

Notifiable incident

Incident ID [5397](#)

Duty holder: Woodside Energy Ltd
Facility/Activity: Angel Facility Operations
Facility type: Petroleum Activity

Incident details	
Division	Environmental Management
Notification type	Incident
Incident date	07/05/2018 09:00 AM (WST)
Notification date	07/05/2018 09:09 PM (WST)
NOPSEMA response date	07/05/2018 09:09 PM (WST)
Received by	[REDACTED]
Nearest state	WA
Initial category type <i>(based on notification)</i>	Environment Reportable
Initial category <i>(based on notification)</i>	EM - hydrocarbon vapour / petroleum liquid release
3 Day report received	11/05/2018
Final report received	28/06/2018
All required data received	28/06/2018
Final category type <i>(based on final report)</i>	Environment Reportable
Final category <i>(based on final report)</i>	EM - hydrocarbon vapour / petroleum liquid release
Brief description	INFO - Potential Report Environmental Incident
Location	
Subtype/s	Structural failure
Summary <i>(at notification)</i>	<p>Titleholder advised that a support vessel identified a 'rosette' of gas approx 1 metre in diameter at the surface between the A4H well and the Angel platform. The well was shut in and the flowline pressure started to bleed down faster than it should indicating a failure in integrity.</p> <p>The operator believes that the flowline is compromised and has organised for an ROV inspection to be carried out. This will be achieved later in the week.</p> <p>At this stage the potential volume and duration of the gas release is unknown but it is likely to exceed 1kg at least. The pressure in the flowline is in the region of 9 mPa.</p> <p>Titleholder was not able to provide a threshold amount for a reportable incident or an EP reference and was notifying NOPSEMA as a precaution.</p>

<p>Details (from final report)</p>	<p>THIS IS ALSO AN OHS INCIDENT #5396</p> <p>Titleholder advised that a support vessel identified a 'rosette' of gas approx 1 metre in diameter at the surface between the A4H well and the Angel platform. The well was shut in and the flowline pressure started to bleed down faster than it should indicating a failure in integrity.</p> <p>The operator believes that the flowline is compromised and has organised for an ROV inspection to be carried out. This will be achieved later in the week.</p> <p>At this stage the potential volume and duration of the gas release is unknown but it is likely to exceed 1kg at least. The pressure in the flowline is in the region of 9 mPa.</p> <p>Titleholder was not able to provide a threshold amount for a reportable incident or an EP reference and was notifying NOPSEMA as a precaution.</p> <p>Information provided in 30 day report -</p> <p>On the basis of this new information it is, under the current Angel EP an Environmental Reportable incident - Hydrocarbon release to environment (sub-sea and also atmosphere given that gas bubbles were sighted at the surface) was greater than 1 kg of gas, and there was damage to safety critical equipment.</p> <p>Estimated duration less than 6 days. Estimated release was 6.04 m3 over 85 hours - 99% converted to gas at sea surface - possible liquid hydrocarbon is 61 L/h but report notes "No liquid hydrocarbon was evident during ROV observation at the subsea location of the release, nor any oil sheen identified during vessel based observations in field, therefore the release estimate is considered worst case"</p> <p>Action taken when leak was detected - "AP4 well shut in. Flow line pressures monitored to determine if leak is likely to be at the Christmas tree, or in the flow line"</p> <p>Further action taken is;-1. "Monitoring and evaluation of potential spill was undertaken." 2. Replacement of relevant choke module is currently planned. Investigation of the module will be undertaken to inform a root cause analysis.</p> <p>Recommendations / Actions:</p> <p>1) Woodside to issue Non Conformance Report and work with supplier to:</p> <ul style="list-style-type: none"> • Run a technical root cause failure analysis to validate the investigation findings • Improve procedure assurance process • Improve materials management process <p>2) AP3 risk assessment and management plan implemented via Woodside risk management processes.</p>
<p>Immediate cause/s</p>	<p>The TH has provided a 30 day report which gives further details to those in the initial report. Causes, as stated in the 30 day report:-</p> <p>Seal/gasket failure of hot stab in choke module.</p> <p>"Failure mode : Incorrect gasket material installed in choke module hub connection during well installation 2008. Carbon steel material instead of inconel, leading to corrosion related failure over time. Investigation indicates this to be the case on wells AP4 and AP3." and "The design of the Angel subsea system specified corrosion resistant materials. The part number referred to in the vendor installation procedure incorrectly refers to a carbon steel test gasket. The offshore consumables list confirms the incorrect gasket was installed. Carbon steel gasket would have accelerated corrosion leading to failure."</p>
<p>Root cause/s</p>	<p>HPD - HUMAN ENGINEERING - Human-machine interface - labels NI, HPD - MGMT SYS - Stds, policies, admin controls NI - not strict enough, HPD - PROCEDURES - Wrong - facts wrong</p>

Root cause description	<p>INVESTIGATION FINDINGS</p> <p>Root causes:</p> <p>Failure mode : Incorrect gasket material installed in choke module hub connection during well installation 2008. Carbon steel material instead of inconel, leading to corrosion related failure over time. Investigation indicates this to be the case on wells AP4 and AP3.</p> <p>1) Procedures – Facts wrong : Part number for the gasket was incorrectly specified in the procedure.</p> <p>2) Management System – Not Strict Enough : Workshop Container contained all consumable spare seals, including carbon steel test gaskets and Inconel production gaskets.</p> <p>3) Human Engineering - Labels Need Improvement : Inconel and Carbon Steel Gaskets appear identical in weight and surface finish.</p> <p>Explanation for root cause:</p> <p>The design of the Angel subsea system specified corrosion resistant materials. The part number referred to in the vendor installation procedure incorrectly refers to a carbon steel test gasket. The offshore consumables list confirms the incorrect gasket was installed.</p> <p>Carbon steel gasket would have accelerated corrosion leading to failure.</p>
Release type	Hydrocarbon gas and petroleum fluid
Equipment	Gaskets/seals
Liquid (L)	6000

Duty inspector recommendation

Date	08/05/2018
Duty inspector	[REDACTED]
Recommendation	Do not conduct Major Investigation
Reasoning	Not applicable
Supporting considerations	

Major investigation decision

Date	08/05/2018
Decision	Do not conduct Major Investigation
Reasoning	Not applicable
Supporting considerations	

Non-major investigation review and recommendation

Date	18/07/2018
Inspector	[REDACTED]
Risk gap	Moderate
Type of standard	Established
Initial strategy	Investigate

Recommended follow up strategy

Recommended strategy	Investigate
Supporting considerations	<p>██████████ contacted, by phone at 0900 hrs 09/05/2018, ██████████ at Woodside ██████████ and ██████████ who provided an update on incident. ██████████ confirmed the information provided by the ██████████ but corrected the report in that the flowline is from the well AP4 to the angel Platform (not AH4). New information provided is that the flowline has been shut in and that a ROV survey was completed last night. ██████████ provided the information that the EP does not have a reportable volume for gas and only refers to 80l of hydrocarbon as well as a class D incident as the trigger for reportable. [NOTE - Non the less WEL will provide an up date with further information later today or early tomorrow. ██████████ asked that the report be submitted and reference the notification number 5397. With this additional information ██████████ will work through the NMI review and recommendation.</p> <p>28/06/2018 - a 30 day Report has been provided. = The 30 day report, stated that worst case estimate of liquid hydrocarbon is 61 L/h for 85 hours, which easily meets the trigger for reportable although they estimate the incident as a class E - none the less they have provided a 30 day report so in effect have treated it as a reportable.</p> <p>The TH assessment of environmental consequence is provided in the 30 day report - E - "potential slight, short-term impact, localised elevated hydrocarbon in water column likely. Unlikely to affect species / ecosystems due to short term release duration and rapid dispersion / dilution effects. On this basis, Woodside does not consider the incident has caused or has potential to cause moderate to significant environmental damage." Monitoring and evaluation of potential spill was undertaken. Satellite imagery and vessel based observation failed to identify evidence of a sheen on sea surface. No liquid hydrocarbon evident during ROV observation.</p> <p>CAUSE - The design of the Angel subsea system specified corrosion resistant materials. Incorrect gasket material installed in choke module hub connection during well installation 2008. Carbon steel material instead of inconel, leading to corrosion related failure over time".</p> <p>Factors consider for follow up strategy:-</p> <p>0. With the 30 day report there is now sufficient information</p> <p>1. Consequence of this incident is considered minor - under different circumstance the leak may not have been detected in under 6 days, however it is unlikely that it would not have been undetected for a long period - "years to decades" - so does not fit "significant description " small scope high intensity and duration at years to decades" Therefore minor.</p> <p>2. Likelihood - probable - it is probable that a release of gas and condensate of this magnitude will have a minor impact on the environment.</p> <p>Benchmark - the cause of the incident is that standard for the gasket material was not met. it was know that the incorrect metal would rust. - The use of the standard material presnts a remote chance of the environmental impact occurring.</p> <p>3. The risk gap is 2 - moderate.</p> <p>4. Established standard</p> <p>5. Investigate</p> <p>Relevant incident history - there are a number of other WEL incidents with gas leaks - notably in Greater Enfield - but these have a different cause. Other wells in the Angel field have the same problem - AP3 and AP4. But this is in effect the same incident and same cause , which has only just been identified over recent months - No relevant incident history.</p>

Non-major investigation decision

Date	24/07/2018
RoN	██████████
RoN review result	Agree with recommendation
Strategy decision	Investigate
Supporting considerations	Agree with recommendation to follow-up in the next planned inspection. Agree that a joint inspection with OHS may be completed if suitable.

Associated inspection

Inspection ID	1858
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