RISK MANAGEMENT AND RESPONSE PLAN OF THE RICHARDS BAY GAS POWER 2 (PTY) LTD IN RICHARDS BAY, KWAZULU NATAL

Author: M P Oberholzer

Date of Issue: 17th of August 2020

Report No.: R/20/SAV- 01 Rev 2

P O Box 2541, Cresta, 2118

Tel: +27 (0) 11 431 2198

Cell: +27 (0) 82 457 3258

Fax: +27 (0) 86 624 9423

Email: mike@riscom.co.za

DOCUMENT CHANGE HISTORY			
PAGE/LINE	**CHANGE**	**DATE**	**REV**
Document	Initial release	30th July 2020	0
Document	Updated with client comments	6 August 2020	1
Document	Section 2 added and numbering updated	17 August 2020	2

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1 INTRODUCTION

The Risk Management and Response Plan is a part of an overall safety management system. The system should include the identification of hazards and risks, training of personnel and consultation with local government and emergency response services, on site personnel, neighbours and experts.

This Risk Management and Response Plan is the initial plan and would require revision when more accurate information becomes available with respect to the design or at the completion of the Major Hazard Installation risk assessment

1.1 Purpose and Objectives

The purpose of the Risk Management and Response Plan is to prioritise activities in the event of an emergency. This is to ensure that any emergency that does occur within the scope of this facility is dealt with in a planned, organised and coordinated manner to prevent or minimise impacts. The purpose of the response plan is summarised as follows:

- To maintain a high level of preparedness;
- To respond quickly and efficiently in order to limit the impacts of an emergency;
- To manage an emergency until the emergency services, arrive and take control;
- To support emergency services with information, knowledge, skills and equipment;
- To protect emergency responders, personnel and the community from harm;
- To minimise damage to property and the environment and to recover as soon as possible from an incident;
- To prevent a reoccurrence of an emergency event.

1.2 Communicating Emergencies

Communication equipment to be used during emergencies includes:

- Telephones:
  - Fixed lines for outside communications;
  - Internal extensions for on-site calls;

- Other:
  - A public address system:
    - Base stations at assembly points for roll call communication;
  - Sirens or alarm systems used in different modes to convey specific messages;
  - Windsocks placed in strategic places throughout the site:
    - A windsock should be visible from any point on the site and from inside the Emergency Control Centre;

- Two-way radios, used with a specific frequency;
- Radios used by security on a specific frequency;
- Megaphones (loud hailers);
- Cell phones are not to be permitted on site.

1.3 Alarm System

A site alarm will sound:

- A continuous tone for emergencies;
- An intermittent tone as the all clear signal.

1.4 Testing of Alarms

The alarm at the main gate will be tested by the Emergency Control Centre in both modes on Fridays at 10:00 am.

2 RISK IDENTIFICATION AND ASSESSMENT

This section describes and rates the risks identified based on the common activities related to the development and construction of a gas to power plant, for which emergency procedures are prescribed in this report.

The assessment entails the process of identifying hazards and evaluating the risks from these hazards whilst taking account of the existing risk controls. Controls may for example include workplace precautions such as physical safeguards, containment of airborne contaminants, safe systems of work, training / competency and personal protective equipment.

The following steps are followed towards assessing the project risks, further expanded on below:

- Determine work activities
- Identify hazards
- Identify current risk controls
- Assess the risk
- Specify actions to reduce the risk

It is important to note that the risks identified and rated within this plan are preliminary and based on an overview of the activities alone. This initial plan would thus require revision when more accurate information becomes available with respect to the design or at the completion of the Major Hazard Installation risk assessment. As such, where more information becomes available, hazards identified may be expanded in future updates to this plan or the Major Hazard Installation risk assessment to be conducted, which will replace this plan considering the level of detail then afforded.

2.1 Determine work activities

The following work activities are related to the development and construction of the plant

Main Activity/Project Component	Components of Activity
Planning	
Conduct surveys	» Risk Assessment by an Approved Inspection Authority which is competent to express an opinion as to the risks associated with the gas to power plant and provide an appropriate emergency response plan. » Geotechnical survey by geotechnical engineer. » Site survey and confirmation of the substation footprint. » Survey of substation site and power line servitude. » Survey of internal access routes. » Environmental walk-through surveys.
Construction	
Establishment of access roads within the site	» Establish internal access roads: permanent roadway within the site for use during construction and operation phase.

Main Activity/Project Component	Components of Activity
Undertake site preparation	» Clearance of vegetation at the footprint for infrastructure. » Site establishment of offices/ admin/ workshops with ablution facilities, parking, area for placement of gas turbines, water and fuel tanks, substation and power line, etc. » Excavations for foundations.
Civil Works / construction of structures	» Concrete works for structures such as foundation, the production unit (which comprises a complete turbine, generator and an auxiliary module), stacks. » Ancillary infrastructure such as guard house, admin building, workshops and a warehouse will be established. » Mechanical work will then follow.
Construct Substation and power line	» A 132 kV substation will be required to facilitate grid connection to the Indus Substation. » Substation components. » Security fencing around high-voltage (HV) Yard.
Commissioning of the facility	» Gas to power plant commissioning.
Undertake site rehabilitation	» Remove all construction equipment from the site. » Rehabilitation of temporarily disturbed areas where practical and reasonable.
Operation	
Operation	» Operation of gas turbines within the power plant.
Maintenance	» Oil and grease – turbines. » Transformer oil – substation. » Waste product disposal.
Decommissioning	
Site preparation, disassembly of production units and associated infrastructure and demolishing of buildings and stacks.	» Confirming the integrity of the access to the site to accommodate required equipment. » Preparation of the site (e.g. lay down areas, construction platform) » Mobilisation of construction equipment

2.2 Identify hazards

Based on the activities identified in section 2.1 above, the following hazards were determined:

- Fires
- Flammable spillages
- Gas leaks
- Medical emergencies
- Bomb threats
- Natural disasters

2.3 Identify current risk controls

Presently the risk controls in place are all related to the design phase planning for the development. As such, the controls in place towards emergencies and hazard responses are contained within this plan, or the Environmental Management Programme (EMPr) for the project.

2.4 Assess the risk

Assessment of risk considers the probability and consequence of the hazard, or in rare instances which is warranted, only one of the criteria is utilised. The following assessment classes are utilised to provide indicative categorisation of the risks identified. It is important to note that these categories must be revised once a Major Hazard Installation risk assessment is conducted nearer construction (and following preferred bidder status for the project).

Severity					
	High	(d) MODERATE		(g) HIGH	(i) CRITICAL
	Moderate	(b) LOW		(e) MODERATE	(h) HIGH
	Low	(a) LOW		(c) LOW	(f) MODERATE
		Low		Moderate	High

Probability

The risks above are afforded preliminary ratings as follows:

Risk	Severity	Probability	Risk class
Fires	High	Low	(d) MODERATE
Flammable spillages	High	Low	(d) MODERATE
Gas leaks	High	Low	(d) MODERATE
Medical emergencies	Moderate	High	(h) HIGH
Bomb threats	Low	Moderate	(c) LOW
Natural disasters	High	Low	(d) MODERATE

2.5 Specify actions to reduce the risk

The LPG storage and offloading will be designed and installed to the Occupational Health and Safety Act 85 of 1993 and its regulations, as well as SANS 10087 relating to LPG installations., as required by legislation This standard is intended to ensure that the equipment will reduce the risk of the facility and provides sufficient distance between high risk areas and facilities such as buildings.

Preliminary procedures have been determined to guide the responses towards management of these identified hazards, described in the remainder of this report. These are subject to revision and update where a Major Hazard Installation risk assessment is conducted.

3 EMERGENCY PROCEDURES

These procedures have been composed according to the Definition of an Emergency (attached in Appendix C). The roles described in Subsection 6.5 and illustrated in Figure 3-1 as well as the assumptions and provisions described in Subsection 6.6 are important for the effective application of the procedures.

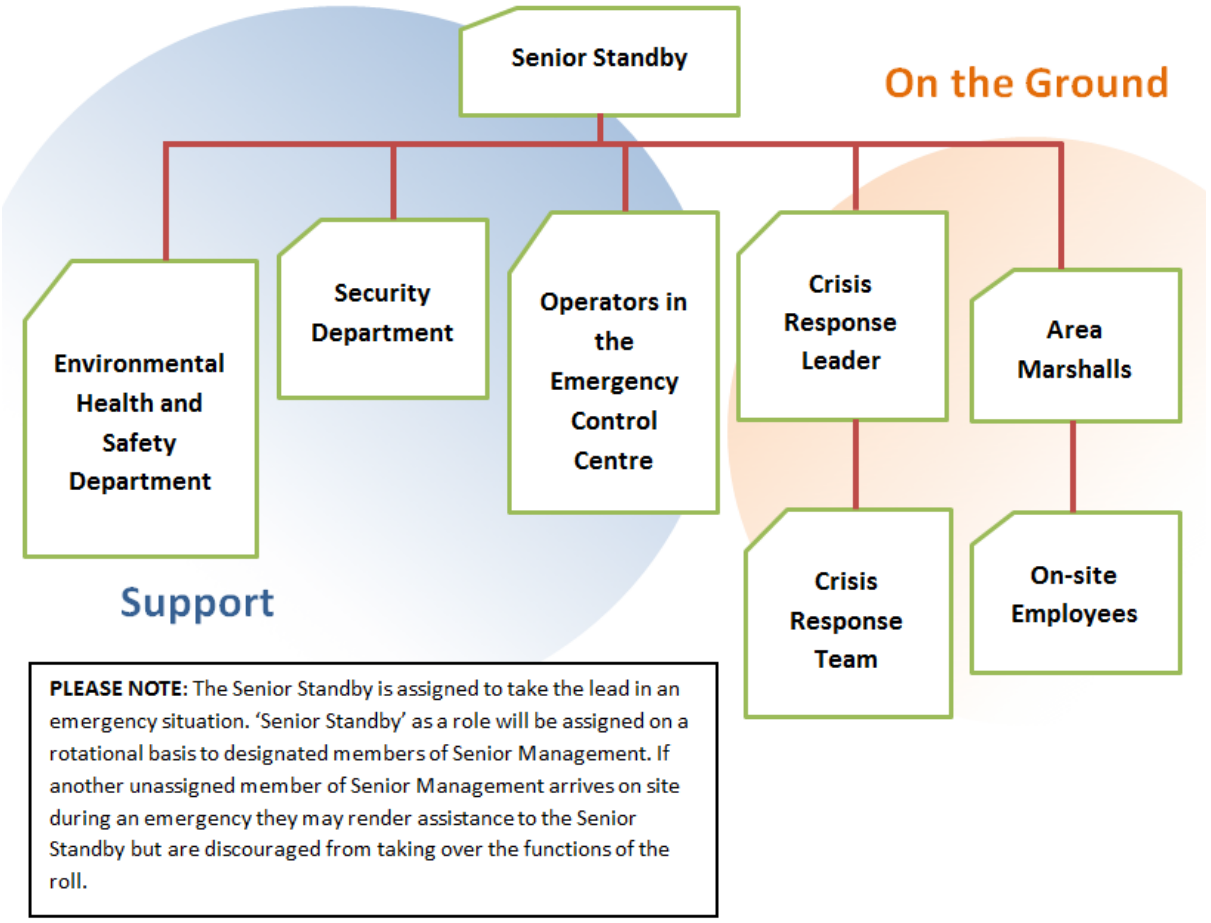

Figure 3-1: Organogram describing roles during an emergency situation

3.1 Main Procedure

3.1.1 Fires, Flammable Spillages, Gas Leaks and Gas Explosions

Employees (including patrolling security personnel if after hours) on the scene will:

- After taking immediate action to address the incident where practical and safe, alert the Emergency Control Centre using two-way radio or an internal line if available;
- If the Emergency Control Centre cannot be contacted or personal safety requires the area to be evacuated immediately activate the nearest and safest panic button;
- On contacting the Emergency Control Centre, give clear indication of the nature and location of the emergency:
  - Establish whether it is:
    - A fire;
    - An explosion;
    - A gas release; OR,
    - A flammable spillage;
- Give all information asked for and do not break off communication until all information asked for has been given;
- Alert other employees, contractors and visitors and, if practical, directly inform the Area Marshall of the affected area without using the emergency lines;
- If responsible for a contractor or visitor they should inform them of the situation and if necessary, guide them to the assembly point or shelter in place under direction of the Area Marshall.

Operators in Emergency Control Centre will:

- Obtain information regarding the nature of the emergency and the location of the emergency;
- Request that the most responsible employee identify the source of the fire, explosion, release or spillage, without jeopardising their own safety:
  - Advise the responsible employee to stay upwind of a possible gas leak;
  - Advise the responsible employee to attempt to stop the flow of flammable material to the area where the leak is; if it can be done safely; all attempts should be made to shut off the main supply by activating the emergency shutdown (ESD) system;
- If the emergency can cause significant injury to people, damage to equipment or production loss, escalate the emergency to a Level 2, activate the alarm and ESD system and notify the Senior Standby;
- Activate the Crisis Response Team and inform them of the nature and location of the emergency event;
- Inform the Area Marshalls of the affected areas of the nature and location of the emergency event;
- Notify security personnel to control entrances and exits so that ONLY officials and emergency vehicles or personnel may enter or exit and all access roads clear to allow free flow for emergency vehicles:
  - Notify security personnel to ensure that all vehicles are parked in a safe manner with engines turned off and keys left in the ignition;
- Carry out any requests from the Senior Standby (or other assisting senior personnel) and direct any requests for information from any source to the Senior Standby, e.g.

relatives of employees, surrounding communities; however, only the managing director or a duly appointed person may make a statement to the media;

- In the event of an evacuation, in consultation with the Senior Standby notify all Area Marshalls;
- Sound 'all clear' on main alarm on request from Senior Standby on resolution of the emergency;
- Keep record of all actions for later evaluation.

The Senior Standby on receiving notification of emergency will:

- Proceed to Emergency Control Centre or, after hours, keep in periodic contact with the Emergency Control Centre until site is reached;
- Inform Crisis Response Leader of their arrival at the Emergency Control Centre and organize available personnel to effectively respond to requests for assistance;
- Determine the scope and nature of the emergency and decide:
    - In consensus with Crisis Response Leader, whether to continue to run or to shut down the facility;
    - On the need to call on any internal support, e.g. Site Leader, maintenance groups, Human Resources, Environment, Health and Safety staff:
        - And how internal support should carry out different tasks in their areas of expertise as needed;
    - On the need to call on any outside assistance, e.g. the Municipal Fire Department, ambulance services, the Department of Environmental Affairs;
    - How to facilitate communication between employees, Area Marshals and Crisis Response Team so that all necessary precautions in and around other areas to safeguard personnel and equipment are carried out:
        - And whether to communicate over PA system status and updates on what people should be doing i.e. stay in place, be patient, time to 'all-clear';
- Liaise by two-way radio with assembly points or shelter in place areas to ensure all people accounted for;
- Communicate with external parties as necessary; however, only the managing director or a duly appointed person may make a statement to the media;
- If necessary, instruct units or departments to evacuate areas according to unit or department emergency procedures;
- Log all actions and information with times to facilitate post review.

The Crisis Response Team will:

- On being notified by phone or radio of an emergency, proceed to the affected area with the necessary personal protection equipment (PPE):
  - In case of gas release, keep wind direction in mind;
- Report to the Crisis Response Leader and the Emergency Control Centre;
- Under the guidance of the Crisis Response Leader, take all possible actions to return conditions back to normal by:
  - Isolating leaking or ruptured pipelines or equipment, etc.;
  - Taking appropriate actions to extinguish fires where possible;
  - Removing any source of heat and applying deluge where necessary;
  - Containing spills where possible;
  - Rescuing and applying first aid to persons where needed and practical;
  - Assisting Area Marshalls with search and evacuation from areas to assembly points or shelter in place.

The Crisis Response Leader will:

- Ensure the safety of his team members first before entering hazardous areas for remedial action:
  - Team members should ONLY enter hazardous areas in pairs with the correct PPE;
- Request any internal assistance which may be needed usually via Senior Standby;
- Request outside assistance where required via Senior Standby;
- Keep the Senior Standby informed of all actions and the status of the emergency condition on an ongoing basis, e.g. need to evacuate areas and for additional equipment or manpower;
- In consultation with the Senior Standby, decide when the emergency is over and that the ‘all-clear’ can be sounded;

Area Marshalls on receiving notification of emergency will:

- Ensure that nobody leaves the area and make first check that all persons are accounted for, where practical by a roll call (it is the Area Marshals responsibility to always have a copy of all the day’s registers on hand);
- On notification from the Senior Standby or if there is clear and present danger, will instruct people to evacuate to the designated assembly point or shelter in place:
  - In case of a gas leak, flash fire or explosion, shelter in place with all windows, doors and vents sealed and if moving from the outside keeping an eye on wind socks;
  - In case of a jet fire, moving in the opposite direction of the flame attempting to put as many walls and buildings between people in the flames path alters;
- Ensure all employees, contractors and visitors are accounted for by a roll call at the designated assembly point;
- Ensure that nobody leaves the assembly point until the Senior Standby gives the ‘all clear’;
- Call the Medical Centre for assistance in case of injuries and direct the application of first aid where required.

Other personnel not directly involved on receiving notification of emergency will:

- Stop all work being done, shutting down all equipment safely and all air conditioners;
- Close all windows and doors in your area;
- Stop all non-essential telephone calls and radio communication, leaving these systems for emergency calls;
- Follow all instructions from Area Marshals, in staying in place or in proceeding to the designated assembly point or off site;
- Under no circumstances will any person not directly involved in the handling of the emergency, congregate at the scene of the emergency;
- Refer requests for information to the Senior Standby, as no information pertaining to the emergency should be given to any person from any outside organization including media;
- If driving any vehicles, ensure vehicles are parked in a safe place and switched off with the keys left in ignition.

3.2 Supplementary Procedures

3.2.1 Medical Emergencies

Injuries or sickness can occur at any time and not only during emergency conditions. It is of utmost importance that sick or injured employees be treated in the correct way to prevent aggravation of the condition. Employees of contractors working on the site will be given the same consideration.

3.2.1.1 General information

Medical Centre personnel or personnel at the first aid station will:

- On receiving notification of an injury from any area, establish the status of the patient;
- Always use plastic or rubber gloves during treatment of any injured person.

3.2.1.2 Minor Injuries

Medical Centre personnel or personnel at the first aid station will:

- Treat all minor injuries at the first aid station or Medical Centre; if, after treatment, the person is able to return to his work and agrees to this, they may be allowed to do so;
- All the particulars of the injured person, together with a short report on any treatment given must be handed to the Environmental Health and Safety Department as soon as possible but not later than the end of the shift on which the injury occurred.

3.2.1.3 Serious Injuries or Fatalities

Employees on the scene will:

- After taking immediate action to address the incident where practical and safe, alert the Emergency Control Centre using two-way radio or an internal line if available;
- If the Emergency Control Centre cannot be contacted or personal safety requires the area to be evacuated immediately activate the nearest and safest panic button;
- On contacting the Emergency Control Centre, give clear indication of the nature and location of the emergency;
- Give all information asked for and do not break off communication until all information asked for has been given;
- If practical, inform the Area Marshall of the affected area without using emergency lines.

Operators in Emergency Control Centre on receiving notice of a serious injury will:

- Contact the first aid stations and Medical Centre for assistance, use of equipment and first aid help;
- Contact Crisis Response Team Leader for assistance, who may instruct nearest Crisis Response Team members to assist in emergency first aid;
- Contact an ambulance service provider and arrange for ambulance escort at main gate;

- Inform the Senior Standby and the relevant Area Marshalls about the occurrence, giving them all the information available.

Area Marshalls on receiving notice of a serious injury will:

- Ensure that the scene of the accident is not disturbed unless this is necessary in order to prevent further injuries, to facilitate the removal of severely injured patients or bodies and safeguard the plant or process;
- Make notes of any observations, especially abnormal circumstances.

3.2.2 Bomb Threats

Bomb threats are very rare but should be handled very seriously and correctly.
Any person on site, who could be phoned directly from an outside telephone, can be the recipient of a bomb threat call and all such employees should be aware of this procedure.
The bomb threat checklist that follows should form part of the in-house telephone directory to ensure easy access when required.

3.2.2.1 Actions of Receiver of the Call

After the caller has ended the call, immediately contact the Emergency Control Centre to inform them of the bomb threat.
BUT during the call, keep the caller on the line as long as possible and ask questions to help in later analysis of the threat:

- **WHY**:
  - Why this company?
  - Why did you phone me?
- **WHEN**:
  - When will the bomb explode?
- **WHERE**:
  - Where is the bomb?
- **WHAT**:
  - What does the bomb look like?
  - What damage will it cause?
  - What do you have against the company?
  - What is your name?

3.2.2.2 Telephone Bomb Threat Checklist

This checklist should be completed by the person who received the call. If possible, during the call and, if not, as soon as possible after the call has been terminated. Rather leave areas blank if you do not know. Incorrect guesses could have an influence on decisions that has to be made from the information.

NAME_____

LOCATION_____ DATE_____

EXACT WORDING OF CALL

_____
_____
_____
_____

TIME_____YOUR EXT._____

NAME OF THE PERSON THE CALLER REQUESTED_____

I SAID_____
_____
_____
_____

WHEN WILL THE BOMB EXPLODE? (RECORD EXACT WORDS)

_____
_____
_____
_____

WHERE IS THE BOMB? (RECORD EXACT WORDS)

_____
_____
_____

WHAT DOES THE BOMB LOOK LIKE? (RECORD EXACT WORDS)

_____
_____
_____

WHAT TYPE OF DETONATOR WAS USED?

_____
_____
_____

OTHER STATEMENTS (RECORD EXACT WORDS)

_____
_____
_____
_____

TIME CALLER HUNG UP_____

CALLER WAS MALE/FEMALE_____

LOCAL/LONG DISTANCE_____

CHECK ALL APPROPRIATE DESCRIPTIONS:

VOICE: FAST?_____ SLOW?_____ STUTTER?_____
DISTINCT?_____ DISTINGUISHED?_____EDUCATED?_____
SIMPLE?_____ INTERNATIONAL?_____ CURSING?_____

ACCENT: LOCAL_____FOREIGN_____

MANNER: CALM_____ ANGRY_____ EMOTIONAL_____
LAUGHING_____ DELIBERATE_____

THE VOICE WAS/WAS NOT FAMILIAR TO ME WHAT WERE THE BACKGROUND SOUNDS (IF ANY)?

_____
_____
_____
_____

SIGNED: _____
DATE: _____
TIME: _____

3.2.2.3 Actions of Other Parties Involved with Safety

Operators in Emergency Control Centre on notification of a bomb threat will:

- Inform the Security Department of the threat;
- Inform the Senior Standby of the threat, giving the name of the person who received the call;
- Carry out any further requests from senior personnel.

The Security Department on notification of a bomb threat will:

- Close the gates and stop all visitors and deliveries to the site;
- Will not allow visitors or delivery vehicles to leave the site and instruct such people to wait in an area with a posted security guard to keep watch.

The Senior Standby on receiving notification of a bomb threat will:

- Arrange for the local police bomb squad be contacted;
- Arrange to get all Area Marshals together at a meeting place;
- Arrange for the person who received the call to go to a quiet office as soon as possible and instruct them to complete the bomb threat checklist:
  - On their own;
  - Without asking leading questions;
  - Instructing them that it is better to leave questions unanswered, if unsure;
- Together with the local bomb squad decide whether there is need to search the site with assistance from the Area Marshalls or from the information gathered, or whether this can be regarded as a hoax call;
- Coordinate with search teams and be prepared to commence an evacuation by alarm or sound an ‘all clear’ based on:
  - Bomb being found and rendered safe;
  - Time given for bomb to explode has passed.

Area Marshalls after meeting with the Senior Standby and the local bomb squad will:

- Institute search teams and procedures in their area ONLY in conjunction with professional bomb disposal experts;
- Be responsible for cooperating with bomb disposal experts as the teams know the area the best and can determine what belongs in the plant and what does not:
  - Regard all objects unusual to the area as suspicious;
  - Bombs can be disguised in any manner, e.g. as a suitcase, small parcel, letter;
- Instruct all employees involved in the search that they shall not:
  - Use radios or cell phones during the search, as sophisticated bombs use frequencies to detonate;
  - Touch any suspicious objects;
  - Pour water over any suspicious object.
- If a bomb is found:
  - The group finding the bomb must immediately inform the Senior Standby to activate the emergency alarm and evacuation;
  - No personnel will be allowed to enter the area until the ‘all clear’ is given.

3.2.3 Natural Disasters

3.2.3.1 Excessive Rain and Flooding

The Security Department will:

- Implement water patrols if rainfall exceeds 25 mm within a 30-minute period;
- Inform the Emergency Control Centre of start of patrols and when the possibility of flooding is noticed at any area.

Operators in Emergency Control Centre on being notified of start of water patrols will:

- Notify Area Marshalls on duty of patrols;
- Inform Senior Standby of start of patrols;
- On receiving notification from the Security Department of possible floods in specific areas inform Senior Standby.

The Senior Standby on being notified of start of water patrols will:

- Arrange for available personnel on site to take action to prevent damage, e.g. placing sandbags to divert water, moving of product which can be damaged by water to safer areas, shut down equipment safely;
- Contact support groups to render assistance, e.g. Engineering Department with moving equipment;
- Coordinate actions taken to prevent damage or pollution;
- Keep record of actions for later evaluation.

3.2.3.2 Lightning

Problems which can result from lightning strikes are:

- Fires and releases:
  - Implement fire and gas release procedures;
- Injuries:
  - Implement medical emergency procedures.

3.2.3.3 Seismic Activity

It is expected that large scale seismic occurrence would be rare. If, however, such an occurrence should take place, there will be no prior warning and such an occurrence will be felt as a violent shaking of buildings and structures. Such shaking can result in damage to buildings and structures. The duration of such disturbances can vary between a few seconds or minutes.

During the occurrence Area Marshalls should:

- Stay calm and, depending on the severity of the disturbance, buildings should be evacuated according to area:
  - As such an occurrence will be strange to all employees, the biggest danger is panic amongst people;

- If necessary and practical, implement emergency shutdown procedures for production areas.

After the occurrence, the Emergency Control Centre should:

- Follow relevant emergency procedures to handle any fires, gas releases or injuries;
- Inform Senior Standby of what procedures have been started.

The Senior Standby on being notified of the seismic activity and its effects will:

- Handle after effects according to normal emergency procedures;
- Ensure in coordination with the Area Marshalls that where areas were evacuated, people do not return until buildings and structures have been checked;
- Give the 'all clear' if employees can return to work after areas have been checked and declared safe.

3.3 Escape Routes, Shelter in Place and Assembly Points

A diagram must be completed by the Site Leader once site layouts have been completed and attached in Appendix B. The escape routes, shelter in place and assembly points should be arranged according to the results of a reliable risk assessment of the on-site hazards.

3.4 Drills and Exercises (Frequency)

The true test of the effectiveness of any procedure can only be measured during the staging of mock emergencies where observers are used to give feedback after such a test. A number of different methods can be used.

3.4.1 Discussion Exercise (Once per Quarter)

This is basically a learning exercise that takes place in an office setting. This exercise generates a discussion of a possible emergency where different levels of personnel forming a part of the response team, are asked a series of questions regarding their duties during an emergency. These exercises should be documented, summarised and distributed to other personnel so that lesson learnt can benefit everybody.

3.4.2 Drills (Twice per Year)

A drill is a supervised field response as in a real situation and should follow after a few discussion exercises. A drill may be announced or unannounced and should test a single response function, e.g. fire, gas release, bomb threat. Use must be made of observers and their observations must be used to train employees further in the implementation of these procedures.

3.4.3 Exercises (Once per Year)

Field exercises practice all or most of the functions of the response systems. These exercises take time to plan and conduct, should be carried out once a year and should also involve any outside agencies, such as local fire brigades, ambulance services, etc. These exercises

should be announced beforehand and observers must be used to document shortcomings in the plan.

Drills and exercises must be followed by a critical evaluation of all aspects of the test.
This must be done in a positive way to improve future exercises or responses to actual emergencies and should also be used as a tool for revision of this plan.

3.5 Revision of Procedures

Revision of the Risk Management and Response Plan should be done when and should be updated at least once every three years in consultation with local government:

- Any significant change has taken place in the site personnel strength;
- Any significant changes are made to production units;
- An introduction of new hazardous chemicals to the process;
- If major shortcomings are shown during drills or exercises;
- The Risk Management and Response Plan should be revised once a year (final quarter);
- The responsibility for the revision of the Risk Management and Response Plan rests with the Site Leader.

3.6 Statements to the Media

Only the managing director or a duly appointed person may make a statement to the media.

4 APPENDIX A: EMERGENCY CONTACT NUMBERS

Contact	Fixed Line Phone No.	Mobile Phone No.
Netcare The Bay Hospital	035 780 6111	
Melomed Richards Bay Private Hospital	035 791 5300	
Ambulance	101 77	
Disaster Management and Fire Services	035 789 0249	
Emergency Control Centre		
Senior Standby 1		
Senior Standby 2		
Senior Standby 3		
Crisis Response Leader 1		
Crisis Response Leader 2		
Crisis Response Leader 3		
Medical Centre		
Site Leader		
Security Department		
Control Room		

5 APPENDIX B: ESCAPE ROUTES, SHELTER IN PLACE AND ASSEMBLY POINT DIAGRAM

6 APPENDIX C: DEFINITION OF AN EMERGENCY

An emergency is a hazardous situation (or threat of a hazardous situation) which requires action to control, correct and return the facility to a safe condition and also requires timely action to protect people, property and the environment from harm.
This appendix deals with how an emergency is defined particularly in the context the Richards Bay Gas Power 2 and its Risk Management and Response Plan.

6.1 Scenarios for Release of Pressurised Liquefied Flammable Gas

The primary type of emergency that may occur at the Richards Bay Gas Power 2 would involve the loss of containment of highly flammable liquefied petroleum gas (LPG) which would either be released as a vapour or would quickly become a vapour in atmospheric conditions.

6.2 Levels of Emergencies

Levels of emergency are defined in this subsection.

Level 1: An event where the impacts are expected to be confined to a specific location within the facility and no escalation is expected.

Internal response may be sufficient to bring the emergency to a close.

If in the case of a minor incident it is not necessary to activate the emergency response plan, such occurrences must be reported in writing to the Site Leader and Senior Standby within the shift during which it took place. After hours, the Senior Standby must be informed by telephone immediately after such a minor occurrence.

Level 2: An event that exceeds Level 1 and that will result in a site alarm being sounded.

An event that can cause significant injury to people, damage to equipment or production loss,

The impacts are expected to spread to or affect other parts of the facility but not spread beyond the site.

Emergency services are likely to be required.

Level 3: An event that has consequences beyond the site boundary and the consequences could affect the health and safety of the public or neighbouring properties or could be of an environmental nature.

Local authorities are responsible for emergency response once the impacts reach beyond the site, and it is required to notify them.

6.3 Details of Hazardous Materials

A large release of LPG with an ignition source may result in pool fires, which would have localised effects and would remain on site.
Various other scenarios where LPG enters the atmosphere as a vapour could with ignition result in jet fires, flash fires and vapour cloud explosions.

Boiling liquid expanding vapour explosions (BLEVEs) would occur only at the road loading gantry. Depending on the different possible scenarios and weather conditions, these fires and explosions may have effect on the whole site and in many instances the consequences could extend off site.

Vapour clouds could drift a distance before encountering a source of ignition. In the event of a release of LPG all efforts should be made to eliminate sources of ignition on site, such as running machinery, metal work, starting and running vehicles, using cell phones, open flames and any activity that could produce a spark. Asphyxiation in a vapour cloud of sufficient concentration is another hazard to be aware of.

See Figure 6-3 for the locations of diesel storage and sources of a possible LPG loss of containment, the LPG storage bunker, the road loading gantries, pipelines and the burn pit.

6.4 Other Emergencies

Emergency conditions can arise due to events that do or do not directly involve hazardous materials stored on site. Such events may have their own particular impacts or may cause a loss a containment of LPG or diesel thereby resulting in impacts from such releases. Where applicable the main procedure for fires, gas releases and explosions and the supplementary procedure for medical emergencies will be activated.
Supplementary procedures have been written for:

- Natural events such as flooding, earthquakes and lightning strikes;
- Subversive activities such as a bomb threat;
- Medical emergencies.

6.5 Emergency Functions, Organisation Structures and Definitions

The procedures are based on certain on-site personnel or members of management being assigned particular roles. They would be trained to carry out particular functions in emergency conditions, drills and exercises and part of their training should include a thorough familiarisation with the Risk Management and Response Plan. These roles would be related to emergency response. While the roles should be appropriate to their usual job description, they would be somewhat independent of it. These roles, shown in Figure 6-1, are defined as follows:

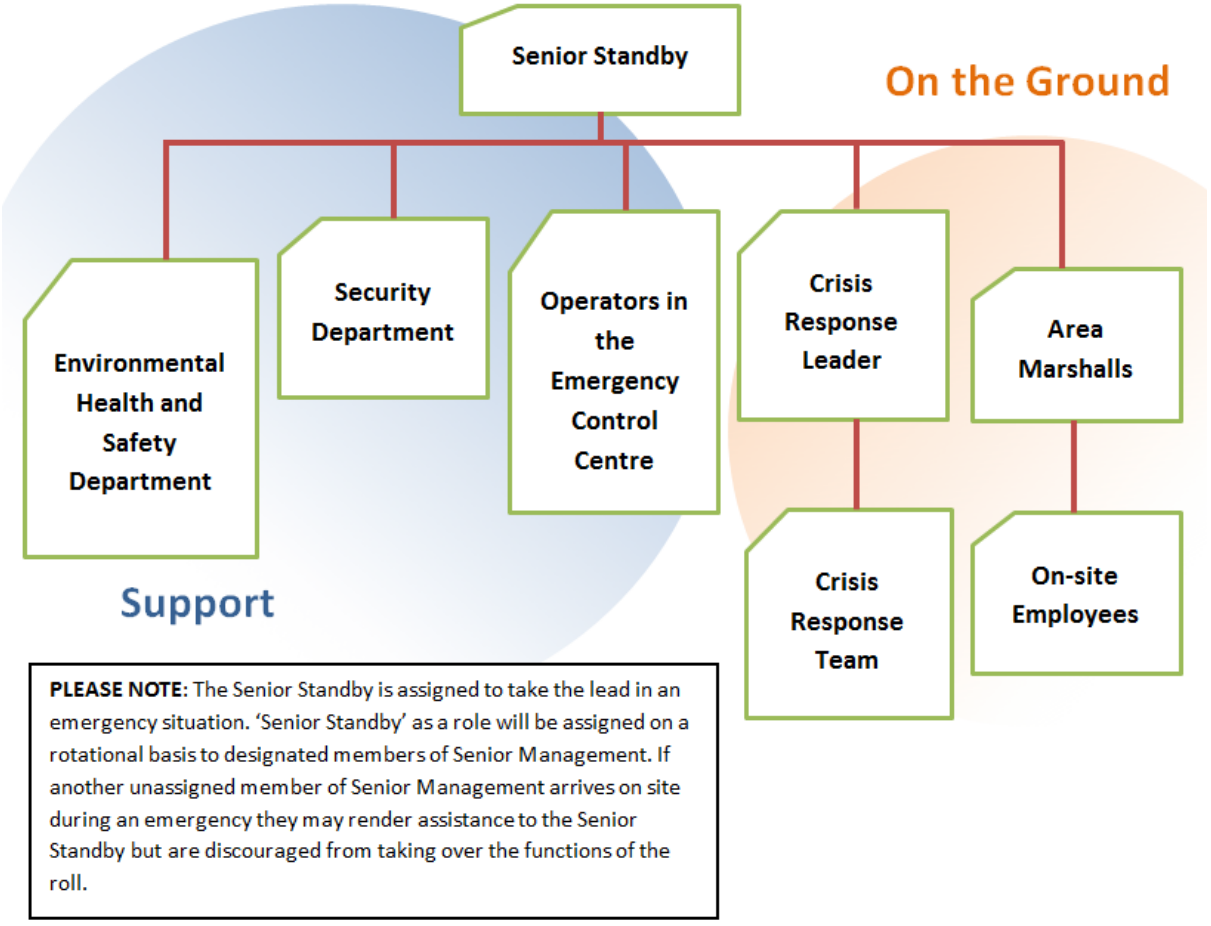

Figure 6-1: Organogram describing roles during an emergency situation

- Operators in the Emergency Control Centre:
  - Are trained operators from the Security Department who man the Emergency Control Centre continuously in shifts and function as:
    - The FIRST emergency reporting facility for all on site personnel;
    - Initial emergency communications facility until the Senior Standby arrives; notifying the Senior Standby, the Crisis Response Leader, the Security Department, Area Marshalls and relevant personnel;
    - Initial operations control until the Senior Standby arrives; operating alarms and coordinating emergency response;
    - Coordination of facility security and traffic control;
  - Is subordinate to the Senior Standby and under his direction at all times, while in communication with him;

- The Senior Standby:
  - Is a designated person or persons with the required knowledge and management skills available on a 24-hour basis who will be in overall command of any emergency, is designated by the site leader and must be able to reach the site within 30 minutes at any time (although standby normally means a service rendered after hours in this case the standby must render this service on a 24 hour basis);
  - Functions as:
    - The communications facility including coordinating or response measures, internal and external, managing alarms and evacuation and mattes of public relations;
    - Operations control; coordinating the operation or shut down of the whole facility;
  - Will coordinate all activities during an emergency from the Emergency Control Centre;
  - Appoints the Area Marshals and oversees the operation of the Emergency Control Centre during day to day operation of the terminal;
  - Is assigned from Senior Management on a rotational basis;

- The Crisis Response Leader:
  - Is a designated person or persons in the Crisis Response Team who takes responsibility in guiding the team's response to an emergency and coordinates with the Senior Standby?
    - The Crisis Response Team would be trained to respond on the ground to an emergency until the emergency is resolved or external emergency services arrive and to assist external emergency responders;
    - The team would function as the internal emergency response and damage control;
  - Is assigned on a rotational basis;

- Area Marshalls:
  - Are designated persons who will control an incident or emergency in the area of their domain of work until the Crisis Response Team arrives and are responsible for the safety of the persons in their area of domain;
  - Are subordinate to the Senior Standby;

- The Site Leader:
  - A designated person with overall responsibility in all respects for the site as a whole;

- Appoints the Senior Standbys and the Crisis Response Leaders who will be assigned on a rotational basis;

- Environmental Health and Safety Department:
  - Are responsible to communicate data to local and state departments where needed, e.g. Department Environmental Affairs, Department of Labour, and to give advice on decontamination procedures and to coordinate proper treatment of water and waste that may be generated during an incident or emergency:
    - Function in terms of damage control, emergency support and protecting the environment.

6.6 Assumptions and Provisions

Certain provisions render this Risk Management and Response Plan effective and practical. The following must be in place to make practical the application of this Risk Management and Response Plan:

1. A particular office should be equipped and manned continually by a trained operator from the Security Department to function as the Emergency Control Centre:

   a. All employees should be made aware of the location, the role and the methods of communicating with the Centre through induction before coming on site the first time;

   b. The Emergency Control Centre should be designed and situated so that it is protected from hazards in the worst emergency conditions, e.g. no windows, doors the open away from possible explosions, reinforced walls;

   c. There should be an up-to-date copy of the registers for every person on site in the Centre at all times and the Area Marshalls for each area should collect a copy every day;

   d. There should be a clearly displayed roster of the rotation of the Senior Standby and Crisis Response Leader;

   e. This is the responsibility of management, the Senior Standby and the Site Leader;

2. The installation of an alarm system, a public address system with base stations at assembly points, prominently displayed windsocks and, where practical, internal telephone lines or a two-way radio system to the Emergency Control Centre for each work area:

   a. These systems should be in working order, checked regularly and, in the case of panic buttons and internal telephone or two-way radio handsets, should be clearly marked for emergencies;

   b. All employees should receive appropriate training to recognise and respond to alarms (along with being notified of the testing schedule) and to locate and interpret the windsocks before being allowed onto site;

   c. This is the responsibility of management, the Senior Standby and the Site Leader;

3. A complete and updated list of contact details of the Senior Standby, the Area Marshall of each area, the Crisis Response Leader of each unit, Environmental Health and Safety Department and the Site Leader should be prominently displayed in the Emergency Control Centre:

    a. This is the responsibility of management and the Senior Standby;

4. A procedure should be established that before entering the facility for the first time all contractors and visitors should have:

    a. A short induction regarding alarm types and tests; windsock and assembly point or shelter in place locations; and the procedure for informing the Emergency Control Centre of hazardous events;

    b. Their names recorded on a daily register on admittance to site that can be used for a missing-person roll call in an emergency situation;

    c. A responsible employee assigned to them who, as far as is practical, will be accountable for their safety on site;

    d. This procedure is the responsibility of management and the Senior Standby;

5. Clearly marked posters should be displayed in all areas especially hazardous areas providing:

    a. The steps an employee, contractor or visitor should take in the case of discovering an incident or emergency;

    b. Simple instructions on how to contact the Emergency Control Centre;

    c. The contact details of the Area Marshall of that area and the Crisis Response Leader;

    d. This is the responsibility of management and the Senior Standby;

6. The emergency shutdown (ESD) system should be maintained and tested on a regular basis.

6.7 Facility Description

Richards Bay Gas Power 2 (Pty)Ltd (hereinafter referred to as RBGP2) is a facility in Richards Bay, that is in the process to develop a new gas fired power plant in Richards Bay, South Africa. The plant comprises of 3 x FT4000 which equals to 6 as turbines.

The **Error! Reference source not found.** facility site location is on Erven 17455, 17443 and 1 7442, uMhlathuze Local Municipality in the Richards Bay Industrial Development Zone 1F at **Error! Reference source not found.** in **Error! Reference source not found.** in KwaZulu Na tal and is 8 km from the deep-sea port.

The location of the site is shown in Figure 6-2 and the site layout is shown in Figure 6-3.

The LPG terminal consists of offices, a control room, workshops, bulk LPG storage, LPG filling and road and rail gantries, as shown in Figure 6-3.

[To be updated]

Figure 6-2: Location of the Richards Bay Gas Power 2 facility in Richards Bay

[To be updated]

Figure 6-3: Site layout of the Richards Bay Gas Power 2 facility in Richards Bay

7 APPENDIX D: ABBREVIATIONS AND ACRONYMS

Asphyxiant	An **asphyxiant** is a gas that is non-toxic but may be fatal, if it accumulates in a confined space and is breathed at high concentrations, since it drives out oxygen-containing air.
Blast Pressure	**Blast pressure** is a measure used in the multi-energy method to indicate the strength of the blast, indicated by a number ranging from 1 (for very low strengths) up to 10 (for detonative strength).
BLEVE	**Boiling liquid expanding vapour explosions** result from the sudden failure of a vessel containing liquid at a temperature above its boiling point. A BLEVE of flammables results in a large fireball.
Emergency	An **emergency** is an event on site that poses danger to employees, contractors, visitors, equipment, the environment or, in extreme cases, on surrounding communities and would result in the Risk Management and Response Plan being activated.
Emergency Response Plan	An **emergency response plan** is a plan in writing that, on the basis of identified potential incidents at the installation together with their consequences, describes how such incidents and their consequences should be dealt with, both on site and off site.
Evacuation	An **evacuation** is a partial or full removal of all employees from affected areas, which may escalate to removal of people from surrounding areas.
Explosion	An **explosion** is a release of energy that causes a pressure discontinuity or blast wave.
Ignition Source	An **ignition source** is a source of temperature and energy sufficient to initiate combustion.
Jet	The **jet** is the outflow of material emerging from an orifice with significant momentum.
Jet Fire/Flame	The **jet fire/flame** is the combustion of material emerging from an orifice with a significant momentum
LOC	See **Loss of Containment**
Local Government	**Local government** is defined in Section 1 of the Local Government Transition Act, 1993 (Act No. 209 of 1993)
Loss of Containment	**Loss of containment** is the event resulting in a release of material into the atmosphere.
Major Hazard Installation	**Major Hazard Installation** means an installation: (a) Where more than the prescribed quantity of any substance is or may be kept, whether permanently or temporarily; (b) Where any substance is produced, used, handled or stored in such a form and quantity that it has the potential to cause a

	major incident (the potential of which will be determined by the risk assessment).
Major Incident	A **major incident** is an occurrence of catastrophic proportions, resulting from the use of plant or machinery or from activities at a workplace. When the outcome of a risk assessment indicates that there is a possibility that the public will be involved in an incident, then the incident is catastrophic.
OHS Act	**Occupational Health and Safety Act**, 1993 (Act No. 85 of 1993)
Risk Assessment	The **risk assessment** is the process of collecting, organising, analysing, interpreting, communicating and implementing information in order to identify the probable frequency, magnitude and nature of any major incident which could occur at a major hazard installation, and the measures required to remove, reduce or control the potential causes of such an incident.
Risk Management and Response Plan	The **risk response planning** involves determining ways to reduce or eliminate any threats to the project, and also the opportunities to increase their impact. Project managers should work to eliminate the threats before they occur. Similarly, the project managers should work to ensure that opportunities occur.
Site	The **site** is total grounds within the security perimeter.
Vapour Cloud Explosion	The explosion resulting from ignition of a pre-mixed cloud of a flammable vapour, gas, or spray with air, in which flames accelerate to sufficiently high velocities to produce significant overpressure.