

**Chevron South Africa (Pty) Limited
Cape Town Refinery**

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1. PURPOSE

To document the procedures that will ensure that effective emergency response rescue plans are prepared for all confined space entries and to ensure that the correct equipment is readily available at the correct location in order to conduct effective emergency rescue if an incident should occur within a confined space.

2. SCOPE

This procedure will apply to all confined space entries.

3. OVERVIEW

Each confined space entry requires a rescue plan to ensure timely response in the event of an emergency. The rescue plan will be completed on site with the Entry Supervisor, Safety Watcher and Fire Department before the job starts, unless requested otherwise for high risk work.

4. DEFINITIONS

IDLH

Immediately Dangerous to Life and Health is where a concentration, or a potential for a concentration, of any toxic, corrosive or asphyxiate substance, that poses an immediate threat to life or would cause irreversible or delayed adverse health, affects or could interfere with an individual's ability to escape from a dangerous atmosphere. This is particularly applicable to where the use of supplied air breathing apparatus is required to sustain life during entry.

OMC

The Operations Maintenance Coordinator who is responsible for issuing the confined space entry permit.

Confined Space

Confined space means any space that meets all of the following criteria:

- A person can bodily enter and perform assigned work;
- The space has limited means of entry and exit;
- The space is not designed for continuous occupancy; and
- The space may contain, or has the potential to contain, a hazardous atmosphere.

RAMS

A Risk Assessed Method Statement is a document that highlights the hazards and controls in place to manage the risks identified in the Method Statement.

5. REQUIREMENTS AND RESPONSIBILITIES

5.1 Responsibilities of the Entry Supervisor

- As per the OSH Act, be competent to perform duties and responsibilities.
- Know the hazards that may be faced during entry including information on signs or symptoms and consequences of exposure to the known hazards (Inhalation, Skin absorption, Injection and Swallowing).
- Verify, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin.

- Oversee entry operations.
- Ensure that all equipment as per the rescue plan is in place before work commences. (See Appendix 4).
- Ensure that the attached confined space rescue plan has been completed (in collaboration with the fire department and Safety Watcher) and that all the rescue equipment identified in the plan is available
- Prevent unauthorized individuals from entering, or attempting to enter, the confined space during entry operations.
- Whenever responsibility for a confined space entry operation is transferred, ensure that entry operations remain consistent with the terms of the entry permit and that acceptable entry conditions are maintained.
- Establish requirements for safe entry conditions.
- Responsible for terminating entry and cancelling permit when:
 - Entry operations covered by the permit are complete
 - A condition that is not allowed arises in or near the confined space
- The Entry Supervisor must ensure that rescue occurs in one of the following ways in order from lowest to highest risk.
 - Self-rescue
 - Non-entry rescue using retrieval device
 - Entry rescue

5.2 Responsibilities of the Safety Watcher

- Ensure that gas monitoring is in place,(as per the Hazard Identification, continuous or periodic) prior to allowing work to commence in a confined space
- Establish communication with all workers, using the means described in the attached rescue plan.
- Remain in constant communication with all workers inside the confined space.
- Ensure that he/she has been fully briefed by the Permit Accepting Authority as to whom to contact in the event of a rescue requirement. (Security Console Operator//Fire Department)
- Ensure that he/she has been given a radio with the Security and Fire Department channels.
- Test radio communications with the contact persons on the various channels before initial entry.
- Ensure that the radio battery is changed with a “fresh” battery when required. The battery is to be checked frequently.
- Ensure that gas test results are entered onto the back of the permit at a minimum of every four hours and after each break but could be more frequent if stated on the permit or hazard identification.
- Withdraw or prohibit all entrants should the gas test validity period expire, whereupon the permit is withdrawn on the grounds of safety.
- Acknowledge and sign the approved Rescue plan.
- Remain observant of changes in conditions inside or outside the confined space that may affect the entrants.

Be able to recognize signs and symptoms of entrant exposure, such as:

- unusual action or behavior of other entrants
- an unexpected hazard
- an unsafe act
- a condition prohibited by the permit

5.2.1 In case of emergency:

- Safety Watcher will summon Rescue Services according to written rescue plan.
- “Safety Watchers” will NOT enter the confined space at any time.
- All “Entrants” shall be safely evacuated from the confined space in an orderly manner.
- All personnel will proceed to the designated evacuation zone.
- All work being conducted in the area will stop until emergency situation is stabilized.
- Immediate gas testing of the confined space will be conducted to determine if safe atmospheric conditions exist for rescue entry.
- External Self Rescue/ Non-entry rescue using retrieval device will be done by Contractor Company until Rescue services arrives at scene.
- Entry rescue will be done by Chevron Fire Department or external emergency services.

5.3 Responsibilities of Confined Space Entrants

- Maintain a means of communication with the Safety Watcher
- Exit the confined space as quickly as possible, when:
 - an order to evacuate is given by the Safety Watcher or Entry Supervisor
 - an entrant recognizes a sign or symptom of over-exposure
 - an unacceptable condition arises
 - an evacuation alarm is activated
- Ensure that he/she has read and understood the approved rescue plan.

5.4 Responsibilities of Confined Space Permit Issuer

- Ensure that all permit conditions for confined space entry are stated on the Permit to Work
- Ensure that the permit reflects what is recorded in the Hazard Identification and the RAMS.

5.5 Responsibilities of the Fire Department

- Conduct a field evaluation of the confined space prior to issuing a written rescue plan.
- Take an initial verification representative gas test of the confined space and check for items listed on entry permit (O₂; H₂S; LEL; CO), working in conjunction with the “Entry Supervisor” and “Safety Watcher” to complete a comprehensive, written rescue plan
- Inspect all contractor equipment which will be used for vertical top special confined space entry (Tripod, full body harnesses, Spreader bar, Fall Arrest, External Mechanical Retrieval system, Respiratory Equipment) and ensure that rescue services are available at all times within the refinery premises while the designated confined space is active with “entrants” inside.
- Conduct a Rescue Simulation Exercise at the Fire School with the contractor before work starts on any vertical top special confined space entry, by entering a special confined space with all necessary equipment and demonstrate rescue capability.

5.6 Responsibilities of Security

Prior to entry work during an Emergency:

Security Console Operator:

- Upon request for external assistance from the Fire Officer or Chief Fire Officer by either radio or telephone, initiate the external emergency services call protocol by Pressing Fire, Ambulance and Speech buttons (linked to the City of Cape Town Fire Control centre) and request a Technical Rescue Team and Ambulance to respond to the refinery and to enter through the entrance closest for rescue requirements.
- Establish location of incident. Record details of incident as well as time call received and time call made as a minimum

Supervisor:

- Test the radio which is normally kept at the North Entrance for fire emergencies, to make sure that the radio is working. Take it to the entrance where the emergency service will enter the premises. Give the radio to the Officer in charge of the Rescue Team and escort the Team immediately to the scene of the incident. - NO DELAYS, PLEASE. Keep a record of all times.

6. EQUIPMENT REQUIREMENTS

6.1 Fall Protection and Non-Entry Rescue Retrieval Equipment

- i. All vertical entries require the use of a full body harness attached to an anti-fall device while ascending and descending ladders or where there is a potential for engulfment (engulfment refers to rescue in an excavation or where the entrant is surrounded by liquids or finely divided solids.).
- ii. Once at the work location entrants must be attached to a mechanical retrieval system located outside the confined space for the duration of the work.
- iii. Retrieval devices must be designed to function as both a retrieval and fall protection mechanism.
- iv. The following are examples where requiring entrants to wear such equipment would create a greater hazard or not allow for safe non-entry rescue retrieval, and therefore waives the requirement for such devices. **The Chief Fire Officer must approve this waiver:**
 - A space with obstructions or turns that prevent pulling on a retrieval line.
 - Where the number of workers within the confined space is such that the use of a lifeline is likely to result in line entanglement which would impede rescue.
 - A space where use of an air supplied respirator and retrieval line is likely to cause the retrieval line to be entangled with the air line. In this case it is a good idea for the retrieval line and the airline to be bundled together to prevent entanglement.

6.2 Special Entry Confined Space (Inert Entry or catalyst wet dump – Vertical Top entry)

Vertical entry in reactors from the top man way for the purpose of catalyst dumping while the vessel is under an inert condition or during a catalyst wet dump.

- All entries into a vertical top *special entry confined space* must have the following equipment in place which must be supplied by the main contractor:

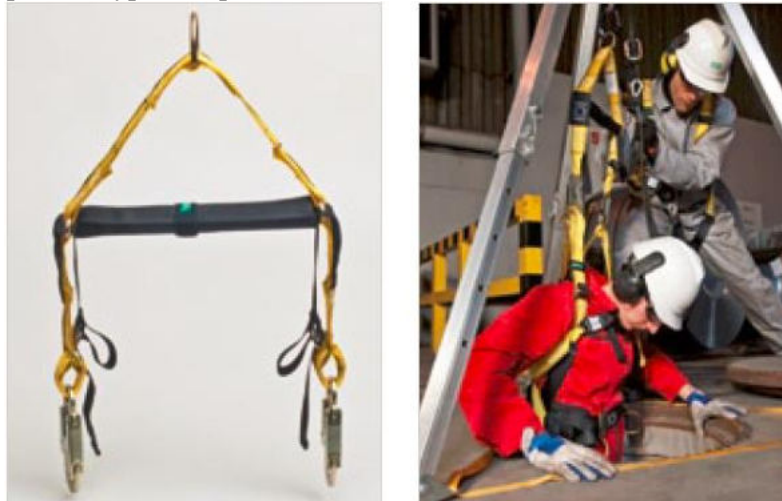
- Tripod, load bearing scaffolding or overhead fixed anchor point.
- External multi-function fall arrest/mechanical retrieval device to protect the worker from falling and have an integral winch mechanism that allows a worker to be retrieved quickly
- Spreader bar which is connected to the D-rings on the shoulders of a manufacturers Full Body Harness.
- Lock-on Non Removable Respiratory Protection hood.

(The Tripod/load bearing scaffolding needs to be secured onto the platform. Lifeline from the fall arrest/mechanical retrieval device must be connected at all times to the spreader bar which is connected to the shoulders of the full body harness (**approval** from **Chief Fire officer** needs to be obtained if lifeline needs to be disconnected from entrant when inside the confined space).

- Approved Type of Full body Harness to be used at Chevron



- Approved Type of Spreader bar to be used at Chevron



6.3 Required Respiratory Equipment for Catalyst and Inert Entry to a Confined Space.

- i. Lock-on Respiratory Protection Helmets are required for confined space entry work inside a vessel for the following conditions:
 - 1. Catalyst work inside a special confined space.
 - 2. All inert entries

3. All non-inert entries into a reactor or vessel that contains spent catalyst, or self-heating/ pyrophoric materials
 4. All entries where catalyst with self-heating/pyrophoric properties are being loaded.
- ii. All Respiratory Equipment (Breathing air) must have a SANS Homologation certificate and Chevron Fire Department needs to inspect the equipment before use.
 - iii. Proof of training on equipment needs to be provided to Chevron Fire Department before work commences.
 - iv. Proof of inspection by a competent person needs to be provided to Chevron Fire Department before use.

6.4 Chain or wire rope ladders (Jacob's ladders)

- i. Chain or wire rope ladders (aka Jacob's Ladders) are ladders with chain or wire stringers as opposed to rigid stringers.
- ii. Jacobs Ladders are not allowed in our facilities for use in normal circumstances.
- iii. The use of a Jacob's ladder should only be considered as a last resort or option. In the rare circumstance that these may be considered, the use must be **approved by the R & M Manager prior to use.**
- iv. Use of a Jacob's Ladder or chain ladder requires a written Equipment Use Plan with the following specific provisions:
 - Description of the specific locations where chain or wire rope access equipment is to be used.
 - Descriptions of tasks requiring access using chain or wire rope equipment access.
 - Justification as to why the use of fixed or portable ladders is not feasible for each location identified for equipment use (a single justification may be used for multiple locations that have substantially the same characteristics).
 - Installation details for each location (a single set of details may be provided for multiple locations that have substantially the same characteristics).
 - An inspection program with annual load testing and maintenance log.
 - Maintenance instructions.
 - TRAINED users – all users must have documented training on the hazards and mitigating the hazards on all provisions for how to use the ladder safely.
 - FALL PROTECTION – all users must be trained on Personal Fall Arrest and secured to a retrieval device by a life line.
 - Employees using chain or wire rope equipment shall wear a safety harness that is attached to a fall protection/rescue retrieval system at all time while on the equipment.
 - The chain or wire rope equipment shall be secured at the top to an anchorage described in the Equipment Use Plan.
 - The chain or wire rope equipment shall be secured at the bottom to a substantial anchorage.

Appendix 1 - CONFINED SPACE DESCRIPTION

Rescue Services

(Check all that apply)

☐ Contractor Provides Own	
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Space Location

(Check all that apply)

Zone:	Section:
Plant No:	Equipment No:
Additional Location Information:	

Space Description

(Check all that apply)

☐ Column	☐ Vessel	☐ Stack	☐ Drum
☐ Reactor	☐ Tank	☐ Furnace	☐ Pipe
☐ Hopper	☐ Pot	☐ Accumulator	☐ Duct
☐ Compressor	☐ Column Skirt	☐ Asbestos Tent	☐ Electrical Vault

Entry Portal Description (large enough to bodily enter)

(Check all that apply)

Number of Entry Portals:			
☐ Round	☐ Oval	☐ Square	
☐ Rectangular	☐ Triangular	☐ Elevated	
☐ Restricted < 24 inches	☐ Non – Restricted > 24 inches	☐ Internally Congested	
☐ Horizontal Entry	☐ Vertical Entry: If checked, equipment listed below must be used		
- External Personal Fall Arrest winch with a spreader bar - Non- Entry retrieval lifeline attached to shoulder "D" rings with Spreader bar - Contractor trained in non-entry rescue procedures			

Work Description

(Check all that apply)

☐ Single Entrants	☐ Multiple Entrants	☐ Mechanical Work
☐ Open, Clean, Inspect	☐ Erect Staging	☐ Hydro-blast / Grit-blast
☐ Welding	☐ Arc Gouging	☐ Interior Coating
☐ Non- Open Flame Hot Work	☐ Demo Work	☐ Catalyst Removal
☐ Water Wash	☐ Remove / Install Trays	☐ Remove/ Install Demister
☐ Does the worker fit the man job specification?		

Hazard / Risk Assessment

(Check all that apply)

☐ Fresh Air Required	☐ Chemical	☐ Physical
☐ MSDS No: _____	☐ Fall of Greater than 6 feet	☐ High Temperature >
☐ Cold Temperature	☐ Sharp Edges	☐ Asbestos
☐ Ceramic Fibers	☐ Noise	☐ High Ventilation
☐ Engulfment Potential	☐ Entrapment	☐ Over / Under Work
☐ Water Jet Cutting	☐ Liquid Leak Test (Deviation)	☐ Dust
☐ Electrical	☐ Flammable Penetrant	☐ Inert Gas

Entry Supervisor Signature

By signing below, I acknowledge that this rescue plan has been reviewed and shared with all Safety Watchers.

Entry Supervisor Name	Entry Supervisor Name
Signature	Signature
Company	Company
Radio Channel / Ph. No.	Radio Channel / Ph. No.
Date / Time	Date / Time

Appendix 2 - CONFINED SPACE DIAGRAM

(use back of page if needed). Include direction of approach and any staging areas.



71C1 – Vertical Entry – load bearing scaffolding with fall arrester and winch to be in place before fire department can sign rescue plan

Safety Watcher to be at entry point with radio comms.

Incase of emegernce contact security by pressing the panic/orange button on a two-way radio or dial 70 on any telephone to initiate rescue.

Chevron Fire Department to perform the rescue.

Patient to be stabilized and transported to the Refinery clinic with Refinery ambulance.

Appendix 3 - SAFETY WATCHER EMERGENCY ACTION PLAN

Evacuation Procedure (if evacuation is necessary)

1. Immediately communicate to entrants to exit the confined space.
2. Summon Rescue Services and report nature of the emergency.
3. Ensure all "Entrants" have exited the confined space and maintain accountability roster.
4. Leave the area last and escort personnel to designated mustering location.

Rescue Procedure (if rescue is necessary)

1. Follow Notification Procedure and summon Rescue Services (Fire and Security Channel). **DO NOT ENTER SPACE**
2. If entrant is within direct line of sight of entry portal and non-entry retrieval system is in place, begin non-entry rescue if trained to do so.
3. If non-entry rescue is not an option, evacuate all non-affected personnel from confined space and maintain accountability roster.
4. Once all non-affected personnel have exited the space, remain at the entry portal and attempt to establish contact with the patient to determine the nature of the emergency.

Medical Aid Procedure (if entrant is injured or requires medical assistance)

1. Follow Notification Information and summon Rescue Services.
2. Provide medical assistance only to the level commensurate with your training.

Notification Procedure Means of Safety Watcher to Entrant Communication (Check all that apply)

☐	Radio Channel	☐	Visual	☐	Verbal	☐	Horn	☐	Whistle	☐	Other
☐	All listed communication devices have been tested by "Safety Watcher"										

Means of Safety Watcher to Entry Supervisor Communication (Check all that apply)

☐	Radio Channel	☐	Other	☐	
☐	All listed communication devices have been tested by "Safety Watcher"				

Means For Safety Watcher to summon Rescue Services (Check all that apply)

☐	Chevron Phone: Extension 70 / 3000	☐	External Phone: (021) 508-3000 or 079 568 3074
☐	Chevron Radio: switch to Fire Channel and Security Channel		
☐	Radio is in working order with good battery tested by "Safety Watcher"		
☐	"Safety Watcher" has been trained in Emergency Response Procedures		

Possible Signs & Symptoms of Exposure

<u>Heat Exhaustion</u>	<u>Heat Stroke</u>	<u>CO Exposure</u>	<u>H₂S Exposure</u>	<u>SO₂ Exposure</u>
Profuse Sweating	Hot , Dry Skin	Headache	Eye Irritation	Eye Irritation
Fatigue	Chills	Dizziness	Cough	Nose Irritation
Dizziness	Confusion	Weakness	Headache	Throat Irritation
Nausea	Slurred Speech	Nausea	Dizziness	Runny Nose
Flushed Skin	High Body Temp	Vomiting	Labored Breathing	Choking, Cough
	Throbbing	Chest Pain	Nausea, Vomiting	Breathing Trouble
	Headache	Confusion	Sore Throat	Cyanosis

Safety Watcher Signature

By signing below, I acknowledge that I have reviewed this Emergency Action Plan and understand my responsibilities. Use Safety Watcher Signature Supplement for additional signature spaces.

Safety Watcher Name		Safety Watcher Name	
Company		Company	
Radio Channel		Radio Channel	
Date / Time	/	Date / Time	/
Signature		Signature	

Appendix 4 - FIRE DEPARTMENT RESCUE PLAN

Rescue Services Planned

(Check all that apply)

☒	Rescue Available (RA) CFD	☐	Rescue Standby (RS)	☐	Technical Rescue Team (TRT)
	RA(2 Rescue Technicians Minimum)		RS(2 Rescue Technicians Minimum)		TRT(6 Rescue Technicians Minimum)

Pre-determined Staging Area (Indicate Locations on Drawing) ☐ N/A

(Check all that apply)

☒	North Side of Space	☐	West Side of Space	☐	East Side of Space
	South Side of Space		Rescue Basket On Site		T-1 Accessible

Non-Entry Retrieval Equipment Required At Entry Portal

(Vertical Entry Requires Option 2 or a Deviation Permit)

(Check One)

	1. Non-Entry Retrieval System Waived by Fire Chief and R&M Manager. If checked indicate reason below:
☐	Entanglement Hazard
☐	Out of Line of Sight Of Opening
☐	Would Create Greater Risk
☐	Other Reason:
☐	1a. Continuous Attachment Waived, yet High Point Anchor Required to be set up to aid in Rescue
☐	2. Entrants Required To Be Continuously Attached To A Lifeline And Harness. If checked indicate:
☒	x Fixed point outside space
☒	x Non-Entry Retrieval System/ Fall Arrest Winch

Bombproof Anchor Point Required ☒ N/A

(Check all that apply)

☐	"A" Frame	☐	Tripod	☐	Weight bearing Scaffolding
☐	Crane Overhead Anchor	☐	Ladder Gin	☐	Rescue Basket
☐	Uni-Hoist	☐		☐	

Harness Type Required ☒ N/A

(Check One)

☐	Single Dorsal "D" Ring	☐	Single Chest "D" Ring	☐	Low Profile Dual Shoulder "D" Rings
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Patient Packaging Equipment Required At Entry Portal ☒ N/A

(Check all that apply)

☐	Stokes	☐	SKED	☐	Scoop Stretcher
☐	LSP Halfback	☐	Backboard	☐	Miller Board
☐	Life Saver Harness	☐		☐	

Medical Rescue / Rehabilitation Equipment Required At Entry Portal ☒ N/A

(Check all that apply)

☐	Trauma Kit	☐	Resuscitator	☐	Drinking Water
☐	Cool Suits	☐	Shaded Area	☐	

Rescue Equipment Required At Entry Portal ☒ N/A

(Check all that apply)

☐	Hauling System	☐	Lowering System	☐	Fall Arrest Winch
☐	Air Purifying Respirators	☐	Air Supplied Respirators	☐	CABE
☐	Continuous Gas Monitoring	☐	Temperature Indicator	☐	
☐		☐		☐	

Fire Department / Final Approval (sign last)

By signing below, I acknowledge that I have conducted a field review of the confined space and formulated a rescue plan based on hazards present and work scope described to me.

Fire Dept Representative (Print)	Signature	Date	Time	Shift Covered