BLPH PRE-INCIDENT PLAN PIP-01
Task Sheet

Asset
BLPH

revision: 05

Scenario-01
Loss of containment of Hydrogen from piping or vessel leading to leak of Hydrogen on BLPH , **H_2 Gas Alarm automatically activated**

Location
BLPH upper deck piping and vessels, electrolyser, fuel cell, vent

Substance involved
Hydrogen (H_2)
Nitrogen (N_2)

EMERGENCY RESPONSE

Control Room Operator
Tasks

1) Confirm Gas Alarm on the OWS (Operator Work Station), access the Master Alarm Database (doc. ref. 123A90-DDL-IN-LIS-40027 - Master Alarm Database)

2) Open HMI screen from the system or package involved and confirm which H2 sensor(s) is(are) activated and which area is concerned

3) Open an event logbook, and record actions taken

4) Confirm from the control screen the automatic activation of the BLPH emergency Alarm system (beacon and buzzer)

5) Confirm from the OWS the automatic activation of the BLPH emergency shutdown (ESD-1) or emergency shutdown with depressuriration (ESD-1D)

6) Notify the Control Room Lead by Radio channel **6**, alternative by phone **0544 878101**

7) Confirm the automatic shutdow of process and system(s) (Ref. 123A90-DDL-PR-DG-80000 rev02)

8) Check from the OWS the status of the surrounding equipment to make sure it is not impacted and report to the Control room Lead

9) Monitor BLPH and Package HMIs on process conditions, gas detection, fire detection

10) Monitor the purging of H2 system with N2 and confirm to control room Lead when purging is achieved

Control Room Lead
Tasks

1) Respond to Notification from Control Room Operator

2)Notify the ROS BLPH HSSE Manager (Radio/Phone) and maintain an open line of communication.
Inform him if assistance from external emergency services is necessary.

3)Monitor the BLPH Status (process shut down, H2 venting and N2 purging)

4)Confirm nature of incident alarm to the ROS BLPH HSSE Manager and to ROS Yard ERP Coordinator

5)Request for additional resources as required (e.g. Vendors, technicians, ...)

6)Suspend Operation as appropriate

7)Maintain a detailed log of events.

8)Upon Request from ROS Yard Emergency Coordinator or External Rescue Emergency Commander ,Stop the BLPH Emergency siren and beacons

9)Check Status of shutdown and depressurisation with Control room Operator

10) Control room Lead to confirm to ROS Yard ERP coordinator when the system is fully purged with N2

IMPORTANT WARNING

For H2 leak investigation post event, Access to BLPH will require the use of <u>O2 portable gas detector</u> as Nitrogen (N2) purging will be activated automatically and N2 may also leak from the same place as H2

Yard Emergency Coordinator
Tasks

1) Upon notification from ROS BLPH HSSE Manager, Activate the Yard Emergency Response Team as per Yard Emergency Response Plan (PRO-HSE-37)

2) Establish and Maintain communication with Control Room Lead, proceed to the Control Room

3) Request and Obtain status of the BLPH Conditions from the Control Room Lead
Collect incident details from all sources

4) Get confirmation from BLPH HSSE Manager if Muster Check is complete or is someone is missing

5) Obtain confirmation from Control Room Lead if the H2 leak has been stop , isolated and BLPH is back to a safe state (N2 purging)

6) Confirm with ROS BLPH HSSE Manager if any missing personnel have been identified

7) Upon confirmation by Control Room Lead on the safe status of BLPH, Initiate search for any missing persons if missing person has been reported

Directing and coordinating all internal operations related to emergency at the yard,

8) Notify ROS BLPH HSSE Manager when the incident is over

9)Ensure all documentation is recorded and submitted as required

Yard Emergency Response Team
Tasks

1) ER Team member respond to the call from the Yard Emergency Coordinator on radio Channel 1 , inform the Coordinator about their current location

2)Act upon request from ROS YARD Emergency Response Coordinator

3)Assigned ERT memeber start preparing the hoses and fire hydrants, alert 2x site fire trucks

BLPH PRE-INCIDENT PLAN PIP-02
Task Sheet

Asset
BLPH

revision: 05

Scenario-02
Loss of containment of Hydrogen from piping or vessel leading to Hydrogen ignition and fire on BLPH , **H_2 Fire Alarm activated**

Location
BLPH, upper deck piping and vessels, electrolyser, fuel cell,

Substance involved
Hydrogen (H_2)

EMERGENCY RESPONSE

Control Room Operator Tasks
1) Confirm Gas Alarm on the OWS (Operator Work Station), access the Master Alarm Database (document reference 123A90-DDL-IN-LIS-40027 - Master Alarm Database)
2)Open HMI screen from the system or package involved and confirm which H2 sensor(s) is activated and which area is concerned
3) Open an event logbook, and record actions taken
4)Confirm from the control screen the automatic activation of the BLPH emergency Alarm system (beacon and buzzer)
5)Confirm from the control screen the automatic activation of the BLPH emergency shutdown (ESD-1) or emergency shutdown with depressuriration (ESD-1D)
6) Notify the Control Room Lead by Radio channel **6**, alternative by phone **0544 878101**
7) Confirm the automatic shutdow of process and system(s) (Ref. 123A90-DDL-PR-DG-80000 rev02)
8) Check from the OWS the status of the surrounding plan equipment to make sure it is not impacted and report to the Control room Lead
9) Monitor BLPH and Package HMIs on process conditions, gas detection, fire detection
10) Monitor the purging of H2 system with N2 and confirm to control room Lead when purging is achieved

Control Room Lead Tasks
1) Respond to Notification from Control Room Operator
2)Notify the ROS BLPH HSSE Manager (Radio/Phone) and maintain an open line of communication. Inform that immediate assistance from external emergency services is required
3)Monitor the BLPH Status (process shut down, H2 venting and N2 purging)
4)Confirm nature of incident alarm to the ROS BLPH HSSE Manager and to ROS Yard ERP Coordinator
5)Request for additional resources as required (e.g. Vendors, technicians, ...)
6)Suspend Operation as appropriate
7)Maintain a detailed log of events.
8)Upon Request from ROS Yard Emergency Coordinator or External Rescue Emergency Commander ,Stop the BLPH Emergency siren and beacons
9)Check Status of shutdown and depressurisation with Control room Operator
10) Control room Lead to confirm to ROS Yard ERP coordinator when the system is fully purged with N2
11) Control room Lead to confirm to ROS Yard ERP coordinator when the system is fully purged with N2

Yard Emergency Coordinator Tasks
1) Upon notification from ROS BLPH HSSE Manager, Activate the Yard Emergency Response Plan, Direct and coordinate all internal operations related to emergency at the yard,until the external emergnecy service arrive.
2) Notify Fire Brigade and extenral emergency service and request immediate mobilization to ROS Yard
3) Establish and Maintain communication with Control Room Lead, proceed to the Control Room Collect incident details from all sources
4) Request and Obtain status of the BLPH Conditions from the Control Room Lead
5) Get confirmation from BLPH HSSE Manager if Muster Check is complete or is someone is missing
Confirm with ROS BLPH HSSE Manager if any missing personnel have been identified
6) Obtain confirmation from Control Rom Lead if the H2 leak has been stop , isolated and BLPH is back to a safe state (N2 purging)
7) Notify Yard security that external emergency services are responding, arrange for escort to the incident scene
8)Handover Emergency Control to Fire Brigate once at site, provide detail if missing peson , incidents information and status of the BLPH process
9) Notify ROS BLPH HSSE Manager when the incident is over , onced emergency situation end confirmed by Fir Brigade
10)Ensure all documentation is recorded and submitted as required

Yard Emergency Response Team Tasks
1) ER Team member response to the call form the Yard Emergency Coordinator on radio Channel 1 , inform the Coordinator about their current location.
2)Act upon request from ROS YARD Emergency Response Coordinator
3) Prepare the Yard Fire pump , install hoses and fire hydrants, alert 2x site fire trucks,

IMPORTANT WARNING
Do not use firefighting equipment directly on H2 fire, the fire may be extinguished but the H2 leak may still happen and reignite, H2 leak must be stopped and isolated first.

BLPH PRE- INCIDENT PLAN PIP-03
Task Sheet

Asset
BLPH

revision: 05

Scenario-03
Start of the Electrolyser , Loss of containment of Hydrogen from piping or vessel leading to Leak of Hydrogen on Electrolyser and H2 piping BLPH ,**Portable H_2 Sniffer activation**

Location
BLPH, upper deck piping and vessels, electrolyser, fuel cell,

Substance involved
Hydrogen (H_2)

EMERGENCY RESPONSE

Process Engineer
Tasks

1) Check H2 ppm reading on the portable H2 sniffer

2) Inform the Control room operator by radio about presence of H2 leak(s)
Record the H2 ppm level at the leak point(s)

Record the location of the H2 leak on drawings

3)

WP1 Stack area : at 100ppm H2 detected by the H2 portable sniffer , request the control room to stop manually the electrolyser to investigate further the leak(s)

WP1 Process:
very first start of the electrolyser , at 500ppm H2 detected by the H2 portable sniffer , request the control room to stop manually the electrolyser to investigate further the leak(s)
other starts, at 300ppm H2 detected by the H2 portable sniffer,request the control room to stop manually the electrolyser to investigate further the leak
.

WP3 area :
very first start of the electrolyser, at 500ppm H2 detected by the H2 portable sniffer,request the control room to stop manually the electrolyser to investigate further the leak
other starts, at 300ppm H2 detected by the H2 portable sniffer , request the control room to stop manually the electrolyser to investigate further the leak
.

Control Room Operator
Tasks

1) Monitor the control system and fixed H2 gas detectors, check for signs of low level H2 gas alarm

2) Inform the Process engineer about the alarms

In case of higher H2 value and H2 sensor(s) being triggered, follow PIP- 1

3)Or Upon request from the Process engineer, proceed with stopping the electrolyser manually by using the HMI

5) Notify the Control Room Lead by Radio channel **6**, alternative by phone **0544 878101**

Control Room Lead
Tasks

1) Respond to Notification from Control Room Operator

2)Monitor the BLPH Status (process shut down, H2 venting and N2 purging)

3)Request for additional resources as required (e.g. Vendors, technicians, ...)

4)Suspend Operation as appropriate

5)Maintain a detailed log of events.

BLPH PRE-INCIDENT PLAN PIP-04
Task Sheet

Asset
BLPH

revision: 05

Scenario-04
An Electric fault of the 6,6Kv feed to the BLPH has occured resulting in loss of power at BLPH a full **black out** on BLPH whilst the H2 was being produced or H2 being stored on vessels

Location
BLPH HV Room B-100, BLPH LV Room B-200 and Aggreko temporary power station

Substance involved
Hydrogen (H_2)
Nitrogen (N_2)

EMERGENCY RESPONSE

Control Room Operator
Tasks

1)Monitor the BLPH control system on the Operator Work Station and monitor any type of Alarms

2) Notify the Control Room Lead by radio channel **6**, alternative by phone **0544 878101**

3) Open an event logbook, and record actions taken

4) Confirm the automatic shutdow of process and system(s) as per the Process Safety Cause & Effect Block Diagram *123A90-DDL-PR-DG-80000 rev02*

5) Check from the Control system panel/screen the status of the surrounding plan equipment to make sure it is not impacted and report to the Control room Lead

6) Assess and report status of power , instruments, process and communicaiton system to Control Room Lead

7) Monitor BLPH and Package HMIs on process conditions, gas detection, fire detection

8) Monitor the status of charge of the UPS **UP-200F3** and **UP-200F4**

Control Room Lead
Tasks

1) Respond to Notification from Control Room Operator

2)Notify the ROS BLPH HSSE Manager (Radio/Phone) and maintain an open line of communication.
Request Immediate assistance from ROS Yard Maintenance Department

3)Monitor the BLPH Status

4)Confirm nature of incident alarm to the ROS BLPH HSSE Manager

5)Request for additional resources as required

6)Suspend Operation as Appropriate

7)Maintain a detailed log of events.

9)Upon Request from ROS Yard Emergency Coordinator Stop the BLPH Emergency siren and beacons

10)Check Status of shutdown and depressurisation with Control room Operator

Others

1)Control Room Lead notify SAEP to investigate the electrical fault

2) SAEP or Commissioning Electrician Engineer to go to the Aggreko power station to investigate the fault , report finding to the control room Lead

3) Continue Effort to re-establish power

BLPH PRE-INCIDENT PLAN PIP-05
Task Sheet

Asset
BLPH

revision: 05

Scenario-05
The BLPH is running,a personnel is working on the platform and suffers a **severe injury**.

Location
Piomboni Yard, BLPH

Substance involved
N/A

EMERGENCY RESPONSE

Control Room Operator
Tasks

1)Upon request of the Control Room Lead , proceed with stopping the Electrolyzer from HMI

2)Confirm to Control Room Lead that BLPH is stopped and in a safe state

3)Monitor BLPH and Package HMIs on process conditions, gas detection, fire detection

Control Room Lead
Tasks

1)Upon Request from ROS Yard Emergency Coordinator , proceed to stop operation on BLPH and bring BLPH to a safe state.

2)Suspend Operation as Appropriate

3)Monitor BLPH and Package HMIs and alarm status

4) Upon request, confirm H2 venting is stopped

Yard Emergency Coordinator
Tasks

1) Upon notification he activate the Yard Emergency Response Plan, mobilize the Yard ERT. Direct and coordinate all internal operations related to emergency at the yard

3) Notify the Control Room and Maintain communication with Control Room Lead

4) Request and Obtain status of the BLPH Conditions from the Control Room Lead

5) In case of MEDEVAC by Helicopter, may resquest the Control Room lead to stop the Electrolyser and inform the 118 to approach the yard from East/South side

6) Obtain confirmation from Control Room Lead if BLPH is stop and safe to access

7) Ensure that incident scene is secured and not disturbed

8) Notify ROS BLPH HSSE Manager when the incident is over

Yard Emergency Response Team
Tasks

1) ER Team member response to the call form the Yard Emergnecy Coordinator on radio Channel 1 , inform the Coordinator about their current location.

2)Act upon request from ROS YARD Emergency Response Coordinator

3)Reach the location of the injured person and start providing first aid

BLPH PRE-INCIDENT PLAN PIP-06
Task Sheet

revision: 05

Asset
BLPH

Scenario-06
There are thunderstrom and **lightning strikes** coming toward the yard

Location
Piomboni Yard, BLPH

Substance involved
N/A

Lightning Hazard RESPONSE

Control Room Operator
Tasks

1)Upon request of the Control Room Lead , proceed with stopping the Electrolyzer from HMI

2)Confirm to Control Room Lead that BLPH is stopped and in a safe state

3)Monitor BLPH and Package HMIs on process conditions, gas detection, fire detection

Control Room Lead
Tasks

1)Upon Request from Yard Manager or ROS PMT proceed to stop operation on BLPH and bring BLPH to a safe state.

2)Suspend Operation as Appropriate

3)Monitor BLPH and Package HMIs and alarm status

Yard Manager
Tasks

1)Monitor daily the weather alerts and particularly Thunderstrom and lightning strikes.

3) Notify the ROS BLPH Commissioning Manager and ROS PMT about a risk of lightning striks at the yard .

4) Request and Obtain status of the BLPH Conditions from the Control Room Lead and Request to STOP the activities on BLPH and evacuate it

6) Obtain confirmation from Control Room Lead if BLPH is stop and all have evacuated