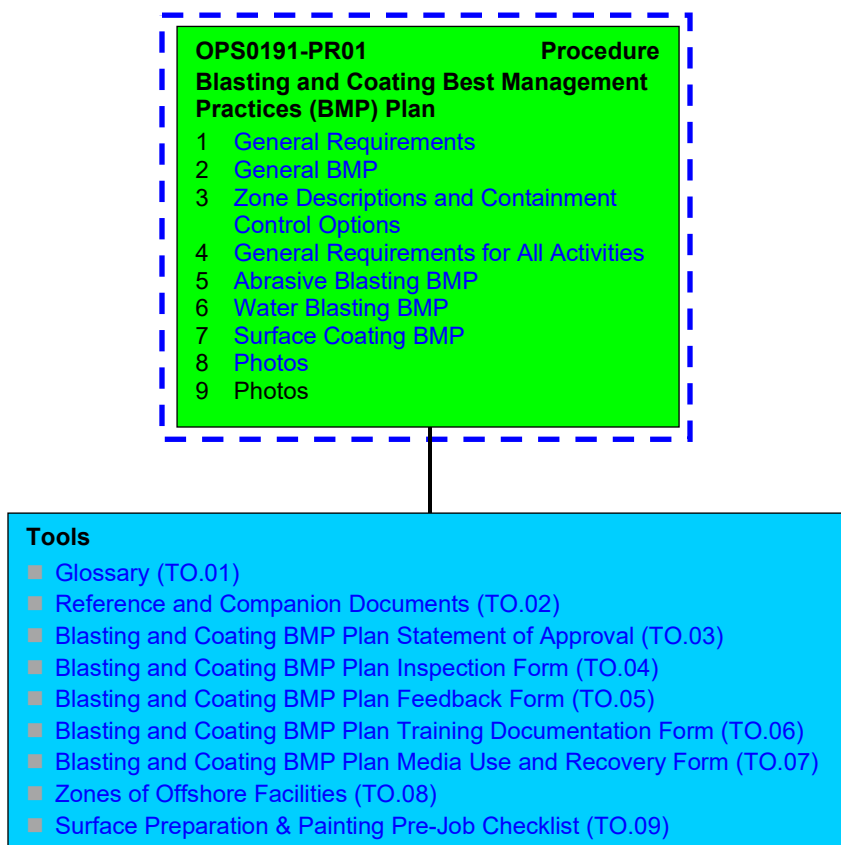


PROCEDURE

BLASTING AND COATING BEST MANAGEMENT PRACTICES (BMP) PLAN



Document Suite Map

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1 General Requirements

1.1 Purpose and Applicability

Using containment and capture strategies, this Best Management Practices (BMP) Plan restricts discharge of abrasives and paint residues/overspray to surrounding waters during maintenance coating operations. It applies for all DW facilities in the Gulf of Mexico (GOM).

Due to possibility of multiple owners for drilling rigs, DW-GOM will apply one of the following on a case-by-case basis for each rig/lease block:

- 1) Rig owner gains coverage under the EPA NPDES General Permit and develops a specific painting and sandblasting BMP plan. All other discharges are covered by Lease Holder's (Operator's) permit. *
- 2) Rig owner performs painting and sandblasting under DW-GOM's BMP plan as agreed by the owner and DW-GOM.
- 3) Rig owner develops a specific BMP plan and (if DW-GOM concurs) discharge occurs under DW-GOM's permit.

For co-located rigs, option 2 will be followed, and for floating rigs, option 1 will be followed. Consult Environmental Engineer if deviation is needed.

*Cooling Water Intake Structure requirements in the NPDES Permit may also be under the rig owner's permit coverage. See HSE0051 Federal OCS Waters (Western GOM) Environmental Compliance Manual for more information.

1.2 BMP Scope and Overall Objectives

This plan was developed to comply with BMP Plan requirements in Part I, Section C.6 of NPDES General Permit GMG290000 (Final NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico). It is based on the following regulatory requirements, industry codes, practices, and guidelines:

- EPA 833-B-98-004 Guidance Manual for Developing Best Management Practices
 - Bureau of Safety and Environmental Enforcement of the U.S Department of the Interior (30 CFR 250).
 - U.S. Coast Guard - U.S. Coast Guard (46 CFR Subchapter I-A)
 - MARPOL Annex V - MARPOL Annex V regulations (33 CFR 151, subpart A)
 - American Petroleum Institute - (API) Bulletin 91, First Edition, June 2007.
 - National Association of Corrosion Engineers International (NACE)
-

2 BMP Plan – Administrative Requirements

2.1 BMP Plan Committee and Statement

The BMP committee is made up of the:
Maintenance Delivery Manager (responsible for maintenance painting of platforms and associated production facilities)

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Wells Delivery Manager(s) (responsible for NPDES Permit compliance of drilling rigs and associated structure/equipment)
Environmental Manager (responsible for all other aspects of environmental compliance at DW locations).

This committee:

is responsible for BMP Plan review, implementation and modification, and evaluates the plan every 5 years (minimum) and amends the plan promptly, if warranted. Significant changes occurring between formal review periods may warrant additional plan review/approvals.

Following each BMP Plan Committee review, committee findings (either re-approval or need for modification) will be saved and available for inspection as OPS0191-PR01-TO.03 Blasting and Coating BMP Plan Statement of Approval. The most recent version of OPS0191-PR01-TO.03 is retained as part of OPS0191, and previous the version discarded.

2.2 Plan Modification

Where modifications are required, action plans with responsible parties will be developed with a goal of implementing improvements within three months of Plan review.

Plan modification triggers include, but are not limited to:

Change in surface preparation or coating operations significantly affecting potential for discharge of spent blast abrasive, paint chips, and paint overspray

Plan is determined ineffective in achieving the BMP objectives (i.e. a significant release resulting from failure of BMP plan controls)

Inspections reveal that procedures or equipment should be modified to further reduce potential for releases

2.3 BMP Stakeholder Input

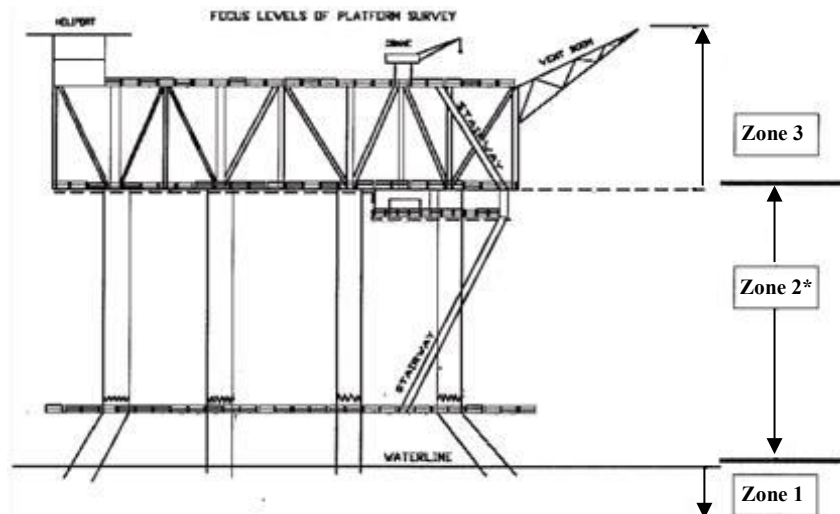
All personnel involved with surface preparation and coating operations are encouraged to suggest improvements using OPS0191-PR01-TO.05 Blasting and Coating BMP Plan Feedback Form. Completed feedback forms are given to the on-site surface preparation and coating operations Person in Charge (PIC) and forwarded to the BMP Plan Committee for periodic review. Plan questions can be directed to any BMP Plan committee member.

3 Zone Descriptions and Containment Control Options

3.1 Introduction

Techniques used to contain and control blasting/coating discharges vary based on the activity zone. The three activity zones are indicated below and described in the following sections. See Figures 1-6 in OPS0191-PR01-TO.08 Zones of Off-shore Facilities for additional information.

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***NOTE:** Areas that extend outward or that are elevated above Zone 3 (e.g. flare or vent boom, crane boom, rig frame, heliport, drilling derrick) are considered Zone 2.

3.2 Zone 1 Zone 1 is the area below the waterline. This BMP does not address surface preparation and coating applications in Zone 1.

3.3 Zone 2 Zone 2 generally encompasses the area below Zone 3 extending to the water line and includes areas that extend outward or that are elevated above Zone 3 (e.g. flare or vent boom, crane boom, rig frame, heliport, drilling derrick). Figures 1-6 in OPS0191-PR01-TO.08 illustrate Zone 2 for various installation types. The following controls should be used to minimize Zone 2 discharges:

- Blast abrasive washing and self-contained abrasive blaster, where appropriate,
- Good housekeeping and collection of waste
- Operation and maintenance controls for equipment, including careful pressure regulation and routine inspection/replacement of blasting and paint application nozzles
- Ceasing operations during adverse weather conditions
- Proper coating selection to decrease frequency of coating and minimize over-spray
- Applying optimum number of coats

Controls are detailed in Sections 5, 6, and 7.

3.4 Zone 3 Zone 3 extends from the bottom deck up to and including the top deck, with exceptions as specified for Zone 2. Figures 1-6 in OPS0191-PR01-TO.08 illustrate Zone 3 for various installation types.

All controls in Zone 2 apply to Zone 3. In addition, the following should be used in Zone 3:

- Containment pads, trays, skids, decking, etc.
- External containment (tarps, plastic sheeting and plywood)

Sealed seams for external containment joints
 Covered skid pans while working
 Plugs or filters for drains
 Frequent removal of spent abrasives, removed materials, and water
 Vacuum blasting, where appropriate

Controls are detailed in Sections 5, 6, and 7.

3.5 Specific Activities Addressed by this Plan

Topic	Reference
Abrasive Blasting	Refer to Section 5.0 for controls.
Water Blasting	Water blasting may be used as an alternative to abrasive blasting. Refer to Section 6.0 for controls.
Surface Coating	Coating operations generate the following 3 wastes: paint residues, paint overspray, and coating supplies that can no longer be used. This plan addresses paint residues and overspray. Coating supplies that can no longer be used must be handled according to owner/operator specific waste management procedures and applicable regulatory requirements (See HSE0131 Waste Management). Refer to Section 7.0 for surface coating controls.

4 General Requirements for All Activities Addressed by this Plan

4.1 Good Housekeeping

Work areas must be maintained clean and orderly during normal operations to minimize potential for releases. Practices include, but are not limited to:
 promptly addressing leaks and spills,
 inspecting work areas and pathways for clutter and related hazards,
 storing and labeling materials properly

Housekeeping practices are included in BMP plan training.

4.2 Inspections

Routine visual inspections shall be performed daily and documented at least weekly (or once per job if shorter than a week). Inspections shall be documented using OPS0191-PR01-TO.04 Blasting and Coating BMP Plan Inspection Form, and inspection deficiencies must be promptly corrected.

4.3 Pollution Prevention and Reporting

All pollution-prevention activities noted in this plan must be performed to the maximum extent practicable (MEP).

Discharge of visible foam and/or any sheen on the Gulf surface from an offshore platform or vessel is prohibited. If sheen or foam is observed, it must be reported to Shell leadership (Job Sponsor, etc.) whether or not the sheen/foam resulted from blasting/coating activities. See HSE0051-PR01-TO.01 OCS Pollution Reporting Procedures Field Guide for details.

If any equipment and/or materials are lost overboard, notify Shell leadership and follow reporting requirements in HSE0051-PR01-TO.01 OCS Pollution Reporting Procedures Field Guide.

4.4 Operational Controls, Pressure Regulation and Routine Inspection/ Replacement of Nozzles

Proper operation and maintenance of equipment can minimize the amount of blasting material used (reducing waste) and minimizes equipment-related spills/leaks.

Nozzles must be maintained in proper operational condition to optimize blasting flow rates and paint application rates. Compressors and pumps operating blast and paint-application nozzles must be periodically checked to verify that nozzles are operated at the manufacturer's recommended pressure (see photos in 8.1 Abrasive Blasting Material and Equipment).

4.5 Sump System and Skid Pan Management

Upsets or mismanagement of the sump and drain system can lead to NPDES Permit Noncompliance. It is very important to prevent sand, soaps, or other materials from entering drains and skid pans. If any of these materials are found in a skid pan, the pan must be cleaned out before the drain plug is removed.

While skid pans remain plugged for blasting/coating activities they shall be kept free of contaminants and debris. When rainy conditions are anticipated, the plugged skid pans shall be cleaned and covered, if possible. If covering is not possible, drain plugs should be removed to prevent overflow of skid pan due to rainfall.

4.6 Waste Minimization and Disposal

During planning, the amount of paint, abrasives and other materials needed for a project should be carefully evaluated to minimize the amount of excess material likely to remain after project completion.

Wastes resulting from blasting and coating operations (abrasives, brushes, empty paint buckets, protective clothing, masks, etc.) shall be collected, properly stored, and disposed of in accordance with HSE0131 Waste Management.

4.7 Blasting Frequency Blasting operations are conducted at the frequency identified by the DW-GOM maintenance program, or during periodic/annual surveys.

4.8 Weather Conditions Careful attention should be paid to weather conditions if the work area is subject to rain and wind. If heavy rains or high winds are forecast, the operations PIC shall determine if conditions pose a threat to personnel safety or render the containment systems ineffective. During unacceptable conditions, abrasive blasting, water blasting, and coating operations must cease.

4.9 Record Keeping Records will be kept as follows:

Record	Location
Master copy of the BMP and Committee Reviews	Maintained electronically in the DW-GOM Controlled Document system
Inspection records	Copy maintained in job file and copy sent to DW-GOM Environmental Engineering for electronic storage
Training records	Copy maintained by contractor and copy sent to DW-GOM Environmental Engineering for electronic storage
Plan Modification records	Changes will be documented in the BMP Revision Record
BMP Plan Media Use and Recovery Form	Copy maintained in job file and copy sent to DW-GOM Environmental Engineering for electronic storage

Records are available to EPA-authorized representatives for inspection upon request.

4.10 Training Initial BMP training covers plan requirements, objectives, and purpose. Training is given to all individuals who perform blasting and coating operations plus appropriate facility personnel (particularly HSE technicians) and contractor supervisors. Once trained, location HSE tech(s) may provide BMP training to others.

Supplemental training is performed as needed when there is a change in facility or contractor personnel, a recurring problem, or a significant BMP plan modification.

Training is documented using OPS0191-PR01-TO.06 Blasting and Coating BMP Plan Training Documentation Form.

4.11 Work Permits All work shall be performed using HSE0008 Safe Work Planning and Authorization (SWPA).

Safe Work Plan should include the following as a minimum:

- Specific Description of Work
 - Scope of Work
 - High Level Hazards addressed in the SWP
 - Personnel performing work
 - Location on asset and equipment involved
 - POB chart
 - SIMOPS and MOPO considerations
- Personnel responsibilities
- TOP HSE Hazards and mitigations
- Post Job considerations

5 Additional Requirements - Abrasive Blasting BMP

5.1 Types of Blast Abrasive Abrasives should be evaluated on a case-by-case basis to determine cost-effectiveness and ability to meet required performance standards. Garnet is the most common blast abrasive used by DW-GOM and is available in many particle size grades to suit various job needs.

For each blast abrasive used, a MSDS must be obtained and reviewed to determine potential risk to human health/environment, PPE requirements, and waste disposal options (see photos in 8.1 Abrasive Blasting Material and Equipment).

5.2 Abrasive Handling Before starting work, blast abrasive shall be dispensed or transferred from transport containers to the blast pot (see photos in 8.1 Abrasive Blasting Material and Equipment). Grating under and around the blast pot shall be covered with plywood or other secured solid flooring. The transfer process shall minimize spillage and dust emissions. Spillage shall be recovered for reuse or disposed as appropriate (see photos in 8.2 Blast Abrasive Transfer and Containment).

5.3 Control and Containment of Spent Blast Abrasives

Operational controls, barriers, containment structures, or a combination must be used to prevent abrasives discharge from the work area. Spent blast abrasive must be contained and collected regularly, not left to accumulate over the course of a job (see photos in 8.2 Blast Abrasive Transfer and Containment). It must then be disposed or reused, depending on type. Follow HSE0131 Waste Management.

Additional technology that may be used include Minnie BRS vacuum blasters on the hull exteriors (dry abrasive spot blast) followed by spot painting and over coat the existing coating system. This system recycles the material and has a dust collector to collect all the fines. The fines are collected in a holding bin in the system that requires being emptied periodically. When emptied the fines will be recovered and managed for proper disposal ashore.

Dry Ice mixed with abrasives

Dry Ice is primarily used to reduce the amount of abrasives used on blasting jobs. Logistical constraints related to CO2 storage and delivery will govern if this blasting technique would be chosen. The process includes using dry Ice which will go from a solid to gas on impact with the sudden expansion of gas from a solid to help remove the rust and coating from the surface (i.e. Sublimation Process). Dry Ice with abrasive aids in faster rust/paint chip removal while profiling the metal surface. Surface profiling is synonymous with coating longevity, thereby, reducing the number of maintenance cycles and the amount of abrasives used during the life of the coating. Based on pilot studies, abrasive use is estimated to be reduced by 40% to 90%. This will also reduce impacts to the Gulf of Mexico, especially in Zone 2 of the asset.

Containment will be installed for open air movement through the work area with covering the floor. If floor containment is not sufficient, additional wall containment will be installed to recover abrasives, rust, dust and coating chips. All recovery techniques would be collected to the maximum extent practicable.

5.4 External Containment

External containment shall be used for blasting where practical and safe. Containment structure shall be as close as practical to the blast area. It should consist of walls, ceiling, flooring, and closable, clearly-marked ingress/egress as appropriate with either a rigid or flexible frame. Control methods/techniques shall ensure containment (see photos in 8.2 Blast Abrasive Transfer and Containment). Containment and/or controls shall be maintained throughout the course of surface preparation in accordance with approved design.

5.5 Sealed Joints

Walls, ceiling, and flooring of the containment structure shall have overlapping sealed seams to minimize escape of spent blast abrasive (see photos in 8.2 Blast Abrasive Transfer and Containment).

5.6 Lead-Based Paint

If lead-based paint is found or suspected, contact the Painting Activity Coordinator who will request personal protection and remediation procedures from Industrial Hygiene. Lead-based paint is not used on DW-GOM's facilities. For questions or concerns at a particular location, contact the Painting Activity Coordinator.

5.7 Other Controls

The following table lists other specific controls for spent blast abrasives.

Washed Blast Abrasive	Washing is rarely required as Shell uses clean abrasive with minimal fines.
Self-Contained Abrasive Blaster	A self-contained abrasive blasting unit that re-circulates the blast abrasive can be used on large flat surfaces (See photo in 8.3 Self-Contained Blast Abrasive Unit).
Sump System Management	Where possible, skid pans shall be covered during blasting activities. The PIC or Job Sponsor is responsible for ensuring that skid pans are cleaned before drain plugs are removed or job is concluded.
Packaging of Spent Blast Abrasive	Once collected, spent blast abrasive shall be stored in an appropriate container (see photos in 8.4 Packaging of Spent Blast Abrasive).
Storage of Spent Blast Abrasive	Spent abrasive shall be stored in contained areas designated for storage. Periodic storage area inspections shall be conducted to ensure proper containment and control.
Disposal of Spent Blast Abrasive	Spent blast abrasive must be transported off-site for disposal in accordance with applicable regulations. Any spills during transportation shall be evaluated to determine if a regulatory Reportable Quantity (RQ) has been released. If a RQ has been released, notification must be made to the regulatory authority. See HSE0131 Waste Management for requirements.
Spent Media Recovery Tracking	Each job will track spent and recovered media using OPS0191-PR01-TO.07 Blasting and Coating BMP Plan Media Use and Recovery Form. This enables recovery efficiencies to be tracked.
HoldTight 102 (HT 102)	HoldTight 102 (HT 102) is a surface decontamination/rust inhibitor product that may be used from time to time. Its use provides a more consistent surface decontamination during cleaning, and a longer period of time before flash rust sets (in case of delayed coating work) thereby reducing the need to re-blast (and so reducing blast media usage overall). Although Shell does not believe this is a strict requirement given this product is used per the BMP, for conservatism, the HT 102 will be routinely checked under the provisions of the EPA GMG290000 permit as a "chemically treated fresh water" discharge. Shell will work with the vendor to ensure an annual toxicity test is performed on neat fluid for representative conditions of use (expected concentrations, discharge rates, etc., which are expected to be uniform across the GOM). Shell Environmental team has the lead to track this testing. Initial toxicity testing (April 2015) per GMG290000 showed compliant results well above the expected critical dilution. HT 102 does not foam nor cause a sheen on surface waters.
CorrZe 100 and CorrZe 200	CorrZe 100/200 is a surface preparation and decontamination product system that may be used to clean and/or prepare surfaces for painting and coating. The product system is intended to prepare surfaces and clean water soluble contaminants (chlorides, sulfates, nitrates) and non water soluble contaminants (sulfides, flash rust). Although Shell does not believe this is a strict requirement given this product is used per the BMP, for conservatism, the CorrZe 100/200 will be routinely checked under the provisions of the EPA GMG290000 permit as a "chemically treated fresh water" discharge. Shell will work with the vendor to ensure an annual toxicity test is performed on neat fluid for representative conditions of use (expected concentrations, discharge rates, etc., which are expected to be uniform across the GOM). Shell Environmental team has the lead to track this testing. Initial toxicity testing conducted May 2022 per GMG290000. Toxicity results used to inform appropriate mixing and procedure controls aligned with the NOEC/LOEC.

Vapor Blasting (Water mist with Garnet abrasive)	• Will reduce airborne nuisance dust (abrasives) to the environment • Less exposure of nuisance dust to personnel • Less pollution to environment using potable water vs dry abrasive • Less damage to equipment from airborne dust
Self-Contained Abrasive Blaster	A self-contained abrasive blasting unit that re-circulates the blast abrasive can be used on large flat surfaces (See photo in 8.3 Self-Contained Blast Abrasive Unit).

5.8 Pre-Job Checklist

Refer to [TOOL OPS0191-PR01-TO.09](#) before blasting begins. The section contains important forms and reference materials to complete and review:

- Surface Preparation & Painting Pre-Job Checklist
 - Must be completed prior to blasting. A pre-job checklist must be completed for each individual job.
 - Sign off responsibilities are designated on the checklist.
- Working at Heights questionnaire
 - Must be completed prior to blasting.
- Photograph examples of previous pipe failures while blasting

6 Additional Requirements - Blasting BMP

6.1 Abrasive Blasting on in service Equipment and Piping

Abrasive blasting on in service equipment and piping hazard controls in place to safely control hazard to ALARP hazards to people, environment, and asset.

Hazards and controls listed on JSEA and attached to the permit to work.

Reference Pre Job checklist (TO.09)

I.D. 1 – 6 PEI GO / NO-GO

ANY Finding of integrity concerns to be wrapped with rubber and remain wrapped until integrity prove-up inspection can be performed. For work executed on pressurized equipment, reference [PEIPOL101.pdf](#) for guidance.

6.2 Water Blasting Techniques

Water blasting is typically for jobs where ambient dust could damage nearby machinery. Depending on required surface cleanliness, water blast pressures can range from 5,000 to more than 15,000 psi.

Ultra-High Pressure Water Jetting Techniques (UHP) to above 25,000 to 55,000 psi may be used. This blasting technique has the following benefits over dry abrasive blasting:

- Will reduce airborne nuisance dust (abrasives) to the environment
- Less exposure of nuisance dust to personnel
- Less pollution to environment using potable water vs dry abrasive
- Less equipment protection, labor to install & change
- Less damage to equipment from airborne dust

6.3 Discharge Reduction Measures

Water blasting control measures shall consist of operational controls, barrier or containment, or a combination to minimize discharges from the work area. Potential external containment structures could include tarps, sheeting, etc. (see photos in 8.5 Blast Abrasive Transfer and Containment [Water Blasting]).

Plugs/Filters for Drain Systems	Plugs/filters should be used to isolate or protect drainage lines and ensure that blast water is not introduced to the wastewater treatment system (see photos in 8.6 Drain Line Plugs).
Spent Blast Water	Due to infrequent use and close quarters typically associated with water blast jobs, spent blast water is not typically collected (low contamination potential).

6.4 Discharge Reduction Measures

Water blasting control measures shall consist of operational controls, barrier or containment, or a combination to minimize discharges from the work area. Potential external containment structures could include tarps, sheeting, etc. (see photos in 8.5 Blast Abrasive Transfer and Containment [Water Blasting]).

UHP	In Zone 3, Ultra High Pressure Water Jetting control measures shall consist of operational controls, barrier or containment, or a combination to minimize discharges of overspray and solids from the work area. Potential external containment structures could include tarps, sheeting, etc. Paint chips & rust removed during UHP surface preparation will include use of filter type barriers in drain troughs, drain pans, skid pans, etc. The filter material will capture paint chips & debris while allowing water to pass on to discharge. Containment screens, tarps or rubber matting may also be used to control flying debris. Paint chips and debris shall be recovered for proper disposal ashore.
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7 Additional Requirements - Surface Coating BMP

7.1 Selection

Coatings and coating supplies are selected based on documented performance history, surveys, and intended use.

7.2 Application Method Coatings shall be applied using the manufacturer's recommendations and DW-GOM practices as defined in ENG0080SP Coatings and Markings (Schedule P).

Between coats, dry surfaces are washed with seawater to remove dust and de-minimis (minimal amounts of) wind-borne particulate adhering to the surface. This water is not collected (low potential for contamination).

7.3 Discharge Reduction Options Coating control measures shall consist of operational controls, barriers, containment, or a combination that minimize discharges from the work area (see photos in 8.7 Painting Containment).

7.4 Painting at the Water Line When painting at or near the water line, some portion of paint spray may reach the water due to wind and proximity to sea surface. When the BMP plan is followed correctly by trained personnel, the amount of paint reaching the water is de minimis. If paint is spilled or sprayed directly into the water in any amount, follow HSE0051-PR01-TO.01 OCS Pollution Reporting Procedures Field Guide for spill reporting.

To minimize windblown paint spray and protect worker safety, painting should not take place at or near the water line during windy conditions. The offshore Paint Foreman and Shell leadership will jointly consider this during job planning.

8 Photos

8.1 Abrasive Blasting Material and Equipment The following photos emphasize aspects of abrasive blasting material and equipment.



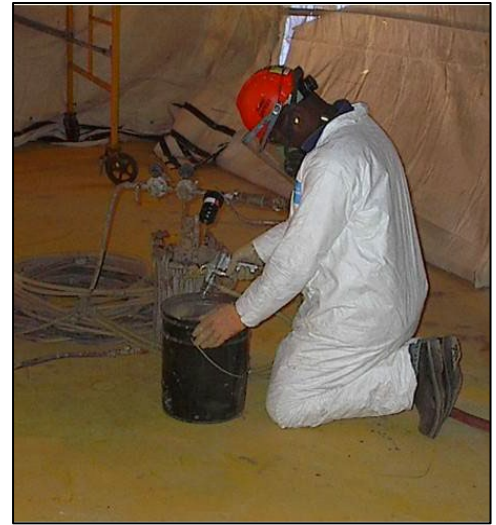
Blast Pot Pressure Gauge



Used and New Blast Abrasive Nozzle



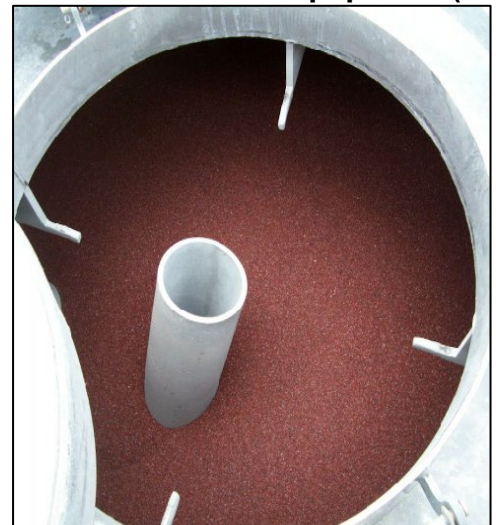
Blast Abrasive Nozzle Gauge



Personal Protective Equipment (PPE)



PPE Including Supplied Air



Unused Blast Abrasive

8.2 Blast Abrasive Transfer and Containment

The following photos emphasize aspects of blast abrasive transfer and containment.

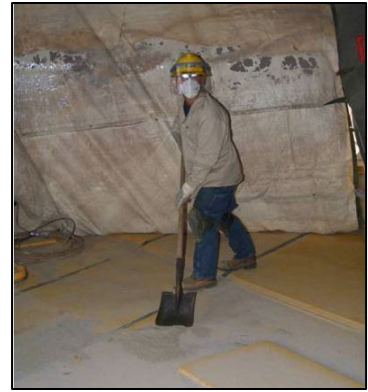


New, Unused Blast Abrasive Being Transferred from Hopper to Blast Pot

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Containment Below the Blast Abrasive Pressure Vessel



Housekeeping Inside the Blasting Containment Area



Blast Abrasive External Containment Being Installed



Blast Abrasive External Containment Being Installed II



Blast Abrasive External Containment



Blast Abrasive External Containment II



**Blast Abrasive External Containment
III**



**Overlapping Walls with Designated
Entrance to the Blasting Area**



**Overlapping Walls with Designated
Exit from the Blasting Area**



**Overlapping Walls with Designated
Exit from the Blasting Area II**



Emergency Exit in Blasting Area



Plywood Flooring for Containment Area



Overlapping Containment Wall Secured Together in the Blasting Area



Plywood Flooring in the Containment Area



Close-up of Sealed Joints between Plywood Flooring in Containment Area

8.3 Self-Contained Blast Abrasive Unit

The following photo depicts a self-contained blast abrasive unit.



Self-Contained Blast Abrasive Unit

8.4 Packaging of Spent Abrasive

The following photos depict the collection and storage of spent abrasive.



Collection of Spent Abrasive in Containment Area



Spent Abrasive Storage

8.5 Blast Abrasive Containment (Water Blasting)

The following photo depicts containment and PPE for water blasting.



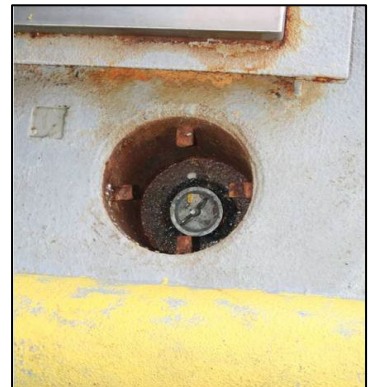
Water Blasting Showing Containment Structure and PPE

8.6 Drain Line Plugs

The following photos depict drain line plugs.



Plug to Isolate Drainage Line



Plug Installed to Isolate Drainage Line

8.7 Painting Containment

The following photos depict elements of painting containment.



Paint Containment Structure



Paint Containment Structure II



Painting in Contained Area

TOOL OPS0191-PR01-TO.01

Glossary

Term / Acronym	Definition
Abrasive blasting	The operation of cleaning or preparing a surface by forcibly propelling a stream of abrasive material against the surface.
API	American Petroleum Institute
BSEE	Bureau of Safety and Environmental Enforcement
Containment system	Cover panels, screens, tarps, scaffolds, plywood, supports, and shrouds used to enclose an entire work area or coating removal tool. The purpose is to minimize or prevent spent blast abrasive generated during surface preparation from entering into the environment, and to facilitate the controlled collection of the spent blast abrasive for disposal.
Discharge	Any spilling, leaking, pumping, pouring, emitting, emptying, or dumping, but excluding the following: • Discharges in compliance with a permit under Section 402 of the Clean Water Act, • Discharges resulting from circumstances identified and reviewed and made part of the public record with respect to a permit issued or modified under Section 402 of the Clean Water Act, and subject to a condition in such permit, and • Continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under section 402 of the Clean Water Act, which are caused by events occurring within the scope of relevant operating or treatment systems. [33 CFR 153.103(g)]
Maintenance waste	Materials collected while maintaining and operating the ship, including, but not limited to, soot, machinery deposits, scraped paint, deck sweepings, wiping wastes, and rags. [33 CFR 151.05]
MARPOL 73/78	The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating to that Convention. (33 CFR 151.05)
MSDS	Material Safety Data Sheets
Maximum extent practicable (MEP)	For the purpose of this document, the MEP is a level of implementing best practices in order to achieve a performance standard which takes into account available technology, cost effectiveness and other essential issues such as human safety. MEP allows flexibility in the way to meet the performance standards and may vary based on site conditions.
NACE	National Association of Corrosion Engineers
Operator	The individual, partnership, firm, or corporation having control or management of operations on the lease or a portion thereof. The operator may be a lessee, designated agent of the lessee, or holder of rights under an approved operating agreement.
Owner	Any person holding title to or, in the absence of title, other indicia of ownership of a unit; however, this does not include a person who holds indicia of ownership primarily to protect a security interest in the unit and does not participate in the management or operation of the unit. (33 CFR 140.10)
Spent blast abrasive	Blast abrasive that has been used and as the result of that use is no longer useful for its intended purpose.
Water blasting	Any abrasive blasting using high-pressure liquid as the propelling force for surface preparation.

TOOL OPS0191-PR01-TO.02

Reference and Companion Documents

Companion Documents Business control documents in this suite are listed in the table below.

Document Number	Title
OPS0191-PR01	Blasting and Coating Best Management Practices Plan
OPS0191-PR01-TO.01	Glossary
OPS0191-PR01-TO.02	References and Companion Documents
OPS0191-PR01-TO.03	Blasting and Coating BMP Plan Statement of Approval
OPS0191-PR01-TO.04	Blasting and Coating BMP Plan Inspection Form
OPS0191-PR01-TO.05	Blasting and Coating BMP Plan Feedback Form
OPS0191-PR01-TO.06	Blasting and Coating BMP Plan Training Documentation Form
OPS0191-PR01-TO.07	Blasting and Coating BMP Plan Media Use and Recovery Form
OPS0191-PR01-TO.08	Figures and Zones of Offshore Facilities

Reference Documents The following documents, practices and procedures relating to Good Housekeeping; Preventative Maintenance; Record Keeping; Inspections; Training and Waste Minimization and Management are incorporated by reference

Shell Documents	
Document Number	Title
ENG0080SP	Coating and Markings (Schedule P)
Regulatory Documents	
Document Number	Title
29 CFR 1910.94	Occupational Safety and Health Administration Program Respiratory Protection Regulations
33 CFR 151, Subpart A	MARPOL Annex V - MARPOL Annex V regulations
GMG290000	Final NPDES General Permit for New and Existing Sources and New Dischargers in the Offshore Subcategory of the Oil and Gas Extraction Category for the Western Portion of the Outer Continental Shelf of the Gulf of Mexico, October 2007.
Industry Documents	
Document Number	Title
API RP 74	Recommended Practice for Occupational Safety for Onshore Oil and Gas Production Operations
API Bulletin 91	Planning and Conducting Surface Preparation and Coating Operations for Oil and Natural Gas Drilling and Production Facilities in a Marine Environment, First Edition, June 2007.
	Recommended Management Practices for Abrasive Blasting, Gulf Coast States Abrasive Blasting Committee, August 2000.

TOOL OPS0191-PR01-TO.03

Blasting and Coating BMP Plan Committee Statement of Approval

A review of this BMP Plan has been completed by the BMP Committee listed below. These individuals are responsible for:

- developing,
- implementing,
- monitoring to ensure that Plan objectives and specific requirements are met, and
- revising the Plan when needed.

This Plan fulfills the BMP Plan requirements of Part I, Section C.6 in NPDES General Permit GMG 290000.

NAME	TITLE	
Jeff McMenis	UPD GOM Environmental Manager	
Suhey Ozyigit	General Manager Global Deepwater Wells	
Bobby Schaff	UPD GOM Hub Capability Manager	
Mike Fairburn	TA/Construction Manager	
Morris Jones	UPD GOM Sr. Environmental Engineer	
Juan Gonzalez	Materials and Corrosion Lead	

BMP Plan review was completed on **17 June 2014**.
(Date)

- ☒ Plan has been updated and is approved; modification is not required.
- ☐ Plan modification is required. Modifications must be made and implemented within 3 months of the above review date.

REQUIRED PLAN MODIFICATION	IMPLEMENTATION DATE	INDIVIDUAL RESPONSIBLE
1.		
2.		
3.		

TOOL OPS0191-PR01-TO.04

Blasting and Coating BMP Plan Inspection Form

Job Name/Facility: _____ Date: _____
 Person Conducting Inspection: _____ Signature: _____

Area	Items to Check	Yes	No	N/A	Describe Corrective Actions (if any)
Housekeeping	Are all work areas clean, neat and orderly?	☐	☐	☐	
Housekeeping	Have all spills and leaks been promptly cleaned up?	☐	☐	☐	
Housekeeping	Are storage areas kept clean, neat and orderly?	☐	☐	☐	
Housekeeping	Are storage containers stored properly?	☐	☐	☐	
Housekeeping	Are the storage containers properly labeled and identifiable?	☐	☐	☐	
Housekeeping	Has all equipment been properly maintained per manufacturers' requirements?	☐	☐	☐	
General Control and Containment	Do drains contain filters or plugs?	☐	☐	☐	
General Control and Containment	Do external containment structures enclose the work area to the maximum extent practicable?	☐	☐	☐	
General Control and Containment	Are external containment structures placed as close as practicable to the immediate blast area to minimize the area of impact?	☐	☐	☐	
General Control and Containment	Do joints in walls, ceiling and flooring have overlapping seams?	☐	☐	☐	
General Control and Containment	Will weather conditions render the containment system ineffective?	☐	☐	☐	
Abrasive Blasting	Are air nozzles maintained for optimum flow rates and air pressures levels?	☐	☐	☐	
Abrasive Blasting	Is accumulated spent blast abrasive cleaned up and collected on a regular basis to prevent excessive amounts?	☐	☐	☐	
Abrasive Blasting	Is blast abrasive washed a minimum of two times to minimize the amount of fines?	☐	☐	☐	
Water Blasting	Are water nozzles maintained for optimum flow rates and water pressure levels?	☐	☐	☐	
Water Blasting	Is accumulated blast water cleaned up and collected on a regular basis to prevent excessive amounts?	☐	☐	☐	
Coating	Are coatings applied using manufacturer's recommendations?	☐	☐	☐	
Coating	Is the type of coating used appropriate for its intended use?	☐	☐	☐	
Coating	Are pressure regulators used?	☐	☐	☐	
Coating	Is the manufacture's specified optimum pressure being used to apply coatings?	☐	☐	☐	

Retention:

- Save one copy in the onsite job file
- Email copy to Environmental Engineering GOM Water mailbox: SEPCo-GOM-Water@shell.com

TOOL OPS0191-PR01-TO.05

Blasting and Coating BMP Plan Feedback Form

NAME: _____

DATE: _____

Location at Facility	Recommended Improvement

Provide completed form to the Blasting/Coating Operation Person in Charge (PIC) for submission to the DW-GOM BMP Committee. Copies may also be submitted directly to DW-GOM Environmental Engineering.

Blasting and Coating BMP Plan Training Documentation Form

Facility or Group being trained:	
Date:	
Trainer:	
Topics discussed should include a review of scope (Section 1.2), zones (Section 3) and all requirements (Sections 4-7) in OPS0191-PR01 Blasting and Coating BMP Plan; and review of OPS0191-PR01.TO.04 Blasting and Coating BMP Plan Inspection Form.	

[illegible]

Retention:

- Save one copy in the onsite job file or contractor training files.
- Email copy to Environmental Engineering Water mailbox: SEPCo-GOM-Water@shell.com

TOOL OPS0191-PR01-TO.07

Blasting and Coating BMP Plan Media Use and Recovery Form

This form will be used by Shell to track percentage of blast media recovered by each job.

- Instructions:
- 1) Please complete this form for each blasting job, each week.
 - Be sure to enter info in the correct row for the job (Zone 2 or Zone 3).
 - “Spent” means total amount of blast media actually used on the job
 - “Picked up” means all spent media actually recovered for disposal/recycle
 - 2) Save one copy in the onsite job file and email a copy at week’s end to Environmental Engineering GOM Water mailbox: SEPCo-GOM-Water@shell.com

Job Name	
Platform/rig	
Person Completing Form (print)	

DATE														
DAY	Mon		Tue		Wed		Thu		Fri		Sat		Sun	
Materials spent and picked up by ZONE (in lbs.)	SPENT	PICKED UP	SPENT	PICKED UP	SPENT	PICKED UP	SPENT	PICKED UP	SPENT	PICKED UP	SPENT	PICKED UP	SPENT	PICKED UP
Jobs in ZONE 2*														
Jobs in ZONE 3*														

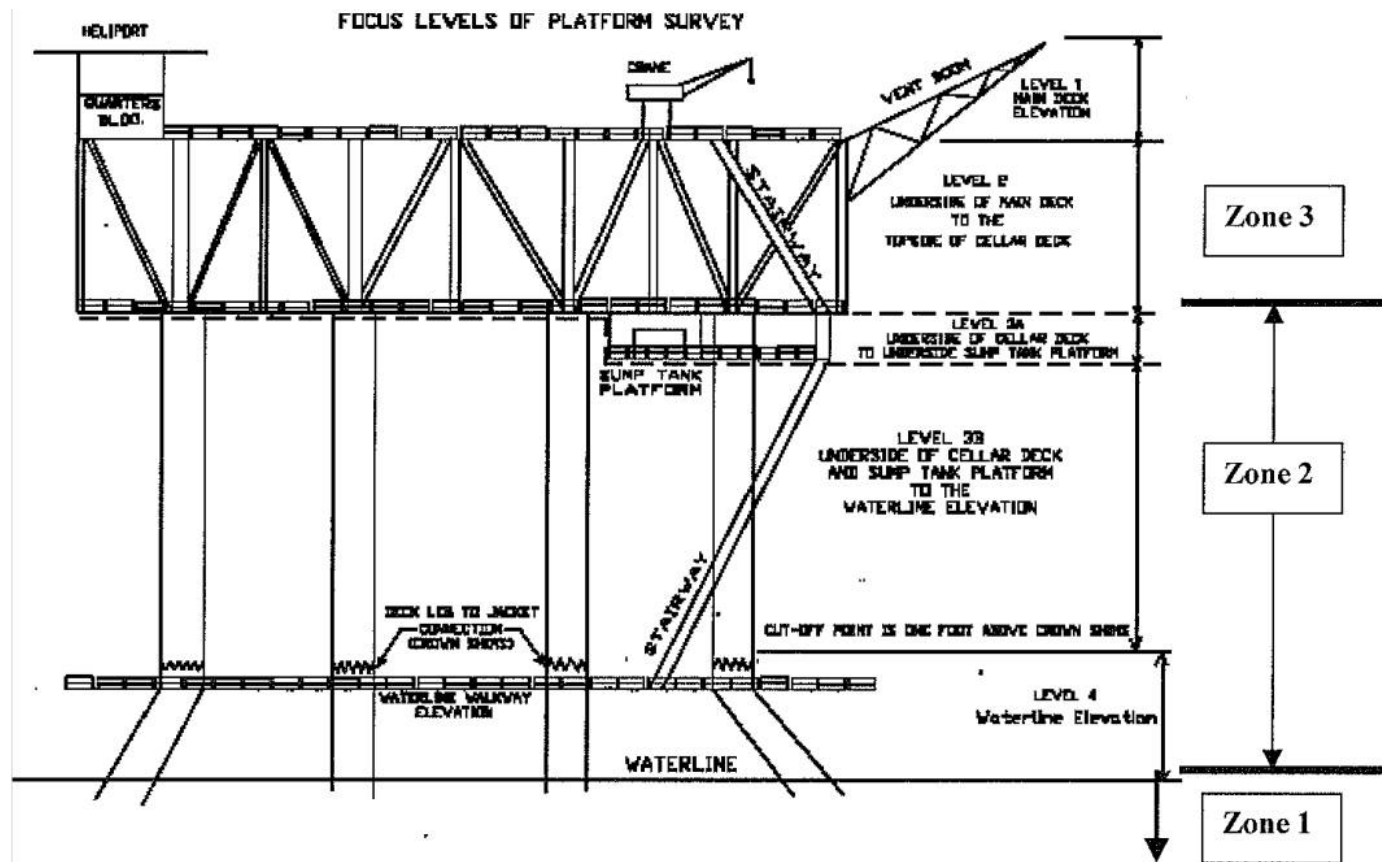
*Zone 2: UNDERSIDE OF CELLAR DECK DOWN TO SPLASH ZONE (WATER LINE)

Zone 3: ALL AREAS ABOVE THE CELLAR DECK

Comments (e.g. form improvement ideas; job issues affecting recovery of media)

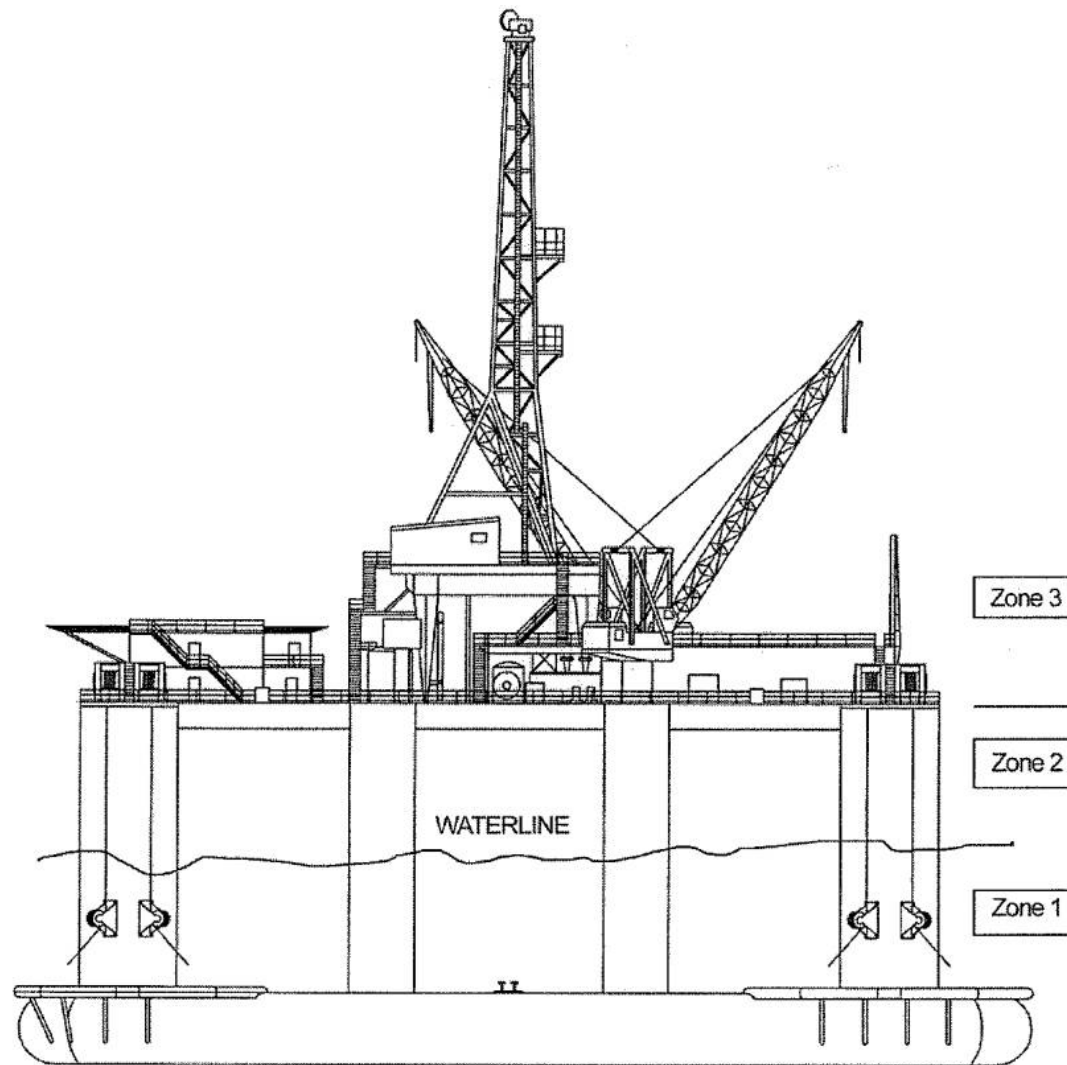
Zones of Offshore Facilities

Figure 1 Platform Zones



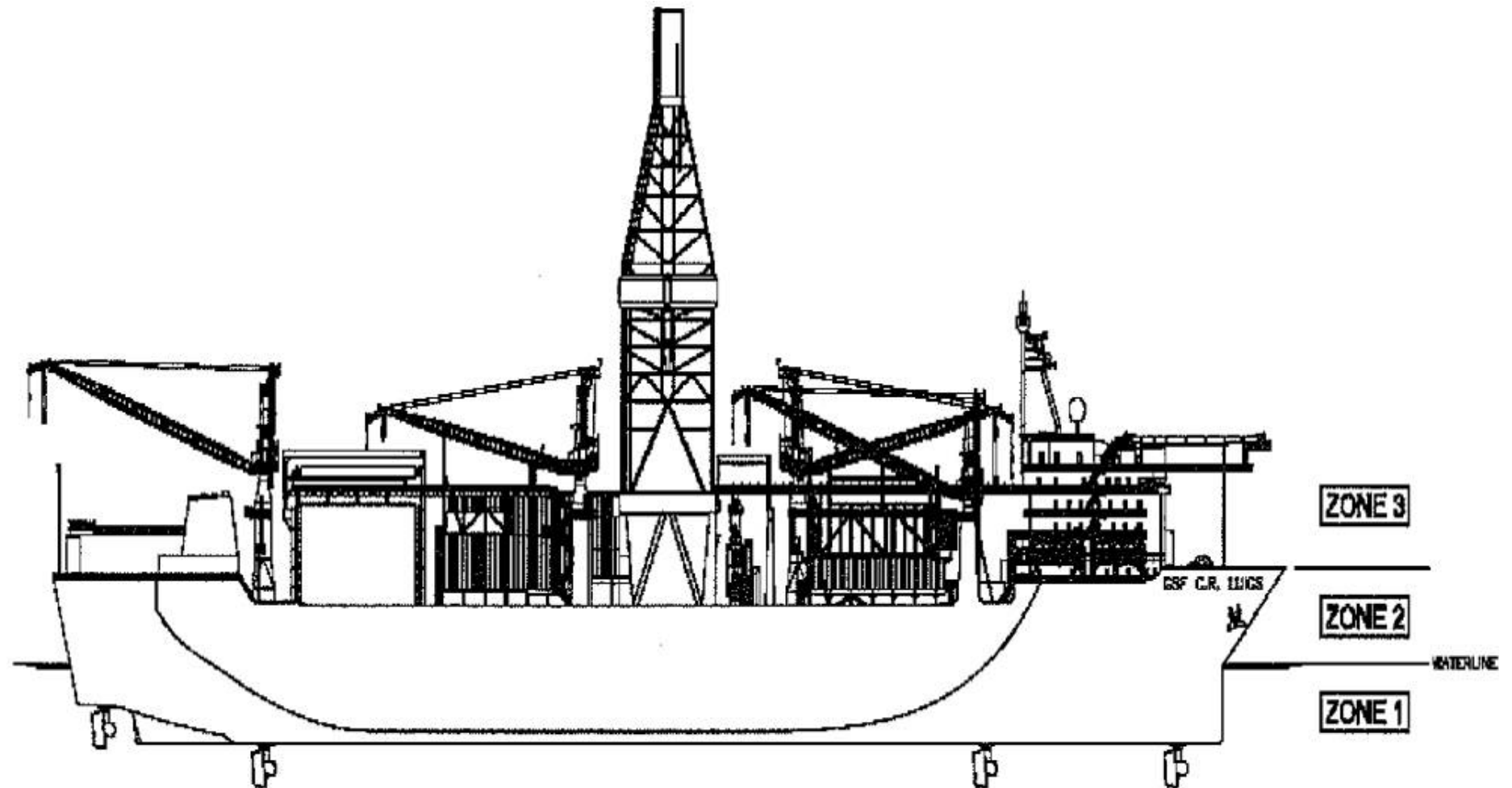
NOTE: Areas that extend outward or that are elevated above Zone 3 (e.g. flare or vent boom, crane boom, rig frame, heliport, drilling derrick) are considered Zone 2.

Figure 2 Semi-Submersible Drilling Rig Zones



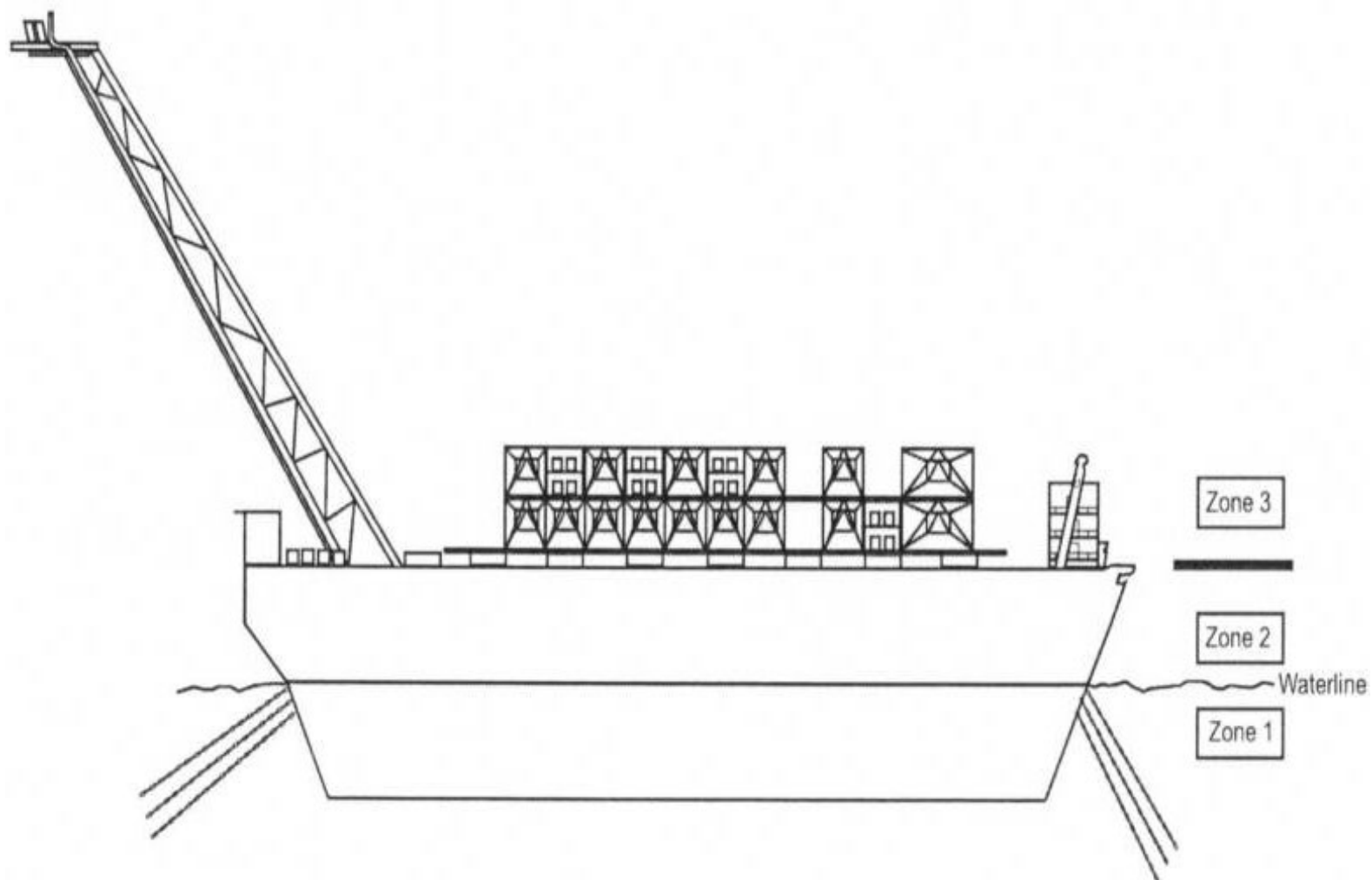
NOTE: Areas that extend outward or that are elevated above Zone 3 (e.g. flare or vent boom, crane boom, rig frame, heliport, drilling derrick) are considered Zone 2.

Figure 3 Drilling Ship Zones



NOTE: Areas that extend outward or that are elevated above Zone 3 (e.g. flare or vent boom, crane boom, rig frame, heliport, drilling derrick) are considered Zone 2.

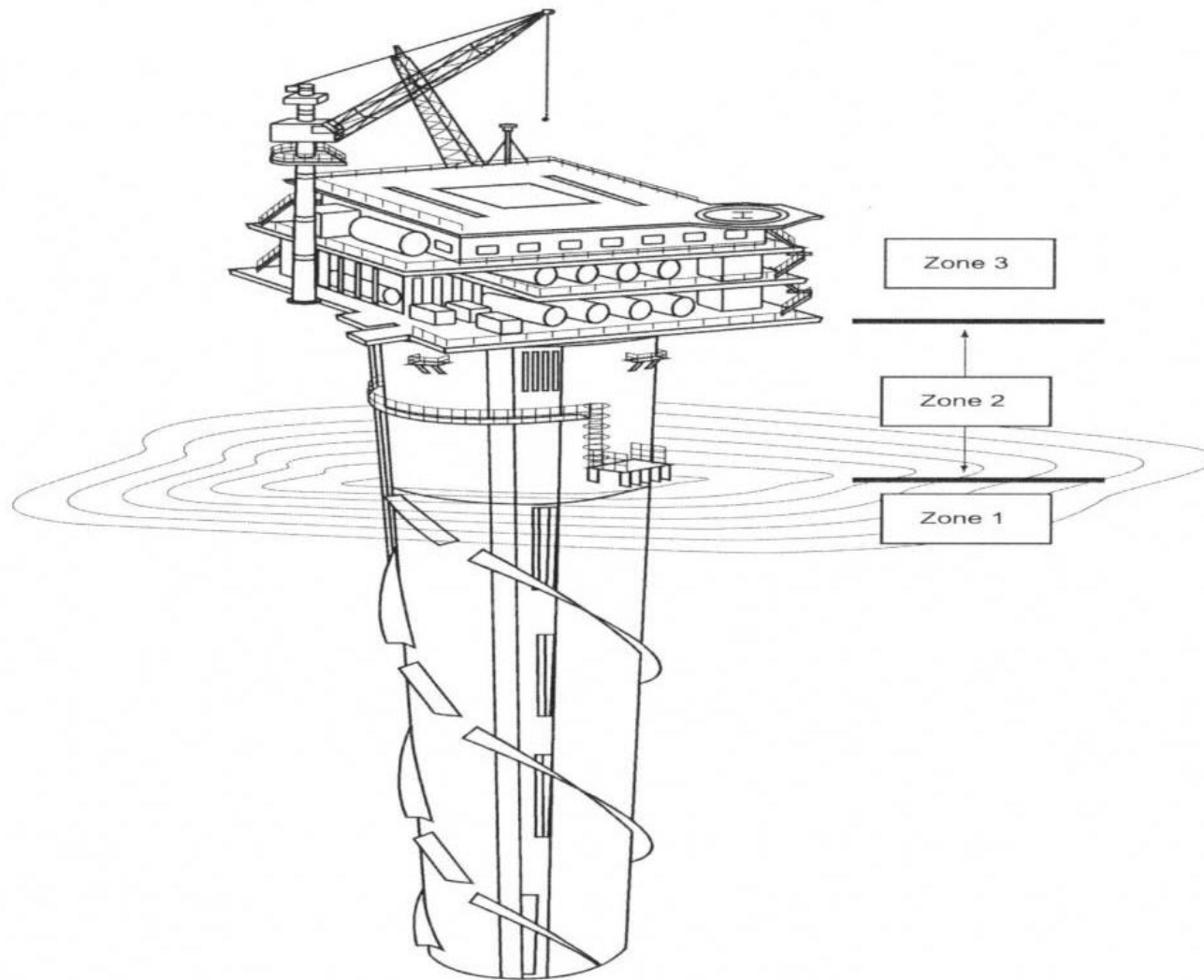
Figure 4 Floating Production Storage and Offloading/Offtake facility (FPSO) Zones



NOTE: Areas that extend outward or that are elevated above Zone 3 (e.g. flare or vent boom, crane boom, rig frame, heliport, drilling derrick) are considered Zone 2.

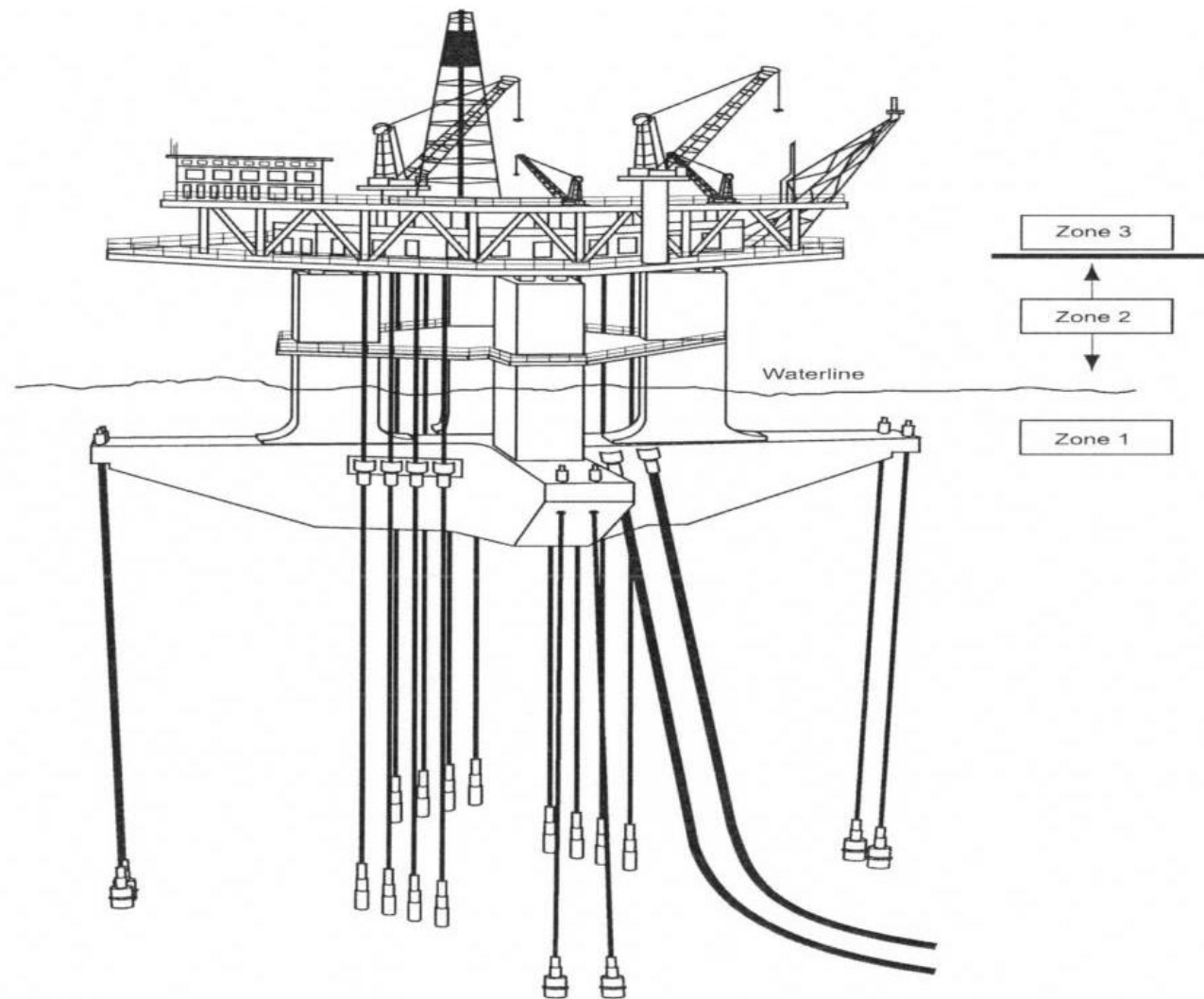
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Figure 5 SPAR Zones



NOTE: Areas that extend outward or that are elevated above Zone 3 (e.g. flare or vent boom, crane boom, rig frame, heliport, drilling derrick) are considered Zone 2.

Figure 6 Tension Leg Platform (TLP) Zones



NOTE: Areas that extend outward or that are elevated above Zone 3 (e.g. flare or vent boom, crane boom, rig frame, heliport, drilling derrick) are considered Zone 2.

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TOOL OPS0191-PR01-TO.09

SURFACE PREPARATION & PAINTING PRE-JOB CHECKLIST

Job Start Date:

Asset:

Work Area:

MTAC Foreman

Paint Superintendent:

Paint inspector

Asset Inspector

Ops rep.

Rev9 Date 8/29/2022 Larry B. & Miguel T.

ID	Status	Task	Initial T-30 Days (days)	Final T-5 Days (days)	Person Respon- sible for task completion	Required Partici- pants	Signed Off By	Date Started	Date Completed	Comments / Ac- tions Cannot be left blank if NA is se- lected
1		Has the scope (CAIR) been re- viewed and agreed upon: Is the scope clear? Are the scope boundaries defined and under- stood by all parties?	Yes / No	Yes / No	Paint inspector	Paint Inspector Paint Superintendent				
2		If the scope is on a specific pressure equipment item (Chase CAIR), was the last in- spection report reviewed? Are there any pending OTIs or CAIRs that the execution team should be made aware of?	Yes / No / NA	Yes / No / NA	Paint inspector	Paint Inspector Paint Superintendent Asset Inspector MTAC Foreman				
3		If the scope is on a block (Block CAIR), was a sweep (ROPE ACCESS inspection) performed?	Yes / No / NA	Yes / No / NA	Paint inspector	Paint Inspector Paint Superintendent Asset Inspector MTAC Foreman				
4		Are items identified by the sweep communicated and un- derstood by the execution team	Yes / No / NA	Yes / No / NA	Paint inspector	Paint Inspector Paint Superintendent Asset Inspector MTAC Foreman				

ID	Status	Task	Initial T-30 Days (days)	Final T-5 Days (days)	Person Respon- sible for task completion	Required Partici- pants	Signed Off By	Date Started	Date Completed	Comments / Ac- tions Cannot be left blank if NA is se- lected
5		Was a PEI Inspection field walk down of piping/equipment completed and approval to begin surface preparation given? If no, work cannot commence.	Yes / No	Yes / No	Asset Inspector	Paint Inspector Paint Superintendent Asset Inspector MTAC Foreman				
6		Identify Pressurized / Energized Piping / Equipment / copper nickel, low pressure thin wall piping or special piping that should not be blasted or painted (corrosion cells, leaks etc.)	Yes / No / NA	Yes / No / NA	Asset Inspector	Paint Inspector Paint Superintendent Asset Inspector MTAC Foreman				
7		Identify necessary material to do job.	Yes / No	Yes / No	Paint Superinten- dent	MTAC Foreman Paint Superintendent				
8		Verify turbine air intake ducting integrity - report defects/concerns to ULT/Turbine Mech - written procedure to protect air intakes & Gen building.	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	MTAC Foreman Paint Superintendent				
9		Identify Special Masking Requirements - (No Abrasive blasting within 18" of turbine air intake ducting). Protect area with heavy material securely.	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				
10		Check that Special Personnel Certifications in Place. identify Proper PPE to be Used.	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	Paint Superintendent MTAC Foreman				
11		Is the required Special Equipment on site to do Work (Paint Pumps / Chartec Pumps, Spider, etc.)?	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	Paint Superintendent MTAC Foreman				

ID	Status	Task	Initial T-30 Days (days)	Final T-5 Days (days)	Person Responsible for task completion	Required Participants	Signed Off By	Date Started	Date Completed	Comments / Actions Cannot be left blank if NA is selected
12		Identify if Work at Heights Required : Complete Working at Heights Questionnaire and obtain required signatures	Yes / No / NA	Yes / No / NA	Paint Superintendent	MTAC Foreman Paint Superintendent				
13		Is Pre Paint Work (valve material changeouts, damaged equipment, etc.) complete?	Yes / No	Yes / No	Paint Superintendent	Paint Superintendent Ops Rep. MTAC Foreman				
14		Identify Overhead & any other SIMOPs work (over/around targeted paint areas).	Yes / No / NA	Yes / No / NA	Paint Superintendent	Paint Superintendent Ops Rep. MTAC Foreman				
15		Identify Special Environmental Waste Needs & Ensure proper persons are notified. HSE Tech etc. (cadmium, lead, ect.) ordering drums etc.	Yes / No / NA	Yes / No / NA	Paint Superintendent	Paint Superintendent Ops Rep. MTAC Foreman				
16		Identify if Over Water Work Required.	Yes / No	Yes / No	Paint Superintendent	Paint Superintendent Ops Rep. MTAC Foreman				
17		Identify if Confined Space / Special Permits Work Required.	Yes / No	Yes / No	Paint Superintendent	Paint Superintendent Ops Rep. MTAC Foreman				
18		Identify Electrical Hazards.	Yes / No	Yes / No	Paint Superintendent	Paint Superintendent Ops Rep. MTAC Foreman				

ID	Status	Task	Initial T-30 Days (days)	Final T-5 Days (days)	Person Respon- sible for task completion	Required Partici- pants	Signed Off By	Date Started	Date Completed	Comments / Ac- tions Cannot be left blank if NA is se- lected
19		Identify Sensitive Equipment to be Protected.	Yes / No	Yes / No	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				
20		Identify Open Hole/Grating Re- quirements (any work requiring open holes).Paying special at- tention to Phenolic grating as it needs to be removed for proper coating application	Yes / No	Yes / No	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				
21		Ensure Skid Pans are Draining Properly Below and In Work Area.	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				
22		Evaluate Contractors Equip- ment for Damages / Wear (Identify any damage to Pro- duction and/or 3rd party equip- ment. Notify proper personnel).	Yes / No	Yes / No	Paint Superinten- dent	MTAC Foreman Paint Superintendent				
23		Ensure BMP Containment is in Place and followed.	Yes / No	Yes / No	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman Paint Inspector				
24		Identify Owner of Work Area.	Yes / No	Yes / No	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				
25		Identify Fresh Water Drops for (wash down water).	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				

ID	Status	Task	Initial T-30 Days (days)	Final T-5 Days (days)	Person Respon- sible for task completion	Required Partici- pants	Signed Off By	Date Started	Date Completed	Comments / Ac- tions Cannot be left blank if NA is se- lected
26		Identify Safety Devices (SDVs, BDVs, PSVs, ESDs, TSCs, Line of Sights, ect.).	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				
27		Identify Trip Tricky Tasks (any task that may shut down equipment and/or the platform).	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				
28		Identify Sweating Overhead Piping.	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	MTAC Foreman Paint Superintendent				
29		Complete Permit to Work (PTW).	Yes / No	Yes / No	Paint Superinten- dent	MTAC Foreman Paint Superintendent				
30		Complete Initiate Job Safety Analysis (JSA).	Yes / No	Yes / No	Paint Superinten- dent	MTAC Foreman Paint Superintendent				
31		Identify Proper Egress Paths.	Yes / No	Yes / No	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				
32		Assure Cranes are available as needed.	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				

ID	Status	Task	Initial T-30 Days (days)	Final T-5 Days (days)	Person Respon- sible for task completion	Required Partici- pants	Signed Off By	Date Started	Date Completed	Comments / Ac- tions Cannot be left blank if NA is se- lected
33		Ensure the execution crew is familiar with the previous failures (see photo examples listed at the end of this section) and understand that if they find items that look like this, they must stop the job and ask PEI for clarification.	Yes / No	Yes / No	Paint Superinten- dent	Paint Superintendent MTAC Foreman				
34		Has this equipment been per- manently air gapped and taken out of service?	Yes / No / NA	Yes / No / NA	Paint Superinten- dent	Paint Superintendent Ops Rep. MTAC Foreman				

Comments: List hazards found and mitigations below and on back as needed to capture findings of the 4 Whats.	What can go wrong? What can cause it to go wrong? What do we do if it goes wrong? What can we do to prevent it from going wrong?

Signatures:

PREVENTION & PROTECTION

Link: <https://eu001-sp.shell.com/sites/AAAAB5447/Pages/HSE.aspx>

USER GUIDE

Surface preparation and Painting Pre-Job Checklist - User guide to share readiness to safely work a given area and capture information in support of continual improvement

Communications and Sharing flow

After crew change Paint superintendent shall review, sign and date and review for completeness, pre job check list with work in progress & those waiting execution

30 days prior to working a paint scoped item - Paint Superintendent, Paint crew members, Paint Inspector, Ops. Rep., HSE Advisor and area owner –

Special Call Out Inspections and reports of past inspections (L1 Inspection, API 570, API 510, L2 Inspection - Prior to any power tool or blasting, team MUST get the PEI inspector to verify wall thickness and provide go/no go approvals.

5 days prior to working Paint Superintendent and Paint Inspector to review the select pre job check list for readiness and follow up as needed to assure the job is ready for execution

Break In Items Shall have a pre job check list done prior to execution of work to assure all possible hazards have been properly mitigated to manage exposures

Document reporting and filing

Paint Inspector shall review pre job check list for completeness and upload it in IMS.

- 1 Team members required to attend 30 day pre walk down. (Wet ink on back of pre job walk down sheet)**
Paint Inspector, Superintendent, Paint crew members, Ops. Rep., PEI , HSE Advisor, area owner
Questions to ask for each category on pre job check list and leave 2 lines open for follow up write in comments.
What can go wrong?
What can cause it to go wrong?
What do we do if it goes wrong?
What can we do to prevent it from going wrong?
- 2 Paint Superintendent and Paint Inspector to review the select pre job check list for readiness and follow up as needed to assure the job is ready for execution**
5 days prior to working.
- 3 Break In Items Shall have a pre job check list done prior to execution of work to assure all possible hazards have been properly mitigated to manage exposures**
Walk down Attendees Paint Inspector, Superintendent, Paint crew members to perform the work, Ops. Rep., PEI when on location, HSE Advisor, area owner
What can go wrong?
What can cause it to go wrong?

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What do we do if it goes wrong?

What can we do to prevent it from going wrong?

- 4 **In cases where the area to work is not accessible until rigged - A follow up walk down of areas that can only be accessed from rigging shall be walk down and hazards documented and report before starting surface preparation.**

Walk down Attendees Paint Inspector, Superintendent, Paint crew members to perform the work and others as needed for support

What can go wrong?

What can cause it to go wrong?

What do we do if it goes wrong?

What can we do to prevent it from going wrong?

- 5 Paint Superintendent shall review for completeness with Paint Inspector, Scan the document pages and name as CAIR number and description and send to Paint Inspector

Document reporting and filing Link to Asset paint team folders:

Paint Inspector shall include the scanned list in IMS on the ECH associated with the CAIR

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PREVIOUS FAILURES

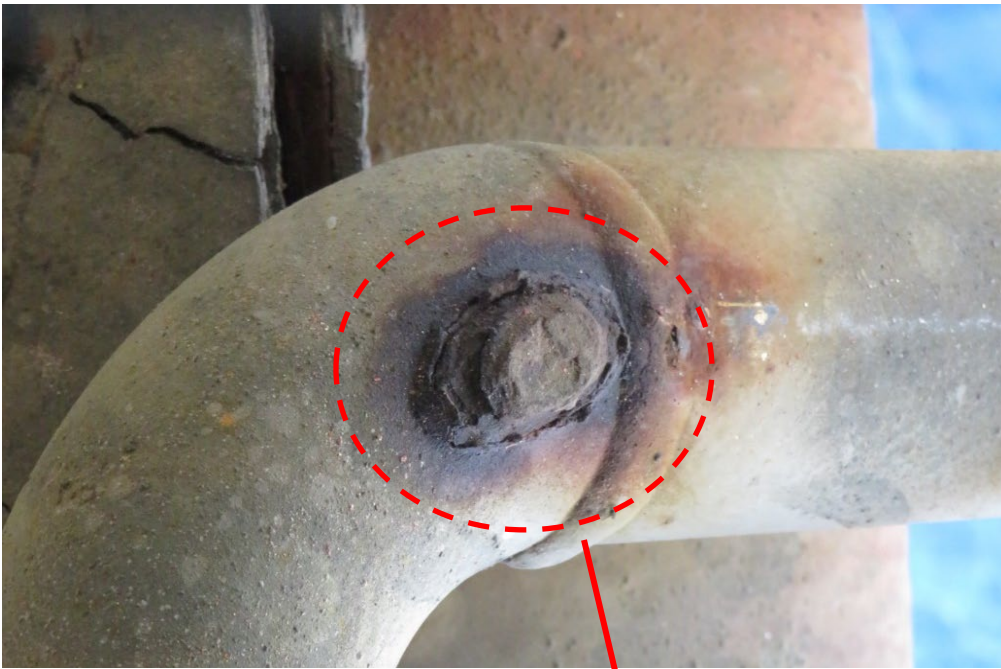
IF THE PIPE YOU'RE WORKING ON LOOKS LIKE THIS, STOP AND TALK TO THE ASSET INSPECTOR



Corrosion blister of a large size

Flare line, small diameter, thin wall





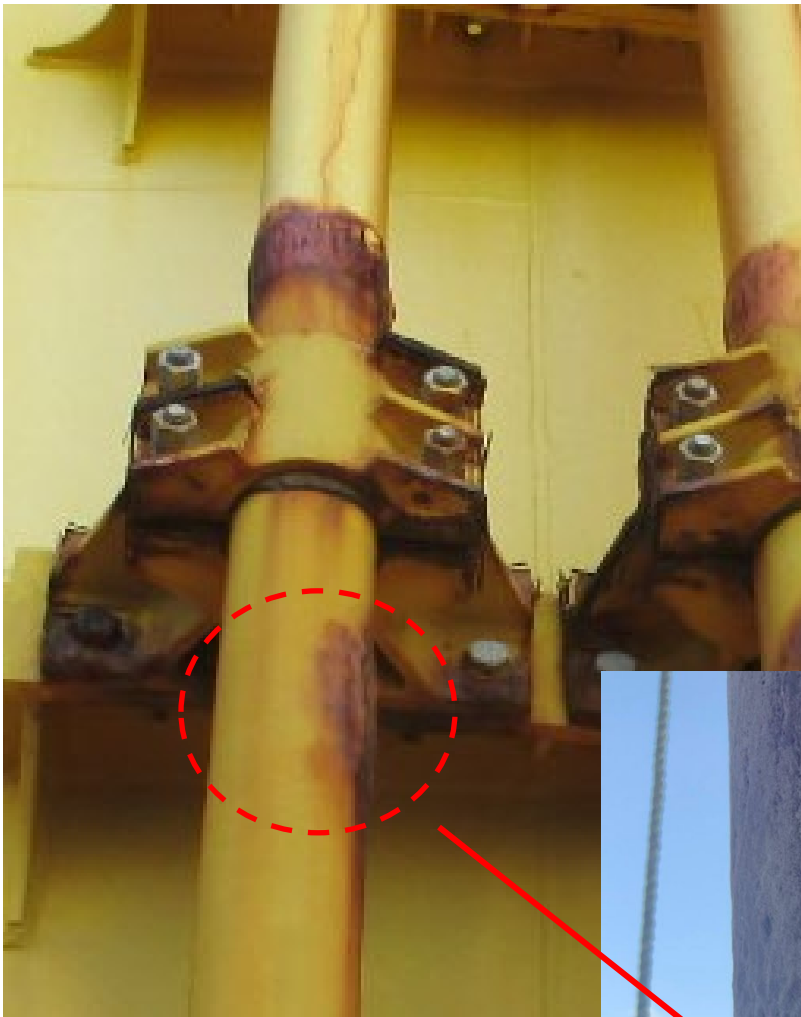
Corrosion blister of a large size
Closed drain, small diameter, thin wall





Point of contact
corrosion
Flare line, large di-
ameter, thin wall
Aggressive corro-
sion from the POC





General corrosion on thin wall

Line corrosion is a good indicator that severe wall loss has occurred

Vent line, large diameter, thin wall

