

Notifiable incident

Incident ID [5651](#)

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	21/10/2018 01:48 AM (WST)
Notification date	21/10/2018 07:00 AM (WST)
NOPSEMA response date	21/10/2018 08:48 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>	Fire or explosion
3 Day report received	23/10/2018
Final report received	21/11/2018
All required data received	21/11/2018
Final category type <i>(based on final report)</i>	Dangerous Occurrence
Final category <i>(based on final report)</i>	Fire or explosion
Brief description	OHS - FIREX - Fire on oxygen regulator
Location	Process deck
Subtype/s	Fire, Alarm, Emergency response, Muster
Summary <i>(at notification)</i>	General alarm and muster triggered by a small fire on an oxygen regulator. Workers were in attendance and the fire was extinguished quickly, but in doing so other alarms were triggered, leading to a long muster of approx 2 hours. The fire was in the main deck aft oxygen store, which has open grate. Operators were working in the oxygen store, and when they opened the valve on the cylinder it caught fire with a small flame. Hot work and the oxygen reticulation system has been suspended while the operator is investigating.

<p>Details (from final report)</p>	<p>General alarm and muster triggered by a small fire on an oxygen regulator. Workers were in attendance and the fire was extinguished quickly, but in doing so other alarms were triggered, leading to a long muster of approx 2 hours. The fire was in the main deck aft oxygen store, which has open grate. Operators were working in the oxygen store, and when they opened the valve on the cylinder it caught fire with a small flame. Hot work and the oxygen reticulation system has been suspended while the operator is investigating.</p> <p>At approximately 0140hrs on the 21st of October 2018 a work group entered the oxygen cylinder store on the aft main deck of FLNG, to investigate the lack of supply to an oxy-acetylene torch from a Oxygen and Acetylene distribution system. Upon turning on the supply from the oxygen cylinders, a loud bang and white flash was observed at the oxygen regulator. The work group took immediate steps to isolate the oxygen, extinguish the fire and raise the alarm. The CCR initiated the general alarm and manually initiated water deluge to the oxygen supply room and the paint store (also on main deck).</p> <p>The facility was mustered and all personnel accounted for in 29 minutes. During this time the emergency response team was mobilised to the area to provide visual confirmation that the fire was extinguished. Once it was concluded that there was no longer a risk to the facility the muster was stood down.</p> <p>Oxygen and acetylene supplies (located in a separate dedicated store) were shut isolated and both systems have been tagged out of service. Testing and replacement of detectors impacted by water spray completed.</p> <p>All personnel onboard Prelude FLNG and POSH Arcadia mustered and were accounted for. Fire teams were sent to event location once considered safe to check and confirm all clear. Fire team confirmed the was clear and the oxygen and acetylene had been isolated. Fire and gas system functioned as per design.</p>
<p>Immediate cause/s</p>	<p>Fire caused by oxygen, combustible materials and high temperature (reaching auto-ignition temperature) within the regulator.</p>
<p>Root cause/s</p>	<p>ED - PREVENTIVE MAINTENANCE - PM NI - PM for equip NI</p>
<p>Root cause description</p>	<p>The flash and bang at the regulator was caused by a fire that started within the regulator. The reason this fire started is:</p> <p>There was an abundance of oxygen:</p> <ul style="list-style-type: none"> • The lines from the oxygen cylinder to the oxy-torch contain 99.9% pure Oxygen gas. <p>AND</p> <p>There was combustible material in the system:</p> <ul style="list-style-type: none"> • The combustible material likely entered the system during cylinder change-outs. A mixture of dust, rust and other debris accumulated in the cylinder value outlet of unused oxygen cylinders and were not removed prior to connecting the cylinders to the oxygen reticulation system. <p>AND</p> <p>The temperature of the system increased to the auto-ignition point of the material.</p> <ul style="list-style-type: none"> • The rapid temperature increase was caused by adiabatic compression of the oxygen gas. Adiabatic compression occurred when depressurized oxygen gas in the closed system was rapidly compressed on opening the oxygen cylinders valves.

Duty inspector recommendation

<p>Date</p>	<p>22/10/2018</p>
<p>Duty inspector</p>	<p>██████████</p>
<p>Recommendation</p>	<p>Do not conduct Major Investigation</p>
<p>Reasoning</p>	<p>Does not meet MI threshold based on information received</p>
<p>Supporting considerations</p>	<p></p>

Major investigation decision

<p>Date</p>	<p>23/10/2018</p>
<p>Decision</p>	<p>Do not conduct Major Investigation</p>
<p>Reasoning</p>	<p>Does not meet MI threshold based on information received</p>
<p>Supporting considerations</p>	<p></p>

Non-major investigation review and recommendation	
Date	23/10/2018
Inspector	
Risk gap	Substantial
Type of standard	Established
Initial strategy	Investigate within 45 days

Recommended follow up strategy	
Recommended strategy	Investigate ASAP
Supporting considerations	The incident caused a fire in the workshop. Initial enquiries regarding a cause for the fire yielded no details. Recommend ASAP investigation to determine any immediate threat to health and safety.

Non-major investigation decision	
Date	23/10/2018
RoN	
RoN review result	Agree with recommendation
Strategy decision	Investigate ASAP
Supporting considerations	

Associated inspection	
Inspection ID	1898