

Hong Kong Offshore LNG Terminal Project

Emergency Response Plan for the Subsea Gas Pipeline for Lamma Power Station (LPS) and the Associated Gas Receiving Station in LPS

30 September 2022

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Emergency Response Plan for the Subsea Gas Pipeline for Lamma Power Station (LPS) and the Associated Gas Receiving Station in LPS



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Hong Kong Offshore LNG Terminal – Works associated with the subsea gas pipeline for Lamma Power Station (LPS) and the associated Gas Receiving Station (GRS) in LPS

Environmental Certification Sheet

FEP-02/558/2018/A

Reference Document/Plan

Document/Plan to be Certified/ Verified:	Emergency Response Plan
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Reference EP Requirement

EP Condition:	Condition No. 4.5 of FEP-02/558/2018/A
Content:	<i>Emergency Response Plan</i>
<p>The Permit Holder shall implement measures to prevent accidental spillage or leakage of gas, oil and chemicals during operation of the Project and contingency measures to respond the accidental spillage or leakage in order to avoid and minimize the potential environmental impacts. The Permit Holder shall, no later than 3 months before the commencement of operation of the Project, deposit with the Director 3 hard copies and 1 electronic copy of an emergency response plan. The emergency response plan shall include but not limited to information relating to preventive measures to prevent accidental spillage or leakage of gas, oil and chemicals, contingency measures and procedures to handle the accidental spillage or leakage, rehearsal arrangements for the contingency measures and procedures and reporting arrangements for the accidental spill event.</p>	

ET Certification

I hereby certify that the above referenced document/plan complies with the above referenced condition of FEP-02/558/2018/A.	
Mr Raymond Chow, Environmental Team Leader:	
Date:	13 February 2023

IEC Verification

I hereby verify that the above referenced document/plan complies with the above referenced condition of FEP-02/558/2018/A.	
Ms Lydia Chak, Independent Environmental Checker:	
Date:	15 February 2023

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1. INTRODUCTION

1.1 Background

To support the increased use of natural gas in Hong Kong from 2020 onwards, Castle Peak Power Company Limited (CAPCO) and The Hongkong Electric Co., Ltd. (HK Electric) have identified that the development of an offshore liquefied natural gas (LNG) receiving terminal in Hong Kong using Floating Storage and Regasification Unit (FSRU) technology ('the Hong Kong Offshore LNG Terminal Project') presents a viable additional gas supply option that will provide energy security through access to competitive gas supplies from world markets. The Project will involve the construction and operation of an offshore LNG import facility to be located in the southern waters of Hong Kong, a double berth jetty, and subsea pipelines that connect to the gas receiving stations (GRS) at the Black Point Power Station (BPPS) and the Lamma Power Station (LPS). The location plan is shown in **Figure 1.1**.

The Environmental Impact Assessment (EIA) Report for the Project was submitted to the Environmental Protection Department (EPD) of the Hong Kong Special Administrative Region Government in May 2018. The EIA Report (EIAO Register No. AEIAR-218/2018) was approved by EPD and the associated Environmental Permit (EP) (EP-558/2018) was issued in October 2018. An application for Further Environmental Permits (FEP) was made on 24 December 2019 to demarcate the works between the different parties. The following FEPs were issued on 17 January 2020 and the EP under EP-558/2018 was surrendered on 5 March 2020:

- the double berth jetty at LNG Terminal under the Hong Kong LNG Terminal Limited, joint venture between CAPCO and HK Electric (FEP-01/558/2018/A) ⁽¹⁾;
- the subsea gas pipeline for the BPPS and the associated GRS in the BPPS under CAPCO (FEP-03/558/2018/B) ⁽²⁾; and
- the subsea gas pipeline for the LPS and the associated GRS in the LPS under HK Electric (FEP-02/558/2018/A) ⁽³⁾.

In accordance with Condition 4.5 of the FEP of the subsea gas pipeline for the LPS and the associated GRS in the LPS (FEP-02/558/2018/A) ('the Project'):

FEP No. FEP-02/558/2018/A, Condition 4.5:

"The Permit Holder shall implement measures to prevent accidental spillage or leakage of gas, oil and chemicals during operation of the Project and contingency measures to respond the accidental spillage or leakage in order to avoid and minimize the potential environmental impacts. The Permit Holder shall, no later than 3 months before the commencement of operation of the Project, deposit with the Director 3 hard copies and 1 electronic copy of an emergency response plan. The emergency response plan shall include but not limited to information relating to preventive measures to prevent accidental spillage or leakage of gas, oil and chemicals, contingency measures and procedures to handle the accidental spillage or leakage, rehearsal arrangements for the contingency measures and procedures and reporting arrangements for the accidental spill event."

- (1) Application for variation of an environmental permit for FEP-01/558/2018 was undertaken and the latest FEP (FEP-01/558/2018/A) was issued on 6 November 2020.
- (2) Application for variation of an environmental permit for FEP-03/558/2018/A was undertaken and the latest FEP (FEP-03/558/2018/B) was issued on 25 August 2021.
- (3) Application for variation of an environmental permit for FEP-02/558/2018 was undertaken and the latest FEP (FEP-02/558/2018/A) was issued on 22 December 2020.

Legend

- Boundary of HKSAR
- Proposed GRS Location at BPPS
- Proposed GRS Location at LPS
- Proposed Route of BPPS Pipeline
- Proposed Route of LPS Pipeline
- Proposed Site for LNG Terminal
- Proposed LNG Terminal Safety Zone

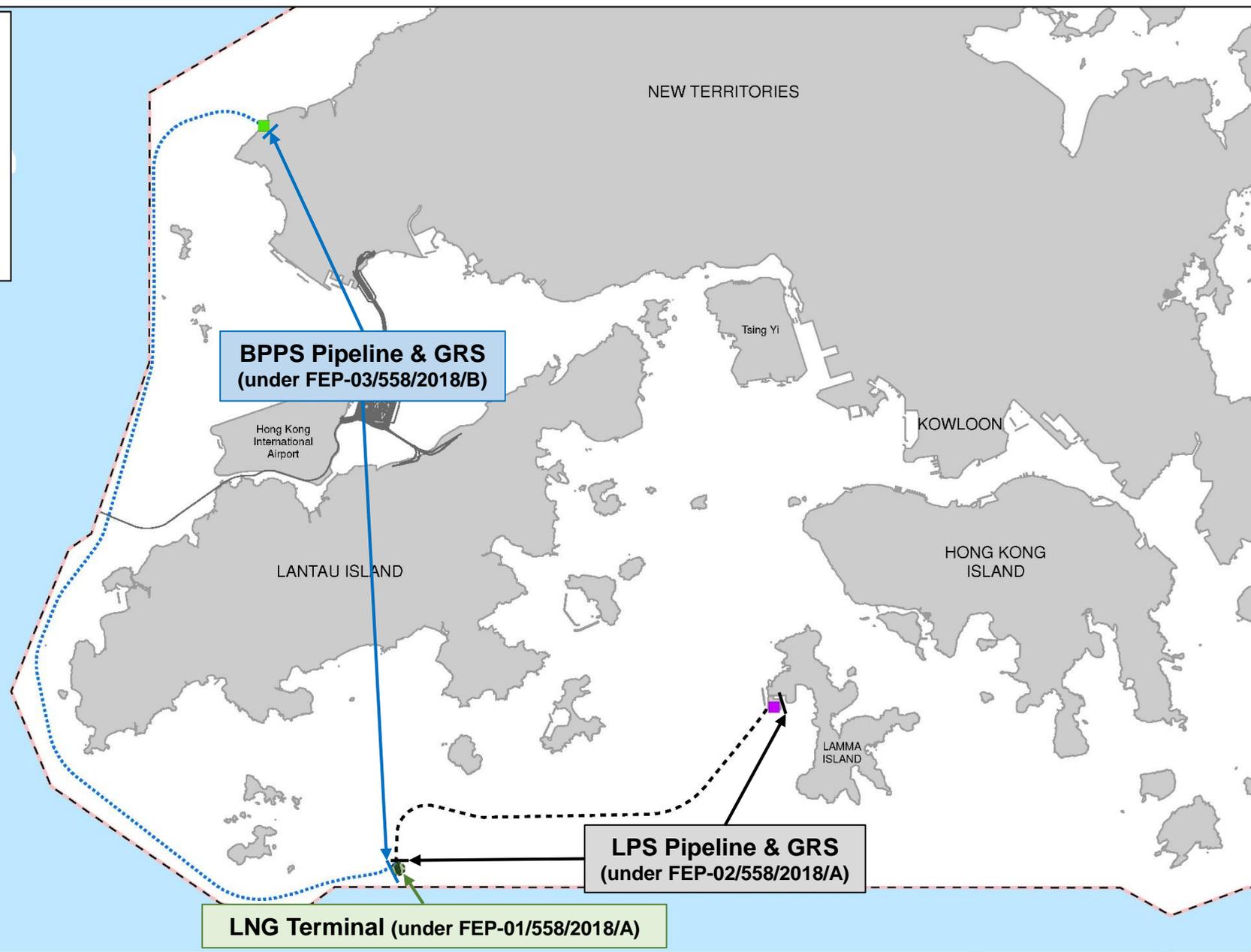


Figure 1.1

Indicative Location of Key Project Components

1.2 Purpose of the Emergency Response Plan

As stated in Condition 4.5 of the FEP, this Emergency Response Plan presents the information relating to preventive measures to prevent accidental spillage or leakage of gas, oil and chemicals, contingency measures and procedures to handle the accidental spillage or leakage, rehearsal arrangements for the contingency measures and procedures and reporting arrangements for the accidental spill event.

This Emergency Response Plan covers the subsea gas pipeline for the LPS and the associated GRS in the LPS. Readers should refer to the Emergency Response Plan for the Double Berth Jetty at LNG Terminal for the emergency response of the LPS Pipeline on the Jetty.

Given that only natural gas (NG) is conveyed from the Hong Kong Offshore LNG Terminal to the GRS of LPS via the subsea gas pipeline, no oil or chemicals would be used in the subsea gas pipeline. Similarly, there is no lubricating oil or chemical treatment recommended by the original equipment manufacturer (OEM) in any equipment in the existing GRS. It is anticipated that there will be no oil or chemical spillage in the existing GRS. Based on the above consideration, the scope of the emergency response plan focuses mainly on gas leakage from the new subsea gas pipeline for the LPS and associated GRS.

1.3 Structure of the Emergency Response Plan

The remainder of this Emergency Response Plan is set out as follows:

- **Section 2** presents the preventive measures to prevent leakage of gas;
- **Section 3** describes the contingency measures and procedures to handle the leakage and the rehearsal arrangements for the contingency measures;
- **Section 4** presents the procedures and reporting arrangements with regular review and revision for gas incidents.

2. PREVENTIVE MEASURES FOR LEAKAGE

This section describes potential natural gas incidents and proposes precautions to be taken in dealing with these scenarios. It also proposes mitigation measures that could be applied to minimize the effects of the incident and to prevent escalation, suggests precautions to be taken to prevent further casualties arising refer to various Administration Standing Instruction (ASI) and Health & Safety Standing Instruction (HSI).

2.1 Emergency Scenarios

The onshore gas facilities and the submarine pipeline may suffer a spontaneous failure or damage to gas pipework or equipment that results in a loss of containment of the natural gas. Whenever there is a loss of containment of natural gas, there is a danger of a fire or an explosion occurring if a source of ignition is present. To a certain extent leaking gas will disperse naturally or can be dispersed by mechanical ventilation, but even a moderate leakage rate can cause a flammable gas cloud to form that can ignite. Depending on the type and rate of the gas release, the ignition of the gas may result in the following:

- A flash fire;
- A jet fire; or
- An explosion

Flash fires will injure personnel and can cause extensive damage, if within a confined or congested space. Anyone within a flash fire is likely to be killed. Where there is a continuing source of gas leakage the fire will normally flash back to the source of the leakage and continue to burn. Where this source of leakage is significant and gas is escaping at high velocity, a jet fire will result. This can burn intensely and, if it impinges on adjacent pipework or equipment, has the potential to cause considerable damage in a relatively short time.

An explosion could result under certain conditions, but a specific gas and air mixture must exist and it is generally thought that a degree of confinement and congestion is necessary for a significant explosion to occur. Explosions are therefore less likely than fires.

The initial flammable effects of all of the above are often loosely termed “fireball”.

2.2 Safety Guidelines

HK Electric has developed the following documents to provide safety guidelines that can be addressed in the event that a natural gas leak or fire occurs:

- Emergency Evacuation
- Fire or Natural Gas Incident
- Casualty Evacuation
- Emergency Rescue
- Submarine Natural Gas Pipeline Integrity Management Manual
- Major Gas Emergency Plan
- Responding to Reports of Gas Escapes from Members of the Public and Outside Organizations
- Submarine Pipeline, Offsite Emergency Information for Police, Fire Services & Marine Department
- Mitigation Measures in the Event of a Natural Gas Incident

Mitigation measures that could be applied to minimize the effects of the incident and to prevent escalation, suggests precautions to be taken are covered in the safety guidelines listed above.

The following approaches have been applied as the preventive measures for leakage:

- **Protection by Rock Armour:** The LNG will be regasified and transported via the new subsea gas pipeline to the tie-in at the existing pipeline on LPS. There is a pre-installed 20" pipeline of approximately 1 km in length that is buried in a common trench together with the existing 20" Dapeng Pipeline that is backfilled and protected by rock armour, except for the last segment approximately 100 m at the LPS shore approach.
- **Notification of information about the gas pipeline to the public as stated in HSI/G11 "Submarine Pipeline – Offsite Emergency Information for Police, Fire Services and Marine Departments":** HK Electric will make every effort to ensure that those planning to carry out works such as dredging, anchoring and cable crossing on or in the vicinity of the pipeline are provided with all information necessary to identify its location and avoid accidental damage. Unusual or unscheduled marine activity in the vicinity of the pipeline shall be brought by the operator to HK Electric's attention.

2.3 Inspection & Monitoring of the associated GRS in LPS

The inspection and monitoring process of the associated GRS in LPS can be regarded as the preventive measures for accidental gas leakage.

Weekly surveillance of the GRS is conducted with the following:

- Look for any sign of leakage or malfunction, abnormal vibration or noise;
- Check the integrity of the fencing and entry gates, and check that all appropriate warning signs are in place and readable;
- Check the above ground and non-insulated pipework of any corrosion or damage; and
- Check the condition of local instruments and observe whether they are indicating normal function.

Regular monthly inspection shall be carried out on all the pipework and equipment using portable gas detection equipment to check all mechanical joints and threaded fittings that are accessible.

2.4 Inspection & Monitoring of Subsea Pipeline

The inspection and monitoring process of submarine natural gas pipeline can be regarded as part of the preventive measures for accidental gas leakage.

2.4.1 Subsea Natural Gas Pipeline Regular Patrolling

The inspection of subsea natural gas pipeline has to fulfil the following purposes:

- To ensure there are no anomalies observed on the sea which may cause damage to the pipeline and in line with the environmental conditions as laid down in Quantitative Risk Assessment in the approved EIA report (AEIAR-218/2018);
- To ensure there is no abnormal bubbling from the seabed to the sea surface as a result of natural gas leak; and
- To record the sea surface condition during the patrolling.

The frequency of patrolling is once every 2 months. Marine activities on the sea and any abnormality observed shall be recorded in the check sheets. Patrolling can be carried out from a helicopter equipped with DGPS. Photographs should be taken to record the conditions at check points specified in the check sheet.

The following precautions should be taken during inspection by boat:

- The patrol should be carried out on days with good and clear weather, and calm sea states;
- The patrol should be within the Hong Kong Waters;

- All precautions and good seamanship in using the boat must be observed;
- Care must be taken when doing the inspection on boat.

The following precautions should be taken during inspection by helicopter:

- Safety briefing will be provided by helicopter services provider, patroller on board must observe the safety precautions and follow them at all times;
- The patrol should be within Hong Kong boundary.

2.4.2 Monitoring Subsea Natural Gas Pipeline

The condition of the natural gas subsea pipeline is monitored by the following:

- Pipeline leak detection system.
- Natural gas composition.
- Analysis of debris collected from gas filters at GRS of LPS Extension (LMX).
- Measurement of cathodic protection system.

Natural gas leakage due to holed pipeline, if any, can be detected by the Pipeline Leak Detection System. Analysis of debris collected from gas filters installed at GRS determines whether there is any excessive wear of pipeline internal. Cathodic protection measurement determines the efficiency of the cathodic protection system to ensure that the pipeline external is receiving protection from the sacrificial anodes.

Leak detection system is provided at LPS Extension to monitor and identify the location of any leakage along the pipeline to ensure prompt action be taken. **Table 2.1** lists out the inspection items and its corresponding frequency.

Table 2.1 Frequency of Monitoring

Inspection Items	Frequency
Pipeline Leak Detection System	Continuous on-line.
Gas composition of natural gas supplied from gas terminal	Continuous on-line.
Analysis of debris collected from gas filters	a) After receiving high differential pressure across gas filters. b) Once every year.
Measurement of cathodic protection system	Once every 3 months at Lamma.
Monitoring of ground differential settlement at GRS and along gas pipeline on landside of Lamma Power Station	Once every 3 months.

3. CONTINGENCY MEASURES AND PROCEDURES FOR LEAKAGE

The following initial actions to be taken after leakage event is reported and the rehearsal arrangements including training and drills for the contingency measures refer to various Administration Standing Instruction (ASI) and Health & Safety Standing Instruction (HSI).

3.1 Intended Strategy for Dealing with Accidents

The following sections provide details on the intended emergency response strategy, evacuation, search and rescue plan and action, all clear & re-entry procedure, plan for recovery and the availability and function of other resources regarding the contingency measures and procedures. The procedure for response to gas leak incident will be the same as that for emergency/ reportable incident as presented in **Figure 4.1**.

3.1.1 Strategy

The intended emergency response strategy is as follow:

- Raise alarm
- Evacuate people
- Isolate
- Summon assistance if necessary
- In case of gas leakage (not yet ignited):
 - Eliminate ignition sources by using/venting/flaring pipeline inventory.
- In case of fire:
 - Apply cooling (water) to vulnerable process items and structures; and
 - Carefully consider whether it is appropriate to extinguish the gas fire. Generally, gas fires should not be extinguished, as it is preferable for them to burn as jets rather than risk and explosion.
- Make area safe
- Only allow people back into the area and recommence work after “All Clear” is declared
- Initiate clean up and recovery

3.1.2 Evacuation

On receiving an evacuation alarm, personnel should leave their working area immediately and evacuate outside to the evacuation muster point(s) as recommended by Operations Section and the information will be broadcasted with the station's public address system. There are three evacuation muster points for the whole station (see **Annex A – Evacuation Muster Points of LPS and Lamma Extension**):

- Near the guard post at Passenger Jetty and Car Park Area;
- Near the guard post at East Gate; and
- Lamma Extension East Heavy Unloading Area (junction of Intake Road and Middle Road).

If anyone, except Operation personnel, does not know which evacuation muster point(s) is recommended by Operations Section, he/she should go to the nearest evacuation muster point for assembly. Lifts are prohibited to use during the evacuation.

Where appropriate the muster point may be changed by the senior person present to take into account weather conditions, changing circumstances, etc.

Operational personnel working in vital areas such as Central Control Rooms may not be required to evacuate immediately, but will do so only on the command of the senior person present.

Before evacuating, personnel should leave their work area safe and shut down equipment as necessary. The Assistant Fire & Security Supervisor (AFSS) will liaise with the Field Commander to decide what rescue attempt should be made. The Field Commander is an Operations Engineer (OE) or his deputy on shift. He is the Captain of the Shift Fire Team.

Visitors are accompanied at all times and will be escorted to a safe area or the appropriate muster point by an HK Electric employee if any emergency arises. Contractors will have sufficient knowledge of the necessary emergency action and shall respond in the same way as HK Electric employee.

3.1.3 Search and Rescue Plan

Prior to the arrival of government emergency services personnel, if the HK Electric AFSS considers it safe, the HK Electric Fire Team will conduct search and rescue operations. The Field Commander shall brief Fire Services Department (FSD) personnel upon their arrival and render assistance to FSD personnel in conducting search and rescue.

Following are the actions to be taken by HK Electric Fire Team:

- On arrival at the scene, the AFSS/OE together with the duty fire team shall immediately proceed to locate any victim.
- The fire team will gather all available information as much as they can from persons in the immediate vicinity and appraise the situation.
- Should the AFSS/OE find that an emergency situation is justified to have outside assistance, he should inform Central Control Rooms immediately who will pass the information to FSD.
- Particularly if the rescue is within a confined space, the established emergency rescue procedure must be complied with. AFSS will have necessary equipment conveyed to the immediate vicinity.
- The AFSS/OE should approach Central Control Rooms for additional manpower as necessary.
- On reaching the casualty, the rescuers will examine whether to carry out immediate evacuation or to render first aid as appropriate. Rescuers will advise OE if casualty requires immediate medical attention.

3.1.4 All Clear & Re-Entry Procedure

After gathering information from all emergency responders and assessing the situation, the Central Control Rooms will declare the All Clear and specify any conditions or procedures for re-entry.

3.1.5 Plan for Recovery

Start-up check shall be conducted according to the Pre-start Checklist (e.g. check whether the area is safe, equipment is in working order, etc.). HK Electric will carry out the necessary recovery work or, if necessary, ask for outside assistance.

3.1.6 Availability & Function of Other Resources

Outside help during an emergency can be provided by the following:

- Fire Services Department
- Government Flying Services (Helicopter Services)
- Marine Department

3.2 Trainings & Drills

Training and drills related to emergency response and management are discussed below.

3.2.1 Training

An induction briefing, including a section on emergency response, will be provided for all persons coming into the vicinity of the gas facilities.

Specific training on isolation of gas equipment will be provided for all Operations personnel.

Gas fire-fighting training has been provided to all Operations Shift Fire Team and Station Fire Team members.

3.2.2 Drills

The objectives of drills are to provide training, test the emergency plan and feedback lessons learnt in order to improve the Emergency Plan.

Each drill will be based on a reasonably foreseeable accident scenario and each of the major gas emergency scenarios is to be included in the drill schedule at least once every three years.

Following are the four major gas emergency scenarios, which will be included in the drill schedule at least once every three years:

- Serious natural gas leak;
- Major fire;
- Explosion; and
- Major leak of sub-sea natural gas pipe.

Fire evacuation drills shall be conducted in all major buildings at LPS on a quarterly basis. Members of each of the four shifts shall be exposed to one evacuation drill at least once a year. A fire drill check sheet will be submitted by the Fire & Security Officer (FSO) at the completion of every drill as a record.

The Senior Manager (Loss Prevention & Training) [SM(LP&T)] shall be responsible for arranging these drills and co-ordinates with FSD and other emergency services for the purpose of training.

4. PROCEDURES AND REPORTING ARRANGEMENTS FOR GAS INCIDENTS

This section states the procedures for reporting of, and investigation into major gas emergencies and reportable gas incidents that occurred in LPS facilities and the LPS Pipeline. In the case where an emergency/incident occurs during the commissioning of the gas facilities, the Generation Division of HK Electric must take charge of the emergency/incident as soon as it is reported by the person discovering the emergency. The Generation Division is responsible for ensuring the natural gas plant of LPS and the LPS Pipeline is operated and maintained in such a manner that all legislative requirements are complied with, and to a high standard such that availability, reliability and efficiency are maximized in a cost effective manner.

The purpose of this instruction is to ensure compliance with the Merchant Shipping Regulations (Cap. 413) and Gas Safety (Registration of Gas Supply Companies) Regulations (Cap. 51 sub. Leg. E) for leakage events. Besides, this instruction is also to satisfy the requirements of the Electrical and Mechanical Services Department (EMSD) and Marine Department Maritime Rescue Coordination Centre (MRCC) on reporting gas incidents to the Gas Authority.

Major Gas Emergency means any gas emergency which is an accident following the definition state in Section 2 under the Gas Safety (Registration of Gas Supply Companies) Regulations (Cap. 51 sub. Leg. E).

As a major gas emergency is considered a “crisis” under HK Electrics Crisis Management Plan (CMP), procedures spelt out in the CMP shall be followed.

Reportable Gas Incident means:

- Reporters of news media present at the scene of gas incident;
- Gas Incident relating to liquefied petroleum gas/natural gas facilities reported to “999” to summon emergency services from Fire Services Department (FSD), Police and/or the Ambulance; or
- Gas Incident which may attract media attention or stimulate public grievance.

Internal requirements on the investigation into gas incidents are also described. To avoid the possibility of failure to respond to borderline cases, this instruction must also be followed in the event of all incidents that have the potential to develop into gas emergencies/leakage. This instruction also covers the handling of minor gas incidents.

4.1 General Requirements

To ensure that accidents are properly reported, HK Electric operates a “no blame” culture in relation to reporting and investigation of accidents and incidents. The procedure shall be implemented to ensure that the Emergency Response Plan is tested, regularly updated and clearly communicated. The procedure shall address:

- Intended strategies for handling potential emergencies;
- Details of responsibilities and authorities associated with emergencies;
- Co-ordination with HKSAR Government agencies; and
- Follow up plan.

Recommendations resulting from this emergency exercise program shall be documented and communicated to the Emergency Responsible Organisation. Where there is a major gas emergency, the implementation of this plan shall be confirmed through:

- The availability of the Emergency Response Plan at all project facilities;
- Completion of all scheduled emergency drills;

- Records of emergency response training and competency for relevant personnel;
- Desktop Reviews and Auditing; and
- Effective management of any incidents where this plan has been implemented.

Where there is an emergency or reportable incident, the registered gas supply company shall report the incident to MRCC or Gas Authority accordingly after knowing its occurrence. The report should provide the Authority with brief information on the incident such as location, time of incident and any casualty involved, whether there is a fire and/or explosion, or gas leakage.

4.2 Pre-Requisites

All persons present at LPS must be familiar with their responsibilities under this procedure, by means of a site induction course. In particular, all persons must be able to recognise an “Emergency” or “Reportable Incident” and know their course of action in case they are the person discovering such an emergency.

Senior Manager (Loss Prevention & Training) must ensure that adequate training (to all persons at Lamma Power Station with refresher courses every three years) and drills (e.g. annually) are conducted.

Persons who have not received induction training must be accompanied by someone who has received Level 3 or above of natural gas safety training at all times for access to any designated Natural Gas Controlled Areas.

4.3 Reporting Procedures

Any person discovering a (potential) “Emergency” or any reportable incident occurred in LPS facilities and the LPS Pipeline must report it to Central Control Room (CCR) 1 immediately. He/she should use a telephone outside the Natural Gas Controlled Area and at a safe up-wind distance from the scene for reporting. Activation of a fire alarm in the vicinity may not be safe.

4.3.1 Emergency Response Organisation

The incident co-ordinator will be the duty Senior Operations Engineer of Central Control Room 1 (CCR1). The Operations Engineer (OE), or his deputy, of each Shift Fire Team shall be in overall command at the scene (Field Commander) of every incident. **Table 4.1** summarises the key roles and responsibilities responding to the leakage events.

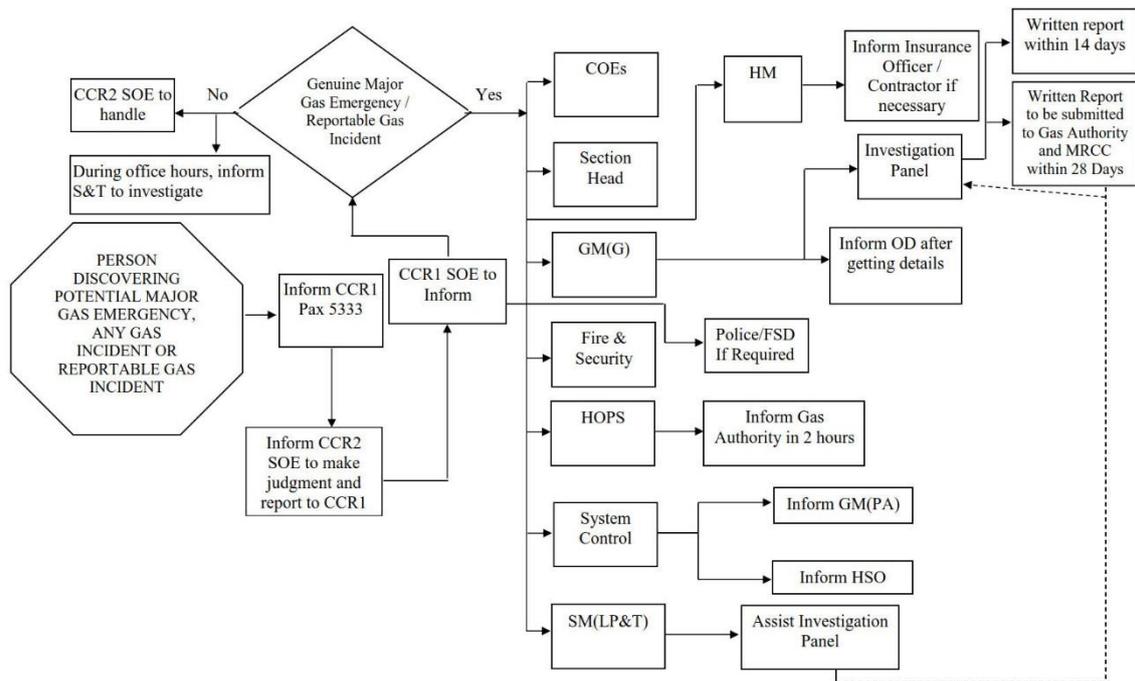
Table 4.1 The Composition of Emergency Response Organisation

Contact Person	Role
Central Control Room 1 (CCR1)	<ul style="list-style-type: none"> Immediately inform the duty CCR2 to investigate upon reception of the potential “Emergency” reporting; Inform the relevant internal and external parties forthwith if it is confirmed the incident is an “Emergency” or “Reportable Incident” from CCR2; Declare the All Clear and specify any conditions or procedures for re-entry; Responsible for the preliminary investigation of the incident and prepare the preliminary investigation report and submit to the Investigation Panel.
Central Control Room 2 (CCR2)	<ul style="list-style-type: none"> Judge whether the incident is a genuine “Emergency” and inform CCR1; Isolate the leaking section if it is possible; Ensure safe evacuation of personnel in area at risk;

Contact Person	Role
	<ul style="list-style-type: none"> ▪ Demarcate the area at risk and exclude personnel; ▪ Seek assistance from Fire & Security Section (F&S) as necessary; ▪ Decide whether external parties are required for assistance.
Head of Operations (HOPS)	<ul style="list-style-type: none"> ▪ Inform the MRCC or Gas Authority verbally of the emergency as necessary; ▪ Provide the MRCC or Gas Authority details in relation to the emergency/reportable incident as required.
System Control Centre	<ul style="list-style-type: none"> ▪ Notify HSO and GM(PA)
Head of Maintenance (HM)	<ul style="list-style-type: none"> ▪ Report the emergency/reportable incident to the Insurance Officer/Contractors where necessary.
General Manager (Generation) [GM(G)]	<ul style="list-style-type: none"> ▪ Report the case to the OD after gathering details of the emergency; ▪ Assist Investigation Panel.
Director of Operations (OD)	<ul style="list-style-type: none"> ▪ Recommend to the Managing Director (MD) on the formation of a Crisis Management Team in accordance with the Crisis Management Plan.
Senior Manager (Loss Prevention & Training) [SM(LP&T)]	<ul style="list-style-type: none"> ▪ Provide assistance to the Investigation Panel in carrying out an investigation.
Investigation Panel	<ul style="list-style-type: none"> ▪ Prepare written report; ▪ Submit written report to MRCC or Gas Authority accordingly
Head of System Operations (HSO)	<ul style="list-style-type: none"> ▪ Being informed by System Control.
General Manager (Public Affairs) [GM(PA)]	<ul style="list-style-type: none"> ▪ Being informed by System Control.

Figure 4.1 summarises the reporting procedure for an Emergency/Reportable Incident.

Figure 4.1 Procedure Flowchart – Reporting of an Accidental Event



4.3.2 Emergency Communication

A list of key emergency contact is made available at LPS. This list is accessible from key locations, such as CCR1. This list shall be checked and updated annually.

The person discovering the Major Gas Emergency and Gas Incident shall inform CCR1 through the emergency phone or telephone, providing the following information:

- Time and location of the occurrence;
- Nature of the occurrence;
 - What equipment is leaking and broad estimate of size of release.
 - Any casualties (whether fatal or non-fatal).
 - Whether there is a fire, with broad estimate of size of fire and facilities which are and could be affected.
 - Whether there has been an explosion.
 - Any damage or potential for future damage.
- Circumstances in which the emergency occurred (if known);
- Name, Department/Section and Contact Telephone or Pager Number of the person reporting the emergency.

The HK Electric point of contact for liaison with Government (e.g. FSD, EMSD, Hong Kong Police, Hospital Authority) for preparation of the Off-site Emergency Plan is the Chief Technical Services Engineer or his deputy.

If the assistance of FSD is required, the following information shall be advised to them, both via telephone and if possible by fax/email to avoid misunderstanding:

- Location of emergency;
- Nature of emergency (leak, fire or explosion);
- Size of leak (release rate, duration or total quantity);

- Potential for hazard to life;
- Number of casualties/missing persons;
- Potential for escalation;
- Means of access and egress;
- Location for initial attendance;
- Location of water supply and other fire-fighting services;
- Isolation valves; and
- Number of people on site and any unaccounted for.

4.4 Investigation Procedures

The representatives from Projects Division, Generation Division of HK Electric and the Contractor (if involved) should take part in the investigation following the Dangerous Occurrence Reporting/Investigation Procedure. The purpose is to determine the causes and recommendation of actions to prevent recurrence. The report check sheet for any major emergency / reportable gas incident is shown in **Annex B**.

4.4.1 Preliminary Investigation

The duty Senior Operations Engineer of CCR1, or his deputy, will start the preliminary investigation and, subject to it being safe to do so, inspect the scene.

In the preliminary investigation, the following should be identified:

1. Preliminary details of the leakage, including
 - a. Location of leak and plant item leaking;
 - b. Estimated severity of leak (i.e. size of leaking hole or crack, release rate and duration of release, total quantity released);
 - c. If there has been a fire or explosion, provide preliminary description of:
 - i. Explosion damage caused by gas where the damage extends beyond the immediate source of the explosion;
 - ii. Explosion damage to any notifiable gas installation where repair is required, irrespective of whether such installation is rendered inoperable by such explosion;
 - iii. Fire damage to any notifiable gas installation; or
 - iv. Any casualty, whether fatal or non-fatal, due to the inhalation of unburnt gas or the products of the combustion of gas.
2. Preliminary details of main and contributory causes of the emergency / reportable incident.
3. Immediate actions to prevent recurrence.
4. Preliminary immediate and possible long-term actions to prevent recurrence. The report on the preliminary investigation shall be passed to the Head of Operations (HOPS) with a copy to the Chairman of the Investigation Panel.

4.4.2 Thorough Investigation

Thorough investigation should be carried out in which the purpose of the investigation is to identify, so far as is reasonably practicable:

- The cause of the emergency or the reportable incident; and

- The actions which are or have been implemented to prevent, so far as is reasonably practicable, the recurrence of any similar emergency or incident.

The details of the emergency or the reportable incident, cause and actions to prevent recurrence are to be presented in a written report.

The Chairman of the Investigation Panel has the power to summon and interview witnesses, inspect and make copies of relevant records and documents, retain any evidence and request assistance from anyone.

The Chairman of the Investigation Panel shall decide the method of investigation. The progress of investigation shall be reported to the General Manager (Generation) [GM(G)] regularly.

The report of the investigation should be submitted to the Secretary of the Health and Safety Board, HSO, within 14 days.

Copies of the report should be kept by Administration Section as well as the S&T. All emergency or reportable incidents records and Investigation records shall be kept properly.

After the day on which the emergency/reportable incident occurred, the final copy of the report must be submitted to the Gas Authority and MRCC within 28 days.

4.5 Review and Audit

The incident reporting and investigation system shall be subject to HK Electric annual audit procedure. The investigation report form shall be reviewed in HK Electric Generation Division Health & Safety Committee Meeting or other suitable meeting(s) to check that remedial actions identified have been adequate, appropriate and implemented until completion.

The SM(LP&T) is responsible for reviewing the established emergency plans at least once every three years or whenever required. The review process should take the following into account:

- All material changes in the activity of HK Electric;
- Any changes in the emergency services relevant to the operation of the emergency plans;
- Advances in technical knowledge, for example new and more effective means of mitigation;
- Changes in staffing resources including contractors where appropriate;
- Knowledge gained as a result of major accidents either in-house or elsewhere; and
- Lessons learned during the testing of emergency plans.

For off-site emergency plans, the review and revision would be done by the relevant emergency service groups.

HK Electric will provide updated relevant emergency plans for concerned Government Departments, including Gas Authority, FSD, Marine Department, Hong Kong Police and Hospital Authority for reference.

Annex B Emergency / Reportable Incident Report Check Sheet

This form can be used as a facsimile to inform System Control Department.

Major Gas Emergency or Reportable Gas Incident occurred date:		Time:	
Location:			
Description of Major Gas Emergency or Reportable Gas Incident:			
No. of person(s) Injured:		[ASI/35 Form 1 should also be used if there is injury of persons(s)]	
Nature of Incident (tick one or more as appropriate):		<input type="checkbox"/> Leakage of gas,	<input type="checkbox"/> Fire, <input type="checkbox"/> Explosion.
		<input type="checkbox"/> Other (Pls specify): _____	
Is the incident under control?	<input type="checkbox"/> Yes,	<input type="checkbox"/> Partly controlled,	<input type="checkbox"/> No.
Is the incident affecting the public?	<input type="checkbox"/> The public is being affected. <input type="checkbox"/> There is a high possibility that the public will be affected. <input type="checkbox"/> The public may be affected. <input type="checkbox"/> The public is unlikely to be affected. <input type="checkbox"/> Insufficient information to assess.		
Report received from:		Time:	
Inform:	Chief Operations Engineer (CCR1)	<input type="checkbox"/>	Time:
	Chief Operations Engineer (CCR2)	<input type="checkbox"/>	Time:
	Head of Operations	<input type="checkbox"/>	Time:
	Head of Maintenance	<input type="checkbox"/>	Time:
	Head of Section involved	<input type="checkbox"/>	Time:
	General Manager (Generation)	<input type="checkbox"/>	Time:
	Fire & Security Control Room	<input type="checkbox"/>	Time:
	Chief System Control Engineer	<input type="checkbox"/>	Time:
	S&T	<input type="checkbox"/>	Time:
	Government Fire Services Department	<input type="checkbox"/>	Time:
Other remarks:			
Name of CCR1 Senior Operations Engineer:		Signature:	