

Notifiable incident

Incident ID [6335](#)

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	09/01/2020 10:05 PM (WST)
Notification date	09/01/2020 11:17 PM (WST)
NOPSEMA response date	10/01/2020 07:11 AM (WST)
Received by	[REDACTED]
Nearest state	WA
Initial category type <i>(based on notification)</i>	Dangerous Occurrence
Initial category <i>(based on notification)</i>	Unplanned event - implement emergency response plan
3 Day report received	12/01/2020
Final report received	07/02/2020
All required data received	07/02/2020
Final category type <i>(based on final report)</i>	Dangerous Occurrence
Final category <i>(based on final report)</i>	Unplanned event - implement emergency response plan
Brief description	OHS-UPE-Gas detector activation
Location	Process deck
Subtype/s	Alarm, Emergency response, Muster
Summary <i>(at notification)</i>	<p>Operator advised that during the re-installation of a relief valve in the process area a zero energy check was being performed and a bleed valve opened which released a small amount of HC gas. This gas activated nearby single point gas detector as well as an acoustic gas detector.</p> <p>A GPA was initiated the ERT Deployed. The all clear was given and the facility returned to normal status.</p> <p>Further investigation is underway into the incident.</p>
Details <i>(from final report)</i>	<p>Operator advised that during the re-installation of a relief valve in the process area a zero energy check was being performed and a bleed valve opened which released a small amount of HC gas. This gas activated nearby single point gas detector as well as an acoustic gas detector.</p> <p>A GPA was initiated the ERT Deployed. The all clear was given and the facility returned to normal status.</p> <p>Further investigation is underway into the incident.</p> <p>** as supplied by duty holder **</p> <p>6. Brief description of incident - Gas detection on 2P1 module, E deck at 10:01pm on Thursday 9th January resulting in general platform alarm (GPA) initiation. Gas detection on 2P1 module, E deck at 10:01pm on Thursday 9th January resulting in general</p>

platform alarm (GPA) initiation.

Gas release was caused by a Permit Holder opening 140RV-1034D upstream bleed valve QV-1400802 and venting pressurised hydrocarbon gas to atmosphere in vicinity of F&G detectors for approximately 50 seconds. At the time of the incident 140RV-1034D was, and still remains, isolated under ICC-917756. The bleed valve QV-1400802 forms part of this isolation (isolation point #3) and was tagged with a LOTO bleed tag in the field. The team member was issued PTW-1021908 at 7:30pm (same day) for work to replace 140RV-1034D after re-certification.

7. Work or activity being undertaken at time of incident - Removal of relief valve 140RV-1034D for recertification.

8. What are the internal investigation arrangements? - Shell are conducting a casual reasoning investigation into the incident.

9. Was there any loss of containment of any fluid (liquid or gas)? - Yes

Type of fluid (liquid or gas) - Hydrocarbon

Please specify - Natural Gas

Estimation details - Calculation

Please specify - 7.5 kg

Composition -

Nitrogen; 3%

C1: 46%

C2: 48%

C3: 2%

C4+: ~1%

Known toxicity to people and/or environment -

Toxicity to people - Non toxic

Toxicity to environment - Non Toxic

How was the leak/spill detected - F&G detection

Did ignition occur - No

10. Has the release been stopped and/or contained? - Yes

Duration of the release - 50 seconds

Estimated rate of release - 7.5 kg released in 50 seconds

11. Location of release - 2P1 E Deck bleed valve of relief valve 140RV-1034D

What equipment was involved in the release? - Bleed point of relief valve

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

13. Hydrocarbon release details -

System of hydrocarbon release - Process

Estimated inventory in the isolatable system - 7.5 kg

System pressure and size of piping or vessel -

Pressure MPag - 3.2

Size - Piping (d in mm) - 300

Size - Piping (l in m) - 2.5

Size - Vessel (V in L) - 175

Estimated equivalent hole diameter (d in mm) - 12.5

15. Action taken to make the work-site safe -

Action taken - Bleed valve was closed.

Details of any disturbance of the work site - None

16. Was an emergency response initiated? - Yes

Type of response - Muster

How effective was the emergency response? - The muster took 11 minutes for a full muster of Prelude FLNG. The bleed that was opened and caused the gas release was closed and the activated gas detectors automatically reset after 53 seconds.

22. What were the immediate causes of the incident? - A bleed valve opened inadvertently

** As Supplied by Duty Holder**

Has the investigation been completed? Yes

Root cause analysis:

Root cause 1 - There have been a number of revisions to the LOTO manual without adequate communication of the impact to the work party

Root cause 2 - Communication around zero energy check requirement was unclear with regards to the responsible party in return to work communication and the Last Minute risk assessment form

Other root causes - Lack of conformance to the passing valve management during isolation

Full Report:
Investigation was conducted using causal reasoning, focusing on both the behavioural element of the permit holder opening the bleed valve, and more broadly at the management of long duration isolations, prepare for maintenance plans and the venting of inventory.

Investigation found that the individual was acting with the belief that he was doing the right thing in checking for zero energy, and the communication around zero energy checks has been unclear in terms of who is responsible. The LOTO manual is clear in the roles and responsibilities section, however can be improved to effectively communicate the responsibility of the AA to perform repeated zero energy checks, as required for the duration of the task. This was found through a review of the LOTO manual, and interviews with those involved.

In terms of the management of the isolation, it was found that the process for management of passing valves is not well understood amongst the production team. In this case, the management of the passing isolation valve that allowed the space to pressure up was not managed as per the manual. Additionally, there were deficiencies with the requirement to vent to a safe location in the Prepare for Maintenance procedure and in the LOTO manual. It was unclear if the Prepare for Maintenance plan had been field verified, however this is not formally captured as a requirement in the Prepare for Maintenance Procedure.

Actions to prevent recurrence of same or similar incident - Shell is undertaking a detailed review of deficiencies and gaps in the Safe Isolation process and related competency on Prelude. Improvement programs will be implemented and demonstrated in accordance with Direction 780. Responsible - Asset Manager. Completion Date - 22 March

Immediate cause/s	tbc
Root cause/s	
Root cause description	Root cause 1 - There have been a number of revisions to the LOTO manual without adequate communication of the impact to the work party Root cause 2 - Communication around zero energy check requirement was unclear with regards to the responsible party in return to work communication and the Last Minute risk assessment form Other root causes - Lack of conformance to the passing valve management during isolation

Duty inspector recommendation

Date	10/01/2020
Duty inspector	
Recommendation	Do not conduct Major Investigation
Reasoning	Does not meet MI threshold based on information received
Supporting considerations	

Major investigation decision

Date	10/01/2020
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	13/01/2020
Inspector	
Risk gap	Substantial
Type of standard	Established
Initial strategy	Investigate within 45 days

Recommended follow up strategy	
Recommended strategy	Investigate ASAP
Supporting considerations	Multiple gas release events in relation to process mechanical isolation, including notification 6151 (Gas release when maintained MLA) and 6293 (MEG system filters identification) and issue (venting to atmosphere during RV maintenance) highlighted in relation to maintaining RVs during last inspection (PI 2051). Elevate notification to Investigate ASAP.

Non-major investigation decision	
Date	13/01/2020
RoN	[REDACTED]
RoN review result	Agree with recommendation
Strategy decision	Investigate ASAP
Supporting considerations	

Associated inspection	
Inspection ID	2134