



Work Management Procedures

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Revision History

Rev #	Date of Issue	Status Description	Originator	Checker	Approver
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شركة غاز البصرة
Basrah Gas Company



Version II

WORK MANAGEMENT PROCEDURES



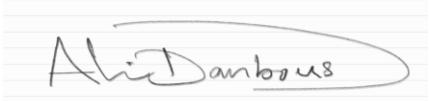


		Increasing Likelihood					Likelihood Definitions	
		Consequences	A	B	C	D	E	
Severity	People	Environment	Never Heard of in the Industry	Has happened in the Organisation or more than once per year in the Industry	Has happened at least once per year in the Organisation or more than once per year in the Industry	Has happened at least once per year in the Organisation or more than once per year in the Industry	Has happened at least once per year in the Organisation or more than once per year in the Industry	Location: Specific BGC Facility location (e.g. South Rumailah, NR NGL, KAZ, etc) Organisation: BGC Oil and Gas Industry
		Asset	No effect	No effect	Slight effect	Minor effect	Moderate effect	
Severity	People Consequences	Asset Consequences	No damage	Slight damage.	Minor damage	Moderate damage	Major damage	
0	No injury or health effect	No damage						No Effect
1	Slight injury or health effect: No Treatment Case or First Aid Case. Illnesses that result in noticeable discomfort, minor irritation or transient effects that are reversible after exposure stops							Slight Effect: Slight environmental damage contained within the premises. Examples include but are not limited to: A small spill in a process area or tank farm area that readily evaporates.
2	Minor injury or health effect: Medical Treatment Case. Lost Workday Case or Restricted Work Case, where either has a duration of up to 10 days. Illnesses with reversible health effects such as food poisoning and dermatitis							Minor Effect: Minor environmental damage, but no lasting effect. Examples include but are not limited to: A small on-site spill with potential to harm the environment that has no off-site impact. On-site groundwater contamination with no potential for off-site contamination. A single exceedance of statutory or other prescribed limit.
3	Major injury or health effect: Lost Workday Case or Restricted Work Case, where either has a duration exceeding 5 days. Illnesses with irreversible health effects such as sensitisation, noise induced hearing loss, chronic back disorders or repetitive strain injury. Mental illness due to stress with reversible health effects							Moderate Effect: Limited environmental damage that will persist or require cleaning up. Examples include but are not limited to: A spill with potential to harm the environment that requires removal and disposal of over 100 m ³ of impacted soil/sand. A spill with potential to harm the environment which reaches surface water off-site. Off-site groundwater contamination. Off-site habitat and/or ecology effects or damage, e.g. fish kill or damaged vegetation. Repeated exceedances of statutory or other prescribed emission limit for longer than 3 months and/or, with potential long-term effect.
4	Permanent total disability or up to three fatalities: Illnesses with irreversible health effects such as corrosive burns, asbestososis and silicosis. Cancer. Mental illness due to stress with irreversible health effects							Major Effect: Severe environmental damage that will require extensive measures to restore beneficial uses of the environment. Examples include but are not limited to: A spill to water with potential to reach a shore and cause harm to the environment. Off-site contamination of surface or groundwater over an extensive area. Requirement for Tier 2 oil spill emergency response. Off-site habitat and/or ecology effects or damage for greater than 1 year. Extended exceedances of statutory or other prescribed emission limits for greater than 1 year and/or with potential long-term effect.
5	More than three fatalities: Illnesses with irreversible health effects such as multiple asbestososis cases traced to a single exposure situation. Cancer in a large exposed population							Massive Effect: Persistent severe environmental damage that will lead to loss of natural resources over a wide area. Examples include but are not limited to: A spill resulting in pollution of a large tract of wetlands, ocean, part of a river estuary or beach/coastal habitat. Requirement for Tier 3 oil spill emergency response. Persistent off-site habitat and/or ecology effects or damage with proven long-term effect.

BGC RISK ASSESSMENT MATRIX (RAM)

See WMP #13 Hazard Identification for Guidance



WMP Owner	 BGC HSE Director: Ali Danbous
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Date	Revision	Description of Revision
March 2021	1.0	Introduction of Work Management Procedure to BGC. The manual communicates BGC's minimum requirements for personal safety in the workplace.
March 2023	2.0	Updated in accordance with improvement & simplification feedback received from the Business

This document in its entirety has a maximum validity of five years from the last revision date. Within this period, this document must be assessed for relevance and re-validated in accordance with the BGC Document Control Procedure.

Suggestions for further improvement in this document should be made via the feedback form found at the back of this document or email via the BGC Hub or to HSE Management Team.

Document No. 0000-BGC-G000-GE00 G00000-HX-6180-00076

Revision 2.0

March 2023

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LIFE SAVING RULES

Bypassing Safety Controls

Obtain authorisation before overriding or disabling safety controls



- I understand and use safety-critical equipment and procedures which apply to my task
- I obtain authorisation before:
 - disabling or overriding safety equipment
 - deviating from procedures
 - crossing a barrier

Confined Space

Obtain authorisation before entering a confined space



- I confirm energy sources are isolated
- I confirm the atmosphere has been tested and is monitored
- I check and use my breathing apparatus when required
- I confirm there is an attendant standing by
- I confirm a rescue plan is in place
- I obtain authorisation to enter

Driving

Follow safe driving rules



- I always wear a seatbelt
- I do not exceed the speed limit, and reduce my speed for road conditions
- I do not use phones or operate devices while driving
- I am fit, rested and fully alert while driving
- I follow journey management requirements

Energy Isolation

Verify isolation and zero energy before work begins



- I have identified all energy sources
- I confirm that hazardous energy sources have been isolated, locked, and tagged
- I have checked there is zero energy and tested for residual or stored energy

Hot Work

Control flammables and ignition sources



- I identify and control ignition sources
- Before starting any hot work:
 - I confirm flammable material has been removed or isolated
 - I obtain authorisation
- Before starting hot work in a hazardous area I confirm:
 - a gas test has been completed
 - gas will be monitored continually

Line of Fire

Keep yourself and others out of the line of fire



- I position myself to avoid:
 - moving objects
 - vehicles
 - pressure releases
 - dropped objects
- I establish and obey barriers and exclusion zones
- I take action to secure loose objects and report potential dropped objects

Safe Mechanical Lifting

Plan lifting operations and control the area



- I confirm that the equipment and load have been inspected and are fit for purpose
- I only operate equipment that I am qualified to use
- I establish and obey barriers and exclusion zones
- I never walk under a suspended load

Work Authorisation

Work with a valid permit when required



- I have confirmed if a permit is required
- I am authorised to perform the work
- I understand the permit
- I have confirmed that hazards are controlled and it is safe to start
- I stop and reassess if conditions change

Working at Height

Protect yourself against a fall when working at height



- I inspect my fall protection equipment before use
- I secure tools and work materials to prevent dropped objects
- I tie off 100% to approved anchor points while outside a protected area

These Work Management Procedures (WMP) contain reference to BGC's 9 Life Saving Rules (LSR).

Failure to comply with these rules may result in disciplinary action up to and including termination of employment.



PROCESS SAFETY FUNDAMENTALS

A green icon showing two white valves with red numbers 1 and 2 inside them.	Always use two barriers for hydrocarbon and chemical drains & vents	A green icon showing a silhouette of a person wearing a hard hat and safety vest, standing next to a drain with a red liquid flowing from it.	Do not leave an open drain or critical transfer unattended
A green icon showing a white valve with a red exclamation mark over it.	Take interim mitigating measures in case of failure of Safety Critical Equipment	A green icon showing a clipboard with a checklist. The first item has a red checkmark and the second item has a red X.	For all defined high risk activities, follow the procedures and sign off after each step
A green icon showing a horizontal pipe with two white valves.	Walk the line – Verify and validate any line up change	A green icon showing a document titled "MOC" with a signature at the bottom.	Do not make a change without a proper MOC
A green icon showing a white valve with a red checkmark inside a red square.	Verify for complete tightness after maintenance work	A green icon showing a pressure gauge with a red needle pointing to zero.	Always check that equipment is pressure free and drained, and provides safe isolation before starting maintenance work
A green icon showing a utility connection with a valve and a red backflow preventer symbol.	Perform MOC and install backflow protection when connecting utilities to process	A green icon showing a factory silhouette with a red alarm light on top.	Respond to critical alarms

These work management procedures contain reference to BGC's 10 Process Safety Fundamentals (PSF).

Failure to comply with these fundamentals may result in loss of process containment (LOPC) and extensive assets damage, injury and even death.



Note From BGC Managing Director

Safety is good for Business and is at the core of everything we do in BGC.

Our aim is to protect and safeguard our employees, contractors, the environment, our communities and BGC's assets. It is therefore essential that we all know and comply with the BGC HSE requirements. We all have the responsibility to protect ourselves and others.

The WMP is a manual that communicates our HSE requirements and best practices and focusses on what is really needed at the work front to keep people safe.



This version 2 of the WMP captures learnings since the implementation of Version 1 and improvement & simplification feedback received from the Business from using the WMP in the field over the last year.

Scope of the WMP

- The WMP captures key activities completed by frontline BGC staff and contractors. Activities conducted by specialized contractors only (e.g. Ionizing Radiation, Tank Cleaning, Asbestos Category 2) may have additional requirements.

Implementation: Roles & Responsibilities

- All BGC and contractors are responsible for following the WMP requirements. If anyone sees these requirements not being followed, they must safely intervene.
- Line Managers (BGC and Contractors) are responsible for ensuring these requirements are available to workers and appropriate supervision and control is in place (including Permit-To Work (PTW), where required) to check that the requirements are understood and implemented.
- Plant, Site and Facility Managers are responsible for confirming that works undertaken on their area of responsibility are confirmed as being in accordance with BGC WMPs.

Training & Competencies

- A number of WMP sections define activity specific training and competence requirements (e.g. WMP #25 PTW) staff and contractors have to meet enabling them to conduct these activities safely.
- On top of these specific requirements as a minimum all BGC staff and contractors shall complete the 'BGC HSE Corporate HSE Induction' supported by site specific HSE orientations

Forms and other Communication Material

- All forms and other communication material in the Appendixes of each WMP section can be download as native file from SpheraCloud and the WMP Portal:
[https://basrahgasccompanyiq.sharepoint.com/sites/AAAAB5066/SitePages/Work-Management-Procedures-\(WMP\)\(1\).aspx](https://basrahgasccompanyiq.sharepoint.com/sites/AAAAB5066/SitePages/Work-Management-Procedures-(WMP)(1).aspx)

Interpretation and Updating

- BGC HSE Risk & Assurance Lead shall ensure periodical update of this WMP as required.
- BGC HSE Director shall direct enquiries on interpretation of this procedure to the most appropriate BGC authority.



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Work Management Procedure #1 Blasting & Painting

1 Overview and Hazards

1.1 This WMP covers blasting and painting activities, which are performed to renew, restore and maintain surface coatings to protect structures, plant and equipment from corrosion and damage. Abrasive blasting uses compressed air or water to direct a high velocity stream of an abrasive material to clean an object of surface, remove corrosion, scale catalyst, apply a texture or prepare a surface to apply a paint or type of coating.

Hazards include:

- High pressure water;
- Confined space;
- Poor ventilation /low oxygen;
- Dust;
- Grit/sand blasting – potential ignition source (static electricity);
- Noise;
- Toxic materials e.g. metals, silica and paint.

Relevant Life Saving Rules and Process Safety Fundamentals

Bypassing Safety Controls	Confined Space Control	Energy Isolation Control	Line of Fire
 Obtain authorisation before overriding or disabling safety controls	 Obtain authorisation before entering a confined space	 Verify isolation and zero energy before work begins	 Keep yourself and others out of the line of fire
Hot Work	Work Authorisation	Pressure Free & Drained	
 Control flammables and ignition sources	 Work with a valid permit when required	 Always check that equipment is pressure free and drained, and provides safe isolation before starting maintenance work	

2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the Hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.
- 2.2 Confirm supervision arrangements including any necessary support, including HSE Advisors, emergency response, gas testing, etc.
- 2.3 Use low toxicity abrasive blasting material. Use abrasives that can be delivered with water (slurry) to reduce dust.
- 2.4 Use barriers and curtain walls to isolate the blasting operation from other workers. Use blast rooms or blast cabinets for smaller operations. Use restricted areas for non-enclosed blasting operations. Keep co-workers away from the blaster.
- 2.5 Use exhaust ventilation systems in containment structures to capture dust.
- 2.6 Only trained and competent blasting and painting personnel shall carry out the activities.



- 2.7 All blasting and painting equipment (air receivers, blasting pots, pressure hoses and paint pumping units) must have valid test and inspection certificates. Equipment must be tagged with a unique identifier, test and certification records shall be available on-site. Ensure equipment is in good condition before use.



- 2.8 **Pump relief devices** (relief valve and/or rupture disc) are in place. Every high-pressure pump must have at least one pressure relief device.

2.9 Pressure Gauge

Every high-pressure pump must have a pressure gauge to indicate system pressure. The gauge must have a scale range of at least 50% above the maximum operating pressure of the high-pressure pump.

2.10 Hoses

Hoses must be armoured, fit for purpose and not be operated above their **Maximum Allowable Working Pressure** (MAWP). Hoses must have a burst pressure at least 2.5 times the MAWP. Hoses must be connected by means of properly rated couplings, with 'whip checks' in place, see WMP #29 Temporary Flexible Hose Assemblies.

- 2.11 Pump filters are clean and suitable for high temperature operations.

- 2.12 Gauges, shields and safety interlocks are in place and in working order.

No plugging in nozzles of jetting gun or flex lance.

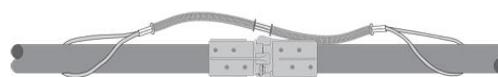
- 2.13 All key components are inspected and in good working condition including:

- Bonding and grounding connections and cable (metal-to-metal contact);
- Seals, fittings and couplings are tight, clean and of correct pressure rating;
- Water/dry blasting machine electrical leads and connectors.

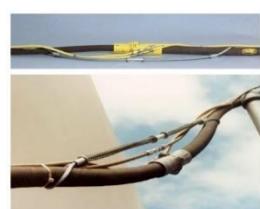
- 2.14 Blasting guns and paint spray guns must be fitted with deadman switch – trigger and Must be in good working condition i.e. immediately dump the pressure either through a diffuser, a pressure regulating valve, or a foot dump when the trigger is released.

- 2.15 Securing the blasting guns and paint spray guns trigger in the **ON position** is strictly prohibited.

- 2.16 Blasting hoses must have secondary hose end retaining or locking devices fitted to retain the hose end in the event of primary connector failure. Use of jubilee clips / clamps is prohibited.



Blast Hose Safety Cable



- 2.17 All work must be carried under a **Permit-To-Work** (PTW) as described in WMP #25 PTW. A **Job Hazard Analysis** (JHA) shall be prepared in conjunction with the PTW, see WMP #13 Hazard Identification. Grit/sand blasting is considered Category 2 Hot Work, see WMP #16 Hot Work.



2.18 Personal Protective Equipment (PPE)

When selecting the appropriate PPE to be worn (e.g. for high-pressure water jetting), it is essential that a risk assessment be carried out in advance of commencing operations as part of the PTW process and that the correct selection is made relative to the pressure



and flow rate being used and the hazards that have been identified. Workers shall be trained in the safe use of equipment and to wear the required PPE as described below.

- Use disposable or half mask or hood or Breathing Apparatus (BA) where applicable - to be specified by the task required;
- When using water-based painting material, worker should wear P3 dust filter and for solvent based painting material, worker should wear half face mask with appropriate OV filter combined with P3 dust filter.



2.19 Low pressure water jetting (up to 100 bars)

- Waterproof suit with BGC coverall underneath
- Safety helmet with face shield (Fig A) and hearing protection.



FIG A FIG B

2.20 High Pressure water jetting (more than 100 bars)

The following PPE is required:

- Specialised coveralls must be worn (e.g. Cut-resistant protective Kevlar® suits)
- Standard waterproof work gloves;
- Safety helmet with face shield (Fig A);
- Safety footwear (Fig B Cut resistant boots available in PPE warehouse).

2.21 In addition, PPE may also include air-fed helmets with a constant supply of fresh, clean breathing air, see WMP #26 PPE.

Strongly recommended: The addition of an air cooler to maintain air supply within the acceptable temperature range of the equipment and the use of visor outer surface 'tear-offs' in acetate or similar material to enable operators to maintain full visibility.

2.22 Painting

In addition to the PPE requirements, protection for painters shall be given as follows:

- Open air circumstances: filter mask or cartridge type respirator and shielded or baffled goggles;
- Confined space circumstances: air-fed helmet;
Confirms if the equipment must be water/dry blasted which could contain flammable or combustible materials is free from hydrocarbons and isolated, see WMP #20 Isolations.



2.23 Storage of Blasting Materials

Abrasives for blasting shall be stored in designated storage areas, kept dry to prevent excessive deck loadings from the added weight of water and with warning signage:

- Bags and sacks shall be neatly stacked no more than waist height and shall not block access ways;
- Personnel directly involved in lifting abrasive bags shall be trained in manual lifting or rigging techniques.



2.24 Storage of Painting Materials

All painting materials including paint, solvents, thinners, additives and cleaners must be stored in a non-enclosed area remote from sources of heat and combustion and protected from direct sunlight.

- All paint **Material Safety Data Sheets (MSDSs)** information shall be made available for all painting materials, see WMP #11 Handling Chemicals;
- Materials shall be stored in a spill container that can retain at least 110% of the total volume of the material;
- All paint materials shall be contained in manufacturers original containers, durably and legibly marked with descriptions of the contents;
- Where paint is transferred to smaller containers paint contents shall be labelled on the smaller containers;
- Drink bottles shall never be used for these purposes;
- A dry-chemical or foam fire extinguisher shall be maintained within 10m from the storage location.

3 Do The Work

3.1 General

Before work starts, the area surrounding the water/dry blasting area must be barricaded off to restrict access. A warning notice – “Keep Clear – High Pressure Blasting” must be displayed at the area of operations, see WMP #27 Safety Signs & Barricade.

- 3.2 Always maintain good housekeeping including removal of blasting grit by the end of each shift, return paint containers to hazardous materials storage area and coiled hoses.
- 3.3 Keep the working surface, including any platform or scaffold, clear of debris that may accumulate during the water/dry blasting process.
- 3.4 Use only equipment, hoses, fittings, couplings and accessories specifically designed or intended for use with high pressure systems.
- 3.5 Protect all electrical equipment and instrumentation from water ingress and jets.
- 3.6 All objects to be water/dry blasted shall be fixed using properly with engineered brackets, clamps, braces, jigs or fixtures.
- 3.7 Ensure firefighting capability is available at the work location as per PTW (JHA) e.g. portable fire extinguishers dry chemical type:
 - Emergency phone numbers and the designated person in charge contact number shall be clearly printed and made available at worksite.



- 3.8 If it cannot be avoided, blasting on live equipment can be executed taking instructions in BGC Procedure ‘Blasting on live equipment’ into account and contacting the the responsible TA.

3.9 Equipment Operator Must Do's

- Always have good vision through the PPE visor. If vision is blocked or restricted at any time, the water/dry blasting is to STOP until the restriction has been removed.
- Position hoses from the pumping unit through to the lance/gun to come from directly BEHIND the Equipment Operator and NOT from either side or front, to reduce any tripping hazard.
- Do not hand hold an object while water/dry blasting is taking place.
- Never point a blasting or spray gun at a person.



- Never place any parts of the body over a jetting nozzle.
- Always engage the trigger safety catch when work is interrupted.
- Never leave the water/dry blasting system unattended when pressurized. Always switch off the pump when not in use.
- Not eat or drink during materials transfer, mixing, thinning and application.

3.10 Flexible Lance – Requirements

- For flexible lances, a back-out preventer shall be used.
- Do not attempt to use the flexible lance to jet the ‘dead zone’ near the orifice opening
- Hose shall be fully depressurized before the lance is removed from the piping or equipment.
- Use an attachment such as a ‘stinger’ when carrying out water/dry blasting activities using any flexible lance. The stinger shall be at least as long as the inside diameter of the pipe being water/dry blasted to avoid it turning back and exiting the pipe at high velocity.
- The Equipment Operator shall stand away from the ‘Line of Fire’ and maintain a safe distance from the opening. This safe location shall be determined before the start of the water/dry blasting operation.
- The person who manipulates the lance shall also be the person who actuates the lance.
- There shall be no separation of the Equipment Operator from actuator e.g. a second person operating a step-activated dump valve is strictly not permitted.
- Always check the manufacturer’s instructions before using any part and ensure that components are identified with the MAWP. If the MAWP is not identifiable, the equipment part shall not be used until the MAWP is determined through documentation provided by the manufacturer or a Professional Engineer.



3.11 Environment & Waste Management.

- Implement the correct waste disposal process for any solids and liquids generated, see WMP #30 Waste Management.
- Clean up any spillage of abrasive, paint, thinners, solvent and detergent immediately (spill kit) and dispose of cleaning material correctly, as per MSDS.
- Paint thinners and solvents shall always be placed in a spill tray to avoid containment to the environment.

3.12 Health

- Inhalng spray paint could penetrate the skin or enters the eyes resulting e.g. dizziness, nausea or a burning sensation in the eyes. In such circumstances, medical attention shall be obtained immediately.
- MSDS must be available at the worksite and explained to the work crew involved. Paint mixing stations shall be provided with eye wash bottles.
- Emergency phone numbers and the designated person in charge contact number shall be clearly printed and made available at worksite.
- Conduct compressed air supply breathing air tests for carbon monoxide, carbon dioxide and oil mist for health risk protection before starting of the activity. Instrument air shall never be used for breathing purposes. Test results must be available at the work site.



- When working in dusty environments, to prevent or minimize the risk of foreign bodies in the eyes to prevent eye injury, remove the build-up of debris on an individual. Best practice is to use a hand-held vacuum or handheld brush.
- Dry Abrasive blasting must not be carried out near running machinery, engine and ventilation system air intakes, valve spindles and actuators, instrument gas pipework, electrical cables, light fittings etc. Dry Abrasive blasting can only be performed if the items have been protected and approved by the Shift Engineer.
- Operate equipment at the lowest pressure necessary to achieve the required quality. Never exceed the Safe Working Pressure, as stated on the equipment.
- Carry out servicing or adjustment of equipment only after it has been depressurized. Release the system pressure, close all isolating valves and open drains and vents before disconnecting any part of the system.
- The water/dry blasting system shall be depressurized anytime when a replacement or repair is made to the system. Any replacement, changes, repairs, or other modifications to high pressure fittings shall be performed by a competent person.



4. References and Resources

Relevant WMPs

- #3 Confined Space Entry
- #5 Emergency Response
- #13 Hazard Identification
- #25 Permit to Work
- #26 Personal Protective Equipment
- #29 Temporary Flexible Hose Assemblies
- #30 Waste Management

BGC ToolBox Talks, Communication Materials, Posters and Information

- 'ToolBox Talk for Water/Dry Blasting' (Appendix 1)

5. Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC Maintenance Director	31-03-2022	Retained on sign-off form
Custodian	BGC Civil, Struct, Marine TA2	31-03-2022	Retained on sign-off form



Appendix 1 'ToolBox Talk for Water/Dry Blasting'

Toolbox Talk Discussion Points	
1	Only authorised personnel shall be allowed to conduct water blasting.
2	All work shall be carried under a Permit-To-Work (PTW) .
3	A Job Hazard Analysis (JHA) shall be prepared in conjunction with a PTW.
4	Confirm that equipment to be water/dry blasted which could contain flammable or combustible materials is gas free and isolated in line with WMP #20 Isolations
5	Pump unit is in good condition.
6	Pump relief devices (relief valve and/or rupture disc) are in place.
7	Pump filters are clean.
8	Hydraulic hose reel (if applicable) is in good condition and within test date
9	Gauges, shields and safety interlocks in place and in working order
10	Nozzles of jetting gun or flex lance are free from plugging and in good operating condition
11	Bonding and grounding connections and cable (metal-to-metal contact)
12	Hoses have correct pressure rating, have no structural damage and are specifically designed for water blasting.
13	Any hoses that have obvious signs of damage shall not be used
14	Signs of damage include kinks, crushing, stretching, or blistering, rusted and broken reinforcing wires.
15	All fittings and couplings are tight, clean, in good order and of correct pressure rating
16	Seals shall be replaced and lubricated as necessary
17	Electrical leads and connectors are in good condition
18	Hoses shall not be operated above the Maximum Allowable Working Pressure (MAWP) .
19	Hoses shall have a burst pressure at least 2.5 times the MAWP.
20	Hoses shall be connected by means of properly rated couplings, with "whip checks" in place
21	Hoses shall be kept as short as possible.
22	Hoses from the pumping unit through to the lance/gun to come from directly BEHIND the Equipment Operator and NOT from either side or front, to reduce any tripping hazard.



Work Management Procedure #2 Breaking Containment

1. Overview and Hazards

1.1 Breaking Containment is a general term used to identify where a flange / fitting or other type of joint is opened, thus allowing the contents to be exposed to the outside of the containment equipment. The containment equipment can be any piece of equipment used to prevent the medium from escaping. Examples of containment equipment include pipes, valves, tanks, pumps, compressors, vessels etc. Breaking Containment is a PLANNED activity and can occur during operational, maintenance and turnaround events

For the use of the BGC Permit-To-Work (PTW) system, Breaking Containment is defined as "Opening a joint of any type, which has the potential to cause harm to people, assets and/or the environment, due to the contained material which, under normal operating conditions, is either hazardous, toxic or corrosive".



1.2 Hazards

The act of breaking containment itself can be very hazardous because it is normally not known for certain, exactly what is inside the container. This, for example, could be at high pressure and high or low temperature. Some examples of breaking containment and its potential hazards work are detailed below:

Activity	Potential Hazard
• Removing a valve on a hydrocarbon gas system	• Hydrocarbons and /or N2
• Spading or de-spading an oil line for positive isolation purposes	• Hydrocarbons and /or N2, oil spills
• Opening a TEG filter housing	• Hazardous liquids and vapours
• Changing out an LPG service valve	• Low temperature hydrocarbons and/or N2, LPG spills
• Spading a hot oil pump	• High temperature hot oil and vapours, hot oil spill
• Changing a gauge with small bore fittings on a compressor containing H ₂ S	• Hydrocarbons / N2 / H ₂ S.

Hazards of breaking containment activities are managed under the BGC Permit-To-Work (PTW) system (see #25 PTW) and are a multidisciplinary effort.



For breaking containment on systems containing non-hazardous materials (for example air or water) then there is no requirement for a breaking containment permit. However a JHA should be considered to identify the hazards and controls, particularly in systems which have a pressure envelope, for example instrument air.

Relevant Life Saving Rules and Process Safety Fundamentals



Bypassing Safety Controls	Confined Space Control	Energy Isolation Control	Hot Work
Obtain authorisation before overriding or disabling safety controls	Obtain authorisation before entering a confined space	Verify isolation and zero energy before work begins	Control flammables and ignition sources
Work Authorisation	Working at Height	Pressure Free & Drained	Attendance
Work with a valid permit when required	Protect yourself against a fall when working at height	Always check that equipment is pressure free and drained, and provides safe isolation before starting maintenance work	Do not leave an open drain or critical transfer unattended
High Risk Activities	Walk the Line	Use of two Barriers	Tightness
For all defined high-risk activities, follow the procedures and sign off after each step	Walk the Line – Verify and validate any line-up change	Always use 2 barriers for hydrocarbon and chemical drains & vents	Verify for complete tightness after maintenance work

2. Plan The Work

2.1 General Requirements

When planning the work, confirm that all workers have the necessary training for the task. This shall include but not limited to:

Required Training	Role/Position
<ul style="list-style-type: none"> PTW level 1 training BGC HSE Induction and HSE site specific briefing 	Site workers
<ul style="list-style-type: none"> PTW level 2 training JHA training Authorised Gas Tester (AGT) 	Person In Charge of the Worksite – PICWS (can be also covered by dedicated AGT)
<ul style="list-style-type: none"> Self-Contained Breathing Apparatus (SCBA) Supply Air Breathing Apparatus (SABA) 	if required

2.2 When working with a Breaking Containment permit the following documentation shall be required:

- Job Hazard Analysis (JHA)** as the primary means of risk assessment, with **Toolbox Risk Identification Card (TRIC)** (see WMP #13 Hazard Identification) being utilized at each shift start.
- A Process and/or Electrical Isolation Certificate as per OMP14/WMP 06 Electrical Safety
- If applicable an Override certificate as per OMP17.
- A gas test certificate as per OMP13.

PERMIT TO WORK - BREAKING CONTAINMENT		WORK SITE RESPONSIBILITIES	
Task Description	1. PERMIT APPLICATION	2. ACCEPTANCE BY PERSON IN CHARGE	Date of the Person in Charge of the Worksite (PICWS) will be informed to:
Applicant Name	Confirmed from PTW No:	Name	Signature
Process	Site	Date	Date
Lockout/Tagout	None	Initial Lockout	Initial Date
Re-Tagging	None	Final Tag	Final Date
Emergency Contact	None	Emergency Procedure	
Work Description			
3. SPECIAL PRECAUTIONS			
Process Isolation	Yes	Continuous Monitoring	Yes
Other Test		Test Frequency	(Time)
Containment System Isolation		Class Category 1	
Electrical Isolation		Class Category 2	
Isolation Verification		Unclassified	
Residual Risk		HSE Classification (Risk)	
Radiography/Cook-off		HESI Impact	
Debris Removal		HESI Arrested	
Condition for Test		HESI H2	
Limitation of Access			
Authorization / Consent (Task)	Administrator	Administrator	
ABP Name	Sign	ABP Name	Sign
4. AUTORISATION			
Recent Approval - I have checked the job, the controls and precautions to the best of my knowledge.			
Non-Workshop Approval - I have checked the job, the controls and precautions to the best of my knowledge.			
AP Name	Sign	AP Name	Sign
AP Position	Sign	AP Position	Sign
AP Signature	Sign	AP Signature	Sign
5. ENDORSEMENT FOR CONTINUED SAFETY AT THE WORKSITE			
By PICWS I understand that this date and time to continue working has been set aside for work completion in endorsement period.			
UHR Engineer	Date	Induct	Date
PICWS (Work Shop)	Date	Induct	Date
PICWS (Work Site)	Date	Induct	Date
PICWS (Work Site)	Date	Induct	Date
PICWS (Work Site)	Date	Induct	Date
PICWS (Work Site)	Date	Induct	Date
PICWS (Work Site)	Date	Induct	Date
PICWS (Work Site)	Date	Induct	Date
PICWS (Work Site)	Date	Induct	Date
PICWS (Work Site)	Date	Induct	Date
6. COMPLETION / CANCELLATION OF PERMITS			
6.1 WORK COMPLETED			
APC Name	Sign	APC Name	Sign
AP Position	Sign	AP Position	Sign
AP Signature	Sign	AP Signature	Sign
6.2 WORK NOT COMPLETED			
APC Name	Sign	APC Name	Sign
AP Position	Sign	AP Position	Sign
AP Signature	Sign	AP Signature	Sign
6.3 CANCELLATION BY PERMIT COORDINATOR			
APC Name	Sign	APC Name	Sign
AP Position	Sign	AP Position	Sign
AP Signature	Sign	AP Signature	Sign
6.4 REGISTRATION OF CANCELLATION BY PERMIT COORDINATOR			
APC Name	Sign	APC Name	Sign
AP Position	Sign	AP Position	Sign
AP Signature	Sign	AP Signature	Sign



- 2.3 For Breaking Containment on a system which has already been spaded in close proximity, (less than 5m as a guide), to the work (for example removing an already spaded pump), then there is no requirement for a Breaking Containment permit, as containment has already been broken previously (along with DFPV) for inserting the spades. This should be highlighted in the special precautions section of the permit used and highlighted during the toolbox talk
- 2.4 For breaking containment on systems containing non-hazardous materials (for example air or water) then there is no requirement for a Breaking Containment permit. However, a JHA should be considered to identify the hazards and controls, particularly in systems which have a pressure envelope, for example instrument air.
- 2.5 Breaking Containment Confined Space (#3 Confined Space Entry) or Excavation (#7 Excavation) has its own hazards to consider, which need to be accounted for in the JHA 
- 2.6 Breaking containment of flare systems has specific N2 purging requirements which are described in Draining, Flushing, Purging & Venting procedure (OMP18).

3. Do The Work

3.1 Before Starting the Work

Ensure that there is no conflicting Manual of Operations (MOPO) or Simultaneous Operations (SIMOPS) review is conducted in the PTW office, to ensure there are no conflicting activities in close proximity to where the breaking containment will take place. Some examples of conflicts could be :

- Hot Work 1 within 50m of the Breaking Containment (HC gas from the Breaking Containment could migrate to the HW site and cause a fire or explosion) 
- Excavations in close proximity (HC's or H2S from the Breaking Containment could migrate to the excavation and cause harm to the workers)
- Lifting operations in close proximity (HC's from the Breaking Containment could migrate to the crane and cause an explosion)

Work at Height (WAH) in close proximity (gases from the Breaking Containment may impede the WAH party from escaping the area safely). 

3.2 The following steps shall be followed and are the responsibility of Operations:

- Execution of the isolation plan (OMP14)
- Execution of the Draining, Flaring, Purging, Venting (DVPF) plan (OMP18):
 - Reduce pressure.
 - Aid removal of liquids to the closed drain system.
 - Remove hazardous liquids.
 - Remove hazardous vapours by depressurisation.
 - Flush.
 - Purge with nitrogen (if applicable)

Purge with air if required.

3.3 When it's not reasonably practicable to depressurize the equipment or make it free of hazardous fluids prior to breaking containment, local procedures must be put in place to ensure that the work parties who are involved in breaking the containment are informed of the nature of the (possible) residual hazard along with the basic safety precautions that are required to control the hazard.



3.4 At the Worksite

- Install barriers around the worksite to prevent unauthorized entry of personnel.
- 3.5 Do a final assessment before work starts using a TRIC. Ensure the workforce understand the work and the associated hazards, controls and what to do if there is an emergency
- 3.6 Ensure all JHA hazard controls and mitigations are in place, including the initial Gas Test completed by an Authorised Gas Tester (AGT).
- 3.7 The Area Operations Technician (AOT) must always be at site during the initial breaking of containment to confirm/address the following:
 - Physically check the plant configuration to confirm that the isolation schedule/P&IDs (or as-built drawings) are accurate.
 - Identify the first point of break.
 - Check for gas and to deal with any unforeseen circumstances such as continuous gas leak, liquid leak etc.
 - Ensures the nuts or bolts are partially removed until the line is proven to be isolated and depressurized.
 - Ensures the flange is always “spread” at a point furthest away.
 - Ensure the workparty wear Full-face protection during the initial break
 - Ensures the appropriate respiratory protections are used where there is a risk of inhalation of released gas (HC, N2, H2S, etc.).

4. References and Resources

Relevant WMPs

- #13 Hazard Identification Relevant WMPs
- #20 Isolations
- #5 Emergency Response
- #25 Permit to Work

5. Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC HSE Operations Manager	31-03-2022	Retained on sign-off form



Work Management Procedure

#3 Confined Space Entry (CSE)

1. Overview and Hazards

1.1 Confined Space is a:

- Fully or partially enclosed space that is not designed and constructed for continuous human occupancy, and
- Has limited or restricted entry or exit, and
- Where there is a risk of injury or health effect from hazardous substances or conditions.

CSE may be required for inspections, maintenance, repairs, cleaning of process vessels and construction projects.



Examples include storage tanks, boilers, furnaces, pits, pipes, drains, sewers, sewage pits, tunnels, excavations (deeper than 1.2m on live operational sites), ducts and process vessels. Full CSE rules apply if a person's head comes within 30cm of an opening into a confined space.

Confined Spaces – Examples



Confined space entry



Confined Space Valve Pit



Confined Space Rescue Exercise

1.2 Hazards include:

- An atmosphere with too much or too little oxygen, flammability, explosivity, toxicity, or high temperature
- Restricted means for exit or entry
- Activities that can release the hazards within the space (e.g., carrying out Hot Work, disturbing solids or fluids within the space)
- Reduced visibility and / or poor lighting
- Difficulty moving due to bulky PPE, breathing equipment, harnesses, etc
- Potential falls due to vertical entry points
- Vessel internals, such as weirs, traps, pipework





Relevant Life Saving Rules and Process Safety Fundamentals

Confined Space Control	Energy Isolation Control	Hot Work	Work Authorisation
 Obtain authorisation before entering a confined space	 Verify isolation and zero energy before work begins	 Control flammables and ignition sources	 Work with a valid permit when required
High Risk Activities	Walk the Line	Tightness	Pressure Free & Drained
 For all defined high-risk activities, follow the procedures and sign off after each step	 Walk the Line – Verify and validate any line-up change	 Verify for complete tightness after maintenance work	 Always check that equipment is pressure free and drained, and provides safe isolation before starting maintenance work

2. Plan The Work

- 2.1 Identify if the work is a CSE task in line with the definitions in section 1 of this procedure.
- 2.2 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Apply the Hierarchy of Controls to determine if confined space entry and risks can be eliminated or reduced. Do the following checks:
 - First:** Can we eliminate the need for CSE?
 - Second:** Can we avoid the need for Breathing Apparatus or skin protection by eliminating flammable, toxic, asphyxiant or other hazards through emptying, flushing, clearing, and ventilating?
 - Third:** Specify Breathing Apparatus and/or other protective equipment and apply working methods that reduce the exposure time of people in the confined space.
- 2.3 Continuous gas monitoring is mandatory, either by Personal Gas Monitoring (PGM)'s or leaving fixed gas test meters in the CSE with ALARM function.
- 2.4 Nightshift CSE is not allowed under current Manual of Permitted Operation (MOPO) philosophy. Any nightshift CSE must be specifically risk assessed and authorised by the Plant Director.
- 2.5 Ensure that arrangements are in place to confirm that all personnel involved in the task have the appropriate training (CSE and H2S training) and follow this WMP and other relevant WMPs, depending upon the task:
 - WMP #25 Permit to Work;
 - WMP #20 Isolations;
 - WMP #16 Hot Work.
- 2.6 Identify and make a visual field verification that the required isolations are in place before work starts e.g. process or electrical in line with WMP #20 Isolations.
- 2.7 Ensure the Job Hazard Analysis (JHA) for the confined space work identifies the necessary controls and is approved by the Department Manager. This will include:
 - Gas testing requirements, see also Table 1 below, Including the frequency of retesting to be specified in the JHA;
 - Risks from any equipment used in CSE work (e.g. electrical tools, compressed air);
 - Use of low voltage equipment if available (battery-tools preferred). If not, use earth leakage current device or ground fault circuit interrupter;
 - Verifying lighting arrangements, with battery operated lights preferred followed by low voltage lighting . Consider emergency lightning arrangement, in case of battery or power failures.





2.8 Hot Work with positive sources of ignition in a confined space is an additional hazard, see WMP #16 Hot Work. Before executing Hot Work in a confined space, workers must first check if alternative method is possible. If not:

- Follow Table 1, below;
- Verify no hydrocarbons are present in hidden pockets or gaps in the confined space;
- Ventilation plan and additional Personal Protective Equipment (PPE) should consider the risk such as (welding) fumes.

2.9 Excavations deeper than 1.2m shall be defined as a confined space:

- Excavations in brownfield assets shall control the risk of hydrocarbon gas or toxic gas (e.g. H₂S - see WMP #18 Hydrogen Sulphide (H₂S));
- For greenfield locations, if the dimensions of the excavation are twice (or more) as wide as deep they can be considered for exemption - see also WMP #7 Excavations.

2.10 Emergency Response

An emergency rescue plan must be developed in partnership with Emergency Response Team (ERT) before entry is allowed into a confined space. The emergency plan must be clearly understood by workers. The plan must, as a minimum, detail the following:

- Cover all scenarios identified in JHA;
- Procedures for communicating emergencies;
- Identification of trained rescue personnel;
- Rescue equipment to be easily available when people are inside a confined space;
- Emergency escape routes;
- The designated emergency assembly area;

Rescue and first aid procedures.

2.11 Communication

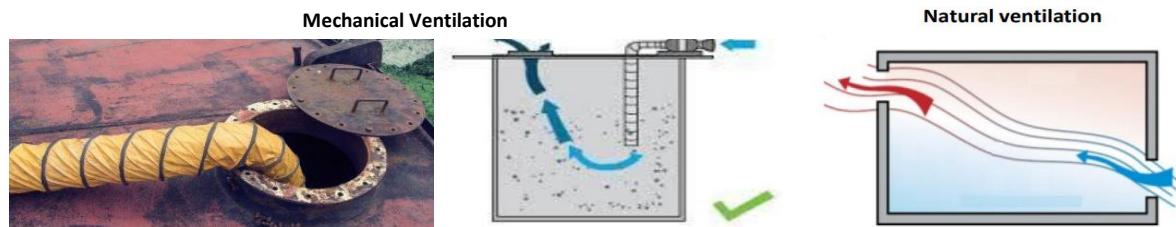
Develop communication arrangements between the people in the confined space, CSE Attendant and control room. Record this in the JHA.

2.12 Verify compliance with the Heat Related illness prevention procedure (WMP #15 Heat Stress & Adverse Weather Conditions) when temperatures can become higher than 32°C inside the Confined Space.

2.13 Ventilation Plan

Develop Ventilation plan:

- For the given working environment and work activities, assess the ventilation requirements (natural and mechanical);



- Natural ventilation should be used where possible (open all possible hatches and openings);
- Mechanical ventilation can be used to provide cool clean air – either Exhaust ventilation (sucks air out) or Forced air ventilation (blows air in).

2.14 Ensure availability of inspected and maintained rescue equipment.



2.15 Select appropriate PPE, including respiratory protection when needed in line with WMP #26 PPE.

2.16 Prepare Area

Determine the isolation required for the CSE, see WMP #19 Isolation.

- All process flows shall be positively isolated (air gap, physical break) as close to the CSE as possible;
- If that is not possible a blind shall be installed as close to the CSE as possible.



3. Do The Work

3.1 Control Energy

Make and confirm all isolations associated with the confined space as per the isolation plan are in place, see WMP #20 Isolations.



3.2 Gas tests will be performed by Authorised Gas Testers (AGT), see Appendix 1 for an example of a Gas Test Record Sheet.

- Initial gas test and all subsequent tests shall be recorded on the gas test record sheet;
- The AGT shall repeat the test at a sufficient frequency as per JHA and at a minimum after meal breaks and shift change
- Respiratory protection in line with WMP #26 PPE shall be used by AGT/ AOT for initial gas test where hydrocarbon presence is suspected;
- The gas test record sheet shall be kept with the PTW.



3.3 Verify that atmospheric conditions meet the following criteria **BEFORE ENTRY** and are maintained **THROUGHOUT** the work. See Table 1, below. If these conditions are not met, all workers must exit the confined space immediately and work cannot restart until the conditions are met.

Table 1 Air Quality Limits for CSE

	Without Respiratory Protection	With Respiratory Protection	Inert Entry
Oxygen %	>20 to maximum 21.5	>16 to 20*	<4
Toxics (H2S)	< ½ OEL	< IDLH	Not Applicable
Flammables % of LFL	Not detectable (<1)	<10 For Hot Work – Not Detectable	<10

Explanatory Notes for Table 1

Definitions: OEL: Occupational Exposure Limit, IDLH: level that is Immediately Dangerous To Life Or Health, LFL: Lower Flammable Limit.

*Even if oxygen levels have a potential to fluctuate into the 20% to max 21.5% range but are found in the >16% to 20% range during pre-entry testing, respiratory protection shall still be required in the form of Self-Contained Breathing Apparatus (SCBA) or Supply Air Breathing Apparatus (SABA).

**Only specialized contractor shall do inert entry when required

*** There must always be an adequate supply of inert gas to maintain the inert atmosphere in the confined space to 4% oxygen or less for the duration of the work.



- 3.4 Indicate the entry points to be used, and barricade or use signs ‘Danger – Do Not Enter without Authorisation’ at all other openings to prevent unauthorised entry. Use hard barriers around open hatches.
- 3.5 Verify all equipment and people (trained for CSE rescue) for implementation of rescue plan are available.



3.6 Start Work

Workers shall do a toolbox talk to verify all workers fully understand the controls and requirements of JHA and PTW Consistent with WMP #25 PTW.



3.7 PTW Issuer shall demonstrate isolations to work crew.

3.8 Workers shall verify all isolations as per isolation plan and in line with WMP #20 Isolations are in place.



3.9 Physical barrier shall be put in place to prevent unauthorized entry when work is suspended or during breaks.

3.10 A Competent CSE attendant (Appendix 2) must be stationed outside the confined space to:

- Maintain a register of numbers and names of people in confined space (sign in / out list)
- Always monitor the confined space and keep communications with confined space worker
- Stop the work if ventilation fails, gas test fails or there is contamination exceedance or other emergencies on site
- Prevent unauthorized entry
- Be aware of the rescue plan and their role in activating the rescue plan.
- Ensure that the BGC Emergency Response Operations Centre (EROC) contact details are available:
 - [BGC Phone 3333](#);
 - [VOIP 12223](#);
 - [Mobile 07809213970](#).
- The CSE Attendant must NEVER attempt any rescue.

3.11 Final check

The work crew and PTW Issuer shall verify all controls as per JHA, including isolations. The CSE checklist shall be used in support of verification, see Appendix 3.



3.12 Issue a CSE PTW as per WMP #25 PTW.

3.13 Gas tests shall be repeated as per defined frequency.

3.14 Monitoring of oxygen levels and harmful gasses shall be continuous whilst workers are in the confined space. Regular gas testing shall be done. Gas tests shall be defined and finished by AGT prior to initial CSE and to be repeated after each designated break.



3.15 Entry points shall be indicated by safe entry tags and barricaded.

3.16 Evacuation Rescue Plan for CSE must be available at entry point. All equipment required to execute the plan must be available at the worksite.

3.17 Each CSE shall have a documented communication process available at the work site:

- Between the Work Crew inside a confined space;
- Between the Work Crew inside a confined space and the CSE Attendant outside;
- Between the CSE Attendant and the control room and/or Emergency Response Team.

3.18 Allow entry into confined spaces with SCBA only when the source, nature and concentration of the hazardous atmosphere are fully understood and meet the requirements of Table 1, above.

3.19 The PTW Issuer shall approve the selection for respiratory protection, and this shall be documented in the PTW. A Competent Worker shall verify the quality of air supply from bottles, compressors or ventilators.

3.20 Verify lighting in the confined space provide good visibility to work safely and allow workers to evacuate immediately during an emergency.



3.21 The Supervisor shall verify work completion and that all workers, tools and materials are removed from the confined space before the Shift Engineer/Site Engineer or Area Operating Technician (AOT) (if identified) authorizes the confined space to be closed.

4. References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #16 Hot Work
- #20 Isolations
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC Checklists

- Gas Test Record Sheet (Appendix 1)
- BGC Confined Space Entry Checklist (Appendix 3)

BGC ToolBox Talks, Communication Materials, Posters and Information

- '5 to Stay Alive - Confined Space Entry' (Appendix 4)

5. Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC HSE Operations Manager	31-03-2022	Retained on sign-off form



Appendix 1 Gas Test Record Sheet



Appendix 2 Confined Space Entry (CSE) Roles & Responsibilities

Person in Charge of the Worksite (PICWS)	<ul style="list-style-type: none">Notify the emergency response team of the CSE work and brief the team on the scopeCarry out Toolbox Talks (TBT) prior to start of activity to ensure personnel are familiar with the hazards present in confined spaceEnsure suitable personnel are trained and competent in usage of safeguarding and monitoring equipment for controlling the hazardsEnsure atmosphere in the confined space is tested for oxygen, toxic and flammable materials by AGTEnsure isolations are in place before work commencement by inspection and witness of zero energy checks along with isolation authority Isolation Owner (IO) and Electrical Isolation Authority (EIA)Prepare ventilation plan and verify that ventilations are in place prior to entryAll personnel working within the area of supervision shall be informed and comply to the requirements of CSEKeep a record of all personnel, tools & materials entering and leaving the confined spaceEnsure a set of emergency procedures including confined space rescue plan has been developed and the work crew are familiar with the proceduresEnsure CSE Attendant is available and work is conducted safely by all personnelCheck condition of work site upon completion of all work. It is recommended to have a second person to duplicate the inspectionEnsure physical barrier is in place at CSE point after completion of work each shift
Permit Authoriser	<ul style="list-style-type: none">Conduct gas tests before start of shift. Record results of tests on gas test sheet attached to work PTWsConduct safety checks on site and perform risk assessment with work supervisor prior to start of any activitiesEnsure work crew has required respiratory protection and functional ventilation equipmentVerify that confined space is isolated from all potential sources of hazardous material and energy, including radiationCheck the integrity of the isolation points, to demonstrate status of isolation points and conduct zero energy check (prove equipment depressurized) with PICWS prior to start of any activitiesVerify isolation points are as close as possible to the confined space and in line with safe isolation – lock out tag outVerify all personnel involved in the confined space have dedicated confined space training records available at site
CSE Attendant	<ul style="list-style-type: none">Maintain register of personnel, tools and materials entering and exiting the confined space using the CSE Log sheetAlways monitor the confined space from outside while personnel are working inside. Do not leave confined space unattended when work is ongoingMaintain communication and visual contact where possible with all personnel in the confined space. Ensure communication with the control room and ERT is functionalEnsure emergency rescue equipment is onsite during confined space workStop work and evacuate personnel from confined space if ventilation system fails, contaminants exceed agreed limits, conditions become unsafe, site alarm activatesActivate ERT in the event of an emergencyThe CSE Attendant shall not attempt rescue and prevent unauthorized entry



Appendix 3 'Confined Space Entry Check List'

Yes	No	Check Items
Work Planning and Pre-Conditions for Entry		
Are the persons assigned to the work competent in the role?		
Has the work team attended a detailed and thorough ToolboxTalk?		
CSE Attendant		
Rescue / Emergency Response Team		
Entry Log available and personnel briefed?		
Have all confined space / vessel connections been isolated as per procedure?		
Has all electrical equipment associated with the confined space/vessel been isolated as per procedure?		
Vessel has been open and ventilated for a minimum of 24hrs prior to entry?		
All liquids, fluids and residues removed from vessel as far as possible		
Are communications with control room available and tested?		
Does the Recue Team have all equipment present on site?		
Are all tools correctly rated (e.g. non-sparking, EX-rated)?		
Are access and egress routes available and kept clear?		
Is there a secondary means of escape from confined space / vessel?		
Are there adequate gas detectors available and tested?		
If pyrophoric combustion is possible has provision been made to keep area wetted?		
Is H2S present? Additional controls identified and implemented?		
For excavations – are excavations supports available to prevent collapse?		
Simultaneous Operations identified and rescheduled if required?		
Confined Space / Vessel Entry - NO Breathing Apparatus		
Confined space / vessel completely drained, cleaned and ventilated?		
Hydrocarbon measured at 2% LEL or below? Not listed in text		
Oxygen level measured between 20 -21.5% ?		
H2S measured at less than 5ppm – where applicable?		
Benzene measured at less than 1ppm – where applicable?		
CO measured at less than 25 ppm?		
Confined Space / Vessel Entry - With Breathing Apparatus		
Confined space / vessel completely drained, cleaned and ventilated?		
Hydrocarbon measured at 5% LEL in atmosphere?		
Long line BA set available with sufficient spare cylinders?		
Individual BA set available with rescue line and safety torch?		
Continuous gas monitoring in place?		
Entry restricted to maximum of 2 persons at a time?		
Non-sparking tools available?		
All external equipment and machines correctly connected and earthed?		
Completion of Confined Space / Vessel Entry		
All tools have been removed from the confined space / vessel?		
All nozzles and internal fittings confirmed as free of foreign materials?		
All disturbed flanges and access points identified for new gaskets?		
External worksite has been left in a clean and tidy condition?		
All required pre/re- commissioning checks completed before closure?		
Final closure immediately after Shift Engineer / Supervisor inspection?		
I confirm that all persons have left the confined space and the site has been left in a safe and tidy state		
PICWS:	Signature:	Date:
CSE Attendant:	Signature:	Date:



Appendix 4 '5 To Stay Alive Confined Space Entry'

5 TO STAY ALIVE

Isolated
Ensure that the confined space has been isolated from any energy sources (LOTO), verify air quality and select the correct PPE for entry.

Paperwork in Place
Complete a work permit, a JSA, and a rescue plan, prior to entering a confined space.

In Position – In Control
Ensure that a competent hole watch is present at all times. The hole watch is in charge of entry and exit and must be respected at all times.

Signs in Place
Prevent unauthorised entry with barricading and labeling for NO ENTRY.

Never Leave in Hole
Never leave any compressed gas hoses, or other sources of oxygen displacing gas, inside a confined space.

Life-Saving Rule

- Work Authorisation**
Work with a valid permit when required
- Confined Space**
Obtain authorisation before entering a confined space
- Hot Work**
Control flammables and ignition sources
- Energy Isolation**
Verify isolation and zero energy before work begins

Comply with the standards

Intervene when you see something wrong

Respect your co-workers

Bawraah Gas Company



Work Management Procedure #4 Driving Safety & Journey Management

1. Overview and Hazards

- 1.1 The purpose of this WMP is to ensure personnel involved in driving understand the potential hazards and apply controls to reduce incidents from driving and transportation.



This WMP applies to all BGC arranged transport on road for BGC personnel, contractors and subcontractors who transport people and materials for BGC business.

Use of private vehicles on company business is strictly prohibited. People traveling for business between sites should use company provided vehicles. Private vehicles should only be used for commuting and commuting is not scope of this WMP unless it is arranged by company provided vehicles.

	Commute				Business trip: Inter-site, as well as a trip to another work site than the normal work location (incl trips in basrah, away days, site visits, etc)					
	Own vehicle	Company (or Contractor) vehicle, self-driven	Company vehicle, profess. driver	Contractor vehicle, profess. driver	Own vehicle	Company vehicle, self-driven	Contractor vehicle, self-driven	Company vehicle, profess. driver	Contractor vehicle, profess. driver	
BGC	Allowed <small>Note: Not part of BGC HSE MS managed operations</small>		BGC HSE MS <small>(Also reportable)</small>		Not allowed (#)	BGC HSE MS <small>Can be BGC or VIP provided vehicle. (Any incidents will be reportable)</small> ALSO ANY NON-PROFESSIONAL DRIVERS MUST HAVE DONE DDT!				
Contractor - Mode 1					Not applicable (?)	Allowed <small>In principle, no part of BGC HSE MS managed operations. (*)</small>	Not allowed			
Contractor - Mode 2					Allowed <small>Note: Not part of BGC HSE MS managed operations</small>		Not applicable	Allowed <small>Note: Not part of BGC HSE MS managed operations</small>	Not applicable <small>(should not be part of contract scope)</small>	
Contractor - Mode 3					Allowed <small>Note: Not part of BGC HSE MS managed operations</small>		Not applicable	Allowed <small>Note: Not part of BGC HSE MS managed operations</small>	Allowed <small>Note: Not part of BGC HSE MS managed operations</small>	

Commuting vs Business Travel

Commuting is the journey from home to the designated BGC work location and the journey from the BGC work location to home. Business travel is the journey from home to any external location or between two work locations.

1.2 Hazards include

- Impact injury to Drivers and Passengers due to vehicle collision or vehicle roll-over;
- Impact injury to Pedestrians;
- Impact injury to Drivers and Passengers due to vehicle incident arising from fatigue;
- Impact injury to Drivers and Passengers due to vehicle incident arising from distraction, particularly mobile phone usage while driving;
- Impact injury to Drivers and Passengers due to vehicle incident arising from drug and/or alcohol abuse;
- Injury due to unsecured materials within the Driver's cabin;
- Impact injury to Drivers and Passengers due to vehicle incident arising from excess speed;



- Impact injury to Drivers and Passengers due to vehicle incident arising from vehicle failure / poor maintenance;
- Impact injury to Drivers and Passengers due to vehicle incident arising from poor driving style;
- 3rd Party vehicles not driving safely on the road which may be involved in an incident with BGC vehicles.

Relevant Life Saving Rules and Process Safety Fundamentals

Driving	Line of Fire	Work Authorisation
 Follow safe driving rules	 Keep yourself and others out of the line of fire	 Work with a valid permit when required



For some operating areas, a valid **Permit-To-Work (PTW)** /Entry permit may be required depending on site requirements. See WMP #25 PTW.



2. Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location.
Apply the hierarchy of control and consider:
 - **First:** Can the journey be avoided? Is the journey necessary?
 - **Second:** Can we combine the journey?
 - **Third:** What is the safest mode of transport?
- 2.2 The following requirements shall be met for all driving on BGC business:
 - Have a valid driver's license for the type/class of vehicle
 - Completed BGC **Defensive Driver Training (DDT)** or any BGC approved and accredited DDT
- 2.3 Additionally, the following requirements shall be met for all professional drivers
 - A valid **Fitness to Work (FtW)** certificate according to BGC FtW requirements
 - Driver introduction training
 - Driver Fatigue Awareness
 - Load securing training (**Heavy Goods Vehicles - HGV**)
 - Dangerous goods training (**Hazardous Materials (HAZMAT)** - HGV)
- 2.4 Drivers shall inspect the vehicle every day using checklist Appendix 1 and maintain a record of inspections. Driver should report back defects from the inspections.
- 2.5 Following requirements shall be met for all BGC, contractor and subcontractor vehicles used on BGC business:
 - All mandatory documentation necessary for the class of vehicle for use in Iraq
 - **Seatbelts:**
 - All vehicles (owned, contracted or leased) shall be fitted with a 3-point inertia reel type seatbelt for the Driver and all Passengers;
 - Existing buses and coaches are acceptable with 2-point seatbelts for all but Driver and front seat Passenger, which must have 3-point seatbelts;
 - All newly purchased multiple passenger vehicles are to be fitted with a 3-point inertia reel type seatbelt for each occupant;
 - Exception to this requirement is for forklift trucks in which seat belts are lap belt only.



- Tires including spares must not be used beyond 5 years from **Date of Manufacturing (DOM)** and tyre tread depth must be deeper than "2.0 mm";
- Lights and signal indicators fully functioning;
- All vehicles operating for or entering BGC facilities to be inspected according to BGC six-month inspection program for road worthiness;
- Vehicles entering a BGC Process area may require a PTW and authorization from the Facility Owner, see WMP #25 PTW;
- **In-Vehicle Monitoring System (IVMS)** shall be fitted and operational. Supervisors shall assess driver's performance on monthly basis and provide feedback to Drivers. Speeding and other violations shall be reported in line with WMP #19 HSE Event Reporting, Investigation and Learning;
- All the vehicles to be fitted with Dry powder fire extinguisher (securely mounted), first aid kit, torchlight and safety triangle (securely stowed).



2.6 The following requirements shall be met for all HGV:

- HGV Drivers to do DDT every two years;
- HGVs to be accompanied by a trained flagmen (can be anyone who attend the BGC flagman training) during oversized cargo movements in BGC premises, inside hydrocarbon process areas and reverse manoeuvring in any BGC premises.
- Loads to be secured in a safe manner according to BGC load securing instructions and when transporting dangerous goods Material Safety Data Sheet shall be available in the vehicle.
- Any oversized cargo movements shall be executed after a road risk assessment, JMP and load securing plan have been approved by BGC.



Journey Management Plan (JMP)

- #### 2.7 A JMP is required for all business-related travel outside BGC facilities. A JMP template can be found in Appendix 2. JMP shall be discussed and approved by Line Manager/JMP Focal Point before and after the journey is executed.
- #### 2.8 Line Manager/JMP Focal Point must ensure that the following are discussed and met as part of JMP approval process:
- Drivers are fit to drive
 - Any vehicles used shall meet the BGC six-month inspection program for road worthiness.



The JMP must be discussed and reviewed by Driver(s) before the journey with focus on the potential road hazards. A printout of the agreed route and known hazards must be available in the vehicle. Journey must be closed out with feedback from drivers after completion.

2.9 Bookings for all vehicles must be made in advance via:

Trobexis online (<http://www.trobexis.com>)

In case vehicles are not available, this must be escalated to BGC Light Vehicle Manager or delegate.

2.10 A generic JMP with validity of maximum 3 months can be used for repetitive journeys with the same transport scope every day. When there is a change in Driver, a new JMP should be used.

2.11 The following requirements shall be met for all Drivers driving on BGC business:

- Rested and fit to drive;
- No driving under influence of drugs and alcohol;
- No smoking in BGC vehicles or vehicles used on BGC business;
- Drivers and passengers shall always use three-point seatbelts and shall intervene if anyone in the vehicle is not wearing seatbelts;
- Obey the speed limits;
- No unauthorized passengers in vehicle;
- Drive with head lights during daytime;
- Drivers are not allowed to use a mobile phone or two-way radio (including hands-free equipment) whilst driving, except as part of convoy management, provided it is hands-free;
- Comply with BGC drive and rest hours.



	At any time (continuous)	Per day (24 hours)	Per 7 days
Maximum driving hours	4.5	9 (extendable to 10 hours up to twice in 7 days)	56
Maximum duty hours		12	72
Max working week			6 consecutive days
Minimum break	45 mins per 12 hours (may be split into three 15 min breaks)	11 consecutive hours (reducible to 9 hours up to three times in 7 days)	

2.12 Night-time driving and/or adverse weather conditions (see WMP #15 Heat Stress & Adverse Weather):

- Driving between midnight and 04.00AM should be avoided and all-night driving activities must have clear mitigations in place and reflected in the approved JMP;
- Night-time driving request need to be submitted at least 24 hours before journey;
- Line Manager approval for journey need to be obtained;
- Night-time JMP is needed;
- Be alert for vehicles without headlights, cyclists, pedestrians, obstructions, animals, potholes, road works, etc.

2.13 Road travel to Baghdad is only allowed on an exceptional basis, subject to Commission Heads and Managing Director approval. Non-emergency requests must be made with 7 days' notice to BGC Business Travel Coordinator. Approved requests will be subject to a specific JMP.



3. Transport Safely

- 3.1 The requirements in Section 2 and the JMP shall be followed.
- 3.2 Everyone is authorised to safely intervene if they witness unsafe Driver or Passenger behaviours.
- 3.3 IVMS data shall be used by BGC and contractors to monitor and improve Driver behaviours.
- 3.4 In the event of weather deterioration, refer to WMP #15 Heat Stress & Adverse Weather.

4. References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #15 Heat Stress and Adverse Weather
- #25 Permit to Work

BGC ToolBox Talks, Communication Materials, Posters and Information

- BGC Daily Vehicle Checklist (Appendix 1)
- BGC Journey Management Plan Template (Appendix 2)

5. Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC Material & Transport Director	31-03-2022	Retained on sign-off form
Custodian	BGC Logistics Manager	31-03-2022	Retained on sign-off form



Appendix 1 BGC Daily Vehicle Checklist

Basrah Gas Company <u>Driver Daily Vehicle Checklist</u>								
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>			
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	Good		
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	Not Good (Request Repair)		
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	DRIVER NAME:		
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	DDT EXPIRY:		
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	KM READING:		
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	DATE INSPECTION:		
	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	SIGNATURE DRIVER:		
	Circle Check <ul style="list-style-type: none">360 degree inspection around the vehicleObserve the rear blind spotObserve the vehicle sidesNote object positionsCheck overhead clearanceCheck underneath the vehicle		 Driver to do 360 safety check every time vehicle is to be moved from parked position.					
	No alcohol or drugs while working or driving			<ul style="list-style-type: none">* Wear your seat belt* While driving, do not use your phone and do not exceed speed limits* Follow prescribed Journey Management Plan				



Appendix 2 Journey Management Plan Template

BGC JOURNEY MANAGEMENT PLAN		خطة الرحلة الآمنة				
To be filled up by Journey Originator						
Serial Number:	الرقم:	Company:	الشركة:			
JOURNEY DETAILS		تفاصيل مدير الرحلة				
Is the journey necessary?		هل الرحلة ضرورية؟				
Can it be combined with another journey? If not, why?		هل يمكن دمج الرحلة؟ او لا؟ ولماذا؟				
Purpose of the journey?.....		الغرض من الرحلة؟				
Will driver reach destination before dark?		هل سيصل السائق الى وجهته قبل حلول الظلام؟				
IVMS installed?		هل يوجد جهاز IVMS؟				
Mobile Phone / or other communication		ماهي وسيلة الاتصال المتاحة مع السائق؟				
HAZARDS REGISTER DATA SHEET must be attached, if includes hazardous materials		يجب ارفاق بطاقة المخاطر اذا كانت الحمولة تحتوي على مواد خطرة				
اسماء الركاب Name of passengers						
..... السيارات الخفيفة فقط For light vehicles only						
Departure Date	اسم السائق Driver Name	رقم السيارة Vehicle number / fleet	السيارة (النوع واللون) Vehicle type / Colour			
اسم الشخص الذي يعمل كمدير للرحلة Name of person acting as Journey Manager وهاتفه and his Mobile						
ملاحظات السائق Comments for driver						
Driver Signature: Mobile number:						
To be filled up by driver						
مسار الرحلة Route – Place Names	وقت الوصول Estimated Time of Departure (Driver)	وقت الوصول Estimated Time of Arrival (Driver)	وقت المغادرة Actual Time of Departure			
			وقت الوصول Actual Time of Arrival			
			الأستراحة Rest tick			
To be filled up with support from Journey Manager/HSE						
Risk Assessment	Impact			Likelihood	Risk	Control Measures
	P	A	C			
Required Resources:						
البرات القيادة النيلية Reason For Night Driving	L 1 Approval			ملاحظات المدير المباشر Comments from Journey Manager		
	التفتيش اليومي على السيارة Vehicle daily checks			شرح موجز للسائق Briefing For Driver		
ترفق صورة من التصريح Attach Copy of Permission	لا تسرع اتبع السرعات المحددة Ensure that seat belts are worn by all before starting the vehicle			تأكد ان الجميع ربطوا الحزامة الامان قبل التحرك		
	Road signs must be obeyed			اتبع اشارات المرور		
مخصوص الرحلة Journey Authorized الاسم: Name:						
تعليمات: النسخة الأصلية لمنسق الرحلة النسخة المقدمة للسائق النسخة الزرقاء للمشرف تعتمد الرحلة من مخصوص الرحلة أو مشرف المقاول						
BGC Emergency Number: 07809393970 رقم الطوارى الطبية : 07809393970						
VEHICLE INSPECTED (USE VEHICLE INSPECTION FORM) and PASSED YES/NO				DRIVERS SIGNATURE		

REPORT ACCEPTED BY

SIGNATURE



Work Management Procedure #5 Emergency Response

1. Overview and Hazards

- 1.1 BGC's Emergency Response Plans (ERP) describe the arrangements in place to respond to an emergency within its area of operations. The BGC emergency response capability has been established to ensure a prompt and appropriate response to an emergency, to mitigate the consequences of an emergency and promote the return to normal and safe operations. Each BGC facility or site has its own ERP. Refer to the respective worksite ERP in case of incidents that require emergency response activation.

This WMP section is only applicable to all non-ER BGC staff and contractors and covers generic ER procedures. Requirements for ER staff are defined in the site ERPs and supporting ER documentation.

1.2 Hazards

The ERPs covering a range of scenarios:

- Oil Spill Response Plan
- Road Transport Incidents
- Confined Space Rescue
- Rescue from Height
- Structural firefighting
- Process related incidents including loss of containment
- Pipelines related incidents, on and beyond BGC concessions
- Incidents involving Hazardous Materials (including mitigating any environmental impacts they may pose)



Relevant Life Saving Rules and Process Safety Fundamentals

Bypassing Safety Controls	Confined Space Control	Energy Isolation Control	Hot Work
Obtain authorisation before overriding or disabling safety controls	Obtain authorisation before entering a confined space	Verify isolation and zero energy before work begins	Control flammables and ignition sources
Line of Fire	Working at Height	Work Authorisation	
Keep yourself and others out of the line of fire	Protect yourself against a fall when working at height	Work with a valid permit when required	

2. Plan The Work

2.1 General Requirements

- Follow WMP #13 Hazard Identification to identify the hazards of the task and location.
- 2.2 Confirm what approvals, documentation, Permit-To-Work (PTW), Job Hazard Analysis (JHA), Toolbox Talk (TBT) etc is required and who will verify implementation before the work starts. Follow #25 PTW.





- 2.3 Develop an ERP to cover all realistic emergency scenarios for the planned activity to address - but not limited to - the above identified Hazards.

3. Do The Work

3.1 EROC (Emergency Response Operations Centre)

For all injuries/illnesses requiring treatment beyond basic first aid (e.g. cold compress, bandage etc) and for all scenario's covered under 1.2 the EROC must contacted. The EROC answers all emergency calls on the following emergency numbers:

- BGC Phone 3333;
- VOIP 12223;
- Mobile 07809213970.

- 3.2 The BGC Duty Manager is on stand-by 24/7 to coordinate an effective immediate response to any emergency at any site in BGC's operations. The Duty Manager roster is held by EROC and can respond to emergencies.

3.3 Arrival at site

- When coming to a site make yourself familiar with the site-specific emergency response alarm system and muster points.
- Site alarms are tested regularly.
- Ensure you know the timing for ER drills at your worksite.



4. References and Resources

Relevant WMPs

- #13 Hazard Identification
- #25 Permit to Work

5. Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	ER Manager	31-03-2022	Retained on sign-off form



Work Management Procedure

#6 Electrical Safety

1. Overview and Hazards

1.1 This WMP provides awareness and guidance how to manage risks and hazards associated with electricity when operating and / or working on electrical systems.

BGC has developed Electrical Safety Rules (ESR) and Electrical Safety Operating Procedures (ESOP) to manage the risks and hazards associated with electricity when operating and / or working on electrical systems. The ESR/ESOP mandates the minimum requirements to ensure safe work methods and practices are adopted for work across BGC's electrical systems. The ESR/ESOP are applicable to any part of the electrical power generation and distribution system in the production and processing facilities, accommodations, and logistics bases across BGC (including temporary facilities and mobile / portable equipment). Within BGC the application of the ESR is mandatory and shall be always followed.

1.2 Hazards

Electricity is a significant hazard. If work is not planned and done correctly this can lead to harm to people and environment and / or damage to equipment, facilities or buildings.

- Direct contact with electrical current can be deadly. While some electrical burns look minor, there still may be serious internal damage, especially to the heart, muscles, or brain. Electric current can cause injury in four ways:
 - Cardiac arrest due to the electrical effect on the heart
 - Muscle, nerve, and tissue destruction from a current passing through the body
 - Thermal burns from contact with the electrical source
 - Falling or injury after contact with electricity
- Electricity operating at higher voltages can cause a spark to jump, initiating an arc flash without the need for physical contact. This can lead to the injuries as listed above and can also cause injuries to eyesight from the 'flash' associated with the arc.
- Overheating of equipment, fires or ignition of explosive atmospheres
- Some electrical systems are critical for the safe operation of equipment. If electrical systems are not correctly designed, installed, maintained, repaired, and protected from damage, the failure of that equipment can subsequently lead to harm or damage
- It is possible for stray electrical currents to be present, where equipment has not been properly designed, installed, maintained, repaired or damaged

Relevant Life Saving Rules and Process Safety Fundamentals

Bypassing Safety Controls  Obtain authorisation before overriding or disabling safety controls	Energy Isolation Control  Verify isolation and zero energy before work begins	Working at Height  Protect yourself against a fall when working at height
MOC  Do not make a change without a proper MOC	High Risk Activities  For all defined high-risk activities, follow the procedures and sign off after each step	



2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the appropriate controls are selected.
- 2.2 Confirm what equipment certifications and specifications are needed and who will check them before the work.
- 2.3 Confirm what approvals, documentation, **Permit-To-Work (PTW)**, **Job Hazard Analysis (JHA)**, **ToolBox Talk (TBT)**, etc, is needed and who will check it is done before the work starts. Follow WMP #25 PTW. 
- 2.4 Confirm supervision arrangements including any necessary support, including HSE advisors, emergency response, gas testing, etc.
- 2.5 In addition to standard Personal Protective Equipment (PPE), see WMP #26 PPE, refer to ESOPs for further details of substation PPE and safety equipment.
- 2.6 No person shall carry out any maintenance, repairs, modifications, construction, pre-commissioning, cleaning, or testing on electrical equipment and conductors unless confirmed isolated and proved **DEAD** (equipment at zero voltage potential and disconnected from any **LIVE** electrical system).
- 2.7 Under no circumstances shall staff work in vicinity of exposed (not suitably guarded, isolate, or insulated) conductors as well.
- 2.8 During failure of supply, all electrical equipment and conductors shall be considered **LIVE**, until isolated and proven **DEAD**.
- 2.9 **Access**
No person shall enter any station or substations under control of BGC unless authorized or supervised by someone who is authorized refer to appendix 4. All switch rooms, electrical room, field auxiliary room and battery rooms shall be locked to prevent unauthorized accessed when unattended.
- 2.10 **Competence**
Only suitably authorized personnel are allowed to perform work or testing of electrical equipment connected with electrical system (e.g. permanent or temporary supply, battery/UPS system).
- 2.11 All authorized electrical staff working in BGC and holding a certificate of authorization are captured in the electrical authorization registers held by the SEA.
- Authorized staff are assessed to establish that the person has the necessary knowledge, training and experiences to undertake the responsibilities of the authorization level.
 - It includes requirements such as solid understanding of hazards associate with electricity, understanding and knowledge of ESRs, adequate knowledge of electrical, experience of work or testing on electrical equipment, first aid, hazardous area (EX) equipment.
- 2.12 **Switching Activities**
Electrical switching activities shall be performed by authorised electrical staff only:
- Switching activities must be communicated beforehand to relevant stakeholders (e.g. operations).
 - Switching plans must be developed and require approval from relevant **Senior Authorised Electrical Person/Responsible Person Electrical (SAEP)/RPE**.



- Switching plans are schedules that lists in order the switching activities necessary to achieve a defined purpose on the electrical systems (for example isolations of segments to make the installation safe prior to issue the PTW).

2.13 Fault-Finding Work on LIVE Equipment

For essential fault-finding work on **LIVE** equipment, additional controls including a buddy system shall apply. Additional controls, safe methods, insulated tools, PPE must be listed on the permit. A **Limitation of Access (LOA)** shall be prepared and issued by the SAEP to the **Competent Electrical Person (CEP)** carrying out the task.

2.14 Check Equipment

All electrical tools, appliances and mobile equipment shall be constructed to international standards, designed for rated supply voltage and frequency, regularly inspected, tested and certified for the environment in which it is to be used.

2.15 Any item whose next inspection date has passed shall not be used until the item has been inspected/tested and re-labelled.

2.16 Portable and Hand-Held Electrical Equipment

- Hand-held lamps shall be rated for maximum 50V AC supply or 12V if to be used within a confined space or restricted conductive location.
- The types of portable electrical equipment to be used in both industrial and non-industrial areas shall be any of the following:
 - Double or reinforced insulation equipment, Class II of IEC 60536, connected to the mains (230VAC) via a 30mA **Residual Current Device (RCD)** that protects both the supply lead and the portable electrical equipment
 - 42 V portable electrical equipment, Class III of IEC 60536, connected to a safety extra-low-voltage circuit by using double-wound safety isolating transformers, complying with IEC 60742 (SELV system)
 - Air-driven equipment.
 - Fibre optic light source.

2.17 Plugs and Socket Outlets

- For outdoor or industrial usage, it shall have a minimum current rating of 13A with IP66 and shall be individually and manually switched.
- A multi-socket outlet box shall not have more than four socket outlets. Adaptors are strictly prohibited.
- Two-pin plugs without fuses shall be replaced with three-pin plugs with suitable rated fuses.
- A RCD shall be in place to protect the user using the outlet.

2.18 Leads and Extension Cords

- For outdoor or industrial usage, rubber-insulated and sheathed type with heavy duty neoprene shall be used.
- For indoor domestic or commercial usage, PVC or rubber-insulated and sheathed type with heavy duty PVC shall be used.
- The cable size shall be rated no less than the rating of the circuit protection device and shall not be less than 1.5mm².
- Extension cords shall not be more than 50m long and shall not be used to extend more than one level above or below the worksite. It shall be protected and kept clear from the floor or ground.
- “Daisy-chained” from a single extension cord is prohibited.



2.19 Mobile Generators

- Shall be diesel-engine driven.
- Shall be mounted on a skid or in a frame, inclusive of any diesel spill protection/containment.
- Shall be provided with over-current and earth-fault protection devices.
- The frame and equipment neutral or star-point shall be connected to earth via a permanent earth bar or a temporary earth rod with an earth resistance of no more than 4 Ohms.
- The means for isolation and protection devices shall be installed at the skid or at the switchboard.
- When installed at the switchboard, the cables between the generator and the switchboard shall be mechanically protected and kept as short as possible.
- Being a potential source of ignition, any temporary generator used inside a hazardous area requires the issue of a Hot Work Permit, see WMP #25 PTW.

2.20 Electric Welding Machines

- Only DC up to a maximum of 110VDC type shall be used. AC welding machines should only be used if approved, in writing, by the contract holder and if the equipment is fitted with one of the following features:
 - Output automatically transfers from AC to DC when welding is interrupted.
 - A voltage reducing device is installed which the voltage to 50V AC maximum at no load.
 - A return cable (red circle) shall always be connected between the work piece and the welding machine, with the connection to the work piece being as close as possible to the point of work to avoid return current flow through electrical earth cables and instruments mounted on the pipeline or equipment. The return cable shall be an integral part of the machine. Steel structures and pipelines shall not be used as return paths as shown in figure 1.
- Diesel-engine driven welding machines including portable generator set shall be earthed and the auxiliary power supply shall be protected with a 30mA ELCB or RCD and its neutral bonded to earth via a permanent earth bar or a temporary earth rod with an earth resistance of no more than 4 Ohms.
- When using the **High Frequency (HF)** starters of **Gas Tungsten Arc Welding (GTAW)** machines in operational areas, care shall be taken to minimize potential interference with instrumentation and communication equipment. The precautions are to install as close as possible to the work piece and ensure casing's earth terminal is connected to local earth.

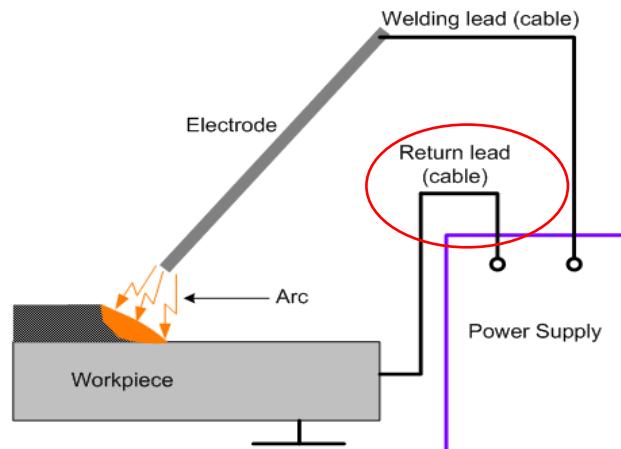


Figure 1 Welding Machine Requirements



- Ensure welding machine frequency generator is not operated within 15 m of any communication and/or instrument circuits. If this is not possible, the potential for interference shall be discussed with operator of the facility and seek approval before starting work. A risk assessment shall be carried out before starting the work.
- Always check the welding equipment, especially welding cables and the electrode holder. They shall be repaired or replaced immediately once damage. Do not use worn, damaged, undersized or cables with joints.
- Welding cable and return cables shall be heat resistant, oil resistant and flame retardant.
- For welding cables running through hazardous area, the cables shall be provided with adequate mechanical protection and be adequately supported (e.g. cable trays) throughout the length to avoid any accidental damage to the cable insulation layer and exposing of the inner copper conductor.
- Welding machines shall be in a safe area outside of a non-hazardous area.
- A risk assessment shall be carried out before starting the work.

2.21 Earthing and Bonding of Electrical Installations and Steel Work

- All electrical installations and steel work shall be earthed or bonded to the main 70mm² earth grid with minimum earth wire size of equal to the supply cable and up to 70mm² maximum. Typical earth wire for steel work is 25 and 70mm².
- Where connection to the main grid is not available, a dedicated 70mm² earth grid with earth pits shall be installed with total earth resistance not more than 4 Ohms for electrical installation and not more than 10 ohms for steel work.
- Precaution shall be taken to ensure the ground is free from any **LIVE** cables or process lines when installing earth pits with the control of excavation permit/certificate.
- Earthing and bonding shall be completed prior to energizing of electrical equipment and 30mA earth fault protection devices, if installed, shall be tested with earth leakages tester at sockets.
- Portable hoses for transferring of hydrocarbon shall be bonded to earth prior work & begins to prevent static built up.
- Temporary electrical installations shall be approved (MOC), inspected, tested, and verified by the SAEP.

2.22 Certified Equipment in Hazardous Areas

- Possible flammable atmospheres are present at BGC hydrocarbon installations.
- All electrical, instrumentation and telecom equipment used and installed shall comply with the EX-certification requirements per IEC-60079 international standard (e.g. gas group, temperature class zone) and as required per the **Hazardous Area Classification (HAC)** drawings.
- Non-certified equipment shall be removed from the hazardous area unless it is covered under WMP #16 Hot Work.

2.23 Overhead Line Requirements

Overhead Lines requirements found in the relevant WMP #31 Overhead Lines.



2.24 Isolations

- Electrical isolation means disconnected from **LIVE** conductors by an open isolator or physical gap and from all sources of supply and secured (locked) to prevent electrical equipment being made **LIVE** in error while work is in progress.
- Electric isolations through Electric Isolation Certificate and **Lock Out Tag Out** (LOTO) must be in place prior to physical interaction with previously energized equipment.
- Isolations must be prepared and registered in line with the LOTO requirements.
- Electrical isolations must be documented in BGC isolation register. This is an integrated system that manages the interactions between work permit and isolations.
- For electrical isolations, the following requirement must be met:
 - Electrical equipment shall be isolated from all possible sources of supply at supply isolation points (e.g. power distribution board feeder, circuit breaker, ON/OFF switch).
 - Isolations of point of isolation (power distribution board or circuit breaker) shall be physically held in isolated position and secured by using an electrical isolation padlock with unique key. Where this is not possible, a circuit isolation fuse must be removed (while the circuit is not on-load). Isolation identification will be by application of a tag as per ESR requirements.
 - Notice shall be attached at the point of isolation by using a caution tag.
 - When isolating the main source of energy, it is also essential to isolate any secondary sources such as standby generators and **Uninterruptible Power Supplies** (UPS).
 - Isolation and de-isolations shall be performed by suitably authorised electrical staff in line with ESR:
 - CEP: Low voltage
 - AEP: Low Voltage and High Voltage single line feeder/motor
 - SAEP: Low Voltage and High Voltage system with multiple sources.
- Voltage testing shall be performed on the equipment to be worked on once isolations are completed:
 - An approved, calibrated (2 pole) voltage indicator shall be used to confirm that normally **LIVE** conductors are **Dead**. Immediately before and after use, the indicator shall be proven to be in working condition using its associated proving unit or a LV supply.
 - An indicator shall not be proven by applying it to a known **LIVE** HV conductor. HV Indicators shall only be used if they are marked with a valid test/calibration certificate.

2.25 Communication

Depending on the nature of the work scope, following electrical safety documents may be issued by the SAEP as applicable in line with ESR requirements:

- Electrical PTW (E-PTW): permit issued by SAEP to AEP in charge of work to be carried out on specific high voltage electrical equipment or low voltage switchboard bus bar after made **DEAD**, isolated from all **LIVE** conductors and connected to earth. The EPTW identifies the electrical equipment that has been isolated and the circuit main earth applied.
- **Sanction for Test (SFT)**: A form issued by a SAEP to an AEP in charge of the testing of specified high voltage electrical equipment that has been made **DEAD**, isolated from



LIVE conductors, is connected to earth and is prepared to carry out testing. The SFT identifies the high voltage electrical equipment that has been isolated and the circuit main earths that have been applied. It also identifies which circuit main earths may be removed and replaced to allow testing to be carried out.

- **Limitation of Access (LOA):** A form issued by a SAEP to a CEP defining the limits and nature of electrical work that may be carried out in the vicinity of exposed **LIVE** electrical equipment. LOA identifies the conductors that are exposed and **LIVE**, the electrical safety precautions that have been taken and the procedures to be followed by those carrying out the work.

2.26 BGC Staff and contractors shall ensure the 10 questions for electrical safety are asked and used as standard TBT before starting any electrical work, see Appendix 1.

3 Do The Work

- 3.1 All permanent or temporary electrical installations shall be inspected and tested by a qualified electrical person prior to first energization.
- 3.2 All temporary electrical installations shall be approved under BGC #22 MOC, inspected, and tested by a qualified electrical person prior to first energization. Temporary installations shall be re-inspected every 6 months or whenever the equipment is relocated.
- 3.3 The results of all inspections and tests shall be recorded and records maintained for the duration of the installation. Inspection records must be available for review at the installation, which can either be found attached to the work order or in the office.

3.4 Work on Low Voltage (LV) Equipment (<1000V)

No person shall undertake any repairs, maintenance, alterations, cleaning or testing on LV Equipment until such parts of that electrical equipment are:

- Switched off from all possible sources of supply, to make **DEAD**.
- Isolated from all sources of supply and where practicable locked off with safety padlocks and caution signs shall be attached at all points of Isolation. The isolation shall normally be carried out by opening circuit breakers/switches or by removing fuses or links.
- Proved **DEAD** with an approved voltage-testing device suitable for the rated voltage of the circuit. The voltage-testing device shall be checked before and after use to prove it is working correctly.
- Released for LV electrical work after completion of electrical isolation and issue of PTW.

Note:

- Work in proximity of energized LV circuits shall require a LOA. Work on LV switchboard (multiple sources of supply) shall require an E-PTW.
- The LV rules shall apply to any work on extra LV electrical equipment that has sufficient energy to cause injury including DC batteries.

3.5 Work on High Voltage (HV) Equipment

No person shall undertake any repairs, maintenance, alterations, cleaning or testing on HV Equipment until such parts of that electrical equipment is:

- Switched off and made **DEAD**.
- Isolated and all practicable steps taken to secure with safety padlocks from all points of supply, including, voltage and auxiliary transformers, common neutral earthing



equipment, auxiliary transformers and any other source from which the electrical equipment and conductors may become **LIVE** and Caution Notices attached at all points of Isolation. The keys for the safety padlocks used to lock all isolation points will be placed in a key safe or another approved security method shall be used prior to issue of the E-PTW and can only be released after clearance section is signed by the recipient. Keys to safety padlocks used to lock circuit main earths, that may be removed to allow for testing/fault finding, shall be issued to the recipient of SFT who shall return them to the SAEP before signing the clearance section of the SFT.

- Proved **DEAD** by earth indication on the front of the switchgear for approved internal earth resistant equipment. For other types of switchgears, use an approved voltage-testing device suitable for the rated voltage of the circuit. The voltage testing device shall be checked before and after use to prove it is working correctly.
- Connected to earth at all points of disconnection from HV supplies to such electrical equipment or between such points and the points of work or testing.
- Those parts of a High Voltage system adjacent to the work area that cannot be isolated and earthed prior to issuing of an Electrical Permit To Work shall be clearly identified with Danger Notices attached and adequately shielded to prevent danger. It is the responsibility of the person issuing the Electrical Permit To Work to ensure that this is done and these points have been clearly identified to the person(s) carrying out the work.
- Released for work on HV by the issue of an E-PTW to an AEP who must be accompanied by another person during the progress of the work
- Released for testing by the issue of a SFT to an AEP who must be accompanied by another person during the progress of the testing.
- The person receiving the E-PTW or SFT is made fully conversant with the nature and extent of the work or testing to be done. The recipient shall be shown all points of isolation and any equipment that remains **LIVE**. The SAEP shall demonstrate and prove to the recipient of the EPTW that the conductors are Dead.
- Additional precautions to ensure safe working for each case shall be specified by the SAEP when issuing the E-PTW.
- It is the duty of the person issuing the E-PTW or SFT to ensure that these provisions are complied with.

3.6 Work on Batteries

All electrical work and/or testing of battery systems shall be undertaken in accordance with the requirements of WMP #25 PTW and ESRs Rules including following precautions:

- Before starting work on battery & UPS system, method statement & JHA to be reviewed by SAEP to ensure necessary risk mitigation, no impact on downstream safety critical supplies, and issue of LOA if work is performed in close vicinity of **LIVE** electrical equipment.
- Isolate and lock off any battery charger and attach a caution notice, where possible isolating the battery.
- As batteries represent a significant energy source, use insulated tools and remove personal articles, e.g. watches & jewelry.
- Remove any lose conductive tools or equipment from pockets.



- The battery room shall be well ventilated and necessary personal protective equipment shall be worn.
- Required PPE: Visor or goggles, rubber gloves, apron.
- Eye wash bottle to be on site or chemical shower to be in close vicinity.
- Ensure that the correct fire extinguisher is readily available while work is in progress.
- Follow instructions as directed by the **Material Safety Data Sheet (MSDS)** when working with battery chemicals.

3.7 Work in Hazardous Classified Areas

All electrical work and/or electrical testing in BGC designated hazardous areas shall be undertaken in accordance with the requirements of the WMP #25 PTW and ESRs. The person in charge of work or testing in hazardous areas shall ensure that:

- Before removing any covers of equipment suitable gas testing equipment is first used to check that no flammable gases, that could create a hazard, are present at the point of work or testing, by an AGT
- Before removing any covers of equipment ensure that the incoming connections, including the neutral, are made Dead and have been Isolated at a unit outside the hazardous area.
- No Switching, testing or other operations are carried out on equipment, whilst its covers are removed and the electrical connections are exposed to the atmosphere.
- Before starting the work or removing any covers of equipment suitable gas testing equipment is first used in line with Hot Work permit requirements to ensure that no flammable gases, that could create a hazard, are present at the point of work by AGT.

3.8 Electrical Work During Construction

- The design, installation and construction of a new permanent or temporary electrical installation that interfaces with existing electrical distribution systems shall follow an approved Project or Asset MOC design, see WMP #22 MOC.
- When installed, a permanent/temporary electrical installation shall be inspected/tested, and its use agreed by the SAEP.
- Any interface with the existing electrical power system, and the related operational responsibilities, shall be clearly defined before any activity takes place.
- Switching operations to carry out isolations or earthing of existing electrical equipment or interfaces with existing electrical distribution systems shall be carried out or coordinated by the SAEP of the area concerned.
- Before any contractor personnel are allowed to carry out work or switching of electrical system interfaced with any sources of supply (permanent or temporary), area SAEP shall verify the contractor's competency and initiate electrical authorization process in line with ESR.

3.9 Energization, Commissioning and Handover of Electrical Installation

- For major construction projects a formal electrical commissioning procedure shall be developed to ensure that the construction and commissioning of the new electrical equipment is carried out in a safe manner. This procedure shall include a method for sending a Notice of Commissioning form to all involved parties before the first electrical connection is made between new electrical equipment and the existing electrical power system.
- At the commissioning stage potentially, dangerous situations can arise. Initial energization of LV Switchboards and HV system must be reviewed and approved by



SEA (or delegate) following Electrical Energization Readiness Certificate (EERC) which is shown in Appendix 5. As soon as the first connection is made between the new electrical equipment and electrical power system, controls in line with BGC ESR must be followed including following:

- Clear instructions should be given to the non-electrical contractors (e.g. civil and building), to ensure that the use, movement and storage of their materials and equipment, especially ladders and scaffolding, complies with the provisions of the electrical safety rules.
- From the time that the first connection is about to be made, it is essential that unclimbable fences and gates are erected and completed for outdoor type substations and that doors of indoor substations are ready for locking with standard electrical padlocks or locks. These ESRs shall then be applied.
- Work or testing in that substation shall now be carried out under an electrical safety document, i.e. E-PTW, SFT or LOA.
- All necessary drawings, manuals, ITRs, special tools and safety equipment has to be handed from Project to Asset following company handover process to ensure safety operation and maintenance of new installation.

4 References and Resources

Relevant WMPs:

- #5 Emergency Response
- #13 Hazard Identification
- #22 Management of Change
- #25 Permit to Work
- #26 Personal Protective Equipment
- #28 Safety System Isolation & Override Control

BGC Checklists and Construction Site Safety Standard (CSSS) Forms

- CSSS Checklist: Electrical Equipment (Appendix 2)

BGC ToolBox Talks, Communication Materials, Posters and Information

- 10 Questions for Electrical Safety (Appendix 1)
- 5 to Stay Alive: Working with Electricity (Appendix 3)
- Roles & Responsibilities (Appendix 4)
- Electrical Energization Readiness Certificate (Appendix 5)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC Asset Service Director	31-03-2022	Retained on sign-off form
Custodian	BGC TA2 Electrical	31-03-2022	Retained on sign-off form



Appendix 1 '10 Questions for Electrical Safety'

10 QUESTIONS FOR ELECTRICAL SAFETY



ELECTRICAL SAFETY: RECOGNIZING HAZARDS ASSOCIATED WITH THE USE OF ELECTRICAL ENERGY AND TAKING PRECAUTIONS SO THAT HAZARDS DO NOT CAUSE INJURY OR DEATH.

1 PRE-JOB BRIEFING

- ✓ Are all essential team members including onsite contractor and subcontractors present at the pre-job meeting? Does everyone understand:
 - the hazards
 - their roles & responsibilities,
 - what to do if an incident occurs



6 TEST BEFORE TOUCH

- ✓ Has the isolation been tested to verify absence of voltage?
- ✓ Has the test device been verified?
- ✓ Has Earthing (Grounding) been applied, where required?



2 PLANNING & PROCEDURES

- ✓ Does the job have clear and complete:
 - Scope
 - Location
 - Electrical Safety Procedures
 - Permit to Work controls
 - Mitigation measures?



7 BARRIERS & GUARDING

- ✓ Are physical barriers, protective equipment, special tools and other controls to prevent harm to personnel in place?



3 COMPETENCY & AUTHORIZATION

- ✓ Are all team members competent and authorised to carry out the assigned electrical work?
- ✓ Has signed authorisation been obtained for switching, testing and work on electrical systems?



8 PERSONAL PROTECTIVE EQUIPMENT

- ✓ Is the appropriate level of PPE used to minimize exposure to shock and arc flash hazards?
- ✓ Is the condition of the PPE acceptable for use?



4 EQUIPMENT ISOLATION

- ✓ Has signed authorisation been obtained for switching, testing and work on electrical systems?
- ✓ Have remote methods been considered?



9 UNDERGROUND & OVERHEAD POWER LINES

- ✓ Is it possible to make contact with underground cables or overhead power lines?
- ✓ Are adequate controls in place to avoid contact?



5 LOCK OUT - TAG OUT

- ✓ Have locks and tags been installed at electrical isolation points in accordance with Safe Isolation (LOTO) procedures?
- ✓ Are tags properly filled-in and substantial, weatherproof and secure?



10 PORTABLE ELECTRICAL EQUIPMENT

- ✓ Has temporary and portable electrical equipment been inspected and approved prior to use?
- ✓ Are portable power tools and personal devices inspected and approved for the area classification?





Appendix 2 CSSS 'Checklist Electrical Equipment'

NOTE: Although the Construction Site Safety Standard (CSSS) materials are used by BGC Projects Department, they can also be utilized by other departments as appropriate.

Nr.	Standardisation Requirement	Yes	No	Actions required/Date/Action Party
	Distribution			
1	Main Switch Board mounted securely and protected against environment			
2	Main switchboard secured against unauthorised access			
3	Notice showing where switchboard is feed from is displayed			
	Cabins			
4	Steel chassis connected to earth via two earth rods			
5	RCD fitted to incoming supply in panel			
6	Switches and sockets free from damage and signs of overheating			
7	No sockets overloaded or fitted with multi adaptors			
	Power Supplies			
8	All power outlets fitted with RCD protection			
9	Industrial type sockets & plugs in use			
10	Trailing leads free from damage, joints and taped repairs			



Appendix 3 '5 to Stay Alive: Working With Electricity'

WORKING WITH ELECTRICITY



Planning – Pre-job Briefing

Ensure all employees are instructed to make preliminary inspections and/or appropriate tests to determine conditions before starting work on electrical equipment.

Life-Saving Rule

Work Authorisation

Work with a valid permit when required



Hot Work

Control flammables and ignition sources



Energy Isolation

Verify isolation and zero energy before work begins



Bypassing Safety Controls

Obtain authorisation before overriding or disabling safety controls

**2**

Competent and Authorised Personnel

Verify training needed for qualified personnel has been completed and that the scope of work has received all approvals needed to do the work.

3

Isolate – Lock Out Tag Out and Try

All energy sources are identified, isolated and secured as described in the Lock Out Tag Out (LOTO) procedures. Before work is done, the isolation is tested to verify no energy is there.

Comply with the standards

Intervene when you see something wrong

Respect your co-workers

4

Barriers and PPE

Prior to work, the barriers needed are available. Any specialised PPE that is needed has been inspected, tested as required and approved for use.

5

Follow the Plan

Maintain the barriers throughout the job scope and control the work area. Once the work is completed, follow the steps to make the job site safe for others.





Appendix 4 Electrical Safety Roles & Responsibilities

Role	Description
BGC and contractor staff	All workers (BGC and contractors) are responsible for following these requirements. If anyone sees these requirements not being followed, they must safely intervene.
Line Manager	Responsible for ensuring these requirements are available to workers and appropriate supervision and control is in place (including Permit to Work, where required) to check that the requirements are implemented.
Plant, Site, Facility Manager	Responsible for confirming that works undertaken on their area of responsibility are confirmed as being in accordance with ESR and ESOP.
Appointed Person	A person authorized by Management, normally not from electrical staff, who is trained on performing specified duties on electrical equipment, e.g. opening or closing motor circuits.
Competent Person	A person authorized by Management who has sufficient technical knowledge or experience to perform work safely
Competent Electrical Person (CEP)	A person authorized by SEA to carry out specified LV operations on electrical power systems and work on electrical equipment.
Authorised Electrical Person (AEP)	A Competent Electrical Person authorized by SEA, to supervise or to carry out specified operations on high and low voltage electrical power systems and work on electrical equipment. The authorization may include the authority to receive a sanction for test and perform the necessary safety procedures associated with such work or testing.
Senior Authorised Electrical Person (SAEP)	An Authorised Electrical Person authorized by SEA, to initiate work on high voltage electrical equipment. The authorization includes the authority to issue and cancel all electrical safety documents and to perform the necessary safety procedures associated with the issue/cancellation of such documents.
Responsible Person Electrical (RPE)	A Senior Authorized Electrical Person responsible for all electrical work, operations and the integrity of the site electrical network and associated equipment. Who will be the Line for the SAEP
Senior Electrical Authority (SEA)	An individual with an electrical engineering degree, authorized by MD or TA1, to develop the BGC ESRs and to oversee the assessment of electrical competency, training and experience of persons operating and working on electrical equipment.



Appendix 5: Electrical Energization Readiness Certificate

No	Item Description	Contractor *	Construction Pre-com**	Asset/P&E ***	SEA ****
1	Organization (Authorised Persons) in place to perform all required tasks in accordance with the ESR/ESOP's after energization. List of emergency contact personnel available.	Yes No NA	Yes No NA	Yes No NA	Yes No NA
2	Permit to Work (PtW) system in place, staff trained and authorized to work with this system in conjunction with the ESR/ESOP's.	Yes No NA	Yes No NA	Yes No NA	Yes No NA
3	Method statement / Commissioning / Electrical Operation procedure are in place to energize the electrical system in a safe and reliable manner.	Yes No NA	Yes No NA	Yes No NA	Yes No NA
4	New Electrical system has been installed in accordance with approved IFC design documents, BGC specifications and ESR/ESOP.	Yes No NA	Yes No NA	Yes No NA	Yes No NA
5	Contents of the System Handover package are complete and of sufficient quality. Preference is given to receive all documents as a softcopy except for the As Built colour mark-up's that shall be submitted as a hardcopy. A complete set of mark-up documents provided in Substation as well.	Yes No NA	Yes No NA	Yes No NA	Yes No NA
6	Work site is in safe condition with all necessary requirements, and system can be energized. (Pre-energization walkdown completed).	Yes No NA	Yes No NA	Yes No NA	Yes No NA
7	The Punch list is cleared from A-Items and the number of B-Items is limited to confirm the quality, good workmanship applied and readiness of the system.	Yes No NA	Yes No NA	Yes No NA	Yes No NA

*(Elect. Engineer); **(RPE/Elect. Engineer); ***(RPE/TA/ Elect. Engineer);****(OR on behalf of SEA)

INTERFACE DEPARTMENT AGREED / CONFIRMED FOR ENERGIZATION OF ELECTRICAL SYSTEM (e.g. Operation, Maintenance, Infrastructure etc. As Applicable)		
Interface Department: (e.g. Operation, Maintenance, Infrastructure etc. As Applicable)	Approved by	
	Name	Sign / Date
1)		
2)		

Energization Approved by:	Sign & Date (Contractor Elect. Engineer):
	Sign & Date (Construction/Pre-com. RPE/Elect. Engineer):
	Sign & Date (Asset/P&E RPE/TA/Electrical Engineer):
	Sign & Date/(SEA (OR on behalf of SEA):

Note: Prior to energization, a Notification of Energization (NOE) together with copy of this approved Energization Readiness Certificate has to be sent to applicable stakeholder in line with ESR/ESOPs.



Work Management Procedure #7 Excavations

1. Overview and Hazards

- 1.1 An excavation is any man-made cavity, trench or depression in the earth's surface formed by earth removal to a depth of more than 0.1m.



1.2 Hazards include

- Buried items, including:
 - Explosive Remnants of War (ERW) – see WMP #8 ERW;
 - Services or equipment: pipelines (gas release with possible fire or explosion), cables (with possible electrocution);
 - Contaminated soil: harmful chemical exposure;
 - Other physical features: voids, structural foundations, sharp material, animal homes (e.g. snakes).
- Collapse of the excavation can injure or kill personnel in the excavation or people stood at the edge of an excavation.
- Working close to deep excavation.
- Objects can fall onto people working in an excavation.
- Equipment that was buried and has been uncovered can get damaged, such as unsupported pipes, pipeline or cables.
- People can trip or fall into an excavation without proper barricading.
- People can experience breathing difficulty from:
 - Exhaust fumes from equipment entering the excavation;
 - Gas or chemical emissions from nearby facilities, plant or equipment;
 - Dust from excavation works.
- Heavy rains can rapidly fill an excavation and increase the likelihood of trench collapse.
- Cuts, abrasions, impact injuries from using tools and equipment.



Relevant Life Saving Rules

Confined Space Control	Line of Fire	Work Authorisation	Working at Height
 Obtain authorisation before entering a confined space	 Keep yourself and others out of the line of fire	 Work with a valid permit when required	 Protect yourself against a fall when working at height

2. Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location.
- 2.2 Confirm that the area to be excavated has been confirmed as clear of ERW – see WMP #8 ERW.
- 2.3 Confirm supervision arrangements including any necessary support, including HSE Advisors, Banksman, emergency response, gas testing, etc.
- 2.4 Apply the Hierarchy of Controls when preparing for an excavation:
 - **First:** Eliminate the need for Excavation by applying Trenchless Technology, such as directional boring or Horizontal Directional Drilling (HDD), water cutting and micro tunneling
 - **Second:** Apply maximum allowable slopes or benching
 - **Third:** Use shoring or trench shields
- 2.5 Appoint Excavation Competent Person (ECP) who:
 - Is knowledgeable in excavations and applying this WMP
 - Will demand compliance to safety requirements and best practices
 - Is the excavation authority in the field
 - Is accountable for sign off on Method Statement (MS), Job Hazard Analysis (JHA).

Excavation Certificate and Excavation Permit

- 2.6 Review Pre-Excavation Requirements:
 - ECP and work team determine the scope/requirements of the excavation
 - Factors to consider:
 - Is there any way to avoid excavation?
 - Will the excavation be deeper than 1.2m?
 - Will entry be required?
 - Underground obstructions?
 - Other foundations nearby?
 - Gather all existing UnderGround (UG) obstructions information, utilize online database and surveys (contact BGC Geomatics Department) and,
 - Use underground detection survey, Ground Penetration Radar (GPR) refer to appendix 4 and cable identification tools to identify buried plant and underground infrastructure. The use of this equipment with trained operator can identify metallic and non-metallic pipes, underground tanks, voids, larger cables.



2.7 The underground detection survey is mandatory:

- Determine which tools should be utilized for survey with SME, either;
- Use of ground penetrating radar (metallic and non-metallic pipes, underground tanks, voids, larger cables) preferred, or;
- Cable identification tools;
- Probing.



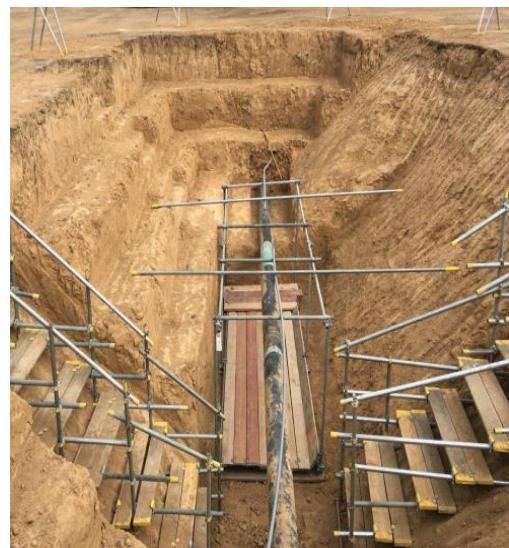
2.8 This will confirm:

- Location of obstructions on the ground
- If hydro-excavation techniques are to be used if UG infrastructure is found or;
- If mechanical digging is to be used for sections where nothing is found up to 2m from live UG infrastructure or;

If hand digging is required (no pickaxes and preferably insulated tools)

2.9 The excavation plan shall confirm:

- Sloping, shoring, shielding proposed method is adequate for applicable soil type and has adequate access & egress
- Excavation drawing will be made for complex and deep excavations where normal slope is not achievable
- Barricade /shoring drawing and plan includes maintaining 1.5m x D (depth) away from edge for spoils and vehicles. Complex shoring needs to be approved by the ECP - see WMP #27 Safety Signs & Barricades.
- Mechanical excavation will not be allowed within 2 m of live underground infrastructure.



Any exceptions to this must have Plant Director approval.

- Mechanical excavation shall always be done with ECP present and
- Potential for contaminated soil and/or water ingress
- Ensure confined space requirements are considered for excavations deeper than 1.2m. See also WMP #3 Confined Space Entry.



2.10 The Permit-To-Work (PTW) will include excavation certificate, MS and JHA for the proposed excavation:

- Excavation plan shall be approved by the ECP and site supervisor prior to application of PTW. The plan must be attached to the work permit
- For excavations exceeding > 1.2 meters depth or where the banks are undercut; adequate shoring by underpinning, sheet piling, bracing or equivalent shall be provided to prevent collapse of the excavation
- For excavations exceeding > 3 meters depth, the excavation plan and procedures shall be reviewed and approved by the BGC Civil Technical Authority.
- The soil conditions shall be assessed, and feedback provided and entered into method statement



- 2.11 • Mechanical digging is not permitted unless the excavation area has been examined using a locating tool and pilot trenches have been dug to verify the area is clear of buried plant or services.
- Pilot trenches shall always be dug manually or by using hydrovac with maximum depth of 1m relative to the adjacent ground level. Using hydrovac the trench width will be 15-20cm, manual will be 30-40cm.



- The rescue plan for the PTW, will determine whether the excavation is a Confined Space, see WMP #3 Confined Space Entry.
- 2.12 Plant and machinery in operational sites may require a Hot Work Permit, see WMP #16 Hot Work.
- 2.13 ECP is accountable for completing the Excavation Pre-Work Checklist (Appendix 1).



3 DO THE WORK

- 3.1 **Permit to Work**
- Before activity starts, a valid work permit must be in place with attached Area drawings and excavation pre-checklist (Appendix 1)
 - Gas tests will be performed according to WMP #25 PTW
 - Person In Charge of the Worksite (PICWS) must have a copy of the PTW at the location until the excavation works are completed
- 3.2 Toolbox talks to be carried out by PICWS daily prior to any works commencing.
- 3.3 Worksite set-up
- All excavations shall be barricaded using hard barriers such as safety fences, scaffolding or equivalent and signboards in place.
 - Barriers shall be adequate for adverse weather conditions such as strong wind, heavy rain, etc.
 - No scaffolding material to be used for shoring, only timber or metal prop





- Exhaust from generators, crane, etc. shall be positioned at least 15m distance from the trench or excavation pit
- Hard stops for lorries and dumpers shall be in place to prevent from falling into the trenches.
- A Flag Man must be used for all unloading of lorries and dumpers
- Ensure adequate visibility and lighting e.g. night time at all working hours and during low visibility



- The ground next to the trench shall be kept clear for 1.5m x D (depth), no storage of materials, plant or spoil is to be allowed in this area
- If a temporary cover is used to cover an excavation it shall be clearly marked "Open Hole" and be fully hard barriered
- Ensure safe means of entry and escape in the event of emergency. Access ladders shall be installed on firm grounds
- Ensure any underground exposed services are adequately supported to prevent damage
- If groundwater is present, the excavation shall be supported by interlocking steel sheeting and a de-watering unit or pump shall be installed.



3.4 During excavations PICWS along with BGC Supervisors or HSE Advisors shall carry out daily checks (see Appendix 1 Excavations Checklist) to ensure compliance and make improvement to the hazard controls.

3.5 ERW

Upon discovery of a suspicious object believed to be an explosive device, the following action shall be taken immediately (see WMP #6 ERW):

- Evacuate all personnel from the area following the normal evacuation procedure
- Inform BGC site team immediately, who will then contact ERW management team and the Asset
- Cordon off the affected area to prevent access of personnel into the area and no unauthorized access until the ERW management have arrived on site





3.6 Damage

Work shall be suspended if an underground service is damaged. Broken cables and burst pipes shall be reported to the Facility Owner as soon as possible. All incidents shall be reported to the BGC site team as soon as possible after they happen.

3.7 Backfilling and Completion

- Once works are completed the contractor must carry out “as-built” survey of the installed services and submit to BGC in the handover documents. Only then the works need to be inspected by BGC disciplines and sign off for approved before any backfilling works can proceed
- Approved materials shall be provided by the contractor and stockpiled on the agreed location by BGC Supervisor on site. Large rocks, excess concrete or hard sharp objects shall not be used and to follow the earthworks and concrete specification for compaction and testing requirements.

4. References and Resources

Relevant WMPs

- #5 Emergency Response
- #8 Explosive Remnants of War (ERW)
- #13 Hazard Identification
- #25 Permit to Work
- #26 Personal Protective Equipment

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC Technical P&E Director	31-03-2022	Retained on sign-off form
Custodian	BGC Civil, Struct & Civil Marine Work TA2	31-03-2022	Retained on sign-off form



Appendix 1 'CSSS Excavation Checklist'

Ser	Standardization Requirement	Yes	No	Actions required/Date/Action Party
1	Are the appropriate PTW/excavation certificates in place?			
2	Are enough barriers/fall protection in place to prevent people/objects falling into the excavations?			
3	Is probing/Hand digging conducted when required?			
5	Are excavation faces/wall in a stable condition?			
6	Are the excavations protected against potential cave in? (Sloping, shoring or benching in place)			
7	Is access/egress suitable? (Ladders/stairs no more than 25ft laterally)			
8	Are vehicle stops employed where necessary? (Prevent vehicles from encroaching too close to excavation)			
9	Operating equipment is kept away from excavation to prevent potential hazards entering excavation? (Exhaust fumes etc., safe distances to be clearly defined)			
10	Are excavations inspected daily by competent persons, or after any change in conditions, (alterations, harsh weather conditions)			



Appendix 2 'Excavation Fundamentals'

BGC Excavation Fundamentals

What is an excavation?

- ANY man-made cut, cavity, trench or depression in the earth's surface, formed by earth removal to a depth of more than 0.1 m

What is applicable to all excavations?

- PTW Process must be followed including confined space if >1.2m
- NO mechanical digging or use of pick-axe without plant director approval
- Prior to Digging, ERW clearance **MUST** be secured
- Prior to Digging, UG obstruction verification **MUST** occur
 - Study existing drawings
 - Conduct survey with underground object identification tools
 - Location of underground objects **MUST BE CONFIRMED** via hand digging, hydro vac, pilot trench prior to actual excavation
- All excavations **MUST** have adequate access/egress every 8m
- MUST** not undermine other foundations

Positive Identification

Excavation <1.2 meters deep

- Not a confined space
- Usually, does not have to be sloped, benched or shored

Deep Excavation 1.2 - 3 meters deep

- A confined space
- All excavation >1.2m must be sloped, benched or shored per the ground conditions
 - If sloped, must follow slope angle in chart below
 - If shored, must be approved by civil engineer TA3

If any of these requirements are not met, the job should be stopped

Ultra-Deep Excavation >3 meters deep

- Must be designed by engineer and approved by civil engineer TA3

All information provided from BGC Excavation Procedure



Appendix 3 BGC '5 to stay alive – Excavation'

EXCAVATIONS

Check Permit
Ensure permits are in place before excavating (where required). Check drawings to identify all potential obstructions and expose using non-mechanical means.

Life-Saving Rule**Work Authorisation**

Work with a valid permit when required

**Confined Space**

Obtain authorisation before entering a confined space

**1****Inspect Excavation**

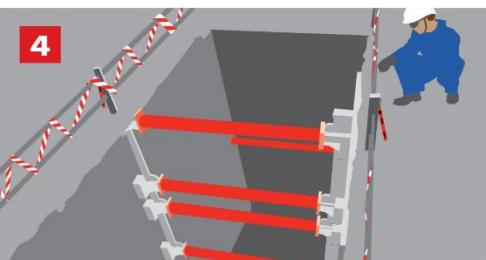
Make sure a competent person has verified probing and inspected the excavation for stability and obstructions, prior to work and after a change in conditions.

2**Check Ladders**

Install access/egress ladders and stairs no more than 25 feet laterally from your work location. Do not use benching (cuts into sides of excavations) for access or egress.

3**Protect Excavation**

Protect the excavation against cave in (sloping, shoring or benching).

4**Comply**
with the standards**Intervene**
when you see something wrong**Respect**
your co-workers**No Vehicles Nearby**

Ensure nearby operating equipment does not present a potential hazard to occupants in the excavation.

5



Appendix 4 Ground Penetration Radar (GPR)

Purpose

The purpose of this addendum is to demonstrate the advantages in using Ground Penetration Radar (GPR) with mechanical excavation to reduce traditional manual / hydrovac excavation. The tool shows a positive impact to HSE exposure, schedule, and cost. The development of the GPR technology has made it possible to detect UG obstacles using proper trained GPR operators and trials at BGC locations and other IOC companies in IRAQ show that with the high-level accuracy of GPR and the use of 100% hydrovac pilot trenching with manual excavation can be significantly reduced.

Procedure

The following steps explain the use of GPR:

- 1- First step will be for the contractor personnel to mark out as per AFC drawings the proposed cable or pipe trench area. The area to be scanned will be increased with 1m on both sides of the planned excavation area. (see figure 1). This will be done using white chalk marked on the ground, so the alignment/trench area is clearly visible. Any clashes with existing services or structures can be identified.

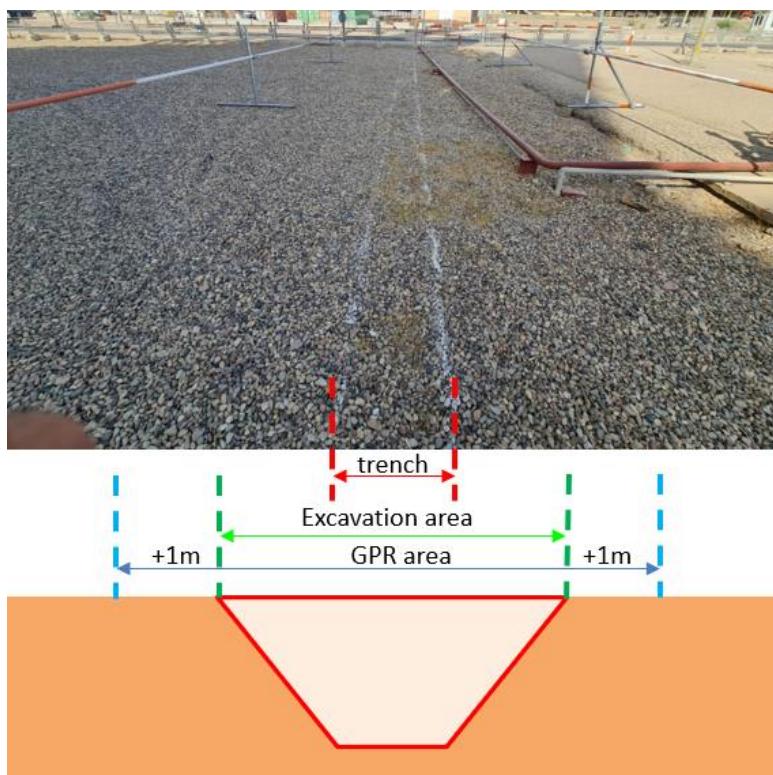


Figure 1- Area to be scanned.



- 2- Second step will be once the alignment /route of the service ie cable/pipe is marked on the ground joint walkdown will be conducted with BGC and Contractor to verify and resolve any clashes if any.
- 3- Third step will be that the contractors' personnel will carry out a site survey using Ground Penetrating Radar (GPR) scan device to survey and identify if there are any underground services in area of the trench to be excavated as shown in Figure-2. The scan will go beyond the proposed area of excavation by 1m to give assurance and safeguard if any existing service are going towards the trench excavation.



Figure-2- GPR Scan KD8K2

- 4- Fourth step will be to contractor's site surveyor to markup the findings using Geometric map for the proposed cable or pipe route as shown in Figure-3, indicating the location and depth of underground service/assets.

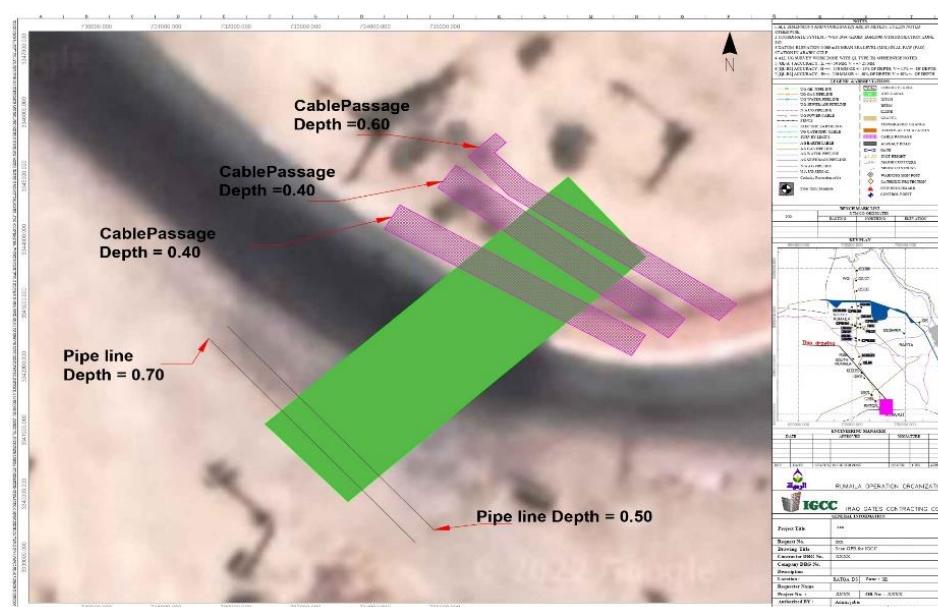


Figure3- report on found UG services (green =GPR scan)



- 5- If there are any underground services detected the contactor will mark the location of the services on the ground from the GPR survey report by using spray paint, fixing stakes or flags pins. This will assist the operators when hydrovac to take extra precautions when coming up the underground service
- 6- Once the underground services have been marked on the ground the work crew will commence the Hydrovac works by completing shallow vertical trenches, 2 meter or less depth with 15 cm wide slots to expose the identified UG services.
- 7- Manual and hydrovac excavation will be done to 1 m from the identified UG services and to the required depth. Upon underground services being exposed /visible, the BGC / Contractor will walkdown and inspect to review for the next stage of excavation which will be mechanical excavation (no services) or manual excavation.
- 8- If no underground services are found with the GPR, mechanical excavation can commence, no hydrovac is needed. Mechanical excavation for the cleared area must be done with close monitoring from competent supervisor at the site. Mechanical excavation will not be used within 2m of any live pipelines or within 1 metre horizontally of any utility until it is fully hand exposed.

Note: traditional pilot trenching is still captured in the excavation procedure under 6.1.2. method A and B

(0000-BGC-G000-GE00-G00000-HX-6180-00005)



GPR / Excavation Pre-Work Checklist

1.	Are all personnel competent to carry out this type of excavation without additional training and/or supervision? Have these personnel been updated in the BGC / Contractors Competent persons register?	Yes/No
2.	Is there a clear method statement explaining the sequence of operations and use of the hydro-vac machinery and other equipment and tools?	Yes/No
3.	Has the GPR device been calibrated and calibration certificate available, and are the GPR operators certified?	Yes/No
4.	Has geomatics team been consulted for location of underground services/facilities? Has the GPR survey report been completed for the area of hydrovac works and included on the Permit to Work?	Yes/No
5.	Have all services been located by using the GPR survey report and marked out on site by using stakes, white chalk or flags?	Yes/No
6.	Has ERW clearance certificate been obtained?	Yes/No
7.	Is there full-time supervisor allocated by the contractor to the work area?	Yes/No
8.	Are the necessary drawings or sketches available?	Yes/No
9.	Are all the job hazards identified in the job hazard analysis?	Yes/No
10.	Have the workers been properly briefed and instructed as to what is required of them?	Yes/No
11.	Has all machinery for the hydro-vac excavation been certified as fit for use and is it suitable for the work it will be undertaking?	Yes/No
12.	Is there adequate working space for the proposed plant and equipment to be used?	Yes/No
13.	Will access scaffold over the trenches if needed? If so, are the materials and equipment ready?	Yes/No
14.	Have barricades been installed?	Yes/No
15.	Is all the appropriate personal protective equipment (PPE) available for personnel?	Yes/No



Work Management Procedure #8 Explosive Remnants of War (ERW)

1. Overview and Hazards

1.1 This WMP describes the BGC requirements for managing the risk from Explosive Remnants of War (ERW). ERW can present significant risk in areas previously subject to armed conflict, long after the conflict has ended.

Post conflict analysis studies show that between 15-30% of all fired ordnance fails to function as designed, this can be due to:

1. Poor firing drills-safety pins not removed, or fuses not fitted
2. Incorrect launch profiles-launched to low or too close to a target
3. Incorrect strike angles-Impacting the ground at a shallow angle
4. Terrain-Wet ground, soft ground, dense undergrowth
5. Equipment Failure-Low cost submunitions have a higher failure rate than high cost missiles

This WMP is to ensure that there are safe working practices in and around ERW risk areas within the BGC areas of operations. ERW falls into 2 categories:

Unexploded Ordnance (UXO) Ordnance that has been fired, dropped, or launched intended but has failed to function.

Sub-munitions



Mortars



Air Dropped weapons



Abandoned Explosive Ordnance (AXO) - Ordnance that has been abandoned by fleeing combatants.

Artillery ordnance





Mines; Anti-Personnel / Anti-Tank (AP/AT) – Falls into their own category and within the BGC area of work there are two known and marked minefields both are in the BPROO Concession.

Anti-Personnel	Anti-Tank
	

1.2 Hazards include

Death or injury to personnel coming into contact with ERW.

Significant damage to facilities, assets, property and production if ERW is activated within close proximity.

Relevant Life Saving Rules and Process Safety Fundamentals



2. Plan The Work

Follow WMP #13 Hazard Identification to identify the hazards of the task and the location.

2.1 Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.

- PLAN your activities in advance
- COMMUNICATE your requirements early to BGC-ERW Department
- KNOW your work areas
- UNDERSTAND the ERW risk
- REMAIN alert to possible ERW hazards
- UNDERSTAND the marking system
- REMEMBER your emergency procedures
- REPORT your concerns to the BGC ERW Manager

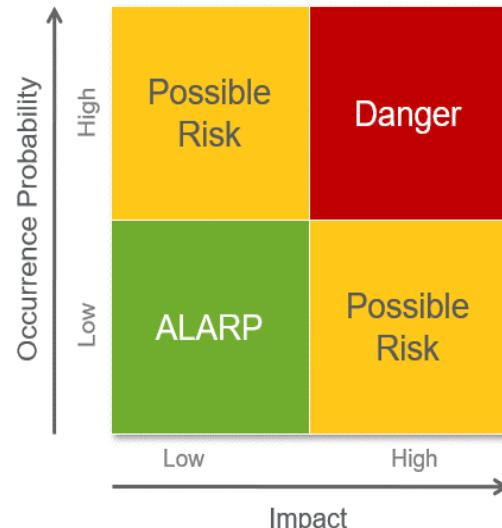


2.2 Works will only be carried out in ERW risk assessed and categorised areas.



Danger Areas: RED

- Probability of ERW is High/Certain It is a “contact risk” and represents a Serious Risk to personnel, Possible loss of life or limbs
- Access is not permitted without direct escort from the BGC ERW Team



Possible Risk: AMBER

- Possible risk of ERW - area is categorized as a “Battle Area” Probability of ERW is Possible, however the area is safe to carry out normal works in.
- However, before any excavations are carried out they will require specific advice and guidance from BGC ERW Team
- Range of Options: Full sub-surface Clearance/Banksman

ALARP: GREEN

- Probability of ERW is As Low As Reasonably Practicable (ALARP)

- 2.3 Excavations will only be carried out in land which have been confirmed as released for intrusive works by ERW Team as ALARP or Amber areas with the required ERW mitigation in place (ERW Banksman), see WMP #7 Excavations.
- 2.4 Obtain a copy of the ERW Land Release Certificate (LRC) on behalf of third-party contractors to present with their Permit-To-Work (PTW) documentation, see  WMP #25 PTW.
- 2.5 Ensure all excavations regardless of size are within an ERW Sub-surface cleared area by use of the MyMaps or that an ERW mitigation plan is in place (ERW Banksman). Consult with the BGC ERW Department if there is any doubt - In some situations, the ERW Manager having assessed the residual risk remaining within a location or area post ERW clearance may utilize the “ERW Excavation Authority” Form as an extra layer of safety. The responsible local HSE and management / project team will be informed of the reasoning behind this action and the time frame for the use of this form.
- 2.6 Ensure all personnel are familiar with the ERW markings systems for working in safe ERW cleared areas.
- 2.7 There are 2 Types of markers common throughout BGC:
 1. **Minefield markers:** Permanent metal posts, signs, wire and which are well maintained.
 2. **Battle Area Clearance (BAC) markers:** Temporary sandbags painted red/white. Will deteriorate if not maintained. White denotes the ERW cleared area and the area Red denotes the uncleared area, all excavations are to be within the white area.
- 2.8 **Minefield markers** denote the boundary of a known mined area.
- 2.9 **BAC markers** denote areas deemed safe to work in by risk assessment and or Sub-surface clearance to remove the threat of ERW.



2.10 UNDERSTAND what the marking identifies, Safe Access – Clearance - Minefield Boundaries.



ERW Land Release: MyMaps Portal

For help getting started, email bgc-geomatics@basrahgash.com or find a Geomatics staff member (Engineering Building, top floor, northeast corner)

Risk Status shown for all areas
▪ No shading means No Assessment Completed

Non BGC Personnel/ Sub-Contractors may require **ERW Land Release Certificate**
These may be issued separately by ERW Department as required

The signatures below confirm that the site has been handed over and accepted (AVW the above).
Name _____ Position _____ Date _____ Signature _____

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3. DO THE WORK

- 3.1 Ensure all BGC Staff and 3rd Party contractors have undergone ERW Inductions prior to any works being carried out.



- 3.2 Ensure all personnel are informed of any potential ERW hazards and of any necessary mitigation that is in place during the toolbox talk. Include the Emergency Immediate Action Drills for entering an uncleared or RED area are as follows.

Having entered an area you believe to be unsafe due to ERW on foot:

- STOP
- DO NOT PANIC and assess the situation
- IF CONFIDENT that the Danger area is to your front, turn around carefully retrace your footsteps until clear of Danger Area
- IF NOT CONFIDENT that it is safe to move, contact the BGC Emergency Response Operations Centre (EROC) contact details:
 - BGC Phone 3333
 - VOIP 12223
 - Mobile 07809213970 and await assistance

Having entered an area you believe to be unsafe due to ERW in a Vehicle

- STOP
- DON'T PANIC and assess the situation
- IF CONFIDENT that the Danger area is to your front, carefully reverse the vehicle retracing your tyre tracks until clear of the Danger Area
- IF VEHICLE UNSAFE TO MOVE, contact the EROC contact details:
 - BGC Phone 3333
 - VOIP 12223
 - Mobile 07809213970 and await assistance
- IF THE VEHICLE IS ON FIRE OR THE ENVIRONMENT IS UNSAFE, carefully exit vehicle using roof and escape hatches until you can safely lower onto tyre tracks and follow vehicle tyre tracks until clear of the danger area.
- DO NOT TOUCH THE GROUND APART FROM ON THE TYRE TRACKS

- 3.3 On discovery of any suspicious item within the work areas or excavation. Ensure the team know to "STOP-CORDON-REPORT".



4. References and Resources

Relevant WMPs

- #5 Emergency Response
- #7 Excavations
- #13 Hazard Identification
- #25 Permit to Work

BGC ToolBox Talks, Communication Materials, Posters and Information

- BGC ERW Training Material

5. Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC Technical P&E Director	31-03-2022	Retained on sign-off form
Custodian	BGC ERW Manager	31-03-2022	Retained on sign-off form



Appendix 1 Role of ERW Department in Risk Mitigation Process



The Role of BGC-ERW Department



To Provide:

Risk Analysis.

All BGC assets (Current & Proposed) are risk assessed.



Risk Mitigation.

Through risk assessments and/or sub-surface clearance.

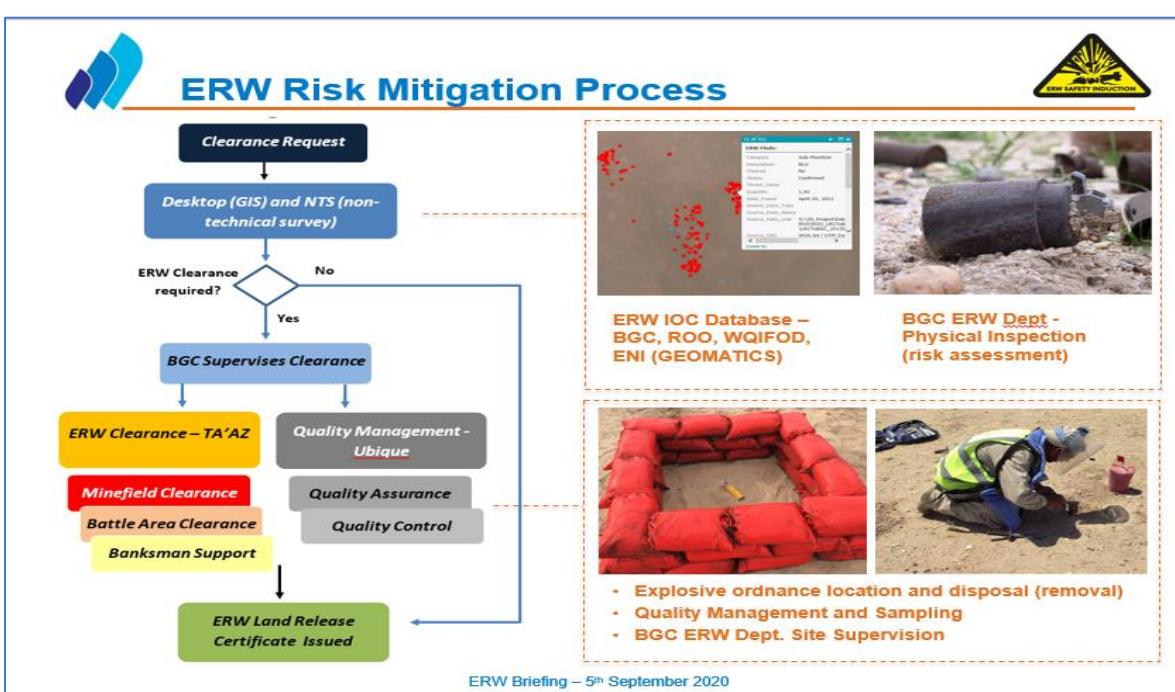


Subject Matter Training.

ERW Awareness & Induction also site specific.

Emergency Response.

Incident management, Specialist EOD Contractor call out and planning.





Work Management Procedure #9 Hand & Power Tools

1. Overview and Hazards

1.1 This WMP establishes minimum requirements for safe use of hand and power tools in BGC.

1.2 Hazards

Hazards associated with misuse of hand tools include:

- Eye injuries due to the flying particles;
- Hammer may cause Impact Injuries;
- Damaged handles of hand tools and slipping while using;
- Falling from height, while climbing ladder carrying tools in hand.

Power tools present hazards such as noise, vibration, electrical, moving parts and projectiles.

Figure 1: Examples Power Tools Hand Tools



Relevant Life Saving Rules and Process Safety Fundamentals

Work Authorisation
Work with a valid permit when required

Line of Fire
Keep yourself and others out of the line of fire

2. Plan The Work

2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.



- 2.2 Confirm what approvals, documentation, Permit-To-Work (PTW), Job Hazard Analysis (JHA), Toolbox Talk (TBT), etc, is needed and who will check it is done before the work starts. Follow WMP #25 PTW.
- 2.3 Confirm supervision arrangements including any necessary support, (e.g.HSE Advisors, emergency response, AGT, etc).
- 2.4 Power tools and appliances shall be classified in accordance with IEC Standards as follows:
 - **Class I:** Tools and appliances with basic insulation and include connection of exposed metal parts to a protective conductor(i.e earthing)
 - **Class II:** Tools and appliances that are double insulated or have reinforced insulation, and are not intended to be earthed;
 - **Class III:** Tools and appliances that receive supply at Safety Extra Low Voltage (SELV).

The use of Class II or Class III power tools and appliances are preferred and is mandatory for hand lamps and hand-held power tools. Fixed power tools and appliances may be Class I if no suitable Class II or Class III power tools are available. Class I power tools and appliances shall only be used with a power supply connected via either a 30mA Residual Current Device (RCD), or an isolating transformer. The earth connection to the Class I power tool shall preferably be located externally and be easily visible for inspection.

- 2.5 Hand tools shall be inspected by the user prior to each use. In addition, supervisors shall regularly check the condition and ensure the correct use and maintenance of hand tools.
- 2.6 All equipment shall maintain an inspection register to record all inspected equipment.
All electrical and pneumatic powered tools shall be inspected and approved prior to first use.
 - Supervisors shall ensure all electrically powered hand tools and portable electrical equipment are inspected and tested regularly (see Appendix 1), with intervals between inspections/ tests not exceeding 6 months;
 - Proof of inspections and testing shall be attached with a tag to the equipment tested;
 - Electrical tools owned by BGC shall be inspected by an Authorized Person - Electrical. Tools owned by contractors shall be inspected and tested by their own qualified electrical person or a qualified 3rd Party Inspector approved by the BGC Electrical Engineer.
- 2.7
 - Equipment with incorrect tag, without tag and/or not inspected shall not be used;
 - A 'Defective, Do Not Use' tag shall be attached to the equipment if the inspection due date has lapsed, or equipment is found unsafe to use;
The use of hand and power tools in operating facilities may require a Hot Work permit with accompanying gas test;
 - Certified gas testing equipment shall be used;
 - **NOTE:** It is prohibited to use personal gas monitor to take gas test. During the work, continuous gas testing must be undertaken in all cases;





- The use of hand and power tools in (Green Field) non-operating facilities requires to follow the PTW process of the respective work site, normally under P&E.
- 2.8 Hand and power tools shall be used for intended purposes, modifications or misuse tools are prohibited (i.e. no removal of guards on grinders or removal of grounding plug on power cords).
- 2.9 Brass tools shall be used in potentially hazardous atmospheres, as iron or steel hand tools (e.g. hammers & mallets) may cause sparks. Use of iron flogging spanners is prohibited in the process area due to spark potential.

3. Do The Work

3.1 **Hand-made tools or modified tools and equipment are prohibited in BGC facilities.**

Prior to using hand and power tools on process equipment, confirm and verify that isolations are in place, see WMP #20 Isolations.

- 3.2 The user must perform a pre-use inspection, ensure power cords and hoses are routed to minimize tripping hazards and power socket is in good working condition. Cabling must be protected when routed on the ground, trenching, cable covers etc.
- 3.3 Shield/protect other workers from hazards in the work area by maintaining good housekeeping in line with WMP #17 Housekeeping.
- 3.4 No loose-fitting articles of clothing or exposed jewelry shall be worn. Long hair shall be tied or kept in a hairnet.
- 3.5 Be aware of 'Vibration White Finger (a permanent and painful numbness and tingling in the hands and arms, also painful joints and muscle weakening). Wear anti-vibration gloves and take breaks (e.g. 10mins every hour).
- 3.6 All grinders shall clearly display the maximum speed.
 - Grinding disks shall display their maximum speed and it shall be greater than the maximum machine speed;
 - Grinders shall be fitted with guards. Ensure the 'dead man switch' is operable and cannot be overridden.
- 3.7 Supervisors and Team Leaders shall ensure their staff are competent to operate the tools and equipment.
- 3.8 If unsure on how to operate hand tool, power tool, or equipment, do not start work and inform your Supervisor.
- 3.9 Ensure safe and correct body positioning while using hand or powered tools to prevent injuries.
- 3.10 Sheathed and self-retracting knives Must be used according to PTW and JHA controls, see WMP #25 PTW. 
- 3.11 Maintain the tools in good working order.
 - Store electric tools in a dry area when not in use tools subject to impact (chisels, drift pins and caulking irons) "mushroom";
 - Keep them 'dressed' to avoid flying fragments;
 - Use 'Hands Free Tools' where possible to reduce the chance of impact injury to hands.
- 3.12 Ensure use of suitable Personal Protective Equipment (PPE) as specified in the JHA/ PTW.
 -



- 3.13 In certain process areas, the use of pneumatically powered tools is preferred over electrically powered tools, and in some instances, the use of electrically powered tools is not permitted. For pneumatically powered tools:
- Ensure the air supply is fitted with a pressure regulator and the tool is not operated at a working pressure greater than the certified pressure;
 - Only industrial air supplies shall be used, not instrument air supplies;
 - Only hoses with secure couplings and connections from an approved supplier shall be used;
 - Hose connections shall be safety-clipped and fitted with safety strops to prevent 'whiplash' in the event of coupling failure;
 - Ensure the line is blown through to remove dust and grit before a tool is connected;
 - Ensure the air supply is isolated and depressurized before disconnecting any tool, before adjusting and fitting or carrying out maintenance.
- 3.14 Ensure that the earth connection is in good condition and the appliance lead is not damaged.

4. References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #17 Housekeeping
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC Checklists and Construction Site Safety Standard (CSSS) Forms

- CSSS Checklist 'Hand & Power Tools' (Appendix 1)

5. Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC Operations HSE Manager	31-03-2022	Retained on sign-off form



Appendix 1 CSSS Checklist 'Hand & Power Tools'

NOTE: Although Construction Site Safety Standards (CSSS) materials are used by BGC Projects Department, they can also be utilized by other departments as appropriate.

Nr.	Standardisation Requirement	Yes	No	Actions required/Date/Action Party
Hand Tools				
1	Of proprietary manufacture (not homemade)			
2	Free from damage and no loose parts			
3	Free from home repair			
4	Have handles / guards in place			
5	Free from burrs			
Power Tools				
6	Has unique ID number and in-date inspection tag			
7	Power lead free from damage, joints and pvc tape repairs			
8	Fitted with suitably rated industrial plug-top and socket			
9	Triggers / switches operate correctly			
10	Casing free from cracks or damage			
11	Guards in place			
12	Chucks and locking mechanisms free from damage and working correctly			



Work Management Procedure #10 Handling Asbestos

1 Overview and Hazards

1.1 This WMP describes the requirements for safe handling and disposal of **Asbestos** and **Refractory Ceramic Fibers (RCF)** Containing Materials A/RCF CM, during construction works and maintenance works.

- Asbestos is a naturally occurring fibrous silicate which is extracted from the earth by mining and then usually incorporated with other materials. It is used to form a large range of materials such as cement products, insulation materials, textiles, tiles, papers, fireproofing, building panels, brake linings, gaskets and many others.
- The introduction of new A/RCF CM is not permitted, use free A/RCF CM (i.e. glass wool and rock wool) instead.

This WMP applies to Category A (Non-Licensable Work) only. Category B (Licensable Work) is outside scope of this WMP.



Gasket



Cement



Textile

1.2 **Hazards include:**

- Inhalation of asbestos fibers could lead to a debilitating lung disease and certain forms of lung cancer;
- The effect of asbestos exposure is cumulative i.e. the more exposure the higher the risk and consequence;
- Exposure to larger RCF material is associated with eye, skin and upper respiratory tract irritation;
- Inhalation of smaller very fine fibers has been linked to cancer.

Relevant Life Saving Rules and Process Safety Fundamentals

Work Authorisation	High Risk Activities
 Work with a valid permit when required	 For all defined high-risk activities, follow the procedures and sign off after each step



2 Plan The Work

2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.

2.2 Confirm what approvals, documentation, Permit-To-Work (PTW), Job Hazard Analysis (JHA), Toolbox Talk (TBT) etc, is needed and who will check it is done before the work starts. Follow WMP #25 PTW.



2.3 Confirm supervision arrangements including any necessary support, including HSE Advisors, Emergency Response, Gas Testing, etc.

2.4 Suspected Materials

Where there is either confirmed A/RCF present (i.e. via the respective registers), or there is some possibility that these materials could be present, then no work shall be started on any new building project, refurbishment or maintenance work, until a suitable and satisfactory risk assessment has been completed.

2.5 Where a material is encountered and it is thought that it may be A/RCF, contact local Asbestos Focal Point (AFP) or BGC Health Team Representative for support and guidance.

2.6 A register for A/RCFs is available for BGC assets. Hardcopy layouts are held at each permit office. They are also available through BGC Health Team or local AFPs.



2.7 The registers will be updated following identification of previous un-known A/RCF in a location, or new material must be introduced.

2.8 In addition, the BGC Health Team will undertake ad hoc inspections during visits to facilities that have known A/RCF.

3 Do The Work

3.1 Activities which may encounter A/RCF CM

All activities that may result in the disturbance of A/RCF CM must be carried out under a valid PTW, except if the activity is limited to the ad-hoc pick-up of a single gasket or maximum of 10 cm² of asbestos cement or asbestos textile seal, and only by an AFP, Trained HSE Specialist or Occupational Hygienist.



3.2 All asbestos work must be duly supervised by trained AFP, nominated persons or an Industrial Hygienists.

3.3 Use the wet spray method for asbestos removal and when cleaning all contaminated surfaces, work areas and used equipment at end of every workday.

3.4 Fit for purpose (unpowered) tools to work with asbestos materials, Powered tools must not use, use only hand-tools.

3.5 Natural ventilation should be sufficient for outside activities. For activities inside buildings & confined spaces consult an Industrial Hygienist for further advice.

3.6 Restrict access to worksite with barriers and signage and verify other work activities won't be exposed to any A/CFM CM from the worksite.

3.7 Apply work rest regime i.e. maximum 30 mins work then 5 mins rest or 1 hr work then 10 mins rest.



3.8 For Category A work undertaken by BGC staff, if the duration of work is more than 30 days per year per person, where asbestos is actively handled, then the person will be classed as an Asbestos Worker.

- Each person reaching the 30-day limit must undergo a medical examination prior to start of any more work and then at two yearly intervals thereafter.

3.9 Personal Protective Equipment (PPE)

All respiratory and personal protective equipment used for A/RCF activities must conform to appropriate standards, see WMP #26 Personal Protective Equipment (PPE).

- Respiratory Protective Equipment (RPE) - Category A Task:
 - P3 (or N100) disposable face mask;
 - Half-mask re-useable respirator fitted with P3 (or N100) filter cartridge(s) prior to work commencing;
- Tyvek type disposable coveralls - (dust protection Type 5 or Type 6) are preferred;
- Gloves with physical/mechanical protection;
- Safety boots (not lace-up type);
- Safety glasses or goggles.

3.10 Designated Dressing/Undressing Area

A designated dressing/undressing area should be established at the edge or near to the asbestos work area. This should be clearly signed and barriered off to restrict access.

Persons entering the asbestos work area must already be fully dressed in their PPE and RPE, and this must not be removed until they are back in the designated area.

The area should allow modesty to be maintained i.e. have sides so that the persons changing are not on view to the passers-by.

The area should also contain:

- A supply of asbestos waste bags and tape for disposal of used PPE;
- Wet wipes for cleaning down PPE and persons;
- A method of hanging personal clothing.

3.11 Asbestos Waste/RCF Waste Handling

For Category A activities, A/RCF CM must be double wrapped and sealed in heavy duty polythene, or double bagged in strong leak-proof plastic bags (with each bag closed using a swan-neck method) or placed in dedicated containers. The bags and containers must be properly sealed, covered and appropriately labelled, for example, "**ASBESTOS – DANGER BY INHALATION**" or "**RCF – DANGER BY INHALATION**"

Or with a warning sign such as:



3.12 For large volume items such as asbestos roofing sheets, the unbroken sheets shall be stacked stored under weather-proof covers until they can be permanently disposed of. Broken sheets must be double wrapped or bagged and labelled appropriately.



3.13 Asbestos Waste/RCF Waste Storage

The BGC Temporary Asbestos Waste Storage Facility is at Um Qasr Marine Terminal.

- No other waste must be kept there.
- This storage area is restricted (controlled) access and is identified as an asbestos area by means of caution signs visibly posted on its perimeter fence.
- Properly wrapped or bagged asbestos waste should be deposited into the storage container located within the Temporary Asbestos Waste Storage Facility.
- The key is held by Infrastructure.
- Arrangements for access are by contacting Waste Management Manager and a Waste Consignment Note (see WMP #30 Waste Management) must be completed for all materials deposited in the facility.
- The volume of waste transferred should be recorded on the note as one of the following:
 - Number of bags
 - Number of drums (and size e.g. 20 liters or 200 liters)
 - Number of cement sheets wrapped
 - Number of wrapped items

3.14 Transportation

Asbestos or RCF waste must be completely covered during transportation to the storage/disposal destination. Waste bags and containers must be transported in a sealed condition to prevent fiber release. Asbestos or RCF waste must only be transported in isolation and shall not be transported within the section of a vehicle that is used for transporting people. Drivers who may be exposed to Asbestos or RCF waste materials e.g. during the loading or unloading of waste from their vehicle, must be provided with suitable personal protective clothing and shall have been provided with the appropriate Level 1 and Level 2 training.

4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #25 Permit to Work
- #26 Personal Protective Equipment
- #30 Waste Management

BGC Checklists and Construction Site Safety Standard (CSSS) Forms

- Checklist for 'Non-licensed Asbestos / RCF Works' (Appendix 1)

BGC ToolBox Talks, Communication Materials, Posters and Information

- Examples of Asbestos Work Categorisation (Appendix 2)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	Occupational Hygiene Lead	31-03-2022	Retained on sign-off form



Appendix 1 Checklist for Non-Licensed Asbestos / RCF Works

	Standardisation Requirement	Yes	No	Actions required Date/Action Party
1	Work is restricted to asbestos gasket / seal or cement-based materials. Work with asbestos insulation material is not allowed under any circumstances			
2	Specific method statement & JHA in place			
3	Current PTW in place			
4	Work area is restricted by barrier and warning signs			
5	All personnel working within the restricted area have undergone BGC Asbestos Awareness training in the last 2 years			
6	RPE is a minimum of P3 standard			
7	Tyvek type disposable coveralls and wellington type boots (no laces) are worn			
8	Suitable wetting agent is available and used - no dry stripping of asbestos			
9	Hand tools only - No power tools to be used			
10	A designated decontamination area is in place			
11	A segregated muster area is identified (to avoid accidental cross contamination in an emergency)			
12	All asbestos waste is double bagged and labelled as asbestos waste			
13	All asbestos waste is disposed of as hazardous waste under a BGC consignment note			



Appendix 2 Examples of Asbestos Work Categorisation

Examples of conditions of work under Category A (Non-Licensable Work)

- Cleaning up small quantities of loose/ fine debris containing ACM dust (where the work is sporadic and of low intensity, the control limit will not be exceeded, and it is short duration work)
- Drilling of textured decorative coatings for installation of fixtures/fittings
- Encapsulation and sealing-in work on ACMs that are in good condition
- Asbestos cement products removal (e.g. roof sheeting, tiles)
- Asbestos in ropes, yarns and woven cloth (textiles)
- Asbestos gaskets or asbestos rope cords (including removal as part of repair, plant rehabilitation and upkeep of equipment) if this can be done without substantial breakage
- Asbestos-containing thermoplastic and vinyl floor tiles, bitumen roof felt, shingles, damp-proofing coatings, and mastics
- Asbestos-containing felt and paper
- Plastic paint coatings, PVC floors, panels and sealing compounds
- Asbestos-containing conveyor belts/drive belts, bonded rubber, electric cables
- Resin-based ACMs such as friction products (e.g. brake linings)
- Painting/repainting AIB that is in good condition
- Asbestos cement products, (e.g. roof sheeting and rainwater goods) provided the material is carefully handled/removed without breaking up; this includes work with asbestos cement which is weathered but not otherwise substantially damaged
- Small areas of textured decorative coatings using suitable dust-reducing methods, to support other activities such as installation/replacement of smoke alarms and light fittings
- Air monitoring and control task to check fiber concentrations in the air, or collection and analysis of asbestos samples to confirm the presence of asbestos in a material

Examples of conditions of work under Category B (Licensable Work)

- Removing sprayed coatings (limpet asbestos)
- Removal or other work which may disturb pipe lagging
- Any work involving loose fill insulation
- Work on asbestos millboard
- Cleaning up significant quantities of loose/fine debris containing ACM dust (where the work is not sporadic and of low intensity, the control limit will be exceeded, or it is not short duration work)
- Work on AIB, where the risk assessment indicates that it will not be of short duration



Work Management Procedure

#11 Handling Chemicals

1 OVERVIEW AND HAZARDS

- 1.1 Chemicals can cause unwanted health effects such as skin irritation, breathing difficulties, injury, etc. Chemicals may be flammable, poisonous, corrosive or very harmful to both people and the environment. The purpose of this WMP is to ensure safe handling, use, storage, transportation and disposal of chemicals used at BGC.



- 1.2 Harmful effects from chemicals vary greatly. **Material Safety Data Sheets (MSDS)** must be referred to so that the specific hazards can be understood and mitigated.

Relevant Life Saving Rules and Process Safety Fundamentals

Work Authorisation	High Risk Activities
 Work with a valid permit when required	 For all defined high-risk activities, follow the procedures and sign off after each step

2 PLAN THE WORK

2.1 Hazard Identification

Follow WMP #13 Hazard Identification to identify the hazards of the task and the location.

- Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.
- Check if a Permit-To-Work (PTW) is required for the task, see WMP #25 PTW.



2.2 Training & Competence

Anyone required to work with, or handle chemicals must be competent to do so, and undergo BGC approved hazardous chemical awareness training.

- Drivers transporting or delivering hazardous chemicals must also complete dangerous goods training and follow WMP #3 Driving Safety.
- Driver and helper must be given copies of the manifests and MSDS and know their roles and responsibilities with respect to spillage.

2.3 Material Safety Data Sheets

Verify that any chemical to be used is included in the BGC inventory of chemicals and MSDS.

- If a new chemical is to be used, with specific environmental or health risks, the Supervisor should contact the BGC Health and Environmental Department prior to use.



- 2.4 Chemicals should be supplied and used as described in their MSDS. Any special instructions arising from a risk assessment, including Personal Protective Equipment (PPE), see WMP #26 PPE, must be understood and followed by the users.
- 2.5 **Chemical Storage**
Ensure chemical storage facilities undertake appropriate risk assessments to confirm conditions, procedures, and mitigations are appropriate (e.g. Control of Substances Hazardous to Health Assessment – COSHH requirements).
- 2.6 Earthing shall be in place for storage of flammable materials.
- 2.7 Inventory movements must be checked and communicated to the store supervisor to ensure that adequate emergency response can be made if needed.
- 2.8 Storage areas and storage cabinets must have:
- A storage plan to allow the separation of different classifications of hazardous chemicals; chemicals shall be stored like for like (see Table 1 below). Consult the Environment Department for guidance and assistance;
 - Containment and response equipment for spills and leaks e.g. bunded (capable of holding 110% of total storage capacity) and have an impermeable floor;
 - Equipment appropriate for the quantity, type and location of the stored chemicals;
 - Suitable conditions for storage including protection from weather conditions, be free of damage, and maintained within a suitable temperature range;
 - Necessary first aid equipment such as eye wash stations, showers and/or chemical response kits

Table 1 Storage Compatability Guide (refer to MSDS)

	Toxics	Aerosols	Flammables	Oxidants	Corrosives
Toxics		X	X	X	X
Aerosols	X		X	X	X
Flammables	X	X		X	X
Oxidants	X	X	X		X
Corrosives	X	X	X	X	

X = incompatible

Figure 1 Storage of Chemicals – Good and Bad Examples





2.9 Incoming and outgoing movement of chemicals

It is the responsibility of the site owner to ensure a detailed inventory is kept of all the chemicals being stored and used at their site.

- This must include a list of all the chemical products names, their function, their storage location, the hazards associated with each product and volumes being stored.
- Regular stock checks must be performed to manage incoming and outgoing chemical movements to ensure the inventory is always kept up to date.
- It is the responsibility of the site owner to ensure this information is verified regularly and kept at a location where it can be easily accessed during routine operations and also in the event of an emergency.

2.10 Chemical containers must be checked to confirm the following (see Figure 2 Label based on the Global Harmonised System (GHS):

- Chemical name and trade name;
- Hazard symbol and hazard identification labels legible and attached firmly;
- Hazard statement of the necessary precautions to be taken;
- Manufacturer's name;
- UN or CAS (Acronyms) number, if applicable;
- Date of manufacture and expiry;
- A description of the main risk(s);
- Containers in good condition, (not leaking, corroded or damaged).

Chemicals not labelled having codes different to the MSDS or damaged are unacceptable for use.

Figure 2: Global Harmonised System

GHS - Hazard Pictograms and Related Hazard Classes		
Exploding Bomb <ul style="list-style-type: none">• Explosive• Self-reactives• Organic Peroxides	Corrosion <ul style="list-style-type: none">• Skin corrosion/burns• Eye damage• Corrosive to metals	Flame Over Circle <ul style="list-style-type: none">• Oxidizing gases• Oxidizing liquids• Oxidizing solids
Gas Cylinder <ul style="list-style-type: none">• Gases under pressure	Environment <ul style="list-style-type: none">• Aquatic toxicity	Skull & Crossbones <ul style="list-style-type: none">• Acute toxicity (fatal or toxic)
Exclamation Mark <ul style="list-style-type: none">• Irritant (eye & skin)• Skin sensitizer• Acute toxicity• Narcotic effects• Respiratory tract irritant• Hazardous to ozone layer (non-mandatory)	Health Hazard <ul style="list-style-type: none">• Carcinogen• Mutagenicity• Reproductive toxicity• Respiratory sensitiser• Target organ toxicity• Aspiration toxicity	Flame <ul style="list-style-type: none">• Flammables• Pyrophorics• Self-heating• Emits flammable gas• Self-reactives• Organic peroxides



Figure 3
Example Label
based on the GHS



- 2.11 Check all required PPE is fit for use, in good condition and meets the requirements of the MSDS.
- 2.12 Reused containers or cut containers should not be used to transfer, hold or store chemicals. Never store containers in used drink bottles or drink receptacles. Containers found to be unsafe for further handling must be assessed and appropriate measures taken to ensure the safety of all personnel.
- 2.13 **Prepare the Area**
 - Store chemicals so that the “First in, First out” method is applied so that the older stock is used first;
 - All chemical drums should be stored on pallets and not stacked more than 3 units high;
 - Chemicals must be stored separately, Different chemicals must not be stored together;
 - Necessary First Aid equipment, including eye wash must be at the storage location;
 - Prepare task to allow work to occur upwind where possible;
 - All containers should be secured with lids closed;
 - Any leaks or spills to be reported and cleaned before new materials are introduced;
 - Additional spill trays and spill kits must be readily available and fit for use;
 - Floor of chemical storage areas should be impermeable and bunded to 110% of total capacity if this is not possible then bunded pallets are required;
 - Emergency contact numbers should be clearly posted;
 - Access should be restricted to those involved in the task;
 - Check that the storage area is well-ventilated; floors shall be non-combustible, liquid tight and sheltered from direct sunlight;
 - Equipped as per Appendix 1: Minimum Requirements for Equipment.
- 2.14 **Communications**
 - Toolbox talks shall be facilitated by Supervisors before work begins.
 - During the TBT, the Supervisor must discuss in detail the MSDS and all associated hazards and the specific controls including the required PPE, see Table 1 ‘Global GHS Hazard Pictograms and Related Hazard Classes’
 - If the work is likely to impact other persons working in the area, this must be communicated in advance to the Supervisor in charge.

3 DO THE WORK

- 3.1 The following requirements shall be followed:
- 3.2 Control measures:
 - Check all containers openings are securely closed
 - Check work areas are adequately ventilated, and emergency exits are clear of obstructions
 - Check suitable response equipment such as fire extinguishers and spill kits are available, and personnel trained.
 - Always maintain good housekeeping
 - A method of secondary containment shall be employed able to hold 110% of the materials. See Figure 4 below for examples.

**Figure 4 Examples of Secondary Containment Spill Trays****Start work**

Handling Do's and Don'ts	
DO	DON'T
<ul style="list-style-type: none">✓ Ensure work methods minimize exposure to chemicals to as low as reasonably practicable✓ Ensure that appropriate isolations are in place and permits are approved when removing or adding chemical storage container into the operating process.✓ Use only chemicals required for the right process. Do not substitute chemicals✓ Keep number of persons involved to the minimum. Working alone is not permitted.✓ Seek medical attention immediately if irritation or discomfort is experienced while handling the chemical.✓ Remove all contaminated clothing immediately.	<ul style="list-style-type: none">✗ Never work with chemicals if the content is unclear e.g. labels are faded or if they do not appear to be in the right condition.✗ Never leave chemical decanting or drain activities unattended.✗ Avoid mixing incompatible chemicals.✗ Do not eat, drink or smoke while handling chemicals.✗ Do not modify chemical transport and storage containers/drums in any way, and only use for original purpose. Modifications such as welding, cutting and grinding are prohibited at all BGC working sites.

3.3 Chemicals should only be transferred between containers by approved means. DO NOT reuse containers or unmarked items. Reporting of all spills, major or minor shall be in accordance with the WMP #19 HSE Event Reporting, Investigation & Learning.

3.4 Follow the three C's of spill response:

- **Control:** Stop further spill from continuing
- **Contain:** Use spill kit, pads, booms, absorbant material to stop the spill from spreading
- **Cleanup-up:** Use PPE and disposal material to cleanup spill and contaminated items

Clean up of minor spills is the responsibility of the Chemical User, at the time of the spill, and shall follow the advice in the appropriate MSDS and risk assessment (see WMP #13 Hazard Identification).

3.5 **Emergency Response Major Spills**

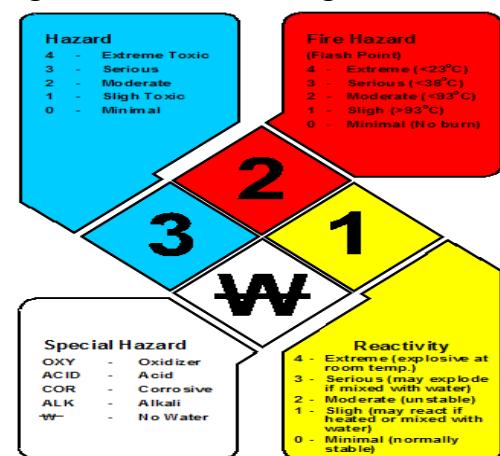
All major spills, fires, road traffic accidents or other incidents involving chemicals shall be dealt with following WMP #19 HSE Event Reporting, Investigation, and Learning.



3.6 The American National Fire Protection Association (NFPA 704) diamond provides a quick visual summary of the health hazard, flammability, reactivity and special hazards that chemical may pose during a fire. See Figure 5.

- Emergency crews must be competent to manage chemical emergencies (refer to the Emergency Response Procedure).

Figure 5 NFPA Hazard Sign Standard



3.7 Clean Up Requirements

Following emergency response to a chemical spill, the affected area shall be assessed in consultation with the BGC Environmental Engineer. See also WMP #19 HSE Event Reporting, Investigation, and Learning.

4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #19 HSE Event Reporting, Investigation, and Learning
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC Checklists and Construction Site Safety Standard (CSSS) Forms

- Minimum Equipment Requirements for Chemical Storage Areas (Appendix 1)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC Operations HSE Manager	31-03-2022	Retained on sign-off form



Appendix 1: Minimum Equipment Requirements for Chemical Storage Areas

Equipment	No. REQ'D	Application
Spill absorbent booms/pillows Kits	2	Liquid chemicals/oils, close access to waterways or storm-water drains
Chemical Spill/clean-up Kit	1	Absorbent appropriate for the chemical(s) stored.
Eye Wash Facility	1	For all chemical storage areas
Safety Shower	1	
Hard bristled broom	1	
Spade	1	
Plastic garbage bags	20	
Drum	2	For placing waste disposal
Over drum	2	To cover a 205 litre drum
Water hose (with supply pressure)	1	For all chemical storage areas
Personal Protective Equipment (PPE) • Goggles/full-face shield • Chemical/oil resistant gloves (Elbow length) • Full 100% coveralls • Chemical resistant apron or coat & leggings • Respirator with filter cartridges (specific for chemicals stored) • Chemical resistant safety boots • Hard-hat	1 1 1 1 1 1 1	Subject to details on each Chemical's MSDS sheet
SCBA (Self Contained Breathing Apparatus)	Designated on-site	Where designated in the site 'Emergency Response Procedures'.
Full encapsulated chemical resistant suit	As above	
Long Sleeve Shirt and long trousers or coveralls	As above	For all chemical storage areas



Work Management Procedure #12 Handling Compressed Gas Cylinders

1 Overview and Hazards

- 1.1 This WMP applies to compressed gases that are stored under pressure in cylinders.
- 1.2 Hazards include:
 - Hazards associated with the health effects of the gas (see Figure 1, below)
 - ‘Line of Fire’ Impact hazards if the cylinder is damaged and gas is released under pressure
 - Fire or explosion risk if the gas is flammable
 - Manual handling of heavy cylinders, see WMP #23 Manual Handling

Figure 1 Hazard Symbols

	Toxic – creates poisonous atmospheres that cause serious illness or death when breathed
	Flammable – when released to the atmosphere they can catch fire or explode
	Oxidizing – they make it easier for things to burn and catch fire, also makes fire stronger
	Corrosive – causes skin and eye damage, and can cause damage to certain materials
	Inert/asphyxiating – displaces oxygen from a space, making it impossible to breathe
	Stored Pressure – can cause injury from suddenly released pressure or objects

Relevant Life Saving Rules and Process Safety Fundamentals

Work Authorisation



Work with a valid permit when required

High Risk Activities



For all defined high-risk activities, follow the procedures and sign off after each step



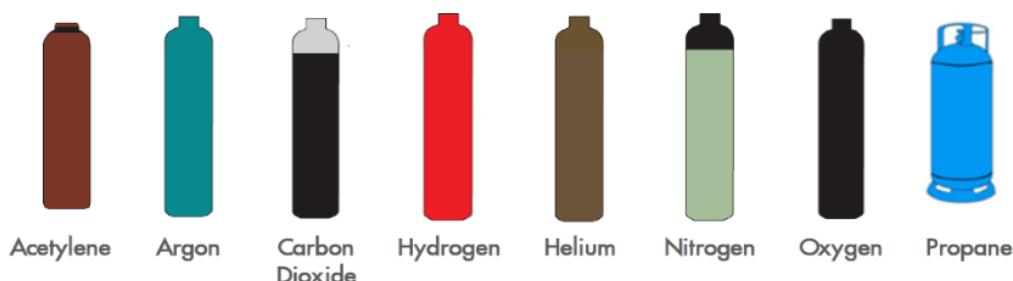
2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.
- 2.2 Confirm what approvals, documentation, Permit-To-Work (PTW), Job Hazard Analysis (JHA), Toolbox Talk (TBT) etc are needed and who will check it is done before the work starts. Follow WMP #25 PTW. 
- 2.3 Confirm supervision arrangements including any necessary support, including HSE Advisors, Emergency Response, Gas Testing, etc.
- 2.4 Have the gas cylinder's Material Safety Data Sheet (MSDS) easily accessible for workers.
- 2.5 Ensure gas cylinders are clearly labelled and easily identifiable. Workers should never use a Cylinders if they cannot read its label, nor should they use only a Cylinder's colour to identify its contents.



- 2.6 Ensure regulators, valves, flash back arrestors and fittings are in good condition.
Compressed gas cylinders are:
 - Colour coded in accordance with Industrial Gas Cylinder Colour coding, see Figure 2
 - Valid within 5 years after inspection date (stamping on cylinder shoulder) or on inspection tagAcceptance and returning of cylinders shall be documented and signed off.
- 2.7 Industrial Gas transportation and storage containers must not be modified in any way.

Figure 1 Industrial Gas Cylinder Colours





3 Do The Work

Precautions

- 3.1 Under pressure, oxygen and hydrocarbons (oil and grease) can react violently, resulting in explosions.

DO	DON'T
<ul style="list-style-type: none">✓ Keep cylinder, cylinder valve, coupling, regulator, hose and apparatus free from oil, grease, and other combustibles, flammable or explosive substances✓ Verify the contents of the cylinder from markings and check that attached labels correspond to the markings before usage✓ Protect cylinders from falling objects.✓ As compressed gas cylinders are large, heavy and awkward to handle, take appropriate steps (Refer to WMP #23 Manual Handling) when moving gas cylinders✓ Ensure that the cylinder valve is shut off and the pressure in the hose/piping is released when the system is not in use.✓ Use hoses recommended for the specific gas and pressure✓ Ensure flashback arrestor is connected to prevent dangerous backfire and flashback.✓ Always "ASK" your supervisor if you are in doubt	<ul style="list-style-type: none">✗ Never use Oxygen gas as a source of compressed air✗ Do not set the regulator pressure above the maximum pressure of the equipment or tool✗ Cylinders shall never be used as rollers or supports, whether full or empty✗ Cylinders shall not be dropped or subjected to excessive shock✗ Smoking and carrying of other sources of ignition is strictly prohibited in the vicinity (minimum 5m) from compressed gas storage area✗ Repair or alteration to the cylinder, valve, or safety relief device is strictly prohibited.✗ Horizontal rolling of cylinders and moving of any cylinder with the valve open is not permitted✗ Defective cylinders, regulators, valves, and/or hoses shall not be used and labelled out of service✗ Do not use any gas cylinder with missing or unreadable precautionary labels and markings or without clear color codes

- 3.2 Precautionary labels shall be available on the cylinders with hazard symbols and text for individual gas cylinders containing single gas or gas mixtures, see in Table 1 below.

3.3 Handling and transporting compressed gas

Safety glasses with side shields (or safety goggles) and other appropriate personal protective equipment must be worn when working with compressed gases.

- 3.4 Cylinders must be marked with a label that clearly identifies the contents.
- 3.5 All cylinders must be checked for damage prior to use. Do not repair damaged cylinders or valves.
- 3.6 Damaged or defective cylinders, valves, etc., must be taken out of use immediately and returned to the manufacturer/distributor for repair.

**Table 1 Gas Hazards, Characteristics & Labels**

Gas	Chemical Formula	Smell	Respiratory Hazard	Flammability	Weight vs Air	Precautionary Labels
Acetylene	C ₂ H ₂	Pungent with hint of garlic	Asphyxiant	Highly flammable	Lighter	 or 
Argon	Ar	None	Asphyxiant	Non-flammable	Heavier	 or 
Carbon Dioxide	CO ₂	None	Asphyxiant	Non-flammable	Heavier	 or 
Hydrogen	H ₂	None	Asphyxiant	Highly flammable	Lighter	 or 
Helium	He	None	Asphyxiant	Non-flammable	Lighter	 or 
Nitrogen	N ₂	None	Asphyxiant	Non-flammable	Same	 or 
Oxygen	O ₂	None	None	Non-flammable, but supports combustion	Same	 or  and 
Propane	C ₃ H ₈	Odourised	Asphyxiant	Highly flammable	Heavier	 or 

- 3.7 All gas cylinders (full or empty) must be rigidly secured to a substantial structure at 2/3 height. Only soldered link chains or belts with buckles are acceptable. Cylinder stands are also acceptable for a short period.
Handcarts shall be used when moving gas cylinders. Cylinders must be chained to the carts.
- 3.8 All cylinders must be fitted with safety valve covers before they are moved.
- 3.9 Safe wheeled carts should be used to move cylinders.
- 3.10 Always use a pressure-regulating device to control the flow of gas from the cylinder.
- 3.11 The main cylinder valve shall be the only means by which gas flow is to be shut off.
- 3.12 The correct position for the main valve is all the way on or all the way off.
- 3.13 Close cylinder valves when not in use. Closing the valve isolates the cylinder's contents from the surrounding atmosphere and prevents corrosion and contamination of the valve.
- 3.14 Keep valves pointed away from others when opening.
- 3.15 Ensure use of caps.
- 3.16 Cylinder valves must never be lubricated, modified, forced, or tampered with.
- 3.17 All cylinder fittings shall be as per manufacturer recommendations.
- 3.18 After connecting a cylinder, check for leaks at connections.
- 3.19 Periodically check for leaks while the cylinder is in use.
- 3.20 Regulators and valves must be tightened firmly with the proper size wrench.
- 3.21 Do not use adjustable wrenches or pliers because they may damage the nuts.



- 3.22 Cylinders must not be placed near heat or where they can become part of an electrical circuit.
- 3.23 Cylinders must not be exposed to temperatures above 50° C (122° F). In summer months where high ambient temperatures are experienced, store cylinders in shaded areas. Some rupture devices on cylinders will release at about 65° C (149° F). Some small cylinders are not fitted with rupture devices and may explode if exposed to high temperatures.
- 3.24 Rapid release of a compressed gas must be avoided because it will cause an unsecured gas hose to whip dangerously, which also may build up enough static charge to ignite a flammable gas.
- 3.25 Appropriate regulators must be used on each gas cylinder.
- 3.26 Threads and the configuration of valve outlets are different for each family of gases to avoid improper use.
- 3.27 Use the **Compressed Gas Association (CGA)** numbered fittings appropriate for the gas in use.
- 3.28 . Adaptors and homemade modifications are prohibited.
- 3.29 Cylinders must never be bled completely empty. Leave a slight pressure to keep contaminants out.

3.30 Storage

When not in use, cylinders must be stored with their main valve closed and the valve safety cap in place.

- 3.31 Compressed gases shall be stored or used in areas with adequate ventilation and away from the personal exit and egress.
 - Stores containing flammable gas cylinders shall be ventilated, preferably be covered and have at least two exits.
 - Flammable gas cylinders must be segregated from oxidizer gases such as oxygen.
 -



- 3.32 Compressed gases shall not be used for cleaning purposes.
- 3.33 • Dry chemical fire extinguishers shall be available on site and be easily accessible
 - All cylinders must be secured upright.
 - Cylinders awaiting use and empty cylinders must be stored according to their hazard classes
 - Cylinders must not be stored in damp areas or near salt, corrosive chemicals, chemical vapors, heat, or direct sunlight
 - Cylinders stored outside must be protected from the weather
 - Never place cylinders where they may become part of an electric circuit.



Inspection

- 3.34 Pre-and post-use checks shall be made to cylinders, hoses, connections, regulators and torches or burners for damage from cuts, abrasion and general deterioration using a liquid leak detector (“snoop brand”) water bubble test.
- 3.35 Cylinder shall be inspected and hydro tested every 5 years. Records of inspection shall be kept and maintained by the inspection team..
- 3.36 **If a gas leak is detected:**
- Check the tightness of the cylinder valve gland nut, and the condition of the threaded connections
 - Report the leak to the Worksite Supervisor
 - If the leak persists:
 - Remove the cylinder to a well-ventilated safe area
 - Notify the owner/supplier

Emergency Situations

- 3.37 In the event of a fire involving the torch assembly or hoses, close the cylinder valves if it is safe to do so.
- 3.38 In the event of a fire involving a compressed gas cylinder:
- Evacuate the area
 - Do not attempt to move the cylinder
 - Notify the Emergency Response Team

4. References & Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #23 Manual Handling
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC ToolBox Talks, Communication Materials, Posters and Information

- 10 Questions: Hazards of Compressed Gas Cylinders (Appendix 1)

5. Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC Operations HSE Manager	31-03-2022	Retained on sign-off form



Appendix 1 '10 Questions for Gas Cylinder Safety'

10 QUESTIONS TO ASK TO AVOID HAZARDS OF COMPRESSED GAS CYLNDERS



COMPRESSED GAS CYLNDERS: ARE WE HANDLING AND STORING THEM SAFELY?

1 STORAGE

Are cylinders always secured in an upright position with caps installed?
Are they prevented from falling, dropping, or rolling?
Are all cylinders stored out of direct sunlight in a shaded area?
Are empty and full cylinders stored separately?



6 HOT WORK

Is there a fire watch on standby? Is there suitable fire fighting equipment nearby?
Does everyone know how to use it?
Is the area free of flammable and combustible materials?
Do you need a hot work permit for the work you are doing?



2 CONTENTS

How do you know what's in the cylinder? Are you treating all cylinders as if they are full?
Does the cylinder have a label? If not - do not use.
Are cylinders without labels tagged out of service and returned to the supplier?



7 HAZARDS

Are cylinders kept away from sources of heat and flame?
Does everyone understand the Life Saving Rule and not to smoke near cylinders?
Are chemicals and other substances kept far away from cylinders, components and hoses?



3 INSPECTIONS

Are cylinders on a routine inspection schedule?
Do you check them each time before use?
Are hoses, cylinders, valves, and fittings free from wear and tear or other damage?
Do you know how to raise a work request to get defects repaired?



8 TREAT WITH CARE

Are cylinder valves and fittings treated with care?
Are they only worked on by competent people with the right tools?
Do you make sure that valves are opened slowly and not overtightened, to avoid damage?
Do we avoid pulling, pushing or lifting fittings, or forcing them in any way?



4 TRAINING/COMPETENCE

Are you trained and competent to use the types of cylinders in the way intended?
Do you understand the properties and hazards of the different gases?
Are competent and experienced personnel in charge of inspecting and maintaining cylinders?



9 HANDLING

Do you need to move cylinders? Do you know how heavy they are?
Do you have a trolley or rack that you can use to move cylinders? Have you got a colleague to help you?
Are lifting points for racks inspected and certified?
Is everyone aware NOT to lift or move cylinders using the valve stems?



5 GAS LEAKS OR FIRES

Do you know what to do if there is a gas leak or fire?
Are the evacuation routes clear and does everybody know where to go?
Do you have the EROC emergency number in your phone? +964 7805 213970



10 COLOUR CODING

Do you understand the different meanings of colours and shapes for gas cylinders?
Do you know for certain that the cylinder has the right gas inside?





Work Management Procedure #13 Hazard Identification

1 Overview and Hazards

1.1 A Hazard is any situation, condition, material, substance or object that has the potential to cause harm to people, damage to assets, effect on the environment, impact to community, or damage BGC's reputation. The purpose of this WMP is to ensure the right steps are followed to recognize hazards at worksites.

Overarching hazards recognized in BGC operating assets are documented and managed through HSE Cases.

- HSE cases are developed, available at BGC operating sites and updated periodically;
- The HSE Case is a facility or operation-specific demonstration that the HSE risks from Major Hazards are managed to **As Low As Reasonably Practicable (ALARP)** and a description on how the HSE Management System is applied to manage HSE hazards;
- Within the HSE Case several risks and hazards management tools are used, such as **Hazards Identification (HAZID)**, **Hazards Operability (HAZOP)**, **Quantitative Risk Assessment (QRA)**, **Health Risk Assessment (HRA)** and Qualitative Risk Assessment.

Activity specific tools such as **Job Hazards Analysis (JHA)**, **7 STEPS** and **Worksite Hazards Management** are used during day-to-day work in facilities.

In BGC we apply a **Hazard and Effects Management Process (HEMP)** following the below steps:

- Identification, risk assessment and control of Hazards;
- Evaluation and implementation of barriers (control and recovery measures);
- Documentation within HSE Cases that major HSE risks have been reduced to ALARP.



1.2 HEMP tools are used in design and plant changes but also for the day-to-day worksite activities.

Relevant Life Saving Rules and Process Safety Fundamentals

All Life Saving Rules & Process Safety Fundamentals are applicable for this WMP section.



2 Plan The Work

2.1 Risk Assessment Matrix (RAM)

The RAM is a tool used to assess the hazards and associated risks of an activity. The RAM is a 6 by 5 matrix used for qualitative assessments of risk and where considered appropriate, for prioritisation of activities and resources.

It is based on the concept of applying experience of events or incidents in the past to provide insights on how we can manage risk in the future:

- Vertical axis represents increasing Consequences (Severity levels 0 to 5) in terms of harm to People, damage to Assets, impact on Community and effect on the Environment (P, A, C, E categories);
- The horizontal axis represents increasing Likelihood (levels A to E) of the Consequence under consideration;
- Boxes in the matrix represent levels of Risk, increasing from top left to bottom right corners of the matrix;
- The matrix is divided into light blue, blue, yellow and red areas to illustrate the increasing level of Risk;
- The meaning of light blue, blue, yellow and red is described in the sections on the specific applications of the Risk Assessment Matrix (Figure 1);
- The Consequence severities (0-5) scales for each P, A, C, E categories are not to be inferred as equal. They are not to be used to infer the value of a life;
- The RAM is used without the consideration of Barriers or controls (Unmitigated Risk).

Figure 1 BGC Risk Assessment Matrix (RAM)

SEVERITY	CONSEQUENCES				INCREASING LIKELIHOOD				
	People	Assets	Community	Environment	A	B	C	D	E
0	No injury or health effect	No damage	No effect	No effect					
1	Slight injury or health effect	Slight damage	Slight effect	Slight effect					
2	Minor injury or health effect	Minor damage	Minor effect	Minor effect					
3	Major injury or health effect	Moderate damage	Moderate effect	Moderate effect					
4	PTD or up to 3 fatalities	Major damage	Major effect	Major effect					
5	More than 3 fatalities	Massive damage	Massive effect	Massive effect					

2.2 How to Use the RAM

The starting point for a RAM assessment is an understanding of the hazard in its context (activity, location etc.) or an understanding of the incident being considered. Always use the BGC RAM Guide (front page) to ensure the RAM is used consistently. The RAM should be used by more than one person together that have relevant experience and knowledge of the activities.



Follow the 4-Step Process:	
Step 1	<ul style="list-style-type: none">Identify potential Consequences for People, Asset, Community, Environment;Identify the “worst case credible” consequences that could develop from the hazard under the prevailing conditions.Ask the question “What could happen if the controls don’t work or are not in place?
Step 2	<ul style="list-style-type: none">Estimate the Severity of each potential Consequence;For each of the identified Consequences use the RAM guide to assess the Severity (0 -5) in the four Consequence categories P, A, C, E.
Step 3	<ul style="list-style-type: none">Estimate the Likelihood of the consequence occurring;For each of the potential Consequences make an estimate of the Likelihood of the Consequence in terms of the Likelihood levels A to E;The Likelihood level is judged from past experience, by asking the question “How often in the past has a hazard release resulted in a Consequence similar to the one that we are considering?Location refers to your work location (e.g. KAZ, Um Qasr, BNGL);Organization refers to Basrah Gas Company;Industry refers to Oil and Gas Industry worldwide, or if applicable another relevant industry (e.g. Electrical Industry for electrical work).
Step 4	<ul style="list-style-type: none">Calculate the Risk rating for each Consequence

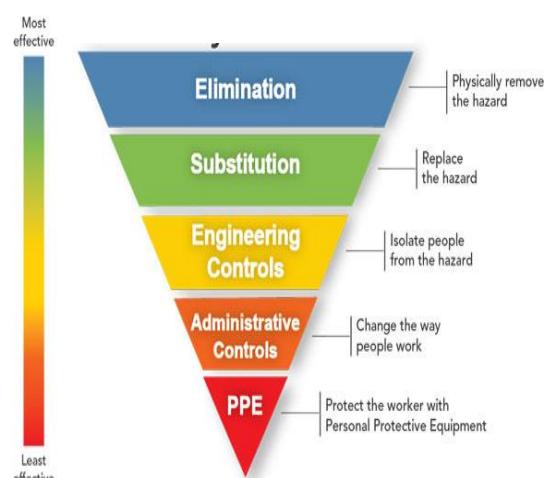
2.3 HAZARDS Identification Definitions & Tools

Techniques and Tools used in the risk management process to identify hazards and implement controls to mitigate risks to ALARP, applicable to day-to-day worksite activities are listed and explained in the Glossary of Terms.

2.4 Hierarchy of Controls

The Hierarchy of Controls is a step-by-step approach to eliminating or reducing workplace hazards. It ranks controls from the most effective level of protection to the least effective level of protection. When choosing a control method, start from the top of the inverted pyramid. Assess the feasibility of the first layer of controls (elimination) before moving onto the second layer (substitution). Continue this process until you reach of the bottom of the pyramid and have identified as many controls as needed to that will adequately protect the worker from the hazard.

Figure 2 Hierarchy of Controls





2.5 PLAN

Each worksite has its own unique hazards surrounding its working area. Specific hazards identification shall be discussed at each BGC worksites.

The following mandatory hazard identification trainings shall be conducted:

- **HSE Induction:** For all new staffs and contractors working at BGC offices and worksites
- **Site Specific HSE Briefing:** For staffs and contractors prior to first entry to the worksites.
Conducted by Asset Site Induction Focal Points.



Figure 3 Worksite Hazard Management

2.6 Job Hazard Analysis

The JHA is part of Permit-To-Work (PTW) and lists the risks and controls to work safely. The following guide shall be used during JHA and permit application:



- Use an approved JHA template (BGC or contractor) Bilingual Arabic and English;
- List all the task steps in order of completion;
- For each step use the hazard identification guide (Appendix 2) to identify Hazards;
- For each hazard, identify potential consequences;
- For each step use the BGC RAM to assess the risk;
- For each consequence apply Hierarchy of Controls (see Figure 2) to identify a control that must be implemented for work to proceed;
- For each control, assign a responsible person to ensure it is implemented;
- The most effective way of managing hazards is by using the Hierarchy of Controls and removing the hazards from the worksites. However, if not possible, the controls introduced to control the hazards shall be ALARP;
- PPE is the last line of defence.

2.7 Communication



PTW shall be submitted before execution of work. JHA should be part of the PTW process and controls shall be listed in the PTW (see WMP #25 PTW):

- JHA to be conducted prior to PTW application;
- As a minimum the Permit Applicant or Person In Charge of the Worksite (PICWS) and their Supervisor shall participate in the JHA discussion. HSE should be consulted and participate in the meeting and review the JHA;
- Ensure JHA team members have the necessary experience and knowledge to be familiar with the work and the hazards of the location;
- Permit Authorisers must review the JHA. Department Managers must sign approval of PTW/JHAs for higher risk using the RAM .



- 2.8 Each worksite has its own unique hazards surrounding its working area as well as hazards specific to the work tasks. It is required to visit the worksite to get familiar with the surroundings as part of the PTW preparation. Team discussion should include:
- Location of work;
 - Work method statement VERSUS specific hazards identified, the mitigation and controls required (using Hierarchy of Controls);
 - Potential issues with work alongside other work crews, or operations and maintenance activities;
 - Competencies and trainings required to perform task;
 - Support of disciplines e.g. logistics, road safety, waste management, emergency response e.g. Rescue plan;
 - Once the team is aligned, the Permit Requestor shall submit the JHA to the permit office for review.

3 Do The Work

3.1 Energy and Situational Awareness

'Line of Fire' is the zone within a work area where there is a risk of injury from an energy release, from machinery, equipment or contained fluids. Supervisor shall ensure the team understand the situations and risks involved at the start and during the work activity. A useful tool is the '10 Questions for Line of Fire' (see Appendix 4).



3.2 Final Checks and ToolBox Talk (TBT)

On daily basis, before commencing any work activities, supervisors shall conduct a pre-task TBT. The TBT should also be conducted after lengthy breaks e.g. > 1hr, or where there has been a change to the worksite e.g. due to weather changes, or other activities nearby (Simultaneous Operations – SIMOPS). See WMP #25 PTW.



TBT Tips:

- All workers, including subcontractors, associated with the work to be included;
- Supervisor/ PICWS leads the TBT and makes sure that everyone is attentive and takes part;
- Questions/answers on the tasks, hazards and controls, checks that PTW requirements are met and signed-off, including the Task Risk Assessment Card (Appendix 2). Projects will also include the Construction Site Safety Standards (CSSS) and '7 Steps – Safe Start of Work' Checklists (Appendix 5);
- Duration typically 10-15 minutes, but possibly longer, depending on the complexity of the work;
- Any new hazards identified during the TBT shall be recorded and documented in the PTW. See also WMP #25 Permit to Work;



3.3 For activities which only involve BGC staff, the TBT shall be conducted by the Company Supervisors with support as needed by HSE Advisors.

3.4 Ignition Sources from Personal Items

Site Inductions and TBT will include restrictions on ignition sources from personal items.

For hydrocarbon process areas, the following will be prohibited:

- Matches, lighters and e-cigarettes / vaping devices;
- Non-Ex Rated electrical equipment, including mobile phones, cameras,;
- Metallic jewellery with the potential to generate sparks.



3.5 Start Work

Once work commences (and after a break), any hazard, condition, and control changes identified shall be recorded in the TRIC Card (Appendix 2). Any change to the original work scope can require a new PTW. Any change or addition to the work team requires a new TBT for the new team members.

- The Hazard Identification Questions & Answers can be discussed during the TBT;
- All identified hazards shall be clearly displayed at worksites;
- All BGC staff and contractors shall stop the work activity and communicate with supervisor or team leader when they feel that the work cannot be performed safely;
- When you return to the worksite after taking a break, how do you ensure that nothing has changed before resuming the work?
- What do you do if someone recognizes a hazard after the JHA is filled out and signed?
- What barriers are in place to control the hazards of this job?
- When you return to the worksite after taking a break, how do you ensure that nothing has changed before resuming the work?
- What do you do if someone recognizes a hazard after the JHA is filled out and signed?

4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #23 Manual Handling
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC Checklists and Construction Site Safety Standard (CSSS) Forms

- CSSS Forms are provided under each relevant WMP section

BGC ToolBox Talks, Communication Materials, Posters and Information

- Hazard Classification (Appendix 1)
- TRIC Card Template (Appendix 2)
- JHA Template (Appendix 3)
- Line of Fire: 10 Questions (Appendix 4)
- 7 STEPS 'Safe Start of Work' (Appendix 5)

5 References and Resources

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC Operations HSE Manager	31-03-2022	Retained on sign-off form



Appendix 1 'Hazard Classification'

	MOTION What is moving? Could anything begin to move? Will people be moving on site? Vehicles? Could someone be trapped or crushed? Where are the pinch points?
	ELECTRICITY Where are the electricity sources? Are there any hidden? How could you contact them? Is isolation confirmed? Is static build-up possible? Are there any overhead power lines?
	THERMAL Does your work generate heat or cold? Where are the hot/cold surfaces or products in your work area? How could hot or cold environment affect your team?
	HEIGHT Who is working above you? Who is working below you? Are these objects above you that could fall? Are you using correct fall protection? Does the work involve climbing?
	FIRE & EXPLOSION Where are the nearby flammable materials? Where are the ignition sources? Are you sure that any hydrocarbons are properly isolated?
	PEOPLE Can all participants explain their role and responsibilities? Are communication channels clearly understood? Are there any personal problems within team? Does team have appropriate competencies?
	PRESSURE Where are the pressure sources? What could cause pressure to be released? Have you checked process isolations? Could your work create pressure?
	TOXICS What is the toxicity of the chemicals around you? Can the work you do change the air around you? Could your worksite be considered a confined space?



Appendix 2 'Toolbox Risk Identification Card (TRIC)'

شركة غاز البصرة – بطاقة تحديد المخاطر لحدث صندوق العد TOOLBOX RISK IDENTIFICATION CARD (TRIC)									
Permit No	رقمتصريح:		Date التاريخ:		Time الوقت:		Work Order No.		
Permit Task	مهمة التصريح:								
TBT Task Details	تفاصيل العمل:								
Toolbox talk leader	الاسم:	Name:	المنصب:	Position:	Sign:	التواقيع:			
الحضور Attendance	Name: الاسم:		Sign: التواقيع:		Name: الاسم:	Sign: التواقيع:			
	Name: الاسم:		Sign: التواقيع:		Name: الاسم:	Sign: التواقيع:			
	Name: الاسم:		Sign: التواقيع:		Name: الاسم:	Sign: التواقيع:			
	Name: الاسم:		Sign: التواقيع:		Name: الاسم:	Sign: التواقيع:			
	Name: الاسم:		Sign: التواقيع:		Name: الاسم:	Sign: التواقيع:			
By Signing this form, I agree with all of the PTW controls and additional identified on this form and will comply with them من خلال التوقيع على هذا النموذج ، اتفاق على جميع ضوابط المحددة والإضافية في هذا النموذج وسوف نلتزم بها									
Life Saving Rules – tick any LSR's applicable to this task دفع اشارة على اي من قواعد حفظ الحياة تطبق على هذه المهمة									
Additional Hazard Prompts – does the task involve any of the following?									
Motion الحركة:			Height الارتفاع:			Pressure الضغط:		Thermal حراري:	
Electricity الكهرباء:			Fire & Explosion الحرائق والانفجار:			Toxic مواد سامة:		People انسان:	
Dynamic Risk Review: Identify points in the task where conditions may change and review of the TBT may be required. i.e. when opening flange النقطة التي من الممكن ان تتغير فيها الظروف، وقد يتطلب الامر مراجعة "TBT" الى "TBT" اي عند فتح فلنج									
1		3			5				
2		4			6				

مراجعة المخاطر التباينية بعد القاء بداخل المهمة التي قد تسبب في تغيير الشروط وتلزم اجراء مراجعة على حدث صندوق العد قبل بدء العمل					
Step Description وصف الخطوة	Hazards associated with the step المخاطر المرتبطة بهذه الخطوة	Controls to be put in place الضوابط المقرر تنفيذها	Person in charge الشخص المسؤول	Controls in Place تطبيق الخطوات	
				No لا	Yes نعم

If any of the above answers were not YES, you MUST NOT start working.

Check again and apply additional controls where necessary. Ensure everything is safe starting work

إذا لم تكن كلية الإجابات عالية يتم فوريًا بحسب الإنتهاء العمل توقف.

ثم باللحسن مرة أخرى،طبق ضوابط إضافية عند التزور،اضمن سلامية كلية الأشخاص قبل الاستمرار

المخواصات النهائية – تم التأكيد من تطبيق كلية المتطلبات التالية قبل بدء العمل – لعم ام لا				
Valid PTW in place and "live"	Life Saving Rules discussed	All personnel wearing correct PPE	All work party have attended TBT	
توافر تصاريح عمل صحيحة و"بلورة العمل"	مناقشة قواعد حفظ على الحياة	ارشاد كافة معدات الحماية الشخصية الصحيحة	حضور كلية اطراف العمل حدث صندوق العد	
Detailed TBT carried out	Communication methods agreed	Tools and equipment all safe	All personnel aware of their roles	
اجراء حدث صندوق العد	الاتفاق على اسلوب التواصل	سلامة كافة المعدات والآلات	درية كلية ايجاد بواجباتهم	
New TBT required if new members of work party join later in shift		Dynamic Risk Review points discussed and agreed	مناقشة نقاط مراجعة المخاطر التباينية والموافقة عليها	
اجراء حدث جديد لحدث صندوق العد قبل بدء العمل عند انضمام افراد جدد للعمل				



Appendix 3 'Job Hazard Analysis Template'

Job Hazard Analysis Form		Facility: _____		Location: _____		Date: _____		
Section A : Task Information		Team Composition :						
Task :								
PTW No : _____								
Section B : JHA Detail Description		POTENTIAL HAZARDS Main hazards that could cause injury / damage when the task step is performed		POTENTIAL CONSEQUENCES		REQUIRED CONTROL MEASURES List both controls to prevent the incident and recovery measures when incident occurs		
STEP NO.	JOB STEPS List the steps required to perform the task in the sequence *Identify "Hold Point"		RISK RANKING P/A/C/E Risk Rating Likelihood Severity	Which LSR applies?	RESPONSIBLE PARTY(IES) Nominate the person who will be required to action the control measures			
	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
Section C : Approval Signatories								
Applicant Supervisor		Prepared by:						
Sign:		Sign:						
Date/Time:		Date/Time:						
Dept Manager*		Dept Manager*						
Sign:		Sign:						
Date/Time:		Date/Time:						
<p>Note : JHA shall be reviewed during onsite Tool Box Talk led by the PICWS prior to work commencing - all team members must be present. Any additional hazards identified once on site shall be noted on the TRIC along with appropriate control measures. All members are to sign on to the TRIC ONLY after they completely understand their role, as well as the hazards and control measures related to the work. If a work step or scope change is required, then work shall be paused and the PTW is updated until the JHA is re-issued, and a further Tool Box Talk communicating the changes must occur before work can re-commence.</p> <p>*Dept Manager sign off is required for complex or high risk tasks</p>								



Appendix 4 '10 Questions - Line of Fire'

10 QUESTIONS TO ASK TO AVOID LINE OF FIRE INJURIES



LINE OF FIRE: THE ZONE WITHIN A WORK AREA WHERE THERE IS RISK OF SERIOUS INJURY FROM MACHINERY AND EQUIPMENT.

1 MOVING VEHICLES / HEAVY EQUIPMENT

Have adequate precautions been taken in a workplace where there are moving vehicles?
Are parking brakes and wheel chocks used for vehicles/equipment parked on an incline?
Does the operator have a clear view of personnel in the immediate area? If not, is there a barksman / flagman present?



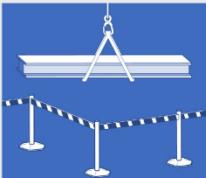
6 PRESSURIZED EQUIPMENT

Have you verified zero energy before cutting into or opening any equipment?
Even after verification of zero energy, do you keep your body out of the line of fire?
Are all compressed gas cylinders secured and upright with caps installed?
Are you aware of the potential for line of fire when working with pressurized tools?



2 LIFTING / HOISTING

Are other workers prevented from entering a lifting/hoisting zone?
Could a load swing when being lifted or lowered?
Has rigging equipment been loaded to more than its maximum safe limit?



7 MACHINERY & TOOLS

Are people working near equipment with parts that can move suddenly?
Could equipment rotate unexpectedly or continue to coast when de-energized?
Do the safety devices designed for your tools and equipment work properly?
Do you keep your hands off of sockets and anticipate movement if wrench slips?
Can hands and fingers be trapped?



3 WORKING AT HEIGHT/ DROPPED OBJECTS

Has a drop zone been established under any work being performed at height?
Have all tools and equipment been secured by those working above?
Are tool bags and hand lines being used to provide tools and equipment to workers above?



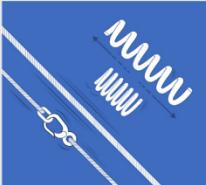
8 ELECTRICAL EQUIPMENT

Do you avoid working on or near energized electrical equipment?
When switching a breaker into position, do you always stand aside in case of an arc flash?
Do you stay clear when breakers are being closed remotely?
Does everyone understand that electrical rooms are not a safe place to 'hang out'?



4 TENSIONED LINES/ SPRING LOADED DEVICES

Are you aware to stay well clear of tensioned lines (i.e., chain, cable and rope), strapping & coiled or spring-loaded devices?
Are your hands and body clear of rigging equipment such as cables & shackles?
Have you considered the potential for pipe movement when tig or unbolted?



9 PROJECTILES

Are you aware of tasks that generate flying debris such as grinding, chipping, abrasive blasting, hydro-blasting, etc.? Are steps taken to contain projectiles and/or barricade and restrict access?
Do you position tools to direct the projectiles in a safe direction, such as directing sparks from grinding into the firebox?



5 OBJECTS WITH ROLL OR FALL POTENTIAL

Are any top-heavy items or objects that can roll secured?
What will you do if a load shifts? Stay out of harm's way!
Are loads secured before lifting, loading, unloading or transporting?
Could any items being transported by forklift or truck move or fall?



10 PUSHING / PULLING

Are you aware of body position when pushing or pulling, such as using a wrench or pushing/pulling a cart?
When pulling or pushing with wrenches, do you remain focused and anticipate the possibility of the fastener suddenly loosening or wrench slipping?
Do you keep your body, face, and hands out of the line of fire.





Appendix 5 '7 STEPS Safe Start of Work'

7 STEPS (Safe Start of Work) <i>"Starting Work is Not Step # 1"</i>		
Nr.	Step	Description
1	Plan	<ul style="list-style-type: none">• What is the job?• What are the phases?• What are the hazards and controls?• What came out of the job risk assessment?• How do we apply the Hierarchy of Control?• What is your role?• How often have you done this job?
2	Communicate	<ul style="list-style-type: none">• Which instruction did you receive for this job?• What specifics about this job was communicated?• How do you communicate during the execution of the job?
3	Check Equipment	<ul style="list-style-type: none">• What equipment are you using?• How do you know it is in good shape?• What can go wrong with it?• What kind of certification tests or rates are applicable?• How did you check?
4	Prepare Area	<ul style="list-style-type: none">• Where do you have RED Zones or NO GO Zones?• Where could you trip or fall?• What other work is going on around/above/below you?
5	Control Energy	<ul style="list-style-type: none">• Which isolation 'Lock Out Tag Out' is in place?• Where do we have stored pressure?• Which fluids do you need to drain?• How can people be in the Line of Fire?
6	Final Check	<ul style="list-style-type: none">• What do you do in case of an alarm?• What are the escape routes?• Which Focus Areas apply to the job?• What is agreed for supervision?• How was Walk to Line applied?
7	Start Work	<ul style="list-style-type: none">• Which Life Saving Rules are applicable?• Example safety alert. Can this happen to us?• When would you intervene? Specific examples?• What if anything changes?



Work Management Procedure

#14 Health Management of Hydrocarbons in Air (BTEX)

1 Overview and Hazards

- 1.1 Benzene, Toluene, Ethyl Benzene and Xylene (BTEX) are aromatic hydrocarbon compounds that occur naturally in crude oil and gas. They are components of a wide range of Volatile Organic Compounds (VOCs) that are detectable by smell. BGC's precautions follow industry standards, to limit exposure and ensure care for people's health. Projects are underway in BGC to further limit exposure potential where required.
- 1.2 **Hazards**
- The component of highest concern is benzene due to its carcinogenic health risk.
- Consequently, Workplace Exposure Limit (WEL) and ambient air quality standards are set at very stringent concentrations.
 - Monitoring VOC and BTEX concentrations show safe occupational levels across the vast majority of BGCs operations and situations. Despite this some people may experience discomfort from VOC odour at particular times and conditions, and extra mitigation is needed in specific locations and conditions.
 - People may feel short term discomfort (like headache, sore throat, sore eyes) if they remain directly downwind of venting odour for extended periods.

Relevant Life Saving Rules and Process Safety Fundamentals

Work Authorisation	High Risk Activities
 Work with a valid permit when required	 For all defined high-risk activities, follow the procedures and sign off after each step

2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location and the potential for BTEX to be encountered. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.
- 2.2 Confirm what approvals, documentation, Permit-To-Work (PTW), Job Hazard Analysis (JHA), ToolBox Talk (TBT), etc, is needed for the task and who will check it is done before the work starts. Follow WMP #25 PTW. 
- 2.3 The potential for exposure to hydrocarbons must be considered when planning any work at BGC facilities. Potential BTEX exposure exists wherever there are hydrocarbons, although the risk is elevated for work around particular sources identified through BGC, including:
- TEG units;
 - Wastewater treatment pits at the NGL plants;
 - Compressor lube and seal oil vents;
 - Burn pits, and anywhere liquid hydrocarbons are released to ground;
 - Excavations in any areas where contaminated soil or groundwater may be expected (e.g. burn pits, drains and process areas).



Planning must consider

- 2.4 Site instructions for the specific areas of concern (see Appendix 1) must be available and understood to ensure the right precautions are taken.
- 2.5 Specific locations will require downwind precautions, site engagement and training in use of **Respiratory Protection Equipment (RPE)**.
- 2.6 Consider the type and duration of the task.
- 2.7 Consult with your Line Manager to help minimize the need to enter or work in areas where the odours may occur (e.g. working downwind of a TEG vent plume should be designed out or avoided where possible).
- 2.8 Contact Health Team for latest BTEX monitoring data and instructions if uncertain.
- 2.9 RPE must be available for facilities and areas with known issues, and workers be provided with instructions for its use (e.g. fitting, adjustment and fit testing), see also WMP #26 PPE.
- 2.10 At the following locations, specific gas monitoring equipment is available for BTEX monitoring:
 - Shamiya
 - Markaziya
 - Compressor Station 7 (CS7) & Station 8 (CS8)
 - West Qurna 6 (WQ6)
 - KAZ NGL
 - North Rumaila NGL (NRNGL)
- 2.11 Where BTEX gas monitoring devices (e.g. Drager hand pumps) have been provided for specific locations, they must be available for use along with trained staff (see Appendix 2).
- 2.12 Prepare contingencies for areas of known concerns, including for when wind direction changes, or unexpected stronger odours are experienced.
- 2.13 PTW be prepared, with all BTEX site instructions clear and attached.



3 Do The Work

- 3.1 Take time to read and understand the permit and site instructions.
- 3.2 Monitor wind direction and conditions, by observing forecasts and windsocks - see WMP #15 Heat Stress and Adverse Weather. Monitor before and during work.
- 3.3 Where possible, avoid outdoor work downwind where odours are detected by smell.
- 3.4 If odour is smelt, maximum 15 minutes working without RPE.
- 3.5 For areas of known concern, where downwind entry is required for essential operations tasks, operator must measure BTEX using the supplied gas monitor (Drager hand pump - see Appendix#2). Operator must be trained to use the Drager hand pump, or consult BGC IH team
- 3.6 If benzene is measured >0.25ppm or odour causes discomfort, then RPE is required.
- 3.7 If benzene is measured >2.5ppm then stop work and move away from the area, across wind.
*It must be noted that short term health effects (eg. headaches, nausea, sore throat, sore eyes) can be experienced at lower levels, therefore first control shall be put in place to avoid work in downwind areas, and this decision shall be based on smell. Work to be suspended if controls were not in place.
- 3.8 Seek Health Team assistance for BTEX monitoring if non routine work is planned in the area. This is any work other than essential operations.



- 4 When using RPE, take breaks away from the work area of at least 15mins for every 1 hour of work, and total max of 2 hours work. Follow instructions for RPE fitting, use, and cartridge replacement (see Figure 1). Report to the BGC Health Clinic should you experience any discomfort from the odour.

Figure 1: Protective Equipment and Measures for BTEX





4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #15 Heat Stress and Adverse Weather
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC ToolBox Talks, Communication Materials, Posters and Information

- Site BTEX Guidance (Appendix 1)
- Draeger Pump Instructions (Appendix 2)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC Health Manager	31-03-2022	Retained on sign-off form

Appendix 1 Draeger Pump Instructions



**Guidance Table for Using Drager Bellow Pump Tubes**

No.	Agent Name	Number of Strokes	Measuring Scale (PPM)	Tube Colour change	Limits (PPM)	Action
1	Benzene	5	0.25 to 2	Light Grey.....> Grey/Black	0.25 (Shift Limit Indicator)	>0.25ppm or strong O dour use Half Face PPE
		1	2 to 10			
2	Toluene	10	5 to 80	White.....> Pale Brown	2.5	>2.5ppm BA Required
		2	50 to 300			
3	Ethyl Benzene	5	10 to 400	White.....> Reddish Brown	100 (Shift Limit Indicator)	>100ppm or strong O dour use Half Face PPE
4	Xylene	6	30 to 400	White.....> Brown	50 (Shift Limit Indicator)	>50ppm or Strong O dour use Half Face PPE



Work Management Procedure

#15 Heat Stress and Adverse Weather

1 Overview and Hazards

- 1.1 This WMP describes requirements for the management of severe heat and adverse weather conditions hazards in BGC facilities.

These conditions may impact people, equipment or the facilities. Controls and pre-cautions shall be applied to ensure work are performed safely during severe heat and adverse weather.

1.2 Hazards include

- Heat stress
- Poor visibility (due to sandstorms, fog or low cloud base)
- Lightning risks
- Heavy rain
- Squalls and high winds.

Relevant Life Saving Rules and Process Safety Fundamentals

Work Authorisation	High Risk Activities
 Work with a valid permit when required	 For all defined high-risk activities, follow the procedures and sign off after each step

2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.
- 2.2 Confirm what materials and equipment are needed and who will check them before the work. This will include water supplies for consumption in extreme heat, devices for measuring wind speed for lifting operations (anemometers), etc.
- 2.3 Confirm what approvals, documentation, Permit-To-Work (PTW), Job Hazard Analysis (JHA), ToolBox Talk (TBT), etc, is needed and who will check it is done before the work starts. Follow WMP #25 PTW. 
- 2.4 Confirm supervision arrangements including any necessary support, including HSE Advisors, emergency response, gas testing, etc.
- 2.5 The HSE Induction training provided to all new employees shall include training on how to respond to Extreme Heat and Adverse Weather. Refresher training will be provided periodically, taking seasons into account for the timing. This is done through Time Out For Safety (TOFS), TBT and seasonal campaigns communicated by line management.
- 2.6 Provide shaded rest area (cooled if practical) for small breaks with plenty of cool drinking water



- 2.7 Air cool conditioning to be considered in workshop, rest area, warehouse, big metal containers...etc. where applicable. Air fan must not be used above 35°C ambient air temperature because it will increase core body temperature.
- 2.8 Work should be planned to start early morning and finish it early & avoid working during the hottest part of the day. Workers should be rotated amongst heavy, moderate and light work tasks as possible.
- 2.9 Encourage workers to work on their work self-pace(s). Apply buddy work system.
- 2.10 Put hydration status guide in all toilets, workers to compare their urine colours with the guide & apply its instructions, see Appendix 2.
- 2.11 Workers who must work close to hot surfaces/ flares should work up wind direction if possible.
- 2.12 Workers should drink cool drinking water regularly before starting & during work based on heat illness index guide. For hydration intake of water
- 2.13 New/off rotation workers come from cold areas, must acclimatize before start working, see below special instructions.
- 2.14 In general, normal work/ rest cycles i.e. maximum 30 mins work then 5 mins rest or 1 hr work then 10 mins rest and rotate worker more frequently with increasing rest cycles duration for confined space entry (PPE should be loosen or take them off partially to allow cooling body).

2.15 **Extreme Heat**

For Extreme Heat, the BGC Heat Stress Coloured Flag process will be applied:

- The causes and symptoms of heat related illnesses, and personal responsibilities will be understood, including the need to take regular breaks in cool shaded areas, take regular intakes of cool water and to get sufficient rest and food intake;
- For adverse weather the applicable limitations and response to that are explained.



2.16 **Activity Planning and Execution**

The effects of adverse weather shall be considered in the planning and execution of the activity. Weather forecast report shall be reviewed for all weather sensitive activities. Weather forecasts shall be checked by supervisors prior to the start of outdoor activities and re-checks to be done when change in weather condition is observed. The weather forecast information is available in both Arabic and English:

Arabic at <https://www.accuweather.com/ar/> Weather forecast in Basrah
English at <https://www.accuweather.com/en> Weather forecast in Basrah

2.17 **Contingency Planning**

Activity plans shall include contingency to ensure weather limiting parameters and actions are captured in the event of deteriorating weather. For each job an individual is identified to authorize the cessation or continuation of work under marginal weather conditions. This is usually the permit issuer.



2.18 Precautions

Personnel shall comply to the requirements stated in BGC Manuals Of Permitted Operations (MOPO). These are available at the PTW desks and the PTW Issuer ensures work permits are issued or revoked accordingly.



The heat stress status of the environment is monitored between 1st May and the last day of September. Measurements are communicated to PTW desks and key personnel by HSE support personnel daily at 09:00, 13:00 and 15:00.

Assessment of the heat stress status is done by measuring the ambient temperature (°C) and the Relative Humidity (RH). The results are then inputted into the Heat Index Matrix to determine the Heat Index (in °C).

3 Do The Work

3.1 Extreme Hot Weather

Prevention of heat related illness is **critical** for all employees, contractors and sub-contractors, particularly during the summer months (when temperatures are commonly and above 40°C and can be accompanied by high humidity levels).

3.2 Failure to advise personnel of the dangers of heat stress, how to manage exposure and to implement this procedure could lead to injury, illness or even death.

3.3 The body's response to high heat exposure manifests in a range of conditions including rashes, cramps, heat stress, and the most severe, heat stroke (which is a medical emergency). In addition, dizziness or fainting as a result of heat exposure may result in more serious injury or incident if the individual affected may have been operating machinery, controlling an operation or working at height etc.

An overview of Health Conditions, Symptoms and Treatment is given in Appendix 1.

3.4 Workplace, Task Evaluation and Risk Assessment

For most workplaces and tasks observation of the flag colour and implementing all the standard controls identified in this procedure provide adequate control of the heat stress risk associated with working in BGC's facilities. Work with an elevated risk for heat stress shall be identified as part of preparing the PTW and associated documents.



Some examples are:

- Confined Space Entry (CSE) or elevated work;
- Tasks that require the use of specific PPE such as respirators, facemasks, insulated clothing etc;
- Any job or task that requires strenuous physical activity;
- Work near radiant heat sources.



If needed, preparation of this type of work can be supported by HSE personnel with the input from BGC Medical and Occupational Health Department.

Heat Stress Control Measures

3.5 Coloured Flag Process

A Heat Awareness Condition is declared when the conditions for heat stress are significant.

This is set at a Heat Index of 32°C or above. A scheme using colour coded flags is implemented to indicate the level of heat stress conditions on a given day, at a given time. Flags corresponding to the colour code in Table 1 are installed at several prominent



locations throughout BGC site to keep personnel informed of current heat stress conditions for that location.

Note:

1 Glass = 250 ml.

Do not drink more than 1.5ltr per hour (maximum water absorption rate of human body).

Table 1 Heat Stress Index

Danger Category	Heat Index Value (°C)	Heat Syndrome		Resting Time	Water Needed
Extreme Danger	54	Heat stroke or sun stroke imminent		Implement Purple Flag Process	
Danger	32- 53	Sunstroke, heat cramps or heat exhaustion likely. Heat stroke possible with prolonged exposure and physical activity		10 minutes/ hour Elevated work to be closely controlled or stopped	1 glass / 10 minutes
Caution	27 - 31	Fatigue possible with prolonged exposure and physical activity		Normal / Scheduled	1 glass / 20 minutes

3.6 Purple Flag Controls

When a Heat Index Value of 54°C or higher is reached, or when the ambient air temperature reaches 50°C the heat stress condition becomes PURPLE FLAG and purple flags must be posted.

Under the purple flag condition all non-critical work must stop, and workers removed from the high heat exposure.

Examples of critical activities are:

- Emergency Response Team operational response;
- Trip recovery;
- Shutdown or start-up of plant;
- Urgent maintenance;
- Activity where abandoning the work will result in an increased risk to persons or plant such as security cover;
- If suspending the activity will result in compromised outcomes (e.g. pouring concrete, laying asphalt, surface treatment etc.).

Figure 1 Heat Index Table

Temperature (°C)	Heat Index Table Relative Humidity (%)																				
	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
52																					
51																					
50																					
49	49	49	49	50	55	59	65	71													
48	48	48	48	49	53	57	62	67	73												
47	47	47	47	47	51	55	59	64	70												
46	46	46	46	49	53	53	57	61	66	72											
45	45	45	45	47	51	51	54	58	63	66	73										
44	44	44	44	46	48	52	52	56	60	64	69	75									
43	43	43	43	43	44	47	49	53	57	61	65	70									
42	42	42	42	42	42	45	47	50	54	58	62	66	71								
40	40	40	40	40	40	41	43	46	48	51	55	59	63	67	72						
39	39	39	39	39	39	39	41	43	46	49	52	55	59	63	67	72					
38	38	38	38	38	38	38	39	41	43	46	49	52	55	59	63	67	71				
37	37	37	37	37	37	37	38	39	41	43	46	48	51	55	58	62	66	70			
36	36	36	36	36	36	36	36	38	39	41	43	45	48	51	54	58	61	65	69	74	
35	35	35	35	35	35	35	35	36	37	39	41	43	45	48	50	53	57	60	64	68	72
34	34	34	34	34	34	34	34	35	37	38	40	42	44	47	49	52	55	58	62	66	
33	33	33	33	33	33	33	33	34	35	36	38	40	42	44	46	48	51	54	57	60	
32	32	32	32	32	33	33	33	33	33	34	36	37	38	40	42	44	47	49	52	54	
31	31	31	31	31	31	31	31	31	31	32	33	34	35	36	38	39	41	43	45	47	49
30	30	30	30	30	30	30	30	30	30	30	31	32	33	34	35	36	38	39	41	42	44



- 3.7 Work is only permitted to continue under purple flag conditions for specific identified critical activities or conditions, with the following requirements being met:
- There is a specific plan in place, including a risk assessment and appropriate additional measures, that has been approved by the Facility Owner and with agreement from the Occupational Health and Hygiene Team;
 - The Facility Owner approves the deviation in writing based on a clear justification for the work to continue;
 - A documented risk assessment has been completed detailing the mitigations in place for the duration of the work;
 - Qualified First Aiders are always available for the duration of the work.
- 3.8 Work can also be allowed to continue where local conditions are more favourable (such as shaded areas and areas with wind and/or natural draft, or for activities having only a light workload) but in these circumstances local monitoring must be undertaken on an hourly basis (as a minimum) and documented.
- 3.9 Where work is approved to continue special attention shall be taken to rotate workers to allow sufficient periods of rest in a shaded or air-conditioned facility (e.g. vehicles with air conditioners) and to ensure rehydration. The work shall also be contained in small discrete areas, controlled directly by the supervisor who must remain present throughout

Working in Adverse Weather Conditions

3.10 Driving

Stop driving or do not start driving when the high-risk conditions in Table 2 are encountered.

Table 2 Restrictions on Driving in Adverse Weather

Item	Forecast / Situation	Condition Assessment	Risk Level (Guideline)
1	Sand/Dust Storm	Reduced Visibility < 50m	High
2	Heavy Fog	Reduced Visibility < 100m	High
3	Heavy Rain	Reduced Visibility < 50m	High
4	High Wind/Dust	Wind speed > 75 km/h or Reduced Visibility < 50m	High

3.11 If these conditions develop or occur during the journey, follow the guidance below:

- Gradually reduce speed of the vehicle
- Pull over to the safe parking location, off the road
- Switch on hazard warning lights
- Driver and passengers must stay in the vehicle, do not allow anyone to get out of the vehicle
- Always keep seatbelt fastened

Any Driver has the full authority and is expected to stop the journey if it is considered unsafe. Passengers are not permitted to instruct drivers to proceed.



3.12 When stationary and safe to do so, driver should notify to Journey Controller or Supervisor to provide a status update of the journey and adverse weather situation.

3.13 When the weather improves and it is safe to depart, driver can resume the journey.

3.14 **Lifting & Hoisting**

Wind limitations for Lifting and Hoisting:

- Apply the maximum value according to the lift plan



- In any case never exceed the crane manufacturer limits
- The absolute maximum allowable wind speed limit for lifting is 9.8m/s, or 7 m/s for man riding operation with suspended basket.

3.15 Work during lightning storms

- Do not start Work at Height during lightning storms
- Stop all Work at Height and lifting operations when the time measured between the lightning and the thunder is less than 30seconds
- Where possible stay inside for 30min after the last visible lighting or thunder
- Stay in a vehicle if you cannot go inside.



3.16 Work at Height

- Scaffolders working at height on land:
 - Any risk assessment developed for Scaffolders working at height on land, shall include the working environment & conditions (e.g. wind increase, heat stress, wind direction, direct sun light & wind gusts). It is recommended that should wind speed reach 9.8 m/s scaffold works should stop until a review of the risk assessment is taken to determine if safe to continue work.



4 References and Resources

Relevant WMPs

- #4 Driving Safety & Journey Management
- #5 Emergency Response
- #13 Hazard Identification
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC ToolBox Talks, Communication Materials, Posters and Information

- Heat Related Illnesses (Appendix 1)
- Urine Hydration Status Guide (Appendix 2)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director		Retained on sign-off form
Custodian	BGC Health Manager		Retained on sign-off form

Appendix 1 Dehydration Check



Appendix 2 Heat Related Illnesses

Condition	Symptoms	Treatment
Heat Stroke Life threatening emergency and serious health problem for workers in hot environments Drug and/or alcohol abuse may increase the risk of heat stroke Requires an evaluation by a competent physician before returning to a job with potential heat stroke	High body temperature (above 40.60C) No sweating Hot dry skin Very rapid, weak pulse Confused and irrational behaviour Convulsions, seizures Loss of consciousness, coma Death	Immediately call for emergency medical assistance Place person in a cool shady area and do not leave him alone Cool person rapidly with running water, cold compresses or rapid fanning Remove the person's outer clothing Provide cool drinking water if the person is alert. Sipping small amounts quickly. Do not give caffeine or alcohol Fluids should be replaced as soon as possible Continue to cool body temperature until medical assistance arrives and worker can be taken to a medical facility for further treatment
Heat Exhaustion Results when there is loss of salt and water through excessive sweating and failure to either drink sufficient fluids, take enough salt or both	Excessive sweating Extreme weakness, fatigue Pale, cold clammy skin	Place person in a cool shady area and do not leave him alone



<p>Can be confused with the symptoms of heat stroke which is a bona fide medical emergency</p> <p>In addition, fainting can be dangerous if the individual is operating machinery or controlling an operation that should not be left unattended. Fainting may also cause injury to the victim</p>	<p>Dizziness Headache Nausea, vomiting Muscle cramps, usually abdominal Fast shallow breathing Normal or slightly increased body temperature Loss of consciousness</p>	<p>Cool person rapidly with running water, cold compresses or rapid fanning Remove the person's outer clothing Provide cool drinking water if the person is alert. Do not give caffeine or alcohol. Rest for at least 12 hours</p>
<p>Heat Cramps</p> <p>Heat cramps are painful spasms of the muscles that occur when workers drink large quantities of water but fail to replace their bodies' electrolyte loss through sweating</p> <p>They often occur when unaclimated workers carry out strenuous physical activity</p> <p>Cramps may also occur during or after working hours and may be relieved by taking liquids by mouth, or saline solutions intravenous for quicker relief, if medically determined to be required</p>	<p>Muscle spasms, usually in the lower extremities, abdomen or both Cool, moist skin Rapid pulse Remains alert Normal body temperature</p>	<p>Stop work immediately and move the person to a cool shady resting place Give enough cool drinking water, juice or oral rehydration solution Let the patient rest for at least 8 hours</p>
<p>Heat Rash</p> <p>Also known as prickly heat</p> <p>Occurs when sweat is not removed quickly enough from the skin by evaporation</p> <p>Severity varies but can be severe enough to inhibit sleep (can impede a worker's performance or result in temporary disability)</p>	<p>Appearance of a skin rash (often with itching) Small clear blisters – mildest form Itchy red bumps Flesh coloured lesions – most severe form Can become infected</p>	<p>Clean the affected area gently with water and a mild soap Severe cases may require medical intervention Wear loose clothing and change regular to minimize prolonged contact with wetness Most cases clear up when the affected person returns to a cooler climate</p>
<p>Heat Syncope / Collapse (Fainting)</p> <p>Caused by prolonged standing (especially in one spot) or standing up suddenly</p> <p>Blood pools in the extremities (legs) thus depriving the brain of oxygen</p> <p>Fainting results</p>	<p>Dizziness Light-headedness Gradual or sudden loss of consciousness Can cause injury as a consequence of fainting or when person was in charge of operating equipment, working at height etc</p>	<p>Lie the person down in a cool place When consciousness returns provide small sips of cool water or juice Treat any injuries caused by the fainting Prevent through acclimatization and avoiding prolonged immobility in hot weather</p>



Work Management Procedure

#16 Hot Work

1 Overview and Hazards

- 1.1 Hot Work includes activities such as welding, cutting, heating, use of lighting towers and descaling as examples. The purpose of this WMP is to ensure personnel involved in Hot Work activities understand the potential hazards and apply controls to reduce the risks of incidents from fires and explosions.



Non-hydrocarbon facilities in BGC like workshops and fabrication yards will be considered as non-hazardous areas as defined in this WMP.



1.2 Hazards include:

- Increased risk of fire and/or explosion due to the presence of flammable products in large volumes and high pressures;
- Fire caused by heat, sparks, molten metal or direct contact with the flame;
- Explosion e.g. when cutting up or repairing tanks or drums which contain or may have contained flammable materials;
- Fire/explosion caused by gas leaks, backfires and flashbacks;
- Fumes created during welding or flame cutting.

Relevant Life Saving Rules and Process Safety Fundamentals

Energy Isolation Control  Verify isolation and zero energy before work begins	Hot Work  Control flammables and ignition sources	Work Authorisation  Work with a valid permit when required
Use of two Barriers  Always use 2 barriers for hydrocarbon and chemical drains & vents	High Risk Activities  For all defined high-risk activities, follow the procedures and sign off after each step	Walk the Line  Walk the Line – Verify and validate any line-up change



2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the Hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.
- 2.2 Hot Work activities must always be performed under a Permit-To-Work (PTW) unless the work is performed in a dedicated asset workshop or fabrication yard outside the process area, where a risk assessment is required for the specific tasks.
- Projects require PTW (general or specific) for all Hot Work activities irrespective of location. Follow WMP #25 PTW.
- 2.3 Hot Work can be defined in two categories:
- **Category 1:** A positive source of ignition (there will definitely be a source of ignition)
 - **Category 2:** A potential source of ignition (there will possibly be a source of ignition)



Examples are shown in Table 1 below. For activity not listed in the table, or if unsure, consult your Supervisor.

Table 1 Types of Hot Work

Category 1 – Positive Sources of Ignition	Category 2 – Potential Sources of Ignition
<ul style="list-style-type: none">• Work involving naked flames• Electrical welding and gouging• Electrical induction heating (>200° C)• Gas cutting• Hot tapping• Using of portable grinders• Use of Flare Guns• Using power tools without EX-rated motors, exception is brushless power tools where there are no sparks from the tool motor• Using heating guns or blowers• Using equipment or working on pipework and vessels contaminated with pyrophoric scale• Opening electrical/instrumentation equipment and junction boxes, which contain live arcing contacts	<ul style="list-style-type: none">• Dry grit and shot blasting• Using needle guns, powered wire brushes, orbital power sanders with EX-rated motors• Use of battery powered non-Ex devices, including non-Ex mobile phones.• Brushless battery powered tools• Opening of electrical/instrument-control equipment and junction boxes, which contain live terminals• Portable diesel engines (used for welding, air compressors, pumps, grass cutting), which are not tied into the fire and gas systems• Any vehicle with a combustion engine• Lighting Towers• Hand tools that might cause a spark• Hydrovac equipment

- 2.3 The following Hierarchy of Controls shall apply for all Hot Work activities in BGC facilities:
- Perform Hot Work outside hazardous areas (e.g. fabricate brackets and pipe spools in non-hazardous areas) and perform task via activity listed under lower risk ‘potential sources of ignition’ for installation in hazardous area;
 - Eliminate ignition sources by selecting alternative work methods or equipment (e.g. water jet cutting rather than plasma cutting), again perform task via activity listed under a lower risk ‘potential source of ignition’;



- Eliminate flammable materials (e.g. isolated and drain flush purge vent to make the area hydrocarbon free);
 - Reduce potential for Hot Work and potential leak sources to come into contact, by use of a Hotbox, isolating nearby lines, reducing pressure etc.
- 2.4 Facility Hazardous Area Classification (HAC) drawings identify the boundaries of the facility HAC Zones. HAC zones are described in Table 2 below:

Table 2 Hazardous Area Classification Zones

HAC	Description	Examples
Zone 0	An area in which a flammable mixture atmosphere is present continuously or for long periods.	Equipment containing flammable liquids like the inside of tanks/vessels, vapour collection lines, open sumps, continuous vents.
Zone 1	An area in which a flammable mixture atmosphere is likely to occur in normal operation. Normally within 1.0m of a potential leak source	Pumps without barrier fluids, floating roof tanks, vents to atmosphere, open hydrocarbon drains, loading arm connections.
Zone 2	An area in which a flammable mixture is not likely to occur in normal operation and if it occurs will exist only for a short time. Zone 2 areas are normally within 3.0m of a potential leak source.	Zones associated with flanges, valves and process equipment like pumps and compressors.
Unclassified	Areas in which flammable atmospheres are not expected to be present.	Areas outside Zone 2 areas but still within the Process Areas boundary
Non-Process Area		Any area outside the Process area boundary, for example offices, workshops, fabrication yards. All hot work cat1 shall follow cat1 permit requirements

- 2.5 When planning work activities, make field checks and confirm with Operations the Hazardous Zone Area identified on the HAC drawing. The HAC may change due to operational conditions e.g. due to a leaking valve or flange.
- 2.6 If HAC drawings are not available, if a leak is identified, then a risk assessment must be conducted to determine the likely Zone Classification and mitigations. Speak with the Permit Issuer and **DO NOT PROCEED** until the Zone Classification has been confirmed. Check that the work location's HAC Zone allows the planned Hot Work Category to be conducted. See Table 3 and Table 4 below:

Table 3 Type of Hot Work Allowed by HAC Zone

Area Classification	Category 1 – Positive Ignition	Category 2 – Potential Ignition
Zone 0	NOT PERMITTED	NOT PERMITTED
Zone 1	ONLY PERMITTED WITH PTW & PRESSURISED HABITAT (specialized equipment not readily available in BGC)	
Zone 2	See "Hot Work in HAC Zone 2" Table 4 below for further guidance	
Unclassified	ALLOWED	ALLOWED



ZONE 0: No Hot Work can occur unless the sources of hydrocarbon that classify the area as Zone 0 can be fully isolated and zone classification can be temporarily rendered to Zone 1 or Zone 2. The only exception to this is hot tapping, see section 3.9.

ZONE 1: PTW with appropriate Hot Work controls such as gas testing, no flammable substances in area, use of pressurised habitat. Provide attention to containment of ignition sources such as sparks.



Hot Work shall only be carried out when a Pressurised Habitat (Safe Habitat) is used.

ZONE 2: PTW with appropriate Hot Work controls, see Table 4.

Table 4 Hot Work in a HAC Zone 2 area*

Type of Hot Work	Distance from live potential leak source (e.g. flange, valve, pump seal) **	Controls and mitigations: This is in addition to the normal HW JHA controls for the work
CAT-1	Less than 3m	Not allowed unless the line is isolated and less than 5 bar, also must comply with the “generic” JHA requirements including a Hotbox and ERT presence based on risk assessment for the task
CAT-2	Less than 3m	Allowed as per normal HW-2 controls
CAT-1	Between 3-15m and more than 10 bar	Allowed if all controls on the “generic” JHA are followed, including a “hotbox”
CAT-2	Between 3-15m and more than 10 bar	Allowed as per normal HW-2 controls
CAT-1	Between 3-15m and Less than 10 bar	Allowed with use of a Hotbox
CAT-2	Between 3-15m and Less than 10 bar	Allowed as per normal HW-2 controls
CAT-1	More than 15m up to limit of zone 2 area at any pressure	Allowed with use of a Hotbox
CAT-2	More than 15m up to limit of zone 2 area at any pressure	Allowed as per normal HW-2 controls
CAT-1 CAT-2	Outside Zone 2 area but inside Process area fence	Allowed as per normal HW controls
CAT-1 CAT-2	Outside Process area fence	Evaluate on individual basis – Follow Infra PTW system in KAZ initially

*NOTE: For the above, refer to the Hazardous Area Classification drawings (HAC)

**NOTE: This does not include distance from the nearest pipe, as a pipe is not a leak source

2.7 Non-Pressurized Habitat (Hotbox)

A non-pressurized habitat also known as a hotbox or Construction Safe Welding Area (CSWA), can be used to provide a safe work environment to perform Hot Work in a Zone 2 areas. Extra care has to be taken to ensure no flammable or asphyxiant gasses build up inside the hotbox, for example welders oxygen / acetylene hoses leaking.

This habitat is a partially enclosed perimeter surrounding a Hot Work (welding, grinding or cutting) area to ensure that ignition sources (e.g. sparks, slag) do not escape the welding area and other workers are not exposed to sparks, grinding debris or welding flashes.



Types of perimeter enclosures include, but are not limited to, curtain walls, ceilings, floors and/or boxes. Building materials must be non-combustible such as metal scaffold, fire blankets and sheet steel. Flooring materials must be capable of being wetted or be flame retardant during Hot Work. More than one Hot Work job can be executed simultaneously in a hotbox under a single Hot Work permit as long as:

- Hazards associated with individual jobs and the collective jobs are identified in PTW;
- Permit controls specify the requirements to manage the collective job hazards.



2.8 Pressurised Habitat (Safe Habitat)

This is a specialized piece of equipment which is not readily available in BGC.

A pressurised habitat, also known as an isolation chamber, can be used to provide a safe work environment for Hot Work in the presence or potential of explosive gases or vapours in hazardous areas.

2.9 Preparing for the Job

Permit Applicant must visit the work area with the Permit Issuer/Authoriser and:

- Look for potential sources of flammable gases or liquids including areas where denser than air gases or vapour could settle;
- Look for materials that might catch fire (combustible) such as wood, plastics, or fabric in the area. Confirm arrangements to have it removed or protected;
- Identify the distance from stored hydrocarbons in nearby vessels/equipment and decide steps for draining and purging to be hydrocarbon free where possible, refer to Table 4;
- Agree on other Hot Work controls or protection required for the activity.

2.10 Prepare the PTW (see WMP #25 PTW). The PTW pack contains the following as a minimum:

- Hot Work Category Permit Form;
- Hot Work Checklist (Appendix 2);
- Job Hazard Analysis (JHA);
- Toolbox Risk Identification Card (TRIC);
- Authorized Gas Testing Certificate;
- Isolation Certificates – if required (see WMP #20 Isolations);
- Include an emergency plan specific to the task if required.



Hot Work Category 1 Permit

PERMIT TO WORK - HOT WORK CATEGORY 1		No.: 7101	
Task Description		Continued from PTW No.:	
7. PERMIT APPLICATION		8. WORK SITE RESPONSIBILITIES	
Applicant Name [Signature] [Date]		Name [Signature] Date [Name] [Signature] Date [Name] [Signature] Date	
Employee Name [Signature] [Date]		Employee Name [Signature] Date [Employee Name] [Signature] Date [Employee Name] [Signature] Date	
Work Order No. [Signature] [Date]		Work Order No. [Signature] Date [Work Order No.] [Signature] Date [Work Order No.] [Signature] Date	
Work Description [Signature] [Date]		Work Description [Signature] Date [Work Description] [Signature] Date [Work Description] [Signature] Date	
9. SPECIAL PRECAUTIONS			
10. SUPPORTING CERTIFICATES / FORMS REQUIRED FOR THIS PERMIT (Complete & attach issued Permit issued by PCHS)			
Process Isolation		Tick Certificate No.	
Gas Test		Tick Certificate No.	
Safety Emergency Services Institute		Class Division 1	
Electrical Isolation		Class Division 2	
Permittee Certificate		Unclassified	
Dust Collection		H2S Classification (Tick)	
Electrical Permit to Work		H2S Major	
Ventilation Test		H2S Minor	
Isolation Certificate		H2S Miner	
Electrical Work, Control Panel		H2S Neutral	
Acknowledgement by AEP		Acknowledgement by AEP	
ADP Home		Non H2S	
11. AUTHORIZATION			
Permit Applicant - I have described the job, the controls and precautions to the best of my knowledge.			
Name: _____		_____ [Signature] [Date]	
Permit Coordinator - I have checked for concurrent operations and that all hazards and controls have been identified.			
Name: _____		_____ [Signature] [Date]	
Dept. Manager - For High Risk Activity (Refer to PTW Manual)			
Name: _____		_____ [Signature] [Date]	
Permit Coordinator - I have checked for concurrent operations and that all hazards and controls have been identified.			
Name: _____		_____ [Signature] [Date]	
Dept. Manager - For High Risk Activity (Refer to PTW Manual)			
Name: _____		_____ [Signature] [Date]	
Permit Coordinator - I have checked for concurrent operations and that all hazards and controls have been identified.			
Name: _____		_____ [Signature] [Date]	
Dept. Manager - For High Risk Activity (Refer to PTW Manual)			
Name: _____		_____ [Signature] [Date]	
12. REGISTRATION OF CANCELLATION BY PERMIT COORDINATOR			
Name: _____		_____ [Signature] [Date]	

Hot Work Category 2 Permit

PERMIT TO WORK - HOT WORK CATEGORY 2		No.: 6991	
Task Description		Continued from PTW No.:	
1. PERMIT APPLICATION		8. WORK SITE RESPONSIBILITIES	
Applicant Name [Signature] [Date]		Name [Signature] Date [Name] [Signature] Date [Name] [Signature] Date	
Employee Name [Signature] [Date]		Employee Name [Signature] Date [Employee Name] [Signature] Date [Employee Name] [Signature] Date	
Work Order No. [Signature] [Date]		Work Order No. [Signature] Date [Work Order No.] [Signature] Date [Work Order No.] [Signature] Date	
Work Description [Signature] [Date]		Work Description [Signature] Date [Work Description] [Signature] Date [Work Description] [Signature] Date	
9. SPECIAL PRECAUTIONS			
10. SUPPORTING CERTIFICATES / FORMS REQUIRED FOR THIS PERMIT (Complete & attach issued Permit issued by PCHS)			
Process Isolation		Tick Certificate No.	
Gas Test		Tick Certificate No.	
Safety Emergency Services Institute		Class Division 1	
Electrical Isolation		Class Division 2	
Permittee Certificate		Unclassified	
Radiography Certificate		H2S Classification (Tick)	
Electrical Permit to Work		H2S Major	
Ventilation Test		H2S Minor	
Isolation Certificate		H2S Neutral	
Department / Current Task		Acknowledgement by AEP	
ADP Home		Non H2S	
11. AUTHORIZATION			
Permit Applicant - I have described the job, the controls and precautions to the best of my knowledge.			
Name: _____		_____ [Signature] [Date]	
Permit Coordinator - I have checked for concurrent operations and that all hazards and controls have been identified.			
Name: _____		_____ [Signature] [Date]	
Dept. Manager - For High Risk Activity (Refer to PTW Manual)			
Name: _____		_____ [Signature] [Date]	
Permit Coordinator - I have checked for concurrent operations and that all hazards and controls have been identified.			
Name: _____		_____ [Signature] [Date]	
Dept. Manager - For High Risk Activity (Refer to PTW Manual)			
Name: _____		_____ [Signature] [Date]	
12. COMPLETION / CANCELLATION OF PERMITS			
7. WORK COMPLETED		8. WORK NOT COMPLETED	
PCHS Initial		PCHS Initial	
Name _____		Name _____	
_____ [Signature] [Date]		_____ [Signature] [Date]	
PCHS CANCELLATION BY SHIFT ENGINEER/SUPERVISOR			
Work Complete, Worksite Clear and Safe (Tick)		Work Not Complete, Continue on PTW No. _____	
_____ [Signature] [Date]		_____ [Signature] [Date]	
9. REGISTRATION OF CANCELLATION BY PERMIT COORDINATOR			
Name: _____		_____ [Signature] [Date]	



3 DO THE WORK

- 3.1 Receive the issued Hot Work PTW pack and supporting JHA.
- 3.2 Confirm with PTW office and Permit Issuer that there are no conflicting SIMOPS tasks planned in the area such as draining, venting, or breaking containment.
- 3.3 At the worksite ensure the following via a ToolBox Talk:
- All controls are fully understood by all involved and are implemented;
 - There are no conflicting work activities;
 - All equipment has been checked and is safe for use;
- 3.4 **Minimum Controls – All Areas**
- Gas tests are conducted by Authorized Gas Tester (AGT) as determined by Permit Issuer and risk assessment, prior to the start of any work;
 - All Hot Work has continuous gas testing during work activities;
 - Separation of potential ignition sources and flammable/combustible materials;
 - Wind direction noted, and nearest potential leak sources identified;
 - Escape routes and nearest manual call points identified and discussed;
 - Boundaries of HAC Zones at the work location known and identified;
 - Further controls as identified in PTW or JHA. See WMP #13 Hazard Identification.
- 3.5 **Additional Controls for CAT 2 (Potential Ignition) in Zone 2 Areas**
- As per 3.4, above, adding:
- Separation of potential ignition sources and flammable/combustible materials. Refer to Table 4 for guidance;
 - Control room notified when work starts, pauses, restarts, and finishes;
 - Consider taping and gas testing nearby flanges.
- 3.6 **Minimum Controls – All CAT 1 (Positive Ignition) in Zone 2 Areas**
- As per 3.4, above, adding:
- Fire Watcher who is positioned to immediately respond to a fire or ignition of material;
 - Barriers and signs are to be in place for the work;
 - Fire extinguisher or firefighting equipment available;
 - No simultaneous activity involving release of hydrocarbons, venting, sampling, or breaking containment is permitted within 50m;
 - Separation of ignition sources and combustible materials. Refer to the previous Table 4 for guidance
 - Control room and local ERT Watch Officer notified when work starts, pauses, restarts, and finishes;
 - Nearby process equipment protected using blankets, or other suitable methods and all open drains to be covered;
 - Consider Hotbox/Pressurised Habitat to approved standard or other mitigation measures;
 - JHA must be approved by the Department Manager.





3.7 Minimum Controls for CAT 1 Working in a Zone 1 Area

As per 3.6 above

- Hot Work shall only be carried out when a Pressurised Habitat (Safe Habitat) is used;
- The JHA and risk assessment must be **approved by the Plant Director.**



3.8 Any Hot Work on process piping and equipment must not proceed until the equipment is positively isolated, free of hydrocarbons, drained, and flushed or purged. Hot-tapping may be approved in specific circumstances – see hot-tapping section.

3.9 Hot Tapping

Hot Tapping is specialized work that involves making connections to process lines or equipment that are either in operation or contain hydrocarbons.

Hot Tapping can only be performed when there is no alternative, or the business risks of the alternatives cannot be justified and can only be approved by the Plant Director.

Only specially trained workers with working experience in the specific operation to be performed can perform a hot tap. Worker qualifications and experience must be approved for the specific job by the **Mechanical Static Technical Authority (MSTA)** for this type of specialized work.



A specific method statement must be prepared with a JHA, as part of the PTW, detailing the critical steps and controls, and must be approved by the MSTA.

3.10 Hot Work in Confined Spaces

Hot Work inside confined spaces introduces additional risks. In addition to the normal precautions for work in Confined Spaces (see WMP #3 Confined Space Entry (CSE)) extra precautions for Hot Work should be taken, and should include at least the following:



- Seek advice from Occupational Hygiene team to determine nature of contaminants generated by the work activity, and if further controls are required;
- Local exhaust ventilation is mandatory when welding or cutting involves metals containing lead, beryllium-containing base or filler metals, cadmium-bearing or cadmium-coated base metals, or mercury-bearing materials (including paint). When such ventilation is not possible or practical, use positive pressure SCBA
- Welding earthing return line must be fully connected to the material being welded.
- Degreasing and other cleaning operations involving chlorinated hydrocarbons must be separated so that no vapours from these operations will reach or be drawn into the atmosphere surrounding any welding operation;
- Do not work alone. Work in pairs (Buddy System);
- Continuous Fire Watch remaining until work area has cooled (30 minutes minimum after the Hot Work is paused or completed). The Fire Watch and CSE Attendant can be the same person but must have all appropriate training (registered in plant PTW office);
- When possible, provide means for readily turning off power, gases, and fuel from inside the confined space, even if outside turn-off means are provided;
- When arc welding is to be suspended for any period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully



located so that accidental contact cannot occur, and the machine must be positively disconnected from the power source;

- When gas cutting is to be suspended for any substantial period, it is required to isolate the supply at the portable gas cylinder and remove lines from confined space;
- Do not allow equipment to block exit or hinder rescue efforts;
- Place as much equipment as possible outside the confined space;
- First aid equipment must always be available;
- Conduct an emergency evacuation drill before starting the work.

3.11 Precautions for all Hot Works

All sampling must stop during Hot Work tasks in a classified area.

No local operational venting or draining will take place within the facility during Hot Work tasks in a classified area (check the MOPOs as part of PTW). Control room to be informed of commencement and stoppage of Hot Work activity.



The basic requirements and precautions for carrying out Hot Work activities are illustrated in '10 Questions For Safe Hot Work' see Appendix 1. Welding machines and equipment shall meet the requirements stated in WMP #6 Electrical Safety.

4 References and Resources

Relevant WMPs

- #04 Confined Space
- #5 Emergency Response
- #6 Electrical Safety
- #13 Hazard Identification
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC ToolBox Talks, Communication Materials, Posters and Information

- '10 Questions for Safe Hot Work' (Appendix 1)
- Hot Work Checklist (Appendix 2)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	Maintenance Director	31-03-2022	Retained on sign-off form
Custodian	Deputy Maintenance Director	31-03-2022	Retained on sign-off form



Appendix 1 '10 Questions for Safe Hot Work'

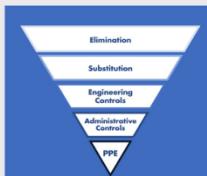
10 QUESTIONS FOR SAFE HOT WORK



SAFE HOT WORK: THE CONTROL OF IGNITION SOURCES DURING WORK IN OR ADJACENT TO CLASSIFIED AREAS AND EQUIPMENT THAT COULD CONTAIN FLAMMABLE MATERIALS

1 HIERARCHY OF CONTROLS

- ✓ To reduce risk, can the work be conducted outside a classified gas hazardous area?
- ✓ Can alternative cold work methods be used?



6 ISOLATION VERIFICATION

- ✓ Has isolation been properly verified so that no stored energy from pressurized systems or flammable hazards remain (walk the line) and demonstrated to those persons protected by the isolation?



2 ISOLATION VERIFICATION

- ✓ Using the Permit to Work (PTW) system, were the scope of work, and Job Hazard Analysis (JHA) approved by relevant authorities and hazards/ controls reviewed with the team?



7 WORK AREA CHECK

- ✓ Is the work site and adjacent area (example 15m) free from flammable and combustible materials including tanks, vents, R/V's, sewers.
- ✓ Have the consequences of heat transfer been considered?



3 PRE-WORK BRIEFING

- ✓ Were all team members present at the Pre-job briefing (Toolbox Talk/Last Minute Risk Assessment).
- ✓ Is level of supervision established for conducting hot work?
- ✓ Are fire resistant clothing requirements met?



8 GAS TESTING

- ✓ Has gas testing of work site and any associated equipment been conducted by an authorised gas tester
- ✓ Is the frequency of gas testing/monitoring during the operation appropriate to the risk?



4 COMPETENCY

- ✓ Does the work party understand the hot work hazards, policies and procedures, including precautions, PPE requirements and Emergency Response plans?



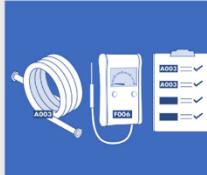
9 FIRE WATCH

- ✓ Is a competent Fire Watch present? Is there effective communications with work party and Emergency Responders? (example radio)
- ✓ Is post hot work monitoring in place?



5 EQUIPMENT CHECK

- ✓ Has hot work equipment, been inspected and approved for use?
- ✓ Has gas testing/ monitoring equipment been bump tested prior to use and calibrated at the appropriate frequency?



10 EMERGENCY RESPONSE PLAN

- ✓ Does the work party know what to do in the event of an incident & are they sufficiently aware of ER plans?
- ✓ Is fire extinguishing equipment available.
- ✓ Have appropriate Drills been conducted?





Appendix 2 'Hot Work Checklist'

Work Planning and Pre-Conditions			
Isolations			
Yes	No	Potential Hazards	Controls
		<i>Isolating Liquids/Gas under Pressure</i>	<i>Process Isolation Certificate / Isolation tags applied</i>
		<i>Isolation of Safety/Emergency Systems</i>	<i>Override WMP to be applied. Enter in inhibit log. Correct levels of Authorisation. Communicate to all concerned. Remove as soon as possible.</i>
Task Related Hazards			
		<i>Hazardous surface (Untidy work areas, trip Hazards, oil spillage, trenches & excavations)</i>	<i>Regular housekeeping. Ensure worksite is cleaned before Permit sign off. Demarcation of excavations</i>
		<i>Others (Job Hazard Analysis)</i>	<i>Identify all Hazards and controls by using a to assess each step of the task to be done. Reduce Risk to ALARP.</i>
Vehicles/Tools/Equipment			
		<i>Internal Combustion Engine</i>	<i>Gas Test Certificate. Not to be left running unattended. ToolboxTalk (TBT).</i>
		<i>Electrical appliances (use of portable electrical equipment in Hazardous Areas)</i>	<i>Continuous gas monitoring.</i>
		<i>Electrical (opening of live electrical enclosures and junction boxes for fault finding in Hazardous Areas)</i>	<i>Continuous gas monitoring. Use of insulated tools. Limitation of access may be required.</i>
		<i>Hazardous equipment (rotating equipment, auto/remote start, workshop tools)</i>	<i>Full electrical isolation & issue of electrical isolation certificate. Warning signs. Tagging system, process isolation certificate, maintenance work instruction, TBT.</i>
		<i>Use of high pressure water jetting equipment lances</i>	<i>Face mask, googles, protective rubber boots, specific gloves to resist high pressure water jets. Warning signs, safety barriers.</i>
		<i>Use of positive source of ignition (welding, cutting, grinding)</i>	<i>Continuous gas monitoring. Electrical earthing, suitable PPE. Bottles to be secured. Fire Watch, extinguisher. Charged fire water hose.</i>
Additional Controls – Tick Applicable			
PPE Requirements			Work Place Equipment
<i>Safety helmet</i>	<i>Dust/Fume Mask</i>	<i>Fire Extinguisher</i>	<i>Scaffolding</i>
<i>Safety shoes</i>	<i>Face Mask</i>	<i>Fire Pump (standby)</i>	<i>Firewater</i>
<i>Rubber boots</i>	<i>Full Face (P3 Filter)</i>	<i>Fire Truck (standby)</i>	<i>Crane Banksman</i>
<i>Leather gloves</i>	<i>Cover role</i>	<i>Torch EX-Pated</i>	<i>Fire Watch</i>
<i>Rubber gloves</i>	<i>Rubber Suit</i>	<i>Temporary Lighting</i>	<i>Vacuum Truck</i>
<i>Leather apron</i>	<i>BA -SCBA</i>	<i>Warning Signs</i>	<i>Drip Trays</i>
<i>Rubber apron</i>	<i>BA – Escape Set</i>	<i>Temporary Demarcation</i>	<i>Radio Coms</i>
<i>Glasses/googles</i>	<i>BA Air Line</i>	<i>Road Closure</i>	<i>Operator Attendance</i>
<i>Face shield</i>	<i>H2S Monitor</i>	<i>Other (specify)</i>	
<i>Earmuffs/plugs</i>	<i>Other (specify)</i>		
<i>I have read, fully understand and agree with the precautions to be taken and controls to be in place for this work permit</i>			
<i>PICWS:</i>	<i>Signature:</i>		<i>Date:</i>



Work Management Procedure

#17 Housekeeping

1 Overview and Hazards

- 1.1 Housekeeping is a practical method of creating a safer workplace and reducing incidents by keeping the work area free of obstruction and waste. Good housekeeping reflects the level of professionalism and standards of its staff and it prevents accidents at work.

Good housekeeping practices begin in the office and this behaviour shall extend to the way worksites are managed. This WMP establishes the minimum requirements and provides safe working practices for housekeeping.

1.2 Hazards Include

- Slips, trips and falls from poorly stored materials and waste / debris
- Increased fire risk from blocked fire exit routes, flammable materials incorrectly stored and waste / debris
- Damage to the environment from discarded materials, leaking fluids, poorly stored materials and waste / debris
- Cuts, abrasions and impact injuries to personnel moving poorly stored materials and waste / debris
- Wildlife and vermin that nest / live within poorly stored materials and waste / debris
- Asset damage to materials left exposed due to poor storage and contamination by waste / debris

Relevant Life Saving Rules and Process Safety Fundamentals

Work Authorisation	High Risk Activities
 Work with a valid permit when required	 For all defined high-risk activities, follow the procedures and sign off after each step

2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.
- 2.2 Confirm what equipment is needed to help ensure good housekeeping: waste bins; storage areas and racking, etc.
- 2.3 Confirm that personnel will be inducted including responsibilities for maintaining high standards of housekeeping.



- 2.4 Housekeeping activities in process areas will be included within the permit for the task and / or the Job Hazard Analysis (JHA). Team Leads and Supervisors must determine what is required to ensure good housekeeping during the work. They must ensure all team members understand their responsibility to maintain their work areas in a clean and orderly manner. Follow WMP #25 Permit to Work.
- 2.5 Plan for storage of material, supplies and waste that considers the movement (flow) of personnel, equipment (e.g. Hi-ab / Bin lorry), materials, fire hazards, and clear routes for evacuation, firefighting and rescue as well as movement. Waste areas must be allocated for temporary storage/stockpiling/ segregation of materials.
- 2.6 Plan for waste and debris to be removed from the work site in a timely manner.
- 2.7 Housekeeping in non-process areas shall be monitored and controlled by the supervisor or team lead responsible for the area.



3 Do The Work

- 3.1 Permit Holders and Supervisors shall ensure worksite is tidy at the start and after work completion and verified by the Permit Issuer prior to permit close out.
- 3.2 Everyone clean ups after every job at every location. A job is only considered complete after your work area is clean.



- 3.3 Team Leaders and Supervisors are responsible to encourage team members to pro-actively intervene whenever good housekeeping practice is not demonstrated. Management expectations on housekeeping should be reinforced through regular site visits.



3.4 Best practices include

- Always keep stairs, walkways, ladder access, scaffold platforms, access routes, fire exits and access to fire and emergency equipment clear from obstructions
- Clearly mark walkways to distinguish them from non-pedestrian areas
- Ensure all equipment and materials are arranged securely and correctly to avoid falling
- Segregate hazardous and non-hazardous waste. Do not mix hydrocarbon/chemical-contaminated waste with general/industrial waste
- Segregating flammable material to minimize fire hazards
- Cables, power lines, pipes and hoses are not allowed to trail across walkways or work areas.
- Used cable trays and cables must be rolled up on completion of use.
- Keep lights and cables away from flammable goods
- Waste collection: provide sufficient waste bins on site and equipment to store and segregate and equipment move and remove waste as required.
- Off-plot lay down areas shall be kept in order and clean.
- Limit the use of temporary laydown areas to the duration of the work
- Clean up after every job at every location is mandatory.

3.5 Ensure office space is neat and tidy. Cables of office machines shall be stowed away from walkways and securely taped to minimize trips and fall.

4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC Checklists and Construction Site Safety Standard (CSSS) Forms

- CSSS 'Housekeeping' (Appendix 2)

BGC ToolBox Talks, Communication Materials, Posters and Information

- '5 to Stay Alive Housekeeping' (Appendix 1)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC HSE Operations Manager	31-03-2022	Retained on sign-off form



Appendix 1 '5 To Stay Alive Housekeeping'

HOUSEKEEPING

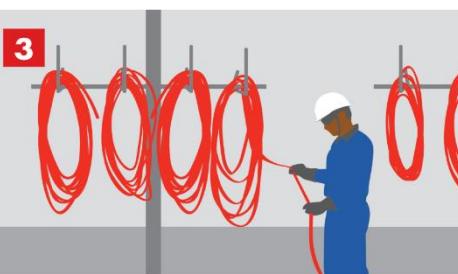
5 TO STAY ALIVE

**Do Not Block**

Ensure emergency equipment is not blocked in and can be reached easily.

**Clean and Go**

Clean up as you go. Don't leave it for someone else.

**Cable Trees**

Plan for a periodic roll up of hoses and cables and use cable trees to keep the floor clear.

**Segregate and Recycle**

Ensure that there are adequate plans for recycling and proper disposal/segregation of waste.

**Neat and Tidy**

A place for everything and everything in its place.

Comply
with the standards

Intervene
when you see something wrong

Respect
your co-workers





Appendix 2 CSSS Checklist 'Housekeeping'

NOTE: Although Construction Site Safety Standards (CSSS) materials are used by BGC Projects Department, they can also be utilized by other departments as appropriate.

Ser	Standardisation Requirement	Yes	No	Actions required/Date/Action Party
1	Do supervisors ensure work area is free from trip hazards, prior to, during and completion of works?			
2	Is the cable management sufficient on site (cable trees used, cables rolled up on completion of use)?			
3	Is waste and debris removed from the work site in a timely manner?			
4	Is the Project Environmental Plan implemented (waste segregated, scrap disposed of correctly)?			
5	Are stairways, passageways, ladder access, scaffold platforms and gangways free from materials supplies and obstructions?			
6	Are Structural openings covered and adequately protected (sumps, shafts & floor openings)?			
7	Are areas allocated for temporary storage/stockpiling/segregation of materials and is it defined in the site layout plans?			



Work Management Procedure

#18 HSE Event Reporting, Investigation and Learning

1 Overview and Hazards

- 1.1 The purpose of this WMP is to ensure the correct action is taken after the occurrence of an HSE Event. An HSE Event is an unplanned event or chain of events that has, or could have, resulted in injury or illness, damage to our assets, the environment or an impact to our communities.



All HSE Events including HSE incidents, Near Misses and Observations (incl unsafe act/conditions RAM3+) related to our activities shall be reported and investigated so that further risk can be mitigated, actions can be taken to prevent recurrence and to enable compliance with regulatory requirements and BGC standards.

1.2 Hazards

If HSE Events are not appropriately reported and investigated, then it is possible that:

- The learning from a 'Near Miss' incident may not be applied and may be repeated, with possibly more significant consequences;
- An HSE Event can escalate into a worse outcome;
- An Injured Person (IP) may not get the treatment that they need;
- The HSE Event may be repeated if potential problems are not corrected.



Relevant Life Saving Rules and Process Safety Fundamentals

Note: All Life Saving Rules & Process Safety Fundamentals are applicable for this WMP section.

2 Plan The Work: Ensure Requirements are Known

- 2.1 All HSE Events are to be reported to the Supervisor of the work activity and Section Head in the operating facilities accordance to the timelines in Appendix 1.
- 2.2 If there is any doubt as to whether the illness or injury is work related or not, or whether the illness or injury is significant, the HSE Event needs to be reported. Initial details can be resolved and corrected as part of the subsequent investigation and follow up.



2.3 The BGC Risk Assessment Matrix (RAM) is used to determine incident severity or potential severity, see WMP #13 Hazard Identification for the RAM.

2.4 HSE Event Owner

The person in the organization who has control over the work activity where the incident occurred. The following order takes precedence to define ownership for the work activity:

- Organization that issues the work permit (i.e. Asset, Projects, Logistics, etc);
- Organisation that is the budget holder for the work being done at the time;
- Where there is no work permit or budget-ownership is unclear, the Event Owner is the organization responsible for the area (e.g. facility, construction site, office buildings);
- If the above is not applicable, for BGC staff the Event Owner is the Line Manager of the IP and for contractors the Event Owner is the Contract Holder.

2.5 HSE Event Owner Accountabilities

- Make the incident site safe and make decision on work continuation or suspension;
- Report the incident using the DLBGCIncident-Notification@basrahgashiq distribution list (Appendix 2) or report directly into SpheraCloud within 24hrs;
- Manage and initiate the incident investigation including reviewing the investigation report, approve or obtain approval for the plan and action follow up until completion;
- Obtain legal advice before beginning to write any investigation report that may need to be shared with external parties and obtain legal review before it is finally approved;
- Ensure that:
 - Terms of Reference (TOR) is prepared by the investigation team for all actual and potential RAM3+;
 - Incident Sponsor is identified and receives regular update on findings.

2.6 Case Management of Injuries and Illnesses

All injuries and illnesses shall follow the case management process from the point of injury/illness to return to work to ensure the IP receives the optimum level of medical care including return to work assessment.

2.7 All cases of IP that require treatment beyond basic first aid (e.g. cold compress, bandage etc) must be reported to BGC Emergency Response Operations Centre (EROC). The EROC answers all emergency calls on the emergency numbers:

- **BGC Phone 3333;**
- **VOIP 12223;**
- **Mobile 07809213970.**

EROC will connect the reporter to BGC Health Manager (or delegate).

2.8 The BGC Employee who is organizationally accountable for the work of the IP shall manage the case. The BGC Health Manager (or delegate) will provide expertise and guidance on interpretation of medical reports. Case management task can be delegated to contractor management if necessary (i.e. logistically unable to be present immediately), however the BGC Employee is still accountable.



2.9 Case management of the incident is vital to ensure any injuries and illnesses are appropriately treated and for BGC to maintain situational awareness in real-time.

The steps below shall be followed:

- IP to report Injury or illness to Designated First Aider (DFA)/their Supervisor immediately;
- DFA/Supervisor contacts EROC and the HSE Event Responsible Person (RP) - equivalent of a Plant Director, Project Manager, Department Manager, or similar (BGC LT -1) – immediately;
- EROC in consultation with DFA initiates Medical Emergency Response (MER);
- An HSE Event Accompanying Person (AP) - Supervisor or HSE Advisor within the IP's line from BGC or contractor company - will be assigned to accompany the IP to a medical facility;
- The HSE Event AP will provide real-time ongoing status updates to the HSE Event RP on the IP's condition;
- The BGC Health Manager will provide expertise to ensure appropriate support to the IP and advice to required BGC management on IP status;
- If the IP is to have an extended stay at the medical facility, the HSE Event RP will confirm stand-down to the HSE Event AP and make arrangements for ongoing update to the IP's status, until they have recovered and returned to work;
- The BGC Health Manager (or delegate) provides the injury/illness classification within seven days of the reported injury/illness.

2.10 Case Management of Process Safety Events (PSE)

All PSEs shall follow the case management process from the point of identifying a Loss of Primary Containment (LOPC) to return to operation. BGC is using the international tiering classification of API 754/OGP 456 to report PSEs as per Appendix 4.

2.11 The steps below shall be followed:

- The HSE Event Owner requests field data collection from respective operations /maintenance team by means of photo's, video, LEL measurement, visual observation, hole size and soil contamination assessment;
- Operations/Maintenance completes the Leak Data Sheet (Appendix 3), to be approved by Deputy Plant Director and submit to the LOPC Focal Point (e.g. Technical Safety Engineer) for calculation/modelling;
- The LOPC focal point gathers information, calculates the LOPC and provides a tiering classification to HSE and AIPSM within seven days of the reported PSE;
- HSE to complete final tiering classification in accordance with OGP guidance;
- Tier 1 & Tier 2 classification will be subject to classification confirmation during the Incident Review Panel (IRP).

3 Do The Work: Investigation Actions

3.1 Level of HSE Event Investigation

The Event Owner must determine the investigation level required based on the initial actual severity and/or potential severity of the HSE Event.

- Table 1 below provides guidance on the required HSE Event investigation level;
- An Investigation Team Leader shall be appointed and briefed – must be trained on HSE Event Reporting and Investigation techniques.



- 3.2 The level of the HSE Event Investigation Lead is as per Table 1 (refer to WMP #13 Hazard Identification for definitions of RAM severity).
- 3.3 The investigation team must be set up within 48hrs/ the Investigation Team Lead should be independent from the location where the incident happened.
- 3.4 Develop a TOR for all actual and potential RAM3+HSE Events.

3.5 **Table 1 Investigation Team Composition***

RAM Severity	Investigation Team Composition	Event Owner	Investigation Methodology
Blue RAM (potential)	First line of Supervision, HSE Advisor	Head of Section or equivalent	
Yellow RAM (potential)	Head of Section, TA Discipline, HSE Advisor	Head of Department or equivalent	5 Whys, RCA
Red RAM (potential)	Head of Dept, TA Discipline / SME, HSE Manager	Head of Commission	In deep investigation: TROPOD- B**
Significant Incident (Actual 4 & 5)	Head of Commission or delegate, TA Discipline / SME, HSE Manager	BGC MD / DMD	In deep investigation: TRIPOD- B**

* BGC HSE Management Systems Team can provide guidance on team composition

** Or equivalent, to be agreed with HSE Director

3.6 **HSE Event Classification**

HSE Event classification shall be determined by the HSE Event Owner as part of the investigation supported by the relevant SME/TA (e.g. Health Manager, ERW) and HSE. If there is a discrepancy on the HSE Event classification, the HSE Director shall discuss and agree with the respective Commission Head on the final classification. Final resolution shall be escalated to the Managing Director.

3.7 **HSE Event Report Submission**

- Incident investigation reports are required to be drafted for review within 21 days of the incident;
- Incident investigation reports should be finalized within 28 days of the incident;
- Exceptions to the above timescales must be requested to the HSE Event Owner's Commission Head/ Director AND the HSE Director for approval;
- Reports with Significant HSE Events and Potential RAM 4 & 5 Events must be submitted to Legal Department for review.

3.8 **Incident Review Panel (IRP)**

An IRP must be held for all RAM3+ actual incidents and for all RAM4+ potential incidents. BGC follows a risk-based hierarchical approach for conducting HSE Event Review Panels.

Table 2 IRP Types/Quorum

Type of IRP	IRP Quorum*	Type of HSE Event
Corporate	<ul style="list-style-type: none">• Chaired by MD• HSE Director• Head of Commission from where incident took place	<ul style="list-style-type: none">• Tier 1 PSEs• HPEs with RAM exceeding 4 A/B
Departmental	<ul style="list-style-type: none">• Chaired by Head of Commission from where incident took place• HSE Manager and Commission LT Member	<ul style="list-style-type: none">• Tier 2 PSEs• HPEs with RAM 4 A/B• LTIs

* Event Owner to agree with Panel Chair additional panel members as required (e.g. Investigation team members, SME, TA Discipline)



3.9 HSE Event Investigation Follow Up and Action Closure

For all HSE Events, as a minimum the close out discussions with Investigation Team/IRP (where required) must cover the following:

- The correct RAM classification for the HSE Event has been recorded;
- The HSE Event has been adequately investigated;
- The primary root causes of the HSE Event have been identified;
- Meaningful actions that adequately cover the findings and prevent reoccurrence;
- Responsibility for the actions is agreed;
- Consequence management agreed in line with Appendix 5.

3.10 Learning from Experience (LFE)

Where there is a need identified to share learnings the LFE Coordinator will arrange for an alert for at least the following HSE Events in coordination with Event Owner:

- Significant HSSE Incidents;
- High Potential HSE Events;
- All recordable incidents;
- Other HSE Events (e.g. from the sites or industry) that may benefit the company may also be submitted to the LFE process.



3.11 NOTE: Under no circumstance shall information, including photos and videos, of incidents be shared on social media.

4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #25 Permit to Work

BGC ToolBox Talks, Communication Materials, Posters and Information

- HSE Event Notification Timings (Appendix 1)
- SpheraCloud GX Notification (Appendix 2)
- Leak Data Sheet (Appendix 3)
- PSE Tier1 and Tier 2 Classification Guidance (Appendix 4)
- Consequence Management Flowchart (Appendix 5)

7 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC HSE Risk and Assurance Lead	31-03-2022	Retained on sign-off form



Appendix 1 HSE Event Notification Timings

*Responsible Person (RP): Plant Director / Site Leader / Contract Holder.

EVENTS <i>Contact the HSE Management Systems Team for any further advice required</i>	IMMEDIATE (first 30 minutes)	TIMES GIVEN ARE MAXIMUM ALLOWABLE, ALL STEPS TO BE COMPLETED ASAP		
		1 HOUR	6 HOURS	24 HOURS
All Incidents, Near Misses and LSR violations	Supervisor, plus additional as per below			GX notification within 24 hours
All cases of that require treatment beyond basic first aid	Designated First Aider, EROC, Health Manager			
<ul style="list-style-type: none">• Near Miss Incidents with potential to result in injury of medical treatment and above• Potential breach of Life Saving Rule (supervisor intervention, not peer to peer intervention)	Supervisor		Responsible Person (RP)*	Commission Head / Dept. Head
<ul style="list-style-type: none">• Injury likely to require medical treatment, or become restricted work or lost time injury• Fire on operational facilities not leading to serious danger• Life threatening non-work-related hospitalization	Supervisor	RP*	Commission Head / Dept. Head	MD, Production Director & HSE Director
<ul style="list-style-type: none">• Injury resulting in Fatality or likely to result in Permanent & Total Disability• Fire/ Explosion leading to serious danger to health, property or the environment• Any other event arising from a work activity on the facility involving death or serious personal injury to five or more persons on the facility or in neighbouring areas	Supervisor	RP* / Commission Head / Dept. Head / MD, Production Director & HSE Director		



Appendix 2: SpheraCloud GX Notification

The below table should be submitted via e-mail to the following address:

DLBGCIncident-Notification@basrahgashiq

Location: الموقع:	e.g. KAZ Plant مثلاً خور الزبير
Incident Owner: مالك الحادث:	e.g. Plant Director... مثلاً مدير الهيئة
Department: القسم:	e.g. Operations, Maintenance, Projects مثلاً: الإنتاج، الصيانة، المشاريع
Incident type: نوع الحادث:	See SpheraCloud Protocols e.g. LWC, LOPC... مثلاً LWC, LOPC انظر قواعد نظام إدارة الحوادث
Description: الوصف:	What? Where? Note: Do not include names of involved parties ماذا وain؟ مما إذا وain؟
Specific Location: الموقع بالتحديد:	e.g. 11.1... مثلاً الوحدة 11.1
Resp. Supervisor: المشرف المسؤول:	Individual responsible for the area or individual involved e.g. Shift Supervisor الشخص المسؤول عن الموقع التي وقع فيها الحادث مثلاً مسؤول الوجهة
Date reported: تاريخ التقرير:	Date when the incident was reported? من قام بإرسال التقرير للقائمة البريدية؟
Date occurred: تاريخ وقوع الحادث:	When? متى؟
Time:	24-hour clock نظام 24 ساعة
Immediate Corrective Actions: الإجراءات الفورية المتخذة:	e.g. shut down... مثلاً إيقاف التشغيل...
Contractor involved:	Name of Contractor Company اسم الشركة المتعاقدة
Medical follow-up required: الحاجة للمتابعة الطبية:	Were there any injuries? Note: Do not include specific medical details. These will be managed and kept by the Medical Department. هل ثمة إصابات؟



Appendix 3 Leak Data Sheet

Pipe/Vessel Identification:	
Exact Location:	
Under/Above ground:	
Flow rate in the pipe at the moment of the incident:	
Product nature/composition:	
Product pressure before leak:	
Pressure in the pipe/vessel after leak started:	
Product temperature:	
Date/time leak identified:	
Date/time pipe/vessel isolated:	
Date/time start depressurization:	
Date/time end depressurization:	
Hole size:	
Hole cause:	
Date hole repaired:	
Repair method:	
Picture available (of the hole once visible with EX-Camera):	

Appendix 4: PSE Tier1 and Tier 2 Classification Guidance



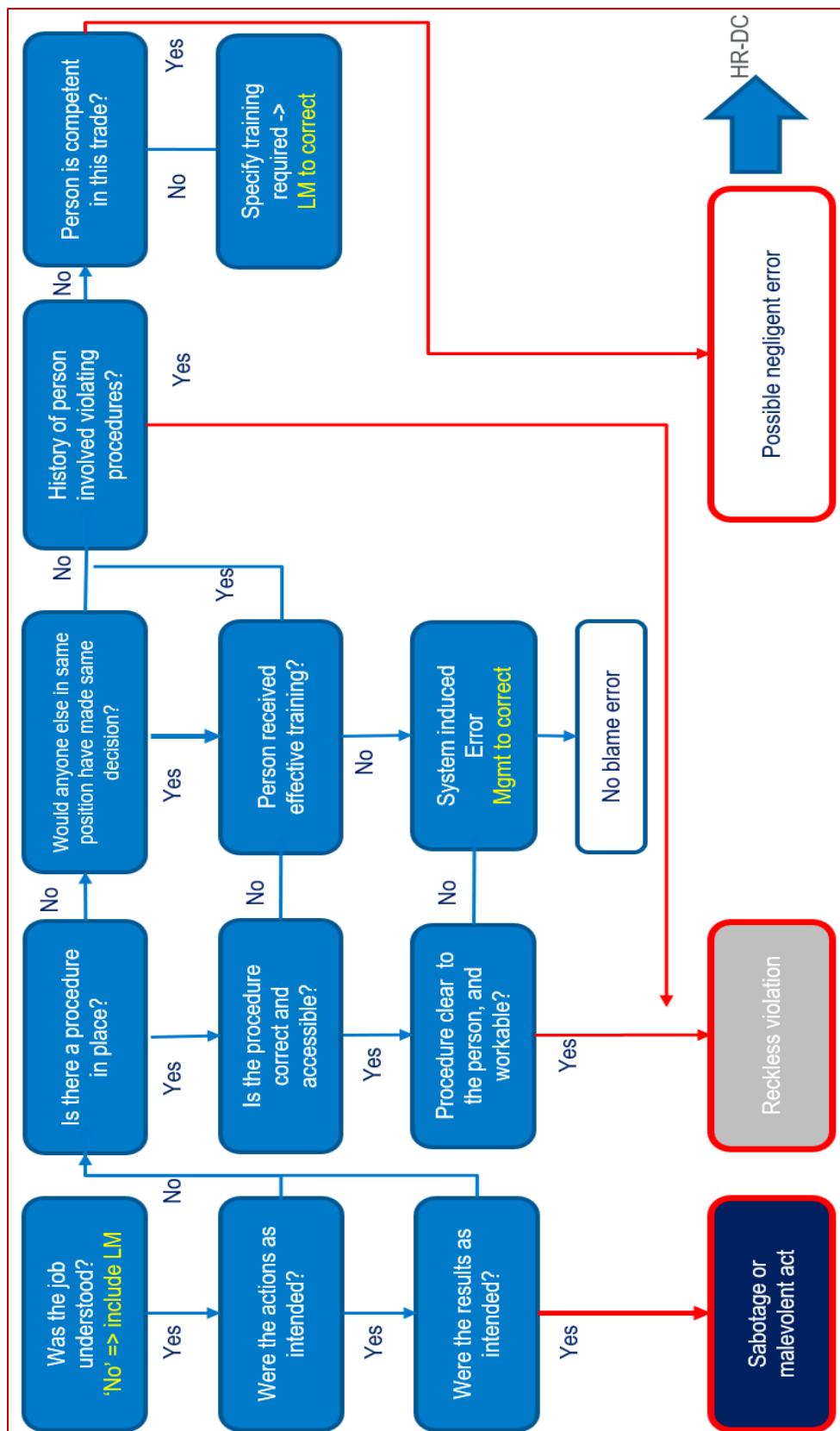
Name	Hydrocarbon	Tier 1 Threshold (kg)	Tier 2 Threshold (kg)
Broadcut	Yes	1000	100
Butane(s)	Yes	500	50
Butene	Yes	500	50
Condensate	Yes	1000	100
Crude Oil	Yes	<i>Not Tier 1 when released at temperature below its flash point</i>	1000
Diesel Fuel	Yes	<i>Not Tier 1 when released at temperature below its flash point</i>	1000
Ethane	Yes	500	50
Gas Oil	Yes	1000	100
Liquefied Gases	Yes	500	50
LPG	Yes	500	50
Lubrication Oil / Grease	Yes	<i>Not Tier 1 when released at temperature below its flash point</i>	1000
Methanol	No	1000	100
Nitrogen	No	2000	1000
Pentane	Yes	1000	100
Petrol/ Gasoline	Yes	1000	100
Phenol	No	<i>Not Tier 1 when released at temperature below its flash point</i>	1000
Propane	Yes	500	50
Raw Gas	Yes	500	50
Sulfinol	yes	<i>Not Tier 1 when released at temperature below its flash point</i>	1000
Triethylene Glycol	No	<i>Not Tier 1 when released at temperature below its flash point</i>	1000

RAM Severity Threshold

PSE Event	TIER 1	TIER 2
Asset Damage (direct costs) due to fire or explosion	≥ \$100,000	≥ \$2,500
Community	RAM Severity 3+	NA
Personal Injury	<ul style="list-style-type: none">• LTI+• 3rd Party hospital submission or fatality	<ul style="list-style-type: none">• RAM Severity 2+



Appendix 5: Consequence Management Flowchart





Work Management Procedure #19 Hydrogen Sulphide (H₂S)

1 Overview and Hazards

- 1.1 Hydrogen Sulphide (H₂S) gas is extremely hazardous. It smells like rotten eggs at low concentrations. It is heavier than air so accumulates in low-lying areas. H₂S can be present in production gas and may be released through leaks or vents and drains, when opening or purging equipment. Table 1 summarises the health and hazardous effects of H₂S.

Table 1 H₂S Health Effects

OEL (ppm in air)	Health Effects
<1 ppm	Smell like rotten eggs detectable by most people at anytime
10-50 ppm	Burning in eyes, nose, throat, and airways. Rotten egg smell disappears
50-100 ppm	Loss of sense of smell after 15 mins, Up to 1 hour exposure, headaches, dizziness, loss of balance serious eye irritation or damage, lungs begin to fill with fluid
100 ppm	After 3 – 15 mins, completely lose sense of smell, coughing, dizziness, eye pain and damage, difficulty breathing, drowsiness. Impair an individual's ability to escape from a dangerous atmosphere. Immediately Dangerous to Life and Health (IDLH) level
200 ppm	Lungs quickly fill with fluid, cannot breathe
>500 ppm	Unconsciousness followed by death if not quickly rescued
>1000 ppm	Breathing stops within one or two breaths, death within 3 minutes

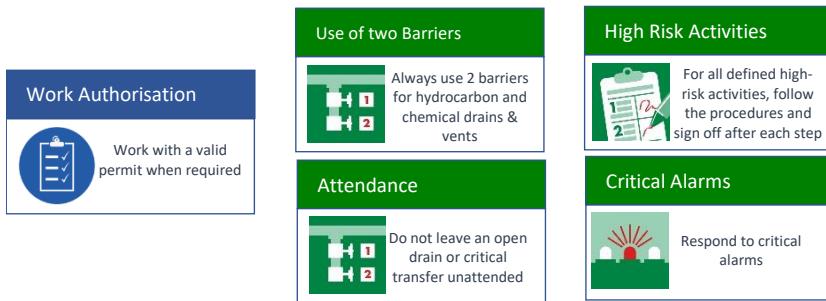
H₂S Hazardous Effects

-  Toxic – creates poisonous atmospheres that cause serious illness or death
-  Flammable – when released to the atmosphere they can catch fire or explode
-  Corrosive – causes skin and eye damage, and can cause damage to certain materials
-  Inert/asphyxiating displaces oxygen from a space, making breathing impossible

- 1.2 H₂S in hydrocarbon systems can also cause the production of pyrophoric material (also known as iron sulphide or black sludge deposit). Pyrophoric material can ignite suddenly when exposed to air. Consider this hazard when opening equipment and dealing with pyrophoric sludges and scales. If H₂S catches fire, it will produce sulphur dioxide, which is highly toxic.



Relevant Life Saving Rules and Process Safety Fundamentals



2 Plan The Work

2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.

2.2 Hazard Management

For Job Hazard Analysis (JHA) and Permit-To-Work (PTW) application:



- Identify the potential sources and concentrations of H₂S
- Identify the events that might result in the release H₂S

Ensure any equipment removed from sour service must be thoroughly isolated/purged/flushed to ensure no remnants of H₂S are introduced during transport or in the workshop.

2.3 H₂S Areas (Sour Facilities)

In BGC facilities operate either with (sour) or without risk of H₂S (always verify with operations before you do work).

- Classification of H₂S Area may change if sampling confirms H₂S exceeds thresholds.
- Place clear warning signs and barriers at the entrance and surrounding H₂S risk areas.



2.4 Access Control and entry requirements to H₂S Risk Areas

Personnel planning to access BGC hydrocarbon facilities with H₂S must go through the normal site orientation process. Area Owners must ensure processes are in place in their area of authority that:

- Access control is in place to stop personnel not meeting below requirements
- Personnel are informed about H₂S presence and emergency response requirement
- Validity of their training is verified (see Table 2)



- Controls measures for managing H₂S including PPE, radio, etc. are specified
- Personal Gas Monitors and Escape sets are provided.

Over and above this, non BGC visitors or first-time visitors must always be accompanied by a person who is familiar with the site.

For the short-term once-off visitors, it is the Plant Director authority to give by exception an exemption for the H₂S training.

- Visitors can make a site visit after receiving the onsite H₂S briefing given by the Area HSE Representative.
- The short briefing shall include a demonstration on how to use H₂S PPE and emergency response requirement
- Short-term visitors shall always be escorted by an H₂S trained person.

3 Do The Work

- 3.1 The Access Control for a H₂S facility is shown below in Figure 1. Personnel entering H₂S areas must have completed the training requirements as shown in Table 2. It is recommended that the BGC HSE Passport (or equivalent for contractors) is used to show training records.

Figure 1 Access Control H₂S areas



Table 2 Training Requirements

Training	Audience	Validity
H ₂ S Respiratory Protective Equipment (RPE)	All BGC staff and contractor working in locations with H ₂ S	3 years Training run by Asset/ Project or Approved Mode 2 Contractor



Self-Contained Breathing Apparatus (SCBA)/ Confined Space Entry (CSE)	All users of SCBA/SABA and CSE	3 years Training run by BGC recognised trainers
Emergency Response Team Member (ERTM)	Emergency Responders	3 years Training run by BGC recognised trainers

Respiratory Protective Equipment (RPE)

- 3.2 RPE Drager Parat 3200 Escape device is typically used on BGC facilities.



- 3.3 Self-Contained Breathing Apparatus (SCBA)

DO NOT RESCUE WITHOUT SCBA. MULTIPLE H₂S FATALITIES CAN OCCUR IF PERSONNEL ATTEMPT RESCUE WITHOUT SCBA.

SCBA shall be used for any high-risk activity such as Breaking Containment, CSE or Work at Height where there is a risk of a H₂S atmosphere. User must be on standby for emergency response, users must:

- Verify pressure gauge is healthy (green)
- SCBA equipment certificate is valid
- Do not wear anything to obstruct mask (e.g. glasses or scarves, beards must not impact the integrity of the face mask)
- Check the mask has a good fit and seal

Note: ERD provides Man Down First Responder courses to Operators



- 3.4 Before starting the work confirm the correct approvals and documentation e.g. rescue plan, JHA are in place as required by the PTW i.e. **Task Risk Identification Card (TRIC), ToolBox Talk (TBT) , gas test and field checks etc. have been performed.** Follow WMP #25 PTW.





- 3.5 During TBT, the discussion must include the following:
- Potential exposure to H₂S during the activity (e.g. confined space)
 - Warning signs and barricades at each point of access; hazards signs in work area
 - Check gas monitors and alarms work. Every month checks are done by ERD
Note: H₂S clips don't need calibrating
 - Operations to maintain the bump testing for the personal multi gas monitoring devices.
 - Check everyone has RPE and up to date H₂S training
 - Wind direction (check windsock) and best route for the given wind direction to the muster location
 - Ensure understanding for Table 3 H₂S ER Scenarios and Response
 - Maintaining communication and checks (for Major H₂S Risk)
 - Areas with limited access/way out hindering escape
- 3.6 Venting the system during the purging activity must be done from various vent points in the system to ensure all sections of the system have been sufficiently purged.
- 3.7 When draining a sour stream, check and ensure there is no connection to other equipment or drain system which could lead to H₂S to migrating into safe areas.
- 3.8 **Person in Charge of the Worksite (PICWS)**
- For H₂S locations the PICWS shall take the following responsibilities in addition to the normal tasks:
- Ensure wind direction via windsock;
 - Alerts the control room and initiates the emergency response process in an emergency;
 - DOES NOT RESCUE but supports the evacuation of the work crew;
 - Must have a working SCBA;
 - Any other work task identified by the Permit Issuer.
- 3.9 WARNING:- CSE at H₂S sites
- A ERTM should be involved in CSE JHA, and in the preparation of the CSE Rescue Plan. During the work activity, no attempt at a rescue shall be undertaken in the event of 'man down' until a fully equipped rescue team is at the scene - a minimum of 2 people to affect a rescue.
- 3.11 Emergency Response Personnel will regularly practice exercises with personnel on site. See Table 3. The frequency of drills is determined by the activities' risk profile.

Table 3 H₂S ER Scenarios and Response

Scenario	Response
1 No gas alarm, Smell of rotten eggs	<ul style="list-style-type: none">• INFORM supervisor• Supervisor alerts CCR (Shift Engineer) for next course of action, expect a gas test• Work crew, pauses work, OBSERVE wind direction (windsock) and identify appropriate muster location
2 Gas Alarm from own personal gas monitor or	<ul style="list-style-type: none">• STOP work• PUT ON escape set immediately• ALERT others• OBSERVE wind direction (windsock)• ESCAPE & MUSTER crosswind or upwind to designated station/safe refuge area.• INFORM CCR (via radio) for further action



	H ₂ S gas detector	<ul style="list-style-type: none">• HEADCOUNT & IDENTIFY missing personnel• FOLLOW next instruction from OSC <p>NOTE: DO NOT ATTEMPT to SEARCH AND RESCUE (SAR). SAR must be performed only by the ER Department , using rescue SCBA (as per Emergency Response Plan).</p>
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4 References and Resources

Relevant WMPs:

- #5 Emergency Response
- #13 Hazard Identification
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC ToolBox Talks, Communication Materials, Posters and Information

- 'Use of Protective Equipment in H₂S Areas' (Appendix 1)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	TSE Manager	31-03-2022	Retained on sign-off form



Appendix 1 'Use of Protective Equipment in H₂S Areas'

No.	Situation	Examples	Protection Equipment
1	Visits, inspections	Outside visitors, management audits, engineers, draftsmen on field visit. Maintenance supervisor inspecting worksite	<ul style="list-style-type: none">• PGM and escape filter device to hand• + IS Radio for Communications to control room.
2	Normal operations	Operator checking instrument readings, stopping/starting pumps, but excluding any live work such as sampling.	<ul style="list-style-type: none">• PGM and escape filter device to hand• + IS Radio for Communications to control room.
3	Work out of range of 'H ₂ S -Designated' equipment	Painting welded lines in pipe track, road repairs, trench digging, repairing light fittings etc.	<ul style="list-style-type: none">• PGM and escape filter device to hand• + IS Radio for Communications to control room.
4	Works near 'H ₂ S -live' equipment, piping, etc but unlikely to disturb them	Any work near flanged piping, pumps, vessels, compressors, etc in which H ₂ S-containing fluids can escape through flanges, seals, vents or breather valves into the immediate atmosphere	<ul style="list-style-type: none">• PGM and escape filter device to hand• + IS Radio for Communications to control room.
5	Work likely to disturb H ₂ S -live equipment, piping, etc	Testing newly commissioned rotating equipment. Modifying piping where stresses could be transmitted to live piping. Adjusting and calibrating 'wet' components of instruments	<ul style="list-style-type: none">• PGM. escape filter device at ready• At least one standby with BASCBA set• + IS Radio for Communications to control room
6	Sampling	Taking gas or liquid samples	<ul style="list-style-type: none">• PGM and SCBA set - mask fitted• At least one standby with SCBA set. (Work responsible person) + IS Radio for Communications to control room
7	Opening H ₂ S live equipment	Turning a spade, removing blind to allow gas test Making a gas test	<ul style="list-style-type: none">• PGM and SCBA set – mask fitted• At least one standby with SCBA set. Work responsible person).• + IS Radio for Communications to control room
8	Leaking equipment	Operational investigation of leak. Operator isolating leaking equipment	<ul style="list-style-type: none">• PGM and SCBA set - mask fitted• At least one standby with SCBA set. (Work responsible person)• + IS Radio for Communications to control room
9	Entry into low lying area	Work on tank bunds or in pipe trenches and culverts Access to tanks via bundled area	<ul style="list-style-type: none">• Monitor• Escape filter device permissible only once isolated, gas freed and air flow established. Escape mask should be used for escape purpose only.• SCBA set - mask fitted• At least one standby with SCBA.• + IS Radio for Communications to control room.
11	Entry into vessel or other confined space	Entry into vessels, tanks, buildings or compartments containing process equipment which may contain H ₂ S in the atmosphere	<ul style="list-style-type: none">• Monitor• Escape filter device permissible only once isolated, gas freed and air flow established. Escape mask should be used for escape purpose only.• SCBA set - mask fitted• At least one standby with SCBA set+ IS Radio for Communications to control room.
12	Entry into suspected unmonitored area	Arrival at unmanned production facility/building where integrity of H ₂ S detection systems is in doubt	<ul style="list-style-type: none">• Monitor• SCBA set - mask fitted• At least one standby with SCBA set. (Work responsible person)

Note: **The escape filter device will give 15 minutes protection** for the wearer to leave the scene to an upwind direction to find a safe location. PPE and emergency response time should be considered as part of the JHA and discussed at the worksite at the TBT. With changes in circumstances e.g. wind direction, the work crew should pause work and reassess the most appropriate muster locations.



Work Management Procedure

#20 Isolations

1 Overview and Hazards

Process Isolations are part of BGC'S Permit-To-Work (PTW) system and are controlled by an Isolation Confirmation Certificate (ICC) which shall be in place prior to start of work. The intent of an isolation and Lock \Out Tag out system is to minimize the risk to people, the environment and assets from exposure to energy (pressure, electrical, kinetic, temperature, etc) and hazardous substances during invasive maintenance, through effective isolation of equipment and the placement of locks and tags. For all types of isolations (e.g., electrical and mechanical / piping) systems / equipment being isolated must be tested to verify zero energy (test to verify dead) by both the person applying the initial locks / isolations and tags and the persons who will be carrying out the work on such equipment / systems.



This WMP is not for:

- Portable equipment with flexible wiring and a plug under complete control of one person;
- Testing of energized electrical equipment or other electrical work.

Examples of energy or hazardous substances are:

- Gas or liquids under pressure;
- Flammable or toxic substances;
- Extreme hot or cold temperatures;
- Stored energy in equipment (e.g. under tension, locked in pressure);
- Mechanical energy from moving internal parts;
- Electricity;
- Kinetic energy from being struck by a moving object;
- Ionizing radiation.

Relevant Life Saving Rules and Process Safety Fundamentals

Energy Isolation Control  Verify isolation and zero energy before work begins	Work Authorisation  Work with a valid permit when required	Line of Fire  Keep yourself and others out of the line of fire	Pressure Free & Drained  Always check that equipment is pressure free and drained, and provides safe isolation before starting maintenance work
Attendance  Do not leave an open drain or critical transfer unattended	Use of two Barriers  Always use 2 barriers for hydrocarbon and chemical drains & vents	High Risk Activities  For all defined high-risk activities, follow the procedures and sign off after each step	Walk the Line  Walk the Line – Verify and validate any line-up change



2 Roles and Responsibilities

2.1 The isolation and Reinstatement process have the following Authorized Person Roles:

- Isolation Owner (IO);
- Isolation Supervisor ((IS);
- Isolation Manager (IM).

2.2 The IO will be the main focal point for isolations for BGC staff and contractors who execute activities as the **Person In Charge of Work Site (PICWS)**.

The responsibilities for an IO are:

- To define the scope of the isolation and undertake a risk assessment to determine the minimum level of isolation required, based on the Isolation Selector Tool;
- To develop an isolation and a de-isolation plan to provide the minimum level of isolation required or mitigates the risk to **As Low as Reasonably Practicable (ALARP)**;
- To execute the authorized isolation as per the agreed isolation scheme, to apply locks and tags;
- To monitor isolations that are live (in place), including checking pressure build up via local gauge;
- To de-isolate the equipment when authorized to do so by the IS.

3 Requirements

3.1 In BGC the Safe Isolation 8 Step Process is applied and is shown in Figure 1.

3.2 The only exemption from this process is the personal isolation.

The personal isolation can be defined as an isolation conducted under the exclusive management of the person servicing or maintaining the equipment and it does not add value to plan and manage the isolation under a full isolation certificate.

A personal isolation can only be applied if the following conditions are met:

- Simple routine activities i.e. a glycol filter change out, for which approved operating procedures are available;
- Isolation and Work conducted by one individual during one shift;
- An effective zero energy check is conducted;
- PICWS is competent to carry out the isolation and permitted work;
- Work site is not left unattended;
- The servicing or maintenance does not create a hazard for other people;
- For electrical isolations, a personal isolation can only be carried out on Low Voltage (LV) equipment. No High Voltage personal isolations are permitted.

3.3 BGC Safe Isolation 8 Step Process

If the above requirements are not met an isolation will be applied according to the Safe Isolation Process:

- Step 6: Maintain Isolation is the key step which is relevant for the PICWS.
- In this process step the different roles have the following Process Step Responsibilities as described below:



3.4 Permit Issuer

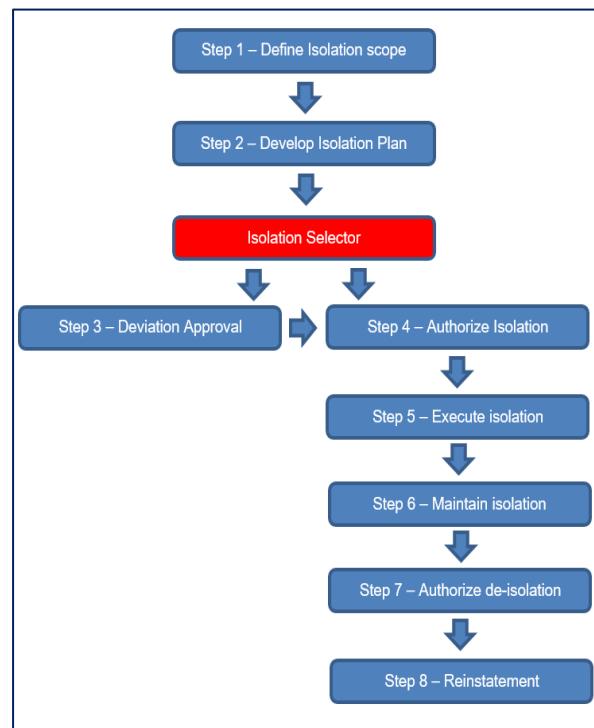
- Demonstrate the safe isolation situation to the PICWS prior to commencing work, through the **Area Operations Technician (AOT)** who most likely will become the IO. If there are electrical isolations the **Electrical Isolation Authority (EIA)** will be part of the discussion;
- If there are electrical isolations, a blue key will be placed in the PTW pack for issue.

3.5 PICWS

Prior to accepting the permit confirm that the **Isolation Confirmation Certificate (ICCs) / Process Isolation Certificate (PIC)** is in **Live (in place)** status.

- Record Permit number on Isolation certificate to help identify if work is complete prior to authorizing de-isolation;
- If there are electrical isolations, verify if a blue key is part of the PTW pack;
- Always ensure a zero-energy check on isolation is done by the AOT before work begins and repeat the check after a break;
- Attach the ICC / PIC / Isolation plan template to the PTW and these documents should be physically available at the worksite.

Figure 1 BGC Isolation 8 Step Process



3.6 Area Operations Technician (AOT) or IO

- Demonstrate the safe isolation situation to the PICWS.
- Only Area Operating Technician or IO are permitted to remove pro-locks and isolation tags from equipment.

3.7 AOT (EIA) & PICWS

- The PICWS to conduct a **ToolBox Talk (TBT)** or pre-job briefing regarding the nature of the job and all isolation points to be aware of;
- AOT or IO shall attend TBT and shall demonstrate all isolation points to the work party via line walk and conduct a zero-energy check with the work party prior to work commencement;
- If there are electrical isolations the EIA will be part of the discussion.



3.8 PICWS and workers

- Be aware of and fully understand the risk associated with the specific process line, including as a minimum:
 - Identification of the specific hydrocarbons (HC) contained in the system, including potential residual waste i.e. inhibiting chemicals / wax deposits / pyrophoric scale / Naturally Occurring Radioactive Material (NORM) / Hydrogen Sulphide (H₂S);
 - Potential Hazards associated with the release of the HC contained in the process line;
 - Emergency response and First Aid requirements for personnel impacted by HC release;
 - Ensure equipment is locked out with proper tags, spaded or blinded off prior to the start of activity;
 - Ask questions to the Supervisor or Person in Charge. Confirm with the Supervisor/Permit Holder that isolations are in place. Ensure zero energy checks are completed, and it is safe to start work;
 - Position the body outside of the Line of Fire at any potential pressure release point where practicable;
 - Be aware of and fully understand that the risk associated with entry into Confined Spaces (see WMP #3 Confined Space Entry) is a high-risk activity and has potential to harm workers due to the following conditions:
 - An atmosphere that has lack of oxygen or oxygen enrichment, flammability, explosivity, toxicity, or high temperature;
 - A space not designed/intended for continuous human occupancy and has restricted means for exit or entry;
 - Activities that can release the hazards within the space and result in harmful consequences (e.g., carrying out Hot Work, disturbing solids or fluids within the space);
- Therefore, its essential that PICWS and workers verify that the confined space is positively isolated (physical mechanical isolation using spades or physical break and blanks, spools removed) from all potential sources of hazardous material and energy sources, including radiation;
- The isolation points shall be as close as possible to the confined space. Verification must be completed at the start of every shift.



3.9 The following ICCs can be part of the PTW process:

- PIC which is shown in Figure 2;
- Electrical ICC which is shown in Figure 3.





BASRAH GAS COMPANY - ELECTRICAL ISOLATION / DE-ISOLATION CERTIFICATE

No : 09651

شركة غاز البصرة - شهادة العزل / إعادة التوصيل الكهربائي

Permit No.	Isolation Certificate Issue Date	Expiry Date					
Name	Dept	Confirmation Permit No.					
Worksite Location	1- العزل الكهربائي - إعادة التوصيل الكهربائي						
Equipment Details	2- العزل الكهربائي						
3 REASON FOR ISOLATION :							
3 DETAILS OF ISOLATION - AUTHORIZED ELECTRICAL PERSONNEL							
Tag/Padlock No.	Initial Position	Isolated Position	De-isolated Position	Tag/Padlock No.	Initial Position	Isolated Position	De-isolated Position
4 Isolators involved on Certificate No.:							
5. DE ISOLATION							
I have checked for disconnected equipment and that all isolators have been removed from the system.							
Required (Initial)	Required (Date)	Authorized (Initial)	Authorized (Date)	Completed (Initial)	Completed (Date)	Complete & Proven (Initial)	Complete & Proven (Date)
EXTENDED PERIOD ISOLATION : To be completed when no specific period is placed with the associated action.							
Reason for (P) :							
Off Applied	Cancelled	Off Removed	Off Proven	Date	Date	Date	Date
Isolation transferred to P.W. - PW Coordinator Off Isolation to "New" Isolation - PW Coordinator							
Name	Sign	Name	Sign	Date	Date	Date	Date

Figure 2: Process ICC

BASRAH GAS COMPANY - PROCESS ISOLATION CERTIFICATE

No : 11200

شركة غاز البصرة - شهادة العزل

Permit No.	Isolation Certificate Issue Date	Expiry Date					
Name	Dept	Confirmation Permit No.					
Worksite Location	1- العزل الكهربائي						
Equipment Details	2- العزل الكهربائي						
3 REASON FOR ISOLATION :							
3 DETAILS OF ISOLATION - (Permit Applicant / Shift Engineer)							
Tag/Padlock No.	Initial Position	Isolated Position	De-Isolated Position	Tag/Padlock No.	Initial Position	Isolated Position	De-Isolated Position
4 Isolators involved on Certificate No.:							
5. DE-ISOLATION							
I have checked for disconnected equipment and that all isolators have been removed from the system.							
Required (Initial)	Required (Date)	Authorized (Initial)	Authorized (Date)	Completed (Initial)	Completed (Date)	Complete & Proven (Initial)	Complete & Proven (Date)
EXTENDED PERIOD ISOLATION : To be completed when no specific period is placed with the associated action.							
Reason for (P) :							
Off Applied	Cancelled	Off Removed	Off Proven	Date	Date	Date	Date
Isolation transferred to PW - PW Coordinator Off Isolation to "New" Isolation - PW Coordinator							
Name	Sign	Name	Sign	Date	Date	Date	Date

Figure 3 Electrical ICC

- 3.10 For some activities certain isolation points need to move to a de-isolated state to test the equipment and special De-isolation for Test (DFT) Certificate will be attached to the PTW. The DFT Certificate is shown in figure 4.



BASRAH GAS COMPANY - DE ISOLATION FOR TEST CERTIFICATE - (DFT)

No : 08051

Installation Details	Worksite Information		
Where Planned No. Job Ref. No. Equipment No. Location Ref.	Isolation Certificate No. Issue Date Process / System Details		
Section 1 - APPROVAL & TIME : (Signature) _____ Date _____			
Duty person or Test supervisor _____			
Section 2 - DE ISOLATION Details (Signature) _____ Date _____ Time _____			
The Equipment / System is in a safe condition and De-isolation by test is requested by the PICWS			
Name	Signed	Date	Time
Section 3 - AUTHORIZATION (Signature) _____ Date _____			
Approved to proceed granted by Approval to proceed granted by			
Shift Engineer Name _____ Signature _____ Date _____ Time _____	Shift Supervisor Name _____ Signature _____ Date _____ Time _____	Shift Engineer Name _____ Signature _____ Date _____ Time _____	Shift Supervisor Name _____ Signature _____ Date _____ Time _____
Section 4 - DE ISOLATION / DE ISOLATION (Signature) _____ Date _____			
DE ISOLATED / DE-ISOLATED DE ISOLATED / DE-ISOLATED DE ISOLATED / DE-ISOLATED DE ISOLATED / DE-ISOLATED			
PIC Approval	Off-Accrued Name _____ Signature _____ Date _____	De-isolated / Completed Name _____ Signature _____ Date _____	Isolated / Completed Name _____ Signature _____ Date _____
TEST 1	-	-	-
TEST 2	-	-	-
TEST 3	-	-	-
TEST 4	-	-	-
Section 5 - CANCELLATION (Signature) _____ Date _____			
To be completed by Shift Supervisor / Audit- Auditor initials initial			
Testing complete this certificate is now terminated. System left in a safe state and all valves closed. (Signature) _____ Date _____ Time _____			
Shift Supervisor Name _____ Signature _____ Date _____ Time _____	De Isolation for Test Certificate CANCELLED (Signature) _____ Date _____ Time _____	Shift Supervisor Name _____ Signature _____ Date _____ Time _____	De Isolation for Test Certificate CANCELLED (Signature) _____ Date _____ Time _____
PTW Coordinator Name _____ Signature _____ Date _____ Time _____	PTW Coordinator Name _____ Signature _____ Date _____ Time _____	PTW Coordinator Name _____ Signature _____ Date _____ Time _____	PTW Coordinator Name _____ Signature _____ Date _____ Time _____

Figure 4 De-Isolation for Test (DFT) Certificate

- 3.11 Process Isolation points shall be identified through **Pro-LOCK** devices, Examples are shown in Figure 5. From the color of the PRO-LOCK it can be identified if a valve is part of an active ICC.



- Yellow PRO-LOCKs shall be used to lock valve positions as per ICC requirements;
- Red PRO-LOCKs are designated for lock closed valves as per LO/LC valve register;
- Green PRO-LOCKs are designated for lock open valves as per LO/LC valve register



Figure 5 Type of PRO-LOCKS

3.12 All process isolation points must be registered with the PRO-LOCK identity tag number in the isolation plan and the tag shall contain the following information:

- Date installed.
- Isolation Owner, who executed the isolation.
- Isolation Point Identity.
- Isolation condition (open, closed, blind, spade).
- ICC identification number.

However, if a Pro-Lock tag is not available an isolation tag can be used instead, but it must state the ICC number (compulsory requirement), and other details can be included.



Note ICC details will be contained in the isolation certificate itself.

Figure 6 Examples of Pro-Lock on Isolation and Assorted Isolation Tags



3.13 Electrical isolations can be identified either by a 'Personal Electrical Isolation Tag', as shown in figure 7, or 'Caution Notice' used for standard electrical isolations as shown in Figure 8.



Figure 7 Personal Electrical Isolation Tag

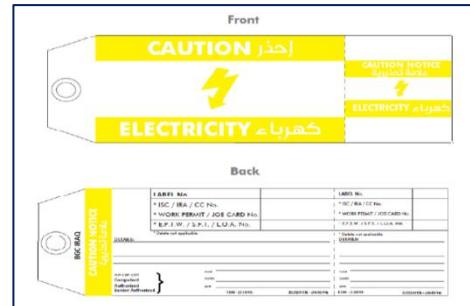


Figure 8 Caution Notice for Electrical Isolations

4 References and Resources

Relevant WMPs

- #3 Confined Space Entry
- #5 Emergency Response
- #13 Hazard Identification
- #16 Hot Work
- #25 Permit to Work

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC Production Director	31-03-2022	Retained on sign-off form
Custodian	Deputy Plant Director NR NGL	31-03-2022	Retained on sign-off form



Work Management Procedure

#21 Lifting & Hoisting

1 Overview and Hazards

- 1.1 This WMP describes BGC's basic requirements for lifting and hoisting (L&H) safety. In BGC there are different types of L&H Equipment that are used at the facilities and locations. This WMP covers all L&H activities from construction, maintenance and operations.
- 1.2 L&H operations are one of the major causes of fatalities and serious incidents across the oil and gas industry.



Hazards include:

- Loads crushing due to impact of moving objects or loads falling from vehicles;
- Contact with overhead electrical cables;
- Lifting over live equipment;
- Moving vehicles or collapsing structures, i.e. cranes falling;
- Trapping/crushing while working at height, falling from height;
- Limbs or bodies caught in machinery or where personnel come between the moving load (or crane) and a fixed object;
- Injuries or damage due to release of stored energy.



Relevant Life Saving Rules and Process Safety Fundamentals

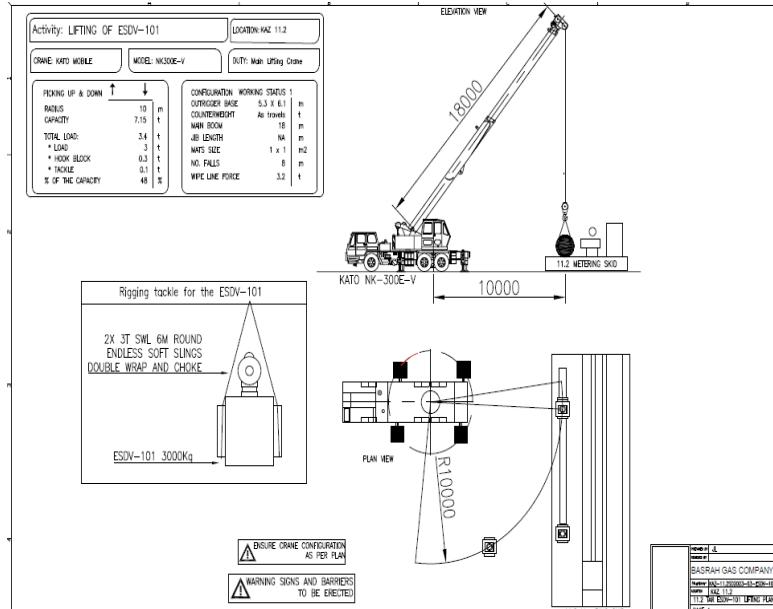
Bypassing Safety Controls	Line of Fire	Safe Mechanical Lifting	Working at Height
Obtain authorisation before overriding or disabling safety controls	Keep yourself and others out of the line of fire	Plan lifting operations and control the area	Protect yourself against a fall when working at height
Work Authorisation	High Risk Activities		
Work with a valid permit when required	For all defined high-risk activities, follow the procedures and sign off after each step		

2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.



- 2.2 Confirm what approvals, documentation, **Permit-To-Work (PTW)**, Job Hazard Analysis (JHA), **ToolBox Talk (TBT)**, etc, are needed and who will check it is done before the work starts. Follow WMP #25 PTW. Confirm supervision arrangements including any necessary support, including HSE Advisor, emergency response, gas testing, etc.
- 2.3 All BGC staff and contractors shall follow the mandatory requirements on training, certification, checklists and equipment requirements specified per type of lift in Table 1 and Appendix 5. Identify L&H activities, define scope of work and categorise the Lift/Hoist (Appendix 3 Lift Categorisation).
- 2.4 For all L&H categories appoint a Person in Charge (PIC). Additionally, for non-routine lifts, also assign an Appointed Person (AP) for the L&H operation:
- The PIC shall manage the L&H operation with a lifting crew that comprises of the L&H lifting equipment Operator, Banksman and Rigger(s)/Slinger(s);
 - The AP is the BGC representative authorised to oversee that the L&H activity complies with this WMP.
- 2.5 The PIC shall assess/inspect site, load & environmental factors
- Site factors: Access / egress including axle load & space for lifting equipment, ground stability;
 - Load factors: size, weight, lift, availability of certified lifting points;
 - Environmental factor: Obstacles in the vicinity of the lift including excavations, overhead & adjacent structures, overhead power lines etc.
- 2.6 Identify and assess Hazards (JHA), see WMP #13 Hazard Identification:
- Identify the applicable Hazards;
 - Develop control measures as specified in Appendix 3 Lift Categorisation.
- 2.7 PIC shall develop a Lift Plan in line with Appendix 3 Lift Categorisation. Include emergency response arrangements.
- 2.8 For non-routine lifts, prepare a Lift Plan using Appendix 6 Lift Plan and identify:
- Control measures as specified in Appendix 3 Lift Categorisation;
 - Equipment required with reference to safe working load in the light of load factors, site factors and set up configuration;
 - Workers required and their roles;
 - Step-by-step instructions on how to execute the lift (Method Statement);
 - Communication methods to be used;
 - Contingency and rescue plans.





- 2.9 For routine L&H operations a generic Lift Plan (which shall be reviewed for relevance and suitability for every lift) may be used.
Approved Lift Plans are valid for the duration of the work, providing no changes are made to the load, location, equipment or personnel as stated in the approved Lift Plan
- 2.10 Review & approve the Lift Plan for non-routine simple lifts (assigned PIC) and for non-routine complex lifts according to categorisation matrix below.
- 2.11 When planning for L&H operations using manual L&H Appliances (chain hoists, lever hoists, trolley hist etc.) the stand-alone rigging plan template in Appendix 7 Rigging Plan can be used.
- 2.12 **Lifting of Personnel**
Lifting of personnel in a suspended basket with cranes for regular work shall be allowed only after:
- a thorough risk assessment has demonstrated there are no alternative or safer means to perform the task;
 - Minimum performance criteria on equipment have been defined and tested;
 - Competent personnel has been identified and approved;
 - Lifting of personnel has been authorized by Site Manager in writing.

3 Do The Work: Lifting Safely

- 3.1 Assign the L&H team including clear roles and responsibilities
- Appoint the L&H team. The team shall comprise of the following workers as a minimum: A PIC (who can be a Banksman for a routine lift), Banksman, Rigger/Slinger and the L&H Equipment Operator;
 - Assign a Flagman when moving cranes near overhead electrical lines, reversing or manoeuvring in an area within the plant (and busy area like office area), machinery or workers.
- 3.2 For all lifts, obtain approved PTW in accordance with BGC WMP #25 PTW.



3.3 Select L&H Equipment and Mobilise to Site

The L&H Equipment shall be of adequate strength and in good condition.

- The certification of the L&H Equipment is current and must be colour coded (for lifting accessories) with the current BGC colour code as per Appendix 2;
- L&H Equipment (cranes and rigging) must be inspected and found satisfactory prior to use;
- Cranes must be free of leaks with all original OEM safety devices functioning as intended.
- Before each lift a pre-use inspection shall be carried out on all lifting equipment.



3.4 Safe Distancing

The L&H Equipment must be used at a safe distance from an excavation or electrical overhead cables and pylons – consult BGC Electrical Technical Authority for **Minimum Safe Approach Distance (MSAD)** for working near overhead power lines, see also WMP #31 Overhead Lines.



- Where cranes and other lifting equipment go underneath overhead power lines, goalpost shall be installed based on guidance of the Electrical Technical Authority.

3.5 Barricading

The L&H area is barricaded with signs and barriers. Warning signs shall have the contact details of the PICWS. Prior to lifting the PIC shall verify barricades are up and no unauthorized workers is in the barricaded area.

3.6 Lift Plan

Execute the lift according to the agreed Lift Plan. Any change from the agreed Lift Plan must result in the job being stopped and reassessed to verify safe operation.

3.7 Adverse Weather

Sitewide wind speed limitation is **9.8 m/s** assessed based on 10min average reading taken as close to the lift elevation as practically possible. Stop L&H activities when the maximum wind is exceeded. The maximum permissible wind speed shall be stated in the Lift Plan and in line with the requirement in the L&H Guide or lifting equipment manufacturer specification.

3.8 Communication

- Communication from the Banksman to the L&H Appliance Operator shall be continuous, two way and verified actively by repeating the command;
- The L&H Equipment Operator shall obey the **STOP** signal at all times, no matter who gives it. All L&H operations need to be controlled by the designated Banksman. Signals between the L&H Appliance Operator and the designated signal person (Banksman / Signaler) shall be audible or visible at all times;
- If a radio is required according to the lift plan then there must be a second fully functional radio at the worksite in the event of radio equipment failure in order to give the **STOP** signal if required;
- Do ToolBox Talk (TBT), communicate Lift Plan incl. mandatory use of '10 Questions for a Safe Lift', see Appendix 1.

3.9 Moving the Load

- The appropriate load-radius chart for the L&H appliance configuration in use shall be visible to the L&H Appliance Operator and shall synchronize with the reading of the automatic load moment indicator. Override of load safety limiters is prohibited;
- The L&H Appliance Operator shall never leave the controls while the load is suspended, or the engine is running. At commencement of the first lift the L&H Appliance Operator shall check the operation of the hoist brake;
- At the commencement of the lift, the L&H Appliance Operator shall do a test lift to ascertain that all safety devices are working and that the load is properly secured and balanced.
- Take up sling slack to verify that the L&H Appliance hook has been positioned centrally over the load lifting point, adjust the L&H Equipment as necessary to minimize any 'drift' of the load as it is lifted.



3.10 No external forces shall be applied to the load that create side loading of the L&H Equipment. Banksman/Signaler shall never handle the load during the L&H operation. No one shall ever get under a suspended load.





- 3.11 The starting and landing area shall be strong enough for the load and enable the load to be stable after disconnecting the L&H Accessories. Set down shall be prepared and made ready to receive the load.
- 3.12 Verify L&H Accessories are disconnected and free from the load before the L&H Appliance or the hook is disconnected.
- Leaving a L&H Appliance with an attached load unattended is prohibited at all times;
 - Cranes shall not be used for dragging a load unless properly rigged for a vertical Lift. Loads shall be free from all obstacles including hold down bolts and other securing so that the load can be lifted freely.
- 3.13 Tag lines of adequate length and size shall be used to guide loads. 'No Hands On Loads' policy shall be applied as much as practically possible
- 3.14 No fewer than five (5) full wraps of rope must remain on the winch drum in any operating conditions or as specified by the equipment OEM.
- 3.15 Where a blind lift is unavoidable, adequate controls shall be put in place including the possibility of using two Banksman or radio communications. In the case of a two Banksman option, one of the Banksman shall be designated as the lead Banksman. The Lead Banksman only shall communicate with the L&H Appliance Operator while the second Banksman communicates with the lead Banksman. Any closed-circuit television that monitors the work area is considered to be an aid, and not a replacement for either of these persons.

4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #25 Permit to Work
- #26 Personal Protective Equipment
- #27 Safety Signs & Barricades
- #31 Overhead Lines

BGC ToolBox Talks, Communication Materials, Posters and Information

- 10 Questions for a Safe Lift (Appendix 1)
- Colour Coding & Key Risks (Appendix 2)
- Lift Categorisation (Appendix 3)
- 5 Ways to Stay Alive (Appendix 4)
- Training Matrix (Appendix 5)
- Lift Plan Form (Appendix 6)
- Rigging Plan Form (Appendix 7)

5 Approval Signatures

Role	Name	Date	Signature
Owner	Material & Transport Director	31-03-2022	Retained on sign-off form
Custodian	BGC L&H Subject Matter Expert	31-03-2022	Retained on sign-off form



Appendix 1 Checklist 10 Questions for a Safe Lift

No	Element	Yes	No	Comments
1	Is everyone aware and fully understands the Lifting and Hoisting (L&H) procedures applicable to the L&H operation?			
2	Has everyone attended the Toolbox Talk?			
3	Has a pre-use inspection of the L&H Equipment been carried out and are the L&H Accessories tagged or marked with: - Working Load Limit (WLL) and/or Safe Working Load (SWL)? - A unique identification numbers? - A valid certification dates?			
4	Are all safety devices working?			
5	Does everyone know the L&H Person-in-Charge (PIC)?			
6	Is everyone competent and aware of his or her tasks?			
7	Is there a current Lift Plan and JHA in place and do all concerned parties fully understand the nature of the work and the necessary precautions that are required to execute the lift safely?			
8	Does everyone know the maximum environmental limits (e.g. maximum permissible wind speed for the lift)?			
9	Is the lift area clear and controlled and does everyone fully understand the potential dangers of a falling or swinging load?			
10	Are signaling methods and communication agreed and clear to you?			

I hereby verify that the lifting job can be executed in line with the 10 questions for safe lift.

PIC Name & Signature:

Date:



Appendix 2 Colour Coding and Key Risks

YEAR \	FIRST HALF OF THE YEAR	SECOND HALF OF THE YEAR
	JANUARY - JUNE	JULY - DECEMBER
2019	BLUE	YELLOW
2020	GREEN	BLUE
2021	YELLOW	GREEN
2022	BLUE	YELLOW
2023	GREEN	BLUE
2024	YELLOW	GREEN
2025	BLUE	YELLOW
2026	GREEN	BLUE
2027	YELLOW	GREEN
2028	BLUE	YELLOW

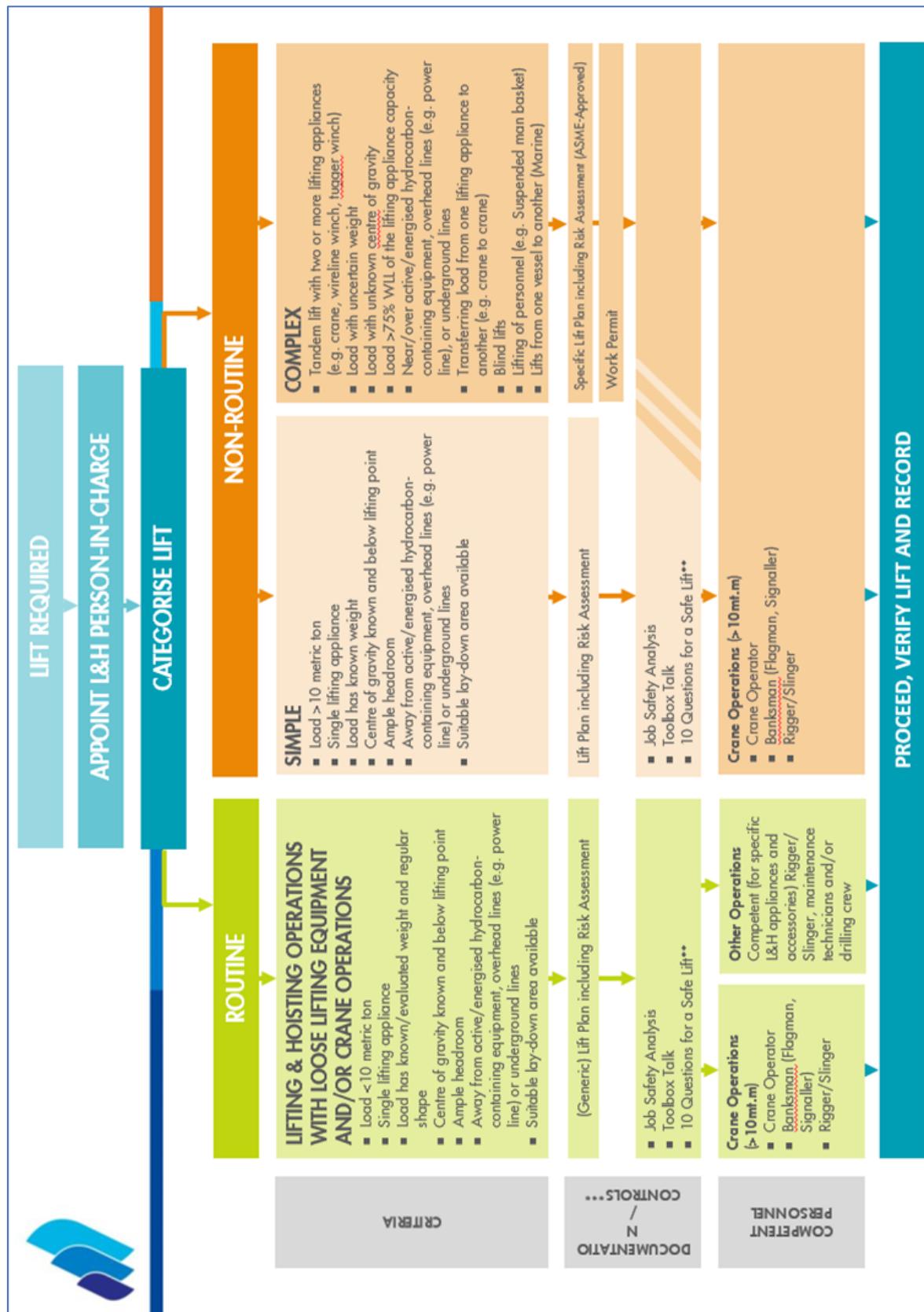
- All Lifting Accessories and Lifting Points on Lifted Equipment shall be colour coded and only such can be used for Lifting activities in BGC.
- Colour Coding shall be after Inspection by a Competent third-party Inspector

Key Risks to be reviewed as part of JHA Development

Availability of approved lifting points on load	Weight, size, shape and center of gravity of load
Cultural, communication and language difficulties	Method of slinging/attaching/detaching the load
Initial and final load positions and how it will get there	Ground and underground considerations
Lifting over live equipment	Suitability and condition of Lifting Equipment to be used
Access and emergency escape routes for e.g. Banksman, Slinger)	Number and duration of lift(s)
Pre-Use Inspection of equipment by Operator	Environmental conditions including weather and permissible limits
Working under suspended loads	Lighting in the pick-up and lay-down areas
Experience, competence and training of workers	Number of workers required for tasks
Proximity hazards, obstructions, path of load (e.g. potentially live electrical, hydraulic or pneumatic lines, underground conduits, bridges and overhead structures)	Conflicting tasks in area
Maximum allowable wind speed limit for BGC 9.8m/s, 7m/s for Man riding operation with Crane & Suspended Basket) or Crane manufacturer limits if lower than 9.8m/s (7m/s) respectively.	Visibility of the load at all times by either the lifting appliance operator or the person guiding the load (banksman). Communication with the operator must always be maintained via hand signals, radio or a relay signal banksman.



Appendix 3 Lift Categorisation





Appendix 4 '5 to Stay Alive Lifting & Hoisting'

LIFTING & HOISTING

5 TO STAY ALIVE

**Follow Lift Plan**

Develop and follow a lift plan approved by a competent lifting operations person. Review the ten questions for a safe lift.

Life-Saving Rule**Safe Mechanical Lifting**

Plan lifting operations and control the area

**2****Qualified and Competent**

Ensure that only competent operators and riggers use stationary or mobile hoisting equipment.

**Inspected and Color Coded**

Inspect ALL rigging accessories prior to each use and ensure colour coding or tagging from the inspection is current and visibly displayed.

Comply

with the standards

Intervene

when you see something wrong

Respect

your co-workers

**Who's in Control**

Agree who is controlling and signaling the lift. Use audible or visible warnings when "flying in loads" and stay out of the swing radius. Maintain eye contact.

**Good Set Up**

Ensure area around the crane is barricaded, outriggers are fully extended and tag lines are being used.





Appendix 5 'Training Matrix'

Role	Qualification/Competency/Skills
Crane Operator Overhead Cranes	<ul style="list-style-type: none">• Relevant experience of crane operation (at least three years experience and a minimum of 50 hours as a crane operator).• Ability to read and write evidenced by a certificate not lower than a post-primary certification but preferably a technical qualification from a technical college or Polytechnic.
Crane Operator Mobile Cranes	<ul style="list-style-type: none">• Practical knowledge of crane operations that shall be verified during pre –job interview and BGC Defensive Driving Training (DDT) for mobile crane drivers.• Be physically fit to operate a crane, demonstrable by a medical certificate of fitness.• Has passed an approved OPITO or industry equivalent BGC approved crane operator's training course / assessment (theoretical and practical), appropriate to the type and capacity of crane they will be required to operate and has a valid certificate of competence. The validity of the certificate of competence shall not exceed three years• Minimum age of 27 years and maximum of 60 years. Good eyesight and hearing ability, which shall be tested during the DDT course (for mobile crane drivers) is also part of the physical features that shall be possessed.• Has passed a rigging and slinging training course / assessment approved by the BGC Lifting and Hoisting SME.
Powered Industrial Truck (forklifts) Operator	<ul style="list-style-type: none">• Relevant experience as a forklift operator (at least two years' experience as a Forklift Operator).• Ability to read and write evidenced by a certificate not lower than a post-primary certification but preferably a technical qualification from a technical college or Polytechnic.• Practical knowledge of forklift operations that shall be verified during pre –job interview and BGC DDT course.• Be physically fit to drive a forklift truck, demonstrable by a medical certificate of fitness.• Has passed an approved OPITO or industry equivalent BGC approved forklift truck driver training course / assessment appropriate for the equipment to be used. The training must comprise practical instruction / examination.• Valid Competence certificate of expertise issued by a recognized training institution whose validity shall not exceed three years.• Minimum age of 27 years and maximum of 60 years. Good eyesight and hearing ability, which shall be tested during the DDT course is also part of the physical features that shall be possessed.
Banksman (Flagman, Signaler)	<ul style="list-style-type: none">• Relevant experience as a rigger (at least one years' experience as a Rigger).• Ability to read and write evidenced by a certificate not lower than a post-primary certification.
Slinger/Rigger (cranes)	<ul style="list-style-type: none">• Has successfully completed an approved OPITO or industry equivalent BGC approved training programme(s) appropriate to the lifting activities that they will undertake in each role. The training criteria should incorporate familiarization with rigging hardware, slings, communication (including hand signals and radio) and safety issues associated with rigging, slinging and lifting loads. It must also include the safe planning of lifting operations.• Be physically fit to undertake the duties (including vision/hearing/signaling) demonstrable by a valid Medical certificate of fitness.• Minimum age of 25 years and maximum of 60 years.• Banksman need to have a minimum of 2 years' experience as a rigger/slinger
Appointed Person/Person- in Charge (PIC) of the Lift	<ul style="list-style-type: none">• Relevant experience as a lifting operations supervisor (at least three years as a lifting operations supervisor) or over seven years' experience as a lifting focal point.• Be physically fit to undertake the duties (including vision/hearing/signaling) demonstrable by a valid Medical certificate of fitness



	<ul style="list-style-type: none">• Ability to read and write evidenced by a certificate not lower than a post-primary certification but preferably a technical/engineering qualification from a technical college or Polytechnic.• Practical knowledge of lifting operations that shall be verified during pre-job interviews result of which shall be made available to BGC. Holds an approved OPITO or industry equivalent BGC approved training certification as an appointed person including the creation of lift plans and risk assessments.• Valid Medical certificate of fitness.• Valid Competence certificate of expertise on the safe use of lifting equipment or its equivalent issued by a recognized training institution whose validity shall not exceed three years.• Minimum age of 27 years and maximum of 60 years.
Lifting Equipment Maintainer	<ul style="list-style-type: none">• Maintenance of Lifting Equipment shall be carried out by suitable qualified and competent personnel with adequate knowledge in the following areas:• Shall be a qualified Engineer by training and shall have preferably been trained by the lifting equipment OEM.• Awareness of the relevant standards and regulations and site-specific requirements and procedures.• Maintenance requirements on all types of Lifting Equipment to be maintained• Inspection frequency requirements.• Detailed inspection requirements for all Lifting Equipment.• Discard criteria and disposal processes for failed equipment.• Be physically fit to undertake the duties (including vision/hearing) demonstrable by a valid Medical certificate of fitness.
Lifting Inspector	<ul style="list-style-type: none">• Shall as a minimum be certified as a competent lifting equipment or lifting gear inspector by verification against industry standard, LEEA or equivalent BGC approved standards and certification.• Where Non-destructive examination is required, the inspector shall have the NDT certification appropriate for the type of test required.• Have a minimum of 5 years' experience in inspection of lifting equipment.• Be familiar with BGC Specification 'Design, Maintenance & Inspection of Lifting & Hoisting Equipment'• Shall be familiar with the relevant international standards applicable to the type of equipment to be inspected.• Be physically fit to undertake the lifting inspector duties



Appendix 6 'Lift Plan Form'

 شركة غاز البصرة Bashas Gas Company	Lifting Plan Details تفاصيل خطة الرفع						
	Lifting Plan Title	عنوان خطة الرفع	الموقع				
	Lifting Plan No.	رقم خطة الرفع	Generic / Specific				
	Date of Plan	تاريخ الرفع	Revision No.				
	PTW No.		Routine / Non-Routine Simple / Complex روتيني / غير روتيني - بسيط / معقد				
	Load Centre of Gravity	مركز جاذبية العمل	Max Weight of Load: أقصى وزن للحمل				
	Load Dimensions	ابعاد العمل	Load weight Assessed or Specific وزن العمل المقدّم أو المحدد				
	All support documents Attached		BGC inspection sticker number				
	Lifting over Live Plant/or spools	Last day on site					
Description of Lifting Operation وصف مختصر لعملية الرفع							
Certified Lifting Equipment to be Used (Configuration & Rated Capacity) معدات الرفع المصادر عليها (الترتيب) & تصنيف القراءة							
Ground conditions كرلين رقم 1		Crane mat size كرلين رقم 2					
Make & Model	الصنع & الموديل	Make & Model					
Outrigger Spread	انشار الركيزة	Outrigger Spread					
Crane Counterweights	قفل الكرلين	Crane Counterweights					
Weight of Hook Block	وزن الخطاف / بدلة رفع الأثقال	Weight of Hook Block					
Weight of Rigging	وزن التجهيزات	Weight of Rigging					
Net Weight	الوزن الصافي	Net Weight					
Gross Weight	الوزن الإجمالي	Gross Weight					
Working Radius	Working Radius	Working Radius					
Working Boom Length	Working Boom Length	Working Boom Length					
Maximum Radius	Maximum Radius	Maximum Radius					
Maximum Boom Length	Maximum Boom Length	Maximum Boom Length					
Capacity at working Radius	Capacity at working Radius	Capacity at working Radius					
Capacity at Maximum Radius	Capacity at Maximum Radius	Capacity at Maximum Radius					
% SWL at Working	% SWL at Working	% SWL at Working					
% SWL At Maximum	% SWL At Maximum	% SWL At Maximum					
Certified Lifting Accessories Marked With Current Colour Code ملحقات الرفع المصادر عليها مع رمز اللون الحالي							
Qty	Description	SWL or WLL	Weight	Qty	Description	SWL or WLL	Weight
Cross Reference Relevant Procedures and Documents: I.E. sketches, BGC lifting procedures, engineering calculations إملاء الأجراءات والوثائق ذات العلاقة على سجل المطالبات والمخططات وأجراءات الرفع في شركة غاز البصرة والصالات الهندسية الخ. etc.							
فحص الكرلين قبل استخدامه مصدق من قبل CRANE PRE-USE INSPECTION CERTIFIED BY BGC ALL EQUIPMENT WITH A CURRENT AND VALID 3rd PARTY CERTIFICATION CERTIFICATE / COMPETENCY OF OPERATOR GROUND CONDITION SURVEY REPORT LIFTING PTW CRANE SPECIFIC LOAD CHART							
جميع عمليات الرفع تحتاج إلى التي تعمل بها ولكن لا يقتصر هذا الأمر حصرياً							
Every Lift Every Time				Specify, Yes / No			



Appendix 7 ‘Rigging Plan Form’



Work Management Procedure

#22 Management of Change (MOC)

1 Overview and Hazards

- 1.1 This WMP describes the MOC process as applied in BGC Operating Asset. MOC is the process to manage risks introduced by changes. A change refers to a planned action or intervention that modifies the function of any item or process on a temporary or permanent basis. MOC processes for other activities (e.g. Projects, Document Management, Organisational Changes, etc.) will be controlled separately from this WMP.

The purpose of this WMP is to provide all BGC staff and contractor employees with information on how to mitigate risks that may result from a change and ensure:

- All risks introduced by changes are identified
- The required mitigations are defined and implemented
- The residual risk is assessed and accepted
- Secondary changes (such as Document updates, trainings, other changes required to systems as Corporate Maintenance Management System (CMMS) are identified and implemented

Every MOC should comply to the DEM2 and relevant industrial best practices. Before energizing and/or introducing hydrocarbons to any modification, the appropriate authorization should be given. Depending on the extend of the change this may be with “5 question before authorisation” or a **Prestart-up Safety Review/Statement of Fitness (PSSR/SoF)**. The boundaries between the P&E and asset MOC processes are shown in Figure 1 below:

Figure 1 MOC Process





1.2 Hazards of not correctly applying MOC

Inappropriate or ineffective MOC can lead to significant incidents, including;

1. Hydrocarbon releases;
2. Fires;
3. Explosions;
4. Electrocution;
5. Failure of safety-critical systems.

Lack of effective MoC has been a major contribution to escalation of incidents in the industry such as:

1. Bhopal (1984) – Operationally out of services (safety) systems;
2. Chernobyl (1986) – Unauthorized change of test run / operating procedures;
3. Piper alpha (1988) – Fireproof refugees impacted after changes;
4. Texas City (2005) - Overfill scenario and impact on isolations missed after change.

Relevant Life Saving Rules and Process Safety Fundamentals

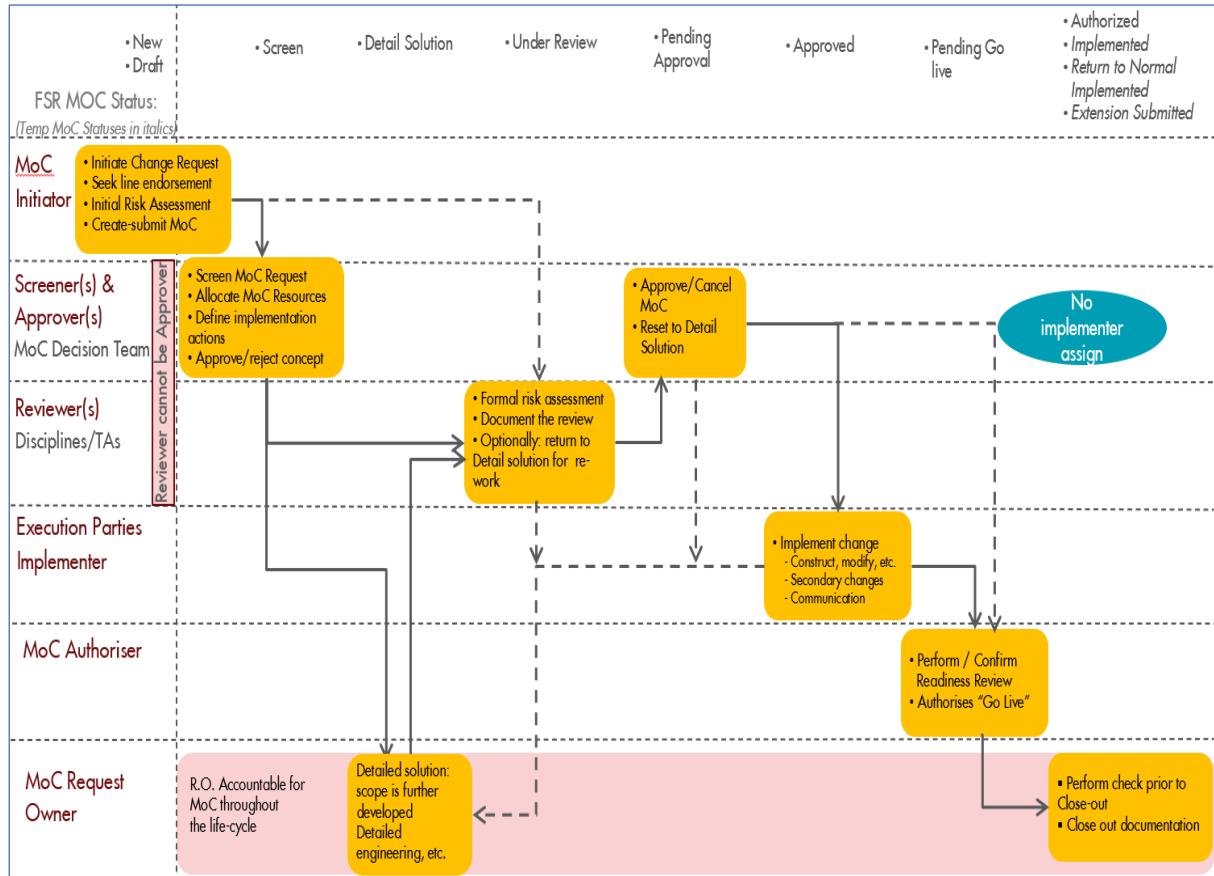
Work Authorisation  Work with a valid permit when required	MOC  Do not make a change without a proper MOC	Backflow protection  Perform MOC and install backflow protection when connecting utility to
--	--	---

2 MOC Overview (Roles and Process)

- 2.1 Follow WMP #13 Hazard Identification to recognize the Hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.
- 2.2 **DO NOT MAKE CHANGES WITHOUT APPROPRIATE AUTHORISATION AND BGC MOC TRAINING.**
- 2.3 BGC uses the Facility Status Reporting (FSR) electronic Management of Change (eMOC) system. The FSR system follows the process shown in Figure 2 below.



Figure 2 BGC MOC Process



2.4 A MOC can be raised for a permanent or a temporary change. Types of the change occurring at the worksite are:

- Process:
 - Hardware;
 - Process control;
 - Process condition.

2.5 MOC Roles

MOC Initiator	<ul style="list-style-type: none"> ● Understand why the MOC process is necessary and what changes must follow the MOC system and how to initiate an MOC Request. ● Responsible for collecting all information reasonable before submitting the MOC for screening. ● Shall populate the risk assessment with at least one other person from outside his/her team. Can get support from Technical Safety Engineer. ● Anyone with a GID account can identify an MOC.
Screener (MOC Coordinator executes on the decisions of the MOC screening panel)	<ul style="list-style-type: none"> ● Endorse the MOC Request and give conceptual approval for the implementation of a Change having considered the benefit / the risk of not doing the change against potential expenditures. ● Review the risk assessment, names the resources, determines readiness checks - 5 questions or Pre-Start Up Safety Review (PSSR) - and any required close-out review or look back. ● Identify an accountable MOC Request Owner for each MOC Request. ● Advance the MOC to the "Detail Solution" stage or directly to Under Review.



MOC Request Owner	<ul style="list-style-type: none">• Accountable for the MOC throughout the life cycle.• Expected to be the manager for the change. As such he is expected to understand the demand and opportunity of the change.• Responsible for identifying all secondary changes reasonable, and ensuring all secondary changes are completed before closure.
Technical Authorities (TAs) and Technical (Reviewers)	<ul style="list-style-type: none">• TAs in the relevant area as per BGC Discipline Authority Matrix (DAM).• Responsible for the technical verification to DEM2 compliance and acknowledgement of MOC request• Revalidation of risk assessment of the requested change based on discipline expertise; identification of any mitigation measures required• Identify which documents / drawings need to be updated and/or compiled• Identify Training and competence development required• A Reviewer cannot be an Approver on the same MOC
MOC Request Approver	<ul style="list-style-type: none">• Person who formally endorses MOC for implementation (typically Asset owner)• Review the comments of the Reviewers. Based on this he makes an informed decision on whether to approve or decline the change.• Appoint/agree with the appointed Authorizer to confirm if the change has been implemented as described.
MOC Implementer	<ul style="list-style-type: none">• Execute the change according to specification in the MOC that is approved. Once the change is executed, the implementer will prepare the handover to the authorizer for readiness check and commissioning, including PSSR/SoF when required as per OMP.• The implementer is an optional role.
MOC Authorizer	<ul style="list-style-type: none">• Authorize the change to 'go live' once the Readiness Review has been satisfactorily completed. This is the case for both a permanent change as well as temporary one going live or being implemented back in its normal state.• Agree with that the secondary changes are indeed secondary before change can be authorized for go-live.
MOC Coordinator	<ul style="list-style-type: none">• Company-wide coordination of the MOC process.• Maintain the Company MOC register of changes via FSR MOC tool.• Support others in identifying whether formal MOC is required for the change, which procedure is required to be followed and how to get started.• Understand the status of MOC's and expedite the MOC Process when MOC's are found to be 'stuck' and not progressing as expected.• Ensure good quality and auditable Close-out of MOC's.• Control the quality and consistency and completeness of the records in the MOC forms.• Establish and tracks MOC Key Performance Indicators (KPI).• Facilitate and keeps the Minutes of the weekly MOC Panel.• Coordinate submission of an MOC for review or enters the rejection reason in MOC form based on the decision made at the weekly MOC Panel.• Provide trainings and advice on MOC process application.

2.6 MOC Process

MOC Training

All staff involved in the MOC process (excluding procedural change) shall complete the following trainings:

- MOC Awareness Training (onboarding and refresher training) by BGC MOC Coordinator or Asset/Function MOC Focal Point;



- Management of Change Upstream Foundation (e-learning);
- Facilities Status Reporting (e-learning).

Identify	Minimal mandatory requirements for MOC initiation: <ul style="list-style-type: none">• Endorsement from relevant Plant Director must be received (KAZ, NRNGL, CS, UQ) for MOC to proceed for MOC panel screening.• Hazard Assessment Check sheet needs to be populated (Appendix 2) and attached to MOC files.
Screen	The MOC Coordinator shall facilitate the MOC Screening panel for level 1/2 MOCs. <ul style="list-style-type: none">• The screening panel shall consist of as a minimum the TA1 (discipline engineering manager), Technical safety Manager, Process engineering TA2, MOC Owners or respective delegates.• Depending on the risk introduced by the MOC, it will be screened-reviewed-approved by the authorities described in Table1.

Table 1 MOC Approval Authorities

MOC Level	Screen	Review	Approve
Level 1 MOC Red Risk	MOC Panel	TA-2	<ul style="list-style-type: none">• Asset Services Director• Plant Director
Level 2 MOC Yellow / blue	MOC Panel	TA-2	<ul style="list-style-type: none">• Plant Director
Level 3 MOC at least: <ul style="list-style-type: none">• Blue risk• Single discipline• Low impact/costs	MOC Coordinator	TA-3 or above	<ul style="list-style-type: none">• Plant Director
Recurring changes	Change specific	Change specific	<ul style="list-style-type: none">• Change specific

* Risk rating indicates risk introduced by change without taking credit for mitigations – See WMP #13 Hazard Identification

Screen	The MOC screening panel shall: <ul style="list-style-type: none">• Screen the MOC request and decide whether to allocate resources to proceed to the next phase. The screening will be based on justification and scope of the MOC request• Confirm the initial assessed risks. When needed appoint responsible individual or team to conduct risk analysis exercise (e.g. desktop safety review, mini-HAZOP, focused procedure review) as per hazard screening checklist.• Confirm or appoint MOC Owner responsible for implementing the change, Authorizer, Approver(s)• Indicate the required reviewers to review the MOC request and provide comments• Decide on the need for “Look Back” review
Detailed Solution	If an MOC is approved in principle but further engineering is required, it can be decided to support the MOC for Detailed Solution. Note this should only be done when this is an active working priority with commitments already made. Threats or opportunities should be kept in the asset repository until actual resources are dedicated to it and startup is within 1 year.
Under Review	After the MOC is supported for review by the Screening Panel the relevant Technical Authorities shall review the proposed change: <ul style="list-style-type: none">• To ensure DEM2 and industrial best practices compliance requirements• Assess all associated risks both in the current status and after introduction of the change from technical perspective.• Make required updates/changes to the MOC risk assessment.



	<ul style="list-style-type: none">Identify any required mitigation actions, action parties and target dates, capture those in the electronic MOC.Determine which documents and drawings to be updated to reflect the change, capture in the electronic MOC. This includes both development of red/blue marked up (Red/Blue Mark Up) drawings and documents and update of original as-built drawings.Determine communications, competences development and training required prior to implementation and what parts of the organization are to be targeted, capture in the electronic MOC.
Approve	When all identified pre-implementation action are closed and MOC is reviewed/acknowledged by TA's the MOC can be endorsed for implementation. Based on benefits vs risk, the MOC Approver either "Approves" or cancels the MOC Request. A further review can also be requested. The approver agrees with the relevant authorizer who will check whether the change has been executed as described.
Implement	<p>The appointed MOC Implementer is responsible for implementation. He/she shall:</p> <ul style="list-style-type: none">Ensure that the change has been completed as specified in the MOC request and in accordance with design details.Ensure that all recommendations from the risk analysis necessary for start-up been completed.Organize Readiness Review. <p>Field changes shall be performed in a controlled manner and with written approval of the relevant Technical Authorities. Open actions will be added as implementation actions not required for go-live.</p>
Readiness Review & handover	<p>The MOC Authoriser will verify, via a Readiness Review, that implementation is sufficiently complete and all hazards are sufficiently mitigated to allow the change to 'go-live'. Before a MOC can go live, all outstanding Mitigations and Implementation Actions 'Req for Go Live' must be completed.</p> <ul style="list-style-type: none">The authorizer confirms the MOC has been executed as described in the MOC or variations are done in a controlled way.The authorizer confirms the readiness review has been successful and that energy (in the form of pressure/flow/temperature/electricity) and/or hydrocarbons can be introduced. To do this he/she should be able to answer at least the following five questions or follow PSSR/Statement of Fitness (SOF) depending on the extent of the change as defined in OMP. <p class="list-item-l1">1. Was the change implemented in the field in accordance with all design details?</p> <p class="list-item-l1">2. Are all affected procedures updated and in place?</p> <p class="list-item-l1">3. Have all affected employees been notified and trained, including training on what they must do differently?</p> <p class="list-item-l1">4. Have all recommendations from the risk analysis, necessary for startup (where applicable), been completed?</p> <p class="list-item-l1">5. Has the documentation (including redlined drawings) required by the recipient of the change been updated and made available to the user?</p> <p>The MOC Authoriser can assign Implementation actions or attach any supporting document to MOC if required.</p> <p>Note: For Permanent MOCs the status will change to Authorised. For Temporary MOC the status will change to Implemented.</p>
Close out	Once MOC owner verify that implementation actions are sufficiently completed including secondary changes (i.e. P&ID, Cause and Effect diagrams, procedures and etc.) the MOC can



	be closed. In the case of a temporary change the pre-change situation must be re-instated or a permanent change carried out before the temporary change can be closed out.
Look back	When thought necessary, the MOC panel can select MOCs for a retrospective review (post implementation review) to verify whether the change delivered what was intended. This is likely to only apply to large scale changes. Learnings captured from this review will be used as input for the overall performance review of the MOC system.

2.7 Additional Types of MOCs

Temporary Changes

- Changes which will eventually be removed, are called temporary changes. Temporary changes will follow the same process as permanent changes. They have a planned removal date and require a new review and approval if installation exceeds the planned removal date.
- In case a temporary MOC is requested, the requestor should indicate how the temporary nature of the change can be eliminated with a normalization plan. The normalization plan is one of the two following:
 - Return to normal;
 - Extend as permanent with additional requirements.
- The MOC should confirm if there are any operating limitations or not. Mitigations to a temporary situation may include an operating instruction, additional inspection intervals and others.
- Temporary changes are not expected to be valid for more than 12 months. Temporary changes may be extended once by the same reviewers and approver(s). Second and following extensions require approval from the Asset Services Director.
- Temporary MOC request Owners shall be tracking their requests, and if there is a requirement to extend an MOC, they shall do it timely at least two weeks before the original expiry date. An overdue MOC is a Process Safety Fundamental (PSF) violation.
- A MOC may be required for Overrides, for details please refer to WMP #28 Safety System Isolation and Override Control.
- Temporary changes include:
 - Temporary equipment;
 - Occupied temporary portable facilities. PSBR1 assessment by Technical Safety Engineering (TSE) TA shall be completed as part of MOC supporting documents;
 - Temporary repairs.
- Overrides, if duration is more than 12 months. Refer to WMP #28 Safety System Isolation and Override Control.



Emergency Change (exceptional circumstances only)

- In the circumstance where the time constraint is such that the MOC process cannot be followed in full as there is an immediate danger to life or health or a condition that may result in severe impact to the environment or imminent equipment damage an emergency change may be requested.
- Emergency change must be approved by the Asset Services Director or on-call delegate. Approval will only be granted once a hazard analyses and risk assessment has been carried out.
- The Approver will determine the timeline for the emergency change without formal MOC approval. In case the emergency change exceeds 24 hours a formal extension will need to be requested. The extension may be granted by the Asset Services Director. An emergency change may be extended max. two times.
- A formal MOC must be initiated once the organization has retained control of the situation.



MOC Assurance

- It is BGC's target to make sure that at least 10% of MOCs are quality checked during the calendar year. This shall be executed by MOC coordinator in conjunction with the site operations representatives.
- The intent of these checks is to ensure that MOCs comply with the requirements of this procedure and are also efficient in achieving the intent of the change proposal itself.
- Any weaknesses or good practices identified through these regular checks should be communicated to the MOC Process Owner for further action.

Recurring changes

A recurring change refers to specific changes with tightly defined scope. These may be temporary or permanent. Examples can be temporary instrument air compressor, additional coolers in hot weather periods. For these changes, the MOC process should be completed once. The second time a MOC shall be raised including a well-defined procedure to be used at that specific asset. A recurring change gives opportunity to delegate to a lower level of authority for efficiency purposes.

4 References and Resources

Relevant WMPs

- #13 Hazard Identification
- #25 Permit to Work
- #28 Safety System Isolation and Override Control

BGC ToolBox Talks, Communication Materials, Posters and Information

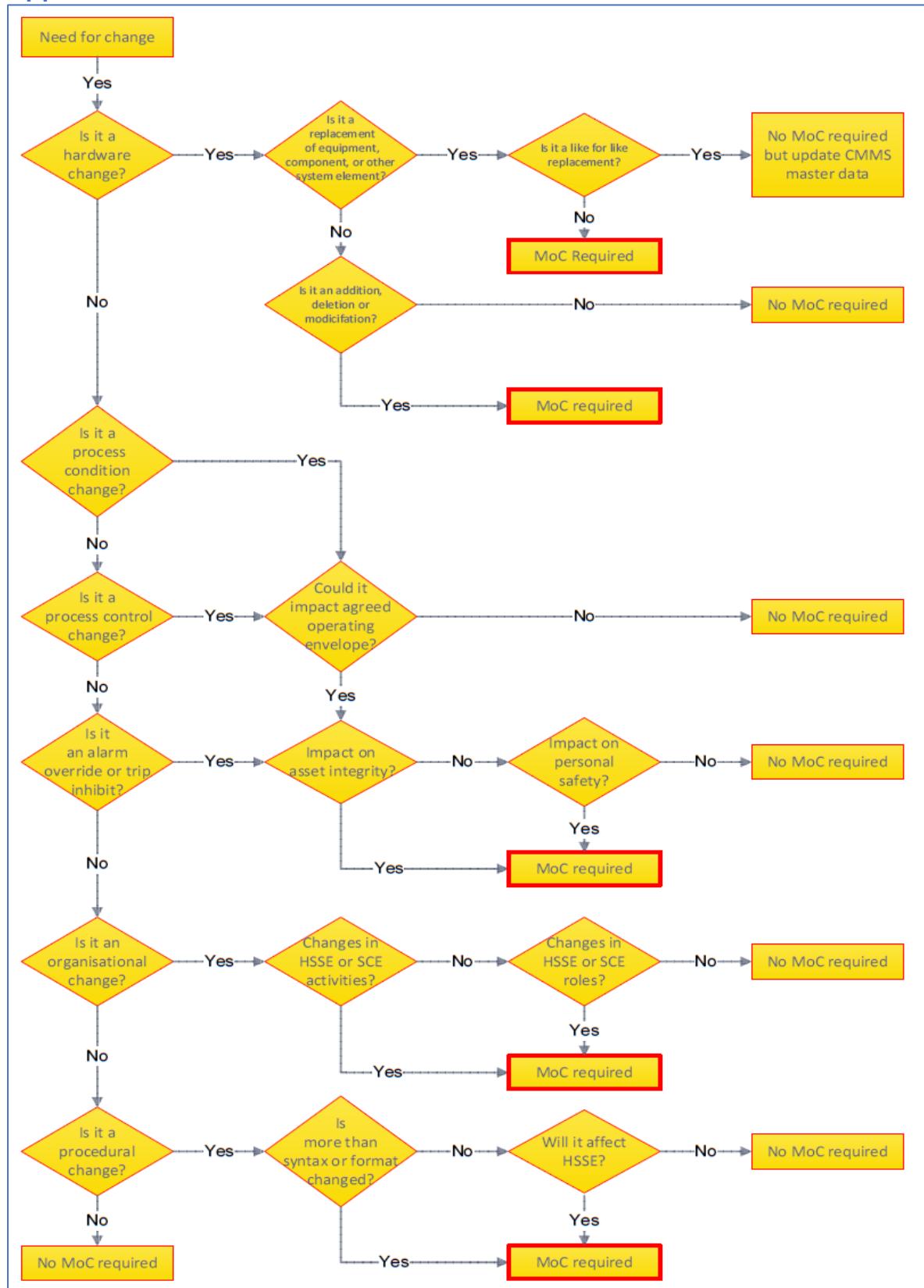
- MOC Process Chart (Appendix 1)
- Hazard Screening Checklist (Appendix 2)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	Asset Services Director	31-03-2022	Retained on sign-off form
Custodian	BGC MOC Coordinator	31-03-2022	Retained on sign-off form



Appendix 1 MOC Process Chart





Appendix 2 – Hazard Screening Checklist 1/3

Source: e-MOC in Facility Status Report (FSR)

Management of Change Request Initiation Check Sheet (Please fill in and attach to MOC in FSR system)



Description وصف	
Initiator's name اسم المبادر	
MOC number and title MOC رقم و عنوان الـMOC	
Screening check list قائمه اختبار الشخص	
Have you discussed the change proposal with relevant production asset director and deputy director and/or asset MOC focal point? Have they supported the MOC to proceed for MOC panel screening? هل ناقشت اقتراح التغيير مع مدير أصول الإنتاج ونائب المدير أو جهة الاتصال المعنية بالأصول ؟ هل أيدوا التغيير للشروع في فحص لوحه التغيير ؟	
Is this MOC linked to any other MOC or activity? هل ترتبط هذا التغيير بأي نشاط آخر ؟	
Is this MOC linked to a SpheraCloud entry? هل هذا التغيير مرتبطة بدخل الحادث ؟	
Is detail design / engineering required? (If YES - who can produce?) هل تفاصيل التصميم / الهندسة مطلوبة ؟ (إذا كان نعم من يمكن أن ينتج ؟)	
Choose key disciplines involved into MOC scope اختبار الأختصاصات الرئيسية المشاركة في نطاق التغيير	<input type="checkbox"/> Electrical <input type="checkbox"/> Emergency Response <input type="checkbox"/> Process <input type="checkbox"/> HSE <input type="checkbox"/> Mechanical Static <input type="checkbox"/> Security <input type="checkbox"/> Mechanical Rotating <input type="checkbox"/> Infrastructure <input type="checkbox"/> Pipeline <input type="checkbox"/> Utilities <input type="checkbox"/> Instrumentation <input type="checkbox"/> Civil, Structural <input type="checkbox"/> Control and Automation <input type="checkbox"/> Materials & Corrosion <input type="checkbox"/> Other (specify below):



Appendix 2 – Hazard Screening Checklist 2/3

قائمة التحقق من التغيير		
Implementation check list		
Materials, equipment requirements and availability المواد والاحتياجات من المعدات ومتوفراها		
Implementation resources الجهات المطلوبة		
Production shutdown / Gain إيقاف الإنتاج/الإرباح		
Cost estimation تقدير الكلفة		
Budget availability موافق الميزانية		
Budget owner مالك الميزانية		
Hazard مخاطر		
<i>Instructions: Complete the questions below. If you answer yes to any of the questions this change is considered high risk and a risk analysis shall be performed (as a minimum Desktop Safety Review). In considering each of the questions, the impact on HSE, product quality and reliability (i.e. equipment failure, process upsets, fouling) is considered.</i>		
<i>Questions 12 and 13 address product quality and reliability in a more general way.</i>		
تحذيرات اكتمل الاستله انتقام إذا اجابت بنعم على اي من الاستله يغير هذا التغيير على المخاطر و يجب اجراء تحليل المخاطر / كحد ادنى لمراجعة الصحة والسلامة . عند النظر في كل من الاستله ، يتم النظر في التأثير على الصحة والسلامة ، وتوزيعه المتمنيات والمتوافقه / اي امثل المعدات ، واضطرابات العملية ، والقتورات في الاستله 12 و 13 عنوان جودة المنتج والمتوافقه بطريقة اكثر عمومية .		
Question سؤال	Select answer اختر الاجابة	Comment تعليق
1. Does this change add the potential to increase, decrease, stop or reverse the flow in any system? هل يضيف هذا التغيير امكانية زيادة او انقصان او ايقاف او عكس التدفق في اي نظام ؟	Yes	
2. Can this change increase or lower the operating pressure, or change the maximum allowable pressure in any equipment or system? هل يمكن ان يزيد هذا التغيير او يخفض ضغط التشغيل ، او يغير الحد الأقصى للضغط المسموح به في اي معدات او نظام ؟		
3. Can this change increase or decrease the temperature of the process or equipment in the system? هل يمكن لهذا التغيير ان يزيد او يخفض درجة حرارة العملية او المعدات في النظام ؟		
4. Can this change create flammability, reactive or chemical instability issue? هل يمكن لهذا التغيير ان يخلق مشكلة قابلة للاشتعال او عدو الاستقرار الكيميائي ؟		
5. Can this change have an effect upon the composition of any stream in the system? هل يمكن لهذا التغيير ان يكون له تأثير على تكوين اي تدفق في النظام ؟	٢	
6. Can this change increase the corrosion or erosion rates anywhere in the system? هل يمكن لهذا التغيير ان يزيد من معدلات الدقل او التآكل في اي مكان في النظام ؟	Yes	



Appendix 2 – Hazard Screening Checklist 3/3

7. Can this change increase potential leak rates of hydrocarbons or chemicals to the atmosphere? هل يمكن لهذا التغيير ان يزيد من معدلات تسرب الهيدروكربونات أو المواد الكيميائية المحتملة إلى الغلاف الجوي؟		
8. Does this change impact any start-up, shutdown, emergency or decontamination activities in the unit? هل يؤثر هذا التغيير على أنشطة البدء أو توقف أو الطوارئ أو إزالة التلوث في الوحدة؟		
9. Could this change the way the operator interfaces with equipment or controls when reacting to process or system upsets? هل يمكن لهذا تغيير طريقة واجبات المشغل مع المعدات أو عناصر التحكم عند الاستجابة لعملية أو اضطرابات النظام؟		
10. Could this change have any effect on the existing pressure relieving capacity of the unit or its other protective or shutdown systems? هل يمكن لهذا التغيير ان يكون له اي تأثير على قدره تخفيف الضغط الحالية للوحدة أو أنظمة الحماية أو توقف النظام؟		
11. Does this change remove or modify or add new safeguards to the process or system? هل يؤدي هذا التغيير إلى إزالة أو تعديل أو إضافة ضمانات جديدة إلى العملية أو النظام؟		
12. Can this change adversely affect Reliability in any other way not covered in the first 11 questions? هل يمكن لهذا التغيير ان يؤثر سلبا على الاعتمادية بأي طريقة أخرى غير مشمولة في الأسئلة الـ 11 الأولى؟		
13. Can this change adversely affect Product Quality in any other way not covered in the first 11 questions? هل يمكن لهذا التغيير ان يؤثر سلبا على جودة المنتج بأي طريقة أخرى غير مشمولة في الأسئلة الـ 11 الأولى؟		
14. Can this change adversely affect Health in any other way not covered in the first 11 questions? هل يمكن لهذا التغيير ان يؤثر سلبا على الصحة بأي طريقة أخرى غير مشمولة في الأسئلة الـ 11 الأولى؟		
15. Are there any civil/structural support concerns on new or existing equipment? هل هناك اي شواغل تتعلق بالدعم المدني/الهيكلية بشأن المعدات الجديدة أو القائمة؟		
16. Does this change impact Environment, e.g. GHG emission; introduce new chemical to site; or utilise flammable material and/or Explosive Precursor at new location? هل يؤثر هذا التغيير على البيئة ، مثل انبعاثات غازات الدفيئة ؛ إدخال مادة كيميائية جديدة إلى الموقع ؛ أو الاستفادة من المواد القابلة للاشتعال وأو المكونات المتفجرة في موقع جديد ؟		
17. Can this change introduce additional noise source(s) or impact the existing noise levels? هل يمكن لهذا التغيير إدخال مصدر ضوضاء إضافي أو التأثير على مستويات الضجيج الموجودة؟		



Work Management Procedure

#23 Manual Handling

1. Overview and Hazards

- 1.1 Manual handling includes lifting, lowering, pushing and pulling by human effort. All BGC staff and contractors shall follow proper handling techniques to avoid back and hand injuries. Back injuries can be prevented by correct manual lifting techniques.
- 1.2 **Hazards include:**
- Strained muscles and torn ligaments can occur while attempting to lift, pull or push a load beyond your physical capabilities;
 - Hernia and slipped discs can occur by attempting to lift a load exceeding your own physical capabilities or by falling or slipping during the lifting or carrying operation.

2. Plan the Work

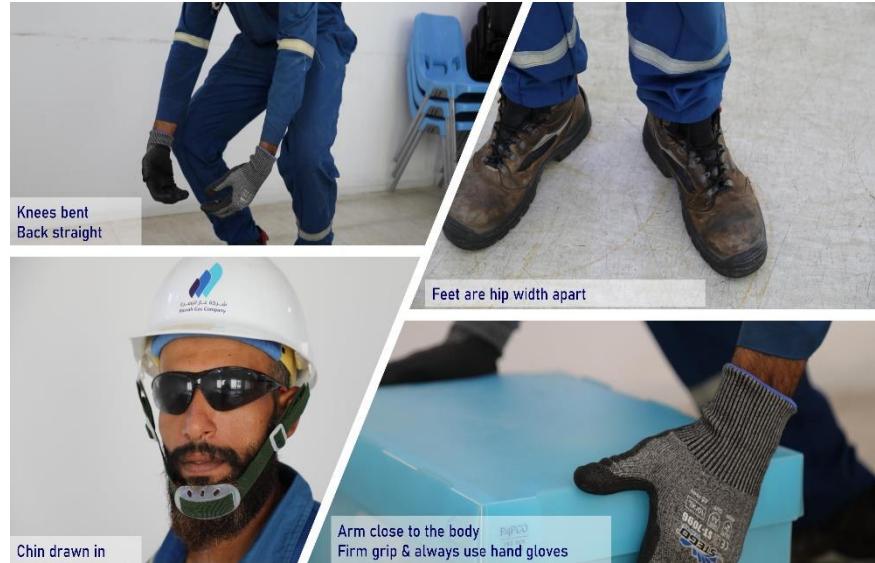
- 2.1 Follow the Hierarchy of Controls for manual handling:
- Eliminate:** Can we redesign the task or activity so that items don't need to be moved or handled?
- Substitute:** Can we use different materials that are lighter and easier to handle? Can we split the load into smaller, easier managed items?
- Engineer:** Can we use mechanical aids or lifting devices to handle the load?
E.g. trolley or lifting jib, cart, strops (ropes) and ergonomics.
- Communication:** Supervision, within a work crew, verification of fitness to work.
Avoid manual handling when there are other methods available.
- 2.2 Where manual handling is still required, team leaders shall ensure, where reasonably practicable, appropriate equipment for lifting, lowering, pushing, pulling, carrying, handling or transporting heavy or awkward loads is provided to team members.
- 2.3 Before any manual Handling of a load that could injure a person, he/she shall perform a hazard assessment that considers the:
- Weight and size of the load;
 - Shape of the load;
 - Type of grips on the load (coupling);
 - Number of times the load shall be moved;
 - Route that shall be taken to move the load;
 - Physical strength and capacity of the individual, including any physical limitations or medical conditions.
- 2.4 Do not manually lift a weight that is more than 20kg, female limit 16kg.
The maximum weight limit shall be adjusted depending on how the load is being lifted, how close to the body it is held, work crew size, and how high or how low the weights are to be lifted.



3 Do The Work

3.1

- Best practices for body positioning for manual handling are as follows;
- Feet: close to the load, slightly apart, lead foot slightly forward;
- Feet: in line with the hips to keep good balance;
- Knees: bend ready to lift by straightening but do not squat;
- Back: straight and rigid at all times. Shall not be more than 15 degrees from the vertical;
- Buttocks: push your buttocks as far back as possible. This helps your position;
- Arms: keep the load close to your body. Do not reach out with fully extended arms. Keeping the load close reduces strain and tiredness;
- Correct Grip: firmly with palms and fingers. Balance by moving your back leg as you lift the load. Use handles when available;
- Hands: always use the BGC default gloves, see WMP #26 PPE;
- Head and Chin: head raised; chin tucked in.



3.2

Supervisors shall ensure team members involved in manual handling understand the risks involved and are able to demonstrate the correct manual lifting techniques.

3.3

Do not start to manually lift a load before:

- The area is free from obstructions;
- You have done a quick weight test;
- You have found the load's center of gravity.

If the object to be handled is too heavy or awkward, get help. The manual lifting method for two or more people is the same as for one person.

Consider similar height during manual lifting where two or more people are involved in carrying the heavy object.

If the load is too heavy or difficult to lift manually, team members shall report to the team leader who shall provide appropriate equipment.

3.4

Injury Prevention Controls

- Reduce distances to the loads to be handled;
- Provide the proper manual handling devices such as carts and dollies;
- Arrange to have smaller, lighter, and easier to handle load sizes;
- Suspend heavy tools from balancers to reduce the force required to hold the tool;
- Avoid standing with a heavy load; if you stop, set it down by reversing the manual lifting techniques;



- Do not carry a load which obstructs your view and always ensure that your line of travel is clear from obstructions;
- Never attempt to change your grip while carrying a load. If a change is necessary, set the load down on a firm support, change your grip and lift the load up again;
- Always consider the physical limitations of the individual, including age, gender, medical conditions, physical fitness.



4 References and Resources

Relevant WMPs

- #13 Hazard Identification
- #25 Permit to Work

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC Operations HSE Manager	31-03-2022	Retained on sign-off form



Work Management Procedure

#24 Mobile Machinery

1. Overview and Hazards

- 1.1 The purpose of this procedure is to ensure safe and controlled use of mobile machinery. This procedure covers the use of mobile machinery (medium and heavy machinery), including forklifts, cranes, excavators, and trucks fitted with hoists. Driving cars, buses, trucks, prime movers and trailers are covered in WMP #4 Driving Safety & Journey Management (JM).
- 1.2 **Hazards include:**
- Injury incidents involving heavy equipment on construction and/ or operational sites have a higher probability of resulting in a fatality than many other types of incidents.



Relevant Life Saving Rules and Process Safety Fundamentals

Driving  Follow safe driving rules	Line of Fire  Keep yourself and others out of the line of fire	Safe Mechanical Lifting  Plan lifting operations and control the area	Work Authorisation  Work with a valid permit when required
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2. Plan the Work

- 2.1 Follow WMP #13 Hazard Identification to identify the Hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.
- 2.2 Maintenance and usage records shall be up to date. Mobile machinery shall be operated and maintained according to **Original Equipment Manufacturer (OEM)** procedures and guidelines. Confirm what equipment certifications and specifications are needed and who will check them before the work.
- 2.3 Team Leaders shall verify all heavy machinery operators are trained and certified for the specific machinery. Records of certification shall be readily available for reference purposes.
- 2.4 Confirm what approvals, documentation, **Permit-to-Work (PTW)**, **Job Hazard Analysis (JHA)**, **ToolBox Talk (TBT)**, etc, is needed and who will check it is done before the work starts.
- 2.5 Follow WMP #25 Permit to Work.





- 2.6 Confirm supervision arrangements including any necessary support, including HSE Advisors, emergency response, gas testing, etc.
- 2.7 Team Leaders and Operators shall ensure mobile machinery is in safe working condition through a pre-start inspection before each usage. Each BGC pre-start inspection checklist shall be specific to each equipment type and in alignment with OEM recommendations. The inspection checklist shall be filled out and signed (by the Operator) on a daily basis. Any defects observed on the equipment shall be recorded on the checklist and reported to the Supervisor.
- 2.8 No maintenance on mobile machinery is to be undertaken within a BGC containing facility without a valid PTW being issued.
- 2.9 Mobile vehicles are required to be fitted with **In-Vehicle Monitoring System (IVMS)** devices if they are registered and roadworthy.
- 2.10 Follow prescribed journey management plan where required, see WMP #4 Driving Safety & JM.



3 Do The Work

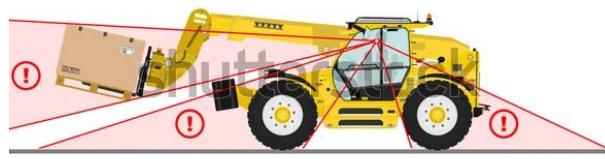
3.1 General Requirements for all Mobile Machinery

Operators who feel unwell or are under the influence of medication shall not operate mobile machinery and shall inform their respective Team Leader or Supervisor of their health condition.

- 3.2 Do not smoke outside designated areas when driving or working in hazardous areas.
- 3.3 Fire extinguisher shall be available on the mobile machinery and shall be checked to be within the validity date.
- 3.4 All mobile machinery shall be fitted with seatbelts
- 3.5 All mobile machinery shall have a flashing visible light fitted and operating when the machine is switched on.
- 3.6 All mobile machinery shall have a reversing alarm fitted.
- 3.7 A site-specific key control and issue system must be put in place.
- 3.8 All mobile machinery shall not to be used until it has passed inspection by the relevant Technical Authority.
- 3.9 Operators shall verify prior to starting work that the equipment is in safe working condition. Do not use mobile machinery if it does not seem to be in a safe condition.
- 3.10 Road worthiness of all mobile machinery shall be assessed by BGC Logistics. Lifting & Hoisting aspects of mobile machinery shall be assessed by L&H Subject Matter Expert (SME).
- 3.11 Vehicle operators are responsible for the safety of their loads and surrounding activities.
- 3.12 Team members shall report to the Team Leader when a load is beyond the capacity of **Safe Working Load (SWL)** of the mobile machinery lifting equipment, see WMP #21 Lifting & Hoisting.
- 3.13 Before usage of mobile machinery in hydrocarbon areas, a valid work permit shall be obtained for the job and all requirements in the permit shall be implemented correctly.
- 3.14 Ignition key shall never be left unattended in the mobile machine



3.15 Before moving and at a blind-spot areas, operator shall honk to alert all staff in the proximity.



BLIND SPOT RISK



Blind Spot Awareness

3.16 Forklifts

- Comply with WMP #21 Lifting & Hoisting when operating a forklift.
- Check the forklift with the pre-use checklist in Appendix 1.
- When driving, give way to pedestrians. Be aware of surroundings when reversing.
- Observe speed limits and ensure the forklift can make a safe stop at any time.
- Avoid harsh accelerating, harsh braking or harsh turning.
- Use a Flagman to guide where visibility is blocked. Watch out for overhead obstructions.
- Ensure that loads are within the rated load capacity of the forklift.
- Movement with loads in excessively raised positions should not be carried out to avoid the danger of toppling, especially on uneven surfaces and while cornering.
- Forklifts should only be used for loads, which can be carried safely on the forks or attachments fitted. Non-standard, unpackaged and excessively wide loads should be avoided wherever possible. Long tubes should be carried using appropriate attachments.
- They are not to be operated on excessive gradients or across gradients.
- In general, they should be driven forwards up a slope, backwards down a slope and in line with the incline. It may be necessary to raise the forks slightly at the bottom of a slope to avoid grounding.
- Operate the forklift with the load placed fully against the load back rest.
- Forklift shall not be used to raise a person. Don't transport a person not in a suitable seat with seatbelt.
- Never park or leave the forklift in any doorway, entrance, emergency exit or in front of fire extinguishing equipment. When parked, fork arms shall be tilted forward and lowered to the ground.

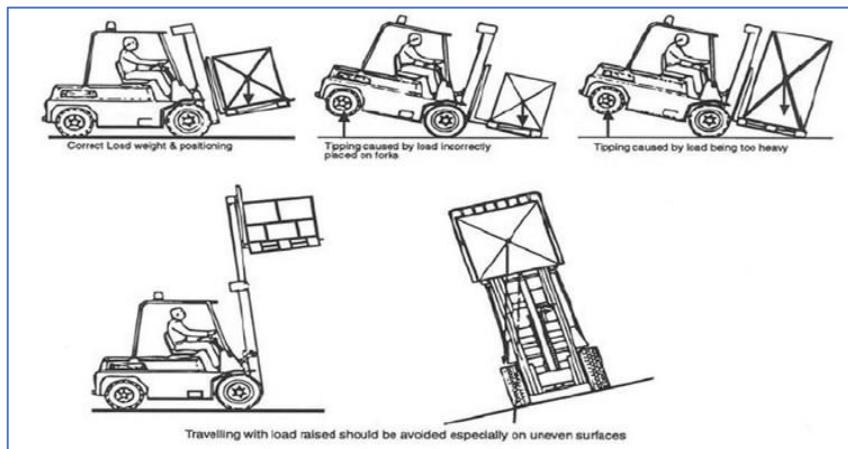


3.17 Additional Requirements for Rough Terrain Forklift Trucks

- Care should always be taken to ensure that traction is retained.
- Loss of traction due to the nature of the terrain or weight transfer taking load off the driving wheels is to be avoided.
- Care should be taken, and speeds minimized to reduce the risk of load toppling caused by the imbalance induced when operating on rough terrain



- Operators should ensure that the parking brake can hold the FLT stationary on an incline.
- Checks for overhead obstructions should be made before lifting and transporting loads
- Special care should be taken near power lines and other materials handling vehicles such as mobile cranes.
- Driving rough terrain FLTs on public roads should be kept to a minimum.
- When public road travel is necessary, fork arms should be removed, folded or protected in some way so that they do not present a hazard to other road users.
- Where this is not possible, forks should be painted or otherwise made highly visible
- Rough terrain FLT Operators should wear seat belts while operating their vehicles.



3.18 Cranes

- Comply with WMP#21 Lifting and Hoisting when operating a crane.
- Observe speed limits and ensure the crane can make a safe stop at any time.
- Ensure safety signages are visible.
- Operation of any crane within 6 meters of overhead electrical cables is strictly prohibited. Other physical overhead obstructions shall be avoided.
- Cranes not in use shall be parked in a designated area. Crane's boom shall be lowered, and sling shall be secured properly.

3.19 Excavators

- Observe speed limits and ensure the machine can make a safe stop at any time.
- Be aware of surroundings when reversing and when machine is in motion.
- Ensure all control levers are in neutral or off position before starting.
- Use steps and handholds correctly. Face the equipment and maintain 3-point contact when getting on and off.
- Do not allow anyone to get under or near the boom and stick when it is raised/in operation.
- Know the location of the bucket before moving the equipment.
- Ensure adequate clearance when making turns or going through narrow passages.
- Follow requirements of WMP #7 Excavations.



4 References and Resources

Relevant WMPs

- #4 Driving Safety & Journey Management
- #5 Emergency Response
- #7 Excavation
- #13 Hazard Identification
- #21 Lifting & Hoisting
- #25 Permit to Work
- #31 Personal Protective Equipment
- #32 Safety Signs & Barricades

BGC Checklists and Construction Site Safety Standards (CSSS) Forms

- Forklift Operator Pre-Use Checks (Appendix 1)
- CSSS Mobile Machinery (Appendix 2)

BGC ToolBox Talks, Communication Materials, Posters and Information

- '5 To Stay Alive Heavy Mobile Equipment' (Appendix 3)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC Material & Transport Director	31-03-2022	Retained on sign-off form
Custodian	BGC Logistics Manager	31-03-2022	Retained on sign-off form



Appendix 1 Forklift Operator Pre-Use Checks

Visual Checks – Vehicle Serial/Identification Number:		Ok	No
01	General: Good condition with no damage, excessive dirt or rust. Any defects previously noted repaired.		
02	Forks: Correctly positioned, not damaged, cracked, bent or worn. Anchor pins secure and not worn, loose or bent.		
03	Carriage Plate: No damage or distortion, sitting square to the mast and lubricated. End stop bolts engaged and secure.		
04	Mast: No damage, distortion or cracks. No undue wear, scoring, dirt or foreign bodies in channels. End stops secure. Rollers, no uneven wear or incorrect tracking. Slides intact and secure		
05	Back Rest Extension / Load Guard: In good condition, secure with no distortion or cracks.		
06	Lift Chains: Not damaged worn or stretched, no broken links or rust. All pins in place.		
07	Tyres: No damage, excessive dirt or wear, rust, cracks, splits or separation of tyres and rims. Pneumatic tyres correct air pressure.		
08	Wheels: Undamaged and free from obstruction and debris. All nuts secure and in place		
09	Overhead Guard / Roll Over Protection Frame: Secure, undamaged with no loose items.		
10	Energy Source: <ul style="list-style-type: none">• Gas or Diesel: Engine oil, fuel and radiator water level correct. Gas bottle secured, no rust, corrosion or damaged pipes, hoses or seals.• Electric: Electrolyte level, battery plug, and connections correct. Power cable intact, connected and secure. No exposed wires, battery brackets secure and battery adequately charged.		
11	Hydraulics: No damage or fluid leaks, no splits in hoses, no leaks around fittings.		
12	Identification / Rating Plate: Intact, clean and legible.		
13	Operator's Compartment: Clean with no loose items.		
14	Access: Steps and grab handles in good condition and clean.		
15	Lights, Windscreen and Mirrors (if fitted): Clean and undamaged.		
16	Fire Extinguisher (if fitted): Secure and charged.		
Operational Checks		Ok	No
17	Seat: Good condition, secure and adjusted correctly.		
18	Safety Belt: Accessible, in good condition and working correctly.		
19	Ignition & Electrical System: Working correctly. All gauges and instruments visible and working.		
20	Reversing Alarm and Horn: Working correctly and audible.		
21	Warning Lights & Lights (if fitted): Working correctly.		
22	Hydraulic Controls: Working smoothly and correctly.		
23	Brakes (Foot & Parking): Working correctly.		
24	Clutch & Gearshift: Working smoothly and correctly.		
25	Steering: Working correctly with no excessive play.		
26	Exhaust: No excessive smoke, sparks or flames.		

Defect Details:

Operator's Signature:

Date:

Manager's / Supervisor's Signature:

Date:



Appendix 2 CSSS Mobile Machinery

NOTE: Although the Construction Site Safety Standard (CSSS) materials are used by BGC Projects Department, they can also be utilized by other departments as appropriate.

Nr	Standardization Requirement	Yes	No	Actions required/Date/ Action Party
1	Is interaction between vehicles/plant and pedestrians adequately controlled - segregated walkways, adequate crossing points?			
2	Does equipment have relevant 3 rd Party Certification (if required) ?			
3	Are vehicles adequately maintained - daily & quarterly periodical checks conducted by competent person?			
4	Are operators competent to use plant/equipment - relevant training/certification in place?			
5	Are loads correctly secured and weights do not exceed carriage capacity?			
6	Are vehicle movements adequately controlled by Flagmen/Banksmen?			
7	Are Flagmen/Banksmen easily identifiable - Hi Viz Vest?			
8	Is reversing of plant and vehicles on site kept to a minimum?			
9	Are vehicles/plant fitted with audible reversing alarms?			
10	Are vehicles/plant kept a safe distance from excavations, steep slopes unless suitable hard barriers/vehicle stops are in place?			
11	Are vehicles/plant parked on flat ground and chocks use where there is a potential for movement?			



Appendix 3 '5 To Stay Alive Heavy Mobile Equipment'

HEAVY EQUIPMENT & VEHICLE OPERATIONS

5 TO STAY ALIVE



Separate People from Equipment

Ensure mobile equipment and vehicle roadways are separated from pedestrian walkways with physical barriers to minimise distractions.

Life-Saving Rule

Driving

Follow safe driving rules

**2**

Inspect Vehicle

Ensure vehicle operators complete a daily inspection prior to use.

3

Competent Operator

Mobile equipment is to be operated only by competent personnel who are fit to drive.

4

Competent Flagger

Ensure a competent flagger is assigned to each mobile heavy equipment, and is controlling all movement. Eye contact must be maintained with the operator at all times.

5

Minimal Reversing

Enforce minimal reversing. Before vehicle moves, check area is clear, check blind spot and use audible warnings. Implement a one way system where possible.



شركة غاز البصرة
Basrah Gas Company



Work Management Procedure

#25 Permit To Work (PTW)

1 Overview and Hazards

- 1.1 BGC's PTW is a formal documented system that manages specific work within BGC's locations and activities. PTW aims to ensure Hazards and Risks are identified, and Controls are in place to prevent harm to **People, Assets, Community, and the Environment (PACE)**. The PTW process:
- Requires proper planning and consideration of activities before permission is given to start work;
 - Authorizes certain people to carry out specific work at a specific time and place;
 - Sets out the precautions required to complete the work safely.
- 1.2 **An issued PTW does not mean all risks are controlled or that work is safe to proceed. Workers must read, understand, and follow the precautions in the PTW documents pack, while continuously assessing and managing risk. BGC Management expects full commitment from staff and contractors to implement the PTW system consistently across all business locations.**



Relevant Life Saving Rules and Process Safety Fundamentals

Bypassing Safety Controls	Confined Space Control	Energy Isolation Control	Hot Work
Obtain authorisation before overriding or disabling safety controls	Obtain authorisation before entering a confined space	Verify isolation and zero energy before work begins	Control flammables and ignition sources
Line of Fire	Safe Mechanical Lifting	Work Authorisation	Working at Height
Keep yourself and others out of the line of fire	Plan lifting operations and control the area	Work with a valid permit when required	Protect yourself against a fall when working at height
Use of two Barriers	High Risk Activities	Pressure Free & Drained	
Always use 2 barriers for hydrocarbon and chemical drains & vents	For all defined high-risk activities, follow the procedures and sign off after each step	Always check that equipment is pressure free and drained, and provides safe isolation before starting maintenance work	
Attendance	Tightness	Walk the Line	
Do not leave an open drain or critical transfer unattended	Verify for complete tightness after maintenance work	Walk the Line – Verify and validate any line-up change	

2 Plan The Permit to Work Activity

General Requirements

- 2.1 When planning the work, confirm that all mandatory training has been completed for the workers and procedure reviewed. This will include:
- Review the WMP manual(s) relevant to the task.
 - Site Inductions
 - Task-specific training should be included in the training passport



- Emergency arrangements specific to the site (see also WMP #04 Emergency Response)
- 2.2 The BGC PTW system applies to all activities within BGC process areas (brownfield) and 150 m either side of a buried or above ground asset.
- 2.3 Pipeline Permits:
- For both intrusive and non-intrusive work on a pipeline, traps and associated piping inside the facilities fence boundaries the PTW will be issued/managed by the respective facility PTW office. A few examples of intrusive and non-intrusive work:
 - Intrusive activities are pigging & ILI inspection, valve operation (and stroking), pig trap door/end closure seal replacement, pipeline cut/replacement.
 - Non-intrusive work is inspection, coating removal, coating application, civil activities.
 - For non-intrusive work on a pipeline or associated accessories (including pig trap and block valve stations) outside the facilities fence boundaries of 150 m the PTW will be issued/managed by the Pipeline team. Activities which involves welding onto a live pipeline (e.g. repair sleeves), the PTW will be issued/managed by the Pipeline team and co-signed by the relevant facilities PTW office. The relevant facility shall ensure the required pressure control measures are correctly implemented and managed.
- 2.4 For non-process areas, site- or activity-specific PTW systems can be developed and deployed, subject to approval by the BGC Director responsible for the site or activity.
- Examples Include:
- Greenfield construction sites operated by Mode 2 Contractors
 - Vehicle maintenance workshops
 - BGC maintenance workshops and fabrication areas
- Warehouse and storage areas
- 2.5 Berthed vessels conducting activities within the boundaries of the vessel itself use their own PTW system subject to the requirements of the Terminal Information Booklet
- 2.6 Routine operational tasks covered by an approved **Standard Operating Procedure (SOP)** such as operating equipment, conducting inspections, or lining up valves do not usually require a permit.
- 2.7 Appropriate level of Hazard identification and risk assessment must be carried out for all activities according to the BGC **Risk Assessment Matrix (RAM)**:
 - For Blue/Light Blue risk use **Task Risk Identification Card (TRIC)**;
 - for Yellow/Red risk use a **Job Hazard Analysis (JHA)** or when requested by the Permit Issuer;
 - See also WMP #13 Hazard Identification for RAM definitions.
- 2.8 Appropriate control measures must be specified in the PTW and implemented at the worksite.
- 2.9 Department Managers must ensure that each work location has a dedicated person or position identified as the Permit Issuer.
- 2.10 Activities which must be conducted using a PTW are shown in Table 1, below. Consult the PTW office if unsure.

Table 1: Activities and Permit Types



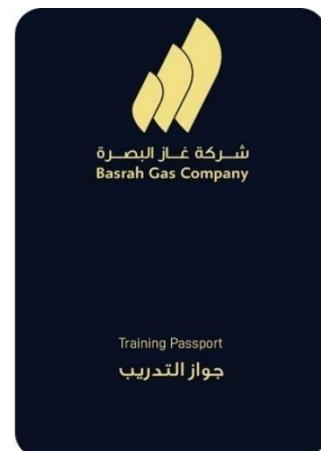
Work Requiring PTW	Examples
Cold Work	Any work that is not categorized in activity types below and that does not generate sparks or heat.
Hot Work Category 1	<ul style="list-style-type: none">Any work that <i>will</i> generate sparks, flames or hot components above auto-ignition temperature (a positive source of ignition);Use of welding equipment;Using grinding or cutting devices;Non-ex electric motors (e.g. hand drills).
Hot Work Category 2	<ul style="list-style-type: none">Any work with <i>potential</i> of generating sparks, flames, or hot components above hydrocarbon auto-ignition temperature;Vehicles entering process or hazardous areas;Using non-EX electronic devices in process or hazardous areas;Grit or shot blasting;Opening junction boxes that contain live terminals.
Confined Space Entry (CSE)	<ul style="list-style-type: none">Entry into confined space such as tanks or vessels;Entering excavations >1.2m depth from grade.
Breaking Containment	<ul style="list-style-type: none">Breaking or cracking flanges in process or hazardous systems;Removing valves or components from process or hazardous systems;Spading/despading/swinging blinds.
Excavation	<ul style="list-style-type: none">Digging a trench;Exposing services;Any removal of natural ground level > 0.1m.
Electrical Work	<ul style="list-style-type: none">Working on High Voltage (HV) or Low Voltage (LV) electrical equipment;Exposing energized components.
Lifting Operations	<ul style="list-style-type: none">Using a Hiab to load a truck;Any lifting of a load with a crane including overhead cranes;All of the above requires a Lift Plan to be developed.
Work outside the Process Area (This is covered under Infrastructure PTW system where system is applied)	<ul style="list-style-type: none">Electrical works inside and outside buildings, eg lights, AC units;Work on building structures and roof;Excavation works;Scaffold works;Use of heavy vehicles (crane/Hiab etc).

2.11 Personnel that plan, prepare, approve, and carry out work activities must be trained and competent as per Table 2 below. Training records will be kept in a personal HSE Training Passport with a BGC stamp. 3rd Party Passports with BGC stamps are acceptable.

**Table 2 BGC PTW Roles & Training Requirements**

Permit Role	Training Required
Department Managers	<ul style="list-style-type: none"> PTW LVL 1/LVL 2 Confined Space Awareness Working at Height Awareness Isolations
PTW Authorisers	<ul style="list-style-type: none"> PTW LVL 1/LVL 2 Authorized Gas Tester Confined Space Awareness Working at Height Awareness Isolations
PTW Issuers	<ul style="list-style-type: none"> PTW LVL 1/LVL 2 Authorized Gas Tester Confined Space Awareness Working at Height Awareness
PTW Coordinators	PTW LVL 1/LVL 2
PICWS* and Permit Applicant	PTW LVL 1/LVL 2
Work Party Member	PTW LVL 1

*Person In Charge of Work Site (PICWS)

Example BGC HSE Training Passport**BGC's PTW System for Process Areas Follows 8 key steps**



STEP 1: Planning – Work Scope

- 2.12 Work is planned after a work request is submitted or identified.
- 2.13 Permit Applicants are assigned by the Supervisor – they will normally become the PICWS.
- 2.14 PICWS will:
- Discuss with Permit Issuer the work location and proposed time and date of the work.
 - Visit the work site with the Supervisor of the work team and PTW Issuer to review work scope, location, and access arrangements.
 - Work with Supervisor and PTW Issuer to identify:
 - Isolations and process conditions;
 - Equipment, Personal Protective Equipment), and tools;
 - Type of PTW required;
 - Task rescue plans;
 - PTW certificates (see Table 3 below);
 - Subject Matter Expert (SME) endorsements.

Table 3 BGC PTW Supporting Certificates

Certificate Type	Description and requirements
Gas Testing	<ul style="list-style-type: none">• Shows requirements for, and records results of gas tests;• Hot Work within process areas (requires initial before work and continuous);• Confined space entry (requires initial test and continuous);• Breaking containment (requires initial test and continuous);• Vehicle entry to process area (continuous while engine is running);• Excavation greater than 1.2m entry (requires initial test and continuous);• As specified in JHA or by PTW Authoriser;• Completed by Authorized Gas Tester (AOT) and endorsed by PTW Issuer <p>NOTE: The frequency of gas retests is minimum every 3 hours and after breaks - to be clearly stipulated in JHA.</p>
Process Isolation	<p>Lists points and means of physical isolation of process equipment to protect exposure from damaging energy or hazardous substances.</p> <ul style="list-style-type: none">• Required for all physical work on process equipment;• Must include a marked-up Process Engineering Flow Scheme (PEFS) also known as Piping & Instrument Diagrams (P&IDs);• Completed by Authorized Isolation Owner (AIO) and endorsed by Isolation Supervisor (often the PTW Issuer);• Must be completed by two people to confirm and verify isolations;• May require countersigning by Section Head or Department Manager depending on complexity and risk.
Electrical Isolation	<p>Lists points and means of physical isolation of electrical supply to equipment preventing exposure to damaging electrical, mechanical, or other forms of energy:</p> <ul style="list-style-type: none">• Required for all physical work on electrically powered equipment, or where there is an electrocution risk;• For work on electrical equipment (e.g. electrical circuits) a single line diagram showing the isolation marked-up must be included;• Approved by Senior Authorized Electrical Person (SAEP) and PTW Issuer;• Blue copy is retained by the Responsible Person Electrical (RPE).



De-isolation for Test	Allows for operation of isolated equipment to be tested as part of the work scope without requiring removal of entire isolation: <ul style="list-style-type: none">• Must be developed in advance in conjunction with any isolation certificates and;• Completed by Authorized Isolation Officer (AIO) and endorsed by Permit Issuer.
Override	Required when any safety critical device or system will be inhibited or overridden as part of the work: <ul style="list-style-type: none">• Must be completed in conjunction with formal override request.
Excavation	Provides assurance that excavations and penetrations will not impact services or assets. Required for all disturbance of earth's surface (ground level) greater than 0.1m: <ul style="list-style-type: none">• Must be accompanied by an Explosive Remnants of War (ERW) land release certificate, a design drawing of the excavation, and underground services map;• Approved by Telecoms, Electrical, Instrumentation, Process Section Heads (others may be identified);• Must be endorsed by SME or TA2 Civils for certain types of excavation.
Radio-graphy	Used for any activity which involves Non-Destructive Testing using a radioactive source or produces X-rays: <ul style="list-style-type: none">• Completed by Radiation Protection Supervisor and endorsed by Permit Issuer;• Department Manager must endorse.
Vehicle Entry Sheet	Used to document risks and controls associated with vehicles entering process or hazardous areas: <ul style="list-style-type: none">• Must include plot plan with approved route;• Completed by Permit Applicant and endorsed by Permit Issuer.

2.15 Develop a clear method statement that describes the scope of work, to be submitted to the PTW Authoriser.

- Check that the PTW Authoriser fully understands the work and is satisfied with PTW requirements identified.
- PTW Authoriser and PTW Coordinator review **SIMultaneous OPerations (SIMOPS)** to identify potential SIMOPS hazards. See WMP #13 Hazard Identification.

STEP 2: Assess Hazards and Controls

2.16 Identify hazards related to the specific work. See WMP #13 Hazard Identification.

Identify any non-standard **Personal Protective Equipment (PPE)** requirements.

2.17 Identify isolation requirements with Permit Issuer and receive **Isolation Confirmation Certificate (ICC)**, see WMP #20 Isolations.



2.18 Work with Permit Issuer to identify any process safeguarding or safety equipment overrides required, see WMP #28 Safety System Isolation and Overrides.



2.19 Discuss the planned work with Permit Issuer and agree on the Risk rating using the RAM (Risk is Light Blue, Blue, Yellow, or Red). See WMP #13 Hazard Identification:

- If Blue/Light Blue risk, write Hazards and controls on the TRIC;
- If Yellow/Red risk (or if Permit Issuer requests) develop a JHA with the Supervisor.

2.20 Department Manager must approve JHA for all Red risk tasks and certain specified activities, see Precautions 3.52.

2.21 Use the Hazard Checklists (Appendix 1) to help identify common hazards.



- 2.22 Complete and submit the PTW pack (including Hazard Checklists) to PTW Coordinator at least 24 hours before the PTW/SIMOPS meeting and at least 48 hours before work is due to start.
- 2.23 Work with the PTW Coordinator to complete any missing items from the work pack.
- 2.24 Attend the PTW/SIMOPS meeting the day before work is due to start and present the work pack to the Permit Issuer at the meeting.
- 2.25 The meeting members will check work pack is completed, agree on risk, review controls are appropriate, and confirm there is no conflicting work (SIMOPS).
- 2.26 Permit Issuer/Authorizer reviews the PTW at the meeting and either authorizes it or requires changes.
- 2.27 Authorized PTW packs are kept at the PTW office awaiting issue.
- 2.28 If PTW pack is not authorized because it needs changes, work with the Permit Issuer, PTW Authoriser and PTW Coordinator to make the changes. Once necessary changes are made, then resubmit the PTW pack for the next PTW/SIMOPS meeting.

3 Do The Work: Working to the PTW

STEP 3: Implement Controls

- 3.1 Implement all relevant WMPs requirements specific to the site and the task. Ensure all hazard controls from the JHA or risk assessment are understood and implemented before work starts.
- 3.2 Everyone must know:
 - Emergency site alarms;
 - Muster points and routes to take to get there;
 - First aid points and nominated First Aiders;
 - The BGC Emergency Response Operations Centre (EROC) contact details:
 - BGC Phone 3333;
 - VOIP 12223;
 - Mobile 07809213970;
- 3.3 The Permit Issuer will arrange any isolations as per isolation plan.
The Permit Issuer will coordinate requested overrides to be approved and installed.
- 3.4 Check that the correct tools and equipment are available and inspected.
- 3.5 Check that lighting, access, and emergency response plans are suitable and ready.
- 3.6 Confirm what measurements and conditions are required for the PTW to be issued (e.g. gas readings, wind speed).
Confirm electrical person approval for the work conducted in the switch gear and battery electrical rooms prior to issuing the permit

STEP 4 Review Controls & Verify On Site That Controls Are in Place

- 3.7 Visit work site with Permit Issuer.
- 3.8 Check with PTW office that there are no planned SIMOPS conflicts and check identified hazards and controls are appropriate.
- 3.9 Look for any new hazards and agree on additional controls to be added to the JHA or the TRIC.
- 3.10 **ANY NEW HAZARDS OR CHANGES IN ACTIVITY MUST BE ASSESSED AND APPROVED BY THE MOST SENIOR PERSON AUTHORISING THE WORK. SIGNIFICANT**



UPDATES MUST BE RESUBMITTED THROUGH THE PTW/SIMOPS MEETING FOR AUTHORIZATION.

- 3.11 Check isolations are correct, locks and tags are in place, and that correctly marked up P&IDs/electrical drawings are present with the ICCs in PTW pack. PTW Issuer must demonstrate to the PICWS that all points of isolation are in place, and that equipment is de-pressureized and de-energized. See WMP #20 Isolations.
- 3.12 For electrical isolations, the Electrical Dept Electrical Isolating Authority must confirm Electrical Isolations and demonstrate all points of isolation are in place to the PICWS. See WMP #20 Isolations.
- 3.13 Confirm all certificates are correct and with the PTW pack.
- 3.14 Return the endorsed PTW pack to the PTW office where it will be stored until issued.



STEP 5 – Issue Permit

- 3.15 On the day of work, check again with the Permit Issuer and PTW Coordinator that there are no SIMOPS issues.
- 3.16 Request the permit to be issued from the PTW office.
Nominated AOT will conduct an initial gas test and record the result on the Gas Test certificate.
- 3.17 Permit Issuer will then check that:
 - The initial gas test has been conducted
 - The PTW work description is correct
 - Hazards are adequately identified and controlled (see WMP #13 Hazard Identification)
 - All PTW pack documents are completed correctly
- 3.18 Show training passport to the Permit Issuer to demonstrate necessary competencies are held and valid.
- 3.19 Permit Issuer will then sign to release the PTW.
- 3.20 PICWS will sign PTW to show that he understands and agrees to implement the PTW controls and conditions.

PERMIT IS NOW ACTIVE

- 3.21 Handover the carbon copies (Yellow and Green) to the PTW Coordinator in the PTW office to be displayed on the Permit Display board under the “Live” section.
- 3.22 A coloured marker will be placed on the facility plot plan showing the work location and a final SIMOPS check is conducted on the board.
- 3.23 Take the PTW pack to work site location. PTW pack includes:
 - Original (White) copies of PTW and Hazard Checklists
 - Necessary certificates
 - TRIC, JHAs, and other attachments

STEP 6 – Work Party Pre-Job Discussion/TBT

- 3.24 Once onsite, check the PTW pack to make sure:
 - All controls are in place on site (including gas checks, access, lighting etc.)
 - All certificates are correctly completed
 - Signatures are correct

ANY ISSUE WITH THE PTW PACK REQUIRES WORK TO BE PAUSED AND ISSUES RESOLVED WITH THE SHIFT ENGINEER BEFORE WORK CAN PROCEED



- 3.25 Conduct a TBT with the work crew. For all RAM yellow work in process areas, operations must attend the TBT. Operations can be represented by PTW Issuer. For RAM red 5A/B the Site/Shift Engineer must attend.
- 3.26 The TBT is a two-way discussion with the work team led by the PICWS using the '7 Steps Safe Work Process' (see WMP #13 Hazard Identification).
- Use the 7 Steps to ask open questions and wait for full answers to confirm that each worker fully understands the task step-by-step, hazards, controls, Life Saving Rules, any lessons learnt from previous work, emergency procedures.
 - Each worker must be able to describe their roles and duties, and those of their colleagues.



- 3.27 Use the TRIC Card (see WMP #13 Hazard Identification) to support the TBT and record the discussion points, particularly the hazards and controls.
- 3.28 Communicate and agree how to:
- Comply with the PTW, TRIC/JHA Controls and applicable WMPs;
 - Respond to an incident or emergency;
 - Intervene safely and respectfully when seeing unsafe acts or conditions;
 - Report interventions and observations via HSE Observation Cards, see WMP #19 HSE Event Reporting, Investigation and Learning.
- 3.29 A TBT talk is required each time a PTW is issued or re-issued and must be refreshed with the work team after every work break. If additional personnel join the work party, they must receive a suitable site brief from the PICWS.

STEP 7 – Execute and Supervise the Works

- 3.30 All work party members must sign the TRIC to acknowledge they understand the activity, risk, and controls, and allow for headcount in case of an emergency.
- 3.31 Work team carries out work safely, ensuring and following controls, and using required PPE.
- 3.32 PICWS is to supervise the work ensuring that controls are implemented, and that work is carried out safely.
- 3.33 Ensure PTW pack is displayed and easily available at the work location for inspection and reference.
- 3.34 PICWS must always be at the work location during work. The only exception to this is where the PICWS can effectively observe and immediately intervene on all work. PICWS is only permitted a max of 2 PTW's in this exceptional case.
- 3.35 If PICWS needs to leave the work site, work must be suspended, and the PTW returned to the PTW office. The PTW can be reissued to a new PICWS once all aspects of the activity have been discussed and understood. The new PICWS must then hold a TBT as per STEP 6.
- 3.36 If any team member is unsure of anything at any stage, they must PAUSE WORK and ask their Supervisor.



- 3.37 Work must PAUSE if there are any unforeseen circumstances or changes to the work site or work scope. Advice must then be taken on appropriate steps. PICWS is to discuss with Permit Issuer.
- 3.38 Minor changes such as weather conditions, access arrangements, or worksite layout should be recorded on the TRIC card. A TBT focusing on the changed conditions must then be completed.
- 3.39 Major changes such as to work scope, critical controls (such as isolations), or introduction of additional hazards will result in PTW suspension. Work cannot continue until the PTW has been revised and resubmitted through the PTW meeting.
- 3.40 If the work has been stopped temporarily and the PTW is pulled or returned to the PTW office then:
 - PTW Co-Ordinator must immediately inform the Operations Shift Engineer / Site Engineer of the reason for stopping the work;
 - PICWS must immediately inform their Supervision of the reason for stopping the work.The above actions will ensure that Operations and the affected work group Supervision are fully informed, enabling discussions to take place to resolve the issue and / or agree further actions.
- 3.41 If work can't be completed by end of shift, make the area safe, and return the PTW pack to the PTW office.
- 3.42 The returned PTW will be suspended and must go through re-issue the following shift.
- 3.43 White copies of suspended PTW packs are moved to suspended section of PTW display board with the Yellow and Green copies. If the PTW duration (maximum two weeks) has expired, then a **new PTW must be created.**

STEP 8 – Verify Work Completion, Close PTW and Hand Back

- 3.44 Inform the Permit Issuer that work is completed.
- 3.45 PTW Issuer goes to work location and confirms that work is completed satisfactorily, and that housekeeping has been completed.
- 3.46 PTW Issuer confirms that the work site is safe and ready to be returned to operating status.
- 3.47 PICWS will sign the PTW form as "ready to hand back".
- 3.48 PTW Issuer coordinates de-isolation of equipment, confirming it is returned to the correct operating condition.
- 3.49 PICWS returns PTW pack and associated documents to the PTW.
- 3.50 PTW Issuer signs off all copies of the PTW as complete.
- 3.51 PTW Coordinator cancels the PTW and archives the PTW pack.



PERMIT IS NOW CLOSED

Precautions / Additional Points to Note:

- 3.52 If a PTW has expired after two weeks, but the work is incomplete, a continuation PTW may be used. A thorough check must be done to ensure there is no change in work scope or hazards.
NOTE: Only ONE continuation PTW is allowed. If work extends past the validity of the continuation PTW, then a new PTW must be raised with a new Risk Assessment
- 3.53 In case of emergency, all active PTWs shall be suspended, and will require approval from PTW Authoriser to recommence. A TBT must be repeated by the PICWS before work begins again.



3.54 The following specified activities require Department Manager signature on the JHA and PTW before the PTW can be issued. Such activities include but are not limited to:

- Any RAM Red or 5A/B risk ranked work;
- Non-routine complex lifts or lifts over live hydrocarbon equipment;
- Hydro-jet blasting activities;
- Working at Height outside an approved platform or scaffold;
- Confined space entry including entering excavations deeper than 1.2m;
- Category 1 Hot Work in process areas or within 15m of a hydrocarbon asset;
- Radiography;
- Grit/sand blasting activities;
- Breaking containment where hydrocarbons may be present.



3.55 Permit Issuers shall ensure a Designated First Aider is available and ready to respond to injured persons **within 4 minutes** and that all personnel are familiar with the emergency procedures.

3.56 In situations where urgent work is required to mitigate an immediate and serious HSSE or production risk, a PTW may be issued without being screened by the PTW/SIMOPS meeting. The PTW must meet all other requirements and be signed off by the Department Manager. Such PTWs are referred to as "Emergency/Break-in PTWs."

4 References and Resources

Relevant WMPs

- #05 Emergency Response
- #13 Hazard Identification
- #16 Hot Work
- #20 Isolations
- #23 Manual Handling
- #25 Permit to Work
- #26 Personal Protective Equipment
- #28 Safety System Isolation & Override Control

BGC ToolBox Talks, Communication Materials, Posters and Information

- PTW Process Swimlane (Appendix 1)
- PTW Roles & Responsibilities (Appendix 2)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC Production Director	31-03-2022	Retained on sign-off form
Custodian	BGC Asset Services Director	31-03-2022	Retained on sign-off form

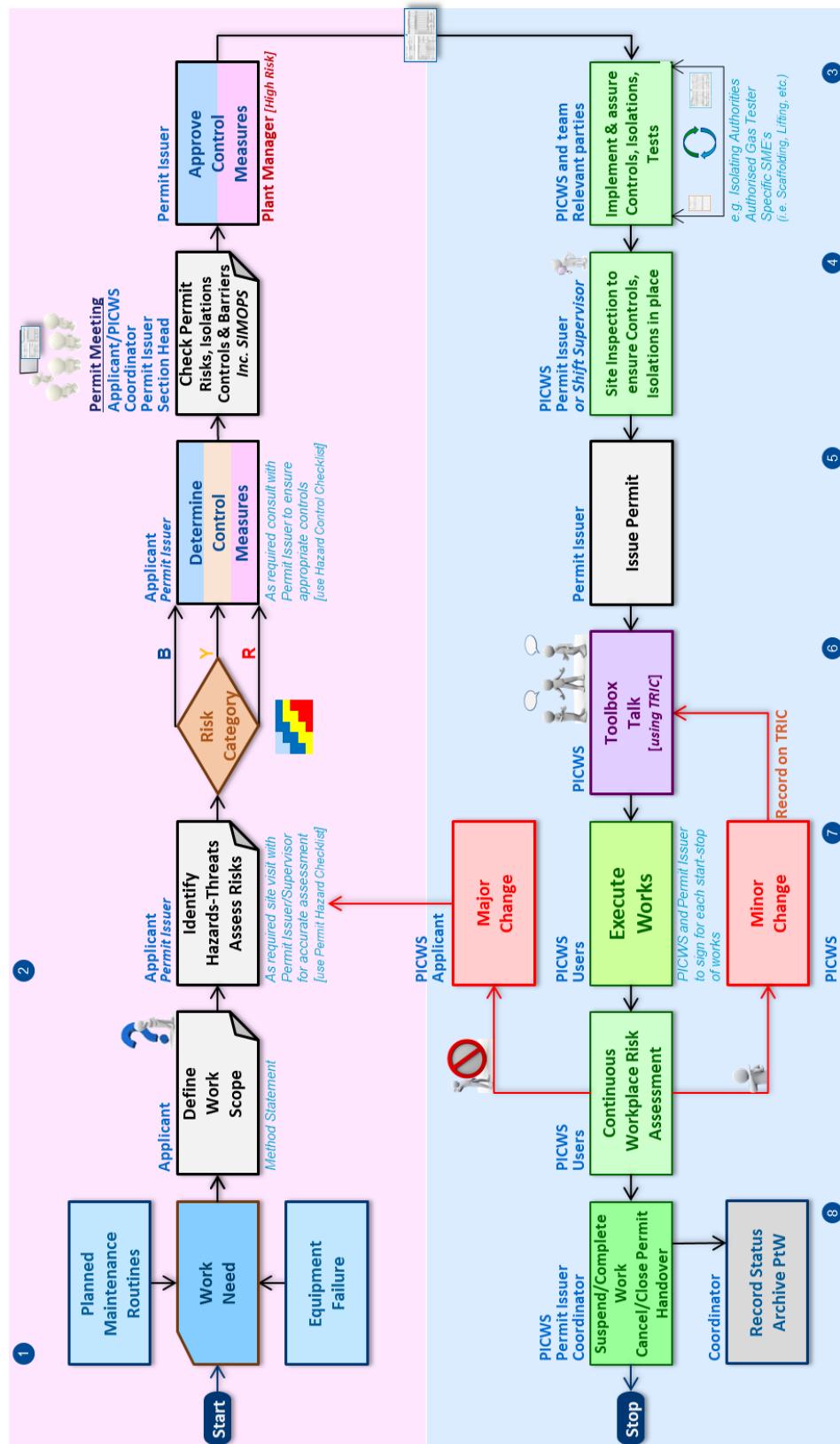


Appendix 1 PTW Process Swimlane

PTW PROCESS FLOW



عملية تطبيق وتنفيذ تصريح العمل





Appendix 2 PTW Roles and Responsibilities

Role & Responsibilities
<p>PTW Coordinator</p> <ul style="list-style-type: none">• Maintain and coordinate PTW system, elements and process through the PTW Office• Ensure the SIMOPS & PTW boards are updated and reflect the status of work in the field• Provide advice to PTW Applicants, PICWS, PTW Issuers, Authorisers, and Department Managers on the requirements of the PTW system• Review submitted PTW packs for completeness before allowing them to be submitted to the PTW/SIMOPS meeting• Secure authorised PTW Packs ready to issue to prevent unauthorized changes or errors• Maintain visibility and awareness of the status of all PTWs at their location of responsibility• Ensure that Yellow and Green copies of the PTW pack remain in the PTW Office at all times until PTW is closed/cancelled ready for archive• Prevent unauthorized access, amendments, or other interference to PTW Packs, status and SIMOPs boards• Ensure there is adequate supply of PTW stationery and equipment at the PTW Office including materials required for isolations• Ensure that PTW Pack submissions adhere to the 48hr/24hr deadlines• Immediately inform PTW Issuers/Authorisers of any change in conditions relating to SIMOPS or MOPO conflicts• Ensure that copies of the BGC RAM Guide, MOPO, and HAC Drawings are posted in the PTW Office• Support PTW Issuers
<p>Note 1: Usually a dedicated role however smaller sites may delegate to a Shift Supervisor or similar. Managers must ensure that a person is nominated in this role.</p>
<p>Note 2: A PTW Office is the location of the PTW status and SIMOPs boards where PTW are issued from. Ideally this is a dedicated office but for smaller locations this might be the local control room or similar.</p>
<p>PTW Applicant</p> <ul style="list-style-type: none">• Visit the worksite with the relevant authority to identify worksite hazards related to the activity• Draft the PTW with clear work scope and correct work categories• Together with the PICWS shall carry out a joint preliminary risk assessment, and JHA if required• Ensure all supporting documents are attached to the PTW. It is important to brief PICWS on hazards and controls to be communicated during Toolbox Talk• Liaise with PTW Issuer / IO or EIA to mark up any isolation plans in accordance with WMP #20 Isolations• Finalize PTW Pack for submission to PTW/SIMOPS meeting
<p>PICWS</p> <ul style="list-style-type: none">• Verify any isolations before work commences by performing personal inspection and Zero Energy Checks along with PTW Issuer / IO or EIA• PICWS responsibilities cannot be delegated, only formally handed over to another qualified PICWS• Where PICWS accepts responsibility for multiple PTW PICWS shall demonstrate they are able to effectively manage each worksite. A PICWS cannot hold >1 PTW if he cannot effectively observe & immediately intervene on all work. By exception PICWS is only permitted a max of 2 PTW's.• Accept PTWs from the PI before starting work• Ensure a TBT (Pre-job discussion) is conducted before work



- Ensure that all required documentation is attached to the PTW pack. This ensures that PTW control is implemented and effective
- Display PTW at worksite. Ensure marked up P&ID/PEFS and ICC showing the isolation are kept with the PTW
- Responsible for safety of all work party members during PTW execution
- Maintain housekeeping at all stages of the activity. Keep the area clear and free from hazards
- Communicate the status of the work scope and raise any queries or concerns immediately with the PTW Issuer
- Supervise and monitor the PTW work scope
- Ensure the work area/ equipment is made safe upon completion of the activity / equipment is made safe upon completion of the activity and prior to handover of the equipment / area back to operations
- Ensure enough coverage of first aiders within work group

PTW Issuer

- Issue PTWs To Work for their nominated areas of responsibility
- Ensure all work carried out within the assigned area is covered by a valid PTW
- Conduct required checks and in field verification upon issuing a PTW, including SIMOPS compliance check
- Be present at / near the [work] site for which PTWs are issued and active
- Arrange for appropriate delegation in case of [un]planned absence. Note: PTW Issuing responsibilities may only be delegated to an appointed person
- Ensure for effective hand over of the PTW[s] to the upcoming shift.
- Conduct required checks and in field verification upon closing a PTW
- Ensure PTW information and risk assessment (e.g. JHA) are appropriate for the scope of work before issuing a PTW
- Ensure specified gas testing frequency is appropriate for the specified work. Verify continuous gas testing is specified, when required
- Ensure PICWS understands and complies with the conditions and controls of the PTW before issuing the PTW
- Ensure training requirements are met by reviewing Training Passports, training certificates or conducting an Authorized Person Register check
- Ensure, by visual inspection on site, that controls specified on the PTW are in place
- Verify isolations before work by conducting Zero Energy Checks with the PICWS, IO, EIA
- Identify and address worksite conflicts (if any) during PTW issuing. [SIMOPS compliance]
- Sign to confirm suspended, re-issued and closed PTWs
- Conduct required checks and in field verification to confirm a PTW can be closed. This will require a field check to make sure the work site is left in a safe condition and that housekeeping standards are met. This may require de-isolation or re-instatement of any associated equipment to take place before PTW can be closed

PTW Authoriser

- Oversee the PTW system for their area of responsibility
- Chair the PTW/SIMOPS meeting
- Ensure PTW information and risk assessment (e.g. JHA) are appropriate for the scope of work before authorising a PTW
- Ensure specified gas testing frequency is appropriate for the specified work. Verify continuous gas testing is specified, when required
- Authorise PTW for their nominated areas of responsibility
- Ensure PTW Issuers are available for the [work] site for which PTWs are to be issued and active
- Ensure required checks and in field verifications are completed



- Arrange for appropriate delegation in case of [un]planned absence.
- Note: PTW Authorising responsibilities may only be delegated to an appointed person
- Ensure PTW Issuer understands & ensures compliance with the conditions and controls of the PTW
- Verify isolations before work by conducting Zero Energy checks with the PICWS, IO, EIA
- Identify and address any potential worksite conflicts (if any) during PTW/SIMOPS meeting (SIMOPS compliance)
- Identify PTWs/JHAs that require escalation to Department Manager
- Sign to confirm PTWs have met all requirements and are authorised to be issued
- Conduct audit checks of the PTW system
- Ensure 24/48hr timeframes for PTW are adhered to and Emergency/Break-In PTW are only by exception

Department Manager

- Manage the PTW system for their location
- Review and authorize PTW pack for RAM Red 5A/5B and other specified activities
- Ensure their location has nominated PTW Authoriser, PTW Issuers, and PTW Coordinators
- Approve Emergency/Break-In PTW by exception

For remote locations, where the PTW Department Manager is not always available, they may delegate signing authority to a competent person. The Department Manager must delegate the authority in writing or by email.

Appendix 3 MANDATORY DAILY PTW/SIMOPS MEETING & PTW office recommendations

ATTENDANCE

- PTW coordinator
- PTW Authoriser
- PTWs Applicant (or PTW Holder / PICWS)
- HSE
- Senior Authorized Electrical Person (SAEP)
- Department Manager, or delegate, if required to sign high-risk PTWs and JHAs

OBJECTIVES & REQUIREMENTS

The Daily PTW/SIMOPS meeting is mandatory. The meetings allow PTW requests to progress safely and efficiently by focusing PTW discussions in one time and place. Table below shows a typical agenda for the Daily PTW/SIMOPS. Minutes should be taken for handover to the next shift of PTW coordinators, PTW issuers and PTW Authorisers. It is best practice that PICWS attend the meeting the day before work, even if the PTW pack was submitted previously.



Description	Responsibility
Continuous Improvement <ul style="list-style-type: none">• Review findings from audits and walkabouts• Plan future audits• Plan corrective activities	PTW Coordinator
Establish Status of Activities <ul style="list-style-type: none">• Review live and suspended PTWs• Review upcoming planned work under control of PTW.• Identify PTWs that pose a concurrent operation or SIMOPS risk which must be considered at the meeting	All in attendance
Assess Concurrent Operation, SIMOPS and Interface Conflicts, Operational Registers <ul style="list-style-type: none">• Review planned PTWs for SIMOPS conflicts or congestion• Consider the implications of unavailability of safety and / or emergency systems (if applicable).• Review current activities and emerging works to identify and manage any known or potential SIMOPS conflicts including impact of external influences.• Discussion / review of activities not under a PTW.	All in attendance
Review Inhibits and Overrides <ul style="list-style-type: none">• Review requested and applied Inhibits and Overrides (OMP16/WMP28)	PTW Authorizer
Authorize or Reject PTW packs <ul style="list-style-type: none">• Review and Authorize new PTW packs as required• Review newly raised PTWs including the nature and scope of the work and agree time to achieve the plan (process isolations, etc)• Agree on risk and review controls of each PTW• Agree on necessary improvements or modifications, if rejected	PTW Authorizer
Approve Application of Isolations <ul style="list-style-type: none">• Review and Authorize Process Isolations to enable planned PTW-controlled work (OMP13 / OMP14 / OMP15 / WMP20)• Review and Authorize Electrical Isolations of Electrical Installations to enable planned PTW controlled work.	PTW Authoriser Senior Authorized Electrical Person

PTW office recommendations:

- Desk and meeting table
- Site map as SIMOPS Board, including leak locations
- Isolation / PTW racks
- Printer & PC
- Archive space
- Isolation lock box



Work Management Procedure

#26 Personal Protective Equipment (PPE)

1 Overview and Hazards

1.1 PPE is equipment worn to reduce severity of injuries resulting from exposure to hazards in the workplace.

1.2 Hazards

Hazards in the workplace include among others chemical, radiological, physical, electrical, mechanical hazards as per WMP #13 Hazard identification. PPE is the least effective control in the Hierarchy of Controls after hazard elimination, substitution, engineering and administrative controls.

Hence PPE alone should not be relied upon to mitigate risk.

Relevant Life Saving Rules and Process Safety Fundamentals

Confined Space Control	Line of Fire	Work Authorisation	Working at Height
 Obtain authorisation before entering a confined space	 Keep yourself and others out of the line of fire	 Work with a valid permit when required	 Protect yourself against a fall when working at height

2 Plan the Work

- 2.1 All BGC staff and contractors must use the correct PPE as required for the job. Before any task Team Leaders and Supervisors are responsible for:
- Ensuring the requirements for PPE are identified and adequate, including proper maintenance and cleanliness of the equipment;
 - The supply, issue and correct use of PPE;
 - Ensuring people who use the PPE are fitted and trained/briefed to use it properly. This includes:
 - How to put on the PPE properly;
 - Specific fitness to work requirements for using the PPE (e.g. Respiratory Personal Protection - RPE);
 - Use of disposable PPE including the disposal of those contaminated PPE .

- 2.2 Mandatory PPE on BGC sites is:

- Hard hat;
- Safety-toed shoes;
- Safety glasses;
- Gloves;
- Hearing protection (ear plugs and/or ear covers);
- Flame retardant coveralls;
- Personal Gas Monitor (PGM)
(currently being rolled across BGC; ask your Supervisor for confirmation).





- 2.3 Additional requirements for PPE are based on a risk assessment, depending on the site conditions and the scope and activities of the work. Where job conditions change, PPE selection must be reviewed to ensure it is still valid. See WMP #13 Hazard Identification.
- 2.4 When specialised PPE is required (e.g. high noise, radiation, chemical storage areas, hydrocarbon process areas) it should be marked with prominent signage, universal symbols and/or in the language of the workforce to ensure that personnel are aware of the requirements. See also relevant WMPs specific to tasks and Hazards;
- 2.5 Personal items with the potential to act as an ignition source are restricted from hydrocarbon process areas. See also WMP #13 Hazard Identification.



3 Do The Work

- 3.1 All BGC staff and contractors must:
- Ensure PPE is in good condition;
 - Replace PPE when it does not comply with this WMP;
 - Not use torn or damaged PPE;
 - Not repair or modify PPE;
 - Inspect, maintain and store PPE properly when not in use.
- 3.2 BGC general requirements related to PPE are as follows:
- Use inherent flame-retardant fabric, includes disposable coveralls;
 - Long hair shall be tied back and tucked into coveralls;
 - Wearing a baseball cap under the safety helmet is prohibited;
 - High visibility vest or clothing must be worn by the banksman and road workers, where there are risks associated with Heavy Mobile Equipment (e.g. HIABs, cranes, excavators, forklifts);
 - Only inherent flame resistant (NFPA 2112) safety helmet shade, balaclava. A clothing tag must show the material inherent flame-resistant properties and certification.

3.3 BGC PPE Catalogue

Table 1 BGC PPE Catalogue

1. Hand Protection	7. Personal Flotation Devices (PFD)
2. Head Protection	8. Fall Protection
3. Eye & Face Protection	9. Foot Protection
4. Hearing Protection	10. Protective Clothing
5. Respiratory Protective Equipment (RPE)	11. PPE Disposal
6. Personal Gas Monitoring PGM	12. COVID-19 /Pandemic Measures

3.4 Hand Protection

All workers within hydrocarbon process areas must wear gloves at all times, regardless of the activity.



The choice of hand protection shall be compatibility with the work and the requirements of the user. The ability of protective gloves to resist abrasion and other industrial wear and tear. Manufacturer instruction and markings for appropriate use and level of protection shall be observed.

When selecting gloves for chemical protection, reference shall be made to chemical permeation and resistance data provided by manufacturers.

When using knives, ANSI level 4 or equivalent cut resistant gloves must be used at all times. In addition, cut resistant sleeves must be used when using knives for cutting insulation materials.

For EN 388 2016 standard, gloves against mechanical risks have 'New Marking' (shown below) to indicate the performance of the glove. This marking can usually be seen on a small tag inside the glove.

3.5 Types of Hand Protection

Protection against Mechanical Hazards



Gloves for Grip &
Dexterity



Cut Resistant
gloves



Impact Resistant
gloves



Steel mesh gloves

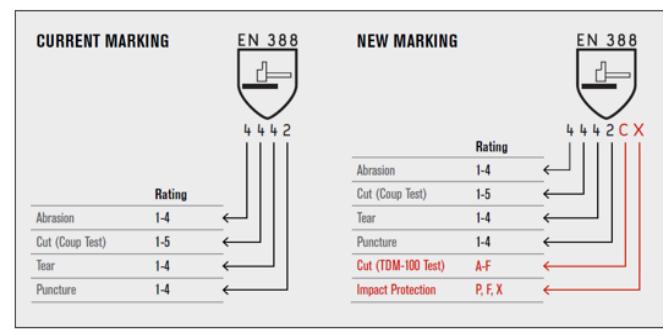


Chainsaw gloves

Applicable Standards

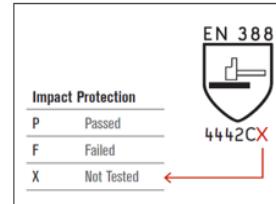
- BS EN 388
- AS/NZS 2161
- ANSI/ISEA 105

- EN 1082-1 (for steel mesh gloves)
- BS EN 381 (for chainsaw gloves)



EN 388 RATING	RANGE (NEWTONS)	CONVERTED RANGE (GRAMS)	ANSI/ISEA 105 LEVEL	RANGE (GRAMS)
A	2 - 4.9	204 - 508	A1	200 - 499
B	5 - 9.9	509 - 1,019	A2	500 - 999
C	10 - 14.9	1,020 - 1,529	A3	1,000 - 1,499
D	15 - 21.9	1,530 - 2,242	A4	1,500 - 2,199
E	22 - 29.9	2,243 - 3,058	A5	2,200 - 2,999
F	30+	3,059+	A6	3,000 - 3,999
---	---	---	A7	4,000 - 4,999
---	---	---	A8	5,000 - 5,999
---	---	---	A9	6,000+

For Cut Protection (TDM-100 Test)



For Impact Protection



EN 388

4442CX



Heat and Fire (Thermal) Hazards



Welding Gauntlets

Applicable Standards

- BS EN 12477
- BS EN 407
- AS/NZS 2161.4
- ANSI/ISEA 105



Cryogenic gloves

Cold Hazards

Applicable Standards

- BS EN 511
- AS/NZS 2161.5
- ANSI/ISEA 105



Chemical/oil resistant gloves

Applicable Standards

- BS EN 374
- AS/NZS 2161.10
- ANSI/ISEA 105



Disposable Vinyl, Latex or Nitrile

Applicable Standards

- BS EN 455
- AS/NZS 2161
- ANSI/ISEA 105



Insulating gloves for live electrical

Electrical Hazards

Applicable Standards

- BS EN 60903
- AS 2225
- ANSI/ISEA 105



Ionizing radiation glove

Ionizing radiation & radioactive contamination

Applicable Standards

- EN 421
- AS/NZS 2161.8
- ANSI/ISEA 105

3.6 Head Protection

Head protection should give the wearer protection against impact and penetration damage:

- The Safety helmet shall be equipped with a chin strap for use when working at height or in windy conditions;
- Only Safety Helmets which conform to the BGC PPE Specifications are allowed for use in BGC premises;
- The use of an aluminum helmet is NOT permitted in BGC;
- A new safety helmet shall be issued to staff if:
 - It is more than 3 years old from date of manufacture;
 - The structural integrity of the safety helmet has been compromised;
- No modification of any kind that compromises the structural integrity of the safety helmet is allowed.

3.7 Eye and Face Protection

All workers within hydrocarbon process areas must wear Eye Protection at all times, regardless of the activity.

Eye and Face protection is designed to protect the wearer from chemical and physical



hazards. The supervisor and wearer must evaluate the type of hazard, risk of injury, conditions of use, type of operation and required field of vision when deciding on what type of eye protection is to be used:

- Where possible each individual worker should be assigned his/her own eye protection to ensure appropriate fit and to minimize potential for infection;
- Safety glasses shall be worn to provide impact protection but will not provide the same level of splash or droplet protection as goggles;
- Appropriately fitted, indirectly vented goggles with anti-fog coating shall be worn to provide protection from splashes and sprays;
- Where splash or spray protection to other parts of the face is required, face shields shall be worn with crown and chin protection. The face shield must wrap around the face to the point of the ear. Face shields shall be used in addition to goggles, not as a substitute for goggles;
- Welding visors must be equipped with the correct type of UV shade for the type of work that is being undertaken;
- For grit blasting work, hoods with supplied breathing air must be worn to protect airways, eyes and face;
- Dark glasses shall not be worn inside buildings, on dull days or low light conditions. Clear glasses should be used instead.

3.8 Types of Eye and Face Protection



Prescription safety spectacles with side shields



Clear/Lightly tinted safety spectacles



Safety goggles

Applicable Standards

- ANSI/ISEA Z87.1-2010,
- BS EN 166
- BS EN 167: 2002,
- BS EN 168: 2002,
- AS/NZS 1337
- BS EN 172:1995 (dark lenses)
- 89/686/EEC
- ANSI Z87.1 (Z87+ for impact rated lens; Z87-2+ for impact rated prescription lens)



Welding goggles



Welding helmet

Clear face shield





3.9 Hearing Protection

- Persons shall not be exposed to continuous noise, which exceeds sound pressure levels of 85 dB (A) for 8-hour exposure or where a safety sign is posted;
- The BGC Health Risk Assessment (HRA) process identifies high noise hearing protection zones;
- Hearing Protection Devices must be worn properly, always make sure that by doing fit checks;
- Ear protection must be worn by any person entering a high noise (>85dB(A)) area;
- Ear protection must be of the approved type;
- The Noise Reduction Rating must be considered when selecting the hearing protection;
- Earplugs must fit tightly to the ears and shall be fitted with clean hands, free of dirt or grease;
- All persons working in high noise areas {personal noise dose exceed 85 dB(A)} are required to undergo an audiometry hearing test every 2 years;
- Double hearing protection i.e. ear plugs and earmuffs, must be worn by all personnel entering a double hearing protection zone i.e. >105dB(A), no matter how brief their intended stay;

PPE	Applicable standards	Photo
Disposable ear plugs	EN 352	
Earmuffs	EN 352	

3.10 Respiratory Protective Equipment (RPE)

- Use RPE to protect against dust, fumes, gases, oxygen deficiency and vapours;
- When handling hazardous gas, chemicals or vapors, use Half or Full mask respirator suited to the gas, chemical or vapor (e.g., breaking containment);
- For protection against dust, use a disposable mask;
- For H₂S escape, use the PARAT H₂S Escape Filter issued at BGC facilities. Refer to WMP #18 Hydrogen Sulphide (H₂S);
- Breathing Apparatus (BA) shall always be used where there is a risk of oxygen deficiency (<20%) or oxygen enrichment (>21.5%);
- Confined space wearers of Self-Contained BA (SCBA) and Air Line BA, shall have completed both the Confined Space Entry and SCBA trainings;
- For emergency fire escape, use the emergency escape hood set below;
- Wear P3 dust filter (unpowered RPE) only for less than 1hr then rest & reuse again, otherwise for continues work for more than 1hr wear powered RPE. For more





complex work consult an Industrial Hygienist for further advice.

PPE	Applicable standards	Photo
Half face mask respirator	<ul style="list-style-type: none">• BS EN 140• AS/NZS 1716• ANSI/ASSP Z88.2	
Full face mask respirator	<ul style="list-style-type: none">• BS EN 140• AS/NZS 1716• ANSI/ASSP Z88.2	
Gas/vapour and combined filters (for respirator)	<ul style="list-style-type: none">• EN 14387• AS/NZS 1716	
Particle filters (for respirator)	<ul style="list-style-type: none">• EN 143• AS/NZS 1716	
Disposable filter mask – Working in dusty condition	<ul style="list-style-type: none">• EN 149• 89/686/EEC• EN405:2001	
H ₂ S escape hood	<ul style="list-style-type: none">• BS 8468-3.2• AS/NZS 1716	
Emergency escape hood set for Fire escape emergency	<ul style="list-style-type: none">• EN 403• AS/NZS 1716• ASTM E2952-14	



Airline Breathing Apparatus with full face mask (using filtered compressed air & fitted with demand valve)	<ul style="list-style-type: none">• BS EN 14593-1• AS/NZS 1716• ANSI/ASSP Z88.2	
Self-Contained Breathing Apparatus (SCBA) (using cylinder type)	<ul style="list-style-type: none">• BS EN 137• AS/NZS 1716• ANSI/ASSP Z88.2• BS EN 12245 (for the composite cylinder)	

3.11 Personal Gas Monitor (PGM)

PGMs are designed for single or multi gas monitoring and detection depending on the model. PGMs shall be used in all BGC hydrocarbon production and process facilities. These monitors shall measure lower explosive limit (LEL), O₂ (Oxygen) and CO (Carbon Monoxide) and H₂S (Hydrogen Sulphide). These monitors shall be used by:

- Contractors at a ratio of 1 monitor per personnel when these personnel work outside a distance of 30 m from each other
- Contractors at a ratio of 1 monitor per 10 personnel when these personnel are working within a distance of 30 m from each other
- Where work occurs within a designated H₂S facility then all personnel must at a minimum wear a single gas (H₂S monitor).

PGM Devices		
 Dräger Pac 3500	 Dräger X-am 5600	 Honeywell 4 gas PGM

3.12 Personal Floating Device (PFD)

Life jackets or buoyancy aids must be worn for all work on, over or near water where there is a risk of falling into the water, a PFD should be able, in the prevailing environmental conditions to:



- Lift the mouth of an exhausted or unconscious person clear of the water.
- Turn the body of an unconscious person in the water from any position to one where the mouth is clear of the water in < 5 seconds.
- Provide sufficient comfort and flexibility in movement for personnel (this will be dependent on activity and/or work requirements).



Life jackets or buoyancy aids must be SOLAS 275N.

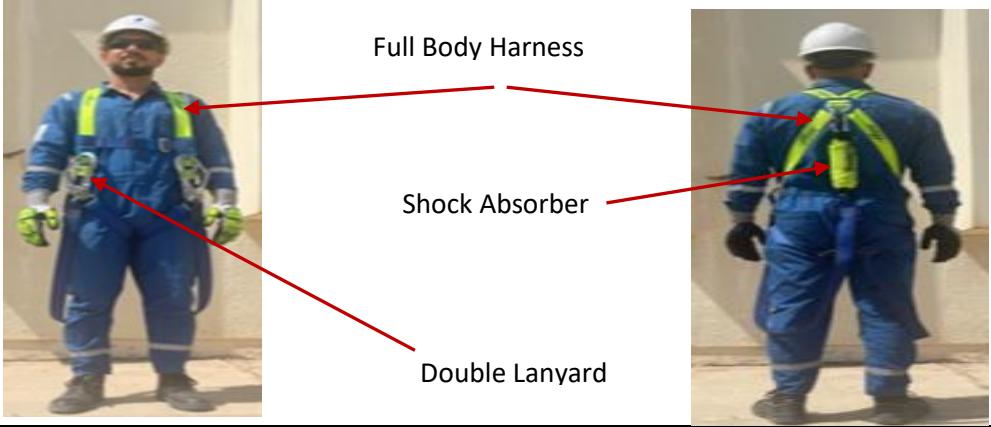
- Before use, life jackets or buoyancy aids must be inspected to ensure that they are not damaged, that any recovery aids (whistle, light) are correctly fitted and they are dry and clean.
- Persons required to use a life jacket or buoyancy aid should be given at the site specific induction which includes instructions in the correct way to inspect, wear and adjust the device before first use.
- Life Jackets must be maintained on a register and be inspected annually by a certified agent.

3.13 Fall Protection

Types of Fall Protection Equipment

 Full body harness		 Sit harness with full body harness	
 Fixed length lanyard for fall system	 Adjustable length lanyard for fall restraint system		
 Double Lanyard with shock absorber			



	Retractable fall arrester (Self-retracting lifeline, inertia reel device, personal fall limiter or fall arrest block) (YOYO)	Connectors
		 Carabiner (autolock)
		 Carabiner (screwgate)
		 snaphook Autolock
 <p>Full Body Harness</p> <p>Shock Absorber</p> <p>Double Lanyard</p>		
Anchor devices		
	Improvised Anchor	
		 <p>Locking Snap Hook Rope Grab D-Clip Lanyard Shock Absorber Lifeline</p>
	Engineered Anchor (Eyebolt)	
		Engineered Anchor (Anchor Beam)

3.14 Equipment Inspection, Testing and Records

- BGC Fall arrest equipment shall be managed by the Life Safety & Critical Equipment (LSCE) section of the BGC Emergency Response Department
- The Fall arrest equipment shall be inspected and maintained (independently) and tagged every 3 months and recorded in the LSCE database
- Inspection records shall be issued to the fall arrest user.



- Fall arrest equipment held by BGC Contractors will independently inspect their own equipment and have a register maintained at all times, with inspection per manufacturers recommendations

3.15 Foot Protection

Protective footwear must protect against a wide range of hazards, such as contact with chemicals, extreme cold or heat, sharp or heavy objects and electrical hazards.

Footwear must also provide the user with reasonable anti-slip capability.

The user should be aware of the limitations afforded by the footwear. Both shoes and boots must be replaced when the material is damaged to the extent that it no longer provides adequate protection or the steel toe cap becomes exposed, and when the tread on the sole becomes worn to the point where anti slip properties are lost, or the presence of cuts, cracks or punctures on the footwear which could result in a leak. When issuing new safety shoes/boots ensure the following:

- Have shoes fitted whilst standing and towards the end of the day.
- Properly and comfortably fitted footwear shouldn't need to be 'broken in'.

Types of Foot Protection						
				Safety shoes	Mid-cut lace-up boots (minimum 6 inches in height)	High-cut lace-up boots
				High-cut pull-on boots	No open-toed	Wellington boots
				Applicable Standards		
				<ul style="list-style-type: none">• BS EN ISO 20345• AS/NZS 2210• ASTM F2413		

3.16 10. Protective Clothing

Flame Retardant Coveralls (FRC) shall always be worn by personnel when they are in BGC process areas or areas where specific PPE is required (e.g. Warehouse).

- Flame Retardant coveralls must meet the BGC PPE Specifications, see following table
- All visitors, guests or any other personnel who will be inside the process area shall wear FRC. The host is responsible to obtain FRC for their Visitors/guests.
- FRC shall be worn as the outmost garment and no other clothing shall be worn outside the FRC, except when the requirements of the tasks stipulate wearing other personal protective equipment.
- Winter Jackets are the exception to this and may be the outermost garment during colder months. Winter jackets shall also be of Fire-Retardant Material.
- FRC should be the correct fit and should be worn properly fastened with the sleeves



- rolled down and fully zipped/ buttoned up.
- FRC should be clean and must not be allowed to become impregnated with hazardous materials or liquids. FRC should be replaced or repaired when torn or damaged to the extent that they do not cover the body as designed.

Type of body Protection	Applicable standards	Photo
One piece long sleeved inherent FRC (with reflector strips)	<ul style="list-style-type: none">• NFPA 2112• EN 340:2003• EN ISO 11612,• EN ISO 20471, 89/686/EEC	
Electrical Arc Flash suit	<ul style="list-style-type: none">• NFPA 70E• EN 1149-5:2008	
Apron (Welding and Impervious)	<ul style="list-style-type: none">• BS EN ISO 1161	<p>Welding Impervious</p>
Disposable coverall	<ul style="list-style-type: none">• EN 13982-1 (Type 5 for protection against airborne solid particulate chemicals)• EN 14605 (Type 4 for liquid spray-tight, Type 3 for liquid-tight)• EN 14126 (for biological protection)• EN 1073-2 (for protection against particulate radioactive)	



Chemical suits	<ul style="list-style-type: none">• BS EN 943	
Rainwear	<ul style="list-style-type: none">• EN 343• ASTM F2733 (for flame resistant rainwear)• ASTM F1891 (for arc & flame-resistant rainwear)	
High visibility vest	<ul style="list-style-type: none">• BS EN ISO 20471• AS/NZS 460• ANSI/ISEA 107	

3.17 PPE Disposal

PPE to be disposed as general or non-hazardous waste. Unless contaminated with hazardous substances, then dispose as hazardous waste. Below specifies when to replace the PPE.

Hand Protection:

- Visible signs of tears, cuts, punctures, split that expose finger, palm or areas between the fingers and flex points.

Head Protection:

Replace immediately after:

- Subjected to a heavy impact even if there is no visible sign of damage;
- Apparent damages (e.g. splits, cracks, distortion) and excessive discoloration;
- Usage of more than 3 years;
- Safety helmet exceeded its maximum replacement period as stipulated by the vendor, see guidance table below:
 - Refer to the stamp inside the helmet to determine the month and year of manufacture.
 - The year is the number in the middle, the arrow points to the number corresponding to the month.



Example – Hard Hat Manufacture date (March 2016)

Helmet Type	Time to Replace
ABS (Acrylonitrile Butadiene Styrene)	Max 5 years from manufacture date
Polyethylene or HDPE (High Density Polyethylene)	Max 5 years from manufacture date
Poly Carbonate (PC)	Max 7 years from manufacture date



Eye and Face Protection

- Broken frames, deep scratches, cracks, pitted lens or chemical deterioration of the lenses;
- Face shields are warped, deeply scratched or brittle with age;
- Headbands used in eye protection (e.g. chemical safety goggles) are broken or damaged.

Hearing Protection

Signs of damages during visual inspection (such as crack or chip) or deterioration to the cushions, linings and headband;

Respiratory Protection Equipment (RPE)

- When showing defect or not working;
- For gas filter/cartridge; when it becomes difficult to breath comfortably (i.e. particle filters become clogged);
- For gas or vapor filter/cartridge; when contaminants can be smelled or tasted;
- When filter/cartridge becomes visibly contaminated and physical damage occurs.

Self-Righting Personal Floatation Devices (PFD)

- Visible signs of tears, damaged straps or buckles, extensive discoloration, missing accessories;
- Buoyant material shrinkage, hardened, permanently compressed, waterlogged or oil soaked;
- When inflatable PFD has been inflated or where in doubt on its serviceability.

Coverall/ Body Protection

- Extensive discoloration, torn or frayed, open seams which expose body parts;
- Large hydrocarbon/chemical stains that cannot be washed out.

Foot Protection

- Soles are torn/worn out significantly, excessive deep cut to the leather or toecap protection exposed.

4 References and Resources

Relevant WMPs

- #13 Hazard Identification
- #16 Hot Work
- #25 Permit to Work
- #32 Safety Signs & Barricades

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	BGC Operations HSE Manager	31-03-2022	Retained on sign-off form



Work Management Procedure

#27 Safety Signs & Barricades

1 Overview and Hazards

- 1.1 The purpose of this WMP is to describe the installation and maintenance of barricades, flagging and warning signs.
- 1.2 A barricade is defined as a system designed to warn of a hazard and physically identify the Hazard's parameters. Barricades (also referred to as barriers) can be "soft" or "hard", depending on the intended use and the nature of the hazard being protected. This WMP outlines the requirements for soft barricades, hard barricades, as well as signage which must be used in conjunction with barricades. All BGC staff and contractors shall be aware of the types of barricades used within the BGC assets and are responsible for respecting the barricades as well as following the conditions set within this procedure.



Relevant Life Saving Rules and Process Safety Fundamentals



2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the Hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate signs, barricades and controls have been selected.
- 2.2 Confirm what approvals, documentation, **Permit-To-Work (PTW)**, **Job Hazard Analysis (JHA)**, **ToolBox Talk (TBT)**, etc, is needed and who will check it is done before the work starts. Follow WMP #25 PTW.
- 2.3 Where potential Hazard may exist in the work location (e.g. excavations): Do a risk assessment to assess potential harm to workers and/or mobile equipment and determine the controls needed for physical barricade using wood, concrete or metal guardrails, see WMP #13 Hazard Identification.





A tag or sign shall be attached or posted on the barricade with the following information:

- Hazard;
- Supervisor responsible for the area;
- Other warnings (as described in this procedure).

- 2.4 Rotating equipment with a swing radius (counterweight) requires hard or soft (red barricade only) as an imminent danger area. Before activities start, these barricades shall be installed a minimum of one meter from any part of the crane or other piece of equipment.
- 2.5 Signs, barricades and warning tape must be:
- reinstalled and/or replaced when damaged or illegible;
 - removed once the job has been completed and the area(s) deemed safe for work.
- 2.6 All emergency exits, passageways, fire doors, first aid stations, eye wash stations and emergency muster points shall be identified and visible using safety signs. The sign must have green background with white symbols, borders or writing that is preferably of a reflective material.



- 2.7 Warning signs must be erected and displayed for fire hazards, electrical equipment, openings, overhead working, noisy areas, utilities, overhead power lines, and other hazards. The standard for these shall be a yellow background with black symbols, borders or writing that is preferably of a reflective material.



- Mandatory signs must be provided in order to identify the use of personal protective clothing and equipment and providing specific instructions appropriate to the task or condition. The standard for these must be a blue background with white symbols, borders or writing that is preferably of a reflective material.



- 2.9 Signs Shall be displayed for restricting access or entry, no smoking areas, no parking, and any other unauthorized acts. The standard is a red prohibition symbol to overlay prohibited act on a white background.



- 2.10 Fire signs must be provided at areas where fire equipment has been sited (i.e. fire extinguishers, fire hydrants/points, fire blankets, etc.). The standard for these is a red background with white symbols, borders or writing that is preferably of a reflective material.





3 Do The Work

Types of Barricades

3.1 Wooden Guardrails (Minimum Requirements)

- The top rail of at least 38mm x 89mm (thickness x width) board must be arranged such that the top of the board is between 920 mm and 1070 mm above the base of the guardrail from the floor or platform level;
- A mid-rail of at least 38mm x 89mm (thickness x width) must be located at the midpoint between top rail and floor or platform level;
- A toe board of at least 25mm x 140mm (thickness x width) must be used for floor holes, floor openings, or wall openings and must run the entire perimeter of the platform;
- The vertical support posts for guardrails must be at least 38mm x 89mm (thickness x width) with spacing not to exceed (2.4m).

3.2 Sub Metal Guardrails (Minimum Requirements)

- Metal handrail material for a guardrail must be (38mm) nominal size or larger for example scaffold pipe
- The top rail must be located between 920mm and 1070 mm from the top of the rail to the floor or platform level;
- The mid-rail must be (38 mm) nominal size or larger and located midway between the top rail and floor or platform level;
- A toe board made from 6 mm x 140 mm flat metal plate must be installed at the floor or platform level and must run the entire perimeter of the platform;
- Vertical support posts must be (38mm) nominal size or larger and located at distances not to exceed (2.4m).



3.3 Road Barricades (Minimum Requirements)

- Barricades across or next to a roadway will be semi-permanent wooden barricades and signs, or equivalent (i.e. Concrete Jersey barriers);
- Retro-reflective tape will be required at barricades left after dark to alert vehicle traffic to their presence.

3.4 Radiography Barricading (Minimum Requirements)

- The radiography work area will be barricaded using radiation flagging;
- All entries and exits will be blocked and warning signs posted at the barricaded areas;
- Personnel will not be allowed to enter the barricaded area unless escorted by a member of the radiography crew;
- The proper distance from the barricade to the radiation source shall be determined and marked by the competent Radiation Protection Supervisor.





3.5 Hydrostatic Pressure Testing

- Yellow/Black barricade (warning) tape will be used to identify areas where equipment or piping is being hydrotested;
- The distance from the pressure tested equipment or piping to the barrier will be determined and marked by the Hydrotest Technician.



3.6 Pneumatic Pressure Testing

- Red/White barricade (personnel excluded unless permitted by technicians) will be utilized to identify areas where equipment is being pneumatic tested;
- The distance from the pressure tested equipment or piping to the barrier is determined by a precisely identified zone that will be included in a Pneumatic testing safety plan that will be developed for each case.

3.7 Hydrogen Sulphide (H₂S) Area Demarcation

H₂S areas are demarcated by yellow and black chain. It is forbidden to access these areas unless:

- Wearing an H₂S Area access pass;
- The required level of H₂S training for the job to be performed has been complied with in line with WMP #18 H₂S;
- Lines and equipment containing H₂S shall be identified by Purple label tape.

3.8 Flagging (barricade tape)

- Soft barricades should be approximately 1.0m high. Barricade tape shall not be tied to instrument lines, valves or other equipment that is in operation;
- Barricade tape will be of a colour or combination of colours that convey the appropriate level of Hazard;
- All personnel working inside the red taped/barrier must be signed on to one Task Risk Assessment Card (TRIC) or Job Hazard Assessment (JHA).

Barricade Tape	Example	Description
Yellow/Black		This type of barricade type serves as a caution to indicate to employees that a potential hazard exists. Employees may enter with permission from erector of this tape once the risks and identified controls have been fully understood and followed.
Red/White		This type of barricade type indicates DANGER and that a potential serious hazard may be present. No worker, other than those assigned to work inside a RED/White barricade, may enter without first obtaining permission from the erector(s) of the tape.
Red		This type of barricade type indicates DANGER (Radiation) and that possible exposure may be present. This barricade is considered an equal to Red/White. This colour is representative of x-ray work being performed. Signs must also be posted to protect areas where radiation operations are in progress.
Purple		Indicates ongoing commissioning activities. Only assigned work crew members are allowed to enter.



3.9 Installation & Maintenance of Barricades

- Personnel using barricading tape shall flag-off only the areas where the Hazard exists. Flagging-off too large an area interferes with other work. Remove the flagging when the work is complete or at the end of the shift once the area is made safe again, whichever occurs first.
- 3.10 Projected objects or guy wires shall be identified with high visibility markings/flagging at eye level and visible at regular intervals along the wire from ground or vehicle height.
 - 3.11 All flagging must be tagged identifying the supervisor's name, contact number, date and reason for its use.
 - 3.12 Information tags shall be attached in visible locations on all sides of a barricade
 - 3.13 The Supervisor responsible for the work area must ensure that the crew posts the necessary barricades, signs and tags so that it can be read from all potential access points. In the case of Red and White "Danger Do Not Enter" or radiation flagging, the Supervisor is required to visit the work area and authorize the installation of any such signage.
 - 3.14 The Person-in-Charge-of-Worksite (PICWS) initiating the work is responsible for erecting the barricades around the work area. A Supervisor must assign an employee the responsibility for maintaining the barricade.
 - 3.15 If the employee vacates the area, that employee should make sure that any remaining employees know who is now responsible for maintenance of the barricade.
 - 3.16 Barricades must completely surround the work area being protected. The work area shall be entirely isolated and identified. Permanent structures that prevent entry may be used as part of the barricade. The barricaded area must be of sufficient size to afford appropriate protection.
 - 3.17 A barricade must not block emergency equipment, such as plant fire extinguishers, safety showers, etc. Where this is not possible, approvals must be obtained from Emergency Response Department and an alternate plan must be initiated.
 - 3.18 The blocking of a fire door with a barricade is prohibited.
 - 3.19 Permanent barricades will surround permanent hazard areas.
 - Gates will be provided. Permanent warning signs should be used to adequately mark the hazard;
 - Locks will be installed if the area is deemed a high hazard area
 - Permanently barricaded areas that use 'hard barriers' shall have an emergency exit appropriate to the maximum occupancy of the enclosed area on all side of the enclosure;
 - Where these are locked no person shall enter the area until such time as all exits are unlocked and available for use by those entering the hazardous area
 - 3.20 Signs and barricades shall be highly visible.
 - 3.21 **Site Perimeter and Access Points / Signs**
Signs will be mindfully placed in prominent locations to warn against hazards, or in combination with barricade tape/fencing. All signs and tags must always be legible and kept in good condition.



- 3.22 All safety signage shall be in accordance with ISO3864-1 Graphical symbols — Safety colours and safety signs —Part 1: ‘Design Principles for Safety Signs in Workplaces and Public Areas’.
- 3.23 Where practical, fencing and signs will be erected to address concerns in construction areas. The following are examples of signs that can be used at such locations:
- Authorized personnel only;
 - High voltage;
 - Working overhead;
 - Swing areas;
 - Road closures / detours;
 - Pedestrian walkways;
 - Hard hats / safety footwear required;
 - Eye protection required;
 - Hearing protection required;
 - All personnel report to Security;
 - Speed limits;
 - Construction vehicles;
 - Open excavation.



- 3.24 If the area is designated as hazardous for work, open excavation, etc. it must be well illuminated for visibility during the hours of darkness.

4 References and Resources

Relevant WMPs

- #13 Hazard Identification
- #16 Hot Work
- #23 Isolations
- #25 Permit to Work
- #27 Personal Protective Equipment

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	31-03-2022	Retained on sign-off form
Custodian	HSE Risk and Assurance Lead	31-03-2022	Retained on sign-off form



Work Management Procedure

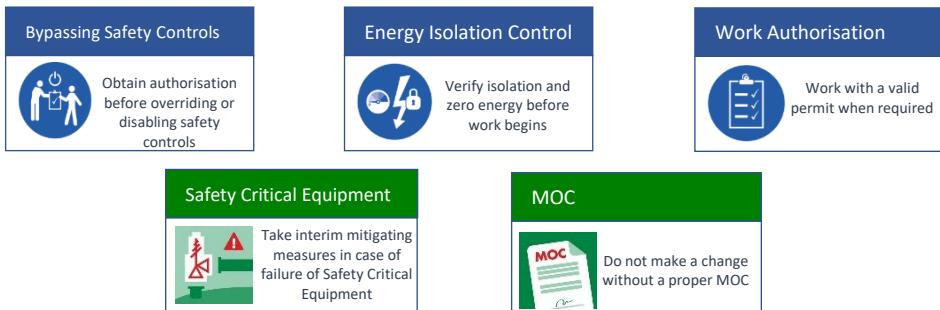
#28 Safety System Isolation & Override Control

1 Overview and Hazards

- 1.1 BGC depends on an operating safeguarding system to ensure the safe operation and maintenance of assets. Sometimes, during maintenance, functional tests, equipment calibrations, and process start-up and stabilization activities, it is required to override a part of the safeguarding system.
- 1.2 Before requesting for an override, it is very important to understand that overrides are only permitted when the production process is being operated within the design envelope. **Safety Critical Equipment shall NOT be overridden** to resolve upset conditions (trips or automated shutdowns). In this case, use stabilize, slow down, shutdown steps as needed.



Relevant Life Saving Rules and Process Safety Fundamentals



- 1.3 At all times, BGC process safeguarding systems, fire & gas systems and equipment shall only be overridden, isolated or inhibited by authorized BGC personnel once authorization is obtained and the activity will be executed with an approved **Permit-To-Work (PTW)**.
- 1.4 The contractor's safeguarding systems on equipment (i.e. portable air compressor, diesel generator, chainsaw, grass cutter, etc.) used on a BGC operated facility and infrastructure shall only be overridden / isolated with authorization from the BGC Permit Authorizer. If a safety system is isolated or an override is installed and you are part of the process, the following questions should be answered during the risk assessment:
- What device is/will be unavailable?
 - What hazard is the device protecting against?
 - What is the reason/driver for the override?
 - Are there any other impaired barriers in the system? Can these be restored prior to the imposition of the override?
 - What alternative layers of protection/ barriers will be relied on as mitigation including other permanent or temporary devices, existing or temporary procedures, authority, competence, oversight, interventions/ practices?
 - What checks are required to ensure that there has been no degradation of plant and that the condition is as expected (i.e. mitigation plan)?





- How long will the device be unavailable for? How can the duration be reduced? Is there a work request to ensure proper prioritization against the other process safety risks in place?
- What will be done to prove that the override is effective?

2 Roles and Responsibilities

The BGC override process is shown in figure 1. In this section the key roles are detailed including responsibilities and interfaces.

(Control Room) Operator / Maintenance Coordinator:

- Identifies the need for an override to ensure safe and efficient execution of operations and maintenance tasks, equipment malfunction or start-up and indicates this need to the Shift Engineer;
- Supports the Shift Engineer to prepare the temporary eMOC (see WMP #22 MOC) or overrides certificate (Appendix 1) and identifies the risks and mitigations associated with applying the override. Records any new overrides in the shift handover and control room shift log.



Shift /Site Engineer or delegate

- Is the owner of low risk overrides;
- Requests override as per this WMP;
- Coordinates the review, approval and installation or removal of the override;
- Engages reviewers and approvers in the way that he deems appropriate this can be by phone, email, Skype or face-to-face;
- Prepares, applies and signs off override tag labels;
- Is responsible for follow-up of mitigating actions;
- Updates the Overrides Register or ensures that the eMOC (see WMP #22 MOC) entry is printed and placed in the override folder once approved;
- Mentions new and changed overrides in the shift handover and records them in the shift report;
- Performs weekly checks on the status of existing overrides and applies for removal or extension when required;
- Must be involved in all JHA risk assessments related to overrides.

PICWS or workers

As the PICWS or anybody who is reporting to you SHALL NOT isolate/override/inhibit or “defeat” any safety equipment within BGC premises unless you are authorized to do so. If you are PICWS (i.e. Instrument Engineer) who will be involved in placing the override, the following steps need to be followed when an override is placed or removed:



Placing an override:

Determine how the override needs to be installed for example:

- Jumper / remove contact or cable;
- Mechanical/ physical barrier;
- Software forcing;
- Inform the operational personnel involved about the override;



- Apply the override and check that it is functional;
- Tag the override.

Removing an override:

- Determine how the override needs to be removed;
- Check to make sure the instrument or unit is not in trip condition prior to removing;
- Inform the operational personnel involved;
- After authorization, remove the override (live testing is not advised as this will usually result in a trip);
- Remove tag.

3 Requirements

3.1 The BGC override process is shown in figure 1.

Multiple simultaneous overrides are only permitted with robust mitigation and controls in place (all on the same F&G loop or process system). It is permitted to request multiple overrides as a group (as one override) in the event of:

- Overrides for an isolation during unit or total plant shutdown;
- Flushing and purging operations;
- Pressure testing;
- Fire and gas testing;
- IPF testing;
- Penetrative maintenance routines.



In these cases, a copy of the eMOC print-out (see WMP #22 MOC) or override certificate (Appendix 1) shall or be attached to the applicable isolation certificate as per PTW process. If a **Manual of Permitted Operations** (MOPO) exists, this can be used as a reference during the risk assessment of multiple overrides.



3.2 When the use of a maintenance or operational override is mentioned in a TA2 approved maintenance or operating procedure (e.g. for preventive maintenance routines or start-up purposes), then there is no requirement for a separate override request.

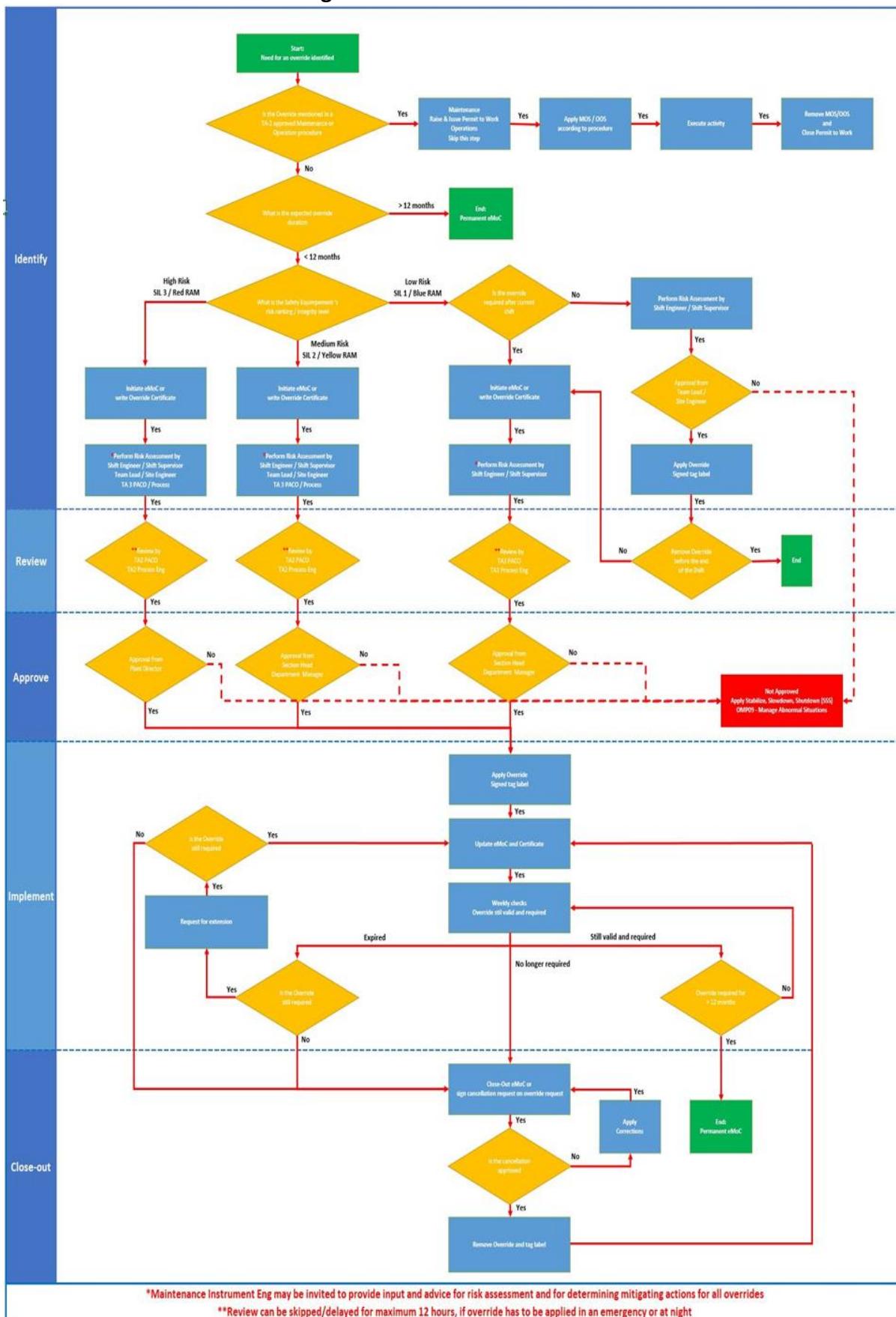
- Maintenance overrides shall be mentioned in an activity-based PTW and Job Hazard Analysis (JHA) for the job and are referred to as **Maintenance Override Switch** (MOS)



Operational Override Switches (OOS) shall only be used under direct supervision of the Section Head or delegate. These overrides have to be removed immediately after completion of a maintenance routine or successful start-up and may not be shift passing.



Figure 1 BGC Override Process





4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #23 Isolations
- #22 Management of Change

BGC ToolBox Talks, Communication Materials, Posters and Information

- BGC Override Certificate (Appendix 1)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	Asset Services Director	31-03-2022	Retained on sign-off form
Custodian	Deputy Plant Director NR NGL	31-03-2022	Retained on sign-off form



Appendix 1 BGC Override Certificate (paper based)

 شركة غاز البصرة Basrah Gas Company	Basrah Gas Company شركة غاز البصرة Override Certificate شهادة التجاوز	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Certificate Number</td> <td style="width: 50%;"></td> </tr> <tr> <td>رقم الشهادة</td> <td></td> </tr> <tr> <td>Tag Number</td> <td></td> </tr> <tr> <td>رقم البطاقة</td> <td></td> </tr> </table>	Certificate Number		رقم الشهادة		Tag Number		رقم البطاقة	
Certificate Number										
رقم الشهادة										
Tag Number										
رقم البطاقة										
Type of override نوع التجاوز	<input type="checkbox"/> Instrument Override * تجاوز الألات الدقيقة		<input type="checkbox"/> Safety Systems Override * تجاوز منظومات الامان							
Location/ الموقع		Unit/ الوحدة		Tag/ رقم المعدة						
Reason for override مبررات التجاوز										
Description of the override وصف التجاوز										
Risk Assessment (Description of the risks) تقييم المخاطر (وصف المخاطر)										
RAM Colour لون مصنفوفة تقييم المخاطر	<input type="checkbox"/> Light Blue / ازرق فاتح		<input type="checkbox"/> Yellow / اصفر							
	<input type="checkbox"/> Dark Blue / ازرق غامق		<input type="checkbox"/> Red / احمر							
Mitigation/ Action تقليل المخاطر / الفعل										
Override start date تاريخ بدء التجاوز		Override end date تاريخ انتهاء التجاوز		Extension end date تاريخ انتهاء التمديد						
Request by طلب بواسطة		Date/ تاريخ		Signature/ توقيع						
Reviewed by المراجعة بواسطة	TA-2 PACO (date + signature)		TA-2 Process Engineering (date + signature)	Deputy Plant Director (date + signature)						
Approved by الموافقة بواسطة		Date/ تاريخ		Signature/ توقيع						
Extension approved by موافقة التمديد بواسطة		Date/ تاريخ		Signature/ توقيع						
Cancellation Request by طلب الازالة بواسطة		Date/ تاريخ		Signature/ توقيع						
Cancellation Approved by موافقة الازالة بواسطة		Date/ تاريخ		Signature/ توقيع						

*: Tick the box for the type of override that applies:



Work Management Procedure

#29 Temporary Flexible Hose Assemblies

1 Overview and Hazards

1.1 This WMP is applicable for the use of temporary flexible hose assemblies. Hoses are considered as temporary when they are not a fixed part of the process equipment or portable equipment.

Examples of temporary hoses are: Spray painting hose, connection of air-powered tools and equipment, compressed gas cylinder hoses for supplementing construction use e.g. purging activity, utility hose to drain a vessel, chemical injection hose, instrument air hose, etc.



The following are not considered to be temporary hoses: Choke and kill hoses, bunkering hoses, braided machinery hose in machinery utility, machinery hose within vehicles or cranes, hoses within snuffing system cylinders, CO₂ hoses and fire water hoses

1.2 Hazards

The use of flexible hose assemblies presents the following hazards:

- Loss of containment of substances (fluid and/or gas) through imperfection, leaks at end connection or from the punctured body of the hose;
- Sudden release of energy i.e. ruptures, parting or sudden disconnection of the hose leading to personnel injury, asset damage and significant loss of containment;
- Hoses improperly run on site presenting tripping hazards or subjecting the hose to excessive stress or abrasion;
- Static electrical discharge in hazardous areas of the plant;
- Selection of the wrong hose for the intended use (e.g., hose not suitable for the service pressure, temperature or fluid).

Relevant Life Saving Rules and Process Safety Fundamentals

Line of Fire  Keep yourself and others out of the line of fire	Use of two Barriers  Always use 2 barriers for hydrocarbon and chemical drains & vents	Attendance  Do not leave an open drain or critical transfer unattended	High Risk Activities  For all defined high-risk activities, follow the procedures and sign off after each step
Work Authorisation  Work with a valid permit when required	MOC  Do not make a change without a proper MOC	Backflow protection  Perform MOC and install backflow protection when connecting utility to	



2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Ensure that the most appropriate controls have been selected.
- 2.2 Confirm what equipment certifications and specifications are needed and who will check them before the work.
- 2.3 Confirm what training is needed and who will check it has been done before the work.
- 2.4 Confirm what approvals, documentation, Permit-To-Work (PTW), Job Hazard Analysis (JHA), ToolBox Talk (TBT), etc, is needed and who will check it is done before the work starts. Follow WMP #25 PTW. 
- 2.5 Confirm supervision arrangements including any necessary support, including HSE Advisors, emergency response, gas testing, etc.
- 2.6 All flexible hose assemblies shall be physically tagged and identifiable by a unique number, traceable to a hose register that allow workers to recognize the specific services, identify and manage the associated risk accordingly. A flexible hose assembly shall not be used unless a valid tag is securely attached. The hose register shall be kept on site and accessible.
- 2.7 Each hose shall show a unique number, pressure rating, service rating and next test date clearly marked. Hose tests shall be done at a frequency of 1 year. In some cases, it shall be more practical to change out with a new hose after 1 year.

2.8 Hose Register

For BGC and contractor hoses, a hose register shall be maintained for each installation and shall contain the following information as a minimum:

- Unique Hose number;
- MOC Number (BGC only);
- Service Medium;
- Pressure Rating;
- Test Done;
- Next Test Date.

3 Do The Work

3.1 Pre-Use Checks





- 3.2 A flexible hose assembly shall not be used if there is visible sign of wear or damage to the hose surface, coupling or tag. In such cases, it shall be removed from service.

Hose Usage

Where hoses are used within maintenance activities, the hazard controls shall be managed within the work permit.

Do not subject flexible hose assemblies to pressures and temperatures above the specified maximum working pressure and temperature.

- 3.4 Flexible hose assemblies shall not be stretched, twisted or bent, kinked or used to support any load.

- 3.5 Avoid pulling over or along sharp objects and dragging over rough floors.

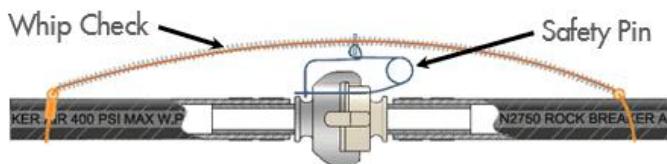
- 3.6 With a suspended hose, always take into account the loads on the hose and couplings subject to their own weight, distance and contents.

- 3.7 Cross connecting the hoses shall be controlled by the PTW system together with a Task Risk Assessment.



- 3.8 Hose assemblies shall be positioned, or barriered-off, to minimize the risk of accidental physical damage and shall be securely anchored-supported at each end and at regular intervals to prevent kinking and whipping in the event of failure. Where a hose shall cross a walkway, a suitable bridge shall support the hose. The crossing of escape routes and doorways, and the passage of the hose through doorways shall be avoided if practicable. The housekeeping of the areas shall be maintained at all times. Any live hoses can be identified by providing a "Live pressure hose" signage with red tape wrapping to alert personnel that the hose is live and in operation.

- 3.9 Hose connections using quick release couplings shall have locking pins and whip check safety cables fitted. Such couplings shall only be used to connect with couplings of the same type. Where the couplings are of the type specifically manufactured such that they cannot be disconnected under pressure, only a whip check shall be fitted.



- 3.10 A hose shall not be used on a pulsating pressure system unless there is clear manufacturer's evidence (e.g. certificate) that it is suitable for such service. In such cases, consideration shall be given to the hose /connection pressure ratings and the line shall be secured at close intervals to prevent whipping.

- 3.11 Hoses used to drain equipment shall never be left unattended. Two points of isolation shall be provided after draining is complete.



Where tools are connected to heavy hose assemblies, they shall be fitted with a lightweight leader hose. The leader hoses shall be at least 2 meters long, fitted with a swivel fitting on the tool connection and a hose coupling at the upstream end. This is to aid the operation of the tool and prevent the operator from needing to lift a heavy hose.





- 3.12 When a connection is made using flexible hoses between two objects which are not electrically bonded together, the hose shall be an anti-static type to avoid the accumulation of a static charge. Anti-static hoses shall not be connected in series in hazardous areas or in areas where flammable fluids are being transferred, unless each joint is individually earthed. In operations involving the use of two or more anti-static hoses in series, procedures shall be reviewed to ensure that appropriate earthing arrangements are made.
- 3.13 Should a hose assembly fail in service, it shall not be replaced like-for-like. It shall be immediately reported (to the line supervisor) to ensure root cause of failure is identified.
- 3.14 **Storage**
Hoses shall be depressurised, drained and flushed (if necessary) after use and prior to storage.
- 3.15 Any defects or damage that has occurred during use shall be reported to the responsible supervisor.
- 3.16 Hoses shall be stored in dry conditions and away from direct sunlight.
- 3.17 Depending on length and diameter, hoses may be stored horizontally in racks that support the hose along its full length, or loosely coiled.
- 3.18 Coiled hoses may be placed on hangers and stored in the vertical plane as long as the hanger does not cause the hose to be bent below its minimum bending radius.
- 3.19 When coiled hoses are stacked horizontally, ensure that hoses at the bottom of the stack are not crushed by the weight of hoses placed on top. Do not stow other objects on top of hoses.
- 3.20 **End Connections**
Flexible hose assemblies shall be supplied complete with end connections fitted.
- 3.21 End connections shall be securely attached to the hose by proprietary clamps or mechanically swaged.
- 3.22 The use of jubilee clips (shown below) to secure hose ends to fittings is prohibited.
- 3.23 Alternatively, heavy duty Oetiker clamp Series-167 as minimum made of SS316L grade could be used to secure hoses onsite.



- 3.24 End connections can be typically any of the following types depending on the service:



4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #25 Permit to Work
- #26 Personal Protective Equipment

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	Asset Services Director	31-03-2022	Retained on sign-off form
Custodian	Deputy Plant Director NR NGL	31-03-2022	Retained on sign-off form



Work Management Procedure

#30 Waste Management

1 Overview and Hazards

- 1.1 BGC will manage waste from its operation using a risk-based approach, demonstrating compliance, control, and a sustainable waste treatment solution.

Waste: Any substance or object which the holder intends or is required to throw away. Even if the substance or article is given to someone else to be reused or recycled, it is still legally considered to be waste if it is no longer required by the person who produced it.

- 2.1 **Hazards** of not following this WMP include:

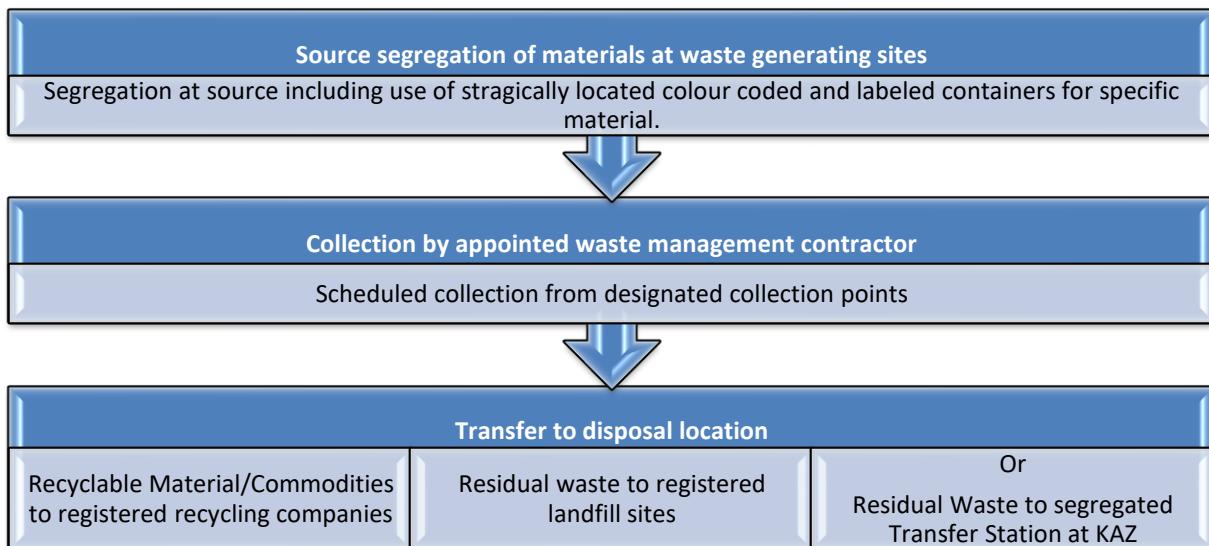
- Environmental harm;
- Potential ill-health effects to people;
- Reputational damage to BGC;
- Enforcement action by local or state authorities.

Relevant Life Saving Rules and Process Safety Fundamentals

None

2 Plan The Work

- 2.1 All staff and contractors are responsible for ensuring that waste generated as a result of their activities are disposed in accordance with the BGC waste management plan (approved disposal facilities) and that good housekeeping practice are observed.



- 2.2 All personnel involved in the storage, handling and disposal of waste shall be made aware of any hazards and risks involved, as well as the proper handling methods, risk controls and emergency responses.



- 2.3 BGC waste disposal is controlled by the **Waste Consignment Note (WCN)** (Appendix 1). All requests for waste handling and transport shall have a WCN.
- 2.4 Waste shall be properly segregated based on their disposal routes.
- 2.5 No waste materials from BGC activities shall be accepted at the waste facility unless the driver is carrying a copy of a completed and authorized BGC WCN which specifies the final disposal/treatment destination.
- 2.6 HSE Environmental Team shall be consulted if there is any uncertainty with the details of this procedure and/or if additional waste management training is required for the activity/location.
- 2.7 Waste management planning, including waste identification, storage, schedule and disposal is important to minimize the waste generation and optimize the reuse, reduce and recycling of waste.

3 Do The Work

3.1 Handling

- **Personal Protective Equipment (PPE)** shall be worn by everyone involved in the handling and transporting of wastes, see WMP #26 PPE.
- For hazardous waste handling (various chemicals), additional guidance on PPE is also provided in the relevant **Material Safety Data Sheets (MSDS)**. Refer to WMP #11 Handling Chemicals.

3.2 Training

- Personnel that handles waste shall be trained. This will include knowledge of this work procedure and of the details for proper handling of waste, waste minimisation, waste segregation and storage and waste documentation/WCN;
- Site Supervisors shall ensure that all personnel generating, and handling waste are aware of the hazards (for example as described on the MSDS sheet) and will be communicated to personnel through toolbox talks, team briefings and safety meetings.

3.3 Segregation

- Waste material shall be segregated at the source. This is to ensure the correct disposal for the waste stream;
- Hazardous waste not to be mixed with non-hazardous waste. There shall be a dedicated labelled bin for all types of identified waste;
- Recyclable waste (paper, wood, scrap metal, plastic etc) to be segregated from non-recyclable waste;
- Segregated recyclable waste from BGC locations shall not be mixed up with non-recyclable waste.

3.4 Storage

Waste containers (skip, drums) shall:

- Be labelled with correct information to clearly communicate the content;
- Be compatible with contents (refer to MSDS sheet for restrictions on container types and chemicals);
- Be in good condition;
- Be sealable where hazardous wastes are to be contained and be resistant to corrosion;



- Not be filled to more than 80% of volume capacity;
 - Be selected to promote recycling where possible (e.g., through colour coding).
- 3.5 The proposed colour scheme is as follows:
- Orange Containers = Hazardous;
 - Red Containers = Asbestos;
 - Yellow Containers = Clinical;
 - Black Containers = Mixed Residual Waste;
 - White Containers = Gypsum;
 - Grey Containers = Inert;
 - Blue Containers = Metal;
 - Green Containers = Wood;
 - Brown Containers = Packaging (including plastics and cardboard).
- 3.6 All waste storage areas should be designed and use such that:
- Equipped with spill containment/drip trays (for Hazardous Waste);
 - Hazardous and non-hazardous wastes are physically segregated;
 - Wastes are segregated by type (metals, plastics, etc) and so as to limit potential for chemical reactions;
 - Containers are labelled;
 - Containers are stacked no more than two drums high;
 - Warning signs are posted;
 - Spill kits (and trained personnel) are available;
 - MSDS to be provided for all chemicals;
- 3.7 Maintain good housekeeping. Refer to WMP #17 Housekeeping.
- 3.8 For chemical wastes, see WMP #11 Handling Chemicals.
- 3.9 Damaged waste containers shall be removed from service, repaired and labelling checked before use is resumed.
- 3.10 **Collection of Waste**
- Waste Sampling
- Laboratory analysis is done on some types of waste to determine waste characteristics to find the best disposal and treatment method. Typical waste streams that may require laboratory testing are as follows:
- | Waste Type | Analysis Required |
|--------------------------|---|
| Contaminated Soil | TPH & Moisture Content |
| Sewage water | Hydrocarbon content |
| Oil contaminated liquids | H ₂ S, Water content and Benzene |
| Insulation material | Asbestos |
| Molecular sieves | TPH, BTEX, PAH & Sulphur |
- 3.11 The activity owner shall consult with HSE Environment team on the required analysis, suitable sampling container and approved laboratory.
- 3.12 **Waste Disposal Form**
- Generators of waste are required to raise request on share point - Logistics Waste Management (at least 48 hrs. in advance) for transport and removal of waste.
 - Urgent request may be handled phone call followed up by a confirmation email.



- The WCN form shall be used by BGC employees and contractors, for waste transportation.
- Original hard copy of approved WCN is to be presented at the disposal location to gain entry.
- For some types of wastes, additional documentation shall be attached in the request before transport.

Waste Type	Supporting Document
Chemicals/Hazardous waste	MSDS
Hydrocarbon Contaminated Soil	Analysis Result hydrocarbon and water content
Mixed Waste	Photos, estimated quantity

3.13 Waste Management Facilities

Waste shall be consigned to only licensed 3rd Party facilities, approved by BGC. Licensed facilities are listed below:

Facility name	Waste Type
KAZ waste yard	Hazardous, Non-Hazardous, Recyclable & Nonrecyclable wastes
Basrah Refinery	Oily Liquids with Water content less than 15%
UQ	Asbestos
Zubair hospital	Medical waste
Zubair Municipal Landfill	Domestic waste, Inert waste
Ruck Co.	Lube Oil & Empty used drums
KAZ STP	Sewage

3.14 Spills or Loss of Containment

Mitigate any spills using spill kits and appropriate clean-up methods.

3.15 Ensure incidents are reported in SpheraCloud, see WMP #19 HSE Event Reporting, Investigation & Learning.

4 References and Resources

Relevant WMPs

- #11 Handling Chemicals
- #13 Hazard Identification
- #17 Housekeeping
- #19 HSE Event Reporting, Investigation & Learning.
- #25 Permit to Work
- #26 Personal Protective Equipment

BGC Checklists and Construction Site Safety Standard (CSSS) Forms

- BGC Waste Management Plan & BGC Go-No-Go Waste Facilities

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	Material & Transport Director	31-03-2022	Retained on sign-off form
Custodian	Waste Manager	31-03-2022	Retained on sign-off form



Appendix 1 'Waste Consignment Note'

Waste Generator Site/ موقع تولد النفايات: _____

Contact Name: _____ اسم مسؤول الموقع _____

Telephone:/ _____ رقم التلفون _____

Address:/ العنوان الوظيفي: _____

Email: _____

Waste Code يترك للوقت الحاضر	Waste Name اسم النفايات	Waste Source مصدر النفايات	Physical State (solid/liquid/sludge) حالة النفايات (صلبة / سائلة / صلخ)	Vol. M ³ الحجم بالماتر المكعب	Wt Kg الوزن	Container Type (drum / skip / bag / bulk) No. نوع الحاوية المستخدمة لنقل النفايات

شهادة مسؤول الموقع : اصرح بموجب ذلك ان البيانات اعلاه في هذه الاستماراة مذكورة بصورة صحيحة لاجل النقل وبصورة سلية

Generator Certification: I hereby declare the contents of this consignment are accurately described above and in all respects in proper condition for transport.

Generator المولد (مسؤول الموقع)	Name: الاسم:	Signature: التوقيع:	Date: التاريخ:
---------------------------------------	-----------------	------------------------	-------------------

Transporter #1 Company: _____ وسيلة النقل Means of Transport: _____

Contact: _____ نقطه اتصال Vehicle Registration #: _____ رقم تسجيل المركبة:

Address: _____ العنوان Driver's License #: _____ رقم رخصة القيادة:

Telephone / FAX: _____ / _____ رقم الكتاب المرجعي: _____ Author. Ref #: _____

شهادة الناقل : اشهد باستلام و ايصال المواد بصورة صحيحة وكما مذكور اعلاه

Transporter Certification: I acknowledge receipt and proper delivery of materials as described above.

Transport # 1	Name:	Signature	Date:
---------------	-------	-----------	-------

Transporter #2 Company: _____ Means of Transport: _____

Contact: _____ Vehicle Registration #: _____

Address: _____ Driver's License #: _____

Telephone / FAX: _____ / _____ Author. Ref #: _____

Transporter Certification: I acknowledge receipt and proper delivery of materials as described above.

Transport # 2	Name:	Signature	Date
---------------	-------	-----------	------

Destination Facility: _____ الجهة المقصودة طريقة الادارة: _____

Contact: _____ اتصال: _____ Author. Ref #: _____ رقم الكتاب المرجعي: _____

Location/Address: _____ العنوان Weigh Ticket #: _____ تذكرة الوزن: _____

Telephone / Fax: _____ رقم الهاتف: _____ Actual Weight: _____ الوزن الحقيقي: _____

Destination Facility الجهة المقصودة	Name: الاسم:	Signature: التوقيع:	Date: التاريخ:
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Transporters

Receiver



Appendix 2 'List of BGC Waste Categories'

Type of Waste and Category	Typical Composition	Risks to the Environment	Social & Health Risks
Non-hazardous May include potentially hazardous materials.	<ul style="list-style-type: none">• Solid domestic wastes and food wastes• Paper, cardboard, wood• Glass• Plastics• Air and water filters• Metals cans• Tyres, Scrap metals• Waste electronic and electrical equipment	<p>Uncontrolled waste dumping:</p> <ul style="list-style-type: none">• Contamination of soil, groundwater, and surface water due to leaching of detergents and toxic metals• Production of landfill gases through degradation of biodegradable fractions: food, garden paper, etc• Wind-blown dust and litter	<ul style="list-style-type: none">• Release of pathogens to environment• Nuisance; odours; Aesthetic degradation• Nuisance / Aesthetic degradation• Habitat for vermin – biological hazards, vector for disease
Hazardous	<ul style="list-style-type: none">• Chemical wastes• Contaminated drums• Fluorescent tubes• Batteries, Asbestos• Hydrocarbons - Waste oil & Lubricants• Contaminated soils• Fire equipment• Mole sieves• Oil filters & compressors• Pyrophoric material• Waste oil	<ul style="list-style-type: none">• Degradation of air quality (vapors and gases), especially during uncontrolled emissions and burning of such waste.• Contamination soil groundwater and surface waters via leaching• Degradation of ecosystems by acute and chronic exposure to contaminants	<ul style="list-style-type: none">• Chronic and/or acute exposure to toxic materials and pathogens
Medical (Clinical) Hazardous	<ul style="list-style-type: none">• Biological materials, including body parts, fluids, and excreta• Medical implements, including sharps, swabs, bandages, catheters etc.• Medications, lab equipment, chemicals, and radioactive materials	<ul style="list-style-type: none">• Degradation air quality from incineration of medical waste release of dioxins and furans. Long-term exposure to such pollutants may lead to chronic health effects	<p>Improper waste handling and disposal may lead to the following, especially if waste is being scavenged:</p> <ul style="list-style-type: none">• Contact with biohazard materials, such as contaminated sharps• Direct exposure to pathogens and viruses• Direct exposure to chemicals and radioactive materials• Indirect exposure to pathogens via leaching to water used for drinking, bathing, recreation and/or irrigation
Inert / Non-hazardous May include potentially hazardous materials.	<ul style="list-style-type: none">• Construction & Demolition:• Material waste: construction, demolition, clearing, reinforced concrete, cement blocks and topsoil	<p>Uncontrolled waste dumping:</p> <ul style="list-style-type: none">• Production of landfill gases through degradation of wood (methane and carbon dioxide) and hydrogen Sulphide (degradation of plaster board)• Wind-blown dust and litter	<ul style="list-style-type: none">• Asbestos-containing materials may cause respiratory diseases due to exposure to dusts (silicosis) and asbestos fibers (mesothelioma – a form of lung cancer)• Nuisance / Aesthetic degradation• Habitat for vermin – biological hazards, vector for disease



Work Management Procedure

#31 Work at Height (WAH)

1 Overview and Hazards

- 1.1 WAH is any activity where there is a risk of injury from falling or Dropped Objects where this a fall distance of 1.8 meters (6 feet) or more from any working level.



This WMP describes the requirements to prevent injuries from falls or dropped objects when accessing or working at height.

Work or access outside an approved fixed work platform equipped with fixed guard rails requires a WAH certificate and additional specific controls and equipment.

This WMP covers the requirements prior to, during and after the completion of any work involving access and working at heights on fixed structures, scaffolds, **Mobile Elevated Work Platforms (MEWP)**, ladders, delta decks or mobile and access towers.

Figure 1: Examples of Mobile Elevated Work Platforms



1.2 **Hazards include:**

- Falls from height
- Falls due to unguarded holes in floors such as hatchways, inspection holes and pits
- Dropped Objects



Relevant Life Saving Rules and Process Safety Fundamentals

Line of Fire

Keep yourself and others out of the line of fire

Work Authorisation

Work with a valid permit when required

Working at Height

Protect yourself against a fall when working at height

High Risk Activities

For all defined high-risk activities, follow the procedures and sign off after each step



2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the Hazards of the task and the location. A Risk assessment should be done in order to select the appropriate access method when involving Work at Height.
Any use of System mobile access towers (scaffold towers) requires approval from the respective BGC Scaffolding Asset/Project SME who will also advise on the appropriate training.
- 2.2 Apply the Hierarchy of Controls to ensure selection of most appropriate controls:
- Eliminate the need to WAH;
 - Work from a permanent work platform with guardrails and toe boards; conduct prefabrication work at ground level to reduce risk of Dropped Objects;
 - Work from a temporary work platform (scaffold) or mobile work platform with guardrails. Consider the Hazards of installing, operating or maintaining the work platform when deciding whether it is reasonably practicable; Introduce methods to prevent Dropped Objects from falling (e.g. safety netting, lanyards for all tools used at height);
 - Introduce control measures like barricading (see WMP #27 Safety Signs & Barricades), watchman to control access to barricaded area or housekeeping, see WMP #17 Housekeeping.
- 2.3 **Training & Competence**

Confirm what training is needed and who will check it has been done before the work.

Workers shall be trained in accordance with job requirements for WAH see Table 1.

Training certificates shall be registered in the HSE Training Passport.

Table 1 WAH Training Requirements

Training Required	Work Description
Working at height level 1	Every worker required to perform work more than 1.8m off the ground (even on a fixed platform)
Working at Height Level 2	Every person required to work above a height of 1.8 on a platform that may not have fixed guard rails, or may be exposed to temporary removal of guard rails, or may be working from a man basket or mobile elevated work platform
Working at Height Level 3	Every person involved with the erection of scaffolding
BGC ERD rescue at height/confined space course	Emergency response personnel expected to engage in confined space and / or rescue at height shall complete the BGC ERT rescue at height/confined space course.

2.4 Emergency Response

Develop a rescue plan to retrieve safely a person who has fallen from an elevated work surface and is suspended in a full body harness:

- Details of the equipment to be used for the rescue
- Configuration of the equipment for different types of rescues (e.g. self-rescue or mechanically aided rescue)
- Identification of anchor points where necessary.
- Limitations of the rescue plan for adverse weather (wind, Heat or Heat Stress).
- Consider the possibility of harness suspension trauma.



- Develop a rescue plan to safely lower MEWP using ground emergency controls per manufacturer requirements (when applicable).

2.5 Supervision

- Working at height is a high-risk task, so it requires close supervision. Even after the necessary training, the workers should be closely supervised to ensure that they are working in compliance to this WMP;
- Confirm supervision arrangements including any necessary support, including HSE Advisors, emergency response, gas testing, etc.

2.6 Scaffolding Design TG 20:13

All scaffolders shall comply with TG20:13, see Appendix 7.

2.7 Dropped Objects

Develop a Dropped Object prevention plan to include but not limited to:

- Limiting the risk of dropped objects by introducing engineering and process methods to prevent objects from falling (safety netting, lanyards for tools, approved tool bags which close on top);
- Establishment and effective demarcation of Drop Safety Zones;
- Housekeeping in line with WMP #17 Housekeeping;
- Barricading in line with WMP #27 Safety Signs & Barricades;
- Watchman to control access to barricaded area.

Figure 2 Dropped Object Prevention Plan Examples



Rescheduling task to ground level



Use of safety lanyards



Housekeeping

- 2.8 JHA should also review the potential of dropped objects during WAH and to assign methods for mitigating the Hazards associated with them.
- 2.9 The scaffold Supervisor shall conduct job site risk assessments and determine the site and material requirements and ensure a ToolBox Talk (TBT) shall be carried out.
- 2.10 A barrier shall be in place blocking access to the drop zone during activities on the scaffold including construction and removal.
- 2.11 In consultation with Operations ensure that all operated equipment are identified and suitably isolated, protected or access provided e.g. electrical cables, F&G detection system values and gauges.
- 2.12 Emergency access and egress walkways should not be blocked, or other temporary alternatives agreed.



3 Do The Work

3.1 Personal Fall Arrest

A fall arrest system minimally includes (A-B-C); Anchorage, Body support and Connecting device. The anchorage is normally a stable point where a connecting device is attached with the other end attaching to a lanyard and harness.



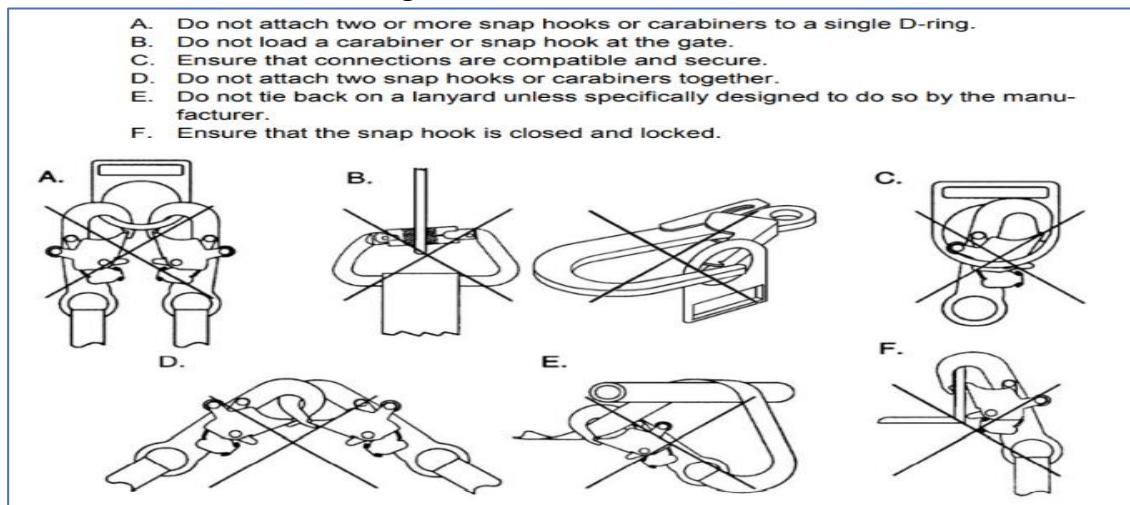
Figure 3 Personal Arrest System

- 3.2 Before use, workers must visually inspect fall protection equipment. Any deficiency found means works must be paused and the supervisor shall be informed, see checklist Appendix 1.
- 3.3 Fall protection equipment must be used only for worker protection and must not be used for the movement of materials.
- 3.4 Except for during erecting and dismantling scaffolds, anchorage points used for attachment of fall protection components shall be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 2,268Kg per person attached to it.
- 3.5 Anchor points shall not be used to anchor multiple lifelines.
- 3.6 Working alone while using a personal fall arrest system shall not be permitted.
- 3.7 Personal fall arrest systems shall not be attached to a guardrail system (e.g. gantry handrails) or to a hoist not designed for personnel lifts.
- 3.8 Fall arrest devices (inertia reels etc.) shall be placed directly above the worker to prevent pendulum falls. The maximum recommended deviation of the wire from the vertical is 30 deg. This means that the worker should always be working in a 60-deg. cone.
- 3.9 Lanyards, vertical lifelines, and body harnesses shall meet standards as per WMP #26 PPE. Except for working from MEWP, only shock absorbing lanyards shall be used. For work from MEWP, restraining harness shall be used and are mandatory immediately on entering the work basket.
- 3.10 Personal fall arrest systems and components subjected to a significant fall or full load shall be immediately removed from service and not used again until the equipment has been inspected and determined to be undamaged and suitable for reuse. However, lanyards subjected to a fall or load shall be immediately discarded and cut in two to prevent re-use.
- 3.11 Ropes and straps used in lanyards, lifelines, and strength components of body harnesses shall be made from synthetic fibers or wire rope.
- 3.12 Tie-off practices shall follow equipment design and manufacturer recommendations.
- 3.13 Tie-offs using a knot in a lanyard or lifeline shall not be used. Tie-offs where the line passes over or around sharp or rough edges shall be avoided.



- 3.14 When it is impractical to use a lanyard, a rope grab system can be used on a vertical lifeline.
- 3.15 When vertical lifelines are used, each worker shall be attached to a separate lifeline.
- 3.16 Horizontal lifelines shall be designed, installed, and used, under the supervision of the Area Engineer as part of a complete fall arrest system.
- 3.17 Dee-rings and snap hooks shall have a minimum tensile strength of at least 2,268 kg (5,000 pounds). They shall be purchased with certification showing proof-test to a minimum tensile load of 1,633 kg (3,600 pounds) without cracking, breaking or taking permanent deformation.
- 3.18 Non-locking type snap-hooks are prohibited. Snap hooks must be connected to suitable hardware and never be connected to another snap hook. Connectors shall have a corrosion resistant finish and all surfaces and edges should be smooth. Figure 4, below, shows examples of **INCORRECT** connections.

Figure 4: Incorrect Connections



3.19 Free Fall Distance & Swing Falls

Personal fall arrest systems must be selected and rigged to ensure that potential free fall distances will never exceed 1.8m.

- Total fall distance is the sum of free fall distance and deceleration distance;
- Dynamic elongation of the system (temporary elastic stretch of connecting components and subsystems) and the worker's height must be added to total fall distance and the user must allow for clearance;



- It is prudent to allow for an additional safety factor of 1m below the fallen worker's feet.

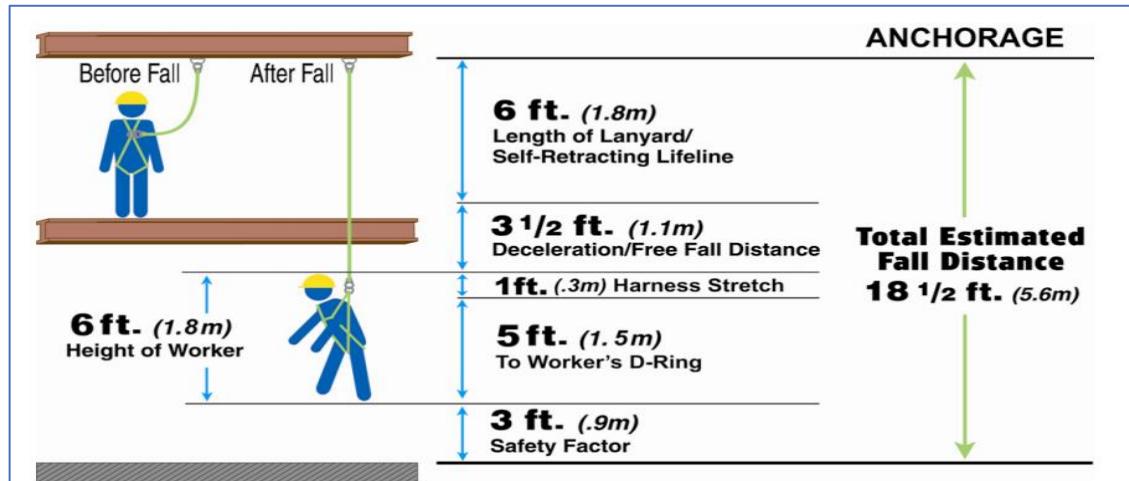
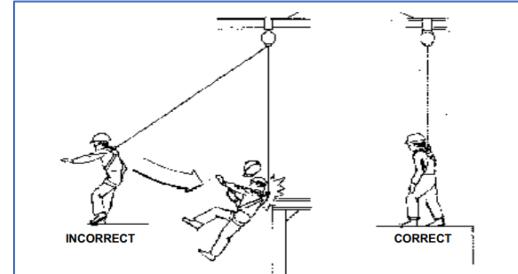


Figure 5 Free Fall Distance & Swing Falls

- 3.20 Swing falls can occur when the system is not anchored directly above the user. The force of striking an object in a pendular motion can cause serious injury. Always minimize swingfalls by working as directly below the anchorage point as possible.



- 3.21 Construction Site Safety Standard (CSSS) Checklist (Appendix 1) and '5 Ways to Stay Alive' (Appendix 2) can be used to communicate minimum requirements at the TBT, site engagements and assurance.

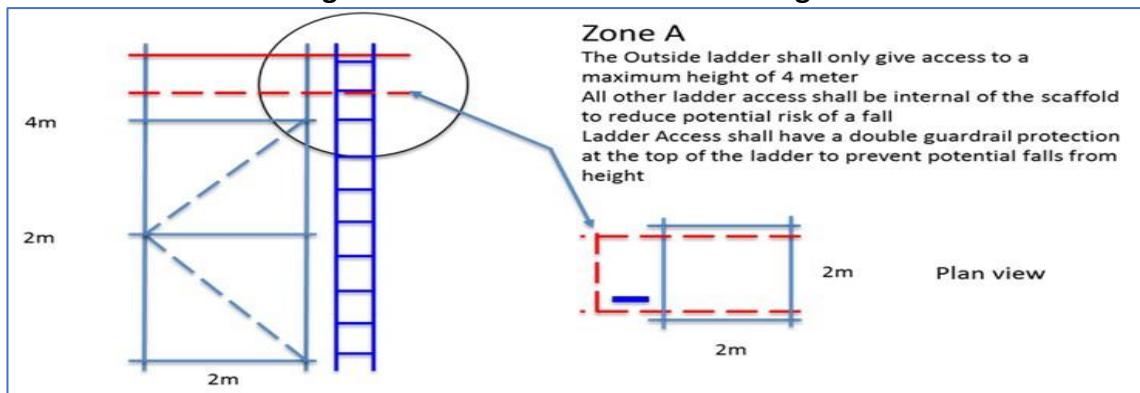
3.22 Scaffold & Ladders Access Points

- Ladders must be erected from a firm and level base (unless they are a fixed part of a mobile tower);
- All ladders must be securely fixed top and bottom to prevent movement and displacement;
- Ladders must be set a 4 to 1 ratio or 75° degrees where practicable;
- Ladders must extend a minimum of 1050mm above the working platform. Any opening (other than access points) shall be enclosed by means of guardrails / toe-boards to stop any potential risk of a fall or dropped objects;
- Where reasonably practicable ladders must be enclosed by means of double guardrails at the top of the access point that provides additional edge protection;
- The intermediate guardrail and toe board must be omitted on the inboard side adjacent to the ladder to permit clear access to the working platform. Swing gates are the preferred method of gaining access and egress from ladders;
- The access and egress point must not have a solid tube running through it;



- The Outside ladder shall only give access to a maximum height of 4m. All other ladder access points shall be on the internal of the scaffold to reduce potential risk of a fall.

Figure 6: Outside Ladder Access Configuration



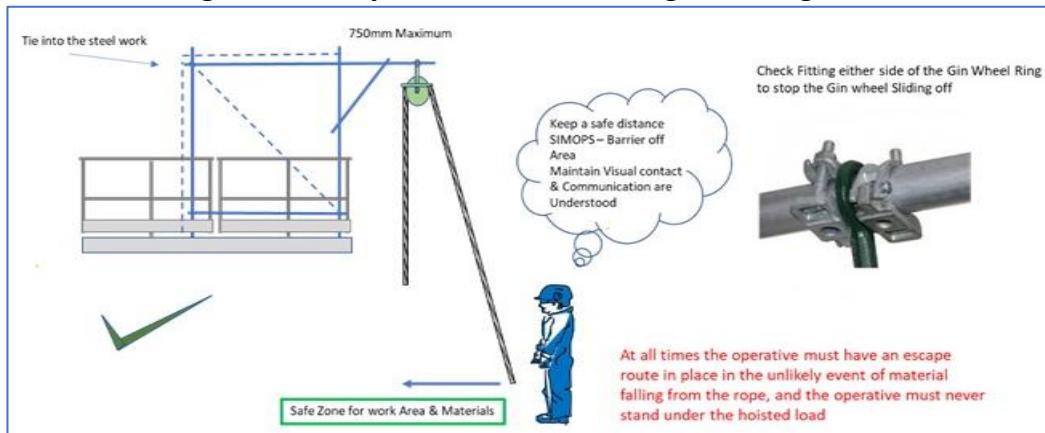
3.23

Use of Rope & Gin Wheel

- All persons shall be trained in the use of gin wheel & rope operations. (Gin Wheels should be installed by approved scaffolders and inspected per project scaffold inspection procedure?) Lesson Learned
- Carefully select a safe area where co-workers (SIMOPS) are not at risk, and barrier off an exclusion zone.
- The gin wheel horizontal supporting tube should be fixed with double couplers to 2 standards.
- Where a joint occurs on the inside standard between the supporting tube and the working platform a sleeve coupler should be spliced using a short tube & swivels above and below the sleeve coupler.
- The gin wheel must be suspended from its supporting tube no more than 750mm (2' 6") from the scaffold.
- A load bearing fitting is required each side of the gin wheel on the horizontal support tube.
- Remove any obstructions, e.g., transoms from route of travel of rope.
- Board – timber hitch.
- Tubes – rolling hitch.
- Ensure when lifting or lowering scaffolding materials by gin wheel and rope you use the correct Knots.
- Do not fix a gin wheel to a platform/plant handrails due to inconsistency or reliability of non-engineered handrails.
- Maintaining clear sight of work party members (ensuring good communication).
- The operatives involved in lifting operations must have clear sight of each other and maintain good communication always.

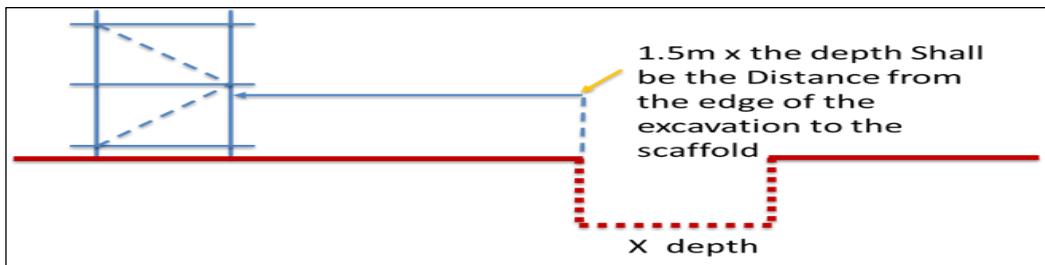


Figure 7: Gin Wheel Set Ups

**Figure 8: Safety Precautions For Using/Installing Gin Wheels**

3.24 Scaffolding and Excavation

Where scaffolds are required to be erected close to an excavation the minimum distance from the edge of the excavation to the closest edge of the scaffold structure should not be less than $1.5m \times \text{depth of excavation}$. Any deviation from this standard shall be subject to Civil TA review / approval.

Figure 9: Minimum Distances

3.25 Scaffolding Ties

- Ties shall not be removed or modified without firstly contacting the BGC Scaffolding department's leads.
- Beam clamps or grave-locks shall be used in pairs tied to steel work.



3.26 Scaffolding Modifications

- All scaffolding modifications shall be undertaken by competent and trained scaffolders.
- During modifications to scaffolding the green insert shall be removed and the red tag scaffold holder "Do Not Use" shall remain in place until the modifications are completed.
- Once the modification has been completed the scaffold shall be re-inspected. If in good order the green tag shall be re-signed, updated, and recorded in the scaffolding register detailing the modifications. Scaffolding contractors are fully responsible in ensuring their scaffolding registers, Inspection records and documentation is updated by the end of every working shift.

3.27 Scaffolding in Electrical Substations or Near Over-headlines



- Plan the work and confirm dates/time with BGC Electrical Authority (SAEP) before work start;
- Any damage shall be reported to the BGC Electrical Authority (SAEP) and work shall stop until confirmation to continue by the BGC Electrical Authority.

3.28 Scaffolding Inspection

- All scaffolding shall use a tag type tagging system. A “DO NOT USE” tag (typically RED) is used for restricting access by scaffolders only until the scaffolding has been inspected and handed over for use.
- The green tag shall be completed and located at all the access points by the competent scaffolding personnel to validate scaffold for use.
- Inspection of scaffold shall take place at least every 7 days or after any event likely to have affected the scaffold’s stability and recorded in the scaffold register. The tag type insert will also be updated to record the inspection.
- Fall protection equipment is not required when working on green tags scaffolds.
- All personnel must wear fall protection and 100% tie off when erecting and dismantling of scaffolding.



3.29 Any work on an incomplete scaffold or requiring a work location outside the guard rail of a completed scaffold shall require fall protection and 100% tie-off. Do not remove the Green Tag unless it's for safety. Inform the Scaffolding Lead or Scaffolding Inspector immediately.

3.30 Working Over Water

- Always have a person on lookout to raise the alarm and provide assistance;
- Train all workers that may work around water on “Man overboard” procedures;
- Always maintain good housekeeping practices around the leading edge of the dock;
- Require any worker working on docks or other equipment/working surfaces unguarded by proper handrails to wear approved personal flotation devices (PFD's);
- Provide throwable flotation devices at 16m intervals in areas work is near water;
- Install proper barricades/signage to prevent workers from falling into the water where needed, as determined by risk assessment.

3.31

- **Do not** allow workers to enter the water unless they are a diver that is to perform approved work or if an abandon platform order is given;
- **Do not** allow workers to run on walking/working surfaces around water;
- **Do not** allow any worker to work alone when around water - Buddy System;
- **Do not** leave the workplace untidy, finish the job with proper housekeeping;
- **Do not** allow workers to stand on handrails;



- **Do not** allow workers to work off of ladders at or above 2m, within 2m of handrails near water without proper fall protection and a personal flotation device.

4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #13 Hazard Identification
- #17 Housekeeping
- #25 Permit to Work
- #26 Personal Protective Equipment
- #27 Safety Signs and Barricades

BGC Checklists and Construction Site Safety Standard (CSSS) Forms

- Inspection of Fall Arrest Systems (Appendix 1)
- CSSS Checklist 'Work at Height' (Appendix 2)
- CSSS Checklist 'Scaffolding' (Appendix 4)

BGC ToolBox Talks, Communication Materials, Posters and Information

- '5 Ways to Stay Alive - Work at Height' (Appendix 3)
- '5 to Stay Alive - Dropped Objects' (Appendix 6)
- Scaffold Designs TG 20:13 (Appendix 7)

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	Asset Services Director	31-03-2022	Retained on sign-off form
Custodian	BGC Scaffolding Supervisor	31-03-2022	Retained on sign-off form



Appendix 1 Inspection of Personal Fall Arrest System Checklist

Component	Conditions or fault to be checked	Check
Webbing	<ul style="list-style-type: none">• Cuts or tears• Abrasion damage especially where there is contact with hardware	
Snap hooks	<ul style="list-style-type: none">• Distortion of hook or latch• Cracks or forging folds• Ware & tear at swivels and latch pivot pin• Open rollers• Free movement of the latch over its full travel• Broken, weak or misplaced latch springs (compare if possible with a new snap)• Free from dirt ingress or other obstruction (e.g. rust)	
D-Rings	<ul style="list-style-type: none">• Excessive ‘vertical’ movement of the straight portion of the D-ring at its attachment point on to the belt, so that the corners between the straight and curved sections of the D become completely exposed Note: Excessive vertical movement of the D-ring in its mounting can allow the nose of larger snap hooks to become lodged behind the straight portion of the D, in which position the snap hook can often accidentally ‘roll out’ of the D under load• Cracks, especially at the intersection of the straight and curved portions• Distortion or other physical damage of the D-ring Excessive loss of cross-section due to wear	
Buckles & adjusters	<ul style="list-style-type: none">• Distortion or other physical damage• Cracks and forging laps where applicable• Bent tongues• Open rollers	
Sewing	<ul style="list-style-type: none">• Broken, cut or worn threads• Damage or weakening of threads due to contact with heat, corrosives, solvents or mildew exposure	



Appendix 2 CSSS Checklist 'Work at Height'

NOTE: Although Construction Site Safety Standard (CSSS) materials are used by BGC Projects Department, they can also be utilized by other departments as appropriate.

Location		Sub Location		
Se r	Standardization Requirement	Yes	No	Actions required/Date/ Action Party
1	Has a competent person inspected fall protection equipment and ladders before use?			
2	Has everyone working at height been trained in the use of fall protection equipment?			
3	Is there a fall protection plan in place and have emergency response procedures been tested with drills to ensure effectiveness?			
4	Chain/rope ladders are not used (unless all other means of access are not possible or pose a greater risk)!			
5	Are suitable fall arrest systems in use for the height of work being conducted?			
6	Are harnesses and any fall arrest system certified, in date for inspection and inspected before use?			
7	Are all openings/covers secure and capable of supporting double the expected load?			
8	Is 100% tie off protocol in place when individuals are working outside a protected area or exposed to a fall of greater than 1.8m or working next to gaps/openings.			
9	Tie off/Anchor points are above the work activity? (Only exception during scaffold erection)			
10	Are lanyards/self retracting lines attached to anchor points that can hold 2,268kg, and is an approved tie off point?			
11	Are all openings/covers secure and capable of supporting double the expected load and are suitably labelled 'Hole Cover'. If a hole/opening cannot be covered is it suitably cordoned off?			
12	Do scaffolds, mobile work platforms and equipment for lifting people meet internationally recognised standards?			

Completed by:

Date:

Signature:



Appendix 3 '5 to Stay Alive – Working at Height'

WORKING AT HEIGHTS



Rescue Plan
Ensure a fall protection rescue plan is in place and has been practised prior to working at height.

Life-Saving Rule**Working at Height**

Protect yourself against a fall when working at height

**2**

Wear a Safety Harness
Fall arresting systems must consist of a full body harness and dual personal self retracting lanyard or dual shock absorbing lanyard.

3

100% Tie Off
Tie off with at least one lanyard is required 100% of the time when exposed to a fall of 1.8 meters (6 feet) or more and must be attached to an approved overhead anchor point.

4

Attach your Tools
Identify and manage potential hazards for dropped objects using tool lanyards and a tool pouch.

5

Barricade Below
Ensure that the area below is barricaded off with red danger tape and tags with information about the hazard, duration of the work and person responsible.

Comply
with the standards

Intervene
when you see something wrong

Respect
your co-workers





Appendix 4 CSSS Checklist - Scaffolding

NOTE: Although Construction Site Safety Standard (CSSS) materials are used by BGC Projects Department, they can also be utilized by other departments as appropriate.

Location:		Sub Location:		
Ser Standardisation Requirement		Yes	No	Actions required/Date/ Action Party
1	Do scaffolds and access ways conform to international standards?			
2	Are scaffolds erected, altered and dismantled by competent certified persons?			
3	Is there a scaftag system in place (any scaffold without a tag considered to be red tagged) ?			
4	If a scaffold is considered incomplete, unsafe or being modified is the tag for the specific section removed and given to responsible person?			
5	Are all gaps closed on work platform to prevent items falling?			
6	Scaffolding that have dropped object potential have area below cordoned off or have netting on side rails?			
7	Are protruding objects into the scaffolding highlighted and suitably protected?			
8	Are scaffolding erection/dismantling activities suspended during inclement weather and lightening?			
9	Does ladder access protrude at least 92cm above landing platform. Is there a suitable barrier/swing gate at entry to platform?			
10	Are swing gates/barriers used on fixed ladder entry points?			
11	If ladder extend for more than 6m is a self-retracting lifeline installed?			
12	Are landing platforms fitted every 6m? (if required)			

Completed by:

Date:

Signature:



Appendix 5 CSSS Checklist - DROPS

NOTE: Although Construction Site Safety Standard (CSSS) materials are used by BGC Projects Department, they can also be utilized by other departments as appropriate.

Location:		Sub-Location:		
Ser	Standardisation Requirement	Yes	No	Actions required/Date/Action Party
1	Has a risk assessment identified the need for the worksite to develop a Dropped Object Prevention Plan?			
	If so, does the Plan contain the following?			
2	Identified responsible person(s) to manage the dropped object prevention plan and manage learnings and improvements?			
3	Potential dropped objects are identified, mitigating controls are established, and coaching/training is included and conducted as part of the pre-job JHA/toolbox talks?			
4	Materials and or equipment to prevent dropped objects (lanyards, netting, barricades, material bags, floor fabric, overhead protection, no-entry exclusion zones, tool pouches, chin straps, toe-boards, etc.) shall be provided by the contractor/subcontractor. Such materials shall be maintained according to manufacturer's specifications.			
5	Self-assurance through audits, inspections, hazard hunts			
6	A process in place to capture and share learnings from dropped object incidents. All incident reporting and investigations shall use the DROPS.org dropped object incident calculator.			



Appendix 6 '5 to Stay Alive – Dropped Objects'

DROPPED OBJECTS



Lift Plan – JSA –
Toolbox Talk Plan carefully to reduce the potential for dropped object incidents.

Life-Saving Rule**Safe Mechanical Lifting**

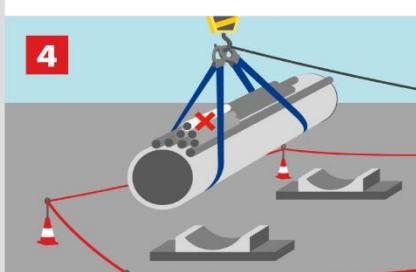
Plan lifting operations and control the area

**2****Tool Lanyard & Tool Pouch**

Ensure tools are secured by a lanyard and all small objects are placed in a tool pouch.

3**Adequate Barricading**

Ensure the proper barricading is in place for the specific hazard.

4**Hazard Hunts – Inspection of Lifting Appliances**

Before making a lift, ensure a hazard hunt for dropped objects has been completed.

5**Housekeeping – Clean Up**

Be sure the work area is clean and all loose items are secure prior to leaving.

Comply

with the standards

Intervene

when you see something wrong

Respect

your co-workers





Appendix 7 Scaffold Designs TG 20:13

BGC Scaffolding - Load Classification for Scaffolding Design TG20 – Bay Sizes					
Load Class	Max Standard Spacing Width	Max Standard Spacing Length	Max Lift Height	Load kg/m2	Maximum Number of Boarded Lifts
Very Light Duty	1.2m	2.4m	2m	75	One Full work lift boarded & one 50% working lift Boarded
Light Duty	1.2m	2.4m	2m	150	One Full work lift boarded & one 50% working lift Boarded
General Purpose	1.2m	2m	2m	200	One Full work lift boarded & one 50% working lift Boarded
Heavy Duty	0.9m	1.8m	2m	300	One Full work lift boarded & one 50% working lift Boarded
Special Purpose	Covers - Handrails / Habitats / Roof Resign / Anything out side of the above. Design scaffold structures Lifting frames & support scaffolding.				
It is a requirement of BGC Scaffolding Procedure that unless a scaffold is assembled to a generally recognised standard configuration, TG20 for tube and fitting scaffolds or similar guidance from manufacturers of system scaffolds, the scaffold should be designed by bespoke calculation, by a competent person, to ensure it will have adequate strength, rigidity and stability while it is erected, used and dismantled.					



Appendix 8 Mobile or Access Tower Inspection Guidance Check List

BGC - PASMA - Mobile or Access Tower Inspection Guidance check sheet			
No	Inspection list	Yes	No
Pre; checks Materials			
1	Check if the Mobile or Access Tower conforms to EN1004.		
2	Are all the Components inspected for damage and available for use?		
3	Are all components correctly stored in stillage's?		
Pre; Check Job Hazard Analysis (JHA) Risk Assessments (RA)			
1	Has the Job Hazard Analysis (JHA) Risk Assessments (RA) Been Completed.		
2	Check the BGC permit to work on site.		
3	Is the Working at Height Rescue plan in place in case of any emergency?		
Pre; Electrical site checks			
1	Inspect the work site and ensure the Mobile or Access Towers are free from over-head electrical power lines or electrical switch boards.		
2	Has the shift supervisor and Electrical Authority been informed of Mobile or Access Tower being erected or dismantled in Switch rooms, or at over-head electrical lines.		
3	Has the work scope been reviewed with the Electrical team, are the Isolations in place to removal or mitigate the electrical hazards in accordance to BGC Electrical Safety Rules (ESR).		
4	Check the work parties are Not working on scaffolding structures in the vicinity of energized (live) Over-head-lines or switchgear.		
Checks; Foundation / Ground conditions			
1	Has the Mobile or Access Tower been Assembled on firm/solid and level Ground? is the SBD to Height ratio less than 3:1 outside and 3.5 to 1 inside YES Safe to Use		
2	Check Foundation / Ground conditions after wet weather.		
Erecting or Dismantling Mobile or Access Tower by preventive measures Working at Height			
1	Are all the employees trained to PASMA certification?		



2	Has the BGC Scaffold Coordinator & L&D have copies of training certificates		
3	Is the team working on fully boarded platforms?		
4	Is the team working behind handrails?		
5	Is the team using Advanced guardrails?		
6	Are the team positioning themselves to the PASMA safe working at height practices avoiding falls from height?		
7	Are the components being lifted or passing within the tower base?		
Weather Conditions			
1	If the wind speeds above 17 mph (Must STOP Working on Mobile or Access Tower.		
2	If the wind speeds above 25 mph then the mobile access tower must be properly tied and secured.		
3	If the wind speeds above 40mph, then the mobile access tower must be dismantled.		
Working Platform			
1	Is the working platforms shall be fully boarded.		
2	Are Tripping hazards or obstructions removed from the area?		
3	Has the Working lift shall have double Handrail with Toe-boards.		
4	Is the minimum toe board height of 150mm is required.		
5	Is the Access and Egress kept clear free from Hazards?		

References

- BGC Scaffolding Technical Data with Design Drawings & Calculations.
- BGC Scaffolding procedure dated 2020 (No: 0000-BGC-G000-GE00-G00000-HX-6180-00013)
- BGC Scaffolding Procedure.
- Technical Guidance -TG20:13
- Scaffold Guidance - SG4



Work Management Procedure #32 Work Near Overhead Lines

1 Overview and Hazards

- 1.1 This WMP defines requirements for safely working near or transiting underneath overhead lines defined as overhead line encroachment. An overhead line encroachment is any activity that intrudes, or has the potential to intrude, within the safe clearance distances of Overhead Lines. The **Minimum Approach Distance (MAD)** means the distance between high voltage lines or equipment and work being performed by non-qualified BGC staff or contractors.

This WMP includes requirements for:

- Encroachment zone authorization and planning;
- Minimum approach distance;
- (Vehicle) Transit underneath or near lines;
- Precautions when working near overhead lines;
- Emergency response.

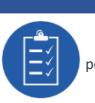
Erection of buildings or structures underneath lines is covered under a Management of Change (MOC) (see WMP #22 MOC) or a project scope. The associated procedures or method statements will have to comply with distances outlined in this WMP.

1.2 Hazards include:

- Electrocution;
- Electrical power outages.



Relevant Life Saving Rules and Process Safety Fundamentals

Bypassing Safety Controls	Energy Isolation Control	Safe Mechanical Lifting	Working at Height	
 Obtain authorisation before overriding or disabling safety	 Verify isolation and zero energy before work begins	 Plan lifting operations and control the area	 Protect yourself against a fall when working at height	
High Risk Activities		MOC	Work Authorisation	
 For all defined high-risk activities, follow the procedures and sign off after each step		 Do not make a change without a proper MOC	 Work with a valid permit when required	

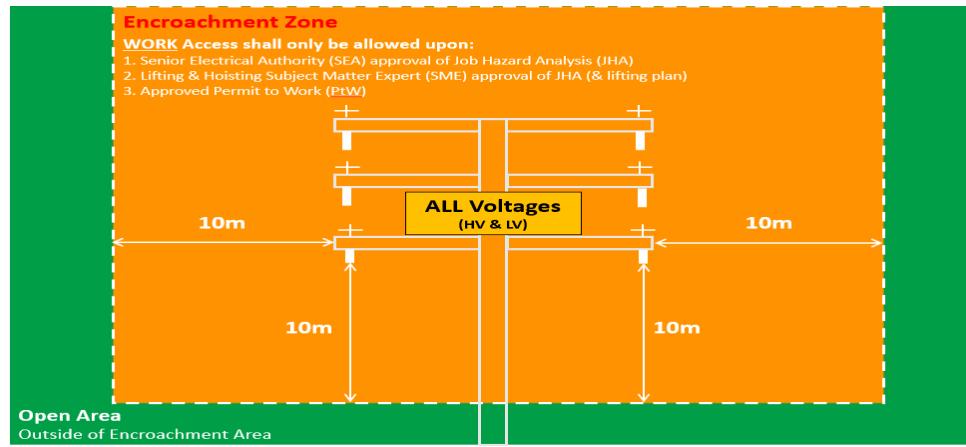


2 Plan The Work

- 2.1 Follow WMP #13 Hazard Identification to identify the hazards of the task and the location. Apply the Hierarchy of Controls to ensure that the most appropriate controls have been selected.
- 2.2 Confirm what approvals, documentation, **Permit-To-Work (PTW)**, **Job Hazard Analysis (JHA)**, **ToolBox Talk (TBT)**, etc is needed and who will verify these are in place before the work starts. Follow WMP #25 PTW. 
- 2.3 **Activity Owner**
- Ensures compliance of work scope against overhead line work and transit requirements by implementing the required barriers and controls;
 - Develops the JHA and/or lifting plans for work scopes near Overhead Lines;
 - Engages the **Senior Electrical Authority (SEA)**, **Senior Authorised Electrical Person (SAEP)**, Lifting & Hoisting Subject Matter Expert (SME) for review & approval of work scope, PTW, JHA and lifting plans;
 - Communicates and reviews the completed work scope with SAEP and Line Owner
 - Ensures all persons involved in the task verify isolations and test for zero energy in conjunction with the SEA and SAEP (as applicable)
- 2.4 **SEA** 

- Reviews the Scope of work, PTW, JHA for any works in vicinity of overhead lines;
 - Engages the SAEP to align the scope of work, PTW, JHA, isolation requirements;
 - Communicates and reviews the completed work scope with SAEP and Line Owner
 - Walks the system with the persons doing the work to verify correct isolation points and joint testing for zero energy.
- 2.5 **SAEP** 

- Reviews the Scope of work, PTW, JHA for any works in vicinity of overhead lines;
 - Engages the SEA to align the scope of work, PTW, JHA, isolation requirements.
- 2.6 **Lifting & Hoisting SME** 
- Reviews the Scope of work, lifting plans, PTW, JHA for any works in vicinity of overhead lines;
 - Provides final approval of Lift Plan;
 - Consults the SEA for any lifting activities near Overhead Lines.
- 2.7 **Encroachment Zone / MAD**
- The encroachment zone for overhead lines is 10m horizontally from the outermost exposed conductor and has a 10m vertical minimum approach distance based on the lowest line height/sag as illustrated in Figure 1;
 - For any work that is planned within the encroachment zone, the Senior Electrical Authority (SEA) and Lifting & Hoisting SME are to be contacted;
 - A JHA shall be conducted to identify risks and remedial action;
 - If the **Minimum Approach Distance (MAD)** cannot be maintained, lines should be de-energized and earthed/grounded;
 - Suitable barriers are to be installed to define absolute limits.

**Figure 1: Encroachment Zone**

- Figure 2, 3, 4 ,5 are examples of 400 V, 3.3 kV / 6.6 kV / 11 kV / 33 kV, 132 kV and 275kV / 400 kV respectively, illustrating the required Open Area, Encroachment Zone, MAD and NO-GO Zones. Similar as the vertical minimum approach distance, the NO-GO Zone is always based on the lowest line height/sag

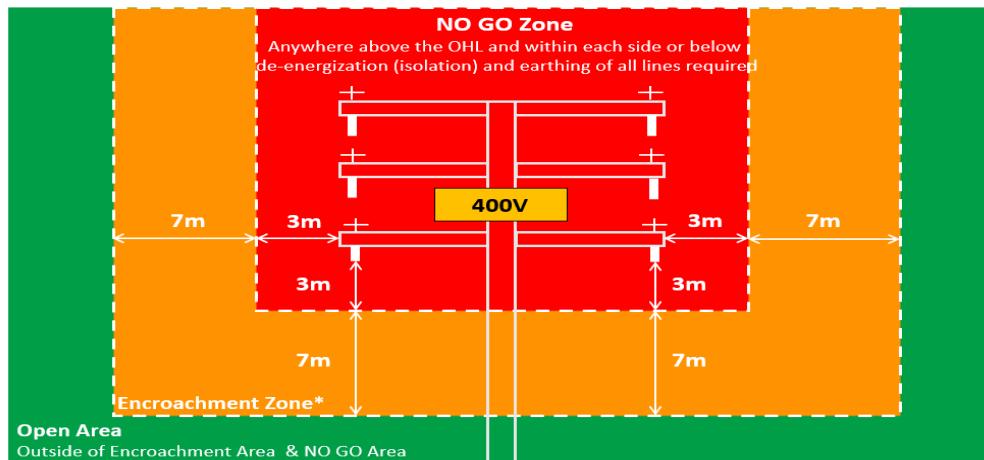
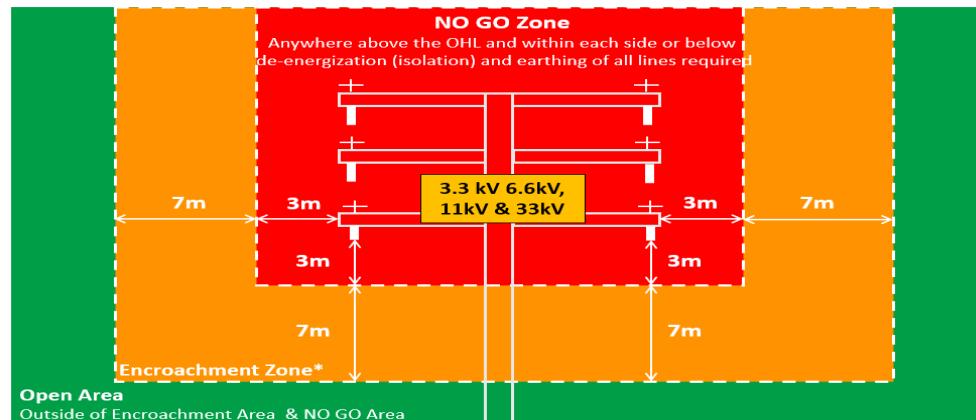
Figure 2: Open Area, Encroachment Zone, MAD and NO-GO Zones for 400 V**Figure 3: Open Area, Encroachment Zone, MAD and NO-GO Zones for 3.3 / 6.6 / 11 / 33 kV**



Figure 4: Open Area, Encroachment Zone, MAD and NO-GO Zones for 132 kV

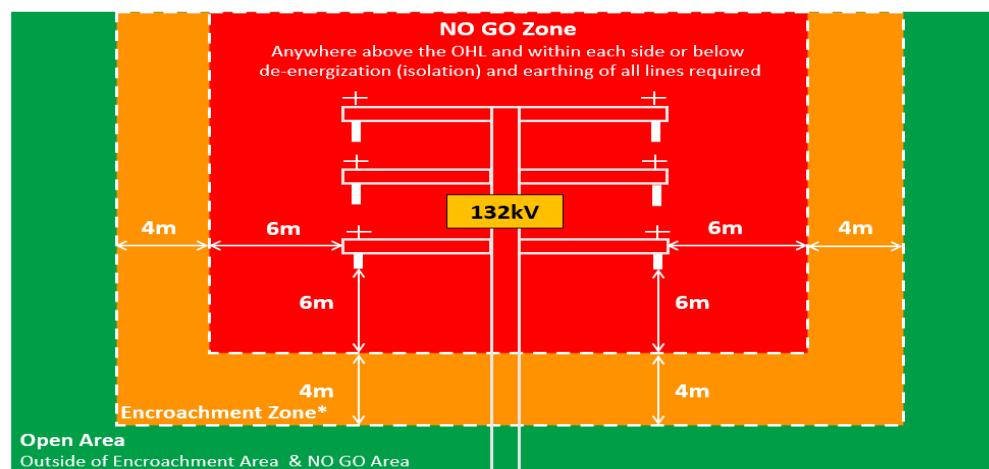


Figure 5: Open Area, Encroachment Zone, MAD and NO-GO Zones for 275 kV / 400 kV



3 Do The Work

3.1 Activity Owner

- Holds TBT at site prior to work scope kick-off ensuring the work parties are aware of the associated risks, required barriers and controls, emergency response and when to stop the job.
- Confirms the lines are de-energised and isolated (WMP20 Isolation)with SAEP and Line Owner prior to start of work activities planned inside the Minimum Approach Distance.
- Is aware of Emergency Response contacts and in periodic communication required with BGC SAEP.





3.2 Line Owner (e.g. MoE)

- Ensures line are de-energised and Isolated (WMP #6 Electrical Safety) prior to start of any work activities inside the minimum approach distance.
- Ensures isolations are correctly implemented by both Line Owner and BGC SAEP preventing any (unintended) re-energisation whilst work activities are ongoing.
- Supports proving dead activities on the isolated lines prior to work activities start
- Confirms with BGC SAEP the readiness for removal of isolations and re-energisation of the lines.



3.3 SEA

- Provides final approval to Activity Owner, SAEP and Line Owner for works to start.
- Is consulted upon by BGC SAEP to review readiness for removal of isolations and re-energisation of the lines.



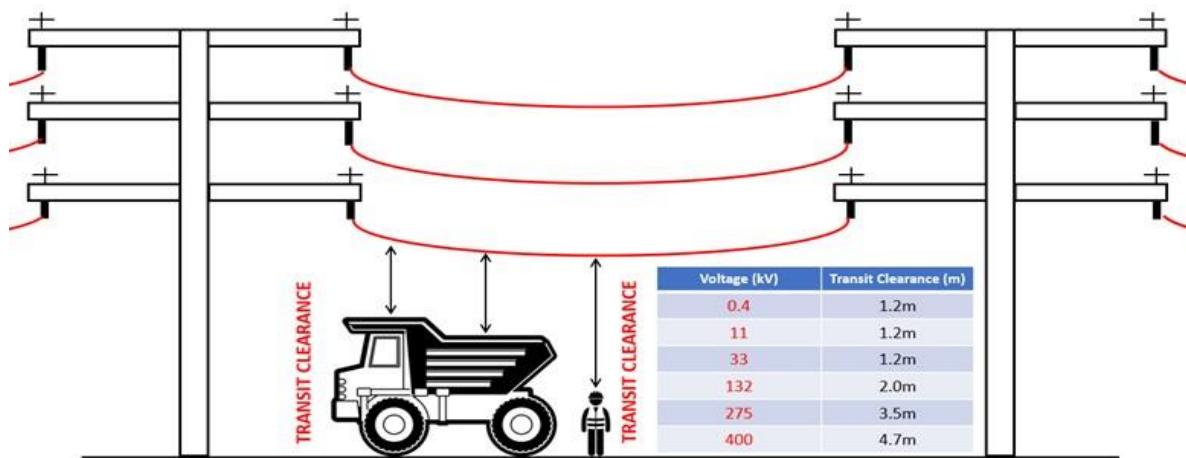
3.4 SAEP

- Applies and Removes BGC isolations (WMP #6 Electrical Safety) on the feeder/supplies of Line Owner.
- Ensures isolations are correctly implemented by both Line Owner and BGC SAEP preventing any (unintended) re-energisation whilst work activities are ongoing.
- Performs proving dead activities of isolated lines (with Line Owner support), confirms/applies circuit main earth or additional earth and gives at site the approval to allow work activities to start.
- Engages the BGC SEA to review readiness for removal of isolations and re-energisation of the line.
- Remains standby throughout the work activities for any Emergency Response support and communication with Line Owner.



3.5 (Vehicle) Transit Under Overhead Lines

- Observe ground contour below power lines. Uneven ground can cause unexpected swings of crane booms and excavator arms.
- Post warning signs and “goal posts” for vehicles in transit under power lines.
- Transit clearance is subject to lowest line height/sag.
- Follow the Transit Clearance as shown in figure 6.

**Figure 6: Transit Clearance of Overhead Lines**

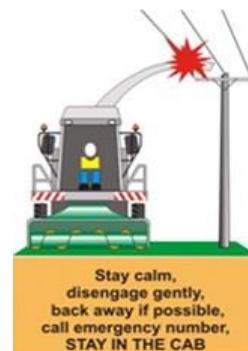
- If the Transit Clearance cannot be met and the transit is necessary, then the lines should be de-energized and earthed. Contact the Senior Electrical Authority (SEA) and Road Safety team to discuss the plan.

3.6 Controls

- Lower the boom of the lifting equipment into its rest position and secure safely in place when transiting underneath or near overhead lines.
- Use spotters wearing high visibility garments.
- Where spotter signals cannot be transmitted properly, a radio or additional spotters should be used.
- Make Use of Warning Signages.

3.7 What To Do In Case Of Overhead Lines Contact

- Call the line operator emergency number via the BGC Senior Authorised Electrical Person (SAEP) who will also inform the ERT as required.
- Keep all persons present at a safe distance.
- Wait for confirmation by the line operator that the overhead line is completely de-energized (voltage-free) and confirm with support from Responsible Person Electrical and team (prove & verify with voltage tester)
- If vehicle still functioning (excluding Cranes in setup position) follow the guidelines as illustrated in figure 7 'What to do in a non-emergency in case of overhead lines contact'
 - If possible, drive away or turn away from the high-voltage line.
 - Do not leave the vehicle until sufficient distance (minimum 4 meter) away from energized conductors.

**Figure 7: Non-emergency in case**



- If vehicle no longer functioning and there is no immediate danger to the operator follow the guidelines as illustrated in Figure 8 'What to do in an emergency in case of overhead lines contact':
 - If the vehicle does not move due to damage and there is no immediate risk to the operator, the operator must remain in the vehicle.
 - There is no immediate danger to the operator while staying in the vehicle.
 - When stepping out, there is an acute risk of electrocution by bridging the full voltage difference between the vehicle and the earth / ground.
- If vehicle no longer functioning and there is immediate danger to the operator follow the guideline as illustrated in Figure 8 'What to do in an emergency in case of overhead lines contact':
 - In the event of immediate danger (e.g., fire and/or explosion) forcing the operator to leave the vehicle, the operator should leave the cabin jumping. This prevents the operator from becoming a conductor between the vehicle and the earth / ground.
 - Then, with small steps, move at least 25 meters away from the vehicle.



Figure 8: Emergency Case

4 References and Resources

Relevant WMPs

- #5 Emergency Response
- #6 Electrical Safety
- #13 Hazard Identification
- #21 Lifting & Hoisting
- #25 Permit to Work

BGC ToolBox Talks, Communication Materials, Posters and Information

- Electrical Safety Rules - 0000-BGC-G000-GE00-G00000-HX-6180-00003
- Electrical Safety Operating Procedures - 0000-BGC-G000-GE00-G00000-HX-6180-00003

5 Approval Signatures

Role	Name	Publish Date	Signature
Owner	Asset Services Director	31-03-2022	Retained on sign-off form
Custodian	TA2 Electrical	31-03-2022	Retained on sign-off form



Work Management Procedure Glossary of Terms

Tools for the Worksite	Definition
Asbestos Category A (Non-Licensable Work)	Work which does not require the use of a specialised licensed contractor. In general works in this category are of short duration, low intensity, on non-friable (non-crumbly) materials where the release of fibers into the atmosphere is small. Persons undertaking this category must hold a current BGC/RCF Level 2 Training.
Asbestos Category B (Licensable Work)	Higher risk work that requires the engagement of a specialised licensed contractor. In general, this applies to work that includes one or more of the following - of prolonged duration, higher intensity, involves friable (crumbly) materials or where the release of airborne fibers is more significant.
As Low As Reasonably Practicable (ALARP)	To reduce a risk to a level that is as low as reasonably practicable involves balancing reduction in risk against time, challenges and cost. This level represents the point, at which time, challenges and cost become unreasonably disproportionate to risk reduction.
Benzene, Toluene, Ethyl Benzene and Xylene (BTEX)	Aromatic hydrocarbon compounds that occur naturally in crude oil and gas. They are components of a wide range of Volatile Organic Compounds (VOCs) that are detectable by smell.
Breaking Containment	A general term used to identify where a flange / fitting or other type of joint is opened, thus allowing the contents to be exposed to the outside of the containment equipment. The containment equipment can be any piece of equipment used to prevent the medium from escaping. Examples of containment equipment include pipes, valves, tanks, pumps, compressors, vessels etc.
Confined Space	<ul style="list-style-type: none">• Fully or partially enclosed space that is not designed and constructed for continuous human occupancy, and• Has limited or restricted entry or exit, and• Where there is a risk of injury or health effect from hazardous substances or conditions.
Electrical Isolation	Meaning disconnected from LIVE conductors by an open isolator or physical gap and from all sources of supply and secured (locked) to prevent electrical equipment being made LIVE in error while work is in progress.
Excavation	An excavation is any man-made cavity, trench or depression in the earth's surface formed by earth removal to a depth of more than 0.1m.
Hazard	Any situation, condition, material, substance or object that has the potential to cause harm to people, damage to assets, effect on the environment, impact to community, or damage BGC's reputation.
Hazards & Effects Management Process (HEMP)	A structured risk analysis involves Hazard identification, Risk Assessment, selection of Controls and Recovery Measures, comparison with tolerability and As Low As Reasonably Practicable (ALARP) criteria.
Hazard Identification (HAZID)	A structured approach to identify and assess hazards associated with the process or execution activity and appropriate controls including recovery measures to be applied. HAZID is typically applied for design, plant change, turnarounds & maintenance and construction activities.



Health Risk Assessment (HRA)	A tool for identifying, evaluating, controlling and managing Health Risks associated with work to prevent acute and chronic health Effects.
High Potential Event	An HSE event for which the potential consequences is assessed as RAM severity of 4 or 5. A High Potential Event can result from: <ul style="list-style-type: none">• Actual impact on People, Asset, Community and/or Environment• A Near Miss
Hot Work	Includes activities such as welding, cutting, heating, use of lighting towers and descaling as examples.
Hydrogen Sulphide (H₂S)	Extremely hazardous gas. It smells like rotten eggs at low concentrations. It is heavier than air so accumulates in low-lying areas. H ₂ S can be present in production gas and may be released through leaks or vents and drains, when opening or purging equipment.
Incident	A HSSE event that causes injury or illness to People, or damage to Assets, the Environment or Community.
ICC	Isolation Confirmation Certificate
Job Hazard Analysis (JHA)	A structured process used to help workers identify hazards on planned activity. It allows the workers to plan how they can safely perform the work and increase safety awareness of individuals on the activity. Any high risk PTW requires JHA to be completed and attached.
Lifting & Hoisting (L&H) Equipment	L&H Equipment comprises of Lifting Appliances (equipment performing the lift – e.g. cranes, forklifts), Lifting Accessories (devices which connect the load to the Lifting Appliance – e.g. chain work, shackles) and the Lifted Equipment. The diagram below includes the main categories but is not comprehensive.
LOTO	Lock Out Tag Out
Management of Change (MOC)	MOC is the process to manage risks introduced by changes. A change refers to a planned action or intervention that modifies the function of any item or process on a temporary or permanent basis. MOC processes for other activities (e.g. Projects, Document Management, Organisational Changes, etc.) will be controlled separately from this WMP.
Near Miss	A HSSE event that could have caused injury or illness to people, or damage to Assets, the environment or community – no energy release.
PASMA	Prefabricated Access Suppliers' and Manufacturers' Association
Permit-To-Work (PTW)	A formal documented system that manages specific work within BGC's locations and activities. PTW aims to ensure hazards and risks are identified, and controls are in place to prevent harm to People, Assets, Community, and the Environment (PACE) .
SABA	Supply Air Breathing Apparatus
Safety Case	A facility or operation specific document to demonstrate HSE risks from Major Accident Hazards are managed to ALARP and a description of how HSE Management System is applied to HSE hazards.
SCBA	Self-Contained Breathing Apparatus
Toolbox Risk Identification Card (TRIC)	A structured process used to help workers identify hazards on planned activity. It allows the workers to plan how they can safely perform the work and increase safety awareness of individuals on the activity. Any red or yellow risk PTW requires JHA to be completed and attached.
Waste	Any substance or object which the holder intends or is required to throw away. Even if the substance or article is given to someone else to be reused or recycled, it is still legally considered to be waste if it is no longer required by the person who produced it.



Worksite Hazards Management	Assessment tool that supports improvements in the management of hazards at the worksite related to job processes, Safety Leadership, and HSE management system.
Work at Height (WAH)	WAH is any activity where there is a risk of injury from falling or dropped objects where this a fall distance of 1.8 meters (6 feet) or more from any working level.



Work Management Procedure

Organisational Hierarchy

In some cases, this WMP uses generic roles to specify responsibilities. Below table provides guidance on the BGC organizational hierarchy and can be used to translate some of the generic roles & responsibilities of this WMP into the relevant BGC Commission, see example below:

Facility Owner:

- Plants & UQ: Plant Director
- CS: Site Engineer
- P&E: Site Construction Lead

LT Level	Organisation Level in Organisation	Job Title in Success Factors	Commissions							
			Main Plants (UQ/NR NGL/KAZ)	Css	Maintenance	Asset Services	Technical P&E	Logistics	Human Resources ****	HSE
LT	Commission Heads & Higher Commission Heads	Selected LT Members	Production & Maintenance Director			Technical P&E Director	M&T Director	HR Director	HSE Director	
LT-1*	Commission Head	Director	Plant Director	Plant Director	Maintenance Director	Asset Services Director				
LT-2	Head of Department	Engineering Manager	KAZ NGL; LPG; PP; UQ: ST/MT	WQ&NR; ZB&SR; Technical; Maint.	Pipeline Manager; Civil Manager; Maint. & Planning Manager	Discipline Engineering Manager; Process Engineering & Production Optimization Manager	Develop. Manager; Project Manager; Engineering Manager	Logistics & Facility Manager C&P Manager; Heavy/Light Vehicle Manager; Warehouse Manager	Real Estate Manager	HSE-MS; ER; Ops HSE; Project HSE; Env; TSE; Health
LT-3	Section Head	Engineering Supervisor	KAZ TLS Maint-Mech	WQ; NR; SR; ZB; PLS; Admin	Engineering Supervisor; Team Leads; TAR Lead	Mech Engr; Process Design;; TA2	FEDM; Engineering Leads; Construction Manager; Project Engineer	Facility & People Manager; Waste Manager; Vehicle Supervisors	Facility Supervisor	Ops HSE Coach; SGW; Project HSE Constr; Medical Services; Occup. Hygiene; ER Station Officer; ER Fleet AIPSM
LT-4	Engineer	Engineer	Shift Engineer (4shifts/unit)	Site Engineer** (23/GS; 4x PTW)	Engineer	Discipline Engineers; TA3	Site Construction Lead		Engineers	Ops HSE: *Unit leads; *Coord; *Coaches; ER: *Watch officer; *Health Advisors; HSE Construction advisors
LT-5	Supervisor	Supervisor	Shift Supervisor (4 shifts/unit)	Shift Supervisor *** (4 shifts/unit)	Shift Supervisor		Construction Site Supervisor	Camp Facility Supervisor		Medics; HSE Advisors; RS Advisors
LT-6	Technician	Operator, Maintenance Technician	Operator	Operator	Maint. Civil Work; Technician			Drivers	Technician	

*LT-1 Schedule

**5/2 Work

***Covers Site Engineer Responsibility during off-time

****Infrastructure

Shift Worker



Work Management Procedure Feedback

Users of the BGC WMP are encouraged to identify where the requirements cannot be met and / or provide suggestions for improvements.

Suggestions for further improvement can be made via this feedback form.

NOTE: Ensure your Line Manager/Supervisor reviews and support the feedback for improvement.

<https://forms.office.com/Pages/ResponsePage.aspx?id=p495EU0FaE6Q9LX9hZjfOWnAwa9ZoapPmuREzWQuflxUMVJVUDA0MVc0VFZHVzIDRE1MWVpGWFQwTy4u>

