Gladstone Ports Corporation
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Abrasive Blasting Procedure

Brief description

The purpose of this Procedure is to define the system for managing safety and environmental risks associated with abrasive blasting.

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Owner	Executive General Manager Safety & Environmental Social & Governance
Custodian	Safety Manager

Endorsed by	Executive General Manager Safety & Environmental Social & Governance on 14/09/2023

If you require any further information, please contact the Custodian.

The current version of this Procedure is available on GPC's Intranet.

Contents

1 Terms and definitions

In this Procedure:

"**Abrasive Blasting**" or "**Blasting**" means using a stream of abrasive material propelled at high speed to clean, abrade, etch or change the original appearance or condition of the surface. Abrasive Blasting includes high pressure air, liquid and steam Blasting incorporating abrasive material.

"Abrasive Media" means the product that is forcibly used to remove surface contaminants (for example sand or garnet). The product is usually propelled against a surface using pressurised fluid usually air but can also be water.

"Air Monitoring" means visual or instrument particulate monitoring during abrasive blasting activity.

"Blaster" means the person holding the live blast nozzle whilst conducting the blasting operations.

"Competent Person" means a person who has acquired through training, qualification or experience the knowledge and skills to carry out the task.

"CTO" means Competency to Operate.

"DES" means Department of Environment and Science.

"Exposure Standard" means an Exposure Standard published by Safe Work Australia in the Workplace Exposure Standards for Airborne Contaminants.

"Pot attendant" means a person charged with the responsibility of looking after the Blasting equipment whilst the Blaster is conducting works.

"OEM" means original equipment manufacturer.

"SEG" means Similar Exposure Group. A SEG is a group/s of Workers having the same general exposure profile because of the similarity and frequency of the tasks they perform, the materials and processes with which they work, and the similarity of the way they perform the tasks.

Terms that are capitalised and not otherwise defined in this Procedure are defined in the GPC Corporate Glossary Instruction (as listed in Appendix 1 – Related documents).

2 Introduction

2.1 Purpose

The purpose of this Procedure is to describe the GPC system for minimising and managing safety and environmental risks associated with Abrasive Blasting and address environmental compliance requirements.

2.2 Scope

This Procedure applies to all Abrasive Blasting activities conducted by GPC Workers (includes Employees and Contractors) on GPC owned and operated land.

2.3 Objectives

The objective of this Procedure is to ensure Abrasive Blasting activities are conducted safely and within the relevant environmental approval and legal obligations at GPC sites.

3 Abrasive Blasting Procedure

3.1 Plant and Equipment Requirements

Air Compressors

Air compressors shall be in good condition and regularly serviced as per the manufacturer's requirements. A safety relief valve shall be fitted on the compressor or air supply system and regularly checked. Valves on air compressors shall be of a rating equivalent to the pressure vessel and be correctly attached.

Air quality tests are required for all compressors and plant air supplying air fed respirator equipment as per Appendix 'A' of AS/NZS 1715.

Breathing Bottles

All breathing bottles shall be in good condition with the breathing bottle filter being changed as per manufacturer's recommendations. The date of filter installation should be visible on the outside of the breathing bottle for operator's pre-operational checks where ensuring aspects of breathing air quality.

Pressure Vessels

Pressure vessels shall comply with AS/NZS 1200 Pressure Equipment. All pressure vessels utilised in Abrasive Blasting activities must be included in daily inspections and be documented in routine inspections by a Competent Person as per the vessels requirements. A safety release valve shall be fitted and checked regularly.

Blast Hoses

All hose joints shall be fitted with whip checks or hose coupling pins or both to control any potential uncontrolled release of energy. The blast hose shall be covered in antistatic lining or fitted with an earth wire to prevent electric shock. Hoses must not be coiled during blasting and should be stored away from water, oil and chemicals to prevent damage. Hoses, whip checks and couplings are inspected, tested and maintained in accordance with the manufacturer's instructions.

The blast hose nozzle shall be fitted with a hold to activate device (dead man) under the direct control of the operator. For distances greater than 40 meters, the dead man shall be electric to reduce response times. The dead man shall be checked several times per shift. Blasting cabinets shall be fitted with a dead man.

All blast hoses must be rated within the supplied air pressure and not be exceeded during Abrasive Blasting activities. All damaged hoses used for blasting or compressed air activities must be replaced once cracking, pin holing is observed or general condition is deemed unsafe for use.

Blast Pots

A muffler should be attached to blast pots to minimise the noise from escaping air when the machine is depressurising.

Portable blast pots should be ergonomically designed to be easily manoeuvred by hand or be engineered to be compatible for mechanical aid.

Inspection / Maintenance

Planned inspection and routine maintenance should be carried out by a Competent Person as per the OEM requirements.

3.2 Abrasive Blasting

Risk assessment

Hazards associated with Abrasive Blasting activities (e.g. dust, noise, line of fire hazards) shall be assessed in a JSA or Contractors equivalent to determine what controls are required to protect the health and safety of Workers and impact to the environment in accordance with the Safety Risk Management Procedure.

Hygiene and safety controls may include higher levels of PPE or restricting the adjacent areas to other Workers.

Blast Media

Only blast media approved for use on site shall be used in accordance with the GPC Engineering Site Standard for Protective Coatings. Alternative blast media shall be approved via the approval process outlined in the Hazardous Chemicals Management Procedure.

Pre-start Checks

Plant and equipment should be checked at least daily during use by operators for wear and damage and recorded. The OEM generally have pre-start checks for their equipment available. An example of a Blasting Component Pre-start Checklist is available. Workers are able to use this pre-start checklist or other checklist they deem fit for purpose. Any damage identified that could impact on the safety or environment must be rectified.

Work area set up

When setting up work areas to undertake Abrasive Blasting, appropriate exclusion zones and signage must be erected warning that Abrasive Blasting is in progress. Other workgroups in the immediate and surrounding area should be notified of all identified hazards/intended control measures and supplied all appropriate PPE.

Refer to the GPC Barricades Procedure for barricading and signage requirements.

Blasting Cabinets

Blast cabinets should be used where ever possible. These cabinets are fully sealed and the operator manipulates the work piece and blasting hose from outside, eliminating the need for respiratory protection.

Field Based Abrasive Blasting, including temporary or permanent blast yard

Where Abrasive Blasting occurs in-situ, controls shall be implemented to manage potential impacts. Shrouds, screens, vacuum blasting and encapsulation may be considered to manage line of fire, spent abrasive media, waste and air emissions. All Abrasive Blasting activities must attempt to achieve 100% encapsulation, Abrasive Blasting activities that cannot achieve 100% encapsulation must be identified in the planning phase so it can be managed and agreed upon with the Executive General Manager Asset Management and Environment Superintendent prior to commencing works. The following documentation must be addressed to assist with the process:

- Documented initial approval of Abrasive Blasting;
- Explanation as to why full encapsulation is not achievable;

- Additional environmental risk associated with not being able to fully encapsulate;
- Additional controls in place to mitigate release to the environment; and
- Additional methods of containing all spent abrasive material.

Encapsulation/shrouding should be made of puncture and tear resistant materials such as woven polypropylene fabric or rubber for high abrasion areas inside the enclosure. Selection should also consider fire retardancy, burst strength and UV resistance. Bunds can be placed across drains to protect onsite ponds and waterways from spent blast media, coating etc.

Initial and continuous visual monitoring is to occur at the start of and every hour during blasting activities. Abrasive Blasting shall cease when emissions are observed leaving or detected outside the work area.

All Abrasive Blasting, other than tasks involving blasting cabinets, will require two operators. One operator will act as a Pot Attendant/safety observer. Both operators will hold a current CTO for the equipment being used.

Where excessive amounts of Abrasive Blasting operations are required due to the excessive thickness of the existing coatings, alternative methods of paint removal are encouraged to reduce both exposure to Abrasive Blasting hazards and spent abrasive.

Abrasive Blasting Over Water

DES's guideline for over-water Abrasive Blasting shall be complied with for all over-water Abrasive Blasting. The Environment Team shall be consulted to ensure the relevant guidelines, approvals and controls are complied with. All over-water Abrasive Blasting needs to be referenced to in the Contractor's Environmental Management Plan (EMP). The EMP is to be forwarded to the Environment Team for review and approval prior to works commencing.

Complete encapsulation of the Abrasive Blasting work area shall be achieved where possible (note this is generally not practicable for hydro blasting).

3.3 Personal Protective Equipment

Requirements outlined in the Personal Protective Equipment Procedure must be met.

Respiratory Protection

Operators of Abrasive Blasting equipment, other than blasting cabinets, shall be supplied with and wear an airline positive pressure hood/helmet complying with AS1716 Respiratory Protective Devices and fitted with an inner bib and a shoulder cape, jacket or protective suit.

Safety helmet and safety glasses to be kept close by and worn when air fed helmet is removed.

An air purifying respirator complying with AS1716 must be worn by the Pot Attendant or any other person within the work area where there is visible dust or during the clean-up of dust. All respiratory protective equipment (RPE) requiring a face seal require a face fit test and the operator to be clean shaven while wearing the RPE in accordance with GPC's Personal Protective Equipment Procedure.

Air-fed respirators must have an alarm to warn and log the incidence of carbon monoxide gas.

Hearing Protection

The main sources of noise for the operator are from the blast nozzle or air feed inside the protective helmet. Appropriate levels of hearing protection must be worn.

Other sources of noise are from air compressors, ventilation systems and air releases during pot blow down. Appropriate hearing protection must be readily available and used by Workers in surrounding areas, where deemed necessary by risk assessment.

Protective clothing

To keep out dust and abrasive grit, protective suits or clothing shall be worn and should have leather or elastic straps at the wrist and ankles and overlapping flaps at suit closures.

Abrasive Blasting gloves must be made from abrasive resistant material such as leather, canvas or kevlar to minimise penetration of particulate matter. The Abrasive Blasting glove must be a suitable length for the operator to protect the lower arm whist Abrasive Blasting.

Protective footwear should be made of material which minimises penetration from particulate matter, and where necessary, should be waterproof.

Where disposable coveralls or other disposable items of personal protective equipment are worn, the items should be appropriately disposed of after use, without risk to the health and safety of others and/or to the environment.

3.4 Hygiene Monitoring

Air Monitoring

Air Monitoring can be used:

- when there is uncertainty about the level of exposure;
- to indicate whether the Exposure Standards are being exceeded or approached; and/or
- to test the effectiveness of the control measures.

Air Monitoring can be undertaken by a Competent Person upon request of any particular work group or upon review of any particular risk assessment.

Where Air Monitoring is conducted, results will be communicated to relevant personnel as per the Hygiene Exposure Risk Management Specification.

The SEG for the GPC employees that conduct abrasive blasting activities will be reviewed as per the Hygiene Exposure Risk Management Specification to determine the risk of exposure and the ongoing air monitoring requirements.

Health Monitoring

Health monitoring allows decisions to be made about implementing ways to eliminate or minimise the Worker's risk of exposure, for example re-assigning a worker to other duties which involve less exposure or improving control measures. Substances commonly encountered during Abrasive Blasting (either in the blasting medium or the surface being blasted) that may require health monitoring to be carried out include:

- Asbestos;
- Crystalline silica;
- Cadmium;
- Inorganic arsenic;
- Inorganic chromium; and

- Inorganic lead.

Refer to the Fit for Work Standard, Injury/Illness Management Standard and Hygiene Exposure Risk Management Specification for further details on health monitoring.

Noise Monitoring

Monitoring of noise emissions may be required for specific Abrasive Blasting activities. This shall be determined during the planning of Abrasive Blasting work with advice from Safety and Environment teams as required.

The SEG for the GPC employees that conduct abrasive blasting activities will be reviewed as per the Hygiene Exposure Risk Management Specification to determine the risk of exposure and the ongoing noise requirements.

3.5 Waste Management and Housekeeping

The collection of spent media or housekeeping should be done as soon as practical after the task is finished using a method that ensures the minimum amount of dust generation or at least once a week to ensure significant amounts of spent blast media do not build up on site. A covered skip shall be placed at the job site to ensure spent blast media can be safely stockpiled after collection. Use of compressed air shall be avoided.

Throughout waste management and housekeeping processes, respiratory protection equipment must be worn.

The cleaning shall be done so all oversized foreign objects and toxic dust are removed from the media.

Spent abrasive and blasting debris is classified as regulated waste and shall be contained and removed from the work site, sampled and disposed of in accordance with statutory regulations. Copies of disposal receipts shall be made available to the GPC's Representative along with the monthly claim back-up information.

3.6 Contractor Management

Contractors are required to develop and provide Safety Management Plans and relevant risk assessments for GPC Representative to review. GPC Safety Team can assist with the review as required.

Contractor Environmental Management Plans shall document controls to manage potential impacts and be approved by the Environment Superintendent or delegated Environment Specialist.

3.7 Training and Competency

Operators (Employees and Contractors) of all blasting equipment shall hold a current Cert III in surface preparation (or equivalent) or be in training to obtain as well as CTOs for the equipment being used.

Contractors shall produce records of CTO's to their GPC Representative upon request. GPC Training Team can assist with the review of contractor CTO's as required.

3.8 Incidents and Community Complaints

All incidents related to Abrasive Blasting activities are to be reported and managed in accordance with the Incident Management and Investigation Procedure.

All potential offsite releases shall be reported to the Environment Team.

All community complaints received in relation to Abrasive Blasting shall be recorded and investigated.

4 Roles and responsibilities

To assist GPC Representatives to better understand their responsibilities, key responsibilities and accountabilities are summarised below:

Role	Responsibilities
Executive Leadership Team	• Ensure that GPC has adequate resources and systems in place for the supply of suitable blasting equipment and training in the appropriate use of such equipment. • Provide adequate resources to ensure the effective monitoring and management of the requirements of this Procedure. • Ensure compliance with this Procedure throughout GPC.
Managers	• Ensure that established systems are promoted, understood and complied with. • Ensure inspections are being undertaken to ensure blasting equipment is being used effectively and this Procedure is being met. • Manage non-conformances with this Procedure.
Superintendents, Specialists or Project Managers	• Ensure that training is provided for the safe use of blasting equipment. • Ensure that appropriate investigations are conducted into non-conformances with this Procedure. • Conduct inspections to ensure blasting equipment is being used effectively and this Procedure is being met. • Manage non-conformances with this Procedure.
Environment Superintendent	• Provide approval, where required, for contractors to operate under the GPC Environmental Authority for the purposes of Abrasive Blasting. • Approve contractor EMP if Abrasive Blasting is over water work.
Environment Team/Specialist	• Provide advice on environmental controls required to manage impacts. • Provide advice on disposal methods and location of waste blast media.

	• Conduct audits on Abrasive Blasting work in accordance with this procedure.
Supervisors, Contract Supervisor or GPC Representative	• Conduct inspections to ensure blasting equipment is being used effectively and this Procedure is being met. • Ensure that blasting and protective equipment is readily accessible to all Workers. • Ensure Workers are conducting risk assessments to determine adequate controls required for tasks. • Ensure Workers are instructed in the correct use of blasting equipment and are competent to operate blasting equipment. • Manage non-conformances with this Procedure.
GPC Safety Department	• Provide relevant advice in managing the risk of blasting equipment. • Provide support in the review of contractor safety management plans and risk assessments. • Monitor compliance with this Procedure. • Support team leaders in the interpretation of legislation and the application of this Procedure.
Workers (Employees and Contractors)	• Attain and maintain training and competency in the correct use of blasting equipment to be used. • Report any defective or damaged blasting equipment supplied by GPC to their Supervisor / Superintendent / GPC Representative. • Not wilfully or recklessly damage, interfere or misuse blasting equipment. • Comply with this Procedure.

5 Appendices

5.1 Appendix 1 – Related documents

(a) Legislation and regulation

Key relevant legislation and regulation, as amended from time to time, includes but is not limited to:

Type	Legislation/regulation
State Acts	*Work Health and Safety Act 2011* *Work Health and Safety Regulation 2011* *Environmental Protection Act 1994* *Environmental Protection Regulation 2019*
Other	Abrasive Blasting Code of Practice Managing Risks of Plant in the Workplace Code of Practice Guideline – Environmental Protection Act 1994 Over water abrasive blasting in marine and other aquatic environments AS/NZS 1715 Selection, use and maintenance of respiratory protective equipment AS/NZS 1716 Respiratory Protective Devices AS/NZS 1200 Pressure equipment AS/NZS 3788 Pressure equipment—In-service inspection

(b) Gladstone Ports Corporation documents

The following documents relate to this Procedure:

Type	Document number and title
Tier 1: Policy	#365624 Safety Policy
Tier 2: Standard/Strategy	#854303 Safety Management Framework Standard #995910 Contractor and Port User Safety Environment and Security Standard #1386034 Engineering Site Standard – Protective Coatings

Type	Document number and title
Tier 3: Specification/ Procedure/Plan	#123526 Barricades Procedure #1285540 Safety Risk Management Procedure #1086240 Hazardous Chemicals Management Procedure #1075526 Incident Management and Investigation Procedure #1169443 Personal Protective Equipment (PPE) Procedure #1357835 Hygiene Exposure Risk Management Specification #123483 Work at Heights Procedure
Tier 4: Instruction/Form/ Template/Checklist	#1621179 GPC Corporate Glossary Instruction
Other	#1543476 Example of a Blasting Component Pre-start Checklist Form

5.2 Appendix 2 – Revision history

Revision date	Revision description	Author	Endorsed by	Approved by
14/09/2023	Initial document creation	Timothy Fysh, Safety Specialist	Tony Young, Safety Manager	Richard Haward, EGM Safety & ESG