Notifiable incident

Incident ID	**6242**
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	09/11/2019 08:00 PM (WST)
Notification date	10/11/2019 10:02 AM (WST)
NOPSEMA response date	10/11/2019 10:02 AM (WST)
Received by	■■■■■■■
Nearest state	WA
Initial category type *(based on notification)*	Dangerous Occurrence
Initial category *(based on notification)*	Damage to safety-critical equipment
3 Day report received	11/11/2019
Final report received	09/12/2019
All required data received	09/12/2019
Final category type *(based on final report)*	Dangerous Occurrence
Final category *(based on final report)*	Damage to safety-critical equipment
Brief description	OHS-DSCE - During normal plant operations, DCS lost communication with the plant.
Location	
Subtype/s	Facility integrity, Other
Summary *(at notification)*	The OIM of Prelude FLNG facility reported a loss of communication between the Distributed Control System (DCS) and the operating plant. As a result of the loss of communication, one of the liquid controllers progressed to a low-low level on vessel V-14000 that led to further activation of the Instrumentation Protection System / SIS.
Details *(from final report)*	The OIM of Prelude FLNG facility reported a loss of communication between the Distributed Control System (DCS) and the operating plant. As a result of the loss of communication, one of the liquid controllers progressed to a low-low level on vessel V-14000 that led to further activation of the Instrumentation Protection System / SIS. ** As Supplied by Duty Holder** What happened: - Loss of communication from IPS into DCS leading to failure of liquid control on V14001 NGL Extraction Column Feed Separator; without this being visible to the panel operator on DCS (DCS continued to show last recorded level and didn't show coms loss alarm). - Loss of liquid control lead to low low level IPS trip on V14001, which triggered IPS executive action for the NGL system, closing various UZVs (emergency shutdown system activation for the system). This is an activation of the Instrument Protective System and hence recordable in FIM and NOPSEMA.

	Work or activity being undertaken at time of incident - Normal plant operations
	What are the internal investigation arrangements? 5 Why Causal Reasoning Investigation
	Action taken to make the work-site safe - Understand reason for IPS activation - slow down process to allow stabilisation process conditions - Investigate extent of coms loss & understand why occurred (understood, but requires more robust solution) - establish clear view of process parameters - continuous monitoring of IPS health
	Immediate action taken/intended, if any, to prevent recurrence of incident - Will be determined as part of investigation.
	What were the immediate causes of the incident? This incident is still being investigated.
	** As Supplied by Duty Holder**
	Has the investigation been completed? Yes
	Root cause 1 - PML202-17_11 procedure not followed (Daily hardware checks are partially and/or not completed) Root cause 2 - Intrusion Protective Device (IPD) unlock procedure not followed as required for an Integrated Protective System (IPS) download. Switch port violation is missing in Functional Design specification and IPD procedure is not clear enough Root cause 3 - When inter-controller communication failed, the Input/Output (IO)_ Management block went into "Readback Failed" error mode and stop updating all 3 PV parameters. Thus, these parameters hold their last good value which then propagate the misleading "healthy PV" all the way to the Proportional Integral Derivative (PID) controller 140LC1001
	Full Report:
	Investigator: Onshore Instrumentation Control and Electrical Engineers
	Investigation findings identified the following sequence of events which resulted in the loss of communication. • Initial communications fault from a hardware failure on IR1SB-L2A-S-02 switch (PML202-17_11 procedure not followed – Daily hardware checks)
	• Second communication fault when the primary switch P05 went bad status due to port locking violation when Intrusion Protective Device (IPD) was bypassed without unlocking the upstream network (IPD Unlock procedure not followed)
	• When inter-controller communication (see image below) between the I_IR1SB_06 and D_IR1SB_16 failed, the IO_ Management block went into "Readback Failed" error mode and stopped updating all 3 Process Values (PV) parameters. Thus, these parameters hold their last good value which then propagate the misleading "healthy PV" all the way to the PID controller 140LC1001. It should be noted that the values within both controllers were healthy.
	Note - see imagine included on 30 day report in this section.
	Actions to prevent recurrence of same or similar incident: Action - Add PML202-17_11 to Maintenance plan. Responsible - ▇▇▇▇▇▇▇. Completion Date - 31-12-2019 Action - Update MAC network FDS Procedures with details of the IPD bypass Process. Responsible - ▇▇▇▇▇▇. Completion Date - 30-04-2020 Action - Update IPD logic to include a 'pop-up' box on the panel screen of the IPD bypass requirement, to prevent comm loss due to port violation. (MTO). Responsible - ▇▇▇▇▇. Completion Date - 30-04-2020 Action - Median out of 3 (Moo3) control module class to be updated to pass 'BAD' status to PV parameter when there is an inter-controller communication failure. (MTO). Responsible - ▇▇▇▇▇▇ Completion Date - 30-05-2020
Immediate cause/s	Loss of communication of DCS, root cause being investigated.

Root cause/s	
Root cause description	Root cause 1 - PML202-17_11 procedure not followed (Daily hardware checks are partially and/or not completed) Root cause 2 - Intrusion Protective Device (IPD) unlock procedure not followed as required for an Integrated Protective System (IPS) download. Switch port violation is missing in Functional Design specification and IPD procedure is not clear enough Root cause 3 - When inter-controller communication failed, the Input/Output (IO)_ Management block went into "Readback Failed" error mode and stop updating all 3 PV parameters. Thus, these parameters hold their last good value which then propagate the misleading "healthy PV" all the way to the Proportional Integral Derivative (PID) controller 140LC1001

Duty inspector recommendation	
Date	11/11/2019
Duty inspector	████████
Recommendation	Do not conduct Major Investigation
Reasoning	Does not meet MI threshold based on information received
Supporting considerations	

Major investigation decision	
Date	11/11/2019
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	12/11/2019
Inspector	████████████
Risk gap	Moderate
Type of standard	Established
Initial strategy	Investigate

Recommended follow up strategy	
Recommended strategy	Investigate
Supporting considerations	Loss of DCS communication has the potential for serious consequence. Cause of loss of communication not known.

Non-major investigation decision	
Date	12/11/2019
RoN	████████
RoN review result	Agree with recommendation
Strategy decision	Investigate
Supporting considerations	

Associated inspection	
Inspection ID	2051