

Notifiable incident

Incident ID [6156](#)

Duty holder: Shell Australia Pty Ltd
Facility/Activity: Prelude FLNG
Facility type: Floating liquefied natural gas facility

Incident details	
Division	Occupational Health and Safety
Notification type	Incident
Incident date	19/09/2019 02:00 AM (WST)
Notification date	19/09/2019 10:49 AM (WST)
NOPSEMA response date	19/09/2019 12:02 PM (WST)
Received by	[REDACTED]
Nearest state	WA
Initial category type <i>(based on notification)</i>	Dangerous Occurrence
Initial category <i>(based on notification)</i>	Other kind needing immediate investigation
3 Day report received	20/09/2019
Final report received	04/10/2019
All required data received	04/10/2019
Final category type <i>(based on final report)</i>	Dangerous Occurrence
Final category <i>(based on final report)</i>	Other kind needing immediate investigation
Brief description	OHS-OKNI-Hydraulic Oil Leak
Location	Deck
Subtype/s	Other
Summary <i>(at notification)</i>	<p>Operator advised that a loss of primary containment has occurred in a hydraulic equipment enclosure located in the aft part of the central trunk.</p> <p>400 litres of hydraulic oil was lost from a connection point on a tank into the enclosure where it was contained. It was identified by a operator during his rounds.</p> <p>It is believed to have occurred during a facility ESD which took place the day before over a period of approx. 24 hours.</p> <p>The oil was cleaned up and the area declared safe.</p>
Details <i>(from final report)</i>	<p>Operator advised that a loss of primary containment has occurred in a hydraulic equipment enclosure located in the aft part of the central trunk.</p> <p>400 litres of hydraulic oil was lost from a connection point on a tank into the enclosure where it was contained. It was identified by a operator during his rounds.</p> <p>It is believed to have occurred during a facility ESD which took place the day before over a period of approx. 24 hours.</p> <p>The oil was cleaned up and the area declared safe.</p> <p>** As Supplied by Duty Holder**</p>

During an operator round the HPU cabinets in Central trunk were checked. Operator found 400l of hydraulic oil had leaked from a known leak point into the bund.
Operator discovered leak had occurred when solenoid valve 330-USV-4251 had opened to its fail safe position during the ESD2 event that happened on 18/9/2019 02:05.
The leak on the hydraulic pipework/fitting/connection was first discovered approx 5-6 weeks ago and the system had been made safe by blocking in the pipework. A notification was raised in SAP to kick off the repair process.

Work or activity being undertaken at time of incident: Operator Round

What are the internal investigation arrangements? Causal reasoning 5 Why Questionnaire

Was there any loss of containment of any fluid (liquid or gas)? Yes. 400 litres - There is no environmental consequence or potential from this leak (as contained within bunding, and central trunk area) or safety consequence (no hot surfaces, contained area).

Estimated quantity: Liquid (L), Gas (kg): 400 litres - There is no environmental consequence or potential from this leak (as contained within bunding, and central trunk area) or safety consequence (no hot surfaces, contained area)

Estimation Details: 2 x 200ltrs drums of hydraulic oil recovered from bund

Composition Percentage and description: Tellus S2 VX15

Known toxicity to people and/or environment: Toxicity to people: Low toxicity

Toxicity to environment: There is no environmental consequence or potential from this leak (as contained within bunding, and central trunk area)

How was the leak/spill detected? Visual

Did ignition occur: No

Has the release been stopped and/or contained? Yes. Duration of release: 25 hours. Estimated rate of release: 16 litres/per hour

Location of release: Central trunk, HPU hydraulic system, downstream of solenoid valve 330USV-4251

What equipment was involved in the release? HPU hydraulic system, downstream of solenoid valve 330USV-4251

Is this functional location listed as safety-critical equipment? No

Hydrocarbon release details:
System of Hydrocarbon release: Utilities

Estimated inventory in the isolatable system Litres or kg 4500ltr

System pressure and size of piping or vessel diameter (d in mm) length (l in m) or volume (V in L):
Pressure MPag 0. Size Piping (d) and Piping (l) or Vessel (V): Hydraulic solenoid lock/fitting- drip

Action taken to make the work-site safe Was permission given by a NOPSEMA inspector to interfere with the site? Solenoid isolated to prevent further leaking, SAP Notification raised to undertake corrective maintenance. Details of any disturbance of the work site: Bund was drained of the hydraulic oil into 44gallon drums

** As Supplied by Duty Holder**

Immediate action taken/intended, if any, to prevent recurrence of incident - Solenoid isolated to prevent further leaking, SAP Notification raised to undertake corrective maintenance. Responsible - Maintenance Coordinator. Completion Date - Completed.

What were the immediate causes of the incident? Appears leak was incorrectly blocked in and was reliant on solenoid in closed position. This valve opens on an ESD2 and another valve should have been used for isolation.

	<p>Root cause 1 - Isolation scheme for leak containment when 1st leak was found did not cover all operating scenarios</p> <p>Root cause 2 - Isolation scheme for leak containment when 1st leak was found did not cover all operating scenarios</p> <p>Full Report: During operator rounds it was identified that 400Lts of hydraulic oil had leaked from a known leak point (330USVS-4251) into a bund beneath. The leak occurred when solenoid valve 330-USV-4251 had opened to its fail-safe position during the ESD2 event on the 18/9/2019. The Solenoid system reacted as it should, however, 330USV-4251 did not close as QV-3306149/150 was isolated. Upon identification of the incident QV3306147 was isolated to contain the leak and the area was cleaned.</p> <p>Actions to prevent recurrence of same or similar incident - Review leak management process involving isolation schemes to ensure fit for purpose process. Completion Date - 30 November 2019.</p>
Immediate cause/s	TBC
Root cause/s	
Root cause description	<p>Root cause 1 - Isolation scheme for leak containment when 1st leak was found did not cover all operating scenarios</p> <p>Root cause 2 - Isolation scheme for leak containment when 1st leak was found did not cover all operating scenarios</p>

Duty inspector recommendation	
Date	19/09/2019
Duty inspector	██████████
Recommendation	Do not conduct Major Investigation
Reasoning	Does not meet MI threshold based on information received
Supporting considerations	

Major investigation decision	
Date	19/09/2019
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	20/09/2019
Inspector	██████████
Risk gap	Nominal
Type of standard	Established
Initial strategy	Inclusion in annual stats/data analysis

Recommended follow up strategy	
Recommended strategy	Inclusion in annual report stats / data analysis
Supporting considerations	<p>Hydraulic fluid is not flammable at the temperature/conditions of release. The fluid was not under pressure and so there was no fluid spray. There were no hot surfaces (>200°C) in proximity to the release. The release was fully contained within a bunded.</p> <p>No follow up / investigation required.</p>

Non-major investigation decision	
Date	20/09/2019
RoN	[REDACTED]
RoN review result	Agree with recommendation
Strategy decision	Inclusion in annual report stats / data analysis
Supporting considerations	

Associated inspection	
Inspection ID	