

Notifiable incident

Incident ID 5548

Duty holder: INPEX Operations Australia Pty Ltd
Facility/Activity: CPF Ichthys Explorer
Facility type: Other platform with accommodation facilities when drilling/workover facilities are not in commission

Incident details	
Division	Occupational Health and Safety
Notification type	Incident
Incident date	27/08/2018 10:58 PM (WST)
Notification date	28/08/2018 12:07 AM (WST)
NOPSEMA response date	28/08/2018 07:25 AM (WST)
Received by	
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	30/08/2018
Final report received	26/09/2018
All required data received	26/09/2018
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-Indication of gas in process area
Location	Process deck
Subtype/s	Facility integrity
Summary <i>(at notification)</i>	<p>Operator advised that gas detectors activated in way of the fuel gas knockout drum which initiated a GA and Muster.</p> <p>All crew mustered on the CPF and Flotel Triumph. The ERT was deployed and could not find identify any gas.</p> <p>The facility was returned to normal status.</p> <p>The operator suspects that a small amount of gas leaked past a gland on a flow control valve for the drum due to a surge in pressure due to gas being introduced into the system.</p>

<p>Details <i>(from final report)</i></p>	<p>Operator advised that gas detectors activated in way of the fuel gas knockout drum which initiated a GA and Muster.</p> <p>All crew mustered on the CPF and Flotel Triumph. The ERT was deployed and could not find identify any gas.</p> <p>The facility was returned to normal status.</p> <p>The operator suspects that a small amount of gas leaked past a gland on a flow control valve for the drum due to a surge in pressure due to gas being introduced into the system.</p> <p>During introduction of fuel gas into the Fuel Gas System, two gas detectors indicated High High alarms, resulting in ESD1 and blowdown of process.</p> <p>On the 27 August at approximately 14:30 the facility had a Platform Shutdown (PSD) event. The restart was from an unusual state because normally after a PSD2 the fuel gas system would remain at its normal operating pressure (no blowdown). However, in this case the fuel gas system had depressured because HV009, which is located on the downstream side of the fuel gas knock out Drum, was open 15% to simulate fuel gas load and to prevent the fuel gas knock out drum from over-pressuring due to normal pressure control valve leakage (PV016). To progress the train restart, numerous permissives need to be satisfied to enable the SDV081 (inlet surge valves from train inlet manifold) to be opened. One of these permissives is to ensure that either the fuel gas knock out drum (B667-V-001) is at a pressure greater than 4000kPa or SDV002 is open. Neither of these two requirements were met as SDV002 had closed as required during the PSD and the pressure in the fuel gas knock out drum was low as HV009 had allowed it to flow to flare. Therefore at this point the start-up could not progress.</p> <p>At approximately 22:57 B667-SDV-002 was opened with a differential pressure of 7.9 MPa, whilst MV0292 was still inadvertently open. Almost immediately two point gas detectors (GD) activated (these GDs are located either side of the base of the knock out drum) triggering an Emergency Shutdown (ESD). The facility went to muster, all safety systems worked as intended and finally the all clear was given at approximately 23:30.</p> <p>A survey of the equipment and piping in the vicinity did not reveal any obvious leak points. A visual survey of the piping and pipe supports found evidence of significant pipe movement, damage to paint work at pipe restraints and mechanical damage to one pipe support in the piping section between SDV004 (low point) and PC016 (high point).</p> <p>The system was then isolated and pressure testing planned. Included in this testing was a requirement to check for liquids in the piping section. Approximately 10 litres was drained from one low point. A greater volume was also drained via fixed piping to the drains system however the amount is unknown. It is likely that this liquid was residual monoethylene glycol (MEG) that was left from the earlier pressure equalisation attempt. The system was pressurised with a Nitrogen/Helium (N2He) mix up to 12 MPa. No leak points were identified.</p> <p>In alignment with Mechanical Technical Authority TA1/TA2 advice the flanges in the vicinity of the pipework were torque checked and no anomalies were found.</p> <p>The small bore drain line immediately upstream of PV016 was dye penetrant inspected and no anomalies were found. This Small Bore Fitting (SBF) was checked as there was superficial evidence of cracking in the paint on the elbows of this drain line.</p> <p>The mechanical damage to the pipe support in the piping section between SDV004 (low point) and PC016 (high point) was assessed and was left as found. This was based on discussions with the Mechanical TA2 who advised that the primary purpose of this pipe support was to provide lateral support, rather than vertical support. The damaged pipe support still provided lateral support as the pipe shoe was still well within the side supports. The welds on the pipe support were Non Destructive Testing (NDT) inspected and no defects were identified.</p> <p>The investigators concluded that the 7.9Mpa pressure pulse released when B667-SDV-002 was opened caused movement in the piping section in the vicinity of the two gas detectors; as part of this movement, one of the piping flanges briefly sprung partially open enough to release a small amount of fuel gas sufficient to activate both gas detectors.</p>
<p>Immediate cause/s</p>	<p>The investigators concluded that the 7.9Mpa pressure pulse released when B667-SDV-002 was opened caused movement in the piping section in the vicinity of the two gas detectors; as part of this movement, one of the piping flanges briefly sprung partially open enough to release a small amount of fuel gas sufficient to activate both gas detectors.</p>
<p>Root cause/s</p>	<p>HPD - HUMAN ENGINEERING - Human-machine interface - displays NI, HPD - PROCEDURES - Wrong - situation not covered</p>

Root cause description	SDV002 was opened with a pressure differential of 7.9Mpa. None of the Operations procedures regarding Start-Up of the Fuel Gas system accurately detailed the sequence required for start-up from the system state (Inlet at pressure, Fuel Gas system without pressure). The Start-Up logic required SDV002 to be opened or the fuel gas system to be pressurised to allow the inlet train valve to be opened; this permissive may not be required.
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Duty inspector recommendation

Date	28/08/2018
Duty inspector	██████████
Recommendation	Do not conduct Major Investigation
Reasoning	Does not meet MI threshold based on information received
Supporting considerations	

Major investigation decision

Date	28/08/2018
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	28/08/2018
Inspector	██████████
Risk gap	Moderate
Type of standard	Established
Initial strategy	Investigate

Recommended follow up strategy

Recommended strategy	Investigate
Supporting considerations	INPEX (██████████) called at 9 am on 28 Aug 2018. The facility is currently on holding mode. 3 gas detectors went off after the facility re-start from trip due the sea water lift pump on 27 Aug. LEL of gas detectors pointed to zone / general location of gas source. Source of gas release could not be pin pointed exactly by the ERT - possible valve glands leak. There is no indication / findings of breakage / failure of HC boundaries. The fuel gas system is isolated and full leak testing using N2 being conducted to identify location of leak. Investigation team was on site from previous event and now tasked to commence investigation of current event. The previous event of gas release from fuel gas vent is not related to current event. This is the second event reported by CPF related to potential gas release. ASV and CPF mustered as required. I recommend the notification is to be followed up in PI 1776 . ██████████

Non-major investigation decision

Date	28/08/2018
RoN	██████████
RoN review result	Agree with recommendation
Strategy decision	Investigate
Supporting considerations	

Associated inspection

Inspection ID	1776
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