APPROVAL

WMP Owner	BGC HSE Director  Chris van den Berg

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.

This document has a maximum validity of five year 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 (hand in paper copies at the permit office) or email via the BGC Hub or to HSE Management Team.

LIFE SAVING RULES

	Work with a valid work permit when required		Conduct gas tests when required
	Verify isolation before work begins and use the specified life protecting equipment		Obtain authorisation before entering a confined space
	Obtain authorisation before overriding or disabling safety critical equipment		Protect yourself against a fall when working at height
	Do not walk under a suspended load		Do not smoke outside designated smoking areas
	No alcohol or drugs while working or driving		While driving, do not use your phone and do not exceed speed limits
	Wear your seat belt		Follow prescribed Journey Management Plan

THESE WORK MANAGEMENT PROCEDURES (WMP) CONTAIN REFERENCE TO BGC'S 12 LIFE SAVING RULES (LSR).

FAILURE TO COMPLY WITH THESE RULES WILL RESULT IN DISCIPLINARY ACTION UP TO AND INCLUDING TERMINATION OF EMPLOYMENT.

PROCESS SAFETY FUNDAMENTALS

	Always use two barriers for hydrocarbon and chemical drains & vents		Do not leave an open drain or critical transfer unattended
	Take interim mitigating measures in case of failure of Safety Critical Equipment		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		Do not make a change without a proper MOC
	Verify for complete tightness after maintenance work		Always check that equipment is pressure free and drained, and provides safe isolation before starting maintenance work
	Perform MOC and install backflow protection when connecting utilities to process		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 AND EXTENSIVE ASSETS DAMAGE, INJURY AND EVEN DEATH.

NOTE FROM MANAGING DIRECTOR

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

Our ultimate 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.

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

Work Management Procedures (WMP) version 1 intends:

- Everyone knows the right way to work
- Everyone understands why the right way is the safe way
- Supervisors make sure the right way is followed
- 'Doing It Right' brings greater benefit to each individual rather than 'Doing It Wrong'

The Manual will be made available to EVERYONE across BGC assets and worksites, bringing the "Paper to the People".

It is applicable to EVERYONE, Staff, secondees and contractors and all work fronts that involve hazardous activities with personal safety exposure.

My expectations are that you familiarize yourself with the WMP. Support each other to apply and comply with the WMP. Your feedback on using the WMP is also important to improve the WMP in the future.

Thank you for your commitment and support you have shown to deliver a safer work environment so far. Going forward, with the WMP, we can truly raise the bar to achieve Goal Zero, so we can all go home safely, every day.

TABLE OF CONTENTS

WORK MANAGEMENT PROCEDURE
#1 BLASTING & PAINTING

1 OVERVIEW & HAZARDS

1.1 This Work Management Procedure (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 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.
This work procedure is applicable to all BGC staff and contractors.

1.2 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

Work with a valid work permit when required

Verify isolation before work begins and use the specified life protecting equipment

Obtain authorisation before entering a confined space

Obtain authorisation before overriding or disabling safety critical equipment

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 #11 Hazard Recognition to recognise 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.

2.8 Ensure equipment is in good condition before use;

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

2.10 **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.

2.11 **Hoses:** Hoses must 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 #28 Temporary Hoses.

2.12 **Pump filters** are clean.

2.13 **Gauges, shields and safety interlocks** are in place and in working order.

2.14 No plugging in nozzles of jetting gun or flex lance.

2.15 **All key components** are inspected and in good working condition including;

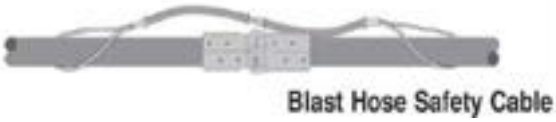
- Bonding and grounding connections and cable (metal-to-metal contact)
- Seals, fittings and couplings are tight, clean and of correct pressure rating
- Water blasting machine electrical leads and connectors

2.16 Blasting guns and paint spray guns must be fitted with Deadman Switch – trigger and is 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.

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

2.18 All components in a blasting and painting system must have electrical continuity and be electrically earthed to the objects or structures being blasted and painted. Electrical earthing test results must be available on-site for each equipment set-up and equipment transfers.

2.19 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.**



2.20 All work must be carried under a PTW as described in WMP#24 Permit to Work. A Job Hazard Analysis shall be prepared in conjunction with the PTW (see WMP #11 Hazard Identification). Grit/sand blasting is considered Category 2 Hot Work (see WMP # 14 Hot Work).

2.21 Personal Protective Equipment: Refer to WMP #25 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 supplied with and trained to use the following PPE:

- Hearing Protection
- Face shield
- Safety glasses
- Hard hat
- Safety footwear
- Rubber gloves - gauntlet type
- Respiratory protection against aerosols and particulates in applications where these are present
- Cut-resistant protective Kevlar® suits

See Figure 1 below.

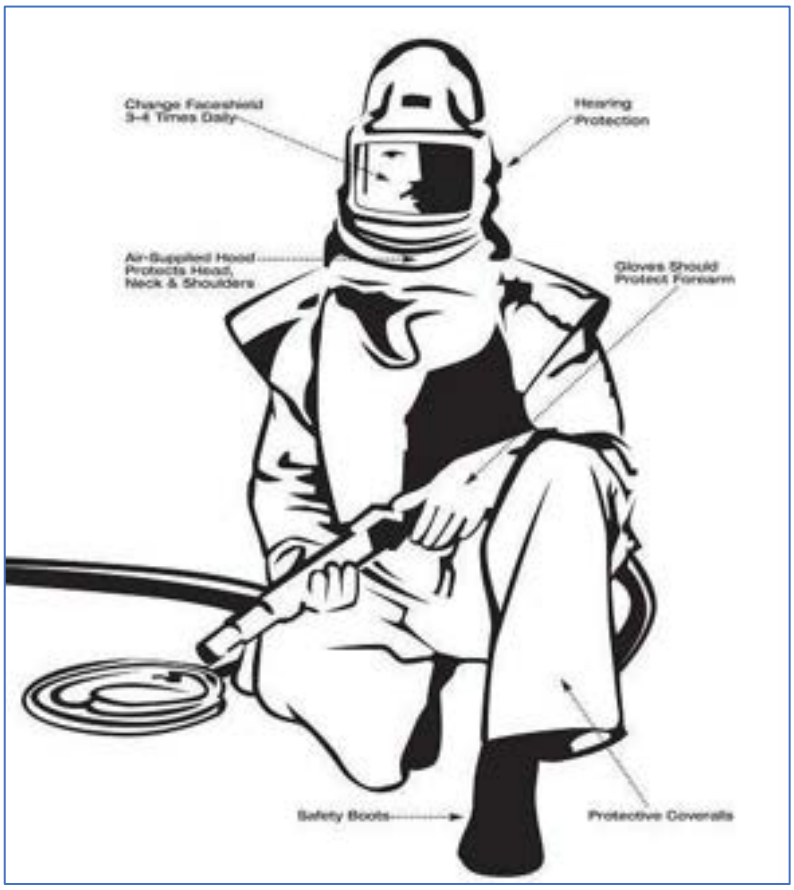
2.22 In addition to PPE may also include air-fed helmets with a constant supply of quality breathing air.
Strongly recommended: The addition of an air cooler to maintain air supply within the acceptable temperature range of the equipment and the use of visor outer

surface 'tear-offs' in acetate or similar material to enable operators to maintain full visibility.

2.23 Painting - In addition to the PPE requirements, protection for painters shall given in open air and confined space circumstances as follows:

- Open air filter mask or cartridge type respirator and shielded or baffled goggles
- Confined space air-fed helmet

Figure 1 Example of PPE for Blasting



2.24 When any breaks are taken, all air supplies and pressurized equipment shall be switched OFF & Bled off.

2.25 Confirm that equipment to be water blasted which could contain flammable or combustible materials is free from hydrocarbons and isolated.
See WMP #19 Isolations.

Storage of Blasting Materials

2.26 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.

2.27 Bags and sacks shall be pyramid-stacked to prevent toppling and shall not block access ways.

2.28 Personnel directly involved in lifting abrasive bags shall be trained in manual lifting or rigging techniques.

Storage of Painting Materials

2.29 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.

2.30 All paint Material Safety Data Sheets (MSDSs) or Safe Handling of Chemicals (SHOC) information shall be made available for all painting materials. See WMP #9 Handling Chemicals.

2.31 Materials shall be stored in a spill container that can retain at least 30% of the total volume of the material.

2.32 All paint materials shall be contained in manufacturers original containers, durably and legibly marked with descriptions of the contents.

2.33 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.

2.34 A dry-chemical or foam fire extinguisher shall be maintained within 10m from the storage location.

3 DO THE WORK

General

3.1 Before work starts, the area surrounding the water 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 #26 Safety Signs & Barricades.

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 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 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.

Operator Must Do's

3.8 Always have good vision through his PPE visor. If vision is blocked or restricted at any time, the water blasting is to STOP until the restriction has been removed.

3.9 Position hoses from the pumping unit through to the lance/gun to come from directly BEHIND the operator and NOT from either side or front, to reduce any tripping hazard.

3.10 Do not hand hold an object while water blasting is taking place.

3.11 Never point a blasting or spray gun at a person.

3.12 Never place any parts of the body over a jetting nozzle.

3.13 Always engage the trigger safety catch when work is interrupted.

3.14 Never leave the water blasting system unattended when pressurized. Always switch off the pump when not in use.

3.15 Not eat or drink during materials transfer, mixing, thinning and application.

Flexible Lance - Requirements

3.16 For flexible lances, a back-out preventer shall be used.

3.17 Do not attempt to use the flexible lance to jet the "dead zone" near the orifice opening

3.18 Hose shall be fully depressurized before the lance is removed from the piping or equipment.

3.19 Use an attachment such as a 'stinger' when carrying out water blasting activities using any flexible lance. The stinger shall be at least as long as the inside diameter of the pipe being water blasted to avoid it turning back and exiting the pipe at high velocity.

3.20 The 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 blasting operation.

3.21 The person who manipulates the lance shall also be the person who actuates the lance. There shall be no separation of operator from actuator e.g. a second person operating a step-activated dump valve is strictly not permitted.

3.22 Always check the manufacturer's instructions before using any part and ensure that components are identified with the Maximum Allowable Working Pressure (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.

Environment & Waste Management.

3.23 Implement the correct waste disposal process for any solids and liquids generated. See WMP# 29 Waste Management.

3.24 Clean up any spillage of abrasive, paint, thinners, solvent and detergent immediately (spill kit) and dispose of cleaning material correctly, as per MSDS.

3.25 Paint thinners and solvents shall always be placed in a spill tray to avoid containment to the environment.

Spill Tray

Health

3.26 Inhaling 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.

3.27 Materials Safety Data Sheets (MSDS) must be available at the worksite. Paint mixing stations shall be provided with eye wash bottles.

3.28 Emergency phone numbers and the designated person in charge contact number shall be clearly printed and made available at worksite.

3.29 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.

3.30 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.

3.31 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 Area Operating Shift Engineer and the relevant technical expert.

3.32 Operate equipment at the lowest pressure necessary to achieve the required quality. Never exceed the Safe Working Pressure, as stated on the equipment.

3.33 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.

3.34 The water 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 WMP

#2 Confined Space Entry
#11 Hazard Recognition
#24 Permit to Work
#25 Personal Protective Equipment
#29 Waste Management
Permit to Work

BGC ToolBox Talks, Communication Materials, Posters and Information

See Appendix 1: ToolBox Talk

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC Maintenance Director	1/3/21	Retained on sign-off form
Reviewer	BGC Inspection TA Michell Schipper	1/3/21	Retained on sign-off form

8 APPENDIX 1 TOOLBOX TALK FOR WATER BLASTING

#	Toolbox Talk Discussion Points
1	Only authorised personnel shall be allowed to conduct water blasting.
2	All work shall be carried under a PTW.
3	A JHA (TRIC card) shall be prepared in conjunction with a PTW.
4	Confirm that equipment to be water blasted which could contain flammable or combustible materials is gas free and isolated in line with WMP 19 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 their 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 operator and NOT from either side or front, to reduce any tripping hazard.

WORK MANAGEMENT PROCEDURE
#2 CONFINED SPACE ENTRY

1 OVERVIEW & HAZARDS

1.1 Confined Space is a fully or partially enclosed space that is not designed and constructed for continuous human occupancy, has limited or restricted means for entry or exit, and where there is a risk of injury or health effect from hazardous substances or conditions. Confined Space entries may be required for inspections, maintenance, repairs, cleaning, 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 Confined Space Entry rules apply if a person's head comes within 30cm of an opening into a confined space.

Confined Spaces - Examples

Confined space entry

Workers in confined space

Pipeline

This work procedure is applicable to all BGC staff and contractors.

1.2 **Hazards include:**

- An atmosphere that is 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)
- Reduced visibility and / or poor lighting
- Difficulty moving due to bulky PPE, breathing equipment, harnesses, etc
- Potential falls due to vertical entry points

Relevant Life Saving Rules and Process Safety Fundamentals

Work with a valid work permit when required

Conduct gas tests when required

Verify isolation before work begins and use the specified life protecting equipment

Obtain authorisation before entering a confined space

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 confined spaces in line with the definitions in section 1 of this work management procedure.

2.2 Follow WMP #11 Hazard Recognition to recognise 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 Confined Space Entry (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 Ensure that arrangements are in place to confirm that all personnel to be involved in the task will have undertaken the appropriate training and follow this WMP and other relevant WMPs, depending upon the task:

- Permit to Work (WMP# 24)
- Isolations (WMP# 19)
- Hot Work (WMP# 14)

2.4 Identify and make a visual field verification that the required isolations are in place e.g. process or electrical are in place before work starts. See WMP#19 Isolations.

2.5 An emergency rescue plan must be developed 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:

- Procedures for communicating emergencies
- Identification of trained rescue personnel
- Rescue equipment to be readily available when people are inside a confined space
- Emergency escape routes
- The designated emergency assembly area
- Rescue and first aid procedures

2.6 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, including the frequency of testing during the work (see also Table 1, below)
- 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

2.7 Hot-work with positive sources of ignition in a confined space is a high risk activity (see WMP # 14 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 or remain in hidden pockets or gaps in the confined space
- Ventilation plan and additional PPE should consider the risk such as (welding) fumes

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

- Excavations in brownfield assets shall consider in the JHA the possibility of hydrocarbon gas or toxic gas (e.g. H2S – See WMP #16 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 #5 Excavations

Communicate

2.9 Develop a Confined Space Entry rescue plan that covers all scenarios identified in JHA. Ensure BGC Emergency Response team reviews & approves rescue plan.

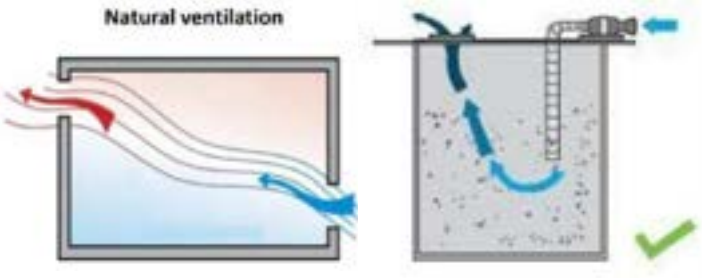
2.10 Develop communication arrangements between the people in the confined space, entry attendant and control room. Record this in the JHA.

2.11 Verify compliance with the Heat Related illness prevention procedure when temperatures can become higher than 32°C inside the Confined Space.

Check Equipment

2.12 Develop Ventilation plan:

- For the given working environment and work activities, make an assessment of 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)



2.22 Ensure availability of inspected and maintained rescue equipment.

2.23 Select appropriate Personal Protective Equipment (PPE) (including respiratory protection when needed). See also WMP #25 .Personal Protective Equipment.

Prepare Area

2.24 Determine the isolation required for the confined space entry in line with the Isolation work management procedure.

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

If both positive isolation and blind is not possible a specific risk assessment shall be made and approved by plant director

3 DO THE WORK

Control Energy

3.1 Make and confirm all isolations associated with the confined space as per the isolation plan (See WMP #19 Isolations)

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

- Initial gas test and all subsequent tests shall be recorded on the sheet
- The AGT shall repeat the test at a sufficient frequency or as per JHA
- Respiratory protection (in line with PPE WMP) shall be used by AGT for initial gas test
- 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 CONFINED SPACE ENTRY

	WITHOUT RESPIRATORY PROTECTION	WITH RESPIRATORY PROTECTION	INERT ENTRY
Oxygen %	<20 to maximum > 21.5	>16 to 20*	<4
Toxics	< 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.*

*** 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 at all other openings to prevent unauthorised entry.

3.5 Verify all equipment and people (trained for CSE rescue) for implementation of rescue plan are available.

Start Work

3.6 Workers shall do a toolbox talk to verify all workers are aware of controls and requirements of JHA and permit.

3.7 Workers shall verify all isolations as per isolation plan and in line with WMP #19 Isolations.

3.8 Physical barrier shall be put in place to prevent unauthorized entry when the operation is suspended or during breaks.

3.9 Station an Attendant outside the Confined Space. The Attendant shall:

- Maintain a record of numbers and names of people in confined space (sign in / out list)
- Monitor confined space at all times and keep communications with confined space workers
- Stopping the work if ventilation fails, gas test failure, contamination exceedance or other emergencies on site
- Be aware of the rescue plan and their role in activating the rescue plan. Do not attempt any rescue unless it is part of rescue plan
- Ensure that the BGC Emergency Response Operations Centre (EROC) contact details are available: BGC Phone 3333 / VOIP 12223 / Mobile 07809213970
- Prevent Unauthorized entry

Final check

3.10 Confined space workers and permit issuer shall verify all controls as per JHA. Verify isolation are also verified. The CSE checklist shall be used in support of verification. See Appendix 3.

3.11 Issue a Confined space Entry work permit as per WMP# 24 Permit To Work.

3.12 Gas tests shall be repeated as per defined frequency.

3.13 Consider continuous monitoring or leaving fixed gas test meters in the CSE with ALARM function.

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 confined space entry and to be repeated after each designated break.

3.15 Entry points shall be indicated by safe entry tags and barricaded. Signages (Danger – Do Not Enter without authorisation) shall be installed at all other openings to prevent unauthorized Entry. Use hard barriers around open hatches.

3.16 Each Confined Space Entry (CSE) shall have an Evacuation (Rescue) Plan. The plan must be available at the entry point. All equipment required to execute the plan must be available at the work site.

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

- Between the workers inside a confined space
- Between the workers inside a confined space and the attendant outside
- Between the attendant and the control room and/or emergency response team

3.18 Allow entry into Confined Spaces with Self-Contained Breathing Apparatus (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 Permit Issuer shall approve the selection for respiratory protection, and this shall be documented in the permit. A competent worker shall verify the quality of air supply from bottles, compressors or ventilators.

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

3.20 zSupervisor shall verify work completion and all workers, tools and materials removed from the confined space before Area Operating Technician (AOT) authorizes the confined space to be closed.

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition

#14 Hot Work

#19 Isolations

#24 Permit to Work

#25 Personal Protective Equipment

BGC Checklists and CSSS Forms

Example Gas Test Record Sheet: see Appendix 1

BGC Confined Space Entry Checklist: see Appendix 3)

BGC ToolBox Talks, Communication Materials, Posters and Information

5 to stay alive Confined Space (Appendix 4)

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.
See Appendix 2 for Summary of Confined Space Entry Roles & Responsibilities.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Operations Manager Steve Wright/Bjorn Lauvstad	1/3/21	Retained on sign-off form

8 APPENDIX 1 EXAMPLE GAS TEST RECORD SHEET

PERMIT NO.									Continuous Monitoring required?	
									YES	NO
DATE	TIME	Oxygen (O_2)	Hydrocarbons (LEL)	Carbon Dioxide (CO_2)	Hydrogen Sulphide (H_2S)	Carbon Monoxide (CO)	Benzene	Other	AGT NAME	AGT SIGNATURE
d/m/y	Hrs	%	%	PPM	PPM	PPM	PPM			

APPENDIX 2 SUMMARY OF ROLES & RSSPONSIBILITIES FOR CONFINED SPACE ENTRY WORK

Applicant & PICWS	• Notify the emergency response team of the confined space entry work and brief the team on the scope • Carry out 'toolbox' talks prior to start of activity to ensure personnel are familiar with the hazards present in confined space. • Ensure suitable personnel are trained and competent in usage of safeguarding and monitoring equipment for controlling the hazards. • Ensure atmosphere in the confined space is tested for oxygen, toxic and flammable materials by BGC authorized gas tester (AGT) • Ensure 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 entry • All personnel working within the area of supervision shall be informed and comply to the requirements of confined space entry • Keep a record of all personnel, tools and materials entering and leaving the confined space • Ensure a set of emergency procedures including confined space rescue plan has been developed and the work crew are familiar with the procedures • Ensure an attendant is available and work is conducted safely by all personnel • Check condition of work site upon completion of all work. It is recommended to have a second person to duplicate the inspection • Ensure physical barrier is in place at confined space entry point after completion of work each shift
Permit Issuer (Shift Engineers)	• Conduct gas tests before start of shift. Record results of tests on gas test sheet attached to work permits • Conduct safety checks on site and perform risk assessment with work supervisor prior to start of any activities • Ensure work crew has required respiratory protection and functional ventilation equipment • Verify that confined space is isolated from all potential sources of hazardous material and energy, including radiation • Check the integrity of the isolation points, to demonstrate status of isolation points and conduct zero energy check (prove equipment depressurized) with permit holder prior to start of any activities

	• Verify isolation points are as close as possible to the confined space and in line with safe isolation – lock out tag out • Verify all personnel involved in the confined space have dedicated confined space training records available at site
Attendant	• Maintain register of personnel, tools and materials entering and exiting the confined space • Always monitor the confined space from outside while personnel are working inside. Do not leave confined space un-attendant when work is ongoing • Maintain communication and visual contact with all personnel in the confined space. Ensure communication with the control room and emergency response team is functional • Maintain emergency rescue equipment onsite during confined space work • Stop work and evacuate personnel from confined space if ventilation system fails, contaminants exceed agreed limits, conditions become unsafe • Activate emergency response team in the event of an emergency • The attendant shall not attempt rescue • Prevent unauthorized entry

APPENDIX 3 CONFINED SPACE ENTRY CHECK LIST

BASRAH GAS COMPANY - CSE CHECK LIST

Permit No.		
		WORK PLANNING AND PRE-CONDITIONS FOR ENTRY
Yes	**No**	**Check Items**
		Are the persons assigned to the work competent in the role? (BA Qualified etc.)
		Has the work team attended a detailed and thorough Toolbox Talk?
		• Vessel Standby Man
		• 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 24 hours prior to entry?
		All liquids, fluids and residues removed from vessel as far as practicable?
		Are communications with Control Room available and tested?
		Does the Rescue Team have all equipment present on site?
		Are all tools correctly rated? E.g. non-sparking, Ex Rated etc
		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 excavation supports available to prevent collapse?
		Simultaneous Operations identified and rescheduled if required?

Basrah Gas Company

شركة غاز البصرة – قائمة الفحص لدخول الأماكن المحصوره

		رقم التصريح
		تخطيط العمل والشروط المسبقة للدخول
نعم	لا	فقرات الفحص
		هل الأشخاص الموكل إليهم تنفيذ العمل مؤهلون للقيام بذلك العمل؟ (مثلاً مؤهلين بدنيا وما إلى ذلك)
		هل حضر فريق العمل اجتماع تفصيلي وشامل قديث صندوق العدة قبل بدء العمل؟
		• عامل المراقبة عند دخول الأوعية
		• فريق استجابة الطوارئ / الإنقاذ
		• هل سجل الدخول متوفر وهل تم إخطار العاملين؟
		هل تم عزل الأماكن الضيقة/توصيلات الأوعية وفقاً للإجراءات المتبعة؟
		هل تم عزل كافة المعدات الكهربائية ذات الصلة بالأماكن الضيقة/الأوعية وفقاً للإجراءات المتبعة؟
		هل تم فتح الأنبوب وتهويته لمدة لا تقل عن ٢٤ ساعة قبل الدخول؟
		هل تمت إزالة كافة السوائل والموائع والرواسب من الأنبوب إلى أكبر قدر ممكن؟
		هل الاتصال مع غرفة السيطرة موجود ومفحوص؟
		هل يمتلك فريق الإنقاذ كافة المعدات في الموقع؟
		هل تم تصنيف كافة الأدوات بالشكل الصحيح؟ على سبيل المثال غير مولدة للشرر أو ذات تصنيف إي إكس وما إلى ذلك
		هل مسارات الدخول والخروج متوفرة وخالية؟
		هل تتوفر طرق ثانوية للهروب من الأماكن الضيقة/الأوعية؟
		هل تتوفر أجهزة كشف الغاز المناسبة وهل تم اختبارها؟
		إذا كان هناك احتمالية توفر خليط سريع الاشتعال هل تم ترطيب المنطقة؟
		هل يوجد كبريتيد الهيدروجين؟ هل تم التعرف وتنفيذ ضوابط إضافية؟
		بالنسبة لأعمال الحفر – هل توجد دعائم حفر لمنع الانهيار؟
		هل تم تحديد العمليات المتزامنة وإعادة جدولتها عند اللزوم؟

APPENDIX 4 CONFINED SPACE ENTRY '5 TO STAY ALIVE'

CONFINED SPACES

5 TO STAY ALIVE

Life-Saving Rule

- Work with a valid Work Permit when required
- Conduct gas tests when required
- Obtain authorisation before entering a confined space
- Obtain authorisation before overriding or disabling safety critical equipment

Comply with the standards

Intervene when you see something wrong

Respect your co-workers

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.

WORK MANAGEMENT PROCEDURE
#3 DRIVING SAFETY & JOURNEY MANAGEMENT

1 OVERVIEW & HAZARDS

1.1 The purpose of this Work Management Procedure (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.

1.2 **Hazards include**

- Impact injury to drivers and passengers due to vehicle collision
- Impact injury to drivers and passengers due to 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

Relevant Life Saving Rules

Work with a valid work permit when required

Wear your seat belt

Follow prescribed Journey Management Plan

While driving, do not use your phone and do not exceed speed limit

Do not smoke outside designated smoking areas

No alcohol or drugs while working or driving

For some operating areas, a valid Permit to Work/Entry permit may be required depending on site requirements. See WMP #24 Permit to Work.

2 PLANNING FOR SAFE TRANSPORTATION

2.1 Follow WMP #11 Hazard Recognition to recognise 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 Driving Training or any BGC-Approved and Accredited Defensive Driver Training

2.3 Additionally, the following requirements shall be met for all professional drivers

- A valid Fitness to Work certificate according to BGC Fitness to Work requirements
- Driver introduction training
- Driver Fatigue Awareness
- Load securing training (HGV)
- Dangerous goods training (HAZMAT) (HGV)

2.4 Drivers shall inspect the vehicle every day using checklist Appendix 1 and maintain a record of 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
- Three-point seatbelts
- >1.6 mm tyre tread depth
- 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 facility may require a Permit to Work (PTW) and authorization from the facility owner. Follow WMP#24 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 accordingly (Fountain Incident Management) and investigated
- Dry powder fire extinguisher (securely mounted), first aid kit and torchlight (securely stowed)

2.6 The following requirements shall be met for all Heavy Good Vehicles (HGV)

- HGV drivers to do Defensive Driving Training every two years
- Loads to be secured in a safe manner and when transporting dangerous goods ensure Material Safety Data Sheet is available in the vehicle
- Driver is responsible to check that the load is well secured at all time according to BGC Load Securing instructions

Commuting vs Business Travel

2.7 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.

Journey Management Plan

2.8 A Journey Management Plan (JMP) is required for all business-related travel outside designated areas (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.

2.9 Line Manager/JMP focal point must ensure that the following are discussed and met as part of JMP approval process:

- Staff are fit to drive
- Any vehicles used shall meet the BGC six-month inspection program for road worthiness

JMP is reviewed together with the drivers before they journey with focus of the Road Hazard and a printout of the agreed route and hazards. Journey should be closed out with feedback from drivers after completion.

2.10 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 Logistics Manager or delegate.

2.11 A generic JMP with validity of maximum 3 months can be used for repetitive journeys with the same transport scope every day.

2.12 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
- Comply with BGC drive and rest hours

- 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

2.13 Night-time driving and/or adverse weather conditions (see WMP #13 Heat Stress & Adverse Weather):

- Driving between midnight and 04.00AM is not allowed
- Night-time driving request need to be submitted at least 24 hours before journey.
- Line Manger approval for journey need to be obtained
- Night-time Journey Management Plan is needed
- Be alert for vehicles without headlights, cyclists, pedestrians, obstructions, animals, potholes, road works, etc.

2.14 Road travel to Baghdad is only allowed on an exceptional basis, subject to L1 Director and Managing Director approval.
Non-emergency requests must be made with 7 days' notice to BGC Business Travel Coordinator. Emergency requests must be made with at least 48 hours' notice.
Approved requests will be subject to a specific JMP.

3 TRANSPORT SAFELY

3.1 The requirements in Section 2 and the JMP will be followed.

3.2 Everyone is authorised to safely intervene if they witness unsafe driver or passenger behaviours.

3.3 IVMS data will be used by BGC and Contractors to monitor and improve driver behaviours.

3.4 In the event of weather deterioration, refer to WMP# 13 Heat Stress & Adverse Weather.

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition
#13 Heat Stress and Adverse Weather
#24 Permit to Work

BGC ToolBox Talks, Communication Materials, Posters and Information

BGC Journey Management Plan Template See Appendix 2

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All drivers, passengers and workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are implemented.

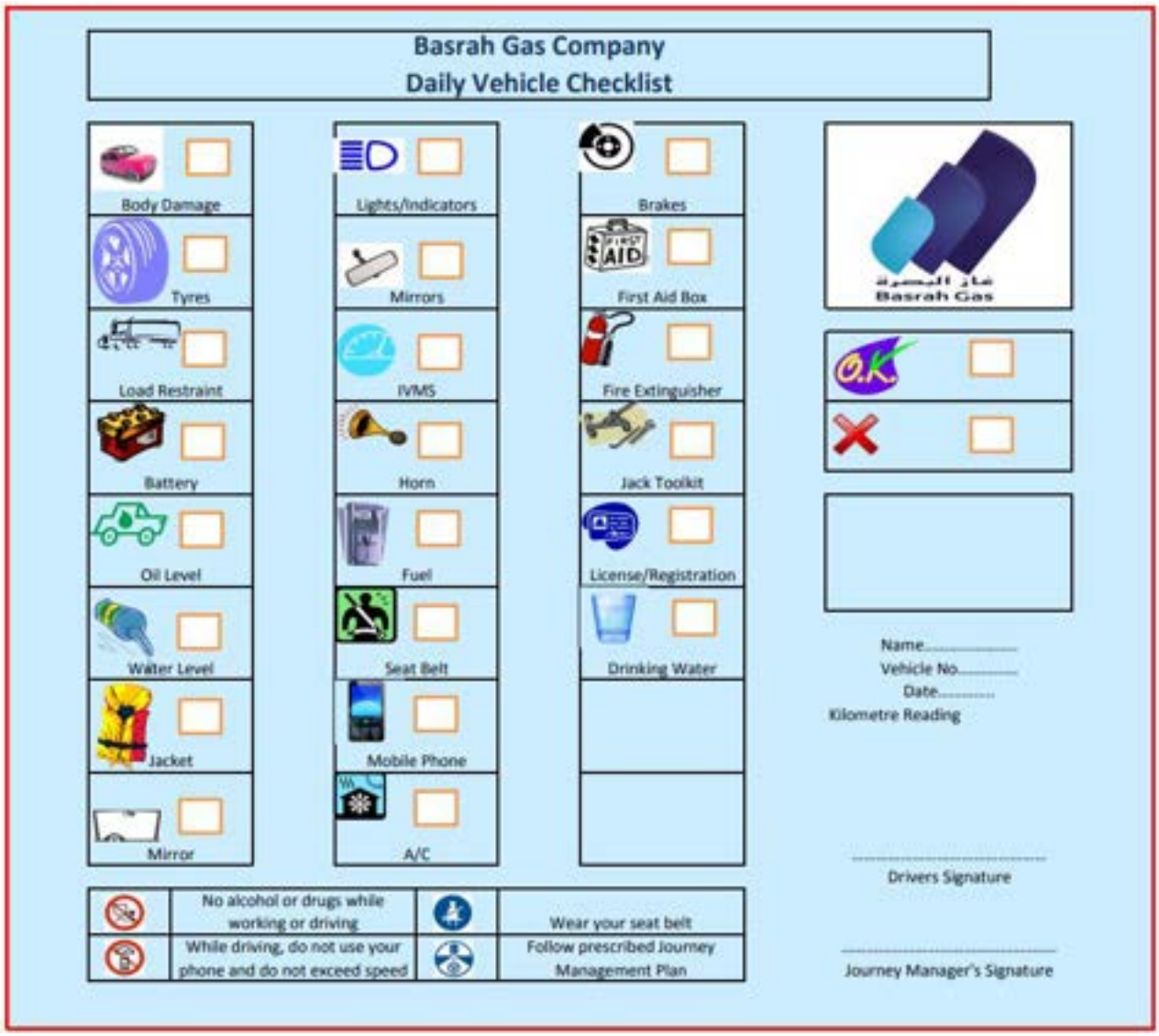
6 INTERPRETATION AND UPDATING

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

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC Material & Transport Director	1/3/21	Retained on sign-off form
Reviewer	BGC Logistics Manager Sam Beggs/Darren Walker	1/3/21	Retained on sign-off form

8 APPENDIX 1 BGC DAILY VEHICLE CHECKLIST



9 APPENDIX 2 BGC JOURNEY MANAGEMENT PLAN

BGC JOURNEY MANAGEMENT PLAN

خطة الرحلة الآمنة

Ser. No.: 32964 الرقم | الشركة Dept.: الادارة:

To be filled up by Journey Originator

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؟ لو لا لماذا؟
Purpose of the journey	الغرض من الرحلة
Will driver reach destination before dark?	هل سيصل السائق إلى وجهته قبل حلول الظلام ؟
IVMS Installed?	هل يوجد IVMS
Mobile Phone/ or other Communication?	ما هي وسيلة الاتصال المتاحة مع السائق
HAZARDS REGISTER DATA SHEET must be attached, if includes hazardous materials	يجب إرفاق بطاقة المخاطر إذا كانت الحمولة تحتوي على مواد خطرة

أسماء الركاب :
Name of passengers:

للسيارات الخفيفة فقط
For light vehicles only

تاريخ المغادرة Departure date	اسم السائق Driver name	رقم السيارة Vehicle number/fleet	السيارة (النوع / اللون) Vehicle type/colour

To be filled up by Driver

مسار الرحلة Route - place names	وقت الوصول Estimated Time arrive (Driver)	وقت المغادرة Estimated Time Depart (Driver)	وقت الوصول Actual Time Arrive	وقت المغادرة Actual Time Depart	الاستراحة Rest Tick ←

اسم الشخص الذي يعمل كمدير الرحلة و تليفونه
Name of person acting as Journey Manager and his Mobile :

ملاحظات للسائق:
Comments for driver:

Driver Signature

Mobile number:-

To be filled up with support from Journey Manager/HSE

Risk Assessment	Impact P	E	A	R	Likelihood	Risk	Control Measures

Required Resources:

Reason For Night Driving	L1 approval	ملاحظات المدير المباشر:
Attach Copy Of Permission.	Vehicle daily checks	التفتيش اليومي على السيارة
	Briefing For Driver	شرح مرهق للسائق
	Do not speed, follow speed limits Ensure that seat belts are worn by all before starting the vehicle	لا تسرع ، التزم بحدود السرعة تأكد أن الجميع قام بربط الحزام قبل التحرك
	Road signs must be obeyed	اتبع إشارات المرور

مرخص الرحلة
JOURNEY AUTHORIZED
الاسم :
Name:
التوقيع
Signature:

Instructions:
White copy for Journey planner

Yellow copy for driver, blue copy for Supervisor

The trip to be authorized by Line supervisor or contact holder.

تعليمات :
النسخة الأصلية لمنسق الرحلة , النسخة الصفراء للسائق , النسخة الزرقاء للمشرف
تعتمد الرحلة من مرخص الرحلة أو مشرف المقول

BGC Emergency Number:- 07809393970 | 07809393970 رقم الطوارئ المحلية :

VEHICLE INSPECTED (USE VEHICLE INSPECTION FORM) and PASSED | DRIVERS SIGNATURE:

REPORT ACCEPTED BY: SIGNATURE:

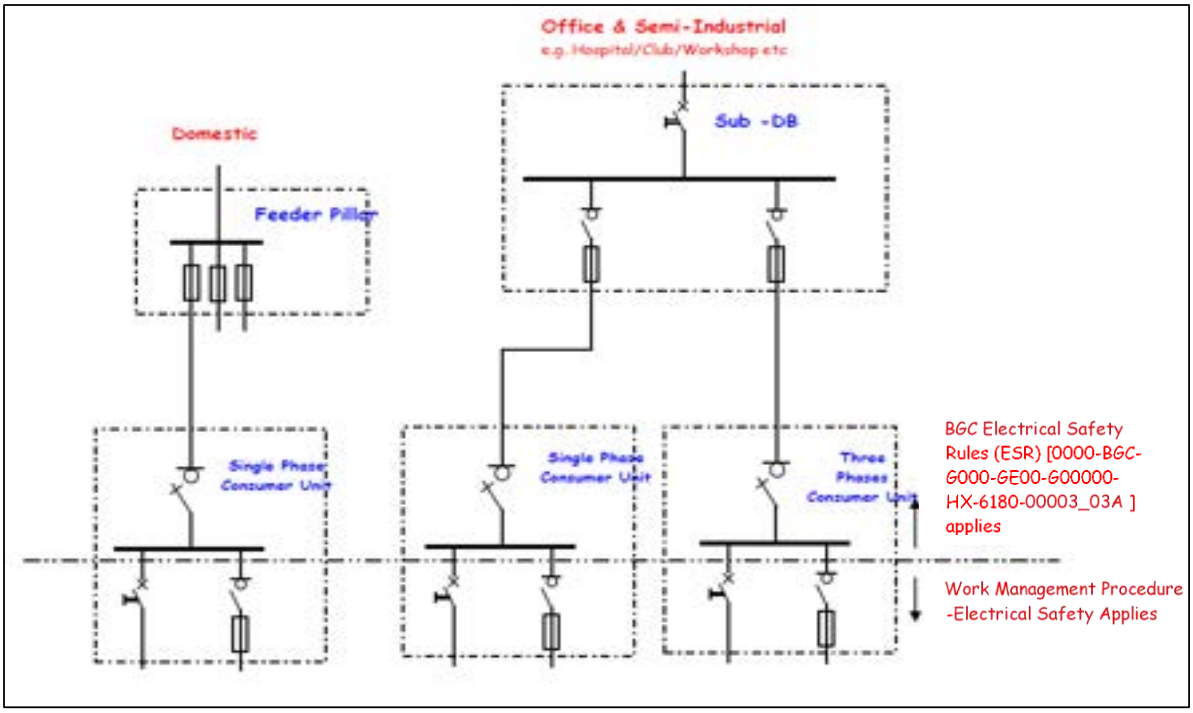
WORK MANAGEMENT PROCEDURE
#4 ELECTRICAL SAFETY (LOW VOLTAGE)

1 OVERVIEW & HAZARDS

1.1 An electrical hazard is a dangerous condition where a worker can or does make electrical contact with energised equipment or a conductor. From that contact, the person can sustain an injury from shock, and there is a potential for the worker to receive an arc flash (electrical explosion), burn, or blast injury.

This procedure forms the basis of electrical safety requirements and ensures all electrical work are conducted in a safe manner. This procedure applies to all electrical work within BGC facilities where the Electrical Safety Rules (ESR) does not apply (see Figure 1).

Figure 1 Boundary between BGC Electrical Safety Rules [0000-BGC-G000-GE00-G00000-HX-6180-00003_03A] vs This Work Management Procedure Electrical Safety



If the works falls under ESR, an Authorized Person (AP) (Electrical) appointed by the Asset Operating Department shall be contacted. The AP shall be responsible for electrical safety and the control of Work and Testing within a specified geographical area or facility. For Electrical isolation padlock key requirements refer to WMP#19 Isolations.

This procedure applies to mobile electrical equipment, single-phase low-voltage electrical equipment in domestic, commercial, industrial premises and temporary electrical installations and is applicable to all BGC staff and contractors.

1.2 **Hazards**

Electricity is a significant hazard. Work that is not planned and done correctly can lead to harm (to people, environment, equipment, facilities or buildings) or damage. The main ways in which people can be harmed;

- 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:
  1. Cardiac arrest due to the electrical effect on the heart
  2. Muscle, nerve, and tissue destruction from a current passing through the body
  3. Thermal burns from contact with the electrical source
  4. 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 listed in 1, above, and can also cause injuries to eyesight from the 'flash' associated with the arc
- It is possible for stray electrical currents to be present, where equipment has not been properly designed, installed, maintained, repaired or damaged
- 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

Relevant Life Saving Rules and Process Safety Fundamentals

Work with a valid work permit when required

Verify isolation before work begins and use the specified life protecting equipment

Obtain authorisation before overriding or disabling safety critical equipment

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

Do not make a change without a proper MOC

2 PLAN THE WORK

2.1 Follow WMP #11 Hazard Recognition to recognise 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, Job Hazard Analysis, ToolBox Talk, etc, is needed and who will check it is done before the work starts. Follow WMP #24 Permit to Work.

2.4 Confirm supervision arrangements including any necessary support, including HSE advisors, Emergency Response, Gas Testing, etc.

Requirements

2.5 Only Qualified Electrical Persons are permitted to perform work on electrical equipment or systems including installations, testing and fault finding.

Minimum requirement for Qualified Electrical Person shall be met:

- General Electrical Knowledge, e.g. complete diploma, degree or certified program in the Electrical field
- Assessed competent as per the Electrical Safety Rules
- Three (3) years of electrical field experience

Communicate

2.6 Electrical switching activities by qualified electrical person must be communicated but does not require a Permit to Work.
No electrical works shall be allowed without Permit to Work.
Work on any portion of an electrical installation shall only be performed after circuit is confirmed isolated and proved de-energized.

2.7 Electrical system isolation must be in place prior to physical interaction with electrically controlled equipment. Isolation must be registered, except for Personal isolation which is defined in WMP#19 Isolations.
For fault finding work on live equipment, additional controls inclusive of buddy system shall apply. These additional controls must be listed on the work permit.

Check Equipment

2.8 Personal Protective Equipment (PPE) shall be worn.
All electrical tools, appliances and mobile equipment shall be constructed to international standards and designed for rated supply voltage and frequency
The following requirements for Plugs and Socket Outlets shall be met:

- 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 (4) socket outlets. Adaptors are strictly prohibited
- Two-pin plugs without fuses shall be replaced with three-pin plugs with rated fuses

2.9 The following requirements for Leads and Extension Cords shall be met:

- 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

Extension cord may serve more than one socket outlet. Mount on common outlet box, “daisy-chained” from a single extension cord is prohibited

2.10 The following requirements for Mobile Generators shall be met:

- Mobile generator sets shall be diesel-engine driven
- The frame and equipment neutral or star-point shall be connected to earth.

- Mobile generator sets shall be provided with over-current and earth-fault protection devices
- Mobile generators shall be mounted on a skid or in a frame
- 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

2.11 The following requirements for Electric Welding Machines shall be met:

- Only DC type shall be used. AC welding machines should only be used if approved, in writing, by the contract holder
- 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. The return cable shall be an integral part of the machine. Steel structures and pipelines shall not be used as return paths (See Figure 1 below)
- A return cable (Figure 2 – circled in red) 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. The return cable shall be an integral part of the machine. Steel structures and pipelines shall not be used as return paths (See figure below)

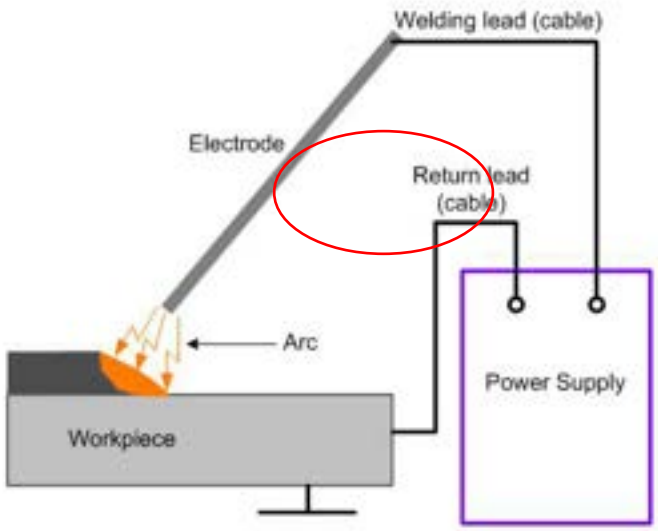


Figure 2 Welding Machine Requirements

2.12 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.

2.13 When using the HF starters of GTAW welding machines in operational areas, care shall be taken to minimise 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.

2.14 Ensure welding machine frequency generator is not operated within 15m 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.

2.15 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.

2.16 Welding cable and return cables shall be heat resistant, oil resistant and flame retardant.

2.17 For welding cable running through hazardous area, the cables shall be provided with adequate protection and be adequately supported throughout the length to avoid any accidental damage to the cable insulation layer and exposing of the inner copper conductor.

2.18 Welding machines shall be located in non-hazardous area.

2.19 Do not use non-Ex certified cable connectors in hazardous area unless they are covered under hot work permit. Ex type connectors are suitable for usage in zone 1 or zone 2.

Earthing and Bonding of Electrical Installations and Steel Work

2.20 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.

2.21 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.

2.22 Earthing and bonding shall be completed prior to energising of electrical equipment and 30mA earth fault protection devices, if installed, shall be tested with earth leakages tester at sockets.

2.23 Portable hoses for transferring of hydrocarbon shall be bonded to earth prior work begins to prevent static built up.

2.24 Temporary Electrical Installations shall be inspected, tested, logged and verified by Responsible Person Electrical (RPE).

Certified Equipment in Hazardous Areas

2.25 Verification of the certified equipment shall be carried out against the Hazardous Area Certification (HAC) drawings. The asset holder shall rectify any discrepancies.

2.26 Non-certified equipment shall be removed from the hazardous area unless it is covered under the hot work permit procedure. Refer to WMP #14 Hot Work.

Overhead Line Requirements

2.27 When work is to be carried out within 6m (horizontal distance) of an overhead line, the Responsible Person Electrical (RPE) of the Asset shall be notified to determine whether the correct process has been followed.

2.28 If there is no work or passage under the overhead lines, ground level barriers shall be erected parallel to the overhead line and placed at least 6m away.
The minimum distance of the ground level barriers from the overhead lines shall be increased to one jib length plus 6m.
Where the work is only at ground level (e.g. pipe-laying), the safe clearance beneath the overhead lines shall be advised by the RPE.

2.29 If there is a passage under, but not work under overhead lines, the previous section shall apply and defined passageways of approximately 10m wide shall be made in the barriers.
Each passageway shall be fenced to define its route.
The surface of the passageway shall be level to minimise bouncing of crane jibs.
'Goal posts' constructed from rigid insulating material shall be erected at each end of the passageway at a height no greater than 3m below the lowest point of the overhead line.
The crossbar height shall be approved by the RPE prior to starting work.
Warning notices stating the crossbar clearance height shall be placed on both goal posts.

2.30 Equipment that could reach beyond the safe clearance limit shall not be taken under the line. Mobile equipment such as cranes and excavators shall be restricted, either by physical restraints or by barriers**. The following requirements for inspections and testing of mobile electrical equipment shall be met:**

2.31 The proof of inspections and testing shall be attached with a tag to the electrical equipment. The test report shall be maintained for a period of 6 month by the electrical equipment owner.

Electrical equipment owned by BGC shall be inspected by an Authorised Person (Electrical) (AP[E])*. Tools and equipment owned by business partners shall be inspected and tested by their own qualified electrical person. Any Third-Party Inspector shall be agreed/approved by BGC Electrical Technical Authorities (AED/4 or OME/4). Contractors owning the equipment shall maintain an Inspection Register of all equipment inspected.

*Authorised Person (Electrical) is a person, authorised by the Senior Electrical Authority (AED) to carry out specified Low Voltage Operations on Electrical Power Systems and Work on Electrical Equipment.

3 DO THE WORK

Final Checks

3.1 BGC Staff and contractors shall ensure the 10 questions for electrical safety are asked before conducting work. Refer to Appendix1.

Start Work

All permanent or temporary electrical installations within BGC facilities shall be recorded, 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.

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.

All electrical installations must be isolated and proven dead before work can commence. Electrical isolation means disconnection and separation of the electrical equipment from every source of electrical energy in a secured manner.

For all work on LV electrical equipment or circuits, it is important to ensure the correct point of isolation is identified and appropriate means of isolation is applied.

Supply cannot be inadvertently reinstated while work is in progress. For single circuit isolation, an MCB shall be used.

3.2 Electrical isolations must be documented in BGC isolation register.

This is an integrated system that manages the interactions between work permit and isolation. See also WMP #19 Isolations.

3.3 For electrical isolations, two points of electrical isolations must be provided prior to any interaction with equipment.

Most commonly this will comprise an isolation at the power distribution board and the local equipment ON/OFF switch.

If two points of electrical isolations cannot be achieved, consult Responsible Person Electrical (RPE) to determine requirement of a deviation.

If RPE indicate a deviation is required, then this deviation should be managed with the responsible Plant Director (or their delegate).

3.4 Where possible, the power distribution board or circuit breaker isolation shall be physically held in an unenergized position by using a white electrical isolation padlock with unique key.

Where this is not possible, a circuit isolation fuse must be removed. Isolation identification will be by application of a tag as per ESR requirements.

3.5 Throughout BGC, all switch room, electrical room, field auxiliary room and battery rooms must be locked to prevent unauthorize accessed. These rooms may have individual door locks and keys.

Where the door lock is not available, a common silver padlock with a common key will be used throughout BGC.

3.6 Testing shall be performed on the equipment to be worked on once isolations are completed to ensure energy sources are cut off.

3.7 Notice shall be attached at the point of isolation by using a caution tag.

3.8 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).

3.9 Isolation and energization of main, sub man switchgear and distribution board shall only be carried out under ESR procedure by Authorised Person (Electrical).

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition
#23 Isolations
#24 Permit to Work
#25 Personal Protective Equipment
#27 Safety System Isolation & Override Control

BGC Checklists and CSSS Forms

Construction Site Standardisation CSSS Checksheet 17: Electrical Equipment, Appendix 2

4 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

5 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.

6 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC Asset Service Manager	1/3/21	Retained on sign-off form
Reviewer	BGC Senior Electrical Maintenance Engineer Alex Irwin/Muhammad Imran Nasir	1/3/21	Retained on sign-off form

8 APPENDIX 1 10 QUESTIONS FOR ELECTRICAL SAFETY

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

2 PLANNING & PROCEDURES

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

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?

4 EQUIPMENT ISOLATION

- ✔ Has all electrical equipment been de-energised and isolated, in line with Electrical Safety Rules and Procedures?
- ✔ Have remote methods been considered?

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?

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?

7 BARRIERS & GUARDING

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

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?

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?

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 CONSTRUCTION SITE STANDARDISATION CSSS CHECKSHEET 17 ELECTRICAL EQUIPMENT

NOTE: Although 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
	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

5 TO STAY ALIVE

Life-Saving Rule

- Work with a valid Work Permit when required
- Verify isolation before work begins and use the specified life protecting equipment
- Obtain authorisation before overriding or disabling safety critical equipment

Comply with the standards

Intervene when you see something wrong

Respect your co-workers

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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.

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.

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.

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.

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.

WORK MANAGEMENT PROCEDURE
#5 EXCAVATIONS

1 OVERVIEW & HAZARDS

1.1 This Work Management Procedure (WMP) describes the BGC requirements for excavations. 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 0.1 Meters.

1.2 **Hazards include**

Buried items, including:

- Explosive remnants of war (ERW – See WMP #6 Explosive Remnants of War)
- 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.

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.

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


Work with a valid work permit when required


Conduct gas tests when required


Obtain authorisation before entering a confined space


Protect yourself against a fall when working at height

2 PLAN THE WORK

2.1 Follow WMP #11 Hazard Recognition to recognise 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 that the area to be excavated has been confirmed as clear of Explosive Remnants of War (ERW – See also WMP #6 Explosive Remnants of War).

- Permit to Work offices hold Land Release Certificates for ground works inside BGC locations
- The ERW Manager is responsible for keeping ERW Land Release Certificates for areas outside of BGC locations. This data is available online through MyMaps or can be obtained from BGC P&E Geomatics Team or BGC ERW Manager
- See also WMP #24 Permit to Work.

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 drilling, 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 or survey (contact BGC PE Geomatics)

- Agree underground detection survey of buried plant and underground obstructions plans

2.7 The approved underground detection survey will help confirm:

- What tools should be utilized
- Use of Ground Penetrating Radar (metallic and non-metallic pipes, underground tanks, voids, larger cables)
- Cable identification tools
- Location of obstructions on the ground
- If Hydro-excavation techniques are to be used
- Hand-digging requirements (no pickaxes and preferably insulated tools)
- Probing

2.8 The excavation plan will confirm:

- Sloping, shoring, shielding proposed method is adequate for applicable soil type and has adequate access & egress
- Barricade plan includes maintaining 1.5m away from edge for spoils and vehicles. (See WMP# 26 Safety Signs & Barricades)
- Mechanical excavation will not be used within 2m of live pipelines. **Any exceptions to this must have Plant Director approval**
- Potential for contaminated soil and/or water ingress
- Ensure confined space requirements are considered for excavations deeper than 1.2m. See Also WMP#2 Confined Space Entry.

2.9 The Permit to Work will include Excavation Certificate, Method Statement and Job Hazard Analysis (JHA) for the proposed excavation:

- 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
- Excavation plan shall be approved by the ECP and site supervisor prior to application of Permit to Work. The plan must be attached to the work permit
- For excavations exceeding > 3 meters depth, 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

2.10
- Mechanical digging is not permitted unless excavation area has been examined using a locating tool and pilot trenches have been dug to verified as clear of buried plant or services.
- Pilot trenches shall always be dug manually in maximum depth of 1m relative to the adjacent ground level
- The Rescue plan for the Permit to Work, will determine whether the excavation is a Confined Space.
  See WMP #2 Confined Space Entry.

2.11 Plant and machinery in operational sites may require a Hot Work Permit. See WMP#24 Permit to Work.

2.12 ECP is accountable for completing the Excavation Pre-Work Checklist. See Appendix 1.

3 DO THE WORK

3.1 Permit to Work (See WMP #24 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 the 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, 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
- If ground water 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 Check list – Excavations) to ensure compliance and make improvement to the hazard controls.

3.5 Explosive Remnants of War (ERW) - Upon discovery of a suspicious object believed to be an explosive device, the following action shall be taken immediately: (See WMP #6 Explosive Remnants of War)

- Evacuate all personnel from the area following the normal evacuation procedure
- Inform BGC site team immediately, who will then contact then 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 Asset Holder as soon as possible. All incidents shall be reported 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 WMP

#6 Explosive Remnants of War (ERW)

#11 Hazard Recognition

#24 Permit to Work

#25 Personal Protective Equipment

BGC Checklists and CSSS Forms

Excavation check List. (See Appendix1)

BGC ToolBox Talks, Communication Materials, Posters and Information

BGC 5 to stay Alive. (See Appendix 3)

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC Technical Director	1/3/21	Retained on sign-off form
Reviewer	BGC Civil, Struct, Marine Discipline Team Lead, Marcel Kuipers	1/3/21	Retained on sign-off form

8 APPENDIX 1 BGC 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 BGC EXCAVATION FUNDAMENTALS

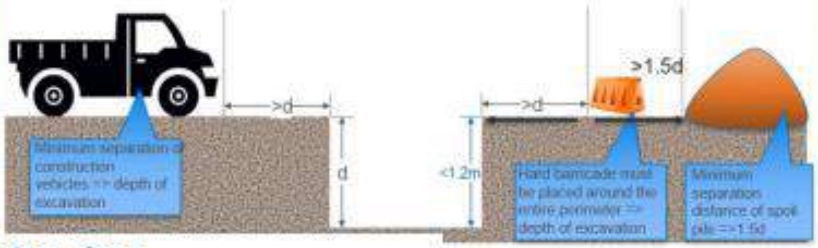
BGC Excavation Fundamentals

- **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

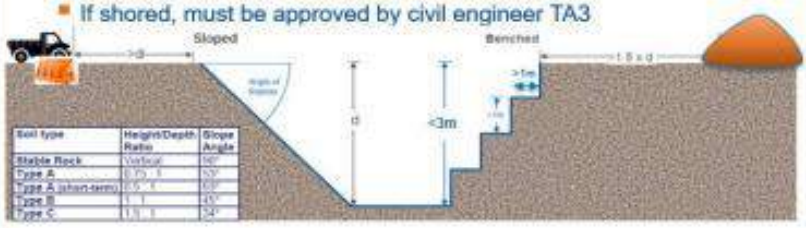
Excavation <1.2 meters deep

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



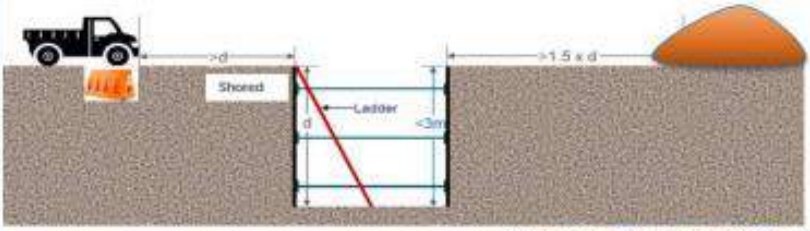
Deep Excavation 1.2 - 3 meters deep

- 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



Soil type	Height/Depth Ratio	Slope Angle
Stable Rock	Vertical	90°
Type A	0.75 : 1	53°
Type A (short-term)	0.5 : 1	63°
Type B	1 : 1	45°
Type C	1.5 : 1	34°

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

5 TO STAY ALIVE

Life-Saving Rule

Work with a valid Work Permit when required

Conduct gas tests when required

Comply with the standards

Intervene when you see something wrong

Respect your co-workers

شركة غاز البحرين
Bahrain Gas Company

Check Permit

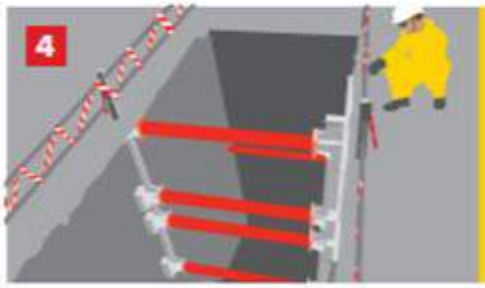
Ensure permits are in place before excavating (where required). Check drawings to identify all potential obstructions and expose using non-mechanical means.

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.

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.



Protect Excavation

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

No Vehicles Nearby

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

WORK MANAGEMENT PROCEDURE
#6 EXPLOSIVE REMNANTS OF WAR (ERW)

1 OVERVIEW & HAZARDS

1.1 This procedure 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 Work Management Procedure 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:

1. Unexploded Ordnance (UXO) has been fired as intended but has failed to function.

Sub-munitions

Mortars

Air Dropped weapons

2. Abandoned Explosive Ordnance (AXO) - Ordnance that has been abandoned.

Artillery ordnance

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

1.2 **Hazards include**

Death or injury to personnel coming into contact or attempting to handle ERW. Significant damage to facilities, assets, property and production if ERW is activated in proximity.

Relevant Life Saving Rules

Work with a valid work permit when required

2 PLAN THE WORK

Follow WMP #11 Hazard Recognition to recognise 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.

2.2

- 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

2.3 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
- 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
- Will require specific advice and guidance from BGC ERW Team
- Range of Options: Clearance/Banksman

ALARP: GREEN

- Probability is As Low As Reasonably Practicable (ALARP)
- No further requirement from ERW Team

2.4 Excavations will only be carried out in land areas which have been confirmed for release by ERW Team as ALARP or Amber areas with the required ERW mitigation in place. (See WMP #5 Excavations).

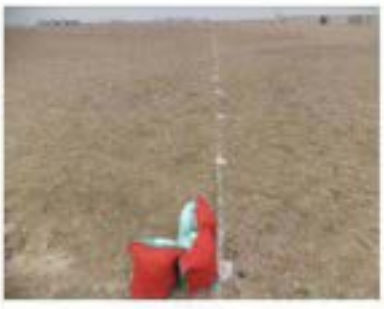
2.5 Obtain a copy of the ERW Land Release Certificate (LRC) on behalf of third-party contractors to present with their Permit to Work (PTW) documentation. See WMP #24 Permit to Work.

2.6 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.

2.7 Ensure all personnel are familiar with the ERW Markings systems for working in safe ERW Cleared areas.

2.8 There are 2 Types of markers common throughout BGC:

1. **Minefield markers:** Permanent metal posts, signs, wire and 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 Red the area Red the uncleared ERW side.

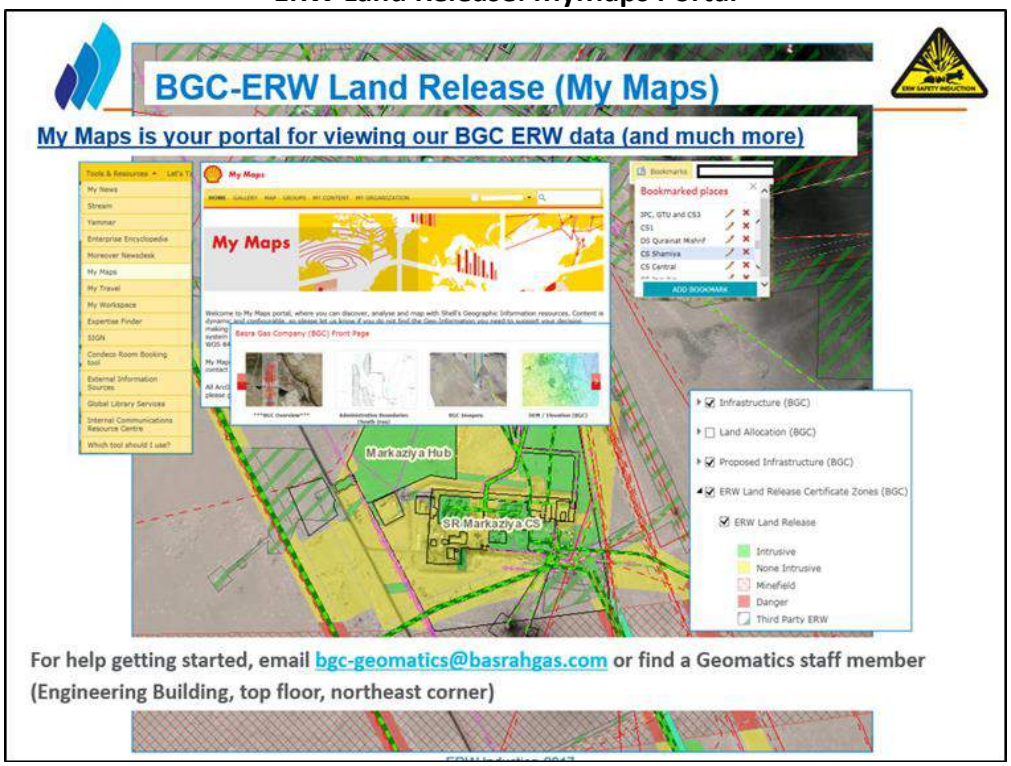


2.9 **Minefield markers** denote the boundary of a known mined area.

2.10 **BAC markers** denote areas deemed safe to work in by risk assessment and or Sub-surface clearance to remove the threat of ERW.

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

ERW Land Release: MyMaps Portal



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 uncleared or RED Area on foot:

- STOP
- DO NOT PANIC and assess the situation
- IF CONFIDENT 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 uncleared or RED Area in a Vehicle

- STOP
- DON'T PANIC and assess the situation
- IF CONFIDENT 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 BGC Emergency Response Operations Centre (EROC) contact details: BGC Phone 3333 / VOIP 12223 / Mobile 07809213970 and await assistance
- IF VEHICLE ON FIRE OR ENVIRONMENT 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 WMP

#5 Excavations

#11 Hazard Recognition

#24 Permit to Work

BGC ToolBox Talks, Communication Materials, Posters and Information

BGC ERW Training Material

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

The ERW Manager acts on behalf of BGC as the Subject Matter Expert in all aspects of ERW Risk Mitigation and clearance and signed certification of Land Release Certificate.

Ensure ERW Inductions and training is available to all BGC Staff and 3rd Party Contractors and to monitor compliance with the training. See information slides below.

6 INTERPRETATION AND UPDATING

BGC HSE Risk & Assurance Lead shall ensure periodical update of this WMP as required. BGC ERW Manager shall provide interpretation of this procedure.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC Technical Director	1/3/21	Retained on sign-off form
Reviewer	ERW Manager Nigel Knott and Paul McCarthy	1/3/21	Retained on sign-off form

WORK MANAGEMENT PROCEDURE
#7 HAND & POWER TOOLS

1 OVERVIEW & HAZARDS

1.1 This procedure establishes a minimum requirement for safe use of hand and power tools in BGC and is applicable to all BGC staff and contractors.

1.2 Hazards associated with misuse of hand tools include:

- Eye injuries due to the flying particles
- Hammer may cause Impact Injuries
- Damage 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.

Power Tools

Hand Tools

Relevant Life Saving Rules shall be adhered to:

Work with a valid work permit when required

2 PLAN THE WORK

2.1 Follow WMP #11 Hazard Recognition to recognise 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, Job Hazard Analysis, ToolBox Talk, etc, is needed and who will check it is done before the work starts. Follow WMP #24 Permit to Work.

2.3 Confirm supervision arrangements including any necessary support, including HSE advisors, Emergency Response, Gas Testing, 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
- Class II: Tools and appliances that are double insulated or have reinforced insulation, and 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, 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 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, with intervals between inspections/tests not exceeding 6 months. (See Appendix 1). 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 third-party inspector approved by the BGC Electrical Engineer.

2.7 Contractor owned equipment shall maintain an Inspection Register to record all inspected equipment.

Equipment with incorrect tag, without tag and/or not inspected shall not be used

A “Defective, Do Not Use” tag (see below) 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 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.

The use of hand and power tools in (Green Field) non-operating facilities require a work permit or work procedure to be in place for routine usage (i.e. fabrication site).

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 and hazardous around flammable substances.

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 #19 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.

3.3 Do Shield/protect other workers from hazards in the work area by maintaining good housekeeping.

3.4 No loose-fitting articles of clothing or jewelry shall be worn. Long hair shall be tied or kept in a hairnet.

3.5 All grinders shall clearly display the maximum speed. Grinding disks shall display their maximum speed and it shall be over the maximum machine speed.

3.6 Supervisors and team leaders shall ensure staff is competent to operate the tools and equipment.

3.7 If unsure on how to operate hand tool, power tool, or equipment, do not start work and inform your supervisor.

3.8 Ensure safe and correct body positioning while using hand or powered tools to prevent injuries.

3.9 Sheathed and self-retracting knives can be used if controls are listed on the work permit.

3.10 Grinders shall be fitted with guards

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 PPE . The minimum mandatory Standard PPE required is covered in WMP - #25 Personal Protective Equipment (PPE) e.g. Flame retardant Overalls, Safety foot ware, Gloves, Hard hat and double Eye protection. Use additional PPE if required upon risk assessment. The use of grinding shall be done with clear safety glasses underneath a face shield.

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 WMP

#11 Hazard Recognition

#24 Permit to Work

#25 Personal Protective Equipment

BGC Checklists and CSSS Forms

CSSSS 14 Hand & Power Tools (See Appendix 1)

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Operations HSE Manager Steve Wright/Bjorn Lauvstad	1/3/21	Retained on sign-off form

8 APPENDIX 1 CSSS CHECKSHEET HAND & POWER TOOLS

NOTE: Although CSSS materials are used by BGC Projects Department, they can also be utilized by other departments as appropriate.

	CONSTRUCTION SITE SAFETY STANDARDISATION (CSSS) CHECKSHEET 14 – HAND AND POWER TOOLS			
Ser	**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
#8 HANDLING ASBESTOS

1 OVERVIEW & HAZARDS

1.1 This procedure describes the requirements for safe handling and disposal of Asbestos Containing Materials (ACM) and Refractory Ceramic Fibers Containing Materials, 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.
This work procedure is applicable to all BGC staff and contractors.

1.2 **Hazards include:**

- Asbestos is a hazardous material as it poses a health risk if the asbestos fibers become airborne and are then inhaled. Inhalation of asbestos fibers could lead to a debilitating lung disease and certain forms of lung cancer. The risk of developing such diseases largely depends on both level and duration of exposure
- It can take many years after exposure for any symptoms to develop. There is no visible immediate effect, but this does not mean that a person will not be affected in later life. The effect of asbestos exposure is also cumulative i.e. the more exposure the higher the risk and consequence
- Refractory Ceramic Fibers (RCF) are ceramic materials, treated at high temperatures into very fine fibers. They are formed into products such as fiber bulk, blanket, board, brick, textiles and molded shapes. Larger refractory ceramic fibers are associated with eye, skin and upper respiratory tract irritation. Inhalation of smaller very fine fibers has been linked to cancer

This procedure describes the requirements for safe handling and disposal of Asbestos Containing Materials (ACM) and Refractory Ceramic Fibers (RCF) Containing Materials, during construction works and maintenance works.

This work procedure is applicable to all BGC staff and contractors.

Relevant Life Saving Rules and Process Safety Fundamentals

Work with a valid work 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 #11 Hazard Recognition to recognise 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, Job Hazard Analysis, ToolBox Talk, etc, is needed and who will check it is done before the work starts. Follow WMP #24 Permit to Work.

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

2.4 Two categories of asbestos/RCF works have been defined within BGC:

2.5 **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.

2.6 **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.

2.7 It is BGC policy that Asbestos or Refractory Ceramic Fibers (RCF) must not be introduced into new or existing facilities unless no alternative exists.

2.8 **Suspect Materials**

Where there is either confirmed Asbestos or Refractory Ceramic Fibers (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.

2.9 Local Asbestos Focal Points (AFPs) are responsible for an annual status inspection of all asbestos and RCF in their location, and subsequent notification to the BGC Health Department of having completed the inspection and of any changes in condition of the material.

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

2.11 All persons undertaking work under Category A must attend a classroom-based Level 1 and 2 Asbestos/RCF Training. This training remains valid for 2 years after which the worker is required to undergo re-training.

2.12 Persons wishing to become Asbestos Focal Points can request Level 3 Asbestos and RCF Focal Point Training via L & D Department. This training is only available on request and when a sufficient need is identified.

2.13 A register for Asbestos and Refractory Ceramic Fibers is available for BGC assets. Hardcopy layouts are held at each Permit Office. They are also available through BGC Health Team or local Asbestos Focal Points (AFPs).

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

2.15 In addition, the BGC Health Team will undertake ad hoc inspections during visits to facilities that have known asbestos or RCF. This will serve as additional cover from those visits by the AFPs but also serve as a quality assurance process.

3 DO THE WORK

3.1 **Activities which may encounter ACM or RCF**

3.2 All activities that may result in the disturbance of asbestos containing materials or RCF must be carried out under a valid Permit to Work (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.

3.3 All asbestos work must be duly supervised by trained Asbestos Focal Points, nominated persons or the Industrial Hygienists.

3.4 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 (2) yearly intervals thereafter.

3.5 Category B work must only be carried out by Approved Licensed Asbestos Contractor. All contractors will be required to show a license of work covering their activity.

3.6 **Personal Protective Equipment (PPE)**

All respiratory and personal protective equipment used for asbestos or RCF activities must conform to appropriate standards. See WMP #25 Personal Protective Equipment.

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

Category B Task

- P3 (or N100) disposable face mask – only for tasks of less than 1 hour
- Half-mask or full-face air-purifying re-useable respirator fitted with P3 (N100) filter cartridge(s)
- Air supplied respiratory equipment – hood or mask
- Compressed air breathing apparatus – cylinder or airline

3.7 Disposable coveralls (dust protection Type 5 or Type 6) are preferred.

3.8 Gloves with physical/mechanical protection.

3.9 Safety boots (not lace-up type).

3.10 Safety glasses or goggles.

3.11 **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

3.12 **Asbestos Waste/RCF Waste Handling**

For Category A activities, asbestos and RCF containing materials 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:

3.13 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. Waste generated by specialist contractors undertaking Category B activities are to be handled on a case-by-case basis within any contractual agreement.

3.14 **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 07809283078 and a Waste Consignment Note (BGC Waste Management Plan, Ref 6) 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

3.15 **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 WMP

#11 Hazard Recognition

#24 Permit to Work

#25 Personal Protective Equipment

#29 Waste Management

BGC Checklists and CSSS Forms

Checksheet for non-licensed Asbestos / RCF Works. See Appendix 1

BGC ToolBox Talks, Communication Materials, Posters and Information

Categorisation of Asbestos Works – Examples, see Appendix 2

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 INTERPRETATION AND UPDATING

BGC HSE Risk & Assurance Lead shall ensure periodical update of this WMP as required.
BGC Health Manager or Industrial Hygienists shall respond to enquiries on interpretation of this procedure.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	Occupational Hygiene Lead Yousif Essa	1/3/21	Retained on sign-off form

8 APPENDIX 1 CHECKSHEET 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 with 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 CATEGORISATION OF ASBESTOS WORKS-EXAMPLES

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 asbestos-containing materials (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

APPENDIX 3 TOOLBOX TALK – ASBESTOS WORK

Asbestos Work Toolbox Talk

To be given before any work starts, serves as a reminder and is in addition to covering the other workplace risks and requirements.

What is asbestos? **Fibrous material which is mined and then mixed in with other materials to form products used for construction, insulation, sealing etc.**

On this worksite the asbestos is found as (insert type – cement sheet, gasket, textile seal)

What are the risks? **When disturbed asbestos materials can release fibres into the air. When these fibres are breathed into the body they become deposited deep in the lungs. The body is unable to expel them and the result can be lung diseases and even cancer**

How long does this take? **It can take 40 years or more after you inhaled the asbestos fibres before you become ill, and there is not a minimum amount that you need to breath in before you might get ill. If you also smoke it is 5 times more likely that you will develop lung disease. So it is essential that you are fully protected every time you work with asbestos.**

So how do I protect myself? **Follow all the instructions provided by your supervisor and in the permit**

- **Your work instructions will tell/demonstrate to you how to minimize the disturbance of the asbestos and avoid unnecessary release of fibres into the air**
- **Wear your PPE and face mask all the time you are in the asbestos area. Help each other to fit the items properly and also to make sure that during the work your PPE does not become damaged or less effectively positioned**
- **Make sure that the area is barriered off and other people are prevented from entering**
- **Wrap or bag all waste securely using polythene and tape, and place in a location where it will not be disturbed**
- **Clear up your work area as you go, do not allow debris to accumulate**
- **Clean down and remove your PPE as you leave your work area, making sure that you take off your face mask last, and only once you have already placed all the other PPE in a bag as waste**

Fitting your face mask **For your facemask to do its job you:**

1. **Must be clean-shaven (except for a moustache that does not extend beyond the corners of your lips)**
2. **Place the mask on your face, with the metal nose clip uppermost**
3. **Put the elastics over your head, one above your ears and one below, and tighten in position**
4. **Shape the metal clip tightly over your nose, ensuring a good fit**
5. **Breath hard in and out several times – you should not feel any air escaping around the edges of the facemask. If you can then remove and refit until you get a good seal around your face**

Any questions or concerns? **If you have any questions or concerns please raise them now before you go into the asbestos workplace. Either the supervisor will be able to answer or else he will find out for you**

Keep Safe and Healthy – look after yourself and those around you

WORK MANAGEMENT PROCEDURE
#9 HANDLING CHEMICALS

1 OVERVIEW & HAZARDS

1.1 Chemicals can cause unwanted health effects such as skin irritation, breathing difficulties, injury, etc. Chemicals may be flammable, poisonous, corrosive and very harmful to both people and the environment.
The purpose of this procedure 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 with a valid work 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 #11 Hazard Recognition to recognise 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 Everyone must be competent working with a particular chemical by following a BGC approved training. Persons trained (BGC or Contractor) are authorized Chemical Users for that chemical.

2.3 Verify that any chemical to be used is included in the BGC Inventory of Chemicals and MSDS Data Sheets. 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 Risk Assessment, including PPE, must be understood and followed by the users.

2.5 Earthing shall be in place for storage of Flammable materials.

2.6 Toolbox talk shall be prepared by supervisor before work begins.
Communicate

2.7 During the Toolbox Talk, the supervisor must discuss in detail the MSDS and all associated hazards and the specific controls including the required PPE. See Table 1 below Global Harmonised System (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.

2.8 Inventory movements must be checked and communicated to the store supervisor to ensure that adequate emergency response can be made if needed.

2.9 Check Equipment and PPE. See WMP# 25 PPE.

2.10 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 2, below). Consult the Environment Department for guidance and assistance
- Containment for spills and leaks e.g. bunded (capable of holding 110% of volume stored) and have an impermeable floor, see Figure 1
- Equipment appropriate for the quantity, type and location of the stored chemicals

Table 1 GHS Pictograms

Table 2 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

2.11.10 Chemical containers must be checked to confirm the following (see Figure 1 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 Example Label based on the Global Harmonised System (GHS)

2.12 Check all required PPE is fit for use, in good condition and meets the requirements of the MSDS.

2.13 Reused containers or cut containers should be not be used to transfer, hold or store chemicals.

Containers found to be unsafe for further handling must be assessed and appropriate measures taken to ensure the safety of all personnel.

2.14 **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
- Emergency contact numbers should be clearly posted
- Access should be restricted to those involved in the task
- Equipped as per Appendix 1: Minimum Requirements for Equipment

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 fire extinguishers 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 1 below for examples

Figure 1 Examples of Secondary Containment Spill Trays

Start work

HANDLING DO'S AND DON'T'S	
DO	**DON'T**
✓ 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.	✗ 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# 17 Incident Reporting. **A minor spill is classed as**:

- Less than 100 L of any liquid chemical
- Less than 100 Kg of any solid chemical

Any spillage GREATER than the above shall be classified as a MAJOR spill.

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# 11 Hazard Recognition).

3.4 **Emergency Response- Major Spills**

- All accidents, fires, spills or similar involving chemicals shall be dealt with under the procedures detailed in the BGC's Emergency Response Procedure

3.5 The NFPA diamond provides a quick visual summary of the health hazard, flammability, reactivity and special hazards that chemical may pose during a fire. See Figure 3. Emergency crews must be competent to manage chemical emergencies (refer to the Emergency Response Procedure).

Figure 3 NFPA Hazard Sign Format

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# 17 Incident Reporting and Investigation.

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition

#24 Permit to Work

#25 Personal Protective Equipment

BGC Checklists

Appendix 1: Minimum Equipment Requirements for Chemical Storage Areas

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Operations HSE Manager Steve Wright/Bjorn Lauvstad	1/3/21	Retained on sign-off form

8 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
#10 HANDLING COMPRESSED GAS CYLINDERS

1 OVERVIEW & HAZARDS

1.1 This Work Management Procedure (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 #22 Manual Material 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 & Process Safety Fundamentals

Work with a valid work 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 #11 Hazard Recognition to recognise 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, Job Hazard Analysis, ToolBox Talk are needed and who will check it is done before the work starts. Follow WMP #24 Permit to Work.

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 container if they cannot read its label, nor should they use only a container's colour to identify its contents.

2.6 Ensure regulators, valves and fittings are in good condition. Compressed gas cylinders are:

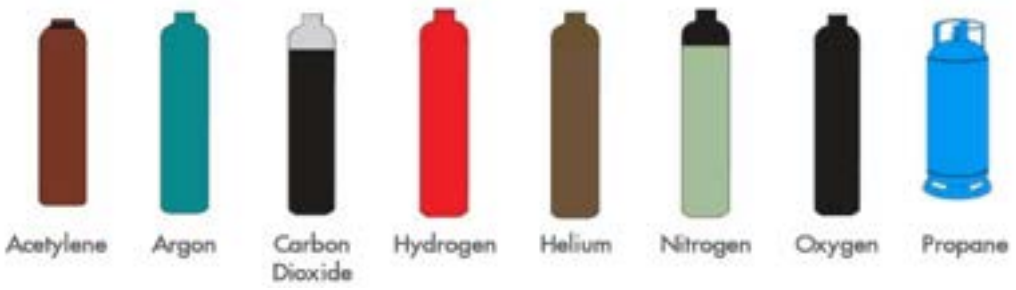
- Colour coded in accordance with Industrial Gas Cylinder Colour coding, see Figure 2
- Valid within 5 years after inspection date (stamping on cylinder shoulder)

Acceptance 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.

2.8 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.

Figure 2 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.

3.2

DO	DON'T
✓ 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 -#22 Manual Material 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 ✓ Always "ASK" your supervisor if you are in doubt	X Never use Oxygen gas as a source of compressed air X Do not set the regulator pressure above the maximum pressure of the equipment or tool X Cylinders shall never be used as rollers or supports, whether full or empty X Cylinders shall not be dropped or subjected to excessive shock X Smoking and carrying of other sources of ignition is strictly prohibited in the vicinity (minimum 5m) from compressed gas storage area X Repair or alteration to the cylinder, valve, or safety relief device is strictly prohibited. X Horizontal rolling of cylinders and moving of any cylinder with the valve open is not permitted X Defective cylinders, regulators, valves, and/or hoses shall not be used X Do not use any gas cylinder with missing or unreadable precautionary labels and markings or without clear color codes

3.3 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.

3.4 **Handling and transporting compressed gas**

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

3.6 Cylinders must be marked with a label that clearly identifies the contents.

3.7 All cylinders must be checked for damage prior to use. Do not repair damaged cylinders or valves.

3.8 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_2H_2	Pungent with hint of garlic	Asphyxiant	Highly flammable	Lighter	
Argon	Ar	None	Asphyxiant	Non-flammable	Heavier	
Carbon Dioxide	CO_2	None	Asphyxiant	Non-flammable	Heavier	
Hydrogen	H_2	None	Asphyxiant	Highly flammable	Lighter	
Helium	He	None	Asphyxiant	Non-flammable	Lighter	
Nitrogen	N_2	None	Asphyxiant	Non-flammable	Same	
Oxygen	O_2	None	None	Non-flammable, but supports combustion	Same	
Propane	C_3H_8	Odourised	Asphyxiant	Highly flammable	Heavier	

3.9 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.

3.10 All cylinders must be fitted with safety valve covers before they are moved.

3.11 Only three-wheeled or four-wheeled carts should be used to move cylinders.

3.12 Always use a pressure-regulating device to control the flow of gas from the cylinder.

3.13 The main cylinder valve shall be the only means by which gas flow is to be shut off.

3.14 The correct position for the main valve is all the way on or all the way off.

3.15 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.

3.16 Keep valves pointed away from others when opening.

3.17 Ensure use of caps.

3.18 Cylinder valves must never be lubricated, modified, forced, or tampered with.

3.19 Regulator fittings must not be sealed with Teflon tape, grease or pipe sealant.

3.20 Never grease any oxygen fittings (use PTFE Teflon tape only).

3.21 After connecting a cylinder, check for leaks at connections.
3.22 Periodically check for leaks while the cylinder is in use.
3.23 Regulators and valves must be tightened firmly with the proper size wrench.
3.24 Do not use adjustable wrenches or pliers because they may damage the nuts.
3.25 Cylinders must not be placed near heat or where they can become part of an electrical circuit.
3.26 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.
3.27 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.
3.28 Appropriate regulators must be used on each gas cylinder.
3.29 Threads and the configuration of valve outlets are different for each family of gases to avoid improper use.
3.30 Use the Compressed Gas Association (CGA) numbered fittings appropriate for the gas in use.
3.31 Consult manufacturer's catalogues for the appropriate equipment. Adaptors and homemade modifications are prohibited.
3.32 Cylinders must never be bled completely empty. Leave a slight pressure to keep contaminants out.

Storage

3.33 When not in use, cylinders must be stored with their main valve closed and the valve safety cap in place.
3.34 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 (>12.5% free wall area), shall preferably be covered and have at least two exits.

3.35 Compressed gases shall not be used for cleaning purposes.
3.36
- 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

Inspection

3.37 Pre-and post-use checks shall be made to cylinders, hoses, connections, regulators and torches or burners for damage from cuts, abrasion, burns and general deterioration using a liquid leak detector (e.g. “snoop brand”) water bubble test.

3.38 Cylinder shall be inspected and Hydro Tested every 5 years. Records of inspection shall be kept and maintained. A record of inspection shall be attached to cylinders.

3.39 **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

3.40 In the event of a fire involving the torch assembly or hoses, close the cylinder valves if it is safe to do so.

3.41 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 AND RESOURCES

Relevant WMP

#11 Hazard Recognition
#22 Manual Material Handling
#24 Permit to Work
#25 Personal Protective Equipment

BGC ToolBox Talks, Communication Materials, Posters and Information

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

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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 PTW where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Operations HSE Manager Steve Wright/Bjorn Lauvstad	1/3/21	Retained on sign-off form

8 APPENDIX 1 10 QUESTIONS FOR GAS CYLINDER SAFETY

10 QUESTIONS
TO ASK TO AVOID
HAZARDS OF COMPRESSED GAS CYLNDERS

شركة غاز البصرة
Basrah Gas Company

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

1 STORAGE

2 CONTENTS

3 INSPECTIONS

4 TRAINING/COMPETENCE

5 GAS LEAKS OR FIRES

6 HOT WORK

7 HAZARDS

8 TREAT WITH CARE

9 HANDLING

10 COLOUR CODING

WORK MANAGEMENT PROCEDURE
#11 HAZARD RECOGNITION

1 OVERVIEW & HAZARDS

1.1 A HAZARD is any situation, condition, toxic gases or object that has the potential to cause harm to people, damage to assets, impact on the environment or damage reputation.

The purpose of this procedure 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 and updated periodically. HSE Cases are available at BGC operating sites.

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), PAUSE and Worksite Hazards Management are used during day to day work in facilities. In BGC we apply a Hazard and Effects Management Process (HEMP) for the development of HSE Cases for the:

- 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 as low as reasonably practicable (ALARP)

1.2 HEMP tools are used in design and plant changes but also for the day to day worksite activities such as; Construction HAZID (Hazard Identification), Health Risk Assessment (HRA), Job Hazards Analysis (JHA), Toolbox Risk Identification Card (TRIC), PAUSE and Worksite Hazards Management. This work procedure is applicable to all BGC staff and contractors.

Relevant Life Saving Rules

Work with a valid work permit when required


Conduct gas tests when required


Verify isolation before work begins and use the specified life protecting equipment


Obtain authorisation before entering a confined space


Obtain authorisation before overriding or disabling safety critical equipment


Protect yourself against a fall when working at height


Do not walk under a suspended load


Do not smoke outside designated smoking areas


No alcohol or drugs while working or driving


While driving, do not use your phone and do not exceed speed limit


Wear your seat belt


Follow prescribed Journey Management Plan

Relevant Process Safety Fundamentals

Always use two barriers for hydrocarbon and chemical drains and vents


Do not leave an open drain orcritical transfer unattended


Take interim mitigating measures in case of failure of Safety Critical Equipment


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

Do not make a change without a proper MOC


Verify for complete tightness after maintenance work


Always check that equipment is pressure free and drained, and provides safe isolation before starting maintenance work


Perform MOC and install backflow protection when connecting utilities to process


Respond to critical alarms

2 PLAN THE WORK

Risk Assessment Matrix (RAM)

2.1 The Risk Assessment Matrix (RAM) is a tool use to assess the hazards and associated risks of an activity. The RAM is a 6 by 5 matrix is 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 predict risk in the future:

- Vertical axis represents increasing Consequences (Severity levels 0 to 5) in terms of harm to people, damage to assets, effect on the environment and impact on community
- 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 People, Asset, Environment & Community categories are not to be inferred as equal. They are not to be used to infer the value of a life

Figure 1 BGC Risk Assessment Matrix (RAM)

SEVERITY	CONSEQUENCES				INCREASING LIKELIHOOD				
	People	Assets	Community	Environment	A	B	C	D	E
					Never heard of in the Industry	Heard of in the Industry	Has happened in the Organisation or more than once per year in the Industry	Has happened at the Location or more than once per year in the Organisation	Has happened more than once per year at the Location
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					

Use of the RAM

2.2 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.

Follow the 4-Step Process:

Step 1 - Identify potential Consequences

Step 2 - Estimate the Severity of each potential Consequence

Step 3 - Estimate the Likelihood

Step 4 - Estimate the Risk rating

HAZARDS Identification Definitions & Tools

2.3 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 in the Table below. Appendix 1 provides a list of Hazard Types with associated symbols that can be used.

Table 1 Hazard Identification and Risk Assessment Tools

Tools for the Worksite	Definition
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.
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.
ALARP – As Low As Reasonably Practicable	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.
HAZID – Hazard Identification	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.
HRA – Health Risk Assessment	A tool for identifying, evaluating, controlling and managing Health Risks associated with work to prevent acute and chronic health Effects.
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. See Figure 2.
JHA – Job Hazard Analysis	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.
TRIC – Toolbox Risk Identification Card	Form attached to each permit that facilitates to identification of risks and putting in place controls and mitigation at job level during the start of work Tool Box talk.
PAUSE	A simple engagement tool for workers to continually recognize and manage safety hazards during work to eliminate incidents and injuries.

Figure 2 Worksite Hazard Management

PLAN

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

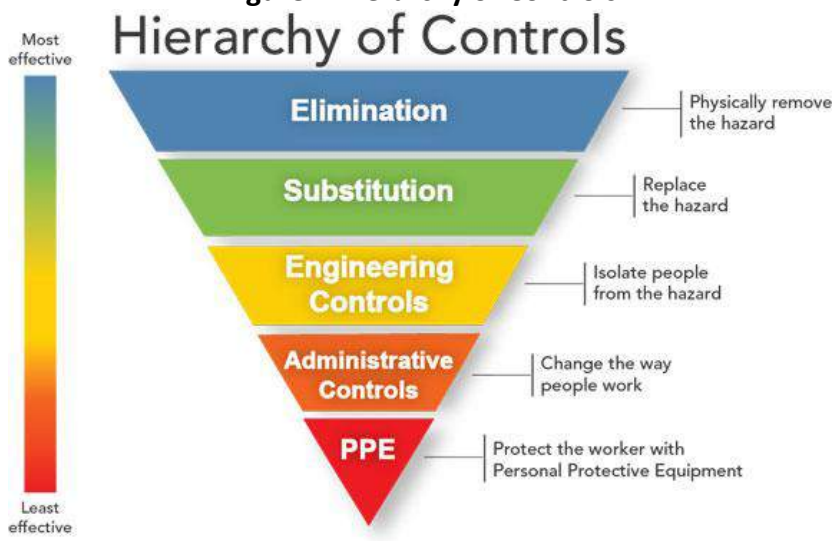
The following mandatory hazard identification trainings shall be conducted:

- HSE Induction – for all new staffs and contractors working at BGC offices and worksites
- Site Specific HSE Induction – for staffs and contractors prior to first entry to the worksites. Conducted by Asset Site Induction Focal Points
- PTW L1 – mandatory for people working on a PTW
- PTW L2 – a pre-requisite for PTW all PTW signatories such as applicants/holders

2.5 Job Hazard Analysis (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.

- Hazard identification guide (see Appendix 2)
- Hierarchy of controls shall be applied (see Figure 2, below)
- 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 'As Low as Reasonably Practical' (ALARP)
- Risk assessments shall consider the hierarchy of controls;
- PPE is the last line of defense. If the primary means of control to hazard exposure is PPE, the risk is most likely Intolerable (high) and managers should re-assess viability

Figure 2 Hierarchy of Controls



COMMUNICATE

2.6 PTW shall be submitted before execution of work. JHA should be part of the PTW process and controls shall be listed in the permit.

JHA to be conducted prior to permit application. As a minimum the Permit Applicant and Shift Engineer shall participate in the JHA discussion. Discipline Leads, HSE and Supervisors etc. can join or contribute to the meeting.

Note that as you prepare the JHA and PTW, each worksite has its own unique hazards surrounding its working area as well as hazards specific to the work tasks.

2.7 Hence it is best practice is 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, Emergence Response Team e.g. Rescue plan
- Once the team is aligned, the Permit Requestor shall submit the JHA to the Permit Issue Point (PIP) for review

For high risk activities, if it is not possible to demonstrate that the controls applied to mitigate the hazards to 'As Low as Reasonably Practical (ALARP)', an assessment shall be performed by a competent and experience person.

3 DO THE WORK

ENERGY & SITUATIONAL AWARENESS

3.1 "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 to avoid Line of Fire Injuries (see Appendix 3).

FINAL CHECKS and ToolBox Talk (TBT)

3.2 On daily basis, before commencing any work activities, supervisors shall conduct a pre-task ToolBox Talk (TBT). 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 PTW.

TBT Tips

- All workers, including subcontractors, associated with the work to be included
- Supervisor leads the TBT and makes sure that everyone is attentive and takes part
- Questions/answers on the tasks, hazards and controls, checks PTW requirements met and sign-off, including the Task Risk Identification Card (TRIC). Projects include CSSS and 7 Steps – Safe Start of Work checksheets.
- Duration 15-20 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#24 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 ToolBox Talks 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, smart watches
- Metallic jewelry with the potential to generate sparks

START WORK

3.5 Once work commences (and after a break), the PAUSE Tool (see below) is a simple engagement tool, that can be used to help a work crew structure a discussion about the change in potential hazards and controls. Hazards, condition and controls 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 to the work team requires a new TBT.

- 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

PAUSE TOOL
Have a conversation with your co-workers and ask the following questions

- 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 will we PAUSE again during this job?

COMMIT TO THE PAUSE PROCESS TO HELP IDENTIFY CHANGE AND HAZARDS

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition
#26 Manual Material Handling
#25 Permit to Work
#31 Personal Protective Equipment

BGC Checklists and CSSS Forms

BGC ToolBox Talks, Communication Materials, Posters and Information

Hazard Classification See Appendix 1
Line of Fire: 10 Questions See Appendix 3

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Operations HSE Manager Steve Wright/Bjorn Lauvstad	1/3/21	Retained on sign-off form

8 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)

Permit No.:		Date:	Time:	Work Order No.:
Permit Task:				
TBT Task Details:				

Toolbox Talk Leader	Name:	Position:	Sign:

Attendees

Name:	Sign:	Name:	Sign:
Name:	Sign:	Name:	Sign:
Name:	Sign:	Name:	Sign:
Name:	Sign:	Name:	Sign:
Name:	Sign:	Name:	Sign:

By signing this form I agree with all of the PTW controls and additional controls identified on this form and will comply with them.

Life Saving Rules – tick any LSR's applicable to this task

Additional Hazard Prompts – does the task involve any of the following ?

Motion		Height		Pressure		Thermal	
Electricity		Fire and Explosion		Toxics		People	

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

1		3		5	
2		4		6	

Use this table to describe the task, identifying the steps, hazards for each, and controls required to work safely					
Step Description	Hazards associated with the step	Controls to be put in place	Person Responsible	Controls In Place	
				No	Yes

Final Checks – Confirm all of the following requirements are in place immediately prior to starting work – Yes or No							
Valid PTW in place and "live"		Life Saving Rules discussed		All personnel wearing correct PPE		All work party have attended TBT	
Detailed TBT carried out		Communication methods agreed		Tools and equipment all safe		All personnel aware of their roles	
New TBT required if new members of work party join later in shift				Dynamic Risk Review points discussed and agreed			

APPENDIX 3 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

2 LIFTING/ HOISTING

3 WORKING AT HEIGHT/DROPPED OBJECTS

4 TENSIONED LINES/ SPRING LOADED DEVICES

5 OBJECTS WITH ROLL OR FALL POTENTIAL

6 PRESSURIZED EQUIPMENT

7 MACHINERY & TOOLS

8 ELECTRICAL EQUIPMENT

9 PROJECTILES

10 PUSHING / PULLING

WORK MANAGEMENT PROCEDURE #12 HEALTH MANAGEMENT OF HYDROCARBONS IN AIR (BTEX)

1 OVERVIEW & 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.

The presence of BTEX and need to mitigate exposure is commonplace throughout the oil and gas industry.

Some of BGC's gas processing facilities vent VOCs and BTEX into the air posing a risk via inhalation, or discharge liquids into the ground posing risk via contact with soil or use of groundwater.

Particular focus is needed for emissions from BGC's 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.

This procedure is to help BGC staff and contractors limit BTEX exposure.

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 odors 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 odor for extended periods.

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.

Relevant Life Saving Rules & Process Safety Fundamentals

Work with a valid work 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 #11 Hazard Recognition to recognise 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, Job Hazard Analysis, ToolBox Talk, etc, is needed for the task and who will check it is done before the work starts. Follow WMP #24 Permit to Work.

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
- 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 A) 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 #25 Personal Protective Equipment.

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)

See Appendix 1 for Site Specific images of these locations showing areas of BTEX-control.

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 Permit to work 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. Monitor before and during work. See Figure 1, below.

Figure 1: Protective Equipment and Measures for BTEX

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 regular 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.

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.

3.8 Seek Health Team assistance for BTEX monitoring if non routine work is planned in the area.

3.9 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. Report to the BGC Health Clinic should you experience any discomfort from the odour.

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition
#24 Permit to Work
#25 Personal Protective Equipment
Gas Testing Site Instruction

BGC ToolBox Talks, Communication Materials, Posters and Information

Site BTEX Guidance – See Appendix 1
Draeger Pump Instructions – See Appendix 2

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

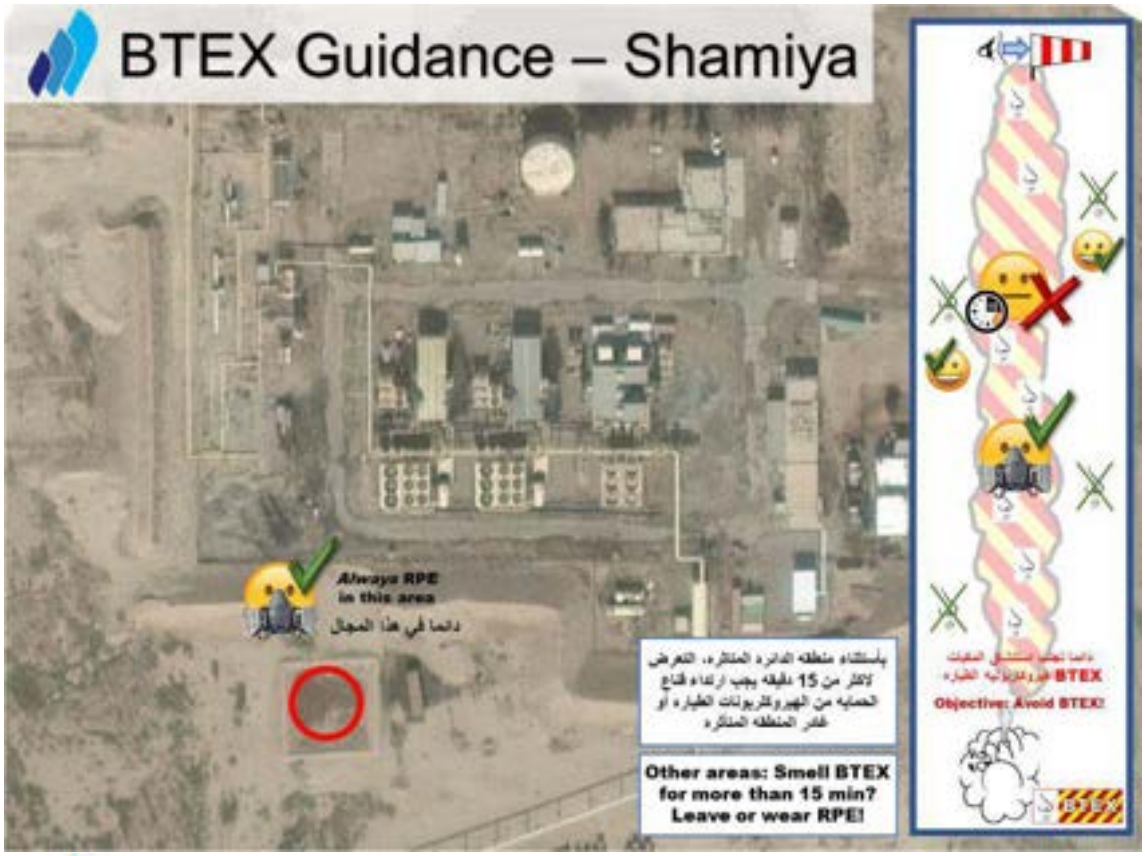
6 INTERPRETATION AND UPDATING

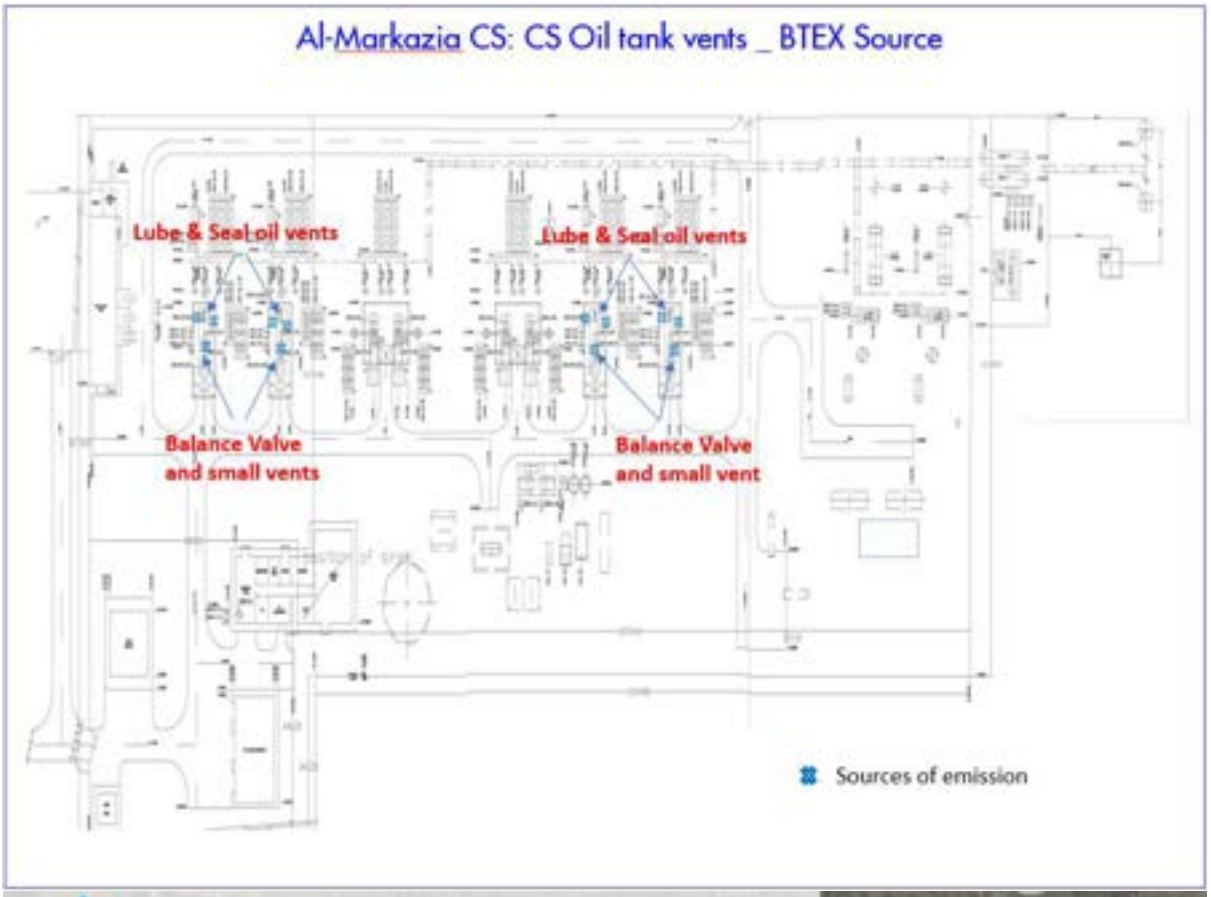
BGC HSE Risk & Assurance Lead shall ensure periodical update of this WMP as required
BGC HSE Director shall direct enquiries on interpretation of this procedure to the most appropriate BGC authority.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Health Manager Dr Hamid Al-Jabara	1/3/21	Retained on sign-off form

8 APPENDIX 1 BGC LOCATIONS WITH BTEX CONTROLS

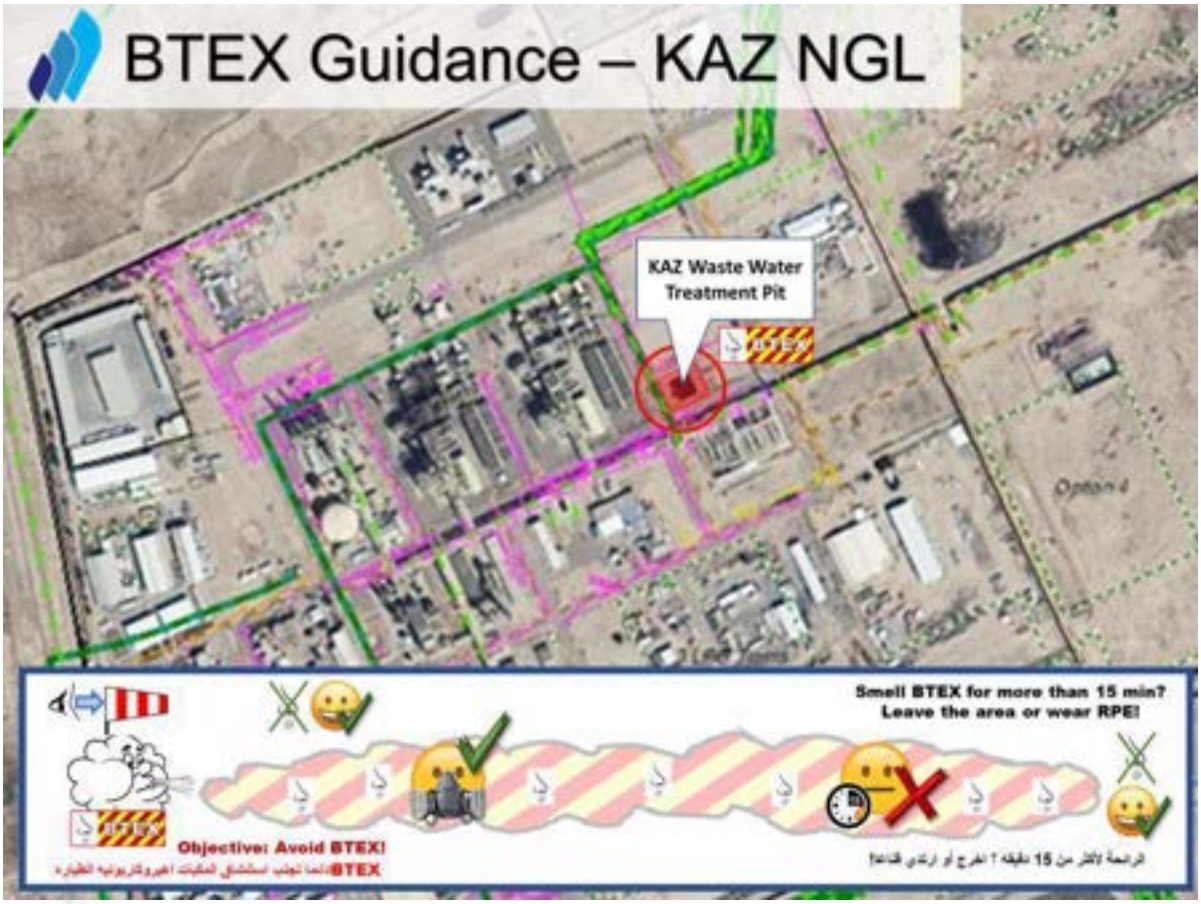


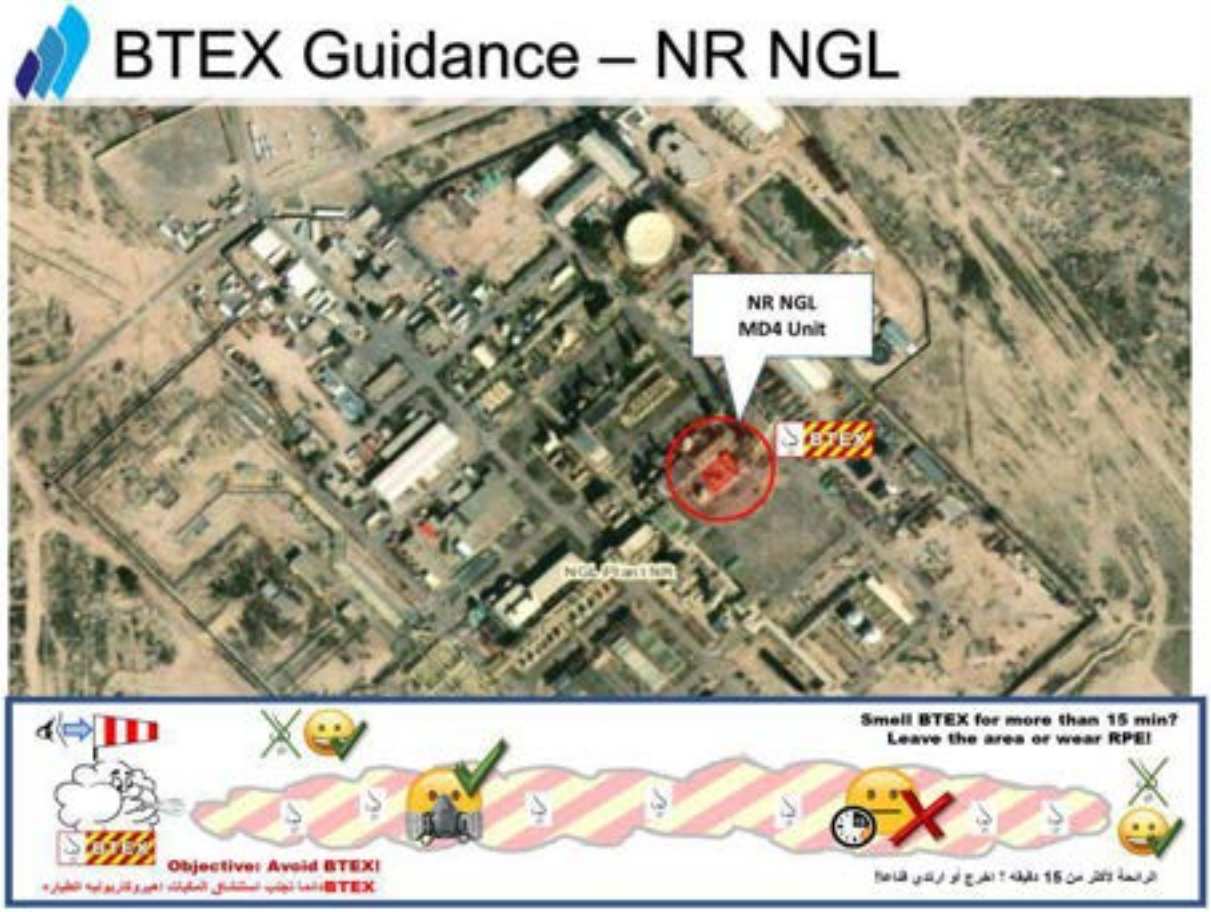

Al-Markazia CS: CS Oil tank vents _ BTEX Source
Lube & Seal oil vents
Lube & Seal oil vents
Balance Valve and small vents
Balance Valve and small vent
Sources of emission


BTEX Guidance – CS7
BTEX
Objective: Avoid BTEX!
Smell BTEX for more than 15 min?
Leave the area or wear RPE!

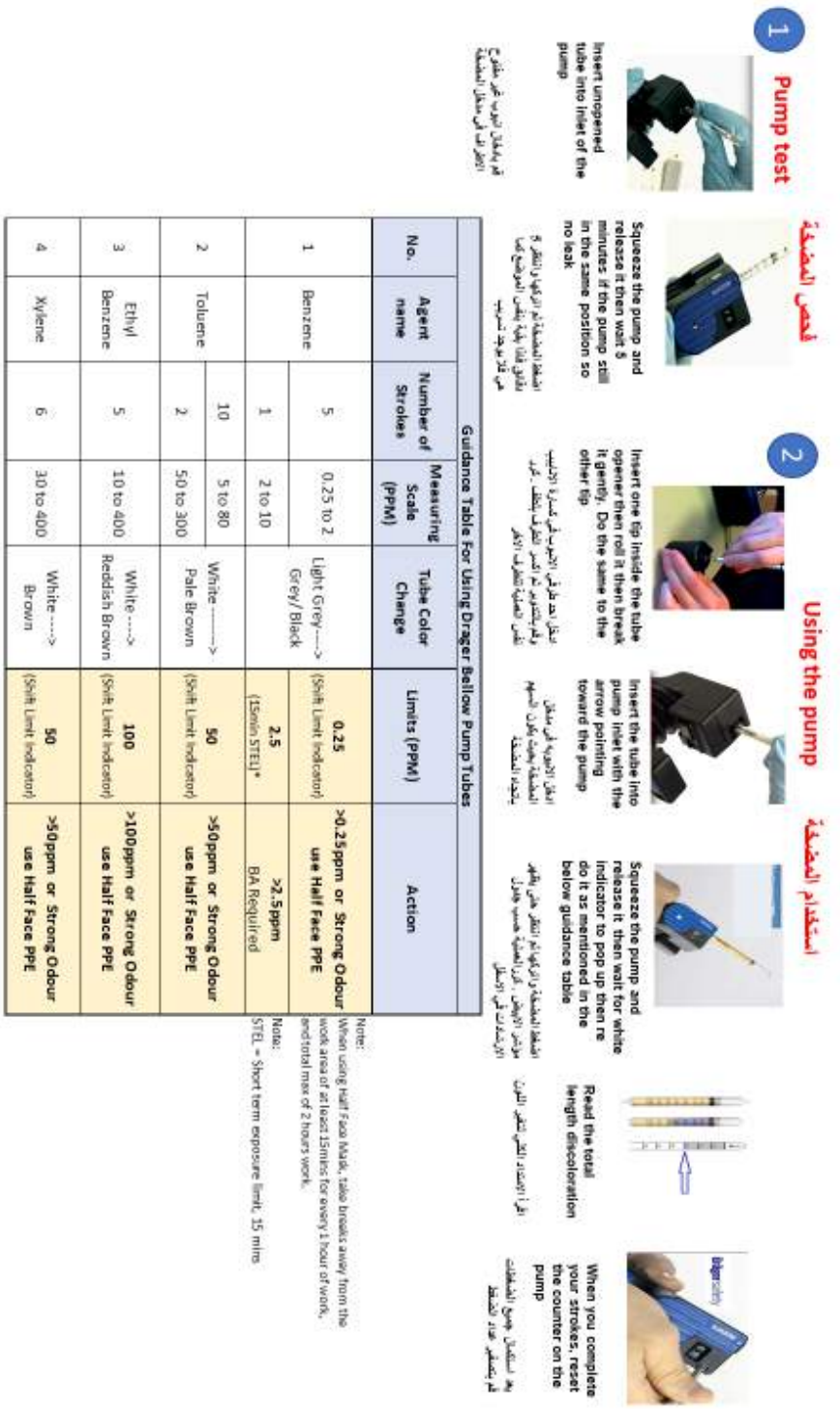

BTEX Guidance – CS8
BTEX
Objective: Avoid BTEX!
Smell BTEX for more than 15 min?
Leave the area or wear RPE!


BTEX Guidance – WQ6
BTEX
CS6 WQ
Objective: Avoid BTEX!
Smell BTEX for more than 15 min?
Leave the area or wear RPE!


BTEX Guidance – KAZ NGL
KAZ Waste Water Treatment Pit
BTEX
Smell BTEX for more than 15 min?
Leave the area or wear RPE!
Objective: Avoid BTEX!
BTEX


BTEX Guidance – NR NGL
NR NGL
MD4 Unit
BTEX
Smell BTEX for more than 15 min?
Leave the area or wear RPE!
Objective: Avoid BTEX!
BTEX

APPENDIX 2 USE OF DRAEGER BELLOWS PUMP FOR GAS MONITORING



Guidance Table For Using Dragger Bellow Pump Tubes

No.	Agent name	Number of Strokes	Measuring Scale (PPM)	Tube Color Change	Limits (PPM)	Action
1	Benzene	5	0.25 to 2	Light Grey----> Grey/ Black	0.25 (Shift Limit Indicator)	>0.25ppm or Strong Odour use Half Face PPE
		1	2 to 10		2.5 (15min STEL)*	>2.5ppm BA Required
2	Toluene	10	5 to 80	White ------> Pale Brown	50 (Shift Limit Indicator)	>50ppm or Strong Odour use Half Face PPE
		2	50 to 300			
3	Ethyl Benzene	5	10 to 400	White ----> Reddish Brown	100 (Shift Limit Indicator)	>100ppm or Strong Odour use Half Face PPE
4	Xylene	6	30 to 400	White ----> Brown	50 (Shift Limit Indicator)	>50ppm or Strong Odour use Half Face PPE

Note:
When using Half Face Mask, table breaks away from the work area of at least 15mins for every 1 hour of work, and total max of 2 hours work.

Note:
STEL = Short term exposure limit, 15 mins

WORK MANAGEMENT PROCEDURE
#13 HEAT STRESS AND ADVERSE WEATHER

1 OVERVIEW & HAZARDS

1.1 Severe heat and adverse weather conditions be hazardous to BGC work and facilities.

This work procedure is applicable to all BGC staff and contractors.

1.2 **Hazards include**

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

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

Relevant Life Saving Rules and Process Safety Fundamentals

Work with a valid work 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 #11 Hazard Recognition to recognise 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, Job Hazard Analysis, ToolBox Talk, etc, is needed and who will check it is done before the work starts. Follow WMP #24 Permit to Work.

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), ToolBox Talks and seasonal campaigns communicated by Line Management.

2.6

- 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

2.7 **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-check 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

2.8 **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.

2.9 **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

Extreme Hot Weather

3.1 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 2.

Workplace, Task Evaluation and Risk Assessment

3.4 For most workplaces and tasks observation of the flag color and implementing all the standard controls identified in this procedure provide adequate control of the heat stress risk associated with working in Company 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 work or Elevated work
- Tasks that require the use of 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 (HAC) is declared when the conditions for heat stress are significant. This is set at a Heat Index (HI) 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 the site to keep personnel informed of current heat stress conditions for that location.

Table 1 Heat Stress Index

HEAT STRESS INDEX			
Category	**Heat Index Value**	**Rest**	**Water Consumption**
PURPLE	**54 and above**	**Purple Flag Controls**	
Orange	**32- 53**	**10minutes/hour**	**1 Glass (250ml) every 10minutes**

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.)

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 Site Manager and with agreement from the Occupational Health and Hygiene Team
- The Site Manager approves the deviation in writing based on a clear justification for the work to continue. The template for requesting approval is given in Appendix 8
- 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

Driving in adverse weather

3.10 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	Reduce Visibility < 50 meters	High
2	Heavy Fog	Reduce Visibility < 100 meters	High
3	Heavy Rain	Reduce Visibility < 50 meters	High
4	High Wind/Dust	Wind speed > 75 km/h or Reduce Visibility < 50 meters	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

Working in adverse weather

3.14 Wind limitations for Lifting and Hoisting:

- Apply the maximum value according the lifting plan
- In any case never exceed the Crane manufacturer limits
- The absolute maximum allowable wind speed limit for BGC is 9.8m/s. or 7 m/s for Man riding operation with Suspended Basket. See Wind Speed Comparison Chart below for other units

Wind Speed Comparison Chart

Beaufort Force	Description	Wind Speed			
		kts	mph	km/h	m/s
0	Calm	0	0	0	0-0.2
1	Light Air	1-3	1-3	1-6	0.3-1.5
2	Light Breeze	4-6	4-7	7-11	1.6-3.3
3	Gentle Breeze	7-10	8-12	12-19	3.4-5.4
4	Moderate Breeze	11-16	13-18	20-29	5.5-7.9
5	**Fresh Breeze**	**17-21**	**19-24**	**30-39**	**8.0-10.7**
6	Strong Breeze	22-27	25-31	40-50	10.8-13.8
7	Near Gale	28-33	32-38	51-62	13.9-17.1
8	Gale	34-40	39-46	63-75	17.2-20.7
9	Strong Gale	41-47	47-54	76-87	20.8-24.4
10	Storm	48-55	55-63	88-102	24.5-28.4
11	Violent Storm	56-63	64-72	103-117	28.5-32.6
12	Hurricane	>63	>72	>117	>32.7

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 30 seconds
- Where possible stay inside for 30 min. after the last visible lighting or thunder
- Stay in a vehicle if you cannot go inside

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition

#24 Permit to Work

#25 Personal Protective Equipment

BGC ToolBox Talks, Communication Materials, Posters and Information

Heat Index Table – see Appendix 1

Heat Related Illnesses – See Appendix 2

Urine Hydration Status Guide – See Appendix 3

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these requirements. If anyone sees these requirements not being followed, they must safely intervene.
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6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Health Manager Dr Hamid Al-Jabara	1/3/21	Retained on sign-off form

8 APPENDIX 1 HEAT INDEX TABLE

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**

1 Glass = 250 ml.

Note: Do not drink more than 1.5 liters per hour (maximum water absorption rate of human body)

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 Can be confused with the symptoms of heat stroke which is a bona fide medical emergency 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	Excessive sweating Extreme weakness, fatigue Pale, cold clammy skin Dizziness Headache Nausea, vomiting Muscle cramps, usually abdominal Fast shallow breathing Normal or slightly increased body temperature Loss of consciousness	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. Do not give caffeine or alcohol. Rest for at least 12 hours
Heat Cramps 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 They often occur when unaclimatised workers carry out strenuous physical activity 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	Muscle spasms, usually in the lower extremities, abdomen or both Cool, moist skin Rapid pulse Remains alert Normal body temperature	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

Heat Rash Also known as prickly heat Occurs when sweat is not removed quickly enough from the skin by evaporation Severity varies but can be severe enough to inhibit sleep (can impede a worker's performance or result in temporary disability)	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	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
Heat Syncope / Collapse (Fainting) Caused by prolonged standing (especially in one spot) or standing up suddenly Blood pools in the extremities (legs) thus depriving the brain of oxygen Fainting results	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	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

APPENDIX 3 DEHYDRATION CHECK

WORK MANAGEMENT PROCEDURE #14 HOT WORK

1 OVERVIEW & HAZARDS

1.1 Hot work includes activities such as welding, cutting, heating, straightening and descaling. The purpose of this procedure 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 defined in this procedure.

For a fire or explosion to occur, three key elements are required:

- Oxygen – already present in the atmosphere
- Any type of Fuel – already an increased presence in our facilities
- Heat or ignition – provides energy to burn or ignite the fuel/oxygen mixture

1.2 **Hazards include:**

- Hot work inside hydrocarbon facilities poses an 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 & Process Safety Fundamentals

Work with a valid work permit when required

Conduct gas tests when required

Verify isolation before work begins and use the specified life protecting equipment

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

Always use two barriers for hydrocarbon and chemical drains and vents

Walk the Line – Verify and validate any line up change

2 PLAN THE WORK

2.1 Follow WMP #11 Hazard Recognition to recognise 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 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 #24 Permit to Work.

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
▪ 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 electric drills or other power tools without EX-rated motors ▪ 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	▪ Dry grit and shot blasting ▪ Using needle guns, powered wire brushes, orbital power sanders with EX-rated motors ▪ Use of battery powered cameras, or non-EX mobile phones ▪ Non-appropriately rated EX equipment in Hazardous zones ▪ 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 ▪ Vacuum Trucks in operations ▪ Dewatering pumps ▪ 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:

1. 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
2. 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
3. Eliminate flammable materials (e.g. isolated and drain flush purge vent to make the area hydrocarbon free)

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

Area Classification	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 Process Areas or the PTW boundaries. Workshops, offices, fabrication yards.

When planning work activities, make field checks and confirm with Operations the Hazardous Zone Area identified on the HAC drawing.

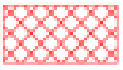
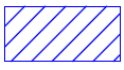
The HAC may change due to operational conditions e.g. due to a leaking valve or flange.

2.5 If HAC drawings are not available, or leaks identified 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, 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	
Zone 2 	ONLY PERMITTED WITH PTW & HOTBOX OR PRESSURISED HABITAT	
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.

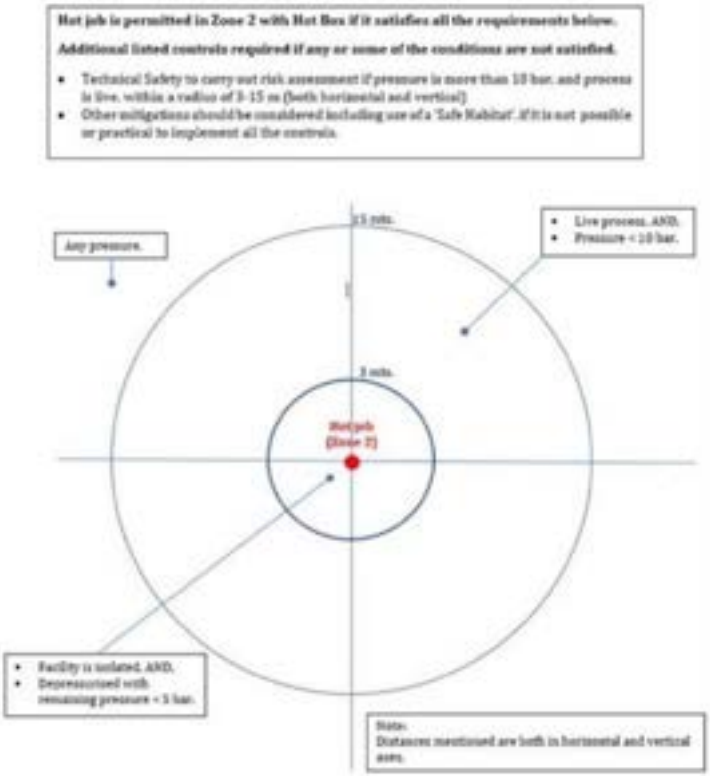
ZONE 2 - PTW with appropriate Hot Work controls such as gas testing, no flammable substances in area, use of hotbox or pressurised habitat. Provide attention to containment of ignition sources such as sparks. See figure 1, use of Hot Box in Zone 2 area

The following shall be adhered to:

- Hot work can be carried out when facility is isolated and all sections within a radius of 3m (both horizontal and vertical) are depressurised with remaining pressure less than 5 bar, Non-Pressurised Habitat (Hotbox) methodology shall be used (see figure 1).
- For hot work within radius of 3-15m (both horizontal and vertical), pressure less than10 bar and equipment is live (not isolated), a Non-Pressurised Habitat (Hotbox) is required.
- For hot work within radius of 3-15m (both horizontal and vertical), pressure more than 10 bar, and process is live, involve technical safety to perform risk assessment (HAZID).
- For hot work beyond radius of 15m (both horizontal and vertical) at any pressure, Non-Pressurised Habitat (Hotbox) is required. See section 2.6.

If it is not possible or practical to implement the above, other mitigations should be considered including use of a Pressurised Habitat (Safe Habitat). See section 2.7.

Figure 1: Use of Hot Box in Zone 2 Areas



2.6 **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.

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

2.7 **Pressurised Habitat (Safe Habitat)**

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.

Figure 2 provides a typical arrangement of a pressurised habitat.

2.8 **Location**

Pressurized hydrocarbon systems with potential leak paths such as valves, flanges, fittings, etc. should be not be enclosed in the habitat

Figure 2 Pressurized Habitat Example

Preparing for the Job

2.9 Permit Applicant must visit the work area with the Permit Issuer 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 stored hydrocarbons in nearby vessels/equipment and decide steps for draining and purging to be hydrocarbon free
- Agree on other hot work controls or protection required for the activity.

2.10 Prepare the PTW (see WMP#24 PTW). The PTW pack contains the following as a minimum:

- Hot Work Category Permit Form
- Hot Work Checklist
- Job Hazard Analysis (JHA) with Technical Safety review, as required
- Toolbox Risk Identification Card
- Authorized Gas Testing Certificate
- Isolation Certificates – if required. (See WMP #19 Isolations)
- Include an Emergency Plan specific to the task

Hot Work Category 1 Permit

Hot Work Category 2 Permit

Hot Work Hazard Checklist Front and Back

3 DO THE WORK

3.1 Receive the issued Hot Work PTW Pack and supporting Job Hazard Analysis (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 is 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#11 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 either by 15m distance or approved protection method (e.g. screens/fire blankets)
- 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)**

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 either by 15m distance or approved protection method (e.g. screens/fire blankets)
- 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 – ANY CAT 1 (POSITIVE IGNITION) IN ZONE 2 AREAS**

As per 3.6, above, adding:

- No simultaneous activity involving release of hydrocarbons, venting, sampling, or breaking containment is permitted within 50m
- A detailed JHA and documented risk assessment may be developed to use a Pressurized Habitat. This is specialist equipment that requires training, competence, and specific controls. Technical Safety shall review the JHA
- The JHA and risk assessment must be approved by the Department Manager

3.8 **MINIMUM CONTROLS FOR CAT 1 WORKING IN A ZONE 1 AREA**

As per 3.7 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**

3.9 **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.**

Sparks Caused by Grinding

3.10 **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 Permit to Work, detailing the critical steps and controls, and must be approved by the MSTA.

The method statement shall meet the following minimum requirements for Hot Tapping on pipelines, piping and equipment:

- The Hot Tapping technique to be used and proposed sequence of activities
- Preliminary inspection of the equipment to ensure that it is in a condition to maintain the necessary strength throughout the Hot Tapping work
- Protection of any connected process plant that may be affected by the operation
- Arrangements to keep the bulk of the equipment cool (e.g. an internal fluid flow)
- Method of avoiding unnecessary weakening of the equipment during the activity
- Control of any pre hot tapping 'burring' (preplanning) work required
- Method of keeping the working area clear of flammable vapours
- Contingency plans in case the line or equipment being worked on fails (e.g. ruptures or collapses etc.) during the work
- Emergency Response plan

3.11 **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#2 Confined Space Entry) extra precautions for Hot Work should be taken, and should include at least the following:

3.12
- Continuous gas monitoring for both Flammables and Oxygen deficiency (due to oxygen used in combustion if welding or cutting)
- Check for and remove any flammable residues. In particular, any flammable liquid in areas such as under gratings, false floors, in sumps, in instrument bridles etc.
- Mechanical 'positive pressure displacement' or 'negative pressure evacuation' ventilation should be provided when Hot Work Cat. 1 works (e.g. welding or cutting) are executed in confined spaces
- 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
- Provide enough extra-low voltage or air operated Ex lighting within the confined space work area to ensure safe work
- 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). The Fire Watch and Confined Space Entry 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

3.13 Finish work and housekeeping. If using a Fire Watcher, they must stay at location with firefighting equipment ready for at least 30 minutes after the hot work is paused or completed.

3.14 **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 Manual of Permitted Operations, 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 #4 Electrical Safety.

4 REFERENCES AND RESOURCES

Relevant WMP
#11 Hazard Recognition
#24 Permit to Work
#25 Personal Protective Equipment
BGC ToolBox Talks, Communication Materials, Posters and Information
10 Questions for Safe Work Hot work (Appendix 1)

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

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7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	Maintenance Director	1/3/21	Retained on sign-off form
Reviewer	Deputy Maintenance Director Crispin Grose/ Ben Reynolds	1/3/21	Retained on sign-off form

8 APPENDIX 1 10 QUESTIONS FOR SAFE HOTWORK

WORK MANAGEMENT PROCEDURE
#15 HOUSEKEEPING

1 OVERVIEW & HAZARDS

1.1 Good housekeeping directly prevents incidents such as slips, trips and falls and dropped objects. Good housekeeping is also a good indicator of a well-run and disciplined site that has pride in its work and site.

This procedure establishes the minimum requirements and provides safe working practices for Housekeeping and is applicable to all BGC staff and contractors.

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
- Increased health risk from wildlife and vermin that have nested / dwelt 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 & Process Safety Fundamentals

Work with a valid work 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 #11 Hazard Recognition to recognise 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.

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 #24 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 holder and supervisor shall ensure worksite is tidy at the start and after work completion and verified by AOT 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
- Flammable materials: are segregated and stored to minimize fire hazards
- Cables and Hose Management is a site priority: Cables, power lines, pipes and hoses are not allowed to trail across walkways or work areas.
- Use cable trees 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. (Hi-ab / Bin lorry)
- Off-plot lay down areas shall be kept in order and clean.
- Onsite limit the use of temporary laydown areas to the duration of the work

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 WMP

#11 Hazard Recognition

#24 Permit to Work

#25 Personal Protective Equipment

BGC Checklists and CSSS Forms

CSSS for Housekeeping – See Appendix 2

BGC ToolBox Talks, Communication Materials, Posters and Information

5 to Stay Alive – See Appendix 1

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Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC HSE Operations Manager Steve Wright/Bjorn Lauvstad	1/3/21	Retained on sign-off form

8 APPENDIX 1 HOUSEKEEPING 5 WAYS TO STAY ALIVE

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

شركة غاز البصرة
Basrah Gas Company

APPENDIX 2 CSSS CHECKSHEET

NOTE: Although 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?			

Completed by: Date:

Signature:

WORK MANAGEMENT PROCEDURE #16 HYDROGEN SULPHIDE (H_2S)

1 OVERVIEW & HAZARDS

1.1 Hydrogen Sulphide (H2S) gas is an extremely hazardous gas. It smells like rotten eggs at low concentrations. It is heavier than air so accumulates in low-lying areas. H_2S 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 H_2S.

Table 1 H_2S 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
50-100ppm	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. 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 H_2S 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 H_2S catches fire, it will produce sulphur dioxide, which is highly toxic.

Relevant Life Saving Rules

Work with a valid work permit when required

Conduct gas tests when required

Relevant Process Safety Fundamentals

Always use two barriers for hydrocarbon and chemical drains and vents

Do not leave an open drain or critical transfer unattended

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

Respond to critical alarms

2 PLAN THE WORK

2.1 Follow WMP #11 Hazard Recognition to recognise the hazards of the task and the location. Apply the hierarchy of controls to ensure that the most appropriate controls have been selected.

Hazard Management

For Job Hazard Analysis (JHA) and Permit to Work application:

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

2.2 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.

Identify if a WRP - Work Responsible Person is required. WRP is not active in the assigned task. Role is to observe the work activities to ensure PTW/ JHA parameters are adhered to at all time. Empowered to pause or stop works at any time and may initiate ERT (but NOT RESCUE) if situation required. If SCBA, Rescue Plan are required consult with the Emergency Response Department (ERD) to agree the controls.

2.3 Confirm what approvals, documentation, Permit-to-Work, Job Hazard Analysis, ToolBox Talk, etc, is needed and who will check it is done before the work starts. Follow WMP #24 Permit to Work.

2.4 Confirm supervision arrangements including any necessary support, including HSE advisors, Emergency Response and Gas Testing, etc.

H_2S Areas (Sour Facilities)

2.5 In BGC facilities operate either with (sour) or without risk of H2S. The following assets are in sour service (always verify with operations before you do work):

- NR NGL, NR: CS1, CS2, CS3, CS4, CS5 and WQ: CS6, CS7, CS8

All above locations have H2S concentration above 50ppm.

2.6 Classification of H_2S Area may change if sampling confirms H_2S exceeds thresholds.

2.7 Place Clear Warning signs and barriers at the entrance and surrounding H_2S risk areas.

2.8 **Access Control and entry requirements to H_2S Risk Areas**

Personnel planning to access BGC hydrocarbon facilities with H_2S must go through the normal Site Induction process. Area Owners must control access and:

- Inform personnel about H_2S presence and emergency response requirement
- Check validity of the training (see Table 2)
- Specify H_2S requirements including PPE, radio, etc.
- Give personal Gas Monitor and Escape set
- Over and above this, non BGC visitors or first time visitors must always be accompanied by a person who is familiar with the site

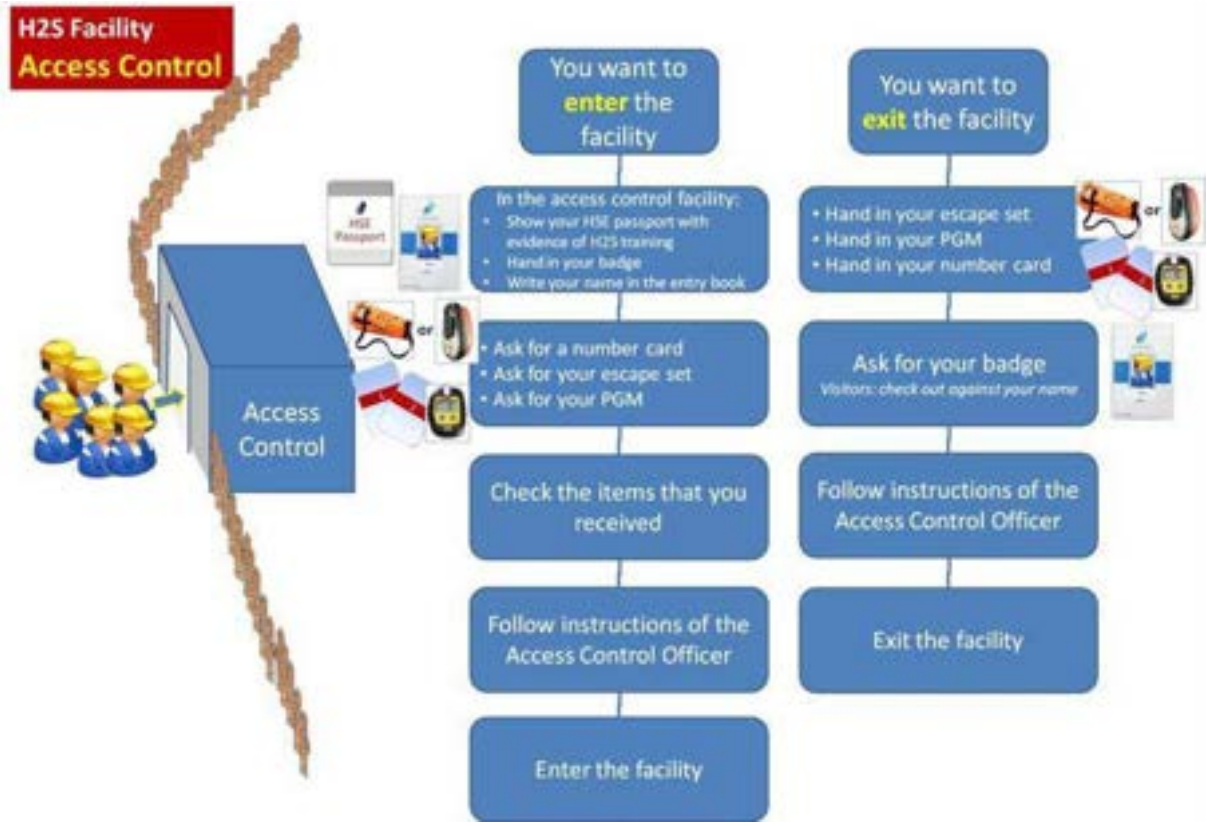
3 DO THE WORK

3.1 Personnel entering H_2S areas should 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 (H_2S Awareness, SCBA/CFE, ERTM). The Access Control for a H_2S facility is shown below in Figure 1.

Table 2 Training Requirements

TRAINING	AUDIENCE	VALIDITY
H_2S (RPE)	All BGC staff and contractor working in locations with H_2S	3 years Training run by Asset/ Project or Approved Mode 2 Contractor
BREATHING APPARATUS WEARER/ CONFINED SPACE ENTRY (SCBA/CFE)	All users of SCBA 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

Figure 1 Access Control H_2S areas



Respiratory Protective Equipment (RPE)

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

Self-Contained Breathing Apparatus (SCBA)

3.3 **DO NOT RESCUE WITHOUT SCBA. MULTIPLE H_2S FATALITIES CAN OCCUR IF PERSONNEL ATTEMPT RESCUE WITHOUT SCBA.**

Note: ERD provide Man Down First Responder courses to Operators

SCBA shall be used for any high risk activity such as breaking-containment, confined space entry or work at height (Table 3) where there is a risk of a H_2S 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

3.4 Before starting the work confirm the correct approvals and documentation e.g. rescue plan, Job Hazard Analysis are in place as required by the PTW i.e. TRIC, Toolbox Talk, gas test and field checks etc. have been performed. Follow WMP #24 PTW.

3.5 During Toolbox Talks, 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, as based on shelf life date

- Check everyone has RPE and up to date training
- Wind direction (check windsock) and best route for the given wind direction to the muster location
- Ensure understanding for table 5
- Maintaining communication and checks (for Major H2S Risk)
- Areas with limited access/way out hindering escape

Ensure the WRP - Work Responsible Person (section 3.4) is aware of their duties, competent to undertake the role and recognised by the work crew.

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 H_2S to migrating into safe areas.

3.8 **WRP - Work Responsible Person**

- Takes no active part in the assigned tasks, can see all workers and windsock
- Observes the work activities to ensure PTW/ JHA parameters are adhered to

- Is empowered to pause or stop work. Alerts the control room and initiates the emergency response process in an emergency. But DOES NOT RESCUE. Helps with evacuation of the work crew.
- Must have a working SCBA

3.9 Activities within a H_2S Risk Area that must have a "WRP", or otherwise determined in the JHA, are below:

- Work likely to disturb ' H2S -live' equipment, piping, etc.
- Sampling or Opening H2S live equipment
- Working on leaking equipment Leaking equipment
- Entry into low lying area
- Entry into vessel or other confined space
- Entry into suspected unmonitored area

Any other work task identified by the Permit Issuer

3.10 WARNING: ERT should be involved in Confined Space Entry (CSE) JHA, and in the preparation of the CSE Escape 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 5 H_2S ER Scenarios and Response

Scenario		Response
1	No gas alarm, Smell of rotten eggs	➢ **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 H_2S gas detector	➢ **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 ➢ **HEADCOUNT & IDENTIFY** missing personnel ➢ **FOLLOW** next instruction from OSC ➢ **NOTE: DO NOT ATTEMPT to SERACH AND RESCUE (SAR). SAR must be performed only by the ERD, using rescue SCBA (as per Emergency Response Plan).**

4 REFERENCES AND RESOURCES

Relevant WMPs:

#11 Hazard Recognition

#25 Permit to Work

#25 Personal Protective Equipment

BGC ToolBox Talks, Communication Materials, Posters and Information

Guidance on the use of Protective Equipment in H_2S areas See Appendix 1

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Operations HSE Manager Steve Wright/Bjorn Lauvstad	1/2/21	Retained on sign-off form

8 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	• 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.	• PGM and escape filter device to hand • + IS Radio for Communications to control room.
3	Work out of range of ' H_2S -Designated' equipment	Painting welded lines in pipe track, road repairs, trench digging, repairing light fittings etc.	• PGM and escape filter device to hand • + IS Radio for Communications to control room.
4	Works near ' H_2S - live' equipment, piping, etc but unlikely to disturb them	Any work near flanged piping, pumps, vessels, compressors, etc in which H_2S - containing fluids can escape through flanges, seals, vents or breather valves into the immediate atmosphere	• PGM and escape filter device to hand • + IS Radio for Communications to control room.
5	Work likely to disturb H_2S -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	• PGM. escape filter device at ready • At least one standby with BASCBASCBA set • + IS Radio for Communications to control room
6	Sampling	Taking gas or liquid samples	• 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_2S live equipment	Turning a spade, removing blank to allow gas test Making a gas test	• 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	• 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	• 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.
10	Entry into low lying area	Work on tank bunds or in pipe trenches and culverts Access to tanks via bundled area	• Monitor • Escape filter device permissible only once isolated, gas freed and air flow established. Escape mask use for escape purpose only. SCBA set - mask fitted • At least one standby with SCBA set + 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_2S in the atmosphere	• 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_2S detection systems is in doubt	• 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 Toolbox Talk. With changes in circumstances e.g. wind direction, the work crew should pause work and reassess the most appropriate muster locations.

WORK MANAGEMENT PROCEDURE #17 INCIDENT REPORTING, INVESTIGATION, AND EMERGENCY RESPONSE

1 OVERVIEW & HAZARDS

1.1 The purpose of this procedure is to ensure the correct action is taken after the occurrence of an incident. An incident is an unplanned event or chain of events that has, or could have, resulted in injury or illness or damage to assets, the environment or reputation.

All HSE incidents, Near Misses, Life Saving Rules (LSR) violations and 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 incidents 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 incident can escalate into a worse outcome
- An injured person may not get the treatment that they need
- The incident may be repeated if potential problems are not corrected

2 PLAN THE WORK: ENSURING REQUIREMENTS ARE KNOWN

2.1 BGC requires everyone to report any incident or near miss. If there is any doubt as to whether the incident or injury is work related or not, or whether the incident or injury is significant, the incident needs to be reported. Initial details can be resolved and corrected as part of the subsequent investigation and follow up.

2.2 All incidents, including **Near Misses, LSR violations and unsafe act/conditions RAM3+,** are to be reported to the Supervisor of the work activity and Section Head, in the operating facilities.

All personnel and contractors must report any Incident they become aware of, as soon as possible (the requirement specified in Appendix 1). Failure to report shall result in disciplinary action, see Appendix 4 Consequence Management.

2.3 The BGC Risk Assessment Matrix (RAM) is used to determine incident severity or potential severity. See WMP #11 Hazard Identification for the RAM.

2.4 **INCIDENT OWNER** is the person in the organization who has control over the work activity where the incident occurred.

- The following order takes precedence to define **Incident 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, Incident 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 Incident Owner is the line manager of the IP and for contractor the Incident Owner is the contract holder
- For BGC staff, the department who reports the exposure hours of the injured person will take the incident into its statistic
- For contractors, the BGC contract holder who reports the exposure hours of the injured person will take the incident into its statistics

2.5 Following are the **ACCOUNTABILIES** of the **INCIDENT OWNER:**

- Make the incident site safe and make decision on work continuation or suspension
- Report the incident using the GX-UI-ISGIncidentNotification@shell.com distribution list or report directly into Fountain Incident Management (FIM) within 24hrs. See Appendix 2 for GX notification Template
- 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

2.6 Any incident which requires reporting to Iraqi authorities shall be submitted. If in doubt, seek guidance from the BGC HSE Management Systems Team.

2.7 Contractors shall at the discretion of the Contract Holder implement this procedure or a material equivalent one (as specified in the Contractor Bridging Document), which shall meet the reporting requirements as defined in Appendix 1.

Case Management of Injuries and Illnesses

2.8 All injury and illness shall follow the case management process from the point of injury/illness to return to work to ensure injured person (IP) receives the optimum level of medical care including return to work assessment.

2.9 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) following the process in Figure 1, below.

2.10 **The BGC employee who is organizationally accountable for the work of the injured person (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 BGC employee is still accountable.

2.11 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:

1. Injury or illness reported by injured/ill person (IP) to Designated First Aider (DFA)/their supervisor immediately
2. Designated First Aider/Supervisor contacts EROC and the BGC Responsible Person (RP) immediately. The RP will be the equivalent of a Plant Director, Project Manager, Department Manager, or similar (BGC LT -1)
3. EROC in consultation with DFA initiates medial emergency response (MER)
4. An Accompanying Person (AP) will be assigned to accompany the IP to a medical facility. The AP should be a Supervisor or HSE Advisor within the IP's line (from BGC or Contractor company)
5. AP will provide real-time ongoing status updates to the RP on the IPs condition
6. The BGC Health Manager will provide expertise to ensure appropriate support to the IP and advice to required BGC management on IP status
7. If the IP is to have an extended stay at the medical facility, the RP will confirm stand-down to the AP and make arrangements for ongoing update to the IP's status, until they have recovered and returned to work
8. he BGC Health Manager (or delegate) to provide injury/illness classification within 7 days of the reported injury/illness

2.12 If the incident involves equipment damage, the equipment must be inspected and certified by a competent person and deemed fit to return to service. An Operation Statement of Fitness may be required to bring production equipment back to service.

Case Management of Process Safety Events (PSE)

2.13 All PSEs shall follow the case management process from the point of identifying an LOPC to return to operation. BGC is using a tiering classification to report PSEs:

TIER	Description LOPC within 1st hour (kg/hr)
1	• Gas/broadcut > 500kg • Condensate/gasoline > 1000kg • Diesel > 2000kg
2	• Gas/broadcut > 50kg • Condensate/Gasoline >100kg • Diesel > 200kg • Seal Oil > 1000kg
3	• LOPC: below Tier 1/2 threshold

2.14 The steps below shall be followed:

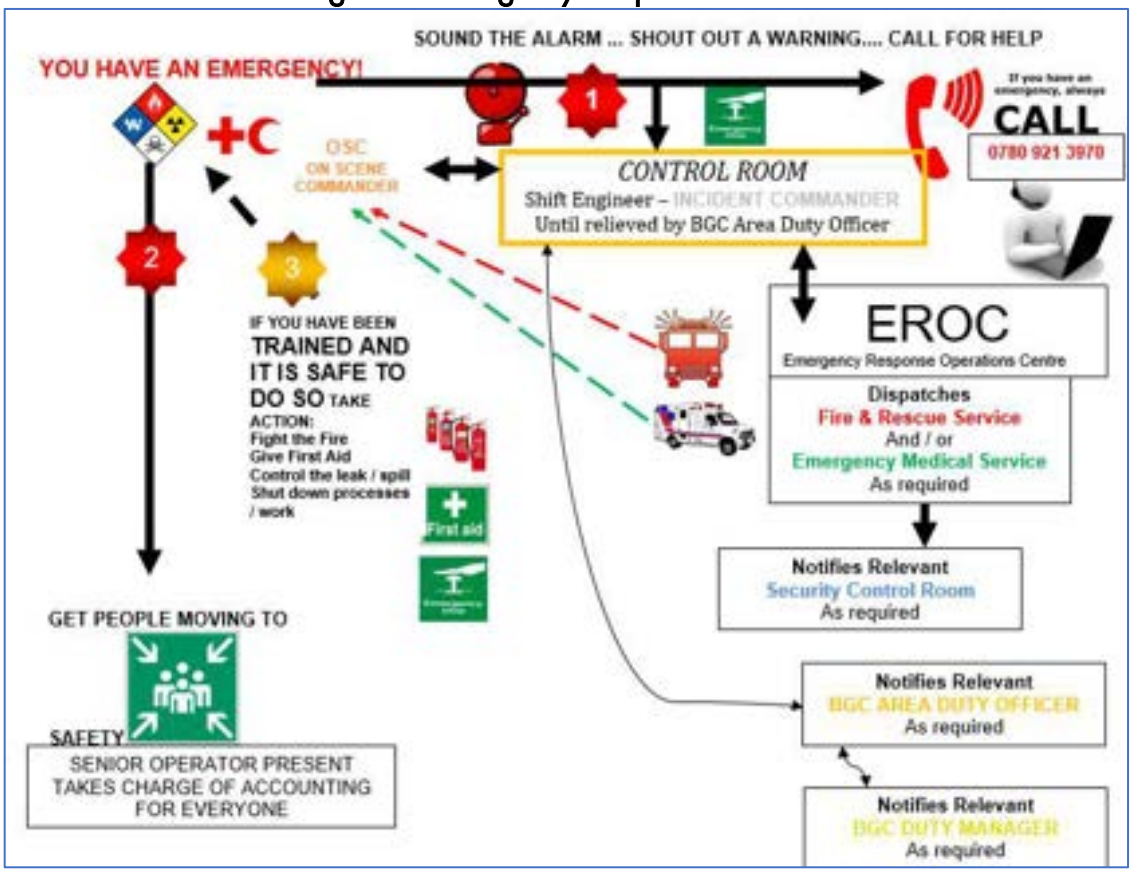
1. *The Incident Owner requests field data collection from respective operations /maintenance team by means of photo's, video, LEL measurement, visual observation, hole size and soil contamination assessment*
2. *Operations/Maintenance completes the leak data sheet (Appendix 3), to be approved by Deputy Plant Director and submit to the LOPC Focal Point (e.g. Technical Safety Engineer) for calculation/modelling*
3. *The LOPC focal point gathers information, calculates the LOPC and provides a tiering classification to HSE and AIPSM within 7 days of the reported PSE*
4. *HSE to complete final tiering classification in accordance with OGP guidance*
5. *Tier 1 & Tier 2 classification will be subject to classification conformation during the IRP*

Emergency Response

2.15 Each BGC facility or site has its own Emergency Response Plan (ERP). Refer to the respective worksite ERP in case of incidents that require emergency response activation. After assessment on the severity of an incident or injury, See Figure 1 for the summary of Emergency Response Actions.

2.16 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.

Figure 1 Emergency Response Actions



3 DO THE WORK: INVESTIGATION ACTIONS

3.1 The **INCIDENT OWNER** must determine the investigation level required based on the initial actual severity and/or potential severity of the incident. Table 1, below, provides guidance on incident investigation level required. It is a requirement for the Investigation Team Leader to be appointed and briefed/trained on Incident Reporting and Investigation techniques.

3.2 The level of the incident investigation lead is as per Table 1 (refer to WMP#11 Hazard Recognition for definitions of RAM severity).

3.3 **Table 1 Investigation Team Composition**

RAM Severity	Investigation Team Composition	Investigation Team Leader	Investigation Methodology
Blue RAM (potential)	Incident Owner, First line of Supervision	Director minus 3	
Yellow RAM (potential)	Section/Dept Head/Contract Holder, Incident Owner, TA Discipline, Line staff as required, HSE Advisor	Director minus 2	5 Whys, RCA
Red RAM (potential)	Dept Head/Manager, TA Discipline, HSE Advisor, Independent Person or Specialist required	Director minus 1	In deep investigation: TROPOD- B, Causal Investigation
Significant Incident (Actual 4 & 5)	Dept Head/Manager, TA Discipline, HSE Advisor, Group/Independent Person or Specialist as required	Director	In deep investigation: TRIPOD- B, Causal Investigation

BGC HSE Management Systems Team can provide guidance on definitions.

3.4 For significant Incidents, Potential RAM 4 & 5 incidents and any incidents which Actual Severity Rating 4+ for People, advice must be obtained from Legal Department before beginning to write the investigation report.

3.5 Incident classification shall be determined by the incident 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 incident classification, the HSE Director shall discuss and agree with the respective Director on the final classification. Final resolution shall be escalated to the Managing Director.

3.6 Incident Reports 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 Incident Owner's Commission Head/ Director AND the HSE Director for approval

The Incident Notification Process Reporting Requirements shall be met, see Appendix 1.

3.7 Incident Review Panel

An Incident Review Panel (IRP) must be held for all RAM3+ actual incidents and for all RAM4+ potential incidents.

- The IRP shall comprise of the following people; Plant Director or equivalent, HSE Manager, legal (optional) and project manager
- All RAM4+ potential incidents will have Director level as IRP Chairperson
- All RAM4+ actual incidents will have Managing Director as IRP Chairperson
- For all incidents, as a minimum the close out discussions and IRPs should cover the following:
    - Confirmation of Potential & Actual RAM and incident classification
    - Determine sequence of events
    - Agree on the immediate & underlying causes
    - Agree on the SMART (Specific, Measurable, Achievable, Realistic and Timely) actions
    - Actions to be updated in Fountain Incident Management (FIM)

3.8 IRP Chairman

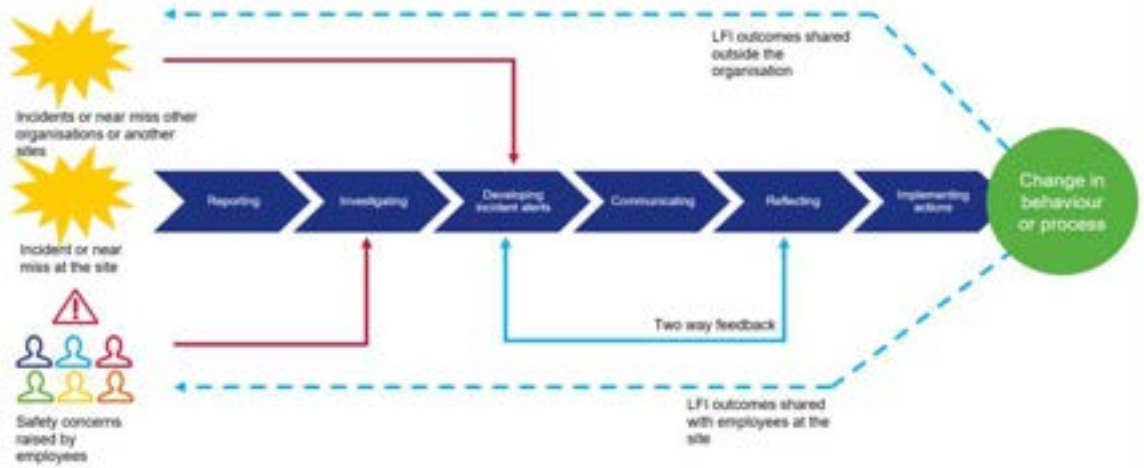
A member of the IRP elected by Incident Owner to chair the IRP session IRP. IRP Chairman will ensure that the objectives of IRP are met which include, but not limited to:

- Confirmation of Potential & Actual RAM and incident classification
- Determine sequence of events
- Agree on the immediate & underlying causes
- Agree on the actions to address based on the investigation outcome

3.9 Incident Investigation Follow Up and Action Closure

After the investigation is finalised and the actions are all confirmed, it is the expectation that Commission Heads / Directors will follow up with the staff in their commission to ensure robust and timely close out of the actions. The HSE Management Systems Team will regularly track action items and plan interventions, when required.

3.10 Learning from Incidents Alerts



3.11 Where there is a need identified to share learnings the LFI Coordinator will arrange for a LFI alert.
The LFI Coordinator will engage with the incident investigation lead and relevant SMEs to produce the LFI alert.
The alert will be reviewed and approved by the HSE Risk & Assurance Lead. Once approved, the LFI is translated into Arabic and circulated.

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

4 REFERENCES AND RESOURCES

Relevant WMPs

#11 Hazard Recognition

#24 Permit to Work

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC HSE Risk and Assurance Lead Andreas Baatz	1/3/21	Retained on sign-off form

APPENDIX 1 INCIDENT NOTIFICATION PROCESS REPORTING REQUIREMENTS

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

EVENTS *Contact the HSE Management Systems Team for any further advice required*	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			
• 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
• 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
• 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 GX NOTIFICATION

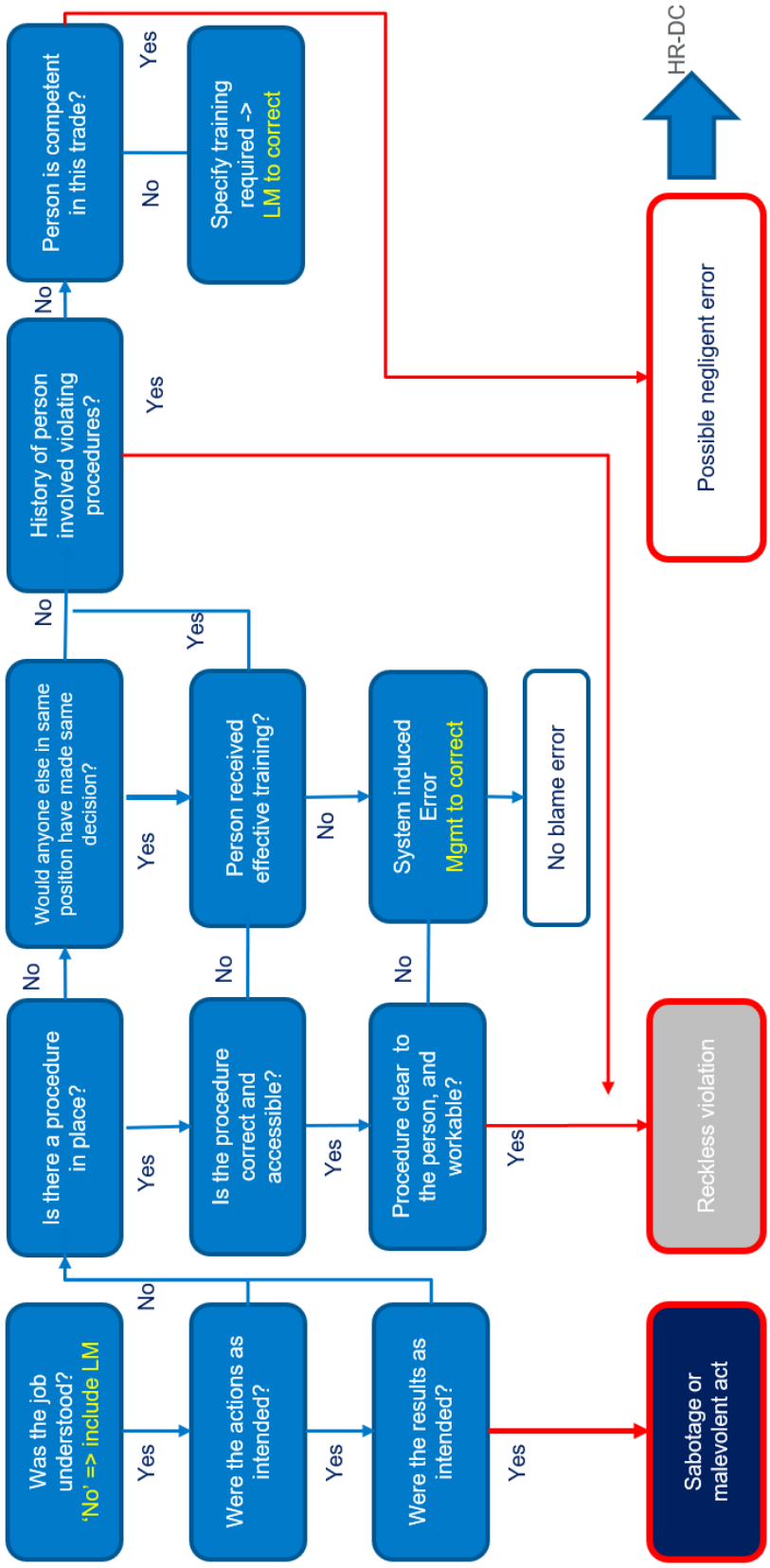
The below table should be submitted via e-mail to the following address GX-UI-ISGIncidentNotification@shell.com

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 FIM Protocols e.g. LWC, LOPC…* مثلاً LWC, LOPC انظر قواعد نظام إدارة الحوادث
Description: الوصف:	*What? Where?* ماذا وأين؟ *Note: Do not include names of involved parties*
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 الوجبة
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: CONSEQUENCE MANAGEMENT FLOWCHART



WORK MANAGEMENT PROCEDURE
#18 IONIZING RADIATION

1 OVERVIEW & HAZARDS

1.1 This Work Management Procedure (WMP) describes BGC's requirements for managing radioactive materials and generators of ionizing radiation to protect people and the environment from harmful effects of ionizing radiation.

This WMP applies to all BGC, Contractor and Sub-Contractor activities involving ionizing radiation and outlines the requirements to be fulfilled.

This WMP does not address Naturally Occurring Radioactive Materials (NORM) that might be present in the gas processing facilities and non-ionizing radiation such as microwave, radiofrequency, ultraviolet, visible light and infrared radiation.

NOTE: If activities involve NORM and/or non-ionizing radiation, STOP and speak to your supervisor or activity sponsor. Work types and typical examples that are out of scope are as follows:

Access/Inspections in areas identified to have Normally Occurring Radioactive Materials (NORM)	• Field inspections in areas identified by Operations and BGC Process Team as NORM hotspot • Working, dismantling process piping in NORM hotspots

1.2 **Hazards include**

- Radiation can damage living tissue
- Radiation cannot be detected by human sense
- Unless adequate precautions are taken during procedures requiring the use of radioactive materials, it is possible that the specified dose limits may be exceeded. In severe cases where the exposure to radioactive material is high, this can cause immediate injury/illness (e.g. nausea, vomiting and skin disorders) and chronic effects which may take years to manifest themselves

Equally likely are accumulated doses of radiation caused by regular exposure to small dose which could result in chronic effects -such as cancer or leukemia etc.

All radiation doses to the reproductive organs are a potential source of injury –both to the person receiving the dose and to any later offspring of that person

Relevant Life Saving Rules and Process Safety Fundamentals

Work with a valid work permit when required

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

Respond to critical alarms

2 PLAN THE WORK

2.1 Follow WMP #11 Hazard Recognition to recognise 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 that radiography equipment certifications are identified and who will check them before the work.

2.3 Confirm qualifications and training of specialist radiography personnel is identified and who will check compliance before the work.

2.4 Confirm what approvals, documentation, Permit-to-Work, Job Hazard Analysis, ToolBox Talk, etc, is needed and who will check it is done before the work starts.

This will also include SIMOPs specific considerations during radiography testing. Follow WMP #24 Permit to Work and see Table 1, below.

Table 1 Activities involving Ionising Radiation and Requiring a PTW

Work Type	Examples
Activities using chemical sources producing gamma rays/ and or neutrons	• Industrial radiography • Thickness measurements
X-ray activities	• Industrial radiography • Medical Imaging (PTW not applicable in Medical Facilities where X-rays are available) • Testing of welding quality

2.5 Consult PTW Office if unsure or activities aren't listed above.

2.6 Identify radiation risk when applicable in your Job Hazard Analysis and specify required controls as agreed with relevant disciplines (HSE, Ops, Construction, Specialists)

- Evaluate minimum PPE requirements (see 2.8 below)
- Using shielded enclosures where practicable

2.7 Individuals below the age of 18 years shall not be involved in radiological work.

2.8 All operations involving the use of ionising radiation shall be carried out by a minimum of two qualified radiological workers.

2.9 Radiography crews (RT and X-ray) shall consist of two radiographers, one of which must be a competent Radiation Protection Supervisor appointed by the Radiation Authorized Person or Subject Matter Expert.

2.10 When possible, plan all activities involving radioactive materials in times when exposure to personnel outside the work party can be minimized i.e. break times, after standard work hours.

2.11 When planning activities involving ionizing radiation, ensure that you identify Controlled areas (restricted access enclosed with soft barriers identified by certified Radiographers) and supervised areas. Entry into these Areas by workers shall only be permitted under a written JHA.

2.12 Determine the required safety signages and identify in your plan where these signs should be installed. Only certified equipment can be used. Ensure all personnel involved in activities involving ionizing radiation have a valid Fitness to Work (FTW) Contract the BGC Health team for any specific requirements over and above standard FTW requirements.

2.13 Contact Emergency Response Team to apply for and/or call off required Emergency Response personnel and equipment.

2.14 Where applicable, prepare minimum PPE including personal cumulative dosimetry badges for exposed personnel (typically for NDT Radiographers, Medical X-ray radiographers, Multi-phase and profiler technicians (Inspection)

Examples of Personal Dosimeters

2.15 Verify and apply minimum requirements for storage (location, security & signages), and labelling radioactive materials See also WMP #26 Safety Signs & Barricades

2.16 Ensure personnel have been trained to minimum requirements. See Table 2, below.

Table 2 Training Requirements

Title	Training Required
Work Party Member	PTW LVL 1
PICWS	PTW LVL 2
Radiological Workers	Industry accepted standard as approved by BGC Radiation Authorized Person or Subject Matter Expert Included as part of Contractor mobilisation Go-No-Go requirements

3 DO THE WORK

3.1 Submit your permit and all required supporting documents to the PTW Office 48 hours before your planned start date of your activity.

Submit required vehicle and driver entry requirements (applicable to all vehicles and drivers involved in the activity. Additional requirements are needed for the vehicle and driver carrying the radioactive material),

3.2 **Site Preparation**

Ensure you have a valid Permit.
Install soft barricades and safety signage around the controlled areas.
Store radioactive materials/sources as far as practicable from the workforce.
Check that when required by the plan, Emergency Services are on standby. Alert ER services that activities involving radioactive materials are ongoing (Indicate time and actual location of work activity).

3.3 **Toolbox Talks/Dynamic Risk Assessment**

Double check that the supervision and work party satisfy all training requirements
Double check control requirements specified in the Job Hazard Analysis (JHA) are in place.
Double check required PPEs and Personal Cumulative Dosimetry badges are available and in use where appropriate.
Reinforce that anyone in the work team is empowered to stop any activity that they feel is not in line with the work plan.

3.4 **Starting and Managing the Work**

PICWS shall always be present while activities involving radioactive materials/sources are on-going.
Monitor Personal Cumulative Dosimetry Badges
Ensure only approved work party members are allowed in the work area
When the radioactive material/source is not in use or if work is suspended, ensure the radioactive material/source is secured in the approved container and storage location.

3.5 When conditions change which maybe because of various condition e.g. weather, work taking longer than planned. STOP and reassess your situation.

3.6 **Emergencies**

Ensure the PTW includes an approved Emergency Response Plan (ERP)
In cases of emergencies, radiographers shall always retreat beyond the Controlled Area to a safe distance. **Under no circumstances shall a radiographer be permitted to stand in the Controlled Area.**
Activate ERP.

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition
#24 Permit to Work
#25 Personal Protective Equipment
#26 Safety Signs & Barricades

BGC ToolBox Talks, Communication Materials, Posters and Information

BGC Radiography Certificate -See Appendix 1

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC Maintenance Director	1/3/21	Retained on sign-off form
Reviewer	BGC Static Corrosion Inspectors Michell Schipper and Niels De Pril	1/3/21	Retained on sign-off form

8 APPENDIX 1 BGC RADIOGRAPHY CERTIFICATE

APPENDIX 1: BGC RADIOGRAPHY CERTIFICATE

Permit No.							
1.Application – by Permit Applicant							
Name			Dept.				
Worksite Location							
Equipment Details							
Sign			Date	Finish Time			
2.Radiography Details -							
Sketch/Drawing attached of Controlled Area (>7.5uSv/h) and Supervised Area (2.5-7.5 uSv/h) Boundaries							
Radiography Contractor			Radiography Supervisor		DWDI		
Radiographer Names					Gbq		
Radiography Duration	Start Time						
Method of Radiography (tick)			Crawler		External Technique		
Manufacturer		Model	Controls	Voltage (kV)		Current (A)	
RT Radiography Type		DWSI		Barriers / Pennant flags posted at 7.5 uSv/h		Panoramic	
Source Size	Ci		Calibrated Survey Meter with every source		Serial No.		
Projector Type			Projector No.		TLD badges provided and worn		
3. Safety Checklist							
Safety Checks	**Yes**	**No**	**Personal electronic Cumulative Dose Meter**		**Yes**	**No**	
SIC conducted site visit and planned job			Collimation for all exposures (>1TVT)				
Work at Height / Confined Space			Calibrated Survey Meter with every source				
Nucleonic Gauges isolated (if applicable)			TLD badges provided and worn				
Optimum source strength available and selected			QFE Dose and Personal Beeper OR				
Emergency equipment in vehicle (if applicable)			Personal electronic Cumulative Dose Meter				
Toolbox Talk (TRIC) with Work Party (inc adjacent teams)			Collimation for all exposures (>1TVT)				
4. Required Precautions							
Safety barriers with trefoil warning signs erected at boundary and all entry / exit points							
Flashing warning lights must be used during operations							
When establishing boundaries ensure areas above and below are also checked for exposure rates							
All unauthorized personnel are excluded from the Controlled and Supervised Areas							
Radioactive materials to be handled ONLY by radiation workers wearing TLD badges and dose meter							
Vehicles shall be correctly signposted, contain a Tremcard and carry Emergency Equipment							
5. Authorisation – Shift Engineer / Day Supervisor - I authorize the above radiography work subject to compliance with precautions and controls above							
Name		Signed		Date			
6. Acceptance – PICWS - I understand and will comply with the conditions and controls specified above							
Name		Signed		Date			
7. Work Completion – PICWS - Work has been completed for the shift period defined above							
Name		Signed		Date			

WORK MANAGEMENT PROCEDURE
#19 ISOLATIONS

1 OVERVIEW & HAZARDS

Process Isolations are part of our Permit to Work (PTW) system and is 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.

This procedure is not for:

- Portable equipment with flexible wiring and a plug under complete control one person
- Testing of energized electrical equipment or other electrical work (see WMP#4 Electrical Safety)

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 (See WMP#18 Ionizing Radiation)

Relevant Life Saving Rules

Work with a valid work permit when required

Verify isolation before work begins and use the specified life protecting equipment

Relevant Process Safety Fundamentals

Always use two barriers for hydrocarbon and chemical drains and vents

Do not leave an open drain orcritical transfer unattended

Always check that equipment is pressure free and drained, and provides safe isolation before starting maintenance work

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 Isolation Owner (IO) will be the main focal point for isolations for BGC staff and contractors who execute activities as the PICWSs (Person In Charge of Work Site).

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 Isolation Supervisor

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.

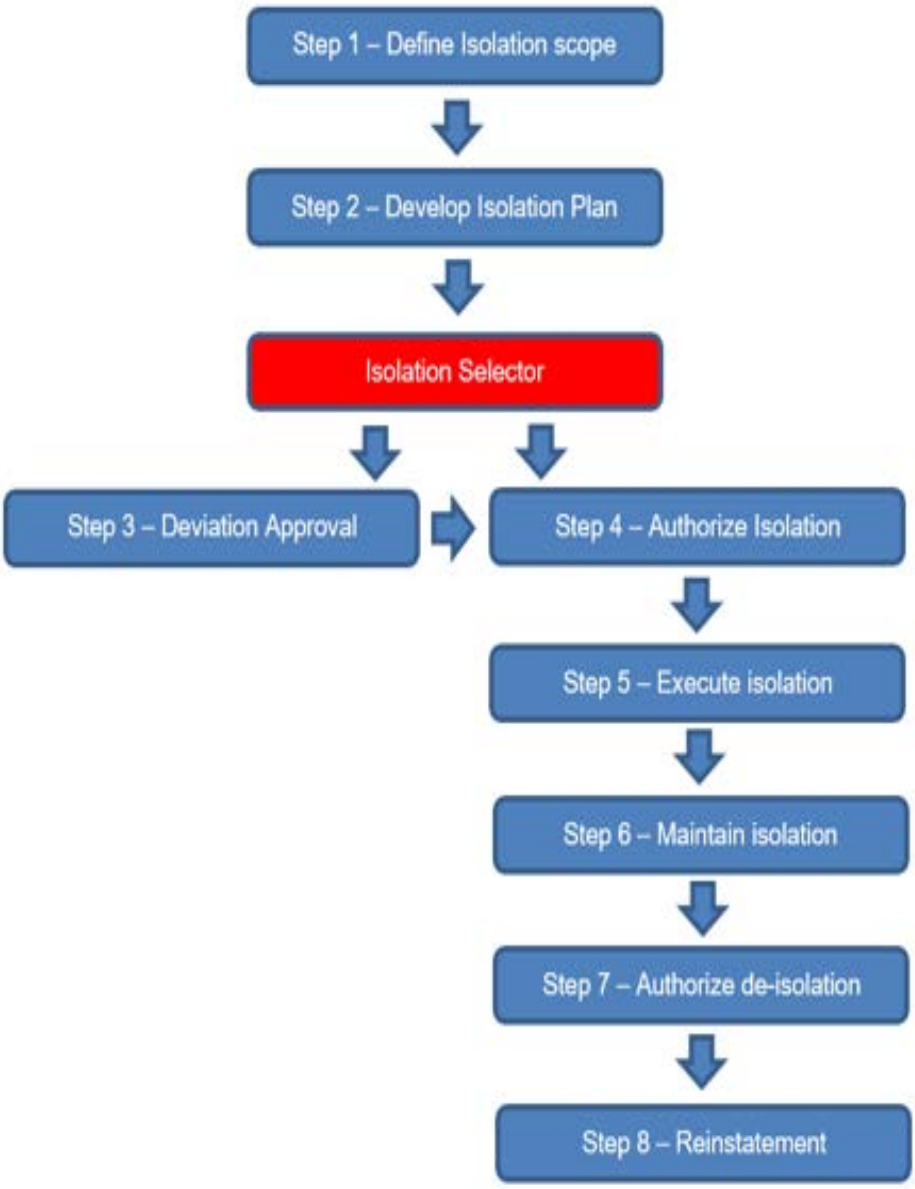
The personal isolation can be defined as an isolation conducted under the exclusive management of the person servicing or maintaining the equipment and it does not add value to plan and manage the isolation under a full isolation certificate.

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 If the above requirements are not met an isolation will be applied according to the BGC Safe Isolation 8 Step Process.
The key step which is relevant for the PICWS is step 6: Maintain Isolation.

Figure 1 BGC 8 Step Isolation Process



3.4 In this process step the different roles have the following responsibilities:

Process Step Responsibilities – 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 Isolation Owner. 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 **Process Step Responsibilities – PICWS** Prior to accepting the permit confirm that the Isolation Confirmation Certificate (ICCs) / PIC (Process Isolation Certificate) 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 Isolation Confirmation Certificate (ICC) / Process Isolation Certificate (PIC) / Isolation plan template to the Permit to Work and these documents should be physically available at the worksite

3.6 **Process Step Responsibilities – Area Operations Technician (AOT) or Isolation Owner (IO)**

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

3.7 **Process Step Responsibilities – 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. Area Operations Technician or Isolation Owner (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 Electrical Isolation Authority (EIA) will be part of the discussion

3.8 **Process Step Responsibilities – 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#2 Confined Space Entry) is a high-risk activity and has potential to harm workers due to the following conditions:

- An atmosphere that is 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.
- With the isolation points as close as possible to the confined space. Verification must be completed at the start of every shift.

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

- Process Isolation Certificate (PIC) which is shown in Figure 2
- Electrical ICC which is shown in Figure 3

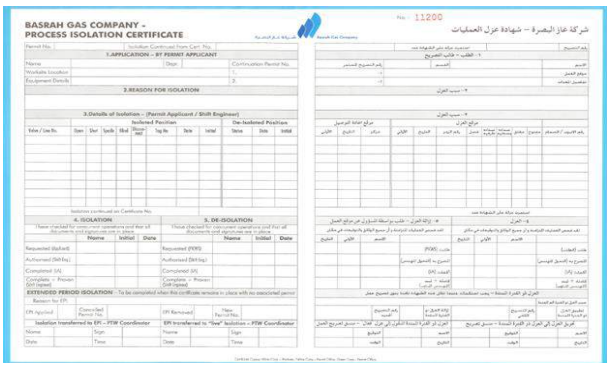

BASRAH GAS COMPANY –
PROCESS ISOLATION CERTIFICATE

Figure 2: Process ICC

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 Permit To Work.
The DFT Certificate is shown in figure 4.

Figure 4 De-Isolation for Test (DFT) Certificate

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

- Yellow PRO-LOCKs shall be used to lock valve positions as per ICC requirements
- Green PRO-LOCKs are designated for lock open valves as per LO/LC valve register
- Red PRO-LOCKs are designated for lock closed 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 should contain the following information:

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

However, if a Pro-Lock Tag is not available you can use an isolation tag, 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.

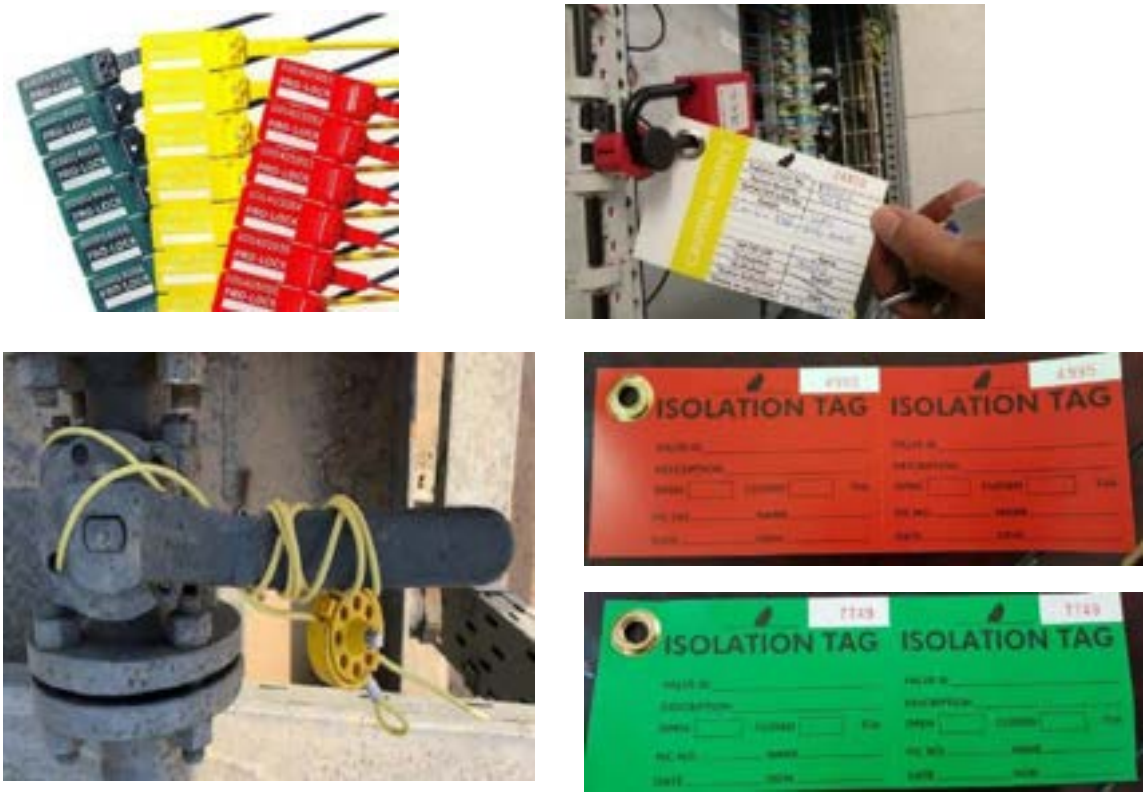


Figure 6 Examples of Pro-Lock on Isolation and Assorted Isolation Tags

3.13 Electrical isolations can be identified either by a Personal Electrical Isolation Tag, as shown in figure 6, or Caution Notice used for standard electrical isolations as shown in Figure 7.

Figure 7 Personal electrical Isolation Tag

Figure 8 Caution Notice for Electrical Isolations

4 REFERENCES AND RESOURCES

Relevant WMP

#3 Confined Space Entry
#11 Hazard Recognition
#14 Hot Work
#24 Permit to Work
Situational Awareness
Operator Proactive Monitoring

BGC isolation procedure (Applicable for operations staff until Operations Management Procedures (OMP) are rolled out):

Isolation and Reinstatement of plant and Equipment - 0000-BGC-G000-GE00-G00000-HX-6180-00001

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC Production Director	1/3/21	Retained on sign-off form
Reviewer	Deputy Plant Director NR NGL Sven Stueben	1/3/21	Retained on sign-off form

WORK MANAGEMENT PROCEDURE
#20 LIFTING & HOISTING

1 OVERVIEW & HAZARDS

1.1 This Procedure describes BGC's requirements for lifting and hoisting.
In BGC there are different types of lifting and hoisting equipment that are used at the facilities and locations. This procedure covers all lifting and hoisting activities from construction, maintenance and operations, and applicable to all BGC staff and contractors.

1.2 **Lifting and hoisting 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

Relevant Life Saving Rules and Process Safety Fundamentals

Work with a valid work permit when required

Obtain authorisation before overriding or disabling safety critical equipment

Protect yourself against a fall when working at height

Do not walk under a suspended load

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

2 PLAN THE WORK

2.1 Follow WMP #11 Hazard Recognition to recognise 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, Job Hazard Analysis, ToolBox Talk, etc, is needed and who will check it is done before the work starts.

Follow WMP #24 Permit to Work.

Confirm supervision arrangements including any necessary support, including HSE advisors, 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 4.

Identify L&H Activities, define Scope of Work and Categorise the Lift/Hoist [Appendix 3 Lifting Categories].

2.4 For all lifting categories appoint a 'Person in Charge' (PIC). Additionally, for Non-Routine lifts, also assign an 'Authorised Person' (AP) for the L&H Operation.

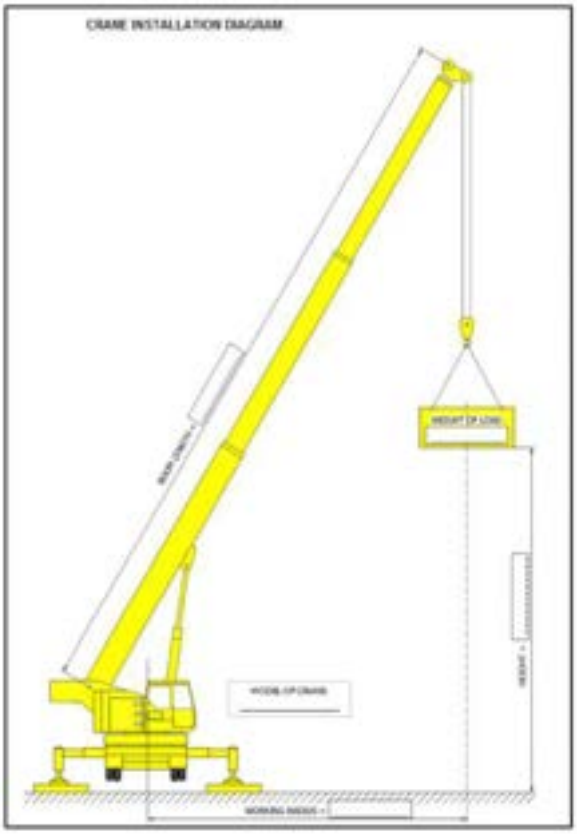
The PIC shall manage the Lifting & Hoisting operation with a lifting crew that comprises of the appliance operator, Banksman and rigger(s)/slinger(s).

The AP is the BGC representative authorized to oversee that the L&H activity complies with this Procedure.

2.5 Assess/inspect site and load factors (PIC)

- 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.



Identify and Assess Hazards (JHA), see WMP# 11 Hazard Identification;

- Identify the applicable Hazards
- Develop control measures as specified in [Appendix 3 Lifting Categories]

Develop Lift Plan in line with L&H Categorisation [Appendix 3 Lifting Categories]. Include Emergency Response arrangements.

- For Non-Routine lifts, prepare a Lift Plan using the form in [Appendix 5 Lift Plan] and identify:

- Control measures as specified in Appendix 3 Lifting Categories
- 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

For Routine Lifting & Hoisting operations a generic Lift Plan (which shall be reviewed for relevance and suitability for every lift) may be used.

2.6 Review & Approve the Lift Plan for Non-Routine simple Lifts (Assigned PIC) and for Non-Routine Complex lifts (Respective L & H Subject Matter Expert (SME).

2.7 Minimise the need for blind lifts (lifts where the crane operator cannot see the load). Blind lift is a non-routine complex lift and must be approved by the L & H SME

3 DO THE WORK: LIFTING SAFELY

3.1 Assign the L&H team including clear Roles and Responsibilities

- Appoint the Lifting & Hoisting team. The lift 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 lifting equipment Operator
- Assign a Flagman when moving cranes near overhead electrical lines, reversing or maneuvering 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# "Permit to Work'.

3.3 **Select pre-mobilisation of equipment and mobilise to site**

The lifting equipment shall be of adequate strength and in good condition.

Lifting Hooks Shall be Of Good Condition

3.4
- The certification of the lifting equipment is current and must be colour coded (for lifting accessories) with the current BGC colour code as per Appendix 2
- The Lifting & Hoisting 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.

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
- The L&H area is barricade with signs and barriers. Warning signs shall have the contact details of the PICWS
- 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

3.6 Communication from the banksman to the crane operator shall be continuous, two way and verified actively by repeating the command.

3.7 Before each lift a pre-use inspection shall be carried out on all lifting equipment.

3.8 Do Toolbox talk, communicate lift plan incl. mandatory use of ’10 questions for a safe lift’ (See Appendix 1)
Execute the lift according to the agreed lift plan.

3.9 Any change from the agreed Lift Plan must result in the job being stopped and reassessed to verify safe operation.
The Lifting & Hoisting Equipment Operator shall obey the STOP signal at all times, no matter who gives it. All lifting operations need to be controlled by the designated Banksman. Signals between the Crane Operator and the

designated signal person (Banksman / Signaller) shall be audible or visible at all times.

3.10 Stop Lifting & Hoisting 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 Lifting and Hoisting Guide or Lifting Equipment manufacturer specification.

3.11 Prior to lifting the PIC shall verify barricades are up and no unauthorized workers is in the barricaded area.

Moving the Load

3.12


- The appropriate load-radius chart for the Lifting Appliance configuration in use shall be visible to the operator and shall synchronize with the reading of the automatic load moment indicator. Override of load safety limiters is prohibited
- The Operator of the Lifting Appliance shall never leave the controls while the load is suspended, or the engine is running. At commencement of the first lift the Lifting Appliance Operator shall check the operation of the hoist brake
- At the commencement of the lift, the crane 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 Lifting Appliance hook has been positioned centrally over the load lifting point, adjust the Lifting Equipment as necessary to minimize any 'drift' of the load as it is lifted

3.13 No external forces shall be applied to the load that create side loading of the Lifting Equipment.

Banksman/Signaller shall never handle the load during the lifting operation

No one shall ever get under a suspended load.

3.14 The Starting and landing area shall be strong enough for the load and enable the load to be stable after disconnecting the lifting and hoisting accessories. Set down shall be prepared and made ready to receive the load.

3.15 Verify lifting and hoisting (L&H) accessories are disconnected and free from the load before the lifting and hoisting 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.

3.16 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.

3.17 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 Crane 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 WMP

#11 Hazard Recognition
#24 Permit to Work
#25 Personal Protective Equipment
#26 Safety Signs & Barricades

BGC ToolBox Talks, Communication Materials, Posters and Information

10 Questions for a Safe Lift – See Appendix 1
Colour Coding & Key Risks – See Appendix 2
Lift Categorisation – See Appendix 3
5 Ways to Stay Alive – See Appendix 4
Training Matrix – Se Appendix 5
Lift Plan Form – See Appendix 6

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Date	Signature
Owner	Material & Transport Director	1/3/21	Retained on sign-off form
Reviewer	BGC L&H Subject Matter Expert Kevin Allen/Ogaga Agbaragu	1/3/21	Retained on sign-off form

8 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 procedures applicable to the lifting operation?			
2	Has everyone attended the Toolbox Talk?			
3	Has a pre-use inspection of the lifting equipment been carried out and are the lifting 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 lifting Person-in-Charge (PIC)?			
6	Is everyone competent and aware of his or her tasks?			
7	Is there a current lift plan and JSA 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 safety?			
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 & KEY RISKS

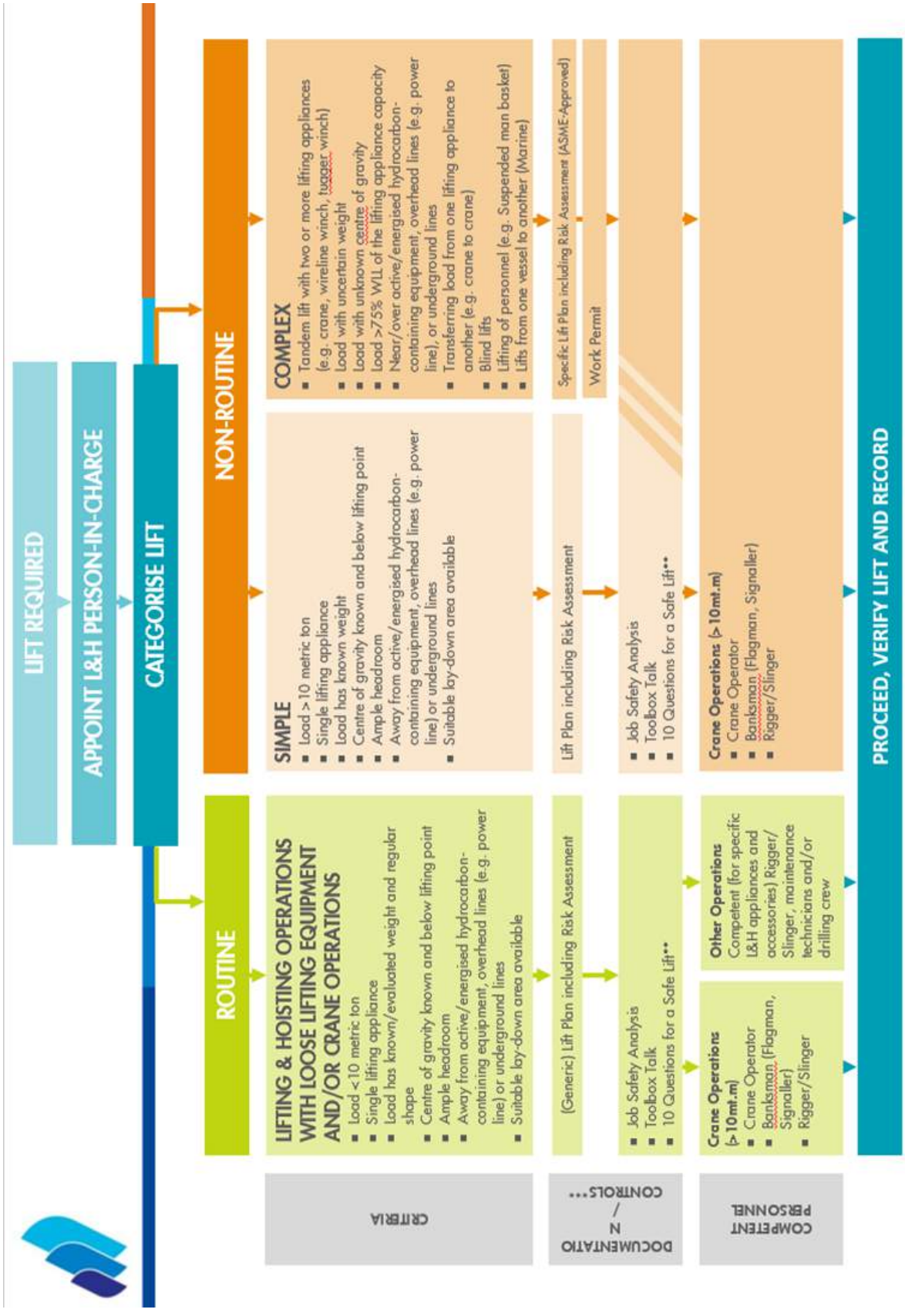
YEAR	FIRST HALF OF THE YEAR JANUARY - JUNE	SECOND HALF OF THE YEAR JULY - DECEMBER
2019	BLUE	YELLOW
2020	GREEN	BLUE
2021	YELLOW	GREEN
2022	BLUE	YELLOW
2023	GREEN	BLUE
2024	YELLOW	GREEN
2025	BLUE	YELLOW
2026	GREEN	BLUE
2027	YELLOW	GREEN
2028	BLUE	YELLOW

- 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 FOR 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, 35km/h (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 WAYS TO STAY ALIVE

LIFTING & HOISTING

5 TO STAY ALIVE

Life-Saving Rule

Do not walk under a suspended load

Comply
with the standards

Intervene
when you see something wrong

Respect
your co-workers

Follow Lift Plan

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

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.

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 Crane Operator Mobile Cranes	☑ 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. ☑ Practical knowledge of crane operations that shall be verified during pre –job interview and BGC Defensive Driving Course (DDC) 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 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 DDC 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	☑ 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 DDC course. ☑ Be physically fit to drive a fork lift truck, demonstrable by a medical certificate of fitness. ☑ Has passed an approved OPITO or industry equivalent fork lift 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 tested during the DDC course is also part of the physical features that shall be possessed.
Banksman (Flagman, Signaler) Slinger/Rigger (cranes)	☑ 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. ☑ Has successfully completed an approved OPITO or industry equivalent

Rigger (portable Lifting Equipment)	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	☑ 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. ☑ 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 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. ☑ Be physically fit to undertake the duties (including vision/hearing/signaling) demonstrable by a valid Medical certificate of fitness.
Lifting Equipment Maintainer	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	☑ Shall as a minimum be certified as a competent lifting equipment or lifting gear inspector by verification against industry standard, LEEA or equivalent 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
Basrah Gas Company

1	Lifting Plan Details تفاصيل خطة الرفع			
Lifting Plan Title عنوان خطة الرفع		Location الموقع		
Lifting Plan No. رقم خطة الرفع		Generic / Specific / عام خاص		
Date of Plan تاريخ الرفع		Revision No رقم المراجعة		
JSA No. رقم تحليل سلامة الوظيفة		Routine / Non-Routine Simple / Complex روتيني / غير روتيني – بسيط / معقد		
Load Centre of Gravity مركز جاذبية الحمل		Max Weight of Load: أقصى وزن للحمل		
Load Dimensions ابعاد الحمل		Load weight Assessed or Specific وزن الحمل المقيم أو المحدد		
Lifting over Live Plant الرفع فوق مكان انتاج		No		

2	Brief Description of Lifting Operation وصف مختصر لعملية الرفع

3	Certified Lifting Equipment to be Used (Configuration & Rated Capacity) معدات الرفع المصادق عليها (التراتيب & تصنيف القدرة)			
Ground conditions:			Outrigger mat size:	
Crane 1 كرين رقم			Crane2 كرين رقم	
Make & Model الصنع & الموديل			Make & Model الصنع & الموديل	
Outrigger Spread انتشار الركيزة			Outrigger Spread انتشار الركيزة	
Crane Counterweights ثقل موازين الكرين			Crane Counterweights ثقل موازين الكرين	
Crane Boom Length ذراع الاضافية للكرين			Crane Boom Length ذراع الاضافية للكرين	
Weight of Hook / Block وزن الخطاف / بكرة رفع الأثقال			Weight of Hook Block وزن الخطاف / بكرة رفع الأثقال	
Weight of Rigging وزن التجهيزات			Weight of Rigging وزن التجهيزات	
Net Weight الوزن الصافي			Net Weight الوزن الصافي	
Gross Weight الوزن الإجمالي			Gross Weight الوزن الإجمالي	
Crane Capacity سعة الكرين على التحميل			Crane Capacity سعة الكرين على التحميل	
Crane % utilization نصف قطر الكرين القصوى %			Crane %Utlization نصف قطر الكرين القصوى %	
% SWL سلامة اتصال التحميل الامن			% SWL سلامة اتصال التحميل الامن	

4	Certified Lifting Accessories Marked With Current Colour Code ملحقات الرفع المصادق عليها مع رمز اللون الحالي							
Qty الكمية	Description الوصف	WLL حدود حمولة العمل القصوى	Weight الوزن	Qty الكمية	Description الوصف	WLL حدود حمولة العمل القصوى	Weight الوزن	

5 Cross Reference Relevant Procedures and Documents: I.E. sketches, BGC lifting procedures, engineering calculations etc. إحالة الإجراءات و الوثائق ذات العلاقة على سبيل المثال المخططات و أجراءات الرفع في شركة غاز البصرة و الحسابات الهندسية الخ	
CRANE PRE-USE INSPECTION CERTIFIED BY BGC	فحص الكرين قبل أستخدامه مصدق من قبل
ALL EQUIPMENT WITH A CURRENT AND VALID 3rd PARTY CERTIFICATE / COMPETENCY OF OPERATOR	شهادة / كفاءة المشغل
GROUND CONDITION SURVEY REPORT	
LIFTING PTW	رخصة عمل الرفع
CRANE SPECIFIC LOAD CHART	

6	All Lifting Operations Require the Following to Be Considered but This List Is Not Exhaustive جميع عمليات الرفع تحتاج إلى التالي لتحمل بها و لكن لا يعتبر هذا الأمر حصرياً	
Every Lift Every Time كل رفع كل مرة		Specify, Yes / No حدد نعم / كلا
• Pre-use equipment checks completed. أكمال فحوصات المعدة ما قبل الأستخدام	• Working under suspended loads العمل تحت أحمال معلقة	
• All lifting equipment should have the SWL / WLL required for the lift clearly marked. يجب أن تُطلب حدود حمولة العمل القصوى و حمل العمل الآمن في جميع معدات الرفع و ان يتم تأشيرها بشكل واضح	• Route adjacent to or over live plant بالقرب من طريق أو فوق مكان أنتاج	
	• Conflicting tasks in area adjacent to worksites واجبات متضاربة في المنطقة القريبة من مواقع العمل	

WORK MANAGEMENT PROCEDURE
#21 MANAGEMENT OF CHANGE (MOC)

1 OVERVIEW & HAZARDS

1.1 A change refers to a planned action or intervention that modifies the function of any item or process on a temporary or permanent basis.
This WMP only applies to changes applied to BGC operating assets.
Management of Change (MOC) processes for other activities (e.g. Projects, Document Management, Organisational Changes, etc.) will be controlled separately from this WMP.
The purpose of this procedure is to provide all BGC staff and contractor employees with information on how to mitigate risks that may result from a change.

Management of Change (MOC) process supports efficient planning, risk management and communication between stakeholders when planning and executing changes to plant, procedure or organizations, whether permanent or temporary.
It is essential to ensure all involved parties are aware of the change process.

1.2 **Hazards of not correctly applying MoC**
Inappropriate or ineffective MoC can lead to significant incidents, including;

- Hydrocarbon releases
- Fires
- Explosions
- Electrocution
- Failure of safety-critical systems

Relevant Life Saving Rules and Process Safety Fundamentals

Work with a valid work permit when required

Do not make a change without a proper MOC

Perform MOC and install backflow protection when connecting utilities to process

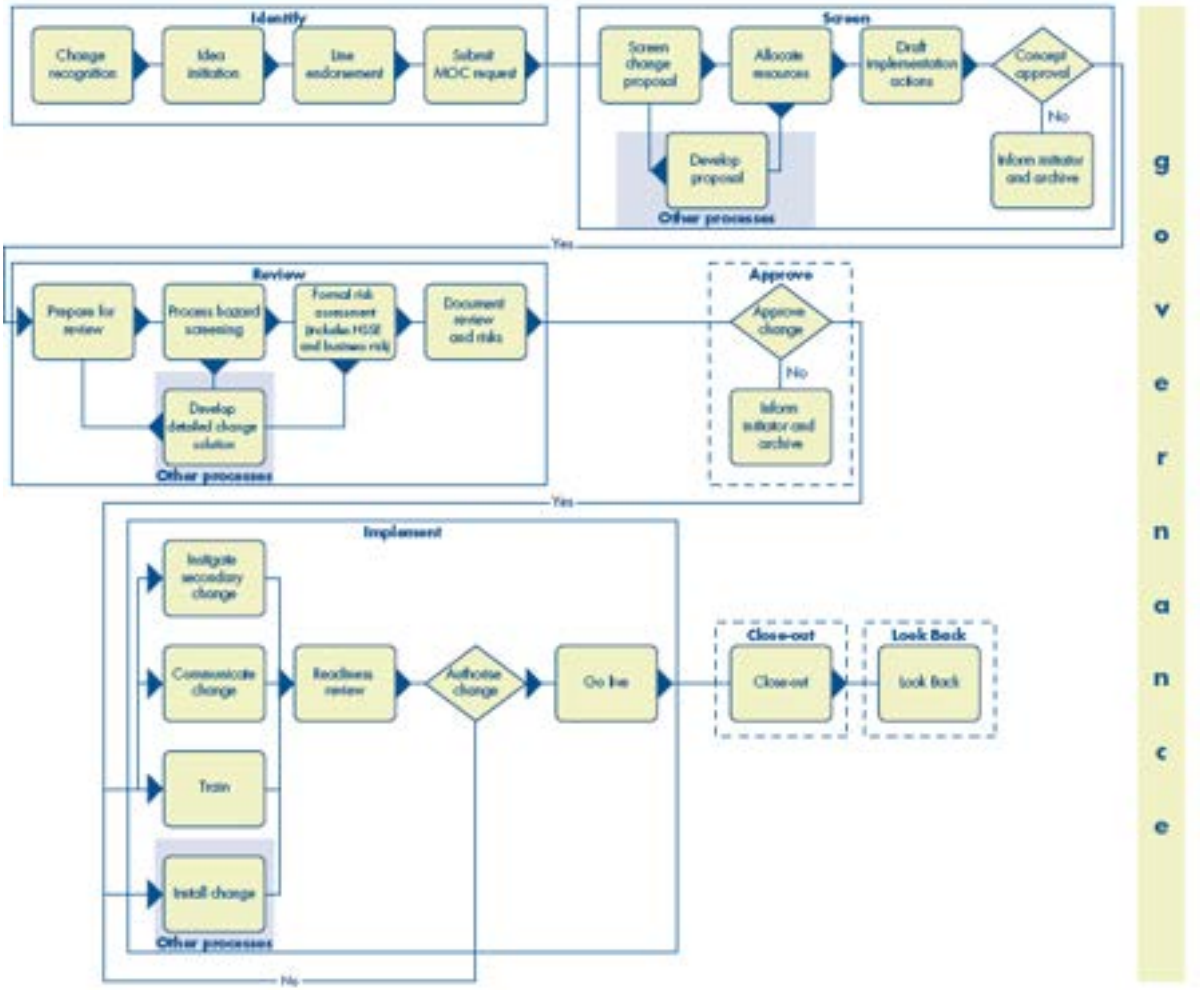
2 PLAN THE MOC

2.1 Follow WMP #11 Hazard Recognition to recognise 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 MOC (EMOC) system for processing operating facility MOCs.
The FSR system follows the process shown in Figure 2, below.

Figure 2 BGC MOC Process



2.4 Types of changes occurring at the worksite addressed as part of this procedure are;

- Process
  - Hardware – sometimes referred to as a plant change or a facility change
  - Process control
  - Process condition
- Brownfield Projects – activities that directly impacting operations

2.5 Changes **not in scope of this procedure** are:

- Like for Like replacement of equipment or personnel
- Procedures as these are controlled via the BGC Document Control Process
- Organisational (BGC and contractor), as these are controlled by Human Resources and Contractor Management processes
- Changes managed by other established MOC processes e.g. projects, IT, human resources

MOC Approval Authorities

2.6 Depending on the associated risk the MOC will be screened-reviewed-approved by the respective authorities described in Table1.

Table 1 MoC Approval Authorities

MOC Level	Screen	Review	Approve
Level 1 MOC (Red Risk*)	MOC Panel	Technical Authorities Level 2 Technical Reviewers (To be assigned by MOC panel)	Asset Services Director Plant Manager (To be assigned by MOC panel)
Level 2 MOC (Yellow/Blue Risk*)	MOC Panel	Technical Authorities Level 2 Technical Reviewers (To be assigned by MOC panel)	Plant Manager (To be assigned by MOC panel)
Level 3 MOC (Blue-risk Minor change request with one discipline involved and no effect on HSE or process safety; No-Cost MOC)	MOC Coordinator MOC process owner	Technical Authorities Levels 3 or above (To be assigned by screeners)	Plant Manager (To be assigned by screeners)

* Risk rating indicates current risk – See WMP #11 Hazard Identification

2.7 **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
- Facilities Status Reporting

Identify

2.8 The minimal mandatory requirements for MOC initiation:
Endorsement from relevant asset manager must be received (KAZ, NRNGL, CS, UQ) for MOC to proceed for MOC panel screening.
Hazard assessment checksheet needs to be populated (Appendix 5) and attached to MOC files.

Screen

2.9 The MOC screening panel will consist of the personnel in Table 2, below (a delegate shall be sent if not able to attend).

Table 2 MoC Screening Panel Members

Position	Role
MOC Coordinator	Facilitator
Discipline Engineering Manager	Decision Executive
Process Engineering & AIPSM Manager	Quorum Member
Technical Safety Manager	Quorum member
P&E Chief Engineering Manager	Quorum member (optional)
KAZ Plant Manager/UQ Plant Manager/NR Plant Manager/ CS Manager	Quorum member (optional)

2.10 The MOC screening panel shall:

- 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)
- 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
- If not enough information to decide, the MOC Panel can request a detail solution to be prepared.
- If a change request is rejected, the change initiator should be informed, and a justification given

Review

2.11 The selected Technical Authority (TA) and specialists need to perform the following:

- Assess all associated risks both in the current status and after introduction of the change from technical perspective.
- Make required updates in the MOC risk assessment details
- 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 (RBMU) 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

2.12 In complex changes, it may not be possible to proceed with Review unless detail solution is developed, in such cases MOC form can be send to MOC Owner to ensure required details developed and added to MOC.

3 DO THE WORK: IMPLEMENTING THE MOC

Implement

3.1 The MOC owner is responsible for the overall coordination of the change and in ensuring the change has been completed as specified in the MOC request and in accordance with design details.

3.2 Any staff affected by the change shall be informed and trained about what they shall do differently.

3.3 MOC owner shall ensure they are aware of all temporary or permanent changes in their areas of accountability, understand the checks to be done, and mitigations required to be in place.

3.4 MOC Authorizer can authorise the change to “go live” prior to the completion of all implementation activities provided the implementation step is sufficiently complete to allow a safe start-up and safe operation of the change.

3.5 If in doubt, please ask immediate supervisor for clarity. If the clarity is unresolved, it shall be escalated to the MOC Coordinator.

Close out

3.6 In this phase, the MOC Owner is responsible for:

- Confirmation that the work has been complete, and all associated deliverables and secondary changes are in place, all implementation actions completed, any outstanding issues identified in the Readiness Review have also been completed.

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

3.7 When seems necessary MOC panel can select of 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.

Temporary Changes

3.8 Changes which will eventually be removed, are called temporary changes. They will follow the same process. They have a planned removal date and require a new review and approval if installation exceeds the planned removal date.

3.9 In case a temporary MOC is requested, the requestor should indicate how the temporary nature of the change can be eliminated. A rough outline of a permanent solution including a planned completion date should be reported in the temporary MOC request. 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.

3.10 Temporary change is 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.

3.11 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.

3.12 An MOC may be required for Overrides, for details please refer to WMP# 27 Safety System Isolation and Override Control.

3.13 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# 27 Safety System Isolation and Override Control

Emergency Change (exceptional circumstances only)

3.14 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.

3.15 Emergency change must be approved by the responsible Asset Services Director or on-call delegate. Approval will only be granted once a hazard analyses and risk assessment has been carried out.

3.16 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.

3.17 A formal MOC must be initiated once the organization has retained control of the situation.

MOC Assurance

3.18 It is BGC's target to make sure that as a minimum 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.

There will be a continuous effort by the MOC coordinator to train everyone involved in the MOC process and Facility Status Reporting (FSR) system.

3.19 Any trained and authorised staff can initiate an MOC in FSR system.

3.20 In case a legacy change is identified at the facility (i.e. a change which has been implemented without having undergone an MOC), it needs to be raised as a threat as part of asset MTO meetings structure. From there, a decision shall be made on the way forward with the identified change.

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition

#24 Permit to Work

#27 Safety System Isolation and Override Control
BGC ToolBox Talks, Communication Materials, Posters and Information
Appendix 1 MOC Roles & Accountabilities
Appendix 2 MOC Requirement Flowchart
Appendix 3 Examples where MOC is / is not required
Appendix 4 Examples of permanent, temporary and secondary changes
Appendix 5 MOC hazard screening checklist
Appendix 6 MOC Panel Terms of Reference
Appendix 7 MOC Quality Assessment Checklist
MOC Training Materials

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

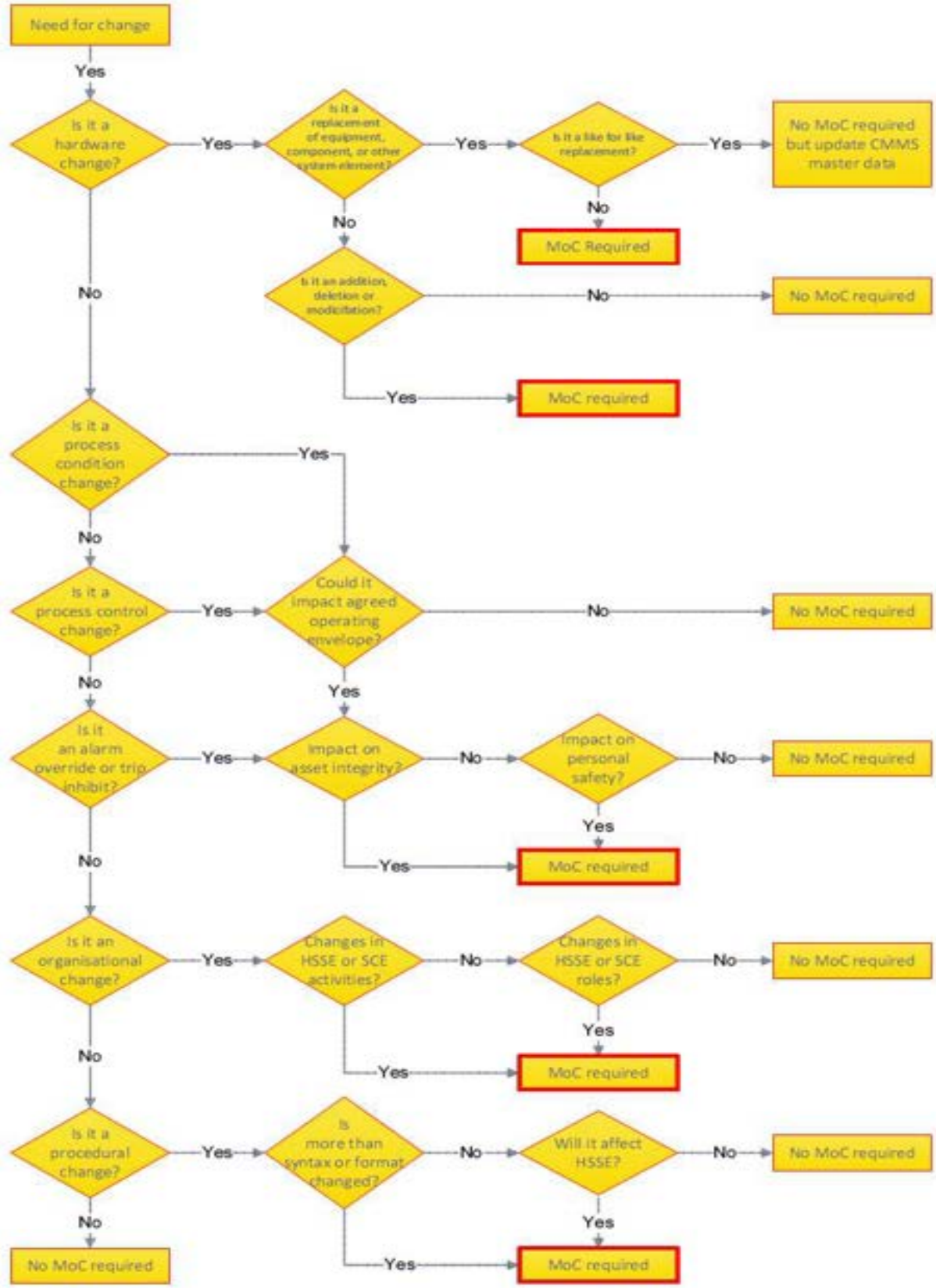
Role	Name	Publish Date	Signature
Owner	Asset Services Director	1/3/21	Retained on sign-off form
Reviewer	BGC MOC Coordinator Arie den Heijer	1/3/21	Retained on sign-off form

8 APPENDIX 1 MOC ROLES AND ACCOUNTABILITIES

MOC role	Main accountabilities
Plant Manager	• Ensure effectiveness of the MOC system of the Asset • Participates in the MOC panel • Act as Approver, when assigned by MOC panel.
MOC Process Owner	• Own, manage and implement the MOC process and Procedures • Verify that staff in HSSE Critical Positions know how to recognize the changes covered by this manual and know how to initiate the MOC process • Establish and maintain documented MOC Procedures to cover permanent Changes, Temporary Changes and Emergency Changes • Setting competency requirements for MOC roles and the composition of MOC Decision Teams supporting the MOC Process and assuring individuals appointed meet the competencies required • Responsible to carry out verification checks to MOC compliance within the Assets
MOC request Initiator	• Understand why the MOC process is necessary, what changes have to follow the MOC system and how to initiate an MOC Request • Maintain MOC documentation and issuing complete set of documents to MOC Panel
MOC request Owner	• Manage development of detail solution and all required documentation • Drive Review phase, when needed organizes Risk Review exercise, performs quality check of the outcome of Review phase before submitting for Approval. This will include checking that all comments and supporting documentation is complete • Manage the MOC implementation step. Coordinates Implementation Resources. Drives secondary changes completion • 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 • Confirm MOC request can be closed out when all the requirements of the Implement step are complete, and any outstanding issues identified in the Readiness Review have been completed
MOC Authorizer	• Authorize the change “go live” once he/she is assured that the Readiness Review has been completed. This is the case for both a permanent change going live as well as a temporary one going live or being brought back to its normal state • Verify that implementation actions are sufficiently completed, and all hazards are sufficiently mitigated to allow the change to “Go Live” safely
MOC Coordinator	• Company-wide coordination of the MOC process • Maintain the Company MOC register of changes • 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 • Know the status of all live MOC Requests; • Ensure good quality and auditable Close-out of MOC’s; • Control the quality and consistency and completeness of the records in the MOC forms

MOC role	Main accountabilities
	• 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
MOC Panel	• Agree on the need for the Change Request and gives conceptual approval for the implementation of a Change having considered the benefit / the risk of not doing the change against potential expenditures • Allocate resources (MOC Request Owner, Authorizer, Reviewers, Approvers) and budget holder See MOC panel terms of reference in the Appendix 6.
Technical Authorities and Technical Reviewers	• Responsible for the Technical verification and acknowledgement of MOC request • Risk assessment of the requested change based on disciplinary expertise; identification of any mitigation measures required • Identify which documents / drawings need to be updated and/or compiled • Identify Training and competence development required
MOC request Approver	• Person who formally endorses MOC for implementation

9 APPENDIX 2: MOC REQUIREMENT FLOWCHART



Mandatory BGC MOC application scope

Permanent process

- hardware modifications excluding like-for-like replacements
- change of technical spec ifications and/or supplier of materials, oils, paint, materials, tools, chemicals
- process condition e.g. sand production, wax production, LSA, water cut outside design envelope
- well hook-up
- changes to DCS, surge control systems and other process control (software) systems

Temporary process

- Temporary well test facilities
- Pipe clamps and/or patches - exception is approved deviated engineered solutions
- Alarm and trip inhibits and over-rides not covered by an procedure endorsed by a TA
- Temporary equipment, e.g. air compressors, generators
- Hoses
- Temp removal insulation
- Temp de-rating of systems

Permanent and temporary procedural

- Operating procedures
- Operational standing orders
- Safety cases
- POPMs
- Design philosophies
- Signed off BFDs

Organisational

- Permanent and temporary organisational changes which affect HSSE critical positions
- Permanent major organisational change including downsizing, rightsizing, divestment and organisational restructuring which significantly change job challenge

10 APPENDIX 3 EXAMPLES WHERE MOC IS/IS NOT REQUIRED

Changes requiring MOC	MOC not required
Valves	
Changes in type (for example gate to globe)	Change in valve brand that still meets design specification
Changes in material (for example CS to SS)	Replacing packing with the same type
Changes in rating (for example 150 to 300)	Change to valve number
Changes in size	
Change in packing type	
Adding any valve (for example adding an additional valve downstream of a leaking bleeder)	
Piping and flanges	
Any addition or change to the P&ID	Using current materials as noted in accurate piping specifications
Change in size	Using current materials as noted in accurate piping specifications (for example, previous spec. "A" used Garlock gaskets – updated spec. "A" uses Flexitallic. Rerouting heat tracing (steam or electric) on a line, valve or fitting Lines involved with a project (covered by the project MOC procedure Document nr. 0000-SGI-G000-GE00-G00000-AA-6006-00001)
Change in piping schedule	
Change in material	
Change in flange rating	
Change in type or finish of flange facing	
Adding heat tracing to a line (steam or electric)	
All hot taps and stopples	
All emergency piping clamps and/or leak sealing devices	
Temporary piping that is installed and used when the plant is running	
All new lines, including bleeders and vents	
Adding insulation or changing type or thickness	
Changing coating type	
Pumps and compressors	
Any change in material Change in flange rating, size, or facing Change in flow or head capacity Change in type of seals or material used in seals Change in packing material Change in impellor size Change in coupling style Change in a component (i.e. pulsation dampener, scrubber, cooler, etc) Modifications to lubrication / Oil system Modifications to foundation outside of design standards	OEM parts that meet design specs. Modifications to foundation to upgrade to standards
Turbines, Reciprocating Steam Drivers and Motors	
Change in materials (including dynamic internals) Flange rating, size and facing changes in turbines and steam drivers Change in flow or head capacity Change in a turbine's nozzle size Change in electrical classification Changes in electrical rating Changes in lubrication system	Changes in carbon rings on turbines

Pressure Vessels	
Adding nozzles Stress relieving an existing process vessel Rerating for higher or lower pressures or temperatures Modifying internals Modifying pressure containing components during turnaround (for example, different metallurgy for clad or weld overlay) Adding or modifying internal coating	Replacing corroded heads or plates with identical material Replacing weld overlays on corroded surfaces with the same metallurgy Cleaning or replacement to restore to design specs. Replacement with identical vessel
Shell and tube heat exchangers	
Changing baffle arrangement Changing TEMA classification in any way Changing the materials Changing to finned tubes Stress relieving an existing process vessel Rerating for higher or lower pressures or temperatures Cladding overlays on the shell Changing pass flow arrangement Addition, removal, or modification of internal refractory or external insulation	Replacing the tube bundle with an identical design Adding a weld overlay of like metallurgy to a corroded surface Cleaning or replacement to restore to like new condition Replacing auxiliary heater/cooler with a comparable model
Air cooled exchangers	
Changing tube materials or type Rerating for higher or lower pressures or temperatures	Adjusting fan blade pitch
Fired heaters	
hanging tube metallurgy, size, thickness, or studding Changing tube support metallurgy or spacing Changing the number of tubes Changing the burner model or tip model Changing the maximum heater firing rate Change pass configuration Changing refractory type	Adjusting firing rates within defined operating limits
Chemicals	
Replacing chemicals with a different chemical composition or brand Changing the technology associated with a chemical Adding a new chemical to the process Changing a chemical injection point	Changing chemical addition rates within the defined operating limits
Safety equipment	
Adding or changing fixed safety equipment (for example H_2S detectors, fire monitors)	Replacing safety equipment with similar equipment with an identical function
Control systems	
Changing DCS control strategies Changing DCS firmware or ROM Changing DCS alarm points to shutdowns Changing PLC logic affecting operator interface Changing trip setting	Tuning changes Algorithm changes
Relief systems	
Leaving a relief valve locked closed for testing Adding an additional relief valve Changes (up or down) of a relief valve setting	Using an approved temporary or emergency procedure to operate during PRD removal for maintenance

Instrumentation	
Changing the range of an instrument Changing a multiplier Changing sensing element or controller type Changing the measurement units Significant transmitter model changes (for example analog to smart) Changing body types Changing the control valve capacity, characteristics, or metallurgy Changing the length of thermowells in critical service Disconnecting instrument air from a control valve to make it inoperable A change in the operational software that can affect plant operations, including computer control schemes	Changing to an instrument with the same range Changing from a coupled to a remote mount
Electrical distribution	
One-line drawing changes	Replacing switchgear with an identical model
UPS and Emergency Back-up systems	
Adding a permanent new load	Replacing components with identical function
Building or cabinet purge and pressurization systems	
Change or addition to a pressurised system	Replacing components with identical models

11 APPENDIX 4 EXAMPLES OF PERMANENT, TEMPORARY AND SECONDARY CHANGES

Examples of Permanent Change		
	Permanent Change	**Examples of associated Secondary Change**
Hardware Change	a) Engineering modification, e.g. addition of depletion compression to existing Facility b) Permanent removal of insulation	• Update to critical drawings and data including as-builts • Update of operating and maintenance procedures • Update of training material for Maintenance and Operations staff • Potential requirement to update Job Competence Profiles
Process Control Change	a) Changes to DCS. b) Changes to surge control systems. c) Changed alarm or trip setting	• Update to critical drawings, documents and data including as-builts. • Update of operating and maintenance procedures.
Process Condition Change	New associated gas of differing composition to be introduced into plant	• Update of operating and maintenance procedures. • Changes to inspection frequencies • Changes to hazardous area classification
Examples of Temporary Change		
	Temporary Change	**Examples of associated Secondary Change**
Hardware Change	a) Temporary installation of booster compressor	• Update to critical drawings • Creation and implementation of temporary operating instruction and maintenance routines
Process Control Change	Temporary Change to alarm setting	
Process Condition Change	Test runs	
Examples of Recurring Change on a specific installation		
• Installation of temporary air compressor or power plant • Installing a portable occupied building in a safe area for shutdown activities • Temporary hose connections for specific tasks • Removal of insulation for Corrosion Under Insulation Inspection • Maintenance and production related process safeguarding system and process safety alarm overrides (trips and inhibits)		

12 APPENDIX 5 MOC HAZARD SCREENING CHECKLIST

Nr.	Screening questions	Answer	Comment
0	Is this MOC linked to any other MOC or activity?	Yes/No	
In the context in which the parameter change (temp, pressure, flow, etc) affects the unit operating window limits:			
1	Does this change add the potential to increase, decrease, stop or reverse the flow in any system?	Yes/No/Not applicable	
2	Can this change increase or lower the operating pressure, or change the maximum allowable pressure in any equipment or system?	Yes/No/Not applicable	
3	Can this change increase or decrease the temperature of the process or equipment in the system?	Yes/No/Not applicable	
4	Can this change create flammability, reactive or chemical instability issue?	Yes/No/Not applicable	
5	Can this change have an effect upon the composition of any stream in the system?	Yes/No/Not applicable	
6	Can this change increase the corrosion or erosion rates anywhere in the system?	Yes/No/Not applicable	
7	Can this change increase potential leak rates of hydrocarbons or chemicals to the atmosphere?	Yes/No/Not applicable	
8	Does this change impact any start-up, shutdown, emergency or decontamination activities in the unit?	Yes/No/Not applicable	
9	Could this change the way the operator interfaces with equipment or controls when reacting to process or system upsets?	Yes/No/Not applicable	
10	Could this change have any effect on the existing pressure relieving capacity of the unit or its other protective or shutdown systems?	Yes/No/Not applicable	
11	Does this change remove or modify or add new safeguards to the process or system?	Yes/No/Not applicable	
12	Can this change adversely affect Reliability in any other way not covered in the first 11 questions?	Yes/No/Not applicable	
13	Can this change adversely affect Product Quality in any other way not covered in the first 11 questions?	Yes/No/Not applicable	
14	Can this change adversely affect Health in any other way not covered in the first 11 questions?	Yes/No/Not applicable	
15	Are there any civil/structural support concerns on new or existing equipment?	Yes/No/Not applicable	
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?	Yes/No/Not applicable	
17	Can this change introduce additional noise source(s) or impact the existing noise levels?	Yes/No/Not applicable	

13 APPENDIX 6 MOC PANEL – TERMS OF REFERNCE

MOC panel Terms of Reference

Timing: Weekly, every Monday 2:00-2:30pm

Agenda:

1. MOC panel to screen all MOCs submitted for screening during last week (except portable buildings and temporary overrides as have separate procedures):
    - Check, confirm/edit MOC description, attached documentation and drawings, justification, necessity for a change, scope of work and impact, change "go live" date
    - Check, confirm/edit initial risk assessment; indicate the way risk assessment to be done at the Review step
    - Make decision on business benefit from implementation against risks
    - Allocate resources for MOC – hazard screener, Owner, Reviewers, Approver(s), Authoriser
    - Check, confirm/detail implementation actions and secondary changes
    - Define necessity for a 'Look Back' review
    - When needed define necessity for PSSR / SOF
    - If possible, indicate at this stage:
        - type of budget to be used for the change implementation and budget owner
        - execution party, e.g. contractor or department that provides resources for physical implementation, design updates etc.
    - Make decision:
        a. MOC can proceed for review - the request is conceptually approved and more in-depth details of what the change entails can be worked;
        b. Detail solution required - substantial engineering modifications might require a concept design;
        c. MOC is cancelled and to be archived.
2. To review MOCs for potential closure

14 APPENDIX 7 MOC QUALITY ASSESSMENT CHECK SHEET

Plant:		Date:	
Performed by:	(Name & Indicator (Reporter), Name & Indicator, Name & Indicator etc.)		
Reference:	(Registration Number and Title of the MOC audited)		

POINTS TO MONITOR:			
A. Change Proposal Quality		y/n	Comments
1	Are the 'Change Description' and 'Justification' clear with sufficient detail		
2	Is all necessary supporting-information attached to the MoC?		
3	Is the change proposal endorsed by line Supervisor?		
B. Risk Management Quality			
4	Is the risk assessment in MoC proposal sufficiently comprehensive; Does the risk assessment identify and address the key risks? Have the appropriate Screeners, Approvers and Request Owner been assigned? Have the appropriate implementation tasks been identified?		
5	Are the reviewers assigned to the MOC proposal of the appropriate disciplines and seniority?		
6	Are the mitigation actions enough to demonstrate ALARP?		
7	Are the secondary changes identified in the MoC proposal? E.g. documents update, training, cascading, etc. appropriate for the MoC proposal? Were there any overlooked?		
C. Compliance			
8	Was the timing of the initiation early enough to effectively follow the MOC process before change implementation?		
9	Were all required approvals from the Screeners & Approvers obtained before the MoC was progressed and in the right sequence?		
10	Have all Screeners and Approvers undergone the relevant MoC training?		
11	Were all the implementation and risk mitigation steps carried out timely as required and there is documented evidence to support this?		
12	Has Authorisation been formally given by MoC Request Owner prior to change to "go live"?		
13	Have all implementation actions (including punch list) been closed out prior to the close out of the MoC?		
14	Was the Risk review and results documented and auditable?		

FINDINGS/REMARKS:

ACTIONS:	**ACTION BY:**	**TARGET DATE:**	**COMPLETED ON:**
(Specific and Actionable)	(Name & Indicator)		
Work orders raised to fix gaps: (list the work order numbers here)	Plant Maintenance		

WORK MANAGEMENT PROCEDURE
#22 MANUAL MATERIAL HANDLING

1 OVERVIEW & HAZARDS

1.1 Manual material 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.
This work procedure is applicable to all BGC staff and contractors. .

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

Follow the hierarchy of controls for Manual handling.

2.1 **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, fitness to work
Avoid manual material handling when there are other methods available.

2.2 Where manual material 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 lo ads is provided to team members.

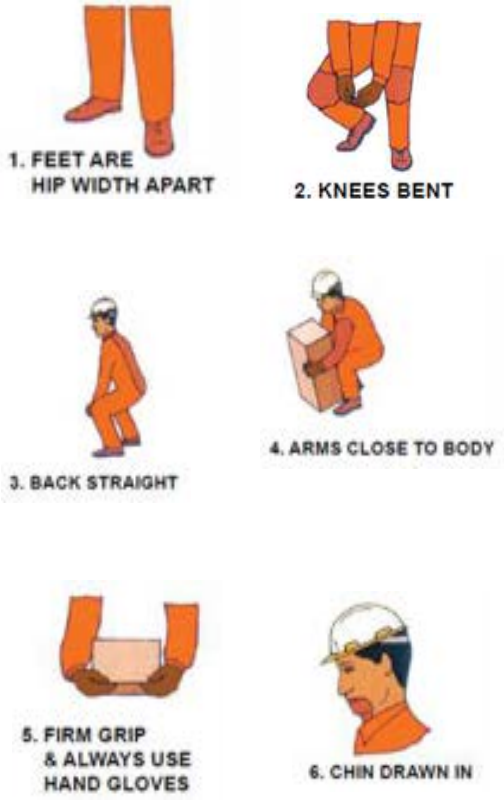
2.3
- Before any manual activity involving lifts, lowers, pushes, pulls, carries, handles or transports of a load that could injure a person, he/she shall perform a hazard assessment that considers the:
- Weight and Size of the load

- 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 (fitness to work or pre-conditions)
- Pregnant women should not lift a load greater than 5kg for work purposes

2.4 Do not manual lift a weight that is more than 20kg.
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 (refer BGC to WMP#25 PPE)
- Head and Chin – head raised; chin tucked in

3.2 Supervisors shall ensure team members involved in manual material handling understand the risks involved and are able to demonstrate the correct manual lifting techniques.

3.3 Do not start to manual 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

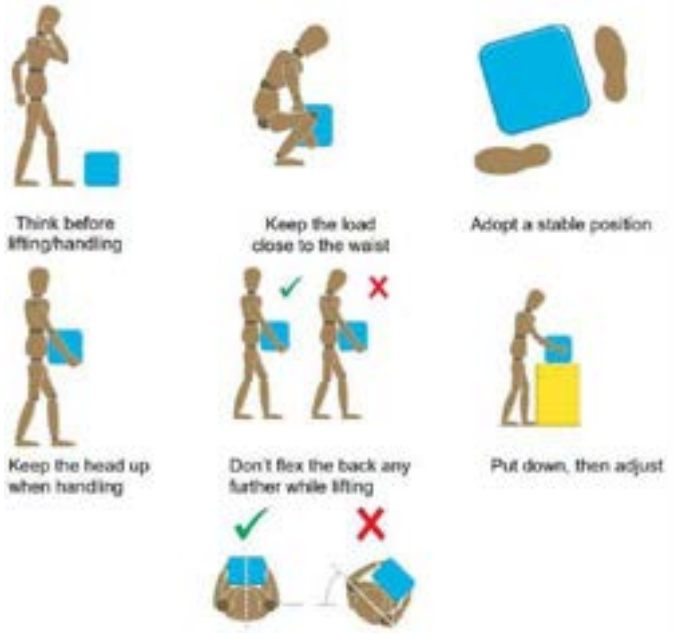
If the object to be handled is too heavy or awkward, get help. The manual lifting method for two or more people is the same as for one person.

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
- **Never allow a pregnant female to lift a load greater than 5 kg for work purposes**



4 REFERENCES AND RESOURCES

Relevant WMP

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#25 Permit to Work

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All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Operations HSE Manager Steve Wright/Bjorn Lauvstad	1/3/21	Retained on sign-off form

WORK MANAGEMENT PROCEDURE
#23 MOBILE MACHINERY

1 OVERVIEW & 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 is covered in the WMP #3– Driving Safety & Journey Management.

1.2 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.

It is important to follow all safety rules and procedures when operating or working near the heavy equipment.

Relevant Life Saving Rules

Work with a valid work permit when required

Do not walk under a suspended load

Do not smoke outside designated smoking areas

No alcohol or drugs while working or driving

While driving, do not use your phone and do not exceed speed limit

Wear your seat belt

Follow prescribed Journey Management Plan

2 PLAN THE WORK: PREPARING TO USE MOBILE EQUIPMENT

2.1 Follow WMP #11 Hazard Recognition to recognise 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, Job Hazard Analysis, ToolBox Talk, etc, is needed and who will check it is done before the work starts. Follow WMP #24 Permit to Work.

2.5 Confirm supervision arrangements including any necessary support, including HSE advisors, Emergency Response, Gas Testing, etc.

2.6 Team Leaders and operators shall ensure mobile machinery is in safe working condition through inspection before each usage.
No maintenance on mobile machinery is to be undertaken within a BGC containing facility without a proper work permit being issued.
Mobile vehicles are required to be fitted with In Vehicle Monitoring System (IVMS) devices if they are registered and roadworthy.
Follow prescribed journey management plan where required (See WMP #3– Driving Safety & Journey Management).

3 DO THE WORK

General requirements for all mobile machinery:

3.1
- Staff and contractors operating mobile machinery 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
- Shall not to be used until it has passed inspection by the relevant Technical Authority
- 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)
- Fire extinguisher shall be available on the mobile machinery
- Shall be checked to be within the validity date

3.2
- 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
- Do not smoke outside designated areas when driving or working in hazardous areas

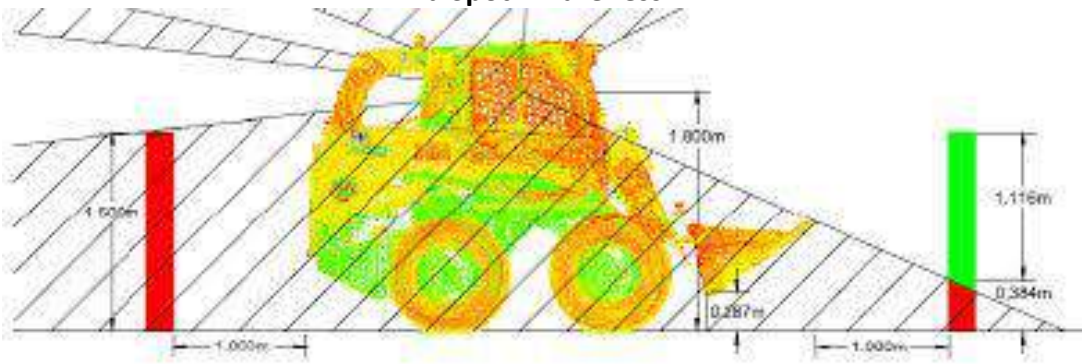
- Team members shall report to the team leader when a load is beyond the capacity of Safe Working Load (SWL) of the mobile machinery lifting equipment (see WMP #20 Lifting & Hoisting)

3.3

- Vehicle operators are responsible for the safety of their loads and surrounding activities
- Before the usage of mobile machinery in hydrocarbon areas, a valid work permit shall be obtained for the job and make sure all requirements in permit implemented correctly
- All mobile machinery shall be fitted with seatbelts when it is a requirement in accordance with the manufacturer's instructions

3.4
- All mobile machinery shall have a flashing visible light fitted and operating when the machine is switched on
- All mobile machinery shall have a reversing alarm fitted
- Ignition key shall never be left unattended in the mobile machine
- A site specific key control and issue system must be put in place
- Before moving and at a blind-spot areas, operator shall honk to alert all staff in the proximity

Blind Spot Awareness



3.5 **Forklifts**

Comply with WMP #20 Lifting & Hoisting when operating a forklift.
Check the forklift with the pre-use checklist in appendix A.

3.6 When driving, give way to pedestrians. Be aware of surroundings when reversing.

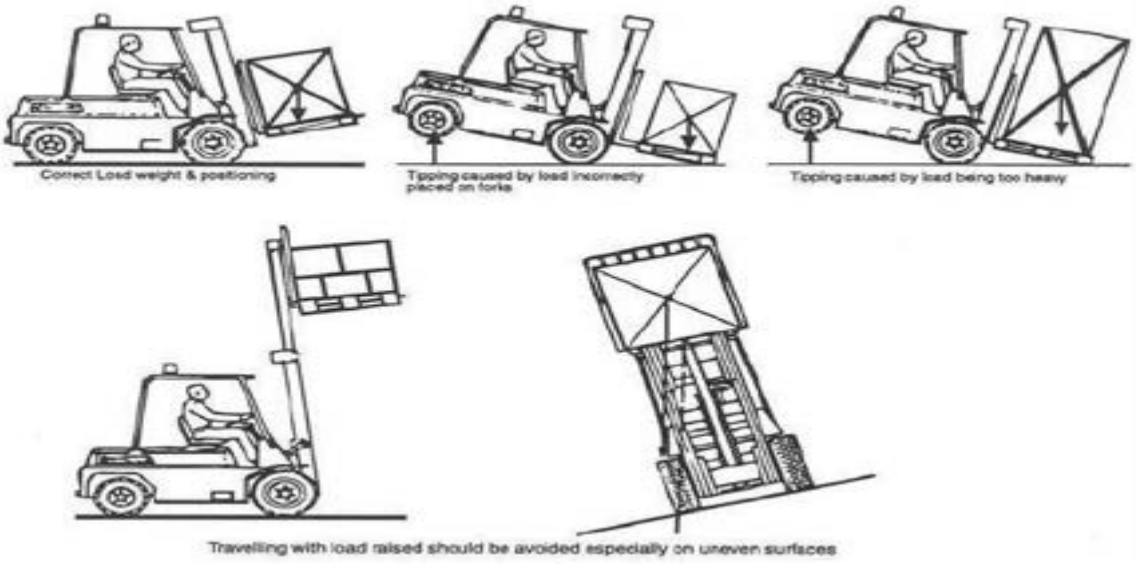
Observe speed limits and ensure the forklift can make a safe stop at any time.
Avoid harsh accelerating, harsh braking or harsh turning.

3.7 Use 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.
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.

3.8 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. Or transport a person not in a suitable seat with seatbelt.

3.9 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.

3.10 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.



3.11 Care should be taken, and speeds minimized to reduce the risk of load toppling caused by the imbalance induced when operating on rough terrain (see picture above).
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.

Cranes

3.12 Comply with WMP#20 Lifting and Hoisting when operating a crane.

3.13 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.

3.14 Cranes not in use shall be parked in a designated area. Crane's boom shall be lowered, and sling shall be secured properly.

Excavators

3.15 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.

3.16 Use steps and handholds correctly. Face the equipment and maintain 3-point contact when getting on and off.

3.17 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.

3.18 Ensure adequate clearance when making turns or going through narrow passages.

Follow requirements of WMP #5 Excavations

4 REFERENCES AND RESOURCES

Relevant WMP

#3 Driving Safety & Journey Management

#11 Hazard Recognition

#26 Manual Material Handling

#25 Permit to Work

#31 Personal Protective Equipment

#32 Safety Signs & Barricades

BGC Checklists and CSSS Forms

Forklift Operator Pre-Use Checks See Appendix 1

CSSS for Plant and Vehicles – See Appendix 2

BGC ToolBox Talks, Communication Materials, Posters and Information

Specific OEM Use Guides

'5 To Stay Alive' Poster – See Appendix 3

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	Material & Transport Director	1/3/21	Retained on sign-off form
Reviewer	BGC Lifting & Hoisting Subject Matter Expert Kevin Allan/Ogaga Agbaragu	1/3/21	Retained on sign-off form

8 APPENDIX 1 VEHICLE 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:** **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

9 APPENDIX 2 CSSS CHECKLIST FOR MOBILE MACHINERY

NOTE: Although 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	Is interaction between vehicles/plant and pedestrians adequately controlled? (segregated walkways, adequate crossing points)			
2	Does equipment have relevant 3rd 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? (Orange 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?			

Completed by: Date:

Signature:

10 APPENDIX 3 5 TO STAY ALIVE – HEAVY MOBILE EQUIPMENT

 Ensure mobile equipment and vehicle roadways are separated from pedestrian walkways with physical barriers to minimise distractions.	 Ensure vehicle operators complete a daily inspection prior to use
 Mobile equipment is to be operated only by competent personnel who are fit to drive.	 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.
 Enforce minimal reversing. Before vehicle moves, check area is clear, check blind spot and use available warnings. Implement a one way system where possible.	 1. No alcohol or drugs while working or driving. 2. While driving, do not use your mobile phone and do not exceed speed limits. 3. Wear your seat belt.

WORK MANAGEMENT PROCEDURE #24 PERMIT TO WORK

1 OVERVIEW & HAZARDS

1.1 BGC's Permit to Work system (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 pack and its documents, while continuously assessing and managing risk. BGC Management expects full commitment from staff and contractors to implement the PTW system in all BGC activities.**

Relevant Life Saving Rules & Process Safety Fundamentals


Work with a valid work permit when required


Conduct gas tests when required


Verify isolation before work begins and use the specified life protecting equipment


Obtain authorisation before entering a confined space


Obtain authorisation before overriding or disabling safety critical equipment


Protect yourself against a fall when working at height


Always use two barriers for hydrocarbon and chemical drains and 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


Do not leave an open drain orcritical 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

General Requirements

2.1 When planning the work, confirm that all mandatory training has been completed for the workers. This will include

- The Work Management Procedures relevant to the task.
- Site Inductions and HSE Training

- Task-specific Training
- Emergency arrangements specific to the site (See also WMP#17 Incident Reporting, Investigation & Emergency Response)

2.2 The BGC PTW system applies to all activities within BGC process areas (brownfield) and 5m either side of a buried asset.

2.3 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

2.4 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

2.5 Routine Operational tasks covered by an approved Standard Operating Procedure such as operating equipment, conducting inspections, or lining up valves do not usually require a permit.

2.6 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 Permit Issuer

See also WMP#11 Hazard Recognition for RAM definitions.

2.7 Appropriate control measures must be specified in the PTW and implemented at the worksite.

2.8 Department managers must ensure that each work location has a dedicated person or position identified as the Permit Issuer (for Operations Areas, this will be the Shift Engineer).

2.9 Activities which must be conducted using a PTW are shown in Table 1, below. Consult PTW Office if unsure. Refer also to the task specific WMPs.

Table 1: Activities and Permit Types

Work Requiring PTW	Examples
Cold Work	• Any work that does not generate sparks or heat • Non sparking tools • Erecting scaffold or barricades • Work outside process area • Using EX rated devices
Hot Work Category 1	• Any work that *will* 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) • Opening junction boxes or electrical equipment with live arcing contacts • See WMP# 14 Hot Work
Hot Work Category 2	• Any work with *potential* 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 • See WMP# 14 Hot Work
Confined Space Entry (CSE)	• Entry into confined space such as tanks or vessels • Entering excavations >1.2m
Breaking Containment	• Breaking or cracking flanges in process or hazardous systems • Removing valves or components • Spading/despading/swinging blinds
Excavation	• Digging a trench • Exposing services • Any removal of natural ground level > 10cm • See WMP# 5 Excavations
Electrical Work	• Working on High Voltage (HV) or Low Voltage electrical equipment • Exposing energized components • See WMP# 4 Electrical Safety
Lifting Operations	• Using a Hiab to load a truck • Any lifting of a load with a crane including overhead cranes • See WMP# 20 Lifting & Hoisting

2.10 Permit Issuers must visit the worksite to ensure it is adequately prepared and appropriate controls (e.g. isolations) are in place prior to PTW issue.

2.11 Personnel authorized to plan, prepare, approve, and carry out work activities must be trained and competent. See Table 2, below.

Table 2 BGC PTW Roles & Training Requirements

Permit Role	Training Required
Department Managers	PTW LVL 1/LVL 2 / FLBM Assessed as Skill
Permit Issuers/Shift Engineers	PTW LVL 1/LVL 2 / FLBM Assessed as Skill Authorized Gas Tester Confined Space Awareness Working at Height Awareness Isolations
Permit Coordinators	PTW LVL 1/LVL 2 / FLBM Assessed as Skill
Person In Charge Work Site	PTW LVL 1/LVL 2 / FLBM Assessed as Knowledge
Work Party Member	PTW LVL 1/LVL 2 / FLBM Assessed as Knowledge
Isolation Officer	PTW LVL 1/LVL 2 / FLBM Assessed as Knowledge

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 Applicant (PA) is assigned by their Supervisor – they will normally become the Person In Charge of Work Site (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 Supervisor and Permit Issuer to review work scope, location, and access arrangements.
- Work with Supervisor and Permit Issuer to identify:
  - Isolations and process conditions (See also WMP# 19 Isolations)
  - Equipment, Personal Protective Equipment (PPE – See Also WMP# 25), and tools (see also WMP# 7 Hand And Power Tools)
  - 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	Stipulates 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 Permit Issuer • Completed by Authorized Gas Tester and endorsed by Permit Issuer
Process Isolation	Lists points and means of physical isolation of process equipment to protect exposure from damaging energy or hazardous substances. • 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 and endorsed by Isolation Supervisor (often the Permit Issuer) • Must be completed by two people to confirm and verify isolations • May require countersigning by Section Head or Dept Manager depending on complexity and risk See WMP #19 Isolations
Electrical Isolation	Lists points and means of physical isolation of electrical supply to equipment preventing exposure to damaging electrical, mechanical, or other forms of energy

	• 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 and Permit Issuer • Blue copy is retained by the Responsible Person Electrical (RPE) See WMP #19 Isolations.
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. • Must be developed in advance in conjunction with any isolation certificates and • Completed by Authorized Isolation Officer and endorsed by Permit Issuer See WMP #19 Isolations.
Override	Required when any safety critical device or system will be inhibited or overridden as part of the work • Must be completed in conjunction with formal Override Request See WMP # 27 Safety System Isolation & Override Control.
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 10cm. • 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 See WMP #5 Excavations
Radio-graphy	Used for any activity which involves Non-Destructive Testing using a radioactive source or produces X-rays. • Completed by Radiation Protection Supervisor and endorsed by Permit Issuer • Department Manager must endorse See WMP # 18 Ionizing Radiation.
Vehicle Entry Sheet	Used to document risks and controls associated with vehicles entering process or hazardous areas • Must include plot plan with approved route • Completed by Permit Applicant and endorsed by Permit Issuer See WMP # 14 Hot Work

2.15 Develop a clear method statement that describes the scope of work, to be submitted to the Permit Coordinator.

Check that the Permit Issuer fully understands the work and is satisfied with PTW requirements identified.

Permit Issuer and PTW Coordinator review simultaneous operations (SIMOPS) to identify potential SIMOPS hazards.

See WMP #11 Hazard Identification.

STEP 2: Assess Hazards and Controls

2.16 Identify hazards related to the specific work. See WMP #11 Hazard Identification

Identify any non-standard PPE requirements.

2.17 Identify isolation requirements with Permit Issuer and receive Isolation Confirmation Certificate (ICC).

See WMP#19 Isolations.

2.18 Work with Permit Issuer to identify any process safeguarding or safety equipment overrides required.

See WMP# 27 Safety System Isolation and Overrides.

2.19 Discuss the planned work with Permit Issuer and agree on the risk rating, using the Risk Assessment Matrix, if the risk is Light Blue, Blue, Yellow, or Red.

See WMP# 11 Hazard Recognition.

- If Blue/Light Blue risk, write hazards and controls on Toolbox Risk Identification Card (TRIC)
- If Red/Yellow risk (or the Permit Issuer requests) develop a Job Hazard Analysis with the supervisor

2.20 Dept Manager must approve JHA for all Red risk tasks and certain specified activities. (*see Precautions 3.51).

2.21 Use the Hazard Checklists to help identify common hazards.

2.22 Complete and submit 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 Permit to Work 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 reviews the PTW at the meeting and either Endorses it or requires changes

2.27 Endorsed PTW packs are kept at the PTW Office awaiting issue.

2.28 If PTW pack needs changes, work with the Permit Issuer and PTW Coordinator to make the changes.

Once 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 WMP 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 This will include confirmations that everyone involved in the task has participated in a site induction and has had all mandatory training.

3.3 Everyone must know:

- Emergency Site Alarms
- Muster points and routes to take to get there
- The BGC Emergency Response Operations Centre (EROC) contact details: BGC Phone 3333 / VOIP 12223 / Mobile 07809213970
- First aid points and nominated First Aiders

Training records will be kept in personal Training Passport (see image opposite)

BGC Training Passport

3.4 The Permit Issuer will arrange any isolations as per isolation plan.

The Permit Issuer will coordinate requested overrides to be approved and installed.

3.5 Check that the correct tools and equipment are available and inspected.

3.6 Check that lighting, access, and emergency response plans are suitable and ready.

3.7 Confirm what measurements and conditions are required for the PTW to be issued (e.g. gas readings, wind speed).

STEP 4 Review Controls & Verify On Site That Controls Are in Place

3.8 Visit work site with Permit Issuer.

3.9 Check with PTW Office that there are no planned SIMOPS conflicts and check identified hazards and controls are appropriate.

3.10 Look for any new hazards and agree on additional controls to be added to the JHA or the TRIC.

3.11 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 ENDORSEMENT.

3.12 Check isolations are correct, and locks and tags are in place, and that correctly marked up P&IDs/electrical drawings are present with the ICCs in PTW pack. Permit Issuer must show the PICWS that all points of isolation are in place, and prove equipment is depressurised and de-energised See WMP#19 Isolations.

3.13 For electrical isolations, Electrical Dept Electrical Isolating Authority must confirm Electrical Isolations and demonstrate all points of isolation are in place to the PICWS. See WMP#19 Isolations.

3.14 Confirm all certificates are correct and with the PTW Pack.

3.15 Return the endorsed PTW pack to the PTW Office where it will be stored until issued.

STEP 5 – Issue Permit

3.16 On the day of work, check again with the Permit Issuer and PTW Coordinator that there are no SIMOPS issues.

3.17 Request the permit to be issued from the PTW office.

Nominated Authorised Gas Tester will conduct an initial gas test and record the result on the Gas Test certificate.

3.18 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#11 Hazard Identification)
- All PTW pack documents are completed correctly

3.19 Show training passport to the Permit Issuer to demonstrate necessary competencies are held and valid.

3.20 Permit Issuer will then sign to release the PTW.

3.21 PICWS will sign PTW to show that he understands and agrees to implement the PTW controls and conditions.

3.22 For remote locations, where the Permit Issuer or 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.

PERMIT IS NOW ACTIVE

3.23 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.

3.24 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.

3.25 Take the PTW pack to work site location. PTW pack includes:

- Original (White) copies of Permit to Work and hazard checklists
- Necessary certificates
- TRIC, JHAs, and other attachments

STEP 6 – Work Party Pre-Job Discussion/Toolbox Talk (TBT)

3.26 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

3.27 Conduct a Toolbox Talk with work crew. For Red risk work the Dept Manager must send a delegate such as the Section Head or Shift Engineer to support the toolbox talk.

3.28 The TBT is a two-way discussion with the work team led by the PICWS.

The PICWS should 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.

3.29 Use the TRIC card to support the Toolbox Talk and record the discussion points, particularly the hazards and controls.

Communicate the need to:

- Comply with the PTW, TRIC/JHA Controls and applicable WMPs
- Incidents and emergencies are to be managed according to WMP#17 Incident Reporting, Investigation and Emergency

3.30 Response

- Intervene safely and respectfully when seeing unsafe acts or conditions
- Report interventions and observations via HSE Observation Cards (and Projects CSSS) or the BGC Information Management System (IMS)

3.31 A TBT talk is required each time a permit is issued or re-issued and must be refreshed with the work team after every work break.

STEP 7 – Execute and Supervise the Works

3.32 All work party members must sign the TBT Sheet / PTW to acknowledge they understand the activity, risk, and controls, and allow for headcount in case of an emergency.

3.33 Work team carries out work safely, ensuring and following controls, and using required PPE. See WMP#25 PPE.

3.34 PICWS is to supervise the work ensuring that controls are adhered to and that work is carried out in a safe manner.

3.35 Ensure PTW pack is displayed and easily available at the work location for inspection and reference.

3.36 PICWS must always be at the work location during work.

3.37 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.

3.38 If any team member is unsure of anything at any stage, they must PAUSE WORK and ask their supervisor.

3.39 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.

3.40 Changes 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.

3.41 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 Permit Issuer or delegate (Shift Supervisor) goes to work location and confirms that work is completed satisfactorily, and that housekeeping has been completed.

3.46 All work party members sign off on the PTW form.

3.47 Permit Issuer confirms that the work site is safe and ready to be returned to operating status.

3.48 Permit Issuer authorises and 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 office

3.50 Permit Issuer (or PTW coordinator as Permit Issuer delegate) signs off all copies of the PTW as complete.

PERMIT IS NOW CLOSED

Precautions / Additional Points to Note:

3.51 In case of emergency, all Active PTWs shall be Suspended, and will require approval from Permit Issuer to recommence. A TBT must be repeated by the PICWS before work begins again. See WMP#17 Incident Reporting, Investigation and Emergency Response

3.52 The following specified activities require Department Manager approval and signature on both the JHA and PTW before the PTW can be issued:

- 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
- Internal tank or vessel cleaning
- Category 1 hot work in Unclassified Zones within process areas or 5m of a pipeline
- Radiography
- Grit/sand blasting activities
- Breaking containment where hydrocarbons are possible to be present
- Work in excavations deeper than 1.2m

3.53 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.

3.54 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 meets all other requirements and be signed off by the Department Manager. Such permits are referred to as “Emergency Permits.”

3.55 For areas that do not have a Shift Engineer, a designated Permit Issuer will be appointed by the Department Manager.

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition
#14 Hot Work
#17 Incident Reporting Investigation and Emergency Response
#19 Isolations
#22 Manual Material Handling
#24 Permit to Work
#25 Personal Protective Equipment
#27 Safety System Isolation & Override Control

BGC ToolBox Talks, Communication Materials, Posters and Information

PTW Process Swimlane – See Appendix 1
PTW Roles & Responsibilities – See Appendix 2

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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 to check that the requirements are 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.

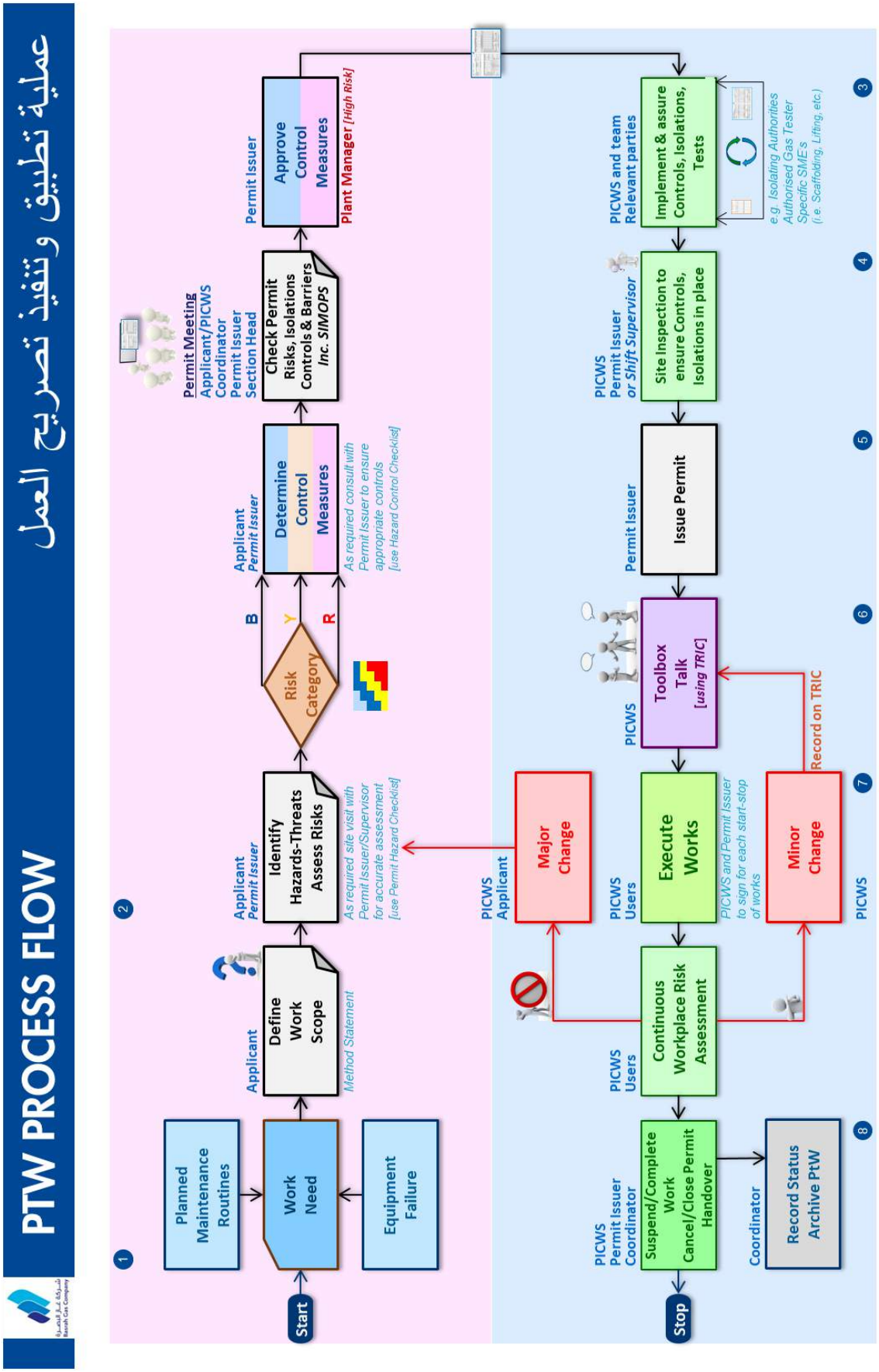
6 INTERPRETATION AND UPDATING

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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Operations HSE Manager Steve Wright/Bjorn Lauvstad	1/3/21	Retained on sign-off form

8 APPENDIX 1 PTW PROCESS SWIMLANE



9 APPENDIX 2 PTW ROLES AND RESPONSIBILITIES

Role	Responsibilities
Permit Applicant (PA)	▪ Visit the worksite with the relevant authority to identify worksite hazards related to the activity ▪ Draft the Permit To Work (PTW) with clear work scope and correct work categories ▪ Permit Requestor (PR) together with the Person In Charge of Work Site (PICWS) shall carry out a joint preliminary Risk Assessment (RA), and Job Hazard Analysis (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 Permit Issuer / Isolation Owner (IO) or Electrical Isolation Authority (EIA) to mark up any isolation plans in accordance with WMP#19 Isolations ▪ Finalize PTW Pack for submission to PTW/SIMOPS meeting
Person In Charge of Work Site (PICWS)	▪ Verify any isolations before work commences by performing personal inspection and Zero Energy Checks along with Isolation Owner (IO) or Electrical Isolation Authority (EIA) ▪ PICWS responsibilities cannot be delegated, only formally handed over to another qualified PICWS ▪ Where PICWS accepts responsibility for multiple PTW (max 2 Blue Risk PTW); PICWS shall demonstrate to PI they are able to effectively manage each worksite ▪ Accept permits from the Permit Issuer (PI) before starting work ▪ Ensure a Toolbox talk (Pre-job discussion) is conducted before work ▪ Ensure that all required documentation is attached to the PTW pack. This ensures that permit 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 ▪ Supervise and monitor the permitted 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

Permit Issuer (PI) – Usually Shift or Site Engineer	▪ Issue Permits To Work at BGC operating facilities ▪ 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 Permits are issued and active ▪ Arrange for appropriate delegation in case of [un]planned absence. Note: Permit 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 permit can be closed

WORK MANAGEMENT PROCEDURE
#25 PERSONAL PROTECTIVE EQUIPMENT (PPE)

1 OVERVIEW & HAZARDS

1.1 Personal protective equipment (PPE) is equipment worn to minimize exposure to hazards in the workplace.
This procedure is applicable to BGC staff, contractors and visitors at BGC operating assets and worksites.
This procedure does not apply to Contractor working at their own worksites away from BGC work locations.

1.2 Hazards in the workplace includes chemical, radiological, physical, electrical, mechanical, or other workplace hazards. PPE is used as a LAST RESORT in the hierarchy of controls after hazard elimination, substitution, engineering and administrative controls (see Appendix 1).

2 PLAN THE WORK: IDENTIFYING PPE REQUIREMENTS

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 sanitation of such equipment
- the supply and issue of PPE and the equipment is worn correctly
- People who use the PPE are fitted and trained/briefed for the proper selection and use, including.
    - How to put on PPE properly, and to remove contaminated PPE
    - Specific fitness to work requirements for using PPE (e.g. Respiratory Personal Protection - RPE)
    - How, where possible, to minimise contamination before removal
    - Use of disposable PPE
    - How to dispose of contaminated PPE safely

2.2 Typical Personal Protective Equipment (PPE) on BGC sites is:

- Hard hat
- Safety-toed shoes
- Safety glasses
- Gloves
- Hearing protection (ear plugs and/or ear covers)
- Flame Retardant Coveralls

2.3 Additional requirements for PPE are based on a risk assessment, taking into account 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# 11 Hazard Identification.

2.4 When Specialized 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 is restricted from hydrocarbon process areas. See also WMP#11 Hazard Identification.

2.6 Some hydrocarbon process areas will have access routes within the boundary of the facility which do not mandate PPE to be worn.

NOTE: it is highly recommended that PPE be worn in these areas, as they can be in close proximity to fire and/or explosion hazardous areas.

These areas will be:

- Identified in site induction training
- Clearly marked by solid painted yellow lines
- Enforced by site managers and supervisors. Individuals straying outside of these areas and without appropriate PPE will be subject to consequence management, which may include disciplinary action

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
- Personnel are not allowed to use self-purchased PPE

BGC general requirements related to PPE are as follows:

- Use inherent flame-resistant 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, bandana and tudung (headscarf for Muslim women) must be used. A clothing tag must show the material inherent flame resistant properties and certification

3.2 BGC specific requirements for PPE use are provided in the following sections of the WMP

1) Hand Protection
2) Head Protection
3) Eye and Face Protection
4) Hearing Protection
5) Respiratory Protective Equipment (RPE)
6) Personal Gas Monitoring (PGM)
7) Personal Flotation devices (PFD)
8) Fall Protection
9) Foot Protection
10) Protective Clothing
11) PPE Disposal
12) COVID 19 l Pandemic Measures

3.3 **1 HAND PROTECTION**

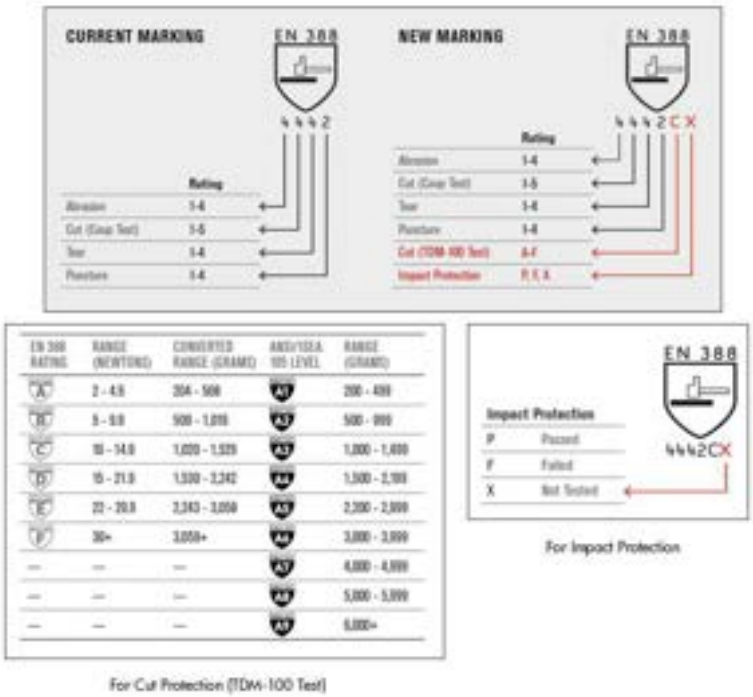
The choice of hand protection shall be made by the compatibility with the work and the requirements of the user. To be considered is the ability of protective gloves to resist abrasion and other industrial wear and tear. Manufacturer instruction and markings for appropriate use and level of protection shall be observed.

When selecting gloves for chemical protection, reference shall be made to chemical permeation and resistance data provided by manufacturers.

All workers within hydrocarbon process areas must wear gloves at all times, regardless of the activity.

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.

3.4



Types of Hand Protection

Protection against mechanical hazards

Gloves for Grip & Dexterity

Cut Resistant gloves

Impact Resistant gloves

Applicable Standards

- BS EN 388
- AS/NZS 2161
- ANSI/ISEA 105

Steel mesh gloves

Chainsaw gloves

- EN 1082-1 (for steel mesh gloves)
- BS EN 381 (for chainsaw gloves)

Protection against heat and fire (thermal hazards)

Welding Gauntlets

Applicable Standards

- BS EN 12477
- BS EN 407
- AS/NZS 2161.4
- ANSI/ISEA 105

Protection against cold hazards

Cryogenic gloves

Applicable Standards

- BS EN 511
- AS/NZS 2161.5
- ANSI/ISEA 105

Protective against chemicals and micro-organisms

Chemical/oil resistant gloves

Disposable Vinyl, Latex or Nitrile gloves

Applicable Standards

- BS EN 374
- AS/NZS 2161.10
- ANSI/ISEA 105

Applicable Standards

- BS EN 455
- AS/NZS 2161
- ANSI/ISEA 105

Protection against electrical hazards	Protection against ionizing radiation and radioactive contamination
 Insulating gloves for	 Ionizing radiation gloves
Applicable Standards • BS EN 60903 • AS 2225 • ANSI/ISEA 105	Applicable Standards • EN 421 • AS/NZS 2161.8 • ANSI/ISEA 105

3.5 **2 HEAD PROTECTION**

Head protection should give the wearer protection against impact and penetration damage.

The Safety helmet shall be equipped with a chin strap.

Only Safety Helmets which conform to the BGC PPE Specifications are allowed for use in BGC premises.

The safety helmets shall be inspected periodically to ensure that the helmet is structurally sound and has not exceeded 3 years from date of manufacture.

A new safety helmet shall be issued to staff if found in exceedance of 3 years from date of manufacture. If the structural integrity of the safety helmet has been compromised, a new safety helmet shall be issued.

No modification of any kind that compromises the structural integrity of the safety helmet is allowed.

The helmet chinstrap shall be used during periods of high wind, when working at heights.

3.6 **3 EYE AND FACE PROTECTION**

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 as well as 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 should be equipped with the correct type UV shade for the type of work that is being undertaken.

For grit blasting work, hoods with air 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.

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)

Applicable Standards

- BS EN 166
- BS EN 167: 2002,
- BS EN 168: 2002,
- BS EN 169
- BS EN 170:2002,
- BS EN 171:2002,
- BS EN 175
- BS EN 207:2009, BS EN 379:2003, CR 13464, 89/686/EEC
- EN379:2003 (automatic welding filters)
- AS/NZS 1337
- AS/NZS 1338
- ANSI Z87.1 (Z87+ for impact rated lens)

Welding goggles

Welding helmet

Clear face shield

3.7 4 HEARING PROTECTION

Persons shall not be also exposed to continuous noise, which **exceeds sound pressure levels of 85 dB (A) for an 8 hours exposure**. Ear protection must be worn by any person entering a high noise (>85dB(A)) area no matter how brief their intended stay.

Ear protection must be of the approved type.

The noise reduction rating (NRR) must be considered when selecting the hearing protection.

Earplugs must fit tightly to the ears and shall be fitted with 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	

3.8 5 RESPIRATORY PROTECTIVE EQUIPMENT (RPE)

Use RPE to protect against dust, fumes, gases, oxygen deficiency and vapors.

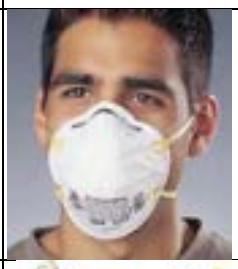
When handling of hazardous gas, chemicals or vapors, use Half or Full mask respirator suited to the gas, chemical or vapor (e.g., breaking containment).

For protection against dust, use the disposable mask.

For H_2S escape, use the PARAT H_2S Escape Filter issued at BGC facilities. Refer to WMP#16 Hydrogen Sulphide (H_2S).

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.

PPE	Applicable standards	Photo
Half face mask respirator	BS EN 140 AS/NZS 1716 ANSI/ASSP Z88.2	
Full face mask respirator	BS EN 140 AS/NZS 1716 ANSI/ASSP Z88.2	
Gas/vapour and combined filters (for respirator)	EN 14387 AS/NZS 1716	
Particle filters (for respirator)	EN 143 AS/NZS 1716	
Disposable filter mask – Working in dusty condition	EN 149 89/686/EEC EN405:2001	
H_2S escape hood	BS 8468-3.2 AS/NZS 1716	
Emergency escape hood set for Fire escape emergency (located in offshore accommodation).	EN 403 AS/NZS 1716 ASTM E2952-14	

Airline Breathing Apparatus with full face mask (using filtered compressed air & fitted with demand valve)	BS EN 14593-1 AS/NZS 1716 ANSI/ASSP Z88.2	
Self-Contained Breathing Apparatus (SCBA) (using cylinder type)	BS EN 137 AS/NZS 1716 ANSI/ASSP Z88.2 BS EN 12245 (for the composite cylinder)	

3.9 6 PERSONAL GAS MONITOR (PGM)

Personal Gas Monitors (PGMs) are designed for single gas monitoring and detection 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) at a minimum. These monitors shall be used by:

- All individual BGC employees whilst they are in hydrocarbon processing areas
- 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). A multi gas monitor that also measures H2S may be used in lieu of a single gas (H2S) monitor if it is available.

Devices			
Personal Gas Monitor Dräger Pac 3500		Dräger X-am 5600 Portable Gas Monitor	

3.10 7 PERSONAL FLOATATION DEVICES (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. Except where the risk assessment has determined that an appropriate level of protection can be reached by wearing an approved PFD with reduced characteristics, 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 kept in a dry, well ventilated storage area away from direct sunlight and sources of solvent or corrosive materials.

Before use, life jackets or buoyancy aids should be examined 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 instructions in the correct way to wear and adjust the device before first use.

3.11 8 FALL PROTECTION

Personal fall protection or full body safety harness shall be used in situations where a person is exposed to the possibility of a fall of greater than 1.8m and where it is not practicable to arrange for the work to be done from a more suitable surface, such as a fixed or temporary work platform with guard rails.

The safety harness should be of the type with twin energy absorbing lanyards to support the weight of the person and minimize injury in the event of a fall

3.12

The wearer shall ensure 100% tie off at all times at fixed points above the wearer in accordance with manufacturer recommendations. A full body safety harness with a properly arranged and attended rescue line must be worn by any person entering a confined space where there is a risk of asphyxiation or being overcome by toxic gases or fumes.

3.13 9 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 upper 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:

- Feet are measured for the correct size.
- 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 lace-up boots with zip

High-cut pull-on boots

No open-toed

Wellington boots

Applicable Standards

- BS EN ISO 20345
- AS/NZS 2210
- ASTM F2413

3.14 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.

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.

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 flame resistant coverall (with reflector strips)	NFPA 2112 EN 340:2003 EN ISO 11612, EN ISO 20471, 89/686/EEC	
Electrical Arc Flash suit	NFPA 70E EN 1149-5:2008	
Apron (Welding and Impervious)	BS EN ISO 1161	  Welding Impervious
Disposable coverall	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	BS EN 943	
Rainwear	EN 343 ASTM F2733 (for flame resistant rainwear) ASTM F1891 (for arc & flame-resistant rainwear)	
High visibility vest	BS EN ISO 20471 AS/NZS 460 ANSI/ISEA 107	

3.15 11 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
- Exceeded its maximum replacement period for the following safety helmet types

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

3.16 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 (such as crack or chip) or deterioration to the cushions, linings and headband
- Earmuff exceeded its lifespan of 5 years from manufacture date

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

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

3.17 12 COVID 19 / Pandemic Measures

There is no change in the PPE supply and provision process.

Use a Risk Assessment to determine the need for additional PPE to address the COVID-19 risks related to the work activity. This will be included in the site specific COVID 19 plan.

The basic requirements are social distancing, facemasks and hand hygiene. More details can be found in the BGC COVID-19 Guide for Worksite Implementation. BGC's latest guidance and tools are posted on the IMS website or contact your HSE Advisor.

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition

#14 Hot Work

#24 Permit to Work

#32 Safety Signs & Barricades

BGC ToolBox Talks, Communication Materials, Posters and Information

Hierarchy Of Controls Information – See Appendix 1

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 INTERPRETATION AND UPDATING

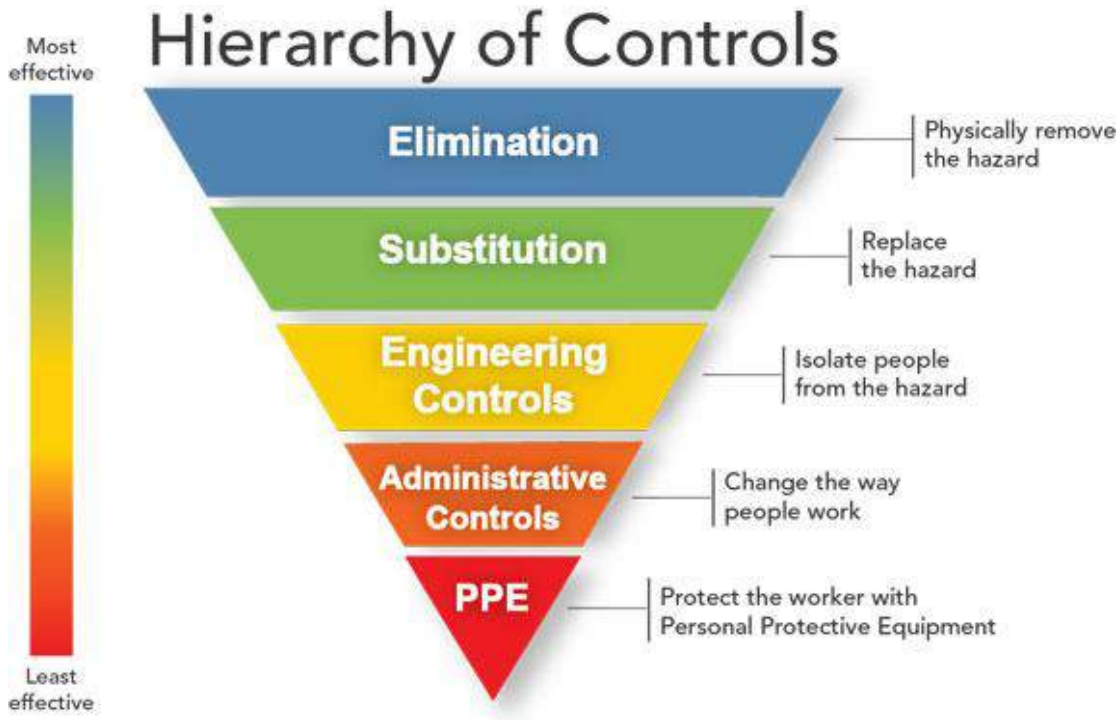
BGC HSE Risk & Assurance Lead shall ensure periodical update of this WMP as required

BGC HSE Director shall direct enquiries on interpretation of this procedure to the most appropriate BGC authority.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	BGC Operations HSE Manager Steve Wright/Bjorn Lauvstad	1/3/21	Retained on sign-off form

8 APPENDIX 1 – HIERARCHY OF CONTROLS



Examples
Hierarchy of Controls
ANSI Z10

Most Effective

Controls	Description / Examples
Elimination	Design to eliminate hazards or completely stop the practice to remove the hazard.
Substitution	Substitute a less hazardous material, for example change out chemicals, use equipment that creates less noise, etc.
Engineering	Examples include: Ventilation such as lab hoods, blast shields, machine guarding, guard rails, interlocks, etc.
Warnings / Administrative	Examples of Warnings include: Signs, alarms, labeling Examples of Administrative Controls include: Procedures and training
PPE	This includes any protection worn by a person to protect them from a hazard, e.g., safety glasses, gloves, respirator, etc.

Least Effective

WORK MANAGEMENT PROCEDURE
#26 SAFETY SIGNS & BARRICADES

1 OVERVIEW & HAZARDS

1.1 The Purpose of this Work Management Procedure (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 shall outline 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

Work with a valid work permit when required

2 PLAN THE WORK

2.1 Follow WMP #11 Hazard Recognition to recognise 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, Job Hazard Analysis, ToolBox Talk, etc, is needed and who will check it is done before the work starts. Follow WMP #24 Permit to Work.

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#11 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.

2.8 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 will 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 (2.4 m)

3.2 **Sub Metal Guardrails (Minimum Requirements)**

- Metal handrail material for a guardrail must be (38mm) nominal size or larger.
- 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 (2.4 m)

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)** - (See WMP #18 Ionising Radiation)

- 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 in line with the Ionizing Radiation WMP# 18

3.5 **Hydrostatic Pressure Testing**

- Yellow/Black Barricade (warning) tape will be used to identify areas where equipment or piping is being a 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 hydrotested
- 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 **H_2S Area Demarcation**

H_2S areas are demarcated by yellow and black chain. It is forbidden to access these areas unless:

- Wearing an H_2S Area Access pass
- Has completed the required level of H_2S training for the job to be performed All requirements of the H_2S WMP# 16 are complied with
- Lines and equipment containing H_2S shall be identified by Purple label tape

3.8 **Flagging (barricade tape)**

- Soft barricades should be approximately 1.0 m 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)

Yellow/Black Barricade Tape

This type of barricade tape 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 Barricade Tape

This type of barricade tape indicates DANGER and that a potential serious hazard may be present. No worker, other than those assigned to work inside a RED barricade, may enter without first obtaining permission from the erector(s) of the tape.

Red Barricade Tape

This barricade is used to indicate DANGER—RADIATION and that possible exposure may be present. This barricade is considered an equal to red. This colour is representative of x-ray work being performed. Signs must also be posted to protect areas where radiation operations are in progress.

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 the end of the shift if is safe to do so, whichever occurs first.

3.10 Projected objects or guy wires shall be identified with high visibility markings/flagging at eye level and visble 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' with 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.

Site Perimeter and access points / signs

3.21 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 WMP

#11 Hazard Recognition
#16 Hot Work
#23 Isolations
#25 Permit to Work
#25 Personal Protective Equipment

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	BGC HSE Director	1/3/21	Retained on sign-off form
Reviewer	HSE Risk and Assurance Lead Andreas Baatz	1/3/21	Retained on sign-off form

WORK MANAGEMENT PROCEDURE
#27 SAFETY SYSTEM ISOLATION & OVERRIDE CONTROL

1 OVERVIEW & 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.

This work procedure is applicable for all BGC staff and contractors who will do activities while Safety System is isolated, or an override is in place for a safety critical function.

Relevant Life Saving Rules and Process Safety Fundamentals

Work with a valid work permit when required

Obtain authorisation before overriding or disabling safety critical equipment

Take interim mitigating measures in case of failure of Safety Critical Equipment

Do not make a change without a proper MOC

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.

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 isolate 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 an MTO entry and/or WR 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

BGC Override Process is applied and is shown in figure 1. In this section the key roles which a PICWS 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 or overrides certificate 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 procedure
- 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 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 (Person in Charge of the Worksite) or workers:

As the PICWS (Person in Charge of the Worksite) 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

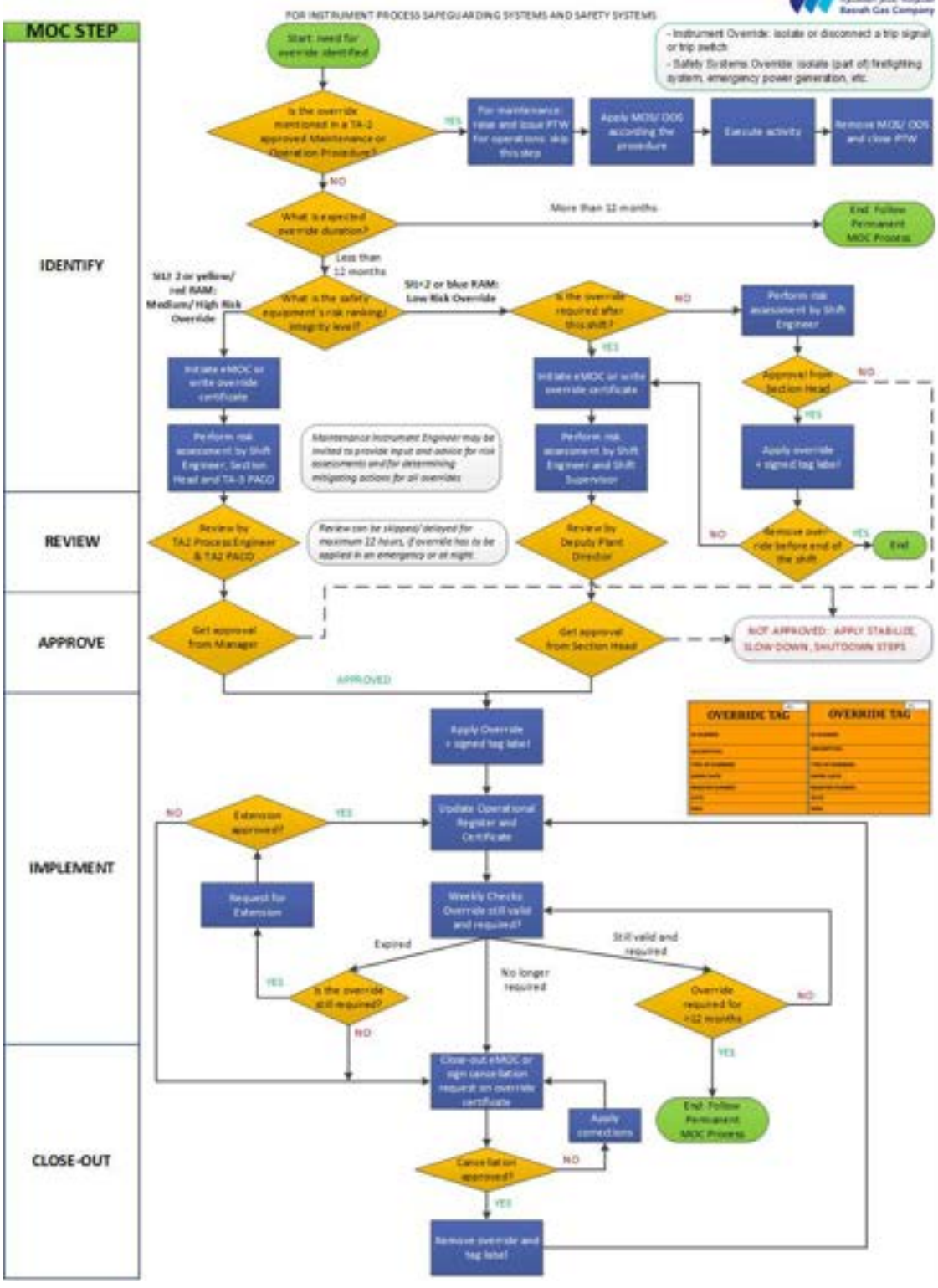
In these cases, a copy of the eMOC print-out (Appendix 1) or override certificate (appendix 2) shall or be attached to the applicable isolation certificate as per PTW Process. If a Manual of Permitted Operations (MOPO) exists, this can be used as a reference during the risk assessment of multiple overrides.

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 Permit to Work (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.

OVERRIDE PROCESS



4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition

#23 Isolations

#25 Management of Change

BGC ToolBox Talks, Communication Materials, Posters and Information

BGC Override Process Flowchart – See Appendix 1

BGC Override Certificate – See Appendix 2

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	Asset Services Director	1/3/21	Retained on sign-off form
Reviewer	Deputy Plant Director NR NGL Sven Stueben	1/3/21	Retained on sign-off form

APPENDIX 1 BGC OVERRIDE EMOC CERTIFICATE

Basrah Gas Compa | MoC Request Form | Page 1 of 4

MoC Id	92700
Workflow Status	APPROVED
Title	BGC-KAZ-NGL-11.1KT04A Gas detector 45HTT,45HTA-forced
Location	Basrah Gas Company|Khor Al Zubair|NGL and Slug Catcher|U11.1 NGL Train 1
FLOC	BGC-KAZ-NGL-11.1 kT04A
FLOC Description	BGC-KAZ-NGL-11.1KT04A Gas detector 45HTT,45HTA FORCE
Equipment	11.2 K04A
MoC Type	Temporary | Process - Control | Overrides & Inhibits
Function	Production
Created Date	August 06, 2020
Initiator	Hussein Hasan Abbas
Look Back Required	No
Priority	Low
Proposed Startup Date	August 26, 2020
Valid To	August 08, 2021
MoC Request Owner	Hussein Hasan Abbas
MoC Request Authoriser	Hussein Hasan Abbas
Emergency MoC	Yes
Screen	No
Turnaround	No
Description	

Description of Change:

force on the gas detector11.1 KT04A 45 HTA prevent ready to start and 45HTT trip signal ,this MOC been implemented since -6/11/2018,base on the new updated need to be put in FSR.

Reason for change:

the ventilation is not efficient so the mist is accumulate om the sensor, also there is gas accumulate during start up

Justification and benefits:

the signal is prevent the turbine from operation.

Normalization Plan:

GAS TESTER

APPENDIX 2 BGC OVERRIDE CERTIFICATE (PAPER BASED)

شـركة غـاز البصـرة
Basrah Gas Company

Basrah Gas Company
شركة غاز البصـــرة
Override Certificate
شهادة التجاوز

Certificate Number رقم الشهادة	
Tag Number رقم البطاقة	

Type of override نوع التجاوز	☐ Instrument Override * تجاوز الألات الدقيقة		☐ 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 مصفوفة تقييم المخاطر	☐ Light Blue/ ازرق فاتح		☐ Yellow/ اصفر		
	☐ Dark Blue / ازرق غامق		☐ 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		TA-2 Process Engineering		Deputy Plant Director
	(date + signature)		(date + signature)		(date + signature)
Approved by الموافقة بواسطة		Date/ تاريخ		Signature/التوقيع	
Extension approved by موافقة التمديد بواسطة		Date/ تاريخ		Signature/التوقيع	
Cancellation Request by طلب الازالة بواسطة		Date/ تاريخ		Signature/التوقيع	
Cancellation Approved by موافقة الازالة بواسطة		Date/ تاريخ		Signature/التوقيع	

*: Tick the box for the type of override that applies:

WORK MANAGEMENT PROCEDURE
#28 TEMPORARY FLEXIBLE HOSE ASSEMBLIES

1 OVERVIEW & HAZARDS

1.1 This procedure 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 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.

1.2 The following are not considered to be temporary hoses: Choke and kill hoses, bunkering hoses, braided machinery hose in machinery utility, machinery hose within vehicle or cranes, hoses within snuffing system cylinders, CO2 hoses and fire water hoses.
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

Work with a valid work permit when required

Always use two barriers for hydrocarbon and chemical drains and vents

Do not leave an open drain orcritical transfer unattended

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

Perform MOC and install backflow protection when connecting utilities to process

Do not make a change without a proper MOC

2 PLAN THE WORK

2.1 Follow WMP #11 Hazard Recognition to recognise 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, Job Hazard Analysis, ToolBox Talk, etc, is needed and who will check it is done before the work starts.

Follow WMP #24 Permit to Work.

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.

3.3 In offshore situation, damaged hoses may not be repaired, however with approval from area operating technician hoses may be shortened to remove a damaged section and re-secured with the same connecting device.

3.4 **Hose Usage**

3.5 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.

3.6 Flexible hose assemblies shall not be stretched, twisted or bent, kinked or used to support any load.

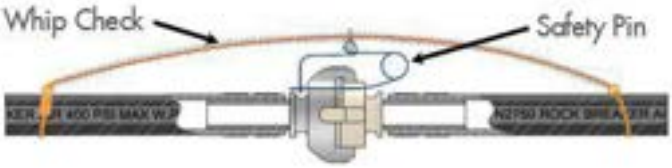
3.7 Avoid pulling over or along sharp objects and dragging over rough floors.

3.8 With a suspended hose, always take into account the loads on the hose and couplings subject to their own weight, distance and contents.

3.9 Cross connecting the hoses shall be controlled by the Permit to Work system together with a Task Risk Assessment.

3.10 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.

3.11 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.



3.12 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.

3.13 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.

3.14 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.

3.15 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.

3.16 **Storage**

3.17 Hose shall be depressurised, drained and flushed (if necessary) after use and prior to storage

3.18 Any defects or damage that has occurred during use shall be reported to the responsible supervisor.

3.19 Hose shall be stored in dry conditions and away from direct sunlight.

3.20 Depending on length and diameter, hoses may be stored horizontally in racks that support the hose along its full length, or loosely coiled.

3.21 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.

3.22 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.

3.23 **End Connections**

3.24 Flexible hose assemblies shall be supplied complete with end connections fitted.

3.25 End connections shall be securely attached to the hose by proprietary clamps or mechanically swaged.

3.26 The use of jubilee clips (shown below) to secure hose ends to fittings is prohibited.

3.27 Alternatively, heavy duty Oetiker clamp Series-167 as minimum made of SS316L grade could be uses to secure hoses onsite.

3.28 End connections can be typically any of the following types depending on the service:

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition

#25 Permit to Work

#31 Personal Protective Equipment

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	Asset Services Director	1/3/21	Retained on sign-off form
Reviewer	Deputy Plant Director NR NGL Sven Stueben	1/2/21	Retained on sign-off form

WORK MANAGEMENT PROCEDURE
#29 WASTE MANAGEMENT

1 OVERVIEW & HAZARDS

Waste is residual materials that may be segregated for resale, reprocessing, recycling or final disposal at a landfill.

This work procedure is applicable to all BGC staff and contractors

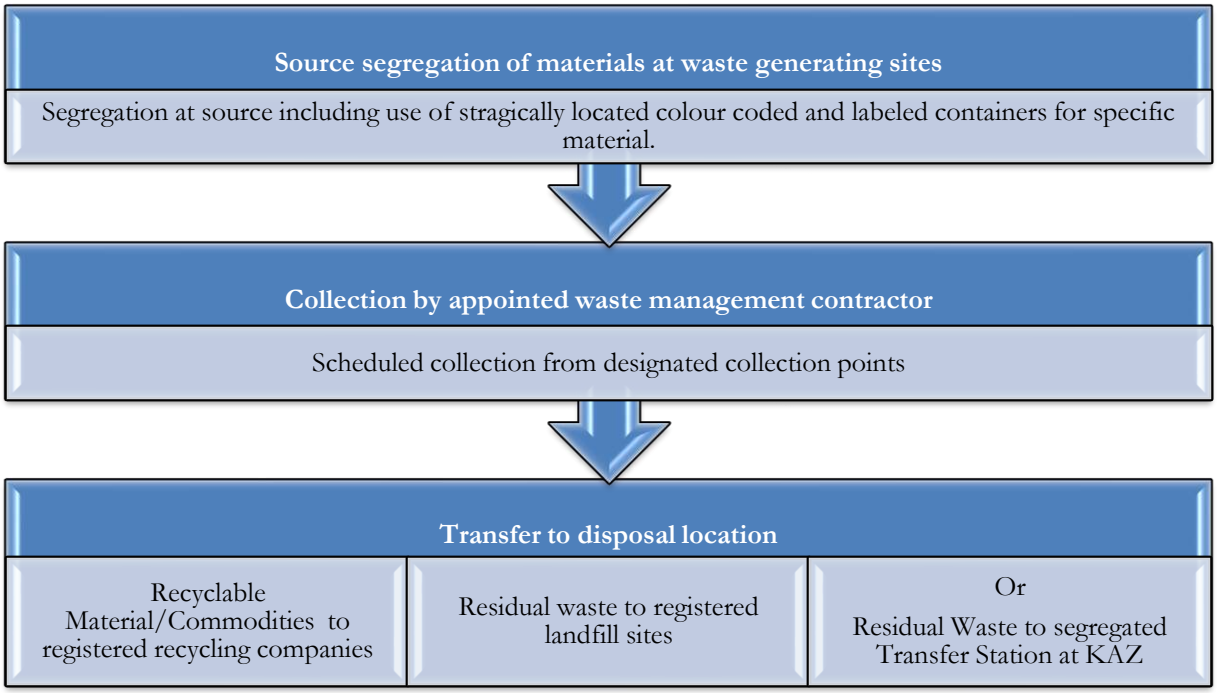
Hazards of not following this WMP include:

- Environmental harm
- Potential ill-health effects to people
- Reputational damage to BGC

Enforcement action by local or state authorities

2 PLAN THE WORK

2.1 Any person responsible for the generation and disposal of waste, including contractors operating on BGC sites, shall ensure that only BGC approved disposal facilities are used for disposal of wastes from our activities.



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 **Waste Generation and Storage**

3.2 Handling

- Personal Protective Equipment (PPE) shall be worn by everyone involved in the handling and transporting of wastes. The minimum mandatory Standard PPE required is covered in WMP #25 PPE
- For hazardous waste handling (various chemicals), additional guidance on PPE is also provided in the relevant MSDS. Refer to WMP #9 Handling Chemicals

3.3 Training

- Personnel that handles waste shall be trained. This will include knowledge of this work procedure and the details with 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 (as described on the MSDS sheet) and will be communicated to personnel through toolbox talks, team briefings and safety meetings

3.4 Segregation

- Waste material shall be segregated at the point of generation. 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

3.5 **Storage**

3.6 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 covered or enclosed, (for hazardous waste)

3.7 All waste storage areas shall be:

- Equipped with spill containment/drip trays (For Hazardous Waste)
- Provided with warning and signage to facilitate proper storage of wastes
- No stacking of waste drums/IBCs higher than two
- Access to site authorized personnel only
- Provided with emergency response equipment/spill kit

3.8 Maintain good housekeeping. Refer to WMP #15 Housekeeping.

3.9 For chemical wastes, see WMP#9 Handling Chemicals

3.10 Damaged waste containers shall be removed from service, repaired and labelling checked before use is resumed.

Transportation of Waste

3.11 Waste Sampling

Laboratory analysis is done on some types of 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_2S, Water content and Benzene
Asbestos	

3.12 The activity owner shall consult with HSE Environment on the required analysis, suitable sampling container and approved laboratory.

3.13 **Waste Disposal Form**

- Generators of waste are required to raise an WCN (at least 3-5 working days in advance) for transport and removal of waste.
- Urgent request may be handled phone call followed up by a confirmation email.
- The WCN system can be used by both BGC employees and contractors.
- 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 together with the WCN before transport

WASTE TYPE	SUPPORTING DOCUMENT
Chemicals/Hazardous waste	MSDS
Hydrocarbon Contaminated Soil	Analysis Result hydrocarbon and water content

3.14 **Waste Management Facilities**

Wastes shall be consigned to only licensed third party facilities, approved by BGC. Licensed facilities are listed below:

FACILITY NAME	WASTE TYPE
Kaz waste yard	Hazardous wastes
Kaz waste yard	Recyclable Waste
Basrah Refinery	Oil contaminated water / hydrocarbon liquid
UQ	Asbestos
Kaz flare area	Demolition waste
Medical waste	Zubair hospital
Domestic waste	Zubair Municipal Landfill
Kaz STP	Sewage

Spills or Loss of Containment

3.15 Mitigate any spills using spill kits and appropriate clean-up methods.

3.16 Ensure incident is reported in Fountain Management System.

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Handling Chemicals

#11 Hazard Recognition

#25 Permit to Work

#31 Personal Protective Equipment

BGC Checklists and CSSS Forms

BGC Waste Management Plan & BGC Go-No-Go Waste Facilities

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

All workers (BGC and contractors) are responsible for following these 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, where required) to check that the requirements are implemented.
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6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	Material & Transport Director	1/3/21	Retained on sign-off form
Reviewer	Waste Manager Ameer Sajad	1/3/21	Retained on sign-off form

8 APPENDIX 1 WASTE CONSIGNMENT NOTE

Waste Generator Site: _____

Contact Name: _____ *Telephone:* _____

Address: _____ *Fax:* _____

Waste Code	Waste Name (See Back)	Waste Source	Physical State (solid/liquid/sludge)	Vol. M^3	Wt. kg	Container Type (drum / skip / bag / bulk) No.	

Generator Certification: I hereby declare the contents of this consignment are accurately described above and in all respects in proper condition for transport.

Generator	Name:	Signature	Date

Transporters

Transporter #1 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 # 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: _____ Management Method : _____

Contact: _____ Author. Ref #: _____

Location/Address: _____ Weigh Ticket # : _____

Telephone / Fax: _____ Actual Weight: _____

Destination Certification: I certify receipt of the materials described above and that such material was properly treated and disposed of on this date

Destination	Name:	Signature	Date

9 APPENDIX 2 LIST OF BGC WASTE CATEGORIES

WASTE CATEGORY	WASTE DESCRIPTION	EXAMPLES
Non-hazardous	Non-hazardous waste is defined as material with no hazardous properties such as being toxic, ignitable, reactive or corrosive characteristics and is of low risk to human health and the environment. It should be noted that some products are considered non-hazardous prior to their intended use (e.g. activated carbon), however they may become hazardous wastes once used and may contain a range of hazardous chemicals or contaminants	➢ Wooden pallets/wood scrap ➢ Insulation ➢ Scrap metals/mixed metals ➢ Plastic ➢ Cardboard ➢ Construction and demolition debris
Inert waste	Inert waste includes that which is biologically and chemically inactive and is non-hazardous.	➢ Concrete and brick materials ➢ Broken clay ➢ Inert elemental sulphur ➢ Spent grid blasting
Domestic waste	Waste generated from domestic and office activities that is not hazardous or recyclable.	➢ Food waste ➢ Packing material ➢ Glass ➢ Plastics
Hazardous waste	Hazardous wastes are those that may be harmful to human health and/or damage the natural environment if not managed and disposed of appropriately. No detailed regulatory guidance defines the criteria for classification of hazardous wastes in Iraq. The Iraqi Ministerial has provisions to prohibit the dumping or burial of hazardous wastes and requires approval for the transportation and treatment of waste. This WMP defines hazardous wastes as those listed in the European Union Waste Framework such as being highly flammable, toxic or corrosive.	➢ Waste oils ➢ Waste grease ➢ Oily water ➢ Oily contaminated soil ➢ Oily contaminated solids (sawdust/rags/sacks/filters, etc.) ➢ Oily sludge ➢ Solvents ➢ Asbestos ➢ Mercury ➢ Batteries ➢ Glycols ➢ Fluorescent tubes

Additional guidance on segregation of the various waste streams are available BGC Waste Management Plan.

WORK MANAGEMENT PROCEDURE
#30 WORK AT HEIGHT

1 OVERVIEW & HAZARDS

This procedure 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 Work at Height Certificate and additional specific controls and equipment.

This document 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.

This work procedure is applicable to all BGC staff and contractors.

Falls from height is one of the biggest causes of workplace fatalities and major injuries in industry.

Work at height (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.

Falls can also be due to unguarded holes in floors such as hatchways, inspection holes and pits

Relevant Life Saving Rules and Process Safety Fundamentals

Work with a valid work permit when required

Protect yourself against a fall when working at height

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

2 PLAN THE WORK

2.1 Follow WMP #11 Hazard Recognition to recognise 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 Application of the hierarchy of controls, in order:

- Eliminate the need to work at height.
- Work from a permanent work platform with guardrails and toe boards.
- 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.
- Use personal fall-protection equipment to prevent access to an edge or potential fall e.g. harness and lanyard (fall restraint).
- Use personal fall protection equipment to minimize the impact from a fall and allow for a rescue in the even a fall occurs, e.g. harness and fall arrest system (fall arrest) Consider the possibility of harness suspension trauma.

JHA should also review the potential of dropped objects during working at height and to assign methods for mitigating the hazards associated with them.

Examples of Mobile Elevated Work Platforms


2.3 Safe working methods should be established in the Permit to Work. See also WMP#24 Permit to Work.

2.4 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 working at height (See Table 1).

Workers must be able to:

- Identify potential fall hazards
- Determine which products to use in specific work environments
- Demonstrate proper anchoring procedures
- Inspect and maintain fall protection equipment
- Demonstrate procedures and the proper wearing of fall protection equipment

Table 1 Work at Height 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 ERD Rescue at Height/confined Space course.

2.5 When conducting, non-routine working at height activities where access/egress conditions are difficult a Rescue Plan shall be prepared with support of the BGC Emergency Response Team.

Equipment: Inspection, Testing and Records

2.6
- Fall arrest equipment **held by BGC** 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) 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

Types of Fall Protection	
 Full body harness	Sit harness with full body harness 
Double Lanyard with shock absorber 	

Fixed length lanyard for fall system system

adjustable length lanyard for fall restraint

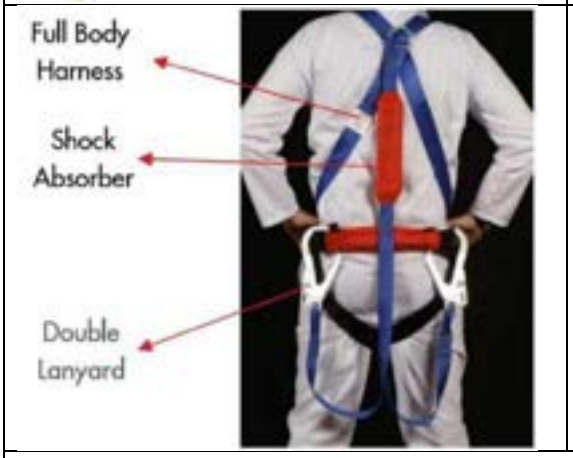
Retractable fall arrester (Self-retracting lifeline, inertia reel device, personal fall limiter or fall arrest block)

Connectors

Carabiner (autolock)

Carabiner (screwgate)

snaphook Autolock)



An**chor devices**

Improvised Anchor

Engineered Anchor (Horizontal Lifeline)

Engineered Anchor (Vertical Lifeline)

Engineered Anchor (Eyebolt)

Engineered Anchor (Anchor Beam)

2.7 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.

Scaffolding

2.8 BGC and Contractor companies shall ensure that their scaffolders have received the appropriate training. according industry standard CISRS by a BGC approved training provider.

2.9 Scaffolders shall comply with CISRS and SG4 standards and shall carry a valid scaffold certificate at all times when working at BGC sites.
A work at height rescue plan shall be prepared in advance and be attached to the PTW
Scaffolding design shall be as per BSEN12811.1

Table 2 Load Classification for Scaffold Design

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 Ligt 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.					

Communicate

2.10 The Scaffold Supervisor shall visit the site to determine best access solution and conduct a JHA to allow him to obtain any necessary permits to work.

2.11 Before starting to erect a scaffolding, assess the risks associated with natural elements, (e.g. rain, sun, wind, etc.). Assess the weather forecast and ensure the scaffolding is secured to withstand the forces.

2.12 A register of all scaffolds erected at a work site shall be maintained and a register shall be updated once a scaffold is dismantled or no longer in use. The register shall be available at the work site.

2.13 The Scaffolding Coordinator shall daily update the appropriate scaffolding register (SharePoint for Asset) according erected or dismantled status by inputting the dates for the purpose of planning / scheduling /auditing and historical records.

Check Equipment

2.14 All stored scaffolding materials on site shall be barricaded.

2.15 All Scaffolding Materials shall be stored in Stillages where possible/available for housekeeping and transporting materials.

2.16 Scaffolding material shall be checked by Scaffolding Supervisor. Only compliant material shall be sent to site. Material not suitable for use will be kept in a marked quarantine area.

2.17 The 'Gotcha' rescue kit or equivalent shall be present of the work site during erecting and dismantling the scaffold.

Prepare Area

2.18 The scaffold supervisor shall conduct job site risk assessments, and determine the site and material requirements and ensure a "tool box talk (TBT) shall be carried out".
A barrier will be in place blocking access to the drop zone during activities on the scaffold including its construction and removal.
In consultation with Operations ensure that all operated equipment is identified and suitably isolated, protected or access provided e.g. electrical cables, F&G detection system values and gauges.
Emergency access and egress walkways should not be blocked, or other temporary alternatives agreed.

3 DO THE WORK

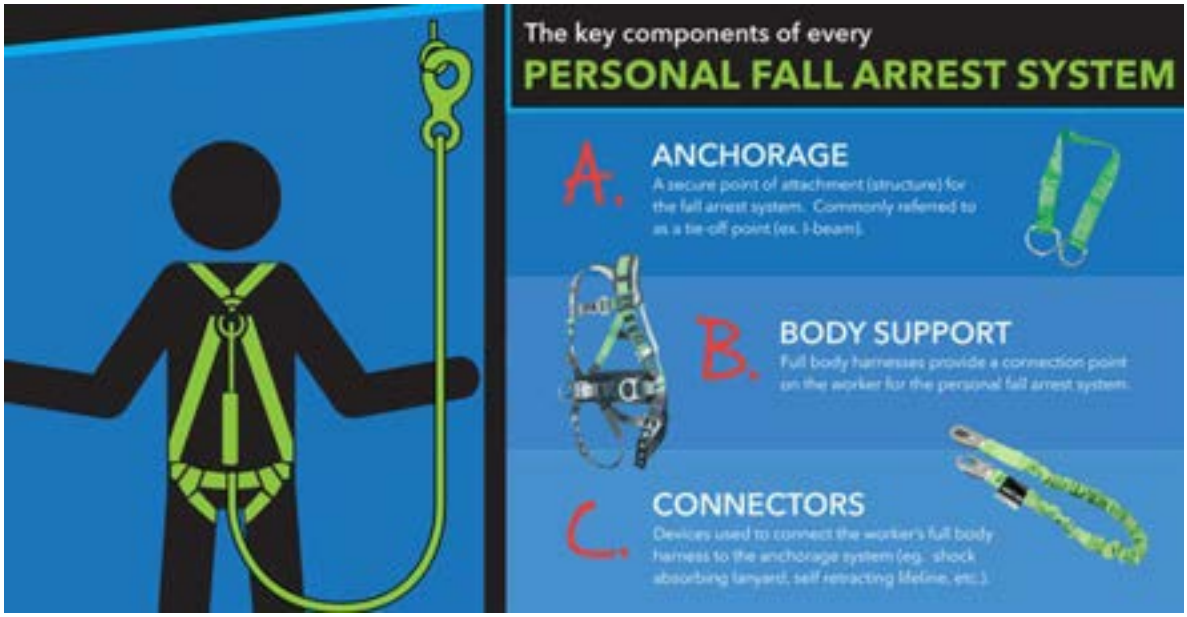
General

3.1 Personnel working at height must always be protected from falling. This can be done by various standard methods e.g. guardrails, personal fall arrest system or safety netting. This equipment does not stop people falling but minimizes the potential injuries.
Due to risk of dropped objects, working above each other must be avoided as far as possible. A fall net/debris net to avoid drops, must only be installed (maintained and removed) by a competent person and tested before use.

3.2 Safe access and egress should be ensured.
Falling from height does not only happen from the working location, it can also occur while accessing or exiting the working location. Hence, access and egress must be safe as much as reasonably practicable.

3.3 Adequate working platform should be used: Depending on the job, chose the most suitable working platform. For example, it is wrong to use a step-ladder while erecting a roofing component at height where you will need both hands and/or spanner for tightening; instead use a scaffold or a MEWP (Mobile Elevated Working Platform). Therefore, the planning the job (including the location and type of work) will guide us the most suitable working platform for the job.

3.4 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



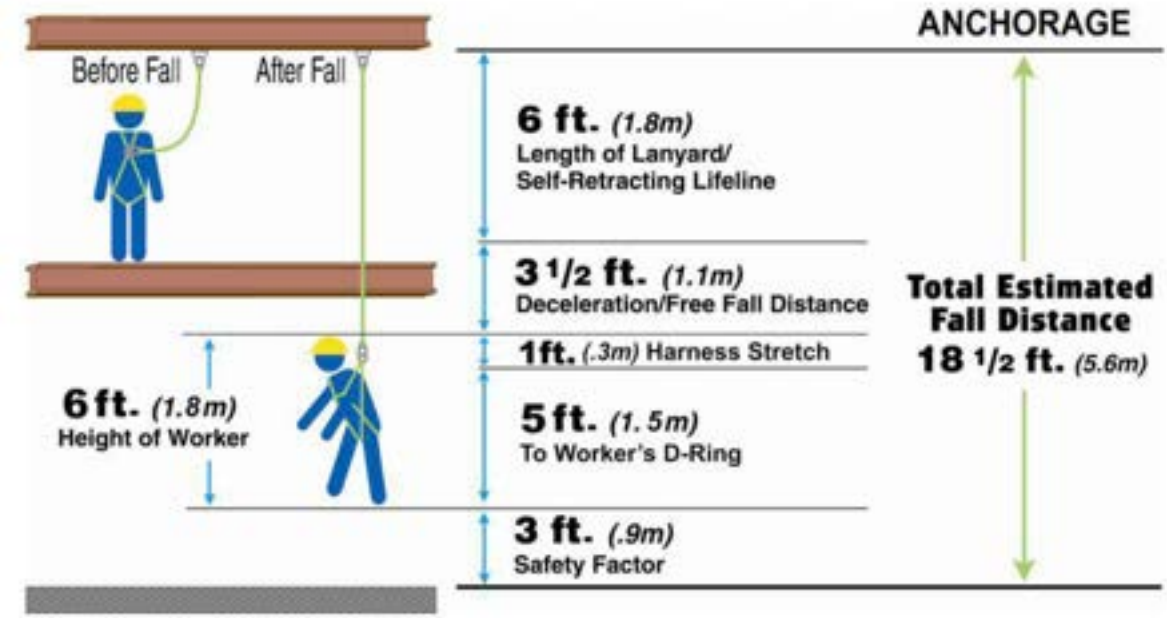
3.5 Before use, worker must l visually inspect fall protection equipment. Any deficiency found means works must be paused and supervisor informed. See checklist in Appendix 1.

3.6 Fall protection equipment must be used only for worker protection and must not be used for the movement of materials.

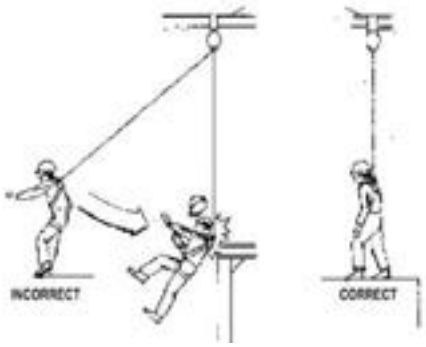
3.7 Ensure a fall protection rescue plan is in place and practiced prior to working at height.

3.8 **Free Fall Distance & Swing Falls:** Personal fall arrest systems must be selected and rigged to ensure that potential free fall distances will never exceed 1.8 m.
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 (3) below the fallen worker's feet.



3.9 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.



3.10 **Personal Fall Arrest**

100% tie off is required when moving between levels and when working within 1.8 meters (6 feet) from a roof edge or work platform without a guardrail and tie off on Pitched roof regardless of proximity.
100% tie-off shall require the use of two lanyards or a double lanyard.

3.11 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.

3.12 Anchor points shall not be used to anchor multiple lifelines.

3.13 When using a personal fall arrest system, it shall be rigged so that a worker can neither freefall more than 2.0m nor contact any lower level.

Working alone while using a personal fall arrest system shall not be permitted.

3.14 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.

3.15 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.

3.16 Lanyards, vertical lifelines, and body harnesses shall meet standards as per WMP #25 PPE.
Except for working from MEWP, only shock absorbing lanyards shall be used. For work from MEWP, restraining harnesses shall be used.

3.17 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.

3.18 Ropes and straps used in lanyards, lifelines, and strength components of body harnesses shall be made from synthetic fibers or wire rope.

3.19 Tie-off practices shall follow equipment design and manufacturer recommendations.

3.20 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.

3.21 When it is impractical to use a lanyard, a rope grab system can be used on a vertical lifeline.

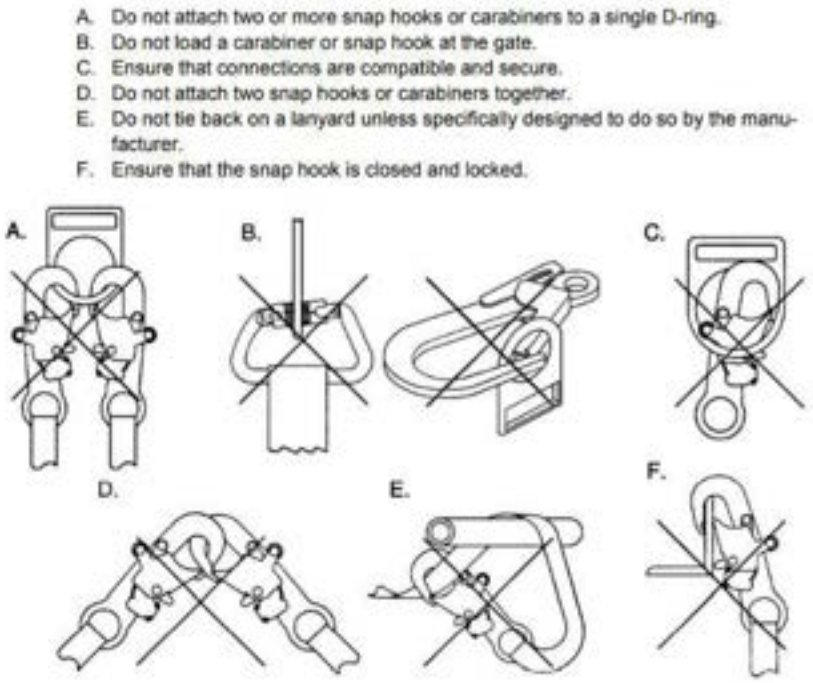
3.22 When vertical lifelines are used, each worker shall be attached to a separate lifeline.

3.23 Horizontal lifelines shall be designed, installed, and used, under the supervision of the Area Engineer as part of a complete fall arrest system.

3.24 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.

3.25 Non-locking type snap-hooks are prohibited. Snap hooks must be connected to suitable hardware and never connected to another snap hook. Connectors shall have a corrosion resistant finish and all surfaces and edges should be smooth.
Figure 1, below, shows examples of **INCORRECT** connections.

Figure 1: Incorrect Connections



Scaffolding Installation

3.26 Scaffold material can only be used for fall arrest by scaffolders in the construction of the scaffolding.

3.27 Tools and portable equipment used at height above 3m shall be tethered to either the user or the workplace.

3.28 Tools used at height shall have a lanyard attachment point that does not compromise the tool's effectiveness.

3.29 All scaffolding shall be erected with toe-boards to prevent dropped objects and swing gates / lift bars providing easy access to prevent falls.

3.30 Apply SG4 construction techniques during construction and dismantling of scaffolding.

3.31 People who gain access to and work at height shall follow all Working at height requirements in Work Management Procedure XX. They are Responsible for tie-off 100% of the time when moving to and from the work at height.

3.32 The maximum height of an unbroken ladder to access the scaffold is 4 meters and above 4 meters the ladders shall always be located inside the scaffold structure.
All exposed scaffold clamps with the potential to hurt or injurer personnel shall be protected e.g. by 'scaffpad' or equivalent protection and scaffold poles shall have end caps fitted.

3.33 All scaffolding materials shall be removed from site upon completion of work scope.

3.34 CSSS Checksheet (Appendix 1) and 5 Ways to Stay Alive (Appendix 2) can be used to communicate minimum requirements at the TBT, site engagements and assurance.

3.35 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.

3.36 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.

Working on Scaffolding

3.37
- 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

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

Working Over Water

3.38
- 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 throw-able flotation devices at 50 foot (16m) intervals in areas work is near water
- Install proper barricades/signage to prevent workers from falling into the water where needed, as determine by risk assessment and TRIC

3.39
- **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 six feet (2m), within six feet (2m) of handrails near water without proper fall protection and a personal flotation device

4 REFERENCES AND RESOURCES

Relevant WMP

#11 Hazard Recognition
#24 Permit to Work
#25 Personal Protective Equipment
#26 Safety Signs and Barricades

BGC Checklists and CSSS Forms

Inspection of Fall Arrest Systems – See Appendix 1
CSSS Checksheet – See Appendix 2
CSSS #9: Scaffolding – See Appendix 4

BGC ToolBox Talks, Communication Materials, Posters and Information

'5 Ways to Stay Alive' – Work at Height. See Appendix 3

5 IMPLEMENTATION: ROLES & RESPONSIBILITIES

5.1 All workers (BGC and contractors) are responsible for following these requirements. If anyone sees these requirements not being followed, they must safely intervene.

5.2 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, where required) to check that the requirements are implemented.

5.3 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.

6 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.

7 APPROVAL SIGNATURES

Role	Name	Publish Date	Signature
Owner	Asset Services Director	1/3/21	Retained on sign-off form
Reviewer	BGC Scaffolding Supervisor Lee Standring	1/3/21	Retained on sign-off form

8 APPENDIX 1 INSPECTION OF PERSONAL FALL ARREST SYSTEM CHECKLIST

Component	Condition or fault to be checked
Webbing	1. Cuts or tears; 2. Abrasion damage especially where there is contact with hardware; 3. Damage due to contact with heat, corrosives, or solvents; 4. Deterioration due to rotting, mildew, or ultraviolet exposure.
Snap hooks	1. Distortion of hook or latch; 2. Cracks or forging folds; 3. Wear and tear at swivels and latch pivot pin; 4. Open rollers; 5. Free movement of the latch over its full travel; 6. Broken, weak or misplaced latch springs (Compare if possible with a new snap); 7. Free from dirt ingress or other obstruction e.g. rust.
D-rings	1. 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.* 2. Cracks, especially at the intersection of the straight and curved portions; 3. Distortion or other physical damage of the D-ring; 4. Excessive loss of cross-section due to wear.
Buckles & adjusters	1. Distortion or other physical damage; 2. Cracks and forging laps where applicable; 3. Bent tongues; 4. Open rollers.
Sewing	1. Broken, cut or worn threads; 2. Damage or weakening of threads due to contact with heat, corrosives, solvents or mildew exposure.

APPENDIX 2 CSSS CHECKSHEET - WORK AT HEIGHT

NOTE: Although CSSS materials are used by BGC Projects Department, they can also be utilized by other departments as appropriate.

Location		Sub Location		
Ser	**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 WAYS TO STAY ALIVE – WORK AT HEIGHT

Ensure a fall protection rescue plan is in place and has been practiced prior to working at height

Fall arresting systems must consist of a full body harness and dual personal self-retracting lanyard or dual shock absorbing lanyard.

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 that can hold 2268kg (5000lbs).

Identify and manage potential hazards for dropped objects using tool lanyards and a tool pouch.

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.

Protect yourself against a fall when working at height.

APPENDIX 4 CSSS CHECKSHEET 9 - SCAFFOLDING

NOTE: Although 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 CHECKSHEET 14 - DROPS

NOTE: Although 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.			

WMP FEEDBACK FORM

Users of the BGC Work Management Procedures - Revision 1 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. Either hand in hard copies of the form via your Line Manager / Supervisor to either email via the BGC Hub or the HSE Management Team.

NOTE: ensure your Line Managers reviews and support the feedback for improvement.

Name:	**Company:**	**Date**
Signature:	**Line Manager Name:**	**Line Manager Signature:**
Title of Work Management Procedure:		
Improvement Suggestions or Identified Requirements Which Cannot Be Met:		