

Notifiable incident

Incident ID [6025](#)

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	03/07/2019 10:00 AM (WST)
Notification date	04/07/2019 04:15 PM (WST)
NOPSEMA response date	04/07/2019 04:25 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>	Could have caused death or serious injury
3 Day report received	06/07/2019
Final report received	20/08/2019
All required data received	20/08/2019
Final category type <i>(based on final report)</i>	Dangerous Occurrence
Final category <i>(based on final report)</i>	Could have caused death or serious injury
Brief description	OHS - DODSI - ice falling from flare boom onto walkway
Location	
Subtype/s	Dropped object, Near miss / high potential
Summary <i>(at notification)</i>	Lumps of Ice Falling from flare boom onto unbarricaded walkway Walkway had been occupied moments prior to incident Weight of ice estimated to be between 1 kg to 3 kg Height was 21 m Walkway immediately barricaded Investigation ongoing - 3 day report to follow Reporting delayed due to crew change.
Details <i>(from final report)</i>	Lumps of Ice Falling from flare boom onto unbarricaded walkway Walkway had been occupied moments prior to incident Weight of ice estimated to be between 1 kg to 3 kg Height was 21 m Walkway immediately barricaded Investigation ongoing - 3 day report to follow Reporting delayed due to crew change. *as supplied by duty holder* Whilst moving past 1P1 module towards the turret, ice began falling from above from pipework located on C deck of 1P1. The distance of the falling ice was approximately 21m. The weight of the largest piece was estimated between 1-3 kgs. There was barricading in the area, but the falling ice was outside of the barricaded areas.

Facility was in process of restarting post a shutdown. The change in process conditions had caused the ice to melt in some places leading to the ice fall.

Shell are investigating the incident by the causal reasoning method.

A further survey of facility was undertaken with respect to presence of ice and potential drops. Additional barricading was put in place to exclude access to areas where there was a risk of dropped ice.

The immediate cause is yet to be determined

as supplied by dutyholder

This incident was investigated by the Operations Support engineer, using causal reasoning investigation methodology.

Timeline

Prior to incident

At 1pm on the 2nd of July, the LNG train was in the process starting up after a train trip with the Main Cryogenic Heat Exchanger (MCHE) commencing cooldown.

On night shift on the 2nd of July, Ice was observed by the night shift Area Authority to be falling around 2P1 Forward end. The plant was approaching final cooldown. Barricades were put in place where Ice were falling.

Incident

At around 10 am on the 3rd of July, two members of a work party signed onto a Tool Box meeting with the Area Authority for a permitted job to change a light fitting in the Turret. Ice was an identified hazard with barricading identified as a key control. As the work party moved through an unbarricaded designated walkway outside of the temporary barricade on 1P1, Ice warning signs were displayed. Pieces of ice was observed to be falling intermittently from the pipework from the top of the module above – from C deck to A deck where the work party was located. The distance of the falling ice was approximately 21m. The weight of the largest piece was estimated between 1-3 kgs. There was barricading in the area, but the falling ice was outside of the barricaded areas.

Immediate response

The work party immediately radioed the Area Authority. Barricades were put in place for the area. The work party stop their job, secured their tools and proceeded back to their workshop to inform their lead.

A further survey of facility was undertaken with respect to presence of ice and potential drops. Additional barricading was put in place to exclude access to areas where there was a risk of dropped ice.

Causal Summary

The following causal findings were identified that led to ice falling on an unbarricaded designated walkway between 1P1 and the Turret after the work party passed through the area.

As part of the LNG train restart, feed gas was initially routed to flare; this resulted in ice formation on the uninsulated flare lines, exposed to highly humid ambient conditions. Once the LNG train was online, flaring was stopped, and ice which had formed on the flare lines started to melt in the ambient condition and eventually break away from the pipe work and fell onto Process Deck A.

Although the main designated topsides walkway (i.e Green Mile) was barricaded with warning signs and ice nets installed on previously identified pipework (as part of the Dropped ice register), there was still unidentified ice fall hazard from the flare header from 1P1 to the Turret which was not barricaded.

As ice formation is unavoidable and will reoccur for the life of the plant and cannot be eliminated from flare lines, a robust engineered solution of ice fall protection is being worked to reduce the risk of damage to personnel and asset.

	In addition, the continued communication and subsequent increase of situational awareness for all work parties during abnormal plant conditions will continue to be paramount.
Immediate cause/s	Ambient high humidity condenses and freezes on cold lines. Prelude was going through a plant restart post a relief event. Unidentified hazard of ice formation on piping situated above main topsides walkway which partially melted during the restart resulting in ice falling to the walkway.
Root cause/s	
Root cause description	Root cause 1 Ambient high humidity condenses and freezes on cold lines Root cause 2 Prelude was going through a plant restart post a relief event Root cause 3 Unidentified hazard of ice formation on piping situated above main topsides walkway

Duty inspector recommendation	
Date	04/07/2019
Duty inspector	
Recommendation	Do not conduct Major Investigation
Reasoning	Does not meet MI threshold based on information received
Supporting considerations	

Major investigation decision	
Date	04/07/2019
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	09/07/2019
Inspector	
Risk gap	Substantial
Type of standard	Established
Initial strategy	Investigate within 45 days

Recommended follow up strategy	
Recommended strategy	Investigate within 45 days
Supporting considerations	Could have resulted in fatality based on weight/height. No previous history of dropped objects. Shell reported that the area has been barricaded and is being investigated. Investigate with 45 days due to potential consequence.

Non-major investigation decision	
Date	09/07/2019
RoN	
RoN review result	Agree with recommendation
Strategy decision	Investigate within 45 days
Supporting considerations	

Associated inspection	
Inspection ID	1990