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Gulf Coast States Abrasive Blasting Committee's

**Recommended Management Practices for
Abrasive Blasting**

August 2000

PREAMBLE

Many abrasive blasting activities in the gulf coast states operate in or near sensitive environmental areas. The nature of the operation is such that the threat of environmental degradation is high and at the same time difficult to address. The practices set forth herein are intended to serve as a tool for abrasive blasters to enhance environmental protection during and following blasting operations. They are not intended to be mandatory, nor does their implementation ensure compliance with local, state or federal environmental laws, rules and regulations. These practices should not be viewed as inclusive of all practices that can or should be applied, and not all practices identified will be appropriate for all yards or all operations.

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DEFINITIONS

Abrasives (Abrasive Media, Abrasive Material) - Any material used in abrasive blasting operation to remove paint or rust scale including, but not limited to, sand, slag, steel shot/grit, garnet, CO₂, water, or walnut shells.

Abrasive Blasting - The operation of cleaning or preparing a surface by forcibly propelling a stream of abrasive material against a surface.

Air - The air outside the outer fence line or other point of compliance in a facility performing abrasive blasting or painting.

Containment System (Containment, Enclosures) - Materials, such as cover panels, screens, tarps, scaffolds, supports, and shrouds designed to enclose an entire work area or a paint removal tool. The walls of a dry dock and the hull of a ship may provide adequate containment; however, the purpose is to prevent or minimize the debris generated during the surface preparation from entering the environment, and to facilitate the controlled collection of the spent materials for recycling or disposal. Containment systems may also employ the use of ground covers or water booms.

Discharge or Emission - The release or transfer of pollutants or contaminants to the environment.

Emission Control Equipment - Any accessory including, but not limited to, filters, ventilation systems, or shrouds which prevent or minimize emissions.

Employees - Management, supervisors or workers hired by a facility and engaged in activity subject to these Recommended Management Practices.

Facility - Any plant, enclosure, site, or operation where abrasive blasting activities are performed.

Floatable Solids - Floatable or other low density trash or waste.

Manage - To perform or control abrasive blasting in a manner that prevents or minimizes emissions.

Practices - Activities that prevent or minimize discharges or emissions to the environment. A practice may be used alone or in combination with other practices to accomplish the desired result.

Pressure Washing - Pressure water cleaning to remove marine growth, scale or dirt using pressures not to exceed 5000 psi.

Prevent or Minimize - To eliminate or reduce emissions to the maximum extent technically and economically practicable.

Sensitive Receptors - Dwellings, child care facilities, schools, playgrounds, churches, protected natural areas, water bodies, public use, commercial, industrial or agricultural properties.

Shipyard - A facility, as described by SIC 3731 and/or SIC 3732, that is engaged in shipbuilding or repair or boat building or repair.

Spent Materials - Residual materials from abrasive blasting.

Water Bodies - Waters of the state.

Water Jetting - Surface cleaning and coating removal using pressurized water.

Wet Abrasive Blasting - Compressed air blasting systems that incorporate water into the blast stream.

I. GENERAL PRACTICES

These practices apply to all shipbuilding, fabrication, and repair facilities conducting paint removal and surface preparation activities by abrasive blasting.

1. All reasonable precautions shall be taken to prevent particulate matter from contaminating the environment.
2. At all times adequate containment, procedures or methods should be employed during abrasive blasting activities to prevent particulate matter from becoming airborne.
3. An Abrasive Blasting Pollution Prevention Plan should be prepared to establish source reduction and waste minimization goals, materials management, and employee training. This plan can be part of other existing plans.
4. No dry abrasive blasting should be conducted outside of a containment system. If the size and shape of the structure makes it impractical for conventional containment, then other methods of emission control should be used. Methods such as optimizing abrasive selection, using dust suppressants, or blasting when the wind direction minimizes impact on sensitive receptors.
5. Materials derived from hazardous, toxic, medical, and/or municipal waste should never be used as abrasive material.
6. New abrasive material should contain less than one percent (by weight) of fines, which would pass through a No. 80 sieve. Samples to determine percent fines should be taken according to ASTM standard ASTM D 75-87, reapproved 1992.
7. In situations where negative air is recommended, the negative air should be sufficient to prevent the loss of abrasive and spent material outside of the containment system.
8. Abrasive blasting should not be conducted when wind speeds render containment systems ineffective.
9. If the coating or surface being blasted contains toxic metals or the resulting spent material might be hazardous, ground cover is recommended. One hundred (100) percent impermeable tarpaulins should be used to prevent deposition on the soil and on vegetation. The side of the tarpaulins should overlap by at least 1-1/2 feet and weighted to prevent separation except on woody vegetation. The tarpaulins should cover the surface of all bare soil and vegetated areas inside the containment system and should extend a minimum of 30 feet, where possible, in all directions beyond the vertical extension of the containment system. Hard paved surfaces such as asphalt and concrete roadway, sidewalk, and slope paving may be left uncovered if they have an unbroken surface and if the owner or contractor is able to thoroughly clean these surfaces

10. Ground cover is not necessary for non-toxic coatings or surfaces being blasted if the spent material is not in danger of entering state waters or becoming airborne.
11. Clean up of spent material. When spent material has the potential to be blown or washed offsite it should be cleaned up at the end of each workday from all areas of the ground and the ground covers outside the containment system. In addition, clean up of spent abrasives shall be required when spent abrasive materials are hazardous, create a nuisance, or pose a threat to the environment. The spent material should be removed from the site or stored in containers or on top of ground cover and covered with impermeable tarpaulins. The spent material should be recovered by manual means or by vacuum, but not by air pressure or water stream which may redistribute the spent material. Methods of handling and movement of spent material should prevent fugitive dust and other loss of any material until final disposition of the material.
12. All emission control equipment should be maintained in proper working condition and in use at the time when abrasive blasting is being conducted.
13. Records of actual operating times, wind speed and direction during operating times, and annual abrasive blasting material usage should be maintained for a 5-year period.
14. The following records should be maintained on the facility premises.
 - a. Type of containment and blasting location
 - b. Inspection and work reports
 - c. Weather conditions
 - d. Disposal records
 - e. Applicable test results and data derived from containment, ventilation, air, soil and other monitoring results
 - f. Records of how spent material is handled, recycled, reused, or disposed of including the facilities used.
15. When dry abrasive blasting is done, every effort should be made to prevent blasting material from reaching the water bodies. All visible floating solids reaching the water should be contained and collected.
16. Spent material collection methods must be compatible with the removal method and the containment system.
17. Prior to blasting, if the paint history is unknown the coatings should be tested for toxic metals.

II. RECOMMENDED MANAGEMENT PRACTICES AT SHIPYARDS AND OFFSHORE FABRICATION FACILITIES

RMP #1 GENERAL MAINTENANCE

Facilities should routinely perform general facility maintenance to prevent or minimize abrasive and spent material from reaching air and water bodies.

1. Facility employees should remain alert for the possibility of abrasive and spent material reaching ambient air or water bodies and take necessary action to prevent or minimize such emissions or discharges.
2. Abrasive and spent material should be stored, handled and managed in a manner that prevents or minimizes it from blowing offsite or otherwise creating a nuisance.
3. Sediment traps and drains should be routinely inspected and cleaned to insure containment of abrasive and spent material.
4. Drainage channels and trenches should be routinely inspected and cleaned of abrasive and spent material.
5. Abrasive and spent materials should not be disposed of to air or water bodies or to drains, drainage channels or trenches that lead to water bodies.

RMP #2 FLOATABLE SOLIDS

1. Facility practices should prevent or minimize floatable solids from reaching air and water bodies.
2. Facility employees should remain alert for the possibility of floatable solids reaching air or water bodies and take necessary actions to prevent or minimize such emission or discharges.
3. Floatable solids should be routinely picked up.
4. Floatable solids should not be allowed to blow offsite or otherwise create a nuisance.
5. Sediment traps and drains should be routinely inspected and cleaned of floatable solids.
6. Drainage channels and trenches should be routinely inspected and cleaned of floatable solids.
7. Abrasive blasting should be performed in a manner that prevents or minimizes the emission or discharge of floatable solids to air or water bodies.
8. Dry docks should be cleaned of floatable solids prior to lowering to prevent or minimize the

discharge of floatable solids to water bodies.

RMP #3 EMPLOYEE TRAINING

Employees and contractors should be trained in Recommended Management Practices related to their employment to prevent or minimize abrasive and spent materials and floatable solids from reaching air and water bodies.

1. New employees and contractors conducting abrasive blasting should be trained on proper abrasive blasting methods, proper handling of abrasive and spent material, floatable solids, and in general, good housekeeping practices for the facility.
2. Employees and contractors should receive refresher training at least once a year or when significant changes are made to the Recommended Management Practices that affect their activities.
3. Contractors should be notified of and required to perform in accordance with Recommended Management Practices applicable to activities related to their contract.
4. Employees, contractors and customer representatives should be instructed not to dispose of abrasive, spent and floatable materials to air and water bodies or to drains, drainage channels, or trenches that lead to water bodies.

RMP #4 FILLING ABRASIVE BLASTING CONTAINERS

1. Abrasive material containers should be filled in a manner that prevents or minimizes emissions.
2. Particulate suppression devices should be used on vents when filling containers with abrasive material to prevent or minimize emissions.

RMP #5 VENT EMISSIONS FROM INDOOR ABRASIVE BLASTING

Abrasive blasting performed inside an enclosed building or structure should be managed to prevent or minimize emissions of abrasives and spent material to the environment.

1. Ventilation systems should be exhausted through particulate suppression equipment to prevent or minimize emissions.
2. Blast cabinet exhaust should be recirculated to the cabinet or vented to emission control equipment to prevent or minimize emissions.
3. When dry abrasive blasting occurs inside of an enclosure, the exhaust to ambient air should be outfitted to prevent or minimize emissions.

RMP #6 EMISSIONS FROM OUTDOOR ABRASIVE BLASTING

When abrasive blasting is performed outside, the activity should be managed to prevent or minimize emissions of abrasive and spent material to the environment.

1. Dry abrasive blasting activities must be contained to prevent or minimize air emissions. Containment systems must have a shade factor of at least eighty-five per cent (85%), overlapping seams and be properly maintained.
2. When containment is not possible, other methods to control emissions such as particulate suppressants, shrouded blasting equipment, hydroblasting, wet-mixture blasting and CO₂ pellet blasting should be used.
3. Relocate the abrasive blasting to a location that prevents or minimizes emissions of abrasive and spent material to the environment.
4. Clean up of abrasive and spent material should be conducted while maintaining the containment system of the dry dock and drains to the extent possible.
5. The blasting nozzle should be directed downward, except when blasting underneath the vessel or on small parts where it is physically impractical to do so.

RMP #7 EMISSIONS OR DISCHARGES FROM HANDLING OF ABRASIVE MATERIAL

Abrasive material should be handled in a manner that prevents or minimizes emissions or discharges of abrasive material to the environment.

1. Abrasive blasting equipment should be properly maintained to prevent or minimize leaks or fugitive emissions.
2. The handling, transfer or movement of abrasive blasting material should be kept to a minimum.
3. Particulate suppressants should be used in handling, transfer or movement of abrasive blasting material as appropriate.
4. Abrasive and spent material should be stored away from drains, ditches, piers, and water bodies, and in a manner that prevents it from blowing offsite or becoming a nuisance.
5. Abrasive blasting materials should be stored in a manner that prevents or minimizes contact with storm water.

RMP #8 DISCHARGES FROM DRY DOCKS AND DOCKSIDE OPERATIONS

Abrasive blasting should be managed to prevent or minimize discharges of abrasive and spent materials to water bodies.

A. Management may includes:

1. Providing sufficient containment of dry abrasive blasting activities.
2. Enclosing or covering drains and openings if present or filtering discharges from the drains or openings.
3. Enclosing, covering or filtering discharges from open areas of a vessel (e.g. scuppers, railings, freeing ports, ladders or doorways) from which a discharge may occur directly to water bodies.
4. If other practices cannot prevent or minimize discharges of abrasive and spent material to the water when blasting, the facility should clean exposed areas throughout the duration of the project and unexposed area upon project completion.
5. Using a system (e.g., filters, troughs, etc.) to remove solids from the discharge of water when the dry dock is raised or lowered.
6. Removing oil, grease and fuel spills from the dry dock before raising or lowering.

B. Hosing a dry dock to remove abrasive and spent material should not be considered a recommended management practice unless:

1. The hosing is done as an integral part of another recommended management practice to prevent or minimize the discharge of abrasive and spent material to water bodies; or
2. The dry dock is hosed after the abrasive and spent materials have been removed to prevent or minimize discharge to water bodies; and
3. The discharge is treated in accordance with all applicable water discharge regulations.

RMP #9 CONTACT WITH SHIPBOARD WATER

Abrasive blasting should be performed in a manner that prevents or minimizes contact of abrasive and spent material with bilge water, cooling water, ballast water and other waters originating from a vessel and discharged directly to water bodies.

RMP #10 WATER JETTING AND WET ABRASIVE BLASTING

When performing water jetting and wet abrasive blasting, the wash water should be managed to prevent or minimize the discharge of abrasive and spent material to water bodies. The wash water is to be collected and solids removed prior to discharge to a sewer system or a water body in accordance with a water discharge permit.

- A. When water jetting and wet abrasive blasting to remove paint:
 - 1. Enclose or cover drains or filtering drains or openings in the work area.
 - 2. Enclose, cover or filter open areas of a vessel (e.g. scuppers, railings, freeing ports, ladders or doorways) from which a discharge may occur directly to water bodies.
 - 3. Prevent or minimize the contact of abrasive and spent material with water to be discharged directly to water bodies.
- B. If detergents or additives are added to pressure wash and/or wet blasting water, they should be biodegradable and free of phosphate.

RMP #11 MARINE RAILWAYS

Abrasive blasting practices performed in a marine railway should be managed to prevent or minimize discharges of abrasive and spent material to water bodies.

Management for a marine railway should include:

- 1. Routinely cleaning land areas in the marine railways of abrasive and spent material.
- 2. Filtering storm water discharges of abrasive and spent material from the marine railway.

RMP #12 WASHING DOCKSIDES AND DRY DOCKS

Water from the washing of docksides and dry docks should be managed to prevent or minimize abrasive and spent material from being discharged to water bodies. Management practices should include:

- 1. Enclosing, covering or filtering drains or openings of docksides.
- 2. Using a system (e.g., filters, troughs, etc.) to remove solids from the discharge of water when the dry dock is raised or lowered.
- 3. Wash water should be treated in accordance with all applicable water discharge regulations.

4. Abrasive and spent material should be cleaned-up prior to washing.

RMP #13 ABRASIVE BLASTING AWAY FROM DOCKS AND WATER BODIES

Abrasive blasting performed in a facility away from docks or water bodies should be performed to prevent or minimize the emission or discharge of abrasive and spent material to the air and water bodies.

Activities away from docks or water bodies should include:

1. Provide appropriate containment of dry abrasive blasting activities to prevent or minimize air or water discharges.
2. Routinely collect and remove abrasive and spent material from areas where abrasive blasting is performed.

RMP #14 MANAGEMENT OF SPENT MATERIAL

1. Spent abrasive blasting material should be recycled to the extent possible.
2. The handling, transfer or movement of abrasive blasting material should be kept to a minimum.

III. RECOMMENDED MANAGEMENT PRACTICES AT OTHER FACILITIES

This section applies to all other abrasive blasting activity, including but not limited to blasting at small fabrication facilities and abrasive blasting on water towers, tanks, and bridges. In addition, to the general practices described in part I, the following practices should be followed.

RMP #1 DRY ABRASIVE BLASTING TO REMOVE NON-TOXIC COATINGS

A. OUTDOOR

1. When abrasive blasting is performed outside, the activity should be managed to prevent or minimize emissions of abrasive and spent material to the environment.
2. Dry abrasive blasting activities should be contained to prevent or minimize air emissions. Containment systems should have a shade factor of at least eighty-five per cent (85%), overlapping seams and be properly maintained.
3. When containment is not possible, other methods to control emissions such as particulate suppressants, shrouded blasting equipment, hydroblasting, wet-mixture blasting and CO₂ pellet blasting should be used.
4. Relocate the abrasive blasting to a location that prevents or minimizes emissions of abrasive and spent material to the environment.

B. INDOOR

1. Abrasive blasting performed inside an enclosed building or structure should be managed to prevent or minimize emissions of abrasive and spent to the environment.
2. Ventilation systems should be exhausted through particulate suppression equipment to prevent or minimize emissions.
3. Blast cabinet exhaust should be recirculated to the cabinet or vented to emission control equipment to prevent or minimize emissions.
4. When dry abrasive blasting occurs inside of an enclosure, the exhaust to ambient air should be outfitted to prevent or minimize emissions.

RMP #2 DRY ABRASIVE BLASTING TO REMOVE TOXIC COATINGS

1. Near sensitive receptors the highest level of emission control, Class 1A, should be provided as described in SSPC, Guide 6, *Guide for Containing Debris Generated During Paint Removal Operations*. Class 1A normally requires air impenetrable walls with rigid or flexible framing, fully sealed joints, airlock or resealable entryways, and negative air achieved by forced or natural air flow (verified by instrument or visual monitoring) and exhaust air filtration.
2. Away from sensitive receptors, a high level of emission control, such as Class 2A, should be provided as described in SSPC, Guide 6, *Guide for Containing Debris Generated During Paint Removal Operations*. Class 2A normally requires air impenetrable walls with rigid or flexible framing, fully sealed joints, partially sealed entryways, and forced or natural air flow (verified visually) and exhaust air filtration.
3. Debris may be collected from the surface at the point of cleaning (e.g., with vacuum) or from the general work area. The collection method should be selected in conjunction with the paint removal method and the containment system design to assure a completely integrated operation.
4. Air quality measurements for toxic emissions should be made by instrument monitoring in accordance with EPA approved test methods (<http://www.epa.gov/ttn/emc/tmethods.html>). The selection of monitoring locations should be based on factors including wind direction, surface or terrain irregularities, and proximity to homes, playgrounds, businesses, bodies of water, etc.
5. Pre-job and post-job soil analysis for toxic metals should be done to determine if adequate ground protection was employed.
6. Pre-job and post-job assessment of toxic metals in sediment should be done to determine if proper protection of a water body has been achieved.