date revised to 31/10/14 for

- 854-12 due date 30/6/14
  - 854-13 due date 30/6/14
  - 854-14 due date 30/6/14
  - 854-15 due date 30/6/14
  - 854-17 due date 31/7/14
  - 854-20 due date 30/9/14
  - 854-21 due date 31/3/14 - Overdue, Maintenance on ballast pump PM4001D scheduled for campaign 4.
  - 854-22 due date 31/3/14 - Overdue, Notifications 20098995 and 2100089177 were determined not required by WEL. Notifications 2009785 and 20090034 are still awaiting valve replacements.
  - 854-23 – due date 30/09/14
  - 854-25 –due date 31/08/14
  - 854-26 – Initial structural assessment on fire monitor towers complete. Completion of repairs is in progress. Due date 31/12/14
- the repair of the stairway on port side mid ship, next to re-compressor K3501.
- 693-01 – due date 31/12/12 Overdue - Reopen, WEL have still not demonstrated that 20 seconds then 10 minute blowdown criteria is being tested/checked as part of a testing procedure for confirmed gas in the turret/process. This is a performance requirement stated in the SC and performance standard and requires evidence of routine assurance.
  - 693-04 – Due date 31/12/12. Overdue - Reopen. This recommendation has been closed in JIRA, however the updated performance standard titled NE (Laminaria – Corallina) Well P10 (Doc No. M1500RF1000.0185 Rev E and Reservoir Isolation (F07) M1000RF022 Rev E have not been issued. The recommendation remains open.
  - 693-023 – Due date 31/12/12 Overdue. Lifeboats watertight integrity and manoeuvrability under load conditions has not yet been demonstrated. The testing procedure is still in draft format.

### 3.2 Consultation with Health & Safety Representatives and members of the workforce

A meeting with the Health & Safety Representative (HSR) was held during the facility visit. Regular HSR meetings are held with the Northern Endeavour (NE) management. It was noted that some HSR's have not undertaken HSR training.

#### Recommendation 982-01

Ensure Health & Safety Representatives (HSR's) are appropriately trained.

### 3.3 Management of Change

The management of change process is critical to ensure risks to health and safety remain as low as reasonably practicable. Management of Change is also one of Woodside's golden safety rules and therefore it was included in the inspection scope. A review of the management of change system was completed. The findings and recommendations are detailed below.

#### Positive findings

- The Change Management Operating Standard was available. WM 1020SG5071536 Rev0 (June 2011)
- The Integrity Management Operating Standard was available standard Doc. No. WM3040SF5154622.
- The Management of Change Procedure 'Technical Change Management System Process' doc No. WM100PG9240494 is available.
- Technical change management system registered routine change guideline (RRC) is in place WM0000MG8361374 Rev 0
- Technical queries, Deviations, modifications, production information , temporary equipment, registered routine changes and CMMS (SAP)changes are all required to go through the management of change process

#### Opportunities for improvement

- Both operating standards, WM 1020SG5071536 & WM3040SF5154622 reference each other, however they do not reference the management of change procedure 'Technical Change Management System Process' doc No. WM100PG9240494 rev 0.

#### Recommendation 982-02

Woodside Energy Limited (WEL) to review operating standards WM 1020SG5071536 & WM3040SF5154622 and ensure they are clearly linked to the procedures that support their implementation, for example the Technical Change Management System Process' procedure, doc No. WM100PG9240494 rev 0.

- A category of Health & Safety Representatives (HSR) in the SAP system is an RRC – Registered Routine change. This type of change is not described in the Management of Change procedure WM100PG9240494 rev 0, whilst other change types are. The procedure does however reference a RRC guideline in the reference section.
- The Management of Change procedure doc No. WM100PG9240494 mentions the Information Change Request (ICR) change form residing in the OCAS system. This system is redundant and has been replaced by the information management process.

#### Recommendation 982-03

WEL to review the Technical Change Management System Process' procedure, doc No. WM100PG9240494 rev 0 to ensure it is up to date and does not reference superseded processes or omits new processes. For example reference to the redundant Information Change Request (ICR) forms in the OCAS system and the procedure failing to describe the Registered Routine change (RRC) process.

- There was no evidence available to demonstrate that some Management of change types had assurance reviews completed as per requirements of the procedure WM100PG9240494 rev 0, for example: Technical queries, Management of modifications, Management of temporary equipment.
- Management of modifications do not appear to be tracked and reported on a monthly basis .
  - It was noted that 4 TI's ones were past their due by date, namely: 93007165, 93007768, 93010151, 93010673.
  - A sample review of the modifications in the implementation phase in SAP identified numerous that are not fully closed out, sample included: 93001618, 93001626, 93001932 TI, 93003350 TI. All 4 were completed 2011.
- A sample review of Technical Query (TQ's) in the system identified some TQ's have been in the system for long time period, in some cases years, and others remaining open after action taken to close, for example:
  - TQ 91012272, identified as high risk was 2 years old and still outstanding. Initially raised 27 February 2012 due to damage to fire protection on structural supports at deck level. Extended to 30 September 2014.
  - TQ 91012831 remained open although its related deviation (93002466) had been closed.

**Recommendation 982-04**

WEL to ensure that all types of change are tracked and managed appropriately to prevent expired due dates, completed items remaining open and items remaining incomplete and open for years. Particular focus should be given to technical queries, management of modifications and Management of temporary equipment.



### 3.4 Inspection Maintenance and Repair

Ongoing inspection and maintenance of the facility is a key control for a large number of Major Accident Event (MAEs) identified in the safety case and therefore was chosen to be part of the inspection scope. Reviews of the inspection, maintenance and repair processes were completed. The findings and recommendations are detailed below.

#### Positive findings

- Engineering strategy Document is available and in use titled – Engineering Standard – Inspection Strategy. Doc No. W1000SL7954516 rev 0
- There is a corroded pipe and repair strategy W1000SM4987861 Rev 5.
- Piping systems performance standard (P08) is in place.
- Maintenance procedures are contained in SAP with pass fail checklists for Technical Integrity (TI) work and are linked to work orders
- Maintenance is tracked using The Production Division - Engineering & Maintenance Key Performance Indicators report.

#### Opportunities for improvement

- Maintenance and testing documents were found to not be fully aligned:
  - The strategy document W1000SL7954516 rev 0 references the Woodside Energy Limited (WEL) engineering Standard – Risk Based Inspection W1000AM148863 Rev3 which is superseded. (The document appears to be superseded by W1000SL8326295).
  - P08 piping systems performance standard also references the W1000AM148863 Rev3 superseded standard.
  - The strategy document W1000SL7954516 Rev 0 references the WEL Engineering Standard – Inspection Management W1000ML4702905 which is superseded. (The document appears to be superseded by W1000SL8273467)

#### Recommendation 982-05

WEL to ensure that the following documents are maintained and up to date

- The strategy document W1000SL7954516 rev 0 references the WEL engineering Standard – Risk Based Inspection W1000AM148863 Rev3 which is superseded. (The document appears to be superseded by W1000SL8326295).
- P08 piping systems performance standard also references the W1000AM148863 Rev3 superseded standard.
- The strategy document W1000SL7954516 Rev 0 references the WEL Engineering Standard – Inspection Management W1000ML4702905 which is superseded. (The document appears to be superseded by W1000SL8273467)

- There appears to be no documented backlog maintenance management strategy

#### Recommendation 982-06

WEL to consider developing a backlog maintenance management strategy

- There are a large number of WAAP orders, safety related and others, that are waiting on resourcing and a subsequent Work Order number. These include:
  - 66 that are over 180 days old
  - 25 that are between 90-180 days old
  - 18 that are between 0-90 days.
  - One TI order which is over 14 days old.

There appears to be no commitment by WEL to ensure WAAP orders are addressed in a timely manner as there is no WAAP Key Performance Indicator (KPI) assigned and monitored.

#### **Recommendation 982-07**

WEL to ensure there is a robust process in place to manage and track WAAP (orders that are waiting on resourcing) in order to reduce risk of not completing safety related risks in a timely manner. This process should include Key performance Indicators (KPI's) to be measured on a routine basis and action taken if targets not met in order to avoid inaction of safety related orders in the WAAP.

### **3.5 Lifeboat Operations**

A review of lifeboat operations was completed. The findings and recommendations are detailed below.

#### **Positive findings**

- Lifeboats are International Marine Organisation (IMO) LSA Code certified;
- The Lifeboats are subject to the following PRTs, which were available in SAP.
  - AU06-P1027 1W Lifeboat Maintenance Check
  - AU06-PSE09002 1M Lifeboat Maintenance Check
  - AU06-PSE09003 6M Lifeboat Maintenance Check
  - AU06-PSE09004 12M Lifeboat Maintenance Check – this is authorised vendor tasks
  - AU06-PSE09006 5Y Lifeboat & Davit Inspection & Service
  - AU06-PSE09006 10Y Lifeboat Air Cylinder Replacement
- 5 yearly load test are conducted based on an average personnel weight of 90kg
- Regulated licence to operate roles look ahead weekly summary report is posted on the noticeboard outside the Central Control Room (CCR) requiring minimum for 2 coxswain qualified personnel. ( 7 personnel were coxswain qualified at the time)
- Annual and 5yearly 3<sup>rd</sup> Party inspections are being conducted on the lifeboat by Wiltrading. (current Certificate # 8-13-34-071 was issued 23 May 2013)

#### **Opportunities for improvement**

- A new Operating Procedure titled Launch and Recover Totally Enclosed Motor Propelled Survival Craft (TEMPSC) lifeboat for sea trails B2105PM946349 Rev -1 has been written that will permit launching of the lifeboats. This procedure is in draft and has not been issued. The boat has not been launched since 2004 and there is an overdue recommendation in relation to its testing (693-023).

- The new Procedure for launching lifeboats B2105PM946349 Rev -1 does not include all methods of release for example it relies on the hydrostatic interlock for off load release and does not test the on-load release as required by IMO.

**Recommendation 982-08**

WEL to review the procedure for launching lifeboats B2105PM946349 and ensure that all methods of release, including off load and on-load release as required by International Marine Organisation (IMO), are tested, or otherwise ensure adequate testing is completed.

- The performance standard TEMPSC (E09) Doc No. M1500RF1000.0030 Rev 3 contains key requirements of being capable of launching and being capable of full manoeuvrability and a speed of 6 knots. The assurance section of the performance standard does not provide adequate testing for this.
- The performance standard TEMPSC (E09) does not contain a key performance requirement of remaining afloat with no leaks.
- There is no clear link between WEL generic maintenance plans and that of the NE specific maintenance plans in the performance standard TEMPSC (E09).

**Recommendation 982-09**

WEL to review the performance standard Totally Enclosed Motor Propelled Survival Craft (TEMPSC) (E09). The review should take into account the following observations:

- The performance standard TEMPSC (E09) Doc No. M1500RF1000.0030 Rev 3 contains key requirements of being capable of launching and being capable of full manoeuvrability and a speed of 6 knots. The assurance section of the performance standard does not provide adequate testing for this.
- The performance standard TEMPSC (E09) does not contain a key performance requirement of remaining buoyant with no leaks.
- There is no clear link between WEL generic maintenance plans and that of the NE specific maintenance plans in the performance standard TEMPSC (E09).

- Inspection of the lifeboats revealed that many of the defect items identified during the previous 3<sup>rd</sup> party annual inspection in May 2013, had not been completed:
  - Stbd Lifeboat items:
    - B4 – slight corrosion on keel shoe backing plates – requires removal and protective coating application
    - B6 – Deposits on propeller need to be removed
    - B13 – Port side air vent fell off – new vent required
    - B1 – Fwd. and Aft Skate wire corrosion require replacement
    - L1 – Coxswains window leaking – requires sealant
  - Stbd Davit items:
    - D1 – corrosion on winch, davit, sheaves and mounting on deck – requires removal and protective coating application
    - D13 – Aft fall wire turn turnbuckle corroded - requires replacement
    - D15 – Aft Maintenance pendant turnbuckle corroded- requires replacement
  - Port Lifeboat Items B1 windows, skate wires & deluge rail

- Port Davit D1 corrosion on winch, davit, sheaves and mounting on deck – requires removal and protective coating application

It was unclear whether all identified defects had notifications raised and assigned to them as no notifications were linked to the original yearly work order within SAP.

### Recommendation 982-10

WEL to ensure defects raised during inspection and testing of lifeboats are reviewed and work orders raised as necessary, have notifications raised, are clearly linked to the original work order within SAP and are completed in a timely manner. The defects include but may not be limited to the following identified in the May 2013 annual inspection:

- Stbd Lifeboat items B4, B6, B13, B1, L1;
- Stbd Davit items D1, D13, D15, D1
- Port Lifeboat Items B1 windows, skate wires & deluge rail
- Port Davit D1 corrosion winch & sheaves



- Both the “Lifeboat Out of Service” and “Lifeboat Ready to Launch” checklists were not used. It was stated that the same checklist controls are available in ISSOW. Therefore there may be a double up on checklist controls (one in ISSOW and one checklist in the procedure).
- It is unclear that the life boat on load release hooks comply with current IMO regulations. IMO has issued guidelines for the evaluation and replacement of release hooks (IMO MSC.1/Circ. 1392). Additionally, IMO guidelines for the fitting and use of fall preventer devices MSC.1/Circ.1327

recommend the use of fall preventer devices as an interim risk mitigation measure until devices compliant with the Life Saving Appliances (LSA) Code are fitted.

**Recommendation 982-11**

WEL to ensure that the existing lifeboat release and retrieval systems are evaluated for compliance with the updated IMO LSA Code and the guidance provided in IMO Circular MSC .1/Circ.1392./Circ 1392. Further, as an interim risk mitigation measure, WEL should consider installing a fall preventer device on the lifeboat release systems as necessary.

### 3.7 Confined Space Entry

A review of confined space entry process was completed. The findings and recommendations are detailed below.

**Positive findings**

- The Confined Space Entry Operating Standard (WM1040PF559927) Rev 1 and Confined Space Operating Procedure (WM1040PF5925453 Rev 2) are available and in use.
- BTEX management is being conducted under the Benzene & VOC Monitoring Operating Procedure (WM1040MF7608816 Rev 0).
- A review of the COT 5 PTW identified risk assessments were completed in line with the confined space entry procedure and PTW system requirements.
- The tank entry sub contractor (██████) personnel stated they checked their equipment daily.
- All persons entering the tank (██████████) and the emergency response team leader were qualified for confined space entry as required by table 2 of the Confined Space Operating Procedure

**Opportunities for improvement**

- BTEX is not specifically stated in the Atmospheric Testing & Monitoring item 4.4.3 (c.vi) of the Confined Space Operating Procedure which lists “any other contaminants identified in the risk assessment including NORMS”
- BTEX Readings are not recorded on tank entry permits when taken, however results are recorded in “LIMS” system.

**Recommendation 982-12**

WEL to consider specifically stating BTEX monitoring requirements in the Atmospheric Testing & Monitoring item 4.4.3 (c.vi) of the Confined Space Operating Procedure and ensuring BTEX readings are recorded and included in tank entry permits.

- An emergency plan had been developed for the COT 5 port tank entry permit. The plan was generic in nature and did not include a list of required equipment, nor did it provide a plan of where the equipment was to be laid out or a drawing of how the rescue would take place.
- The Confined Space Entry (CSE) emergency response plan does not meet the requirements as detailed in Item 4.4.2 of the Confined Space Operating Procedure WM1040PF592545. For Example:
  - The location of the emergency equipment is not detailed in the plan.
  - The method of extraction and equipment required.
  - Maximum number of persons occupying the space.



- During the COT 5 port tank entry 1 of the Emergency Life Support Apparatus (ELSA) bottles assigned for the rescue team was below the required level of charge.
- Item 4.4.2 of the Confined Space Operating Procedure WM1040PF592545 states that “an appropriate emergency response plan for confined space or entries shall be developed in accordance with the Emergency Management Operating Standard (WM1100SG54444584). This Management standard does not provide guidance on the format or content of the emergency response plan.

**Recommendation 982-13**

WEL to review the process of creating a confined space entry emergency response plan and ensure providing appropriate guidance is provided. The review should address the following issues:

- Ensure alignment with the requirements of the confined space entry Procedure WM1040PF59254, including:
  - The location of the emergency equipment was not detailed in the plan.
  - The method of extraction and equipment required was not detailed in the plan.
  - Maximum number of persons occupying the space was not detailed in the plan.
- Confined Space Operating Procedure WM1040PF592545 states that “an appropriate emergency response plan for confined space or entries shall be developed in accordance with the Emergency Management Operating Standard (WM1100SG54444584). This Management standard does not provide guidance on the format or content of the emergency response plan.

- There was no evidence of audits being conducted on the confined space entry process. It is noted that WEL are currently reviewing their audit process.

### 3.8 General Findings

During the inspection several Occupational Health and Safety (OHS) observations were made in addition to the original scope items for the inspection. These observations and recommendations are detailed below.

#### Positive findings

- Vibration health hazard awareness presentation was given by the medic during the HSR meeting
- There has been a notable improvement in several locations on the facility in relation to structural corrosion. However corrosion is still an issue and requires continued focus.
- Housekeeping on the facility is generally considered good.
- Personnel are reporting on process safety hazards – for example crack on PSV Small Bore Connection pipework

Based on the sampled findings a good health and safety culture was observed on board.

#### Opportunities for improvement

- Several small bore connections on the flare & Blowdown piping were identified by the workforce to have cracks. These pipe spools were subsequently replaced. This incident had not been reported to National Offshore Petroleum and Environmental Safety Authority (NOPSEMA) at the time of the inspection. Cracking on hydrocarbon containment pipework is a dangerous occurrence and requires reporting to NOPSEMA. It was suspected by operations personnel that the cause of the cracks was incorrectly installed bracing that had damaged the connections.

- Two small bore connections are braced to the pipe support next to the flow control valve (37-FCV-001) on the debutaniser preheater feed inlet. The main line is supported on resting supports allowing movement. The Small Bore Connection (SBCs) will therefore not be able to move with the pipe which could lead to excessive stress on their welded joints.
- In several locations on the facility there are lines with SBCs that are braced and their paired lines SBC unsupported, which suggests an unstructured methodology to reduce vibration fatigue. Either the SBC requires bracing or it doesn't. For example:
  - The Coralline 1st stage separator PSV's. 21-PSV-221 has an SBC that is braced, while 21-PSV-045 and 21-PSV-044 are not.
  - The debutaniser feed drum PSV's. 37-PSV-084 has a braced SBC, while 36-PSV-083 does not.
  - Laminaria Separator choke inlet PSVs. 21-PSV-030 and 031, have identical SBCs. One of which is braced the other not.
  - The debutaniser feed pre heater PSVs. 37-PSV-091 has an SBC which is braced, while 37-PSV-092 has an SBC which is not.

#### Recommendation 982-14

WEL to undertake a review of all the small bore connections and their bracing on the topside hydrocarbon pipework to ensure that the pipework is fit for service and risk of cracking from vibration or static loading are reduced to As Low As Reasonably Practicable (ALARP). Consideration should be made to the following observations:

- The Coralline 1st stage separator PSV's. 21-PSV-221 has an Small Bore Connection (SBC) that is braced, while 21-PSV-045 and 21-PSV-044 are not.
- The debutaniser feed drum PSV's. 37-PSV-084 has a braced SBC, while 36-PSV-083 does not.
- Laminaria Separator choke inlet PSVs. 21-PSV-030 and 031, have identical SBCs. One of which is braced the other not.
- The debutaniser feed pre heater PSVs. 37-PSV-091 has an SBC which is braced, while 37-PSV-092 has an SBC which is not.
- Two small bore connections are braced to the pipe support next to the flow control valve (37-FCV-001) on the debutaniser preheater feed inlet. The main line is supported on resting supports allowing movement. The SBCs will therefore not be able to move with the pipe which could lead to excessive stress on their welded joints.



Figure 1 –Example of inconsistent bracing to deck SBC



Figure 2 – Debutaniser preheater feed inlet braced to deck SBC

- There are several corrosion related findings:
  - Insulation on the LPG pump A discharge line (35-TE-011) is open to the elements so that the pipe is exposed to water beneath the insulation.
  - Starboard hazardous open drains level gauge 47-LG-006 and surrounding pipework is in very poor condition and requires repair.
  - Port hazardous open drains level gauge 47-LG-003 is in very poor condition and requires repair. A notification was raised (2100071754) on the 10 October 2010 for its repair.
  - Two isolation valves on the water ballast lines to slop tanks have their handles corroded off.
  - The Fast rescue Craft (FRC) launch controls box is in very poor condition

**Recommendation 982-15**

WEL to take action to rectify the following issues related to corrosion:

- Insulation on the LPG pump A discharge line (35-TE-011) is open to the elements so that the pipe is exposed to water beneath the insulation.
- Starboard hazardous open drains level gauge 47-LG-006 and surrounding pipework is in very poor condition and requires repair.
- Port hazardous open drains level gauge 47-LG-003 is in very poor condition and requires repair. A notification was raised (2100071754) on the 10/10/2010 for its repair.
- Two isolation valves on the water ballast lines to slop tanks have their handles corroded off.
- The Fast rescue Craft (FRC) launch controls box is in very poor condition.



Figure 3 – LPG pump A discharge line insulation      Figure 4 – Corroded open drains level gauge

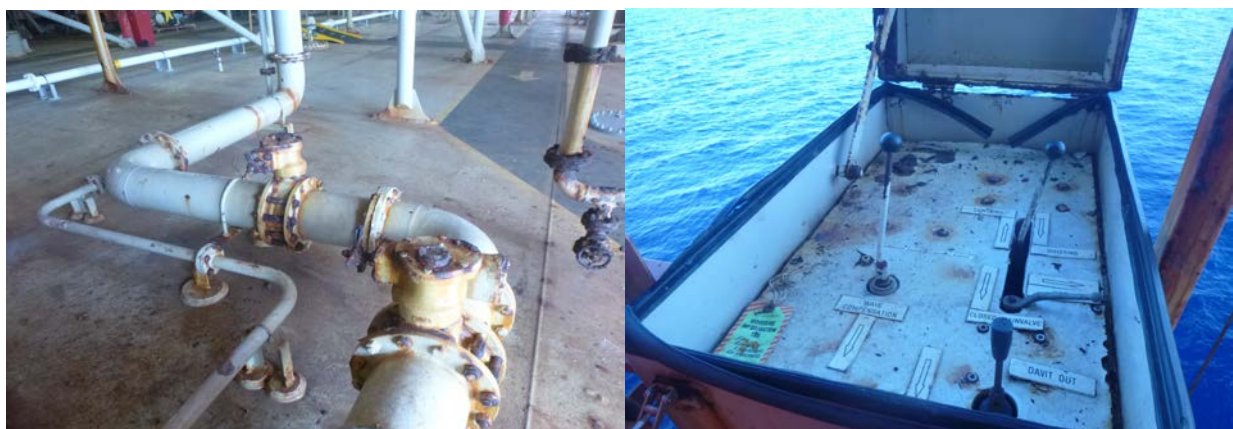


Figure 5 – Water ballast lines to slop tanks      Figure 6 – Corroded FRC launch controls box



- Seawater fire pump B has water leaking from its drive shaft.
- The crude oil export cargo pump No 3 starboard has a notification (20099501) on it which was raised on the 23 July 2011 regarding a leaking mechanical seal.
- The passive fire protection on the port side forward life raft evacuation station is damaged and requires repair.
- The aft fire water diesel generator engine did not have a guard protection against burns on the engine jacket water pipework (both inlet and outlet)

**Recommendation 982-16**

WEL to take action to rectify the following issues in order to ensure persons at the facility are safe and without risk.

- Seawater fire pump B has water leaking from its drive shaft.
- The crude oil export cargo pump No 3 starboard has a notification (20099501) on it which was raised on the 23 July 2011 regarding a leaking mechanical seal.
- The fire protection on the port side forward life raft evacuation station is damaged
- The aft fire water diesel generator did not have a guard protection against burns on the engine jacket water pipework (both inlet and outlet)



Figure 7 – leaking seawater fire pump B



Figure 8 – Damaged fire protection Fwd life raft station

## 4 Attachments

### Attachment A – Meetings

#### 1. Pre-Inspection Meeting

The pre-inspection meeting was held on 5 March 2014 in order to discuss the proposed inspection scope and to ascertain senior management's understanding and expectations of the OHS risks posed by the operation at the facility and the control measures employed to reduce risks to As Low As Reasonably Practicable (ALARP).

Name	Position
██████████	NE Asset manager
██████████	NOPSEMA OHS inspector
██████████	NOPSEMA OHS inspector

The main points arising from this meeting were:

- Inspection Scope items were briefly discussed
- ██████████ provided an updated status on previous recommendation
- Inspectors requested information prior to inspection
- Logistics were finalised for travel to the facility

## 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.

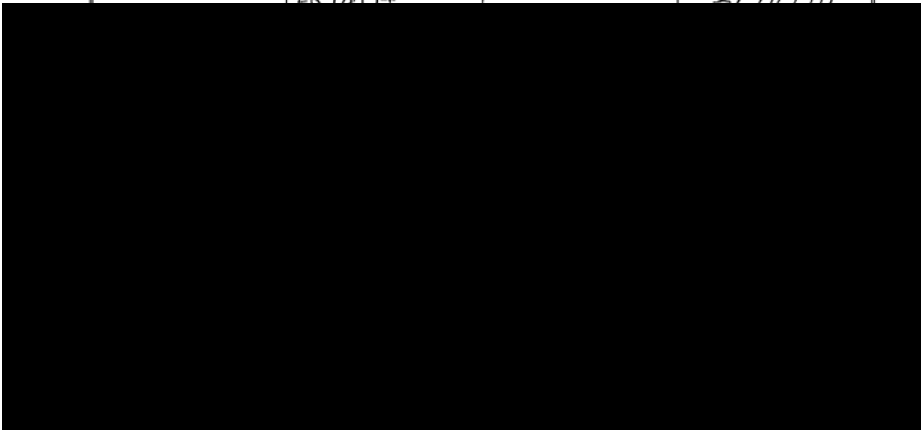
A list of personnel at the entry and exit meetings is attached below:



### Form

**NOPSEMA** Entry and Exit Meeting Attendance Register

OPERATOR:	WOODSIDE	FACILITY:	NORTHERN END
Entry meeting date:	26/1/14	Exit meeting date:	29/1/14




### 3. Post-Inspection meetings

A meeting was also held on 21 May 2014 in order to discuss the inspection findings. People present at that meeting are listed below:

Name	Position
[REDACTED]	OHS Inspector
[REDACTED]	OHS Inspector
[REDACTED]	NE Asset Manager

The main points arising from this meeting were:

- No factual errors were raised by WEL regarding the recommendations contained in the report.
- Cracks on the relief Blowdown lines should be reported to NOPSEMA investigation team as a dangerous occurrence.

**Attachment B – Detailed Recommendations**
**NOPSEMA Recommendations and Follow-Up List**

NOPSEMA – Report No. 0982		OPERATOR TO COMPLETE				NOPSEMA
No.*	Recommendation	Response	Operator Action	Position**	Due Date	Status
982-01	Ensure Health & Safety Representatives (HSR's) are appropriately trained.					
982-02	Woodside Energy Limited (WEL) to review operating standards WM 1020SG5071536 & WM3040SF5154622 and ensure they are clearly linked to the procedures that support their implementation, for example the Technical Change Management System Process' procedure, doc No. WM100PG9240494 rev 0.					
982-03	WEL to review the Technical Change Management System Process' procedure, doc No. WM100PG9240494 rev 0 to ensure it is up to date and does not reference superseded processes or omits new processes. For example reference to the redundant Information Change Request (ICR) forms in the OCAS system					

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	and the procedure failing to describe the Registered Routine change (RRC) process					
<b>982-04</b>	WEL to ensure that all types of change are tracked and managed appropriately to prevent expired due dates, completed items remaining open and items remaining incomplete and open for years. Particular focus should be given to technical queries, management of modifications and Management of temporary equipment.					
<b>982-05</b>	WEL to ensure that the following documents are maintained and up to date <ul style="list-style-type: none"> <li>- The strategy document W1000SL7954516 rev 0 references the WEL engineering Standard – Risk Based Inspection W1000AM148863 Rev3 which is superseded. (The document appears to be superseded by W1000SL8326295).</li> </ul>					

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	<ul style="list-style-type: none"> <li>- P08 piping systems performance standard also references the W1000AM148863 Rev3 superseded standard.</li> <li>- The strategy document W1000SL7954516 Rev 0 references the WEL Engineering Standard – Inspection Management W1000ML4702905 which is superseded. (The document appears to be superseded by W1000SL8273467)</li> </ul>					
<b>982-06</b>	WEL to consider developing a backlog maintenance management strategy					
<b>982-07</b>	WEL to ensure there is a robust process in place to manage and track WAAP (orders that are waiting on resourcing) in order to reduce risk of not completing safety related risks in a timely manner. This process should include Key performance Indicators (KPI's) to be measured on a routine basis and action taken if targets not					

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	met in order to avoid inaction of safety related orders in the WAAP.					
<b>982-08</b>	WEL to review the procedure for launching lifeboats B2105PM946349 and ensure that all methods of release, including off load and on-load release as required by IMO, are tested, or otherwise ensure adequate testing is completed.					
<b>982-09</b>	WEL to review the performance standard Totally Enclosed Motor Propelled Survival Craft (TEMPSC) (E09). The review should take into account the following observations: <ul style="list-style-type: none"> <li>The performance standard TEMPSC (E09) Doc No. M1500RF1000.0030 Rev 3 contains key requirements of being capable of launching and being capable of full manoeuvrability and a speed of 6 knots. The assurance section of the</li> </ul>					



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	<p>performance standard does not provide adequate testing for this.</p> <ul style="list-style-type: none"> <li>The performance standard TEMPSC (E09) does not contain a key performance requirement of remaining buoyant with no leaks.</li> <li>There is no clear link between WEL generic maintenance plans and that of the NE specific maintenance plans in the performance standard TEMPSC (E09).</li> </ul>					
<b>982-10</b>	<p>WEL to ensure defects raised during inspection and testing of lifeboats are reviewed and work orders raised as necessary, have notifications raised, are clearly linked to the original work order within SAP and are completed in a timely manner. The defects include but may not be limited to the following identified in the May 2013 annual inspection:</p>					

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	<ul style="list-style-type: none"> <li>- Stbd Lifeboat items B4, B6, B13, B1, L1;</li> <li>- Stbd Davit items D1, D13, D15, D1</li> <li>- Port Lifeboat Items B1 windows, skate wires &amp; deluge rail</li> <li>- Port Davit D1 corrosion winch &amp; sheaves</li> </ul>					
<b>982-11</b>	WEL to ensure that the existing lifeboat release and retrieval systems are evaluated for compliance with the updated IMO LSA Code and the guidance provided in IMO Circular MSC .1/Circ.1392./,Circ 1392. Further, as an interim risk mitigation measure, WEL should consider installing a fall preventer device on the lifeboat release systems as necessary.					
<b>982-12</b>	WEL to consider specifically stating BTEX monitoring requirements in the Atmospheric Testing & Monitoring item 4.4.3 (c.vi) of the Confined Space Operating Procedure and ensuring BTEX					

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	readings are recorded and included in tank entry permits.					
982-13	<p>WEL to review the process of creating a confined space entry emergency response plan and ensure providing appropriate guidance is provided. The review should address the following issues:</p> <p>Ensure alignment with the requirements of the confined space entry Procedure WM1040PF59254, including:</p> <ul style="list-style-type: none"> <li>• The location of the emergency equipment was not detailed in the plan.</li> <li>• The method of extraction and equipment required was not detailed in the plan.</li> <li>• Maximum number of persons occupying the space was not detailed in the plan.</li> </ul> <p>Confined Space Operating Procedure WM1040PF592545 states that “an appropriate emergency response plan for confined space or entries shall</p>					

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	be developed in accordance with the Emergency Management Operating Standard (WM1100SG54444584). This Management standard does not provide guidance on the format or content of the emergency response plan.					
<b>982-14</b>	<p>WEL to undertake a review of all the small bore connections and their bracing on the topside hydrocarbon pipework to ensure that the pipework is fit for service and risk of cracking from vibration or static loading are reduced to As Low As Reasonably Practicable (ALARP). Consideration should be made to the following observations:</p> <ul style="list-style-type: none"> <li>The Coralline 1st stage separator PSV's. 21-PSV-221 has an Small Bore Connection (SBC) that is braced, while 21-PSV-045 and 21-PSV-044 are not.</li> <li>The debutaniser feed drum PSV's. 37-PSV-084 has a braced SBC, while 36-PSV-</li> </ul>					

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	083 does not. <ul style="list-style-type: none"> <li>Laminaria Separator choke inlet PSVs. 21-PSV-030 and 031, have identical SBCs. One of which is braced the other not.</li> <li>The debutaniser feed pre heater PSVs. 37-PSV-091 has an SBC which is braced, while 37-PSV-092 has an SBC which is not.</li> <li>Two small bore connections are braced to the pipe support next to the flow control valve (37-FCV-001) on the debutaniser preheater feed inlet. The main line is supported on resting supports allowing movement. The SBCs will therefore not be able to move with the pipe which could lead to excessive stress on their welded joints.</li> </ul>					
<b>982-15</b>	WEL to take action to rectify the following issues related to corrosion:					

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	<ul style="list-style-type: none"> <li>Insulation on the LPG pump A discharge line (35-TE-011) is open to the elements so that the pipe is exposed to water beneath the insulation.</li> <li>Starboard hazardous open drains level gauge 47-LG-006 and surrounding pipework is in very poor condition and requires repair.</li> <li>Port hazardous open drains level gauge 47-LG-003 is in very poor condition and requires repair. A notification was raised (2100071754) on the 10/10/2010 for its repair.</li> <li>Two isolation valves on the water ballast lines to slop tanks have their handles corroded off.</li> <li>The Fast rescue Craft (FRC) launch controls box is in very poor condition.</li> </ul>					
<b>982-16</b>	WEL to take action to rectify the following issues in order to					

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-	ensure persons at the facility are safe and without risk. <ul style="list-style-type: none"> <li>• Seawater fire pump B has water leaking from its drive shaft.</li> <li>• The crude oil export cargo pump No 3 starboard has a notification (20099501) on it which was raised on the 23 July 2011 regarding a leaking mechanical seal.</li> <li>• The fire protection on the port side forward life raft evacuation station is damaged</li> <li>• The aft fire water diesel generator did not have a guard protection against burns on the engine jacket water pipework (both inlet and outlet)</li> </ul>					

\* Suggested numbering sequence for recommendations is: {PI No.} - {Recommendation No.} e.g. for PI Report No. 128 with 11 recommendations, the numbering of recommendations would be: 128-1 to 128-11

\*\* Position identified to aid in follow up of action for recommendation by providing a contact for the OHS inspector.