INTERNAL USE ONLY

Notifiable incident

Incident ID	5858
Duty holder:	Woodside Energy Ltd
Facility/Activity:	OKHA Floating Production Storage and Offloading Facility Operations
Facility type:	Petroleum Activity

Incident details	
Division	Environmental Management
Notification type	Incident
Incident date	19/03/2019 12:00 AM (WST)
Notification date	19/03/2019 02:30 PM (WST)
NOPSEMA response date	19/03/2019 02:30 PM (WST)
Received by	[redacted]
Nearest state	WA
Initial category type *(based on notification)*	Environment Reportable
Initial category *(based on notification)*	EM - other
3 Day report received	19/03/2019
Final report received	19/03/2019
All required data received	19/03/2019
Final category type *(based on final report)*	Environment Reportable
Final category *(based on final report)*	EM - chemical release
Brief description	EM-OTHER - Release of Shell Tellus S2 M 46 into marine environment.
Location	
Subtype/s	Spill
Summary *(at notification)*	The Woodside [redacted] called to inform that around 300 litres of hydraulic fluid (Shell Tellus S2 M 46) was released into the marine environment during FPSO disconnect and as per the OKHA Environment Plan the quantities of release trigger that this event is reportable.

Details *(from final report)*	The Woodside [redacted] called to inform that around 300 litres of hydraulic fluid (Shell Tellus S2 M 46) was released into the marine environment during FPSO disconnect and as per the OKHA Environment Plan the quantities of release trigger that this event is reportable. Post the disconnection from the Okha Riser, Hydraulic Fluid (Tellus S2 M 46) was observed leaking from the ship side Riser Connect /Disconnect system. Further details Discharge of approx. 300 L of hydrocarbon based hydraulic fluid at the Okha location, approx. 95 km from Dampier, approx. 33 km to the nearest sensitive receptor (Glomar Shoals). Approximately 10 minutes after the disconnection of the OKHA riser for TC Veronica on 19th March 2019, hydraulic fluid was visually observed leaking from the structural connector. On 27th March, facility sailed to anchor post TC [redacted] to undertake inspections and repair the source of hydraulic leak on disconnect system via rope access. Upon inspection of the assembly, it was discovered that the leak was from a 2" hydraulic flange of the "A" disconnect piping manifold. When the flange was disassembled, the O-ring seal was found protruded from the flange with no evidence of O-ring damage due to material type or chemical. The O-ring was damaged due to insufficient compression on the flange connection, as the holding bolts were found to be below required torque setting. A torque check was completed on the flange bolts in the vicinity and these were all found to be below the vendor specified torque setting of 250Nm. It has been determined that the structural connector hydraulic flanges were not sufficiently torqued during construction, as no other maintenance has been identified as being completed on this piping system since construction. Insufficient tension on the hydraulic flanges has then made them susceptible to vibration induced reduction in tension, which has ultimately led to the O-ring protrusion resulting in "loss of containment". Subsequently, the entire connect/disconnect hydraulic piping system was inspected, which identified that approximately 95% of flange bolts were found to be torqued to less than 100 Nm. This was rectified by tensioning all flanges within the hydraulic connect/disconnect system to 250 Nm, followed by function testing of both "A" and "B" systems. During investigation of equipment installation documentation, an inconsistency was found between torque specified on the vendor's General Arrangement drawing (60 Nm) and the vendor's maintenance manual (which specified 250 Nm).
Immediate cause/s	Unknown being investigated.
Root cause/s	ED - PREVENTIVE MAINTENANCE - PM NI - PM for equip NI, HPD - PROCEDURES - Followed incorrectly - limits NI
Root cause description	Root cause 1 HP4-3 Procedures incorrectly followed- The most likely root cause is poorly followed procedure for torqueing when the structural connector was assembled in the shipyard. This is more than likely due to two different torques being specified on vendor General Arrangement Drawing and the vendor Maintenance Manual. Root cause 2 EQ3-1 Equipment predictive/Preventative maintenance requires improvement- Some additional maintenance activities have been identified during the investigation that require a review to ensure they are captured in maintenance plans for RTM equipment.
Release type	Hydraulic/fuel oil
Equipment	Joints/flanges
Liquid (L)	300

Duty inspector recommendation	
Date	20/03/2019
Duty inspector	[redacted]
Recommendation	Do not conduct Major Investigation
Reasoning	Does not meet MI threshold based on information received
Supporting considerations	

Major investigation decision	
Date	20/03/2019
Decision	Do not conduct Major Investigation
Reasoning	Does not meet MI threshold based on information received
Supporting considerations	

Non-major investigation review and recommendation	
Date	20/03/2019
Inspector	[redacted]
Risk gap	Nominal
Type of standard	Established
Initial strategy	Inclusion in annual stats/data analysis

Recommended follow up strategy	
Recommended strategy	Investigate
Supporting considerations	Considered of minor potential consequence due to the short term nature of the incident and chemical toxicity(??). Likelihood of a minor consequence being realised is possible as it has been realised within the offshore industry. In practice chemical spills should not be realised with the correct controls in place, therefore the benchmark likelihood is nil/negligible. Shell Tellus S2 M 46 is rated Group B - Using the CEFAS hazard assessment available at https://www.cefas.co.uk/cefas-data-hub/offshore-chemical-notification-scheme/hazard-assessment-process/ and an MSDS available online (http://www.epc.shell.com/documentRetrieve.asp?documentId=112502259). The OCNS ranking of the hydraulic oil is Group B (aquatic toxicity is >100mg/L; "not readily biodegradable and contains components with the potential to bioaccumulate") - discussed with [redacted] Relevant incident history - MRIR from March 2018 A604500 - loss of production fluid to area during cyclone disconnect - however this is only similar in the sense that a spill to the marine environment occurred during cyclone disconnection. 20/3/2019 - waiting on 3 day report as cannot tell from the current details what the potential consequence could reasonably be - ie whether the spill originated from a fixed volume container or flowline. Final report states a 500 L isolatable inventory in the system. Therefore the potential consequence is minor. The root cause analysis provided in the final report (A668789) states "It has been determined that the structural connector hydraulic flanges were not sufficiently torqued during construction, as no other maintenance has been identified as being completed on this piping system since construction." Corrective actions to rectify the immediate issue are stated to be completed 6th April 2019, with SAP maintenance plans to be updated by 15 September 2019. For this reason - it is recommended that the disconnection/re-connection operations and associated controls including preventative maintenance be inspected during the next planned inspection.

Non-major investigation decision	
Date	22/03/2019
RoN	[redacted]
RoN review result	Agree with recommendation
Strategy decision	Investigate
Supporting considerations	Agree with recommendation. Refer also to notification 5855.

Associated inspection	
Inspection ID	1996

Runsheet entries		
1	**Event date**	18/07/2019 11:51 AM
	Event	Next planned inspection for Okha is Q2 2020