INTERNAL USE ONLY

Notifiable incident

Notification ID	NTF11797
Duty holder	Woodside Energy Global Pty Ltd
Facility/Activity	Pyrenees
Nearest state	WA
Incident	OHS-DSCE: gas leak identified from Crosby 3H1 subsea Xmas Tree

Basic information provided at time of notification	
Notification type	Incident
Incident date	09/10/2022 07:00 AM (AWST)
Notification date	09/10/2022 10:42 AM (AWST)
NOPSEMA response date	09/10/2022 02:30 PM (AWST)
Received by	[redacted]

Summary of information provided	
Brief descriptive title	OHS-DSCE: gas leak identified from Crosby 3H1 subsea Xmas Tree
Incident location	
Subtype/s	
Summary *(provided at notification)*	During ROV operations, gas bubbles were identified rising from the Crosby 3H1 horizontal Xmas Tree. The leak appears to be downstream of the gas lift choke and annulus wing valve crossover valve. Still unsure of leak origin. The well was offline and now remains offline and isolated. Video showed small leak 50-60 bubbles every 30 seconds.

Request permission to disturb the site	
Permission given	Not Applicable
Permission given by	
Permission given on	

Initial spill and release amounts	
Gas (kg)	
Liquid (L)	
Release type	
More information	

Details of person providing information to NOPSEMA	
Full name	[redacted]
Job title	[redacted]

Initial notification category	
Initial category type *(based on notification)*	Dangerous Occurrence
Initial category *(based on notification)*	OHS - damage to safety-critical equipment

Running sheet
There are no running sheet entries for this notification

Decision	
Escalate to level 1	Yes
Inspector	[redacted]
Escalated on	11/10/2022 06:59

Final notification category	
Final category type *(based on final report)*	Dangerous Occurrence
Final category *(based on final report)*	OHS - damage to safety-critical equipment

Immediate causes	
Details	Appears to be a leaking stem seal on the CRO 3H1 HXT XOV

Initial report	
Due date	12/10/2022
Received date	10/10/2022
Reviewed date	21/10/2022
Reviewed by	[redacted]

Additional details provided by duty holder	Brief description of incident: Initially a small volume of bubbles was observed emanating from under the CRO 3H1 HXT top plate, during ROV operations. Well was producing at the time of the initial observation with a typical operating pressure of ~90 bar in the Gas Lift system. The well was shut in as part of planned preparations for isolations prior to rig intervention. Further investigation, with ROV equipped with remote mounted camera, revealed that there is a constant stream of bubbles from the XOV actuator stem seal when the valve is in the open position and gas lift pressure applied; bubbles cease when XOV is closed @ operating pressure CRO 3H1 GLIV A & B “ROV operated” isolation supply valves have been closed following the detailed ROV inspection & test process; all SST valves and the GLC are in the closed position in readiness for planned rig intervention. Work or activity being undertaken at time of incident ROV operations – HXT “as found” survey and cleaning in preparation for rig intervention. What are the internal investigation arrangements? ROV detailed camera survey and assessment by the subsea engineering team to determine leak origin. Action taken to make the work-site safe: Action taken Detailed ROV camera survey to determine origin of the leak. Was an emergency response initiated? No Was anyone killed or injured? No Was there any serious damage? No Equipment damaged CRO 3H1 HXT XOV Extent of damage Leaking stem seal. Will the equipment be shut down? Yes - If Yes, for how long?Rig intervention was and is planned for this well in ~mid Oct 2022 Will the facility be shut down? No Immediate action taken/intended, if any, to prevent recurrence of incident. Action - Detailed survey of the SST using ROV equipped with remotely mounted camera to identify origin of bubbles. - Responsible party - [redacted] - Completion date - Complete

Final report	
Due date	08/11/2022
Received date	08/11/2022
Reviewed date	15/11/2022
Reviewed by	[redacted]

Additional details provided by duty holder	Full Report: A detailed ROV inspection & test process on XT Crosby-3H1 was conducted following first identification of bubbles. The leak was verified as coming from the XOV Actuator / Stem Seal area Further observation/ testing confirmed leak ceased (100%) when the XOV was closed. ALARP Assessment Review Performed The review has determined that the well can be operated with reduced functionality on the basis that: • Good practice can be met with closure of the XOV (i.e. no continuous leak), and that the regulatory approvals allow for the proposed modifications to non-routine operations. • The likelihood of degradation of the XOV seal in the closed position is highly unlikely. • The XOV will be monitored by ROV on an opportunity basis and the well will be shut in if the inspection confirms leak present with valve in the closed position until a replacement XT can be installed. There is no intention to operate the well with a continuous release. 'Opportunity' frequency basis is the Highly Unlikely scenario that the back seal will pass, as this risk is present on all subsea tree valves. • There are controls that can be implemented to reduce the risk of loss of containment to ALARP during non-routine operations, and that these operations are permitted under the Environment Plan (EP) (covered under Section 6.9 of the EP) and WOMP. • The risks associated with replacing the XT (if not required to) are greater than the risks associated with the modifications to non-routine operations implemented for compensate to the reduced functionality of the XOV. The current status is that the XOV is closed and not leaking, MCS control disabled, and valve status logged in the facility long term isolation register. Scenarios where the XOV may need to be opened have been identified along with appropriate controls to ensure regulatory compliance, and to demonstrate that the risks are both tolerable and ALARP. Actions to prevent recurrence of same or similar incident Action - XOV is closed, MCS control disabled, and valve status logged in the facility long term isolation register - Responsible Party - [redacted] - Completion Date - Complete

Final spill and release amounts	
Gas (kg)	1.00
Liquid (L)	0.00
Release type	Hydrocarbon gas

More information	Was there any loss of containment of any fluid (liquid or gas)? Yes Type of fluid (liquid or gas) - Hydrocarbon - Gas bubbles Estimated quantity < 1kg from time of observation to time of isolation. Estimation details - Calculation - Rough estimate of 50-60 bubbles intermittently escaping every 20-30 seconds at the time of initial observation. A constant stream of bubbles through the XOV actuator stem seal was later observed for a short duration when the XOV was in the open position with gas lift pressure applied. Composition - Predominately Methane How was the leak/spill detected? Visual - Did ignition occur? No Has the release been stopped and/or contained? Yes Duration of the release hh:mm:ss Unknown. Estimated rate of release Litres or kg per hour Unknown Location of release: LOC appears to be originating through the actuator stem seal on the XOV on CRO 3H1 HXT What equipment was involved in the release? Crosby 3H1 Horizontal subsea Xmas Tree Hydrocarbon release details: System of hydrocarbon release - Subsea / Pipeline - Well Estimated inventory in the isolatable system Litres or kg From the GLC on the subsea manifold to the SST is 115m of 2.5” flowline with a volume of .36m3. Typical pressure ~90 bar gas. System pressure and size of piping or vessel diameter (d in mm) length (l in m) or volume (V in L) Pressure bar 90 bar operating. Size Piping (d) and Piping (l) or Vessel (V) 2.5”

Root causes	
Code	
Description	

All data received	
Date	08/11/2022