INTERNAL USE ONLY

Notifiable incident

Incident ID	6318
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	24/12/2019 12:00 AM (WST)
Notification date	25/12/2019 11:10 AM (WST)
NOPSEMA response date	25/12/2019 11:15 AM (WST)
Received by	[redacted]
Nearest state	WA
Initial category type *(based on notification)*	Dangerous Occurrence
Initial category *(based on notification)*	Uncontrolled HC release >1 - 300 kg
3 Day report received	26/12/2019
Final report received	28/01/2020
All required data received	28/01/2020
Final category type *(based on final report)*	Dangerous Occurrence
Final category *(based on final report)*	Uncontrolled HC release >1 - 300 kg
Brief description	OHS-HC1-HC Gas leak from MEG injection point
Location	Process deck
Subtype/s	Other
Summary *(at notification)*	Operator advised that an operator in the field detected a HC gas odour and it was identified that there was a gas leak on the MEG injection point for riser 5. No fixed gas detection was activated. The exact location of the gas leak was not identified at the time of notification but based on the pressure (160 bar) in the system and the rate of depressurisation it was estimated to be approx. 4.5kg Further investigation will be undertaken to ascertain the exact location of the leak.
Details *(from final report)*	Operator advised that an operator in the field detected a HC gas odour and it was identified that there was a gas leak on the MEG injection point for riser 5. No fixed gas detection was activated. The exact location of the gas leak was not identified at the time of notification but based on the pressure (160 bar) in the system and the rate of depressurisation it was estimated to be approx. 4.5kg Further investigation will be undertaken to ascertain the exact location of the leak. ** as supplied by duty holder ** 6. Brief description of incident - What happened: - Person working in turret area reported smell of hydrocarbon. No fixed detection triggered - Area Technician traced leak back to MEG injection line to riser 5 - Riser 5 removed from service - Leak volume estimated 4.9kg based on duration and line operating pressure

7. Work or activity being undertaken at time of incident - Production Operations

8. What are the internal investigation arrangements? - Shell is conducting an investigation into this incident to prevent a repeat.

9. Was there any loss of containment of any fluid (liquid or gas)? - No
Type of fluid - Hydrocarbon
Estimated quantity - 4.9kg
Estimation details - Calculation 4.9kg
Estimated Quantity = 4.9 kgs
• Hole diameter =0.1 mm
• Pressure over the 480 minute duration started at 175barg and reduced to 120barg before the leak was isolated
• Conditions at time
o Time – 480minutes
o Temperature reduced from 92degC to 77 degC over the duration
• Resulted in 4.9 kgs release
Composition - Well gas and condensate from subsea reservoir
Known toxicity to people and/or environment -
Toxicity to people - Yes
Toxicity to environment - No
How was the leak/spill detected? - Visual
Did ignition occur? - No

10. Has the release been stopped and/or contained? - Yes
The wells were closed to reduce pressure and the flow lines treated with MEG. P8 well was diverted into a different flow line and P1 well was shut down. This allowed the impacted Riser 05 PI 7046 to be isolated and blocked in. Riser 5 removed from service until further notice. Other risers (3) checked at same MEG injection point for leaks. Area restricted
Duration of the release hh:mm:ss - 08:00:00
Estimated rate of release Litres or kg per hour - 0.6125kg/per hour

11. Location of release -
What or where is the location of the release? - Prelude FLNG; Turret, TLER Deck - Riser 05 PI 7046
What equipment was involved in the release? - Riser 05 PI 7046
Is this functional location listed as safety-critical equipment? - No

13. Hydrocarbon release details -
System of hydrocarbon release - Process
System pressure and size of piping or vessel - Pressure MPag - Pressure over the 480 minute duration started at 175barg and reduced to 120barg before the leak was isolated
Estimated equivalent hole diameter - 0.1mm

15. Action taken to make the work-site safe -
The wells were closed to reduce pressure and the flow lines treated with MEG. P8 well was diverted into a different flow line and P1 well was shut down. This allowed the impacted Riser 05 PI 7046 to be isolated and blocked in. Riser 5 removed from service until further notice. Other risers (3) checked at same MEG injection point for leaks. Area restricted

21. Immediate action taken/intended, if any, to prevent recurrence of incident. -
Action - Remove PFP for detailed inspection and confirm leak test records
Responsible party - Prelude Production Coordinator
Completion date - 10/1/2020
Action - Repair leak path, leak test prior to return to service (as per process)
Responsible party - Prelude Maintenance Coordinator
Completion date - 30/1/2020

22. What were the immediate causes of the incident? - Yet to be determined, Riser 05 PI 7046 has been isolated and blocked waiting detailed inspection

** As Supplied by Duty Holder**

Has the investigation been completed? Yes

Root cause 1 Thread fitting not tight and inadequate thread sealant coverage.

	Full Report: Investigation identified that the high pressure tapered thread fitting into the flushing ring on the transmitter had leaked as it had not been correctly tightened which resulted in an inadequate thread sealant coverage on the thread. **See photos in report** Investigation methodology – 5 Causal Reasoning Questions Actions to prevent recurrence of same or similar incident: Action - Clean and remake fitting with correct type and amount of thread sealant . Responsible - MMTL. Completion Date - Completed Action - Pressure test fitting after reinstallation and correct curing time for sealant. Responsible - MMTL. Completion Date - Completed Action - Snoop check same function transmitters on other risers. Responsible - MMTL. Completion Date - 1/3/2020
Immediate cause/s	TBC
Root cause/s	
Root cause description	
Release type	Hydrocarbon gas
Gas (kg)	4.5

Duty inspector recommendation	
Date	26/12/2019
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	26/12/2019
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	07/01/2020
Inspector	[redacted]
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	Gas detectors did not activate. Release rate was estimated to be 0.6 kg/h and can be considered fugitive (< 3 kg/h, is unlikely to present a safety hazard - Ref. EU guidance. Not reportable under EU regulations). Leak was was not from obvious equipment failure, therefore likely from equipment tightness etc.. Release has been stopped and riser 5 was removed from service.

Non-major investigation decision	
Date	07/01/2020
RoN	[redacted]
RoN review result	Agree with recommendation
Strategy decision	Inclusion in annual report stats / data analysis
Supporting considerations	

Associated inspection	
Inspection ID	