



Terms of Reference Prelude Power Outage December 2021

Background

On 2 December 2021 at approximately 2240, smoke was detected in Uninterrupted Power Supply (UPS) 214 room. The presence of smoke was visually confirmed to be inside the room. The facility was mustered and all accounted for within 11 minutes. It was confirmed that there was no impact to surrounding rooms above, below and on either side and that all detection and management systems in the UPS room functioned as expected. The power to the room was isolated and the room barricaded and an ESD1 was manually initiated. After some time, all power was lost. The facility remained at muster until approximately 8am on 3 December, as the power and essential services were attempted to be reinstated. All communications with the facility were also lost, with initial communications via VHF relay through ISVs and later via satellite phones. Over the course of the 3-5 December power was partly re-established and lost multiple times, with particular difficulties in establishing and maintaining EDG power supply. The facility was down-manned from 293 to 148 POB via ISV and helo operations between 4-5 December.

Air compressors, N₂, HVAC, potable water and sanitation systems all stopped working which resulted in the facility becoming increasingly inhabitable over the course of the event and a potential for significant damage to equipment. This resulted in a decision to stand up the CMT and down-man the facility. Several individuals required medical attention for dehydration.

Purpose and scope of the investigation

The purpose of this investigation is to establish:

1. what caused the **initial shutdown** of power (including essential services and normal communications) on the facility on 2 Dec, including what caused the smoke in UPS 214 room; and
2. what caused the availability of power to the facility (including essential services and normal communications) to **remain unstable for an extended period**.

The investigation will focus on technical causes, and where deemed relevant underlying human and system causes.

The team will also review the investigation report related to the power outage in 2020 to identify similarities between causes and/or line of sight between corrective actions from the 2020 investigation and causes identified in this 2021 incident. The Group SIA Organisational Health review conducted at Prelude in 2020 will be used as a reference.

The investigation team will seek to understand whether the recent reorganisation, manning levels and competence were causally related or contributing factors to the incident.

Excluded from the scope are:

- Decision-making and activities related to the mitigation of the smoke in UPS 214 room (unless these are deemed causal to the power shutdown)
- Decision-making and activities related to the down-manning of the facility (only address in the Timeline where relevant). This will be reviewed in the After Action Review of the IMT response.

Problem Statement

The problem statement will be further reviewed by the sponsor and investigation team and is therefore subject to change

Expected

Following initiation of an ESD1 on Prelude, essential power (EDG) would remain available to the facility allowing for continued operation of essential services (including instrument air, N₂, HVAC, and sanitation). The expectation was that if essential power was subsequently lost, it would be quickly restored.

Actual

At ~22:50 on December 2 2021, an ESD1 was initiated following the detection of smoke in the Prelude Uninterrupted Power Supply (UPS) 214 room. Subsequently, essential power to Prelude was unreliable for an extended period.

Impact

The loss of main and essential power (i.e. STG and EDG power) led to loss of Instrument Air, N₂, HVAC, and sanitation systems for an extended period of time (~60 hours). The facility was held at muster for ~10 hours



and down-manned on December 4-5 (POB from 293 to 148). Several personnel required medical attention for dehydration.

Investigation process

Discovery

- The incident will be investigated as per the Causal Learning methodology.
- This investigation will seek to discover technical causes, and where deemed relevant behavioural and system causes.
- To the extent possible, data gathering and analysis activities will be conducted out of Shell House in Perth.

Learning

- The Investigation Sponsor, with support from the investigation team, will lead a learning session with key stakeholders, who will be selected by the Investigation Sponsor. The Investigation Sponsor and investigation team may decide to conduct additional learning sessions.
- The Investigation Sponsor and investigation team will jointly decide on the scope, duration and timing of the learning session(s).
- The Investigation Sponsor will select ~2-3 causes to address, with input from the investigation team and key stakeholders.

Action

- The Investigation Sponsor will nominate action parties which are tasked to develop corrective actions for the selected causes to address.
- The investigation team will support the action parties with the development of SMART actions.
- The Investigation Sponsor, with support from the leadership team, will
 - decide on the final actions, action parties and target dates for implementation
 - decide which actions will be verified for effectiveness, and how
 - decide on any learning materials to be created as per the (new) Learn process

Deliverables

- Problem Statement, Timeline and Causal Tree
- Investigation Report, which shall be approved by the Investigation Sponsor

Sponsor

██████████ ██████████

Team members

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	Independent	Facilitator
	Independent	Facilitator
	Prelude	██████████
	Independent	Electrical Teamlead
	Prelude	████████████████████
	Prelude	

Additional support

Individuals that were involved in the events that occurred at the facility related to the detection of smoke and power outage(s) and relevant SMEs/TAs will be interviewed as part of the investigation.

The following individuals will be asked to review the draft investigation report:

- ██████████ ██████████
- ██████████ ██████████

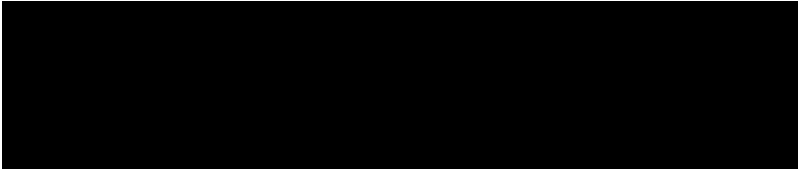
¹ ██████████ will take on the role as Lead Facilitator until 17 Dec, after which ██████████ further participation will be agreed with the sponsor. ██████████ role as Lead Facilitator will be handed over to ██████████.




The following individuals may be asked to provide expertise and/or test specific content. The investigation team may ask for additional support from other personnel icw the Investigation Sponsor.



Key stakeholders



Timing

- The Discovery phase is expected to run from 8 Dec – 4 Jan
 - From 8-22 Dec, unless otherwise agreed with the Investigation Sponsor, the investigation team will work 6-8 hours per day on the investigation.
 - From 23 Dec-4 Jan, the Investigation Sponsor and investigation team will decide on working days/hours given criticality of the investigation with regards to the restart of the facility and team availability due to the holiday season
- The Learning and Action phase are expected to run from 4 Jan-31 Jan
 - The facilitator(s) will work full-time (6-8 hours per day) with the rest of the investigation team working part-time (4-8 hours per week)
 - The key activities include:
 - prepare for and conduct the learning session(s)
 - support the action development
 - finalise the investigation report (mid-Feb)
 - providing input to HSSE team  for NOPSEMA report

During the Discovery phase, the Investigation Sponsor will connect 2-3 times per week (30 mins) with the investigation team. During the Learning and Action phase, the Investigation Sponsor will connect as appropriate to prepare for and lead the learning session(s), sponsor the action development and approve the final report.

Risks

Due to issues with communication between the facility and mainland and availability of key stakeholders, data availability to the investigation team may be delayed.