# STANDARD (PET-HSE00-HX-STD-00001)

# Health, Safety and Environment

## Objective

To define the minimum performance requirements and controls for managing Health, Safety and Environment (HSE) risks within Petroleum that are not outlined within *Our Requirements* (formally *Group Level Documents*) or globally standard legal requirements.

**Note:** Where external documents are referenced within the Standard, the intent is for those documents to be applied as minimum expectations. The use of further referenced material (secondary or otherwise) is at the discretion of local management unless required by regulations.

## Audience

Employees and contractors working on behalf of Petroleum Deepwater (Woodside Energy).

**Note:** This standard applies to contractors unless formally agreed to (and documented) through the *Petroleum Contractor Management Framework Standard* (PET-SUP68-SU-PRD-00001).

## Content Administrator

Jason Flockton, Senior Personal Safety Adviser

## Document Signatures

| Role | Position Title | Name | Signature |
|---|---|---|---|
| **Approver** | VP HSEQ Projects | Karelis Holuby | *Signature on file – refer to Memorandum: Heritage BHP Petroleum HSE MS Post-Merger Update* |

***Disclaimer:***
*This document has been updated to meet post-merger requirements. Updates have been restricted to rebranding of logo, company name and revision number and date. Updates have not impacted the design or functionality, or taken away from original intent, of the document.*

PART OF A BETTER FUTURE

Woodside Energy

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## Health and Safety

The risk of harm to personnel is reduced by implementing additional minimum controls not outlined in ***Our Requirements - Safety*** and ***Our Requirements – Health***.

## Permit to Work

**Implement a Permit to Work process that identifies and defines the criteria for "permitted" work activities and their subsequent management through the Permit to Work process.**

Designate personnel to perform the process roles defined below:

- Work Planner
- Plan Verifier (*electronic PTW systems*)
- Permit Authorizer
- Permit Issuer
- Control Room Operator (*electronic PTW systems*), and
- Permit Holder
- Comply with the Permit to Work requirements within Appendices 2.1 to 2.3 – Permit to Work Requirements.
- Train personnel involved in the use of the *Permit to Work Processes* in accordance with the following:

| Training Module | Process Role |
|---|---|
| Permit to Work Application | Work Planner<br>Plan Verifier (*electronic PTW systems*)<br>Permit Authorizer<br>Permit Issuer<br>Control Room Operator (*electronic PTW systems*)<br>Permit Holder |
| Permit to Work Awareness | Every person that works under a Permit to Work |

## Isolation

**Implement an isolation process that identifies and defines the criteria and types of isolation and their subsequent management through the isolation and permit to work processes.**

Designate personnel to perform the process roles defined below:

- Isolation Authority (Planner)
- Isolation (Plan Verifier)
- Isolation Authority (Isolator)
- Isolation Verifier
- Isolation Owner

Comply with the Isolation requirements within Appendices 3.1 to 3.4 – Isolation Requirements.

Train personnel involved in the use of the *Isolation Processes* in accordance with the following:

| Training Module | Process Role |
|---|---|
| Isolation Application | Isolation Authority (Planner)<br>Isolation (Plan Verifier)<br>Isolation Authority (Isolator)<br>Isolation Verifier<br>Isolation Owner |
| Isolation Awareness | Every person that works under an Isolation |

## Road Going Vehicles

**Minimum controls are implemented to mitigate significant and material risks associated with road going vehicles used for PETROLEUM DEEPWTER (WOODSIDE ENERGY) business purposes.**

- Establish and document traffic management controls in Company owned and managed locations (including temporary sites) in accordance with Appendix 4.1
- Verify all new Company and contractor owned or leased light vehicles meet the following requirements relevant to the region of operation and year of vehicle manufacture:
  - USA, Canada, Mexico: IIHS *Top Safety Pick+ (preferred), IIHS Top Safety Pick or NTSA 5 Star*
  - Australia: 5 Star ANCAP
  - Trinidad and Tobago: depending on country of supply, 5 Star NCAP, IIHS *Top Safety Pick+ (preferred), IIHS Top Safety Pick or NTSA 5 Star*
  - Verify, where relevant, any optional safety equipment required to achieve the maximum NCAP / IIHS / NTSA safety rating is fitted to the vehicle
- Obtain authorization for any planned aftermarket modifications after first confirming safety will not be negatively affected by the change, including any impact on the vehicle safety rating.
- Inspect and maintain ***road going vehicles*** in accordance with Original Equipment Manufacturer (OEM) and regulatory requirements, retaining associated records.

- Maintain a functional first-aid kit (ANSI/ISEA Class A or equivalent), road-side safety triangles and a reflective safety vest in Company and contractor owned or leased ***road going vehicles***.[1]
  - Ensure the content of the first-aid kit and first-aid training is appropriate to the risk of the journey and the availability of emergency response along the planned route
- Identify the personnel having accountability for chartering high occupancy vehicles (HOV) and ensure they are familiar with the controls associated with the HOVs and journey planning.
- Prevent potential fatal projectiles by minimizing and restraining loose items in the cabin and bed of vehicles.
- Secure loads on haulage trucks in accordance with *IOGP Report 365-18 Land transportation safety recommended practice – Guidance Note 18, Load Securement*
- Manage business related driving using ***road going vehicles***:
  - Conduct a risk assessment and establish controls for work related driving, including driver training requirements, based on the regional risk profile.
  - Obtain authorization (one-up supervisor/manager) for self-drive business-related travel in jurisdictions where the driver does not have a local driver's license.[2]
  - Require personnel to complete online defensive driver training prior to conducting business related driving. In-vehicle (coached) defensive driver training shall be completed for business related driving in high-risk environments as per the criteria in Appendix 4.1.
- Use an In-Vehicle Monitoring System (IVMS) to manage driver behavior in accordance with Appendix 4.1
- Establish limits on driving and duty hours consistent with *IOGP Report 365 - Land transportation safety recommended practice.*
- Obtain authorization (one-up supervisor/manager) and implement a *Journey Management Plan* (PET-HSE27-SF-TEM-00002) for vehicle journeys that meet any one of the criteria in Appendix 4.1.
- Require all vehicle occupants to wear seatbelts for the duration of the journey.
- Prohibit the use of mobile devices by drivers (other than for navigation purposes), including hands-free applications, unless safely parked with the brake on.
- Use the following criteria for car rental services:

| Country | Sedan Minimum Size | Preferred Brand / Model | Non-Preferred Brand / Model |
|---|---|---|---|
| USA / Mexico | Full Size | Kia, Hyundai, Ford, Subaru, Toyota, Volvo<br>• Dodge - RAM 1500 Pickup only<br>• Chevrolet - SUVs only | Chrysler, Dodge, Chevrolet, GMC, Jeep Wrangler, Volkswagen |
| Canada | Full Size | | |
| Australia | Full / Mid-Size | Kia, Hyundai, Ford, Isuzu, Mitsubishi, Nissan, Subaru, Toyota, Volkswagen, Volvo | Great Wall, Chrysler, GMC, Jeep Wrangler, Holden |
| UK | ≥ Group F | | Citroen, Fiat, Opel/Vauxhall |

[1] Short-term (less than one month) rental vehicles are exempt.

[2] Self-drive for business related travel permitted where a local driver's license is held.

| | | | |
|---|---|---|---|
| Continental Europe | Intermediate | Kia, Hyundai, Ford, Mitsubishi, Subaru, Toyota, Volkswagen, Volvo, Peugeot, Renault, Skoda, Volkswagen | |

**NOTES:**
**All Locations**: No coupes, sports cars, convertibles.
All luxury brands (e.g. Audi, BMW, Lexus and Mercedes) are acceptable where permitted by travel policy.
**Canada**: Rent only 4WD / AWD during November 01 – May 31, or as otherwise directed by the Head of Asset.

- Apply the ground travel mode principles in accordance with Appendix 4.1 when Woodside Energy Limited (PETROLEUM DEEPWATER (WOODSIDE ENERGY)) personnel are traveling by vehicle on business.

## Mobile Equipment

- Establish and document traffic management controls in Company owned and managed locations:
  - in accordance with Appendix 5.1 where it is a ***manned location***
  - using the Job Risk Assessment process in other locations.
- Prevent potentially fatal projectiles by restraining loose items in the cabin, on the pallet or the bed of mobile equipment prior to operation.
- Prohibit the use of mobile devices by mobile equipment operators, including hands free application, unless part of the positive communication plan or stopped at a safe location.
- Confirm equipment operators are qualified in accordance with regulatory requirements and that evidence of qualifications is available at the work location (apply US requirements if no regulatory requirements exist).
- Utilize ***mobile equipment*** designed for the task with the following functional minimum equipment:
  - Seat belt
  - Horn
  - Fire extinguisher
  - Wind shield wipers, where wind shields are installed
  - Original Equipment Manufacturer (OEM) User Manual available on-site.
- Prohibit use of golf carts and ***all-terrain vehicles*** (ATVs) (***utility vehicles*** (UTVs) are permitted).
- Prevent the use of modified ***mobile equipment*** unless signed-off by a professional engineer to confirm safety will not be negatively affected by the modification.
- Document ***mobile equipment*** inspections as per the OEM recommended checklist each shift prior to use, taking action to address identified defects.
- Maintain ***mobile equipment*** in accordance with OEM recommendations, with deviations signed off by a professional engineer to confirm safety will not be negatively affected.
- Implement controls to prevent uncontrolled movement of ***mobile equipment*** (e.g., apply parking brakes, dropping blades, chocks).
- Establish controls to manage significant risks associated with loading, unloading, towing and recovering ***mobile equipment*** (e.g., job risk assessment).

- Implement controls outlined in Appendix 5.1 to prevent pedestrian/equipment interactions. In scenarios where the minimum controls may be impractical, use the HSE Standard Variation Process[2] to identify alternative, risk-based controls for approval and subsequent implementation.

[2] Obtain authorization, using the *Management System Variation Request Form* (PET-HSE27-GV-FRM-00001), where the HSE controls or procedural requirements of Petroleum level management system content cannot be complied with.

## Explosives Operations

**Defines the minimum controls to manage material risks associated with any PETROLEUM DEEPWATER (WOODSIDE ENERGY) operations involving explosives.**

- All businesses using explosives shall designate a Control Owner to provide subject matter expertise for the use of explosives. The responsibilities of the Control Owner are further defined in Appendix 1.1.
- Engage licensed, or otherwise qualified, personnel/contractors to manage and use explosives.
- Ensure the nominated explosives contractor, at a minimum, has the people, processes, and equipment to meet the requirements provided in Appendix 6.1 that are based on an assessment of the hazards associated with transportation, storage, handling, use, and disposal of explosives.
- Undertake audits of personnel qualifications and licenses, service facilities, and equipment prior to contract award, and subsequently every two years in compliance with regulatory requirements and industry standard.
- Document and implement risk-based controls for explosives, using suitably qualified explosives expertise, include risk assessment, how the risk is communicated, and monitoring/review of identified risks over time.

## Dropped Objects

- The integrity of primary, secondary, and tertiary structures will be managed by the *Petroleum Integrity of Fixed Equipment (IFE)* document.
- Survey, identify, record, and monitor the integrity of objects/equipment affixed at height that have the potential to fall and result in a lost time injury or greater, using the DROPS Calculator, at an interval of every 12 months, alternating between an external third-party survey (utilizing working at heights) and an internal survey (conducted from ground/deck or fixed platform).
- For objects/equipment affixed at height, install and maintain secondary retention/safety securing (fit for purpose and properly designed, e.g. netting over light fixture, valve handle retention lanyard, etc.) or alternative mitigation, such as physical barriers for equipment components that have the potential to fall and result in a lost time injury or greater.
- A mapping of all threats associated with dropped objects can be found in Appendix 7.1, including where the controls can be found.

## Lifting Operations

- All lifting operations must be categorized (Appendix 8.1 Lift Categories), assessed, and lift plans developed (Appendix 8.2 Lift Plan Requirements) prior to execution.
- Utilize lifting device and rigging within limits identified by the manufacturer (to include weight, reach, angle, weather parameters, etc.).
- Prohibit the use of friction reliant lifting devices (e.g., plate and screw clamps) without documented approval from the Woodside Lifting Operational Authority (OA) and Lifting Technical Authority (TA), and in accordance with the Complex/Critical Lift Category (Appendix 8.1).
    - Use of friction reliant devices, where approved, must be done in strict compliance with the OEM's requirements.
- Pre-existing lift plans require review prior to lift to ensure nothing has changed (new plan is required if changes are made).
- Lift team must consist of:
    - Overhead crane, truck mounted crane, and non-crane lifting operations must have a minimum of two persons: The Crane Operator/Signaler (dual role during this type of operation) and Load Handler

  - Mobile and offshore crane operations must have a minimum of three persons: Crane Operator, Banksman/Signaler, and Load Handler
  - The Banksman/Signaler must not be involved in the actual handling of the load except during preparation of the lift. He/she must retain an overview of the lifting operation at all times.
- Obtain training, or verify training, in the specific role to be filled Training and Competency Requirements (Appendix 8.3).
- Maintain communication between operator and banksman/signal person during lifts.
- Segregate personnel from suspended loads.
- Manage lifting and/or rigging activities combined with rope access activities in accordance with the Complex/Critical Lift Category (Appendix 8.1)
- Ensure loads to be lifted are free from loose items prior to the commencement of lifting to prevent dropped objects.
- Use hands-free lifting unless explicitly defined in the risk assessment.
- Use, maintain, store, test functionality, and complete routine/pre-use inspection of (must be documented) lifting equipment in accordance with manufacturer recommendations and the Lifting Equipment Maintenance Requirements Matrix (Appendix 8.4) and Lift Equipment Requirements (Appendix 8.5).
- Condemn and quarantine damaged or defective lifting equipment that cannot be immediately removed from site by attaching an out-of-service tag and a red colored indicator (e.g., paint, tag).
- Prohibit the modification, repair, or addition to lifting equipment without documented approval from the Original Equipment Manufacturer.
- Require independent competent person to sign-off on crane assembly, commissioning or changes to crane configuration prior to use.
- Establish and use a rigging loft storage system (include register of equipment, check in check out process, quarantine area) for lifting equipment used on any established facility or long-term construction site.

## Presence of Hydrogen Sulphide (H2S)

- Select equipment, instrumentation, and piping for facilities expected to see sour service in accordance with NACE MR0175 / ISO 15156 Materials for use in H2S containing environments in oil and gas production.

## Safeguards on Fixed and Portable Equipment

- Verify that equipment with moving components has functional ***safeguards*** to prevent injury (e.g., guards, fail-safe switches).
- Prohibit the operation of equipment with ***safeguards*** removed or bypassed, unless additional controls have been implemented as part of a Sanction to Test (see *Isolation Procedure* PET-HSE27-SF-PRD-00005).

## Working with Pressure

- Establish a process to review and approve contractor equipment that interconnects with Company operated ***pressure containment systems*** and third-party to third-party interconnections occurring at PETROLEUM DEEPWATER (WOODSIDE ENERGY) managed locations (e.g., bulk transfers, well work-over, wireline operations, cementing, coil tubing, fracking).

- Inspect, maintain, and restrain flexible hoses and temporary piping that has the potential to cause serious injury in the event of a connection failure (e.g., hose whipping).
- Confirm pressure relief device(s) are installed on ***pressure containment systems*** before testing.
- Manage tests of ***pressure containment systems*** in accordance with a documented test plan.
- Implement controls to protect personnel from unanticipated pressure release during pressure testing and operational activities (e.g., exclusion zones, barriers, pressure relief directed away from safe zones).
- Test ***pressure containment systems***, including associated process control and safety devices, prior to placing the equipment into service and thereafter on a risk-based frequency while adhering to regulatory requirements.

## Radioactive Materials

- Engage licensed or otherwise qualified contractors to manage and use ***radioactive materials***.
- Document and implement radioactive materials management controls that are based on an assessment of the hazards associated with transportation, storage, handling, use and disposal of radioactive materials and include:
  - Access control to areas where radioactive materials are used or stored, including clearance zones
  - Exposure controls to personnel through all stages of operations using radioactive materials, including transportation, storage, handling and disposal.

## Naturally Occurring Radioactive Materials (NORM)

- Evaluate the potential for NORM in Company owned and managed locations.
- Where a NORM risk is identified, develop and maintain a NORM monitoring (survey) program and NORM management plan.
- The NORM management plan must include personnel exposure and contaminated material handling management controls according to applicable country and local requirements.

Note: In the absence of specific regulatory controls, the NORMS management plan shall be in accordance with the IOGP Managing Naturally Occurring Radioactive Material (NORM) Guidelines.

## Confined Space Entry

**Establish controls for the identification of confined spaces and implement processes to make the confined space atmosphere and physical conditions safe and habitable prior to entry and commencement of work activities. *Note: Where the work activity can be conducted without personnel entry to the confined space, this shall be the default position.***

- Use the *Confined Space Entry Decision Tree* (Appendix 9.1) to determine if a location meets the criteria for classification as a Confined Space.
- Undertake a formal risk assessment of the confined space. A Risk Assessment Template (PET-HSE27-SF-FRM-00015) is provided, but not mandated where a more detailed Risk Assessment is deemed necessary.
- Develop a "Confined Space Entry Safe Work Plan" (Appendix 9.2) to ensure all hazards impacting the safe entry, residence and exit of personnel have been removed, or suitable and sufficient controls are put in place to allow safe entry of personnel when atmospheric or physical conditions within the space cannot be made fully acceptable.

- Implement a decontamination process to remove hazardous materials/substances and ensure acceptable atmospheric conditions Appendix 9.3 – "Permit-Required Confined Space Control Requirements."
- Where work activities within a confined space cannot be avoided, implement *Permit to Work* (PET-HSE27-SF-PRD-00006) and Isolation (PET-HSE27-SF-PRD-00005) to remove hazardous energy sources from the confined space and determine applicable controls for personnel entry.
- Work activity to be conducted within the confined space shall be conducted under a separate independent permit to work.
- Where the confined space atmosphere has been managed to ensure a breathable atmosphere is in place, initial entry shall be conducted with the use of Self-Contained Breathing Apparatus (SCBA) or a Cascade Air System.
- Comply with the requirements of Appendix 9.3 – Permit-Required Confined Space Control Requirements.
- Comply with the requirements of Appendix 9.4 – Non-Permitted Confined Space Control Requirements.

## Working at Height

**To establish a safe practice and controls for working at heights activities that are 6 feet (1.82 meters), or more, above a surface or area to which an employee could fall (Appendix 10.1).**

**Note: For all shore-based facilities supporting GOM, follow the local regulatory requirements of 4 feet (1.21 meters).**

- Determine work at height method using the "Work at Height Decision Tree" (Appendix 10.2) seek input from competent person if necessary.
- Complete Job Risk Assessment utilizing controls listed in the relevant "Work at Heights Control Requirements Matrix" (Appendix 10.3) and seek input from competent person if necessary.
- Follow required steps for permit to work as required in *Petroleum Permit to Work Procedure* PET-HSE27-SF-PRD-00006. (Exception – ladders utilized for access and egress only, green field projects work or routine activities utilizing fixed elevated work platforms on drilling rig).
- Review job risk assessment and supporting documents, confirm equipment is ready for start of work (refer to Appendix 10.3).
- Engage qualified contractors to manage working at height activities.
    - Ensure the nominated working at height contractor has, at a minimum, the people, processes and equipment meeting the requirements outlined in Appendix 10.3.

## Management of Electrical Work

**These requirements apply to all high and low voltage systems and equipment, or any other electrical system which may present the risk of electrical shock during operations, maintenance, or installation activities.**

**As a minimum the following applies:**

- Electrical work shall be done only by competent electrical persons or be supervised by a competent electrical person.
- All electrical systems, equipment, and conductors shall be considered live until proven dead.
- All work that has the risk of injury via electric arc or electric shock shall take place within an established control of work system.

- No electrical work is permitted on live systems with exception where there is no reasonable alternative if:
    - The work could not be carried out effectively if the installation was de-energized;
    - The health or safety of one or more persons would be put in imminent and significant danger if the installation (or part of) was de-energized to do the work;
    - It is not possible to test, measure the performance of or detect or locate faults or defects in the electrical installation, or part of the installation, unless it is energized.
- Ensure all electrical systems and equipment are correctly labeled, visible, and identified (this does not include small fittings; light switches, plugs, outlets, etc.)
- Ensure all electrical systems and equipment (temporary and permanent) are adequately designed (to include grounding requirements), identified in drawings and updates are made anytime there is a change
- No electrical work shall be performed by lone workers.
- Portable electrical tools shall only be utilized with an RCD/Ground Fault Circuit Interrupter and cords protected from damage (i.e. cord bridges, blocking doors open, etc.)
- All persons working on electrical equipment and systems shall have the correct PPE for the task (Appendices 11.1 to 11.5).

## Aviation Operations

**The risk of harm to personnel is reduced by implementing additional controls to those outlined in *Our Requirements - Aviation*.**

- Designate and obtain authorization for a Focal Point to manage aviation operations, integrating minimum accountabilities defined in Appendix 1.1 into the assigned person's role profile.
- Require all ***employees*** and ***contractors*** working offshore to hold a valid certificate of medical fitness that meets PETROLEUM DEEPWATER (WOODSIDE ENERGY)'s minimum requirements as outlined in the PET Medical Assessment and Surveillance Procedure (PET-HSE27-HH-PRD-00003).
- Require, where possible and practicable, provision of Category A Emergency Breathing Systems (CA-EBS) for helicopter passengers and crew travelling over water on a PETROLEUM DEEPWATER (WOODSIDE ENERGY) chartered helicopter.
- Require ***employees*** and ***contractors*** travelling over water on a PETROLEUM DEEPWATER (WOODSIDE ENERGY) chartered helicopter to complete an Offshore Petroleum Industry Training Organization (OPITO) recognized cold or tropical water Basic Offshore Induction and Emergency Training with CA-EBS (BOSIET/TBOSIET +CA-EBS) and attend Further Offshore Emergency Training with CA-EBS (FOET +CA-EBS) every 4 years.[3]

[3] During a 2-year transition period granted by OPITO, personnel with HUET or T-HUET qualifications have until Feb 28th 2020 to complete a one day FOET +CA-EBS course. Those not upgrading to FOET +CA-EBS by this date must instead attend the initial three day BOSIET / T-BOSIET +CA-EBS before being eligible for FOET +CA-EBS refresher training.

- Require ***employees*** and ***contractors*** travelling offshore in Canadian jurisdictional waters to comply with the medical fitness and training requirements of the *Atlantic Canada Offshore Petroleum Standard Practice for the Training and Qualifications of Offshore Personnel*. [4]
- Submit a Variation Request (PET-HSE27-GV-FRM-00001) to obtain authorization and maintain a record for specific instances where a passenger cannot meet the training requirement, confirming that the untrained passenger will be accompanied by a BOSIET / TBOSIET +CA-EBS trained passenger able to activate the emergency exit if needed.

## Diving, Remotely Operated Vehicle (ROV) and Marine Operations

**Minimum controls are implemented to mitigate significant and material risks associated with any diving, ROV or marine operation planned and executed on behalf of PETROLEUM DEEPWATER (WOODSIDE ENERGY).**

### Diving and ROV Operations

- Conduct diving operations only where use of a remotely operated vehicle or alternative technologies is not reasonably practicable.
- Design, engineer and plan underwater operations to minimize the need for divers and, where they must be used, the time they are exposed to in-water operations
- Engage appropriately qualified diving expertise meeting competency requirements of *IMCA Information Note TCPC 12/04 (IMCA C)* before:
  - awarding a contract for work that involves diving
  - changing the scope of a diving program
- Prohibit any use of SCUBA, hookah diving or swimmer techniques (including when undertaking environmental sampling / surveys)
- Use saturation diving techniques at depths greater than 60-feet (18-meters) unless alternative risk-based controls are documented and authorized.
- Prohibit the use of in-water or surface decompression techniques when diving from offshore hydrocarbon facilities in active production.
- Ensure the nominated diving contractor has the people, processes and equipment meeting the requirements of the International Marine Contractor Association (IMCA) International Code of Practice for Offshore Diving.
- For saturation diving operations:
  - Develop a *Project Hyperbaric Evacuation Plan* meeting the requirements of IOGP 478 – *Performance of saturation diving emergency hyperbaric evacuation and recovery, Appendix A.*
  - Locate a Hyperbaric Reception Facility (HRF) and supporting equipment to enable safe connection of a Self-Propelled Hyperbaric Lifeboat (SPHL) to the HRF within 75% of the SPHL survival endurance capability as demonstrated by a thermal balance assessment based on worst case ambient sea and air temperatures for the location and period of diving operations.

[4] Canadian offshore survival and medical fitness requirements are more stringent than most countries and have a 3 yearly refresher requirement. The referenced standard should be read carefully to avoid personnel experiencing significant delays in operational deployment.

  - The HRF may be a dedicated or shared facility. If it is a shared (non-owned / operated) facility, there must be a formal contract in place between the diving contractor and the HRF owner operator which assures access in the event of an emergency and clearly defines accountabilities for all aspects of HRF operations.
- Undertake audits of personnel, plant and equipment prior to commencement of diving or ROV operations using suitably qualified personnel meeting the competence requirements of IMCA D 07/13 for diving operations, and IMCA C 005 for ROV operations.
- Document, obtain authorization and implement risk-based controls for diving operations based on a risk analysis involving appropriately qualified diving expertise.

### Marine Operations

- Designate and obtain authorization for a Focal Point to manage marine operations, integrating minimum accountabilities defined in Appendix 1.1 into the assigned person's role profile.
- Comply with the Marine Management Procedure (PET-HSE27-SF-PRD-00014):
  - when awarding a contract for work that involves a marine vessel
  - when changing the scope of activity, a marine vessel was originally contracted to perform
  - before introducing a marine vessel not previously approved for use
- Close-out all ***high priority audit findings*** before putting the marine vessel into service.
- Revalidate the Offshore Vessel Audit annually for vessels engaged for extended periods.
- Document, obtain authorization and implement controls for marine operations based on a risk analysis that involves personnel with marine expertise and include the minimum requirements provided in Appendix 12.1.

## Security and Emergency Management

**Implementation of additional controls not outlined in *Our Requirements - Security and Emergency Management* further reduces the risk of harm to employees, contractors, Company assets and reputation.**

### Security

- Designate and obtain authorization for a Focal Point within the HSE Function to manage security operations, integrating minimum accountabilities defined in Appendix 1.1 into the assigned person's role profile.
- Document, obtain authorization and implement controls based on a risk assessment of security threats identified and risk ranked in accordance with *Our Requirements - Risk Management*.
- Include, as a minimum, an analysis of the following threats in the security risk assessment:
  - ***armed conflict***
  - ***explosives remnants of war (ERW)***
  - ***terrorism***
  - ***civil unrest***
  - ***crime***
  - ***information / cyber theft***
  - ***extreme activist action***
  - ***kidnap for ransom or extortion***
  - ***piracy***

- Review and revalidate the security risk assessment at the following frequency based on the country security risk level (available through the Principal Security) and occurrences as defined below.

| Risk Level | Review Period |
|---|---|
| Low risk: | every 5 years |
| Medium risk: | every 3 years |
| High risk: | annually |
| Extreme risk: | every 6 months |
| Lessons identified through training exercises | within 90 days |
| Following a significant security-related event | within 60 days |
| Following material change in operational activity | within 30 days |

## Crisis and Emergency Management

- Develop a tiered emergency response structure (FRT/IMT/EMT)[5], with associated reporting relationships, that uses the National Incident Management System's (NIMS) Incident Command System (ICS).
- Obtain authorization and implement documented emergency response plans[6] that include the minimum inputs defined in Appendix 13.1 to support the response structure.
- Conduct training and exercises in accordance with Appendix 13.2.
- Maintain a sufficient number of trained personnel for responding to credible emergency scenarios based on material risks, including those of a protracted nature, with a response team duty roster provided to the Emergency Crisis Center (ECC).
- Provide and maintain emergency response resources matched to credible emergency scenarios based on material risks, documenting critical resources within response plans.
- Maintain an approved Medical Response Plan in accordance with the PET Injury and Illness Case Management Procedure (PET-HSE27-HH-PRD-00002).

[5] Where a campaign or project is in the boundary of an existing Production Unit, the Production Unit IMT Plan will typically support the response. Where this is not the case, the EMT will typically support the response.

[6] For contractor managed locations/activities, the interface between the contractor emergency response plan and the WEL Petroleum plan must be documented.

## Environment

**Implementation of additional controls not outlined in *Our Requirements – Environment and Climate Change* further reduces the risk of environmental harm from Company activities.**

- Implement a plan, where noise from seismic operations may impact marine fauna, in accordance with the Joint Nature Conservation Committee guidelines for minimizing the risk of injury and disturbance to marine mammals from seismic surveys or industry equivalent.
- Utilize waste disposal facilities and vendors that have been vetted and approved through the *Waste Vendor Audit* Procedure (PET-HSE27-EN-PRD-00008).

### Water Stewardship

Manage water resources in accordance with the PETROLEUM DEEPWATER (WOODSIDE ENERGY) water stewardship position statement, ***Resource Engineering Centre of Excellence - Drinking (Potable) Water Standard, Water Data Management Standard and the Technical Centre of Excellence PETROLEUM DEEPWATER (WOODSIDE ENERGY) Water Management Standard –Our Standards.***

Establish the supply and access to safe and reliable drinking water in accordance with *Resource Engineering Centre of Excellence - Drinking (Potable) Water Standard – Our Standard* and (PET-HSE27-HH-PRD-00004) Occupational Exposure Management Procedure.

- Where applicable actions to be tracked within the relevant PETROLEUM DEEPWATER (WOODSIDE ENERGY) work management systems (i.e. 1SAP or CMO)

Ensure that material water data is collected, stored and managed in accordance to *Resource Engineering Centre of Excellence – Water Data Management Standard – Our Standard* and water data management plan (PET-HSE00-EN-PLN-00001)

- Where applicable actions to be tracked within the relevant PETROLEUM DEEPWATER (WOODSIDE ENERGY) work management systems (i.e. CMO)
- Where applicable ensure the data objectives are aligned with Our Requirements HSEC Reporting
- Where applicable ensure water objectives for collection and storage is aligned to the principles in appendix 1 in the water data management standard

Establish an integrated, holistic approach to water management where Petroleum operates per the *Technical Centre of Excellence PETROLEUM DEEPWATER (WOODSIDE ENERGY) Water Management Standard –Our Standards* and the Petroleum level Water Management Strategic Framework (PET-HSE00-EN-PLN-00002)

- Review annually the Petroleum level Water Management Strategic Framework (PET-HSE00-EN-PLN-00002)
- Consider the RACI in appendix 2 of the Water Management Strategic Framework (PET-HSE00-EN-PLN-00002) and ensure alignment with the accountabilities and actions where applicable
- Track and complete relevant actions in PETROLEUM DEEPWATER (WOODSIDE ENERGY) work management systems (i.e. 1SAP or CMO)

- Develop and implement a catchment water management plan to control regional scale water risks and incorporate annual review of context based water target. Development & management of Context based water targets is described in the Water Management Strategic Framework (PET-HSE00-EN-PLN-00002)
- Review LOA/5YP freshwater forecasts and update annually. See appendix 3 in the Water Management Framework
- Maintain a quantitative operational water balance (PET-HSE00-EN-PLN-00004) which considers all primary water inflows, users, treatments, storages, losses, diversions and discharges and review annually as outlined in each assets water management plan

## Health, Safety and Environment Regulatory

**Health, Safety and Environment regulatory obligations are managed to obtain and maintain compliance, including the monitoring and management of regulatory changes.**

- Use the CMO compliance management system, or approved equivalent system, to document HSE legal and other obligations (e.g., license conditions, permit obligations, consents, agreements and environmental commitments required to support PETROLEUM DEEPWATER (WOODSIDE ENERGY) activities) that can impact license to operate including:
  - roles(s) responsible for specific compliance obligations
  - list of external regulations required to maintain license to operate
  - list of external permit conditions required to maintain license to operate.
- Identify changes in HSE legal and other obligations matched to Company activities, updating the register as necessary to keep it current in accordance with the *Management of Regulatory Issues and Assurance Procedure* (PET-HSE27-EN-PRD-00007).
- Communicate applicable HSE legal and other obligations and associated tasks to personnel that have a role to support and manage compliance with the obligation(s).
- Maintain a process to periodically verify compliance by testing a representative sample of HSE legal and other obligations.

## HSE Governance

**Risks with HSE impacts are effectively managed by maintaining the integrity of HSE content within the Petroleum Management System, training personnel in HSE processes, and managing changes to HSE requirements.**

### HSE Content in the Petroleum Management System

- Engage the HSE Function for the identification, design and maintenance of processes and systems (i.e. HSE content) that support management of risks and legal obligations with HSE impacts, regardless of where this is documented or including where HSE is not the risk or functional owner.
- Maintain a mapping document, informed by the *Petroleum Management System Framework* (PET-PL00-SF-TEM-00001) and local content, to illustrate how the Petroleum Management System content meets management system expectations of HSE regulatory agencies.

- Utilize the process defined in the *Petroleum Document Control Procedure (Standards and Procedures)* (PET-IT36-RM-PRD-00001) to propose changes to Petroleum level HSE content, including those identified through the local effectiveness review.
- Apply the simplification principles in Appendix 14.1 when creating or revising HSE content.
- Comply (HSE Content Administrator) with the workflow requirements defined in Appendix 14.2 when creating or revising HSE content

## HSE Assurance and Verification

- Complete a local (Operation/applicable Function) HSE-MS certification review by end of each financial year in accordance with the template (PET-HSE27-GV-TEM-00001).
- Prepare a Petroleum level annual statement certifying the design, implementation and effectiveness of the Health, Safety, Environment and Community (HSEC) Management System.
- Plan, support and conduct HSE assurance activities in accordance with the *Regional HSE Assurance Manual* and the *Petroleum HSE Assurance Procedure* (PET-HSE27-GV-PRD-00001).
- Plan, support and conduct HSE Field Leadership activities in accordance with the *Field Leadership Program* (PET-HSE27-GV-PRD-00002).

## HSE Training

- Document a localized training needs analysis, informed by the *Petroleum HSE Training Catalogue* (PET-HSE27-GV-MTX-00001) and local regulatory requirements, identifying mandatory training for individual roles.
- Enter the outcome of the localized training needs analysis into the Petroleum Learning Management System and monitor execution of mandatory training.
- Revalidate the localized training needs analysis annually and whenever the *Petroleum HSE Training Catalogue* (PET-HSE27-GV-MTX-00001) is updated or there is a regulatory change necessitating it.

## Variation Management

- Obtain authorization, using the *Management System Variation Request Form* (PET-HSE27-GV-FRM-00001), where the HSE controls or procedural requirements of Petroleum level management system content cannot be complied with.

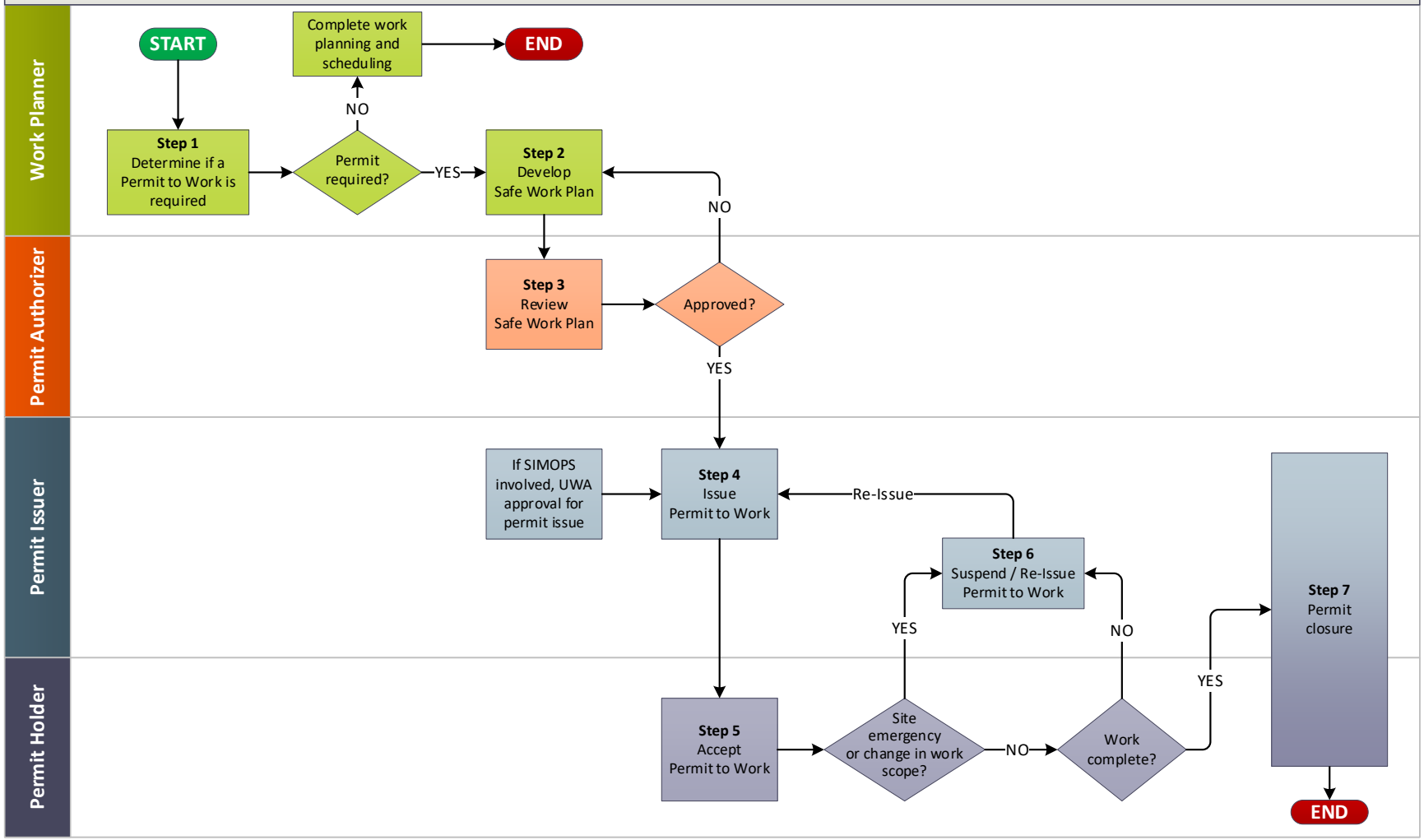
## Management of Change

- Conduct all change management activities in accordance with the Petroleum Management of Change Standard (PET-HSE00-SF-STD-00002).

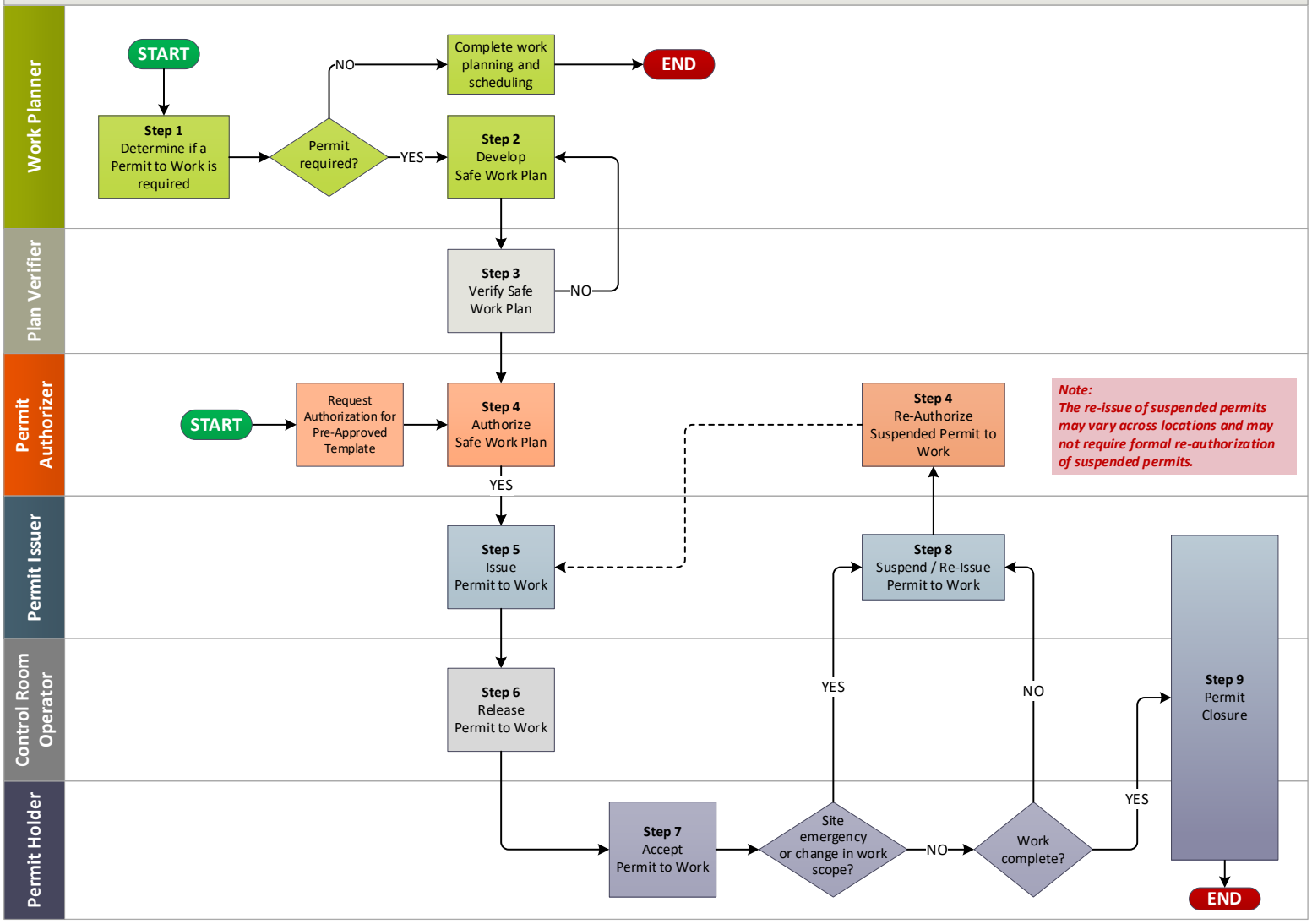
## Appendix 1.1 Focal Point Responsibilities

| Role | Minimum Responsibilities |
|---|---|
| **Aviation** | ▪ Maintain awareness of the Basic Aviation Risk Standard, *Our Requirements - Aviation* and the Petroleum *Aviation Management Procedure* (PET-HSE27-SF-PRD-00001).<br>▪ Participate in the selection and ongoing evaluation of vendors providing aviation services.<br>▪ Provide input to the Aviation Operational Reviews and other verification activities associated with the effective control of aviation activities.<br>▪ Liaise with the Principal S&I Safety approved and other Focal Points to exchange lessons learned and leading practice. |
| **Explosives** | ▪ Maintain knowledge of industry standards and regulations relevant to use of explosives.<br>▪ Participate in the selection and evaluation of vendors involved in the use of explosives.<br>▪ Provide input to the assessment of risk associated with the use of explosives.<br>▪ Ensure critical controls are updated when deficiencies are identified, or industry standards are revised.<br>▪ Identify critical controls and verification methods.<br>▪ Liaise with other explosive Control Owners and approved contracted specialists (SMEs) to exchange lessons learned and leading practice. |
| **Marine Operations** | ▪ Maintain relevant knowledge of industry standards and jurisdictional regulations.<br>▪ Participate in the evaluation and selection of marine vendors.<br>▪ Provide input to the assessment of hazards associated with marine operations.<br>▪ Maintain local documentation required by the HSE Standard and associated regulation for the safe execution of marine operations.<br>▪ Liaise with other Marine Focal Points to exchange lessons learned and leading practices.<br>▪ Engage, and keep informed, the Principal S&I Safety or Principal Marine Systems of marine activities. |
| **Security** | ▪ Maintain knowledge of relevant industry standards, practices, and regulations relevant to security in the area of responsibility.<br>▪ Maintain knowledge of local security risk, threats, and mitigation practices.<br>▪ Participate in the evaluation and selection of vendors involved in security related activities.<br>▪ Provide input to the assessment of risk associated with relevant security threats.<br>▪ Develop and maintain appropriate security plans, policies, and procedures to address identified relevant security risks.<br>▪ Liaise with other Security Focal Points and approved contracted specialists to exchange lessons learned and leading practice related to security operations. |

## Appendix 2.1 – Permit to Work Flowchart (Paper-Based Permit Systems)



## Appendix 2.2 – Permit to Work Flowchart (Electronic Permit Systems)



## Appendix 2.3 – Permit to Work Requirements

| Permit to Work Requirements (*Paper-based Permit Systems*) | Permit to Work Requirements (*Electronic Permit Systems*) |
|---|---|
| **Determining the Requirement for a Permit to Work and Develop Safe Work Plan** | |
| Work Planner to determine if a Permit to Work is required for the proposed scope of work by referring:<br>▪ Activities requiring a Permit to Work (below)<br>▪ Local requirements, over and above those detailed below, that mandate the need for a Permit to Work<br>**Note:** The Permit to Work process can be used for other activities outside of those mandated where supervision has determined that an additional level of work validation and authorization, other than normal supervision, is required.<br>**Note:** Where a *Permit to Work* is not required there should still be a formal methodology (Safe Work Plan, PRT, Work Instruction etc.) for conducting the work and consideration given to the inclusion of a Job Risk Assessment (JRA). | The Work Planner shall determine if a Permit to Work is required for the proposed scope of work by referring to:<br>▪ Activities requiring a Permit to Work (below)<br>▪ Local requirements, over and above those detailed below, that mandate the need for a Permit to Work<br>**Note:** The *Permit to Work* process can be used for other activities outside of those mandated where supervision has determined that an additional level of work validation and authorization, other than normal supervision, is required.<br>**Note:** Where a *Permit to Work* is not required there should still be a formal methodology (Safe Work Plan, PRT, Work Instruction etc.) for conducting the work and consideration given to the inclusion of a Job Risk Assessment (JRA). |
| **Identifying Activities that Require a Permit to Work (*common to Paper-based & Electronic PTW Systems*)** | |
| ***Confined Space Entry:*** The requirements for managing confined spaces and confined space entry are contained within the confined space entry section of the *Petroleum HSE Standard* (PET-HSE00-HX-STD-00001) and associated appendices (9; 9A; 10 & 11).<br>***Spark Potential:*** The use, or possible creation, of any source of ignition within a hazardous area. For example:<br>▪ Non-intrinsically safe, battery-operated tools.<br>▪ Motor vehicle or mobile equipment entry within 35-ft (10.5-m) of live plant.<br>▪ Opening live junction boxes.<br>***Hot Work (Open Flame):*** The use or production of a flame, spark or other high energy source of ignition that can ignite combustible materials:<br>▪ Onshore Facilities - within a radius of 35-ft (10.5-m) of live plant.<br>▪ Offshore Facilities - all open flame work requires a hot work permit regardless of distance from live plant unless there is designated safe burning area approved by the relevant regulatory agencies.<br>▪ Examples include Welding, cutting, brazing, or burning with a torch, welding with an electric arc. | |

| Permit to Work Requirements (*Paper-based Permit Systems*) | Permit to Work Requirements (*Electronic Permit Systems*) |
|---|---|
| ***Breaking Containment:*** Breaking into the containment envelope of a hazardous process or system that could potentially cause a serious injury or fatality (e.g., process spools, valves, vessels). Does not include routine sampling.<br><br>***Live Electrical Work:*** Work on live electrical equipment, or within the arc flash exclusion zones as defined by local regulatory entities, (where no local regulatory requirements exist, utilize the OSHA requirements).<br><br>***Cold Work:***<br>▪ Simultaneous operations (SIMOPs) that have the potential for a significant event, but do not fall under any of the other permit required activities.<br>▪ ***Ground disturbance*** or ***excavation*** inside the perimeter of a PETROLEUM DEEPWATER (WOODSIDE ENERGY) controlled location, excluding the exceptions defined in the *Ground Disturbance and Excavation* procedure (PET-HSE27-SF-PRD-00003).<br>▪ Diving operations<br>▪ For drilling and completions, the use of explosives is normally managed as "cold work". Use of explosives on a production facility would be addressed on a case-by-case basis and defaulted to hot work.<br>▪ Vessel bunkering of hazardous materials.<br><br>***Working at Height:*** The requirements for managing working at height are contained within the working at height section of the *Petroleum HSE Standard* (PET-HSE00-HX-STD-00001) and associated Appendices (12; 13 & 14). | |
| **Developing the Safe Work Plan** | |
| The *Work Planner* shall develop a *Safe Work Plan* by following the requirements below and commence development of the *Permit to Work* (where required, template PET-HSE27-SF-FRM-00012 is available). | The *Work Planner* shall develop a *Safe Work Plan* by following the requirements below and commence development of the *Permit to Work* (where required, template PET-HSE27-SF-FRM-00012 is available). |

| Activity | Safe Work Plan Requirements (*Common to Paper-Based & Electronic PTW Systems*) |
|---|---|
| **Confined Space Entry** | ▪ Use the *Confined Space Entry* Standard to determine if the space meets the criteria of a ***confined space*** and implement the requirements of Appendices 9; 9A; 10 & 11.<br><br>***Note:*** *In the USA, the Occupational Safety and Health Administration (OSHA) differentiates between a Confined Space and a Permit Required Confined Space. For the purpose of this Procedure, the PETROLEUM DEEPWATER (WOODSIDE ENERGY)* ***confined space*** *definition covers what OSHA defines as a Permit Required Confined Space.*<br><br>▪ Where hazardous energy sources are identified, use the *Isolation Standard* (PET-HSE00-HX-STD-00001) to plan and establish isolations.<br><br>▪ Complete a *Job Risk Assessment* (JRA) to identify specific hazards and controls for the tasks to be completed within the space. Separate permits shall be required for "entry into the Confined Space" and "work within the boundary of the confined space" work). |

| Permit to Work Requirements (*Paper-based Permit Systems*) | Permit to Work Requirements (*Electronic Permit Systems*) |
|---|---|
| **Hot Work (open flame)** | ▪ Use the *Hot Work (open flame) Permit* and Job Risk Assessment to prepare the job site to safely perform ***hot work*** (open flame).<br>▪ Where hazardous energy sources are identified, use the *Isolation Procedure* (PET-HSE27-SF-PRD-00005) to plan and establish isolations.<br>▪ Monitor atmospheric gas and record on the *Gas Test Log.* The required testing frequency shall be determined per the risk assessment and entered on the Gas Test Log.<br>▪ Identify a Fire Watch for the job, who must at a minimum:<br>○ be trained in the use of site gas detectors and firefighting equipment.<br>○ not perform other duties while designated as Fire Watch.<br>○ remain on location 30 minutes after completion of open flame activities.<br>▪ Complete a *Job Risk Assessment* to identify hazard controls for the specific task. |
| **Spark Potential** | ▪ Use the no flame *Hot Work Permit* to prepare the job site to safely perform ***hot work*** (non-flame).<br>▪ Where hazardous energy sources are identified, use the *Isolation Procedure* (PET-HSE27-SF-PRD-00005) to plan and establish isolations.<br>▪ Monitor atmospheric gas and record on the *Gas Test Log*. The required testing frequency shall be determined per the risk assessment and entered on the Gas Test Log.<br>▪ Complete a *Job Risk Assessment* to identify hazard controls for the specific task. |
| **Breaking Containment Certificate** | ▪ Use the *Breaking of Containment Certificate* to prepare for the safe execution of work that involves ***breaking containment***.<br>▪ Where hazardous energy sources are identified, use the *Isolation Procedure* (PET-HSE27-SF-PRD-00005) to plan and establish isolations.<br>▪ Monitor atmospheric gas and record on the *Gas Test Log*. The required testing frequency shall be determined per the risk assessment and entered on the Gas Test Log<br>▪ Complete a *Job Risk Assessment* to identify hazard controls for the specific task. |
| **Live Electrical Work** | ▪ Use the *Live Electrical Work Certificate* to prepare for safe work on electrical equipment. Arc Flash calculations for high voltage must be defined in accordance with local regulatory requirements (where local regulatory requirements do not exist, utilize OSHA requirements). All live electrical work must be carried out by a person qualified in accordance with local regulatory requirements.<br>▪ Where associated hazardous energy sources are identified (other than the live electricity), use the *Isolation* |

| Permit to Work Requirements (*Paper-based Permit Systems*) | Permit to Work Requirements (*Electronic Permit Systems*) |
|---|---|
| | *Procedure* (PET-HSE27-SF-PRD-00005) to plan and establish isolations.<br>▪ Complete a *Job Risk Assessment* to identify hazard controls for the specific task. |
| **Cold Work** | ▪ Complete a *Job Risk Assessment* to identify hazard controls for the specific task.<br>▪ Where hazardous energy sources are identified, use the *Isolation Procedure* (PET-HSE27-SF-PRD-00005) to plan and establish isolations.<br>▪ Use support tools, where relevant and available, for the given work scope (e.g., Ground Disturbance and Excavation Certificate (PET-HSE27-SF-CER-00001). |
| **Reviewing and Approving Safe Work Plan and Permit to Work** | |
| *Permit Authorizer* to review the *Safe Work Plan* for hazard identification, risk recognition and adequate controls:<br>▪ If the *Safe Work Plan* is not satisfactory, return the plan to the *Work Planner* with deficiencies identified.<br>▪ If plan is acceptable, Approve the *Permit to Work* (PET-HSE27-SF-FRM-00012) and move forward for work scheduling | *Safe Work Plan Verifier* to review the *Safe Work Plan* and Permit to Work for hazard identification, risk recognition, and adequate controls:<br>▪ If the *Safe Work Plan* is not satisfactory, return the plan to the *Work Planner* with deficiencies identified.<br>▪ If the *Safe Work Plan* is acceptable, verify the *Safe Work Plan* and *Permit to Work* and move forward for scheduling of the work. |
| **Authorizing Safe Work Plan and Permit to Work** | |
| | *Permit Authorizer* to review overall work schedule and authorize work if there are no simultaneous operations (SIMOPS) issues.<br>**Note:** Where required by the location/facility, the *Permit Authorizer* reviews and authorizes suspended permits for reissue. |
| **Issuing Permit to Work** | |
| ▪ *Ultimate Work Authority* to review overall work schedule and authorize work if there are no SIMOPS issues:<br>– *Ultimate Work Authority* countersigns the permit.<br>▪ *Permit Issuer* with the *Permit Holder*, to walk-down the job and verify controls in the *Safe Work Plan* are in place:<br>– *Permit Issuer* signs the permit authorizing work to commence if controls are in place.<br>▪ *Permit Issuer* (or qualified delegate) to periodically visit the job | *Permit Issuer* or qualified delegate with the *Permit Holder*, to review the Safe Work Plan and Permit to Work and verify controls in the *Safe Work Plan* are in place:<br>▪ *Permit Issuer* issues the permit authorizing work to commence if controls are in place.<br>▪ *Permit Issuer* or delegate (Area Authority) to periodically visit the job site to verify work and controls remain within the permit parameters. |

| Permit to Work Requirements (*Paper-based Permit Systems*) | Permit to Work Requirements (*Electronic Permit Systems*) |
|---|---|
| site to verify work and controls remain within the Permit parameters.<br>▪ *Permit Issuer* to register and display Permit to Work and associated documentation in accordance with locally determined practice, ensuring it is available to personnel involved in executing the work scope. | **Note:** Where practicable, a walk-down of the work site should take place between the Permit Issuer and Permit Holder. |
| **Releasing the Permit to Work (as required)** | |
| | Control Room Operator (CRO) reviews current state SIMOPs/Operating Conditions.<br>▪ *If there are no SIMOPS conflicts, Permit to Work is released.* |
| **Accepting the Permit to Work** | |
| *Permit Holder* **signs** Permit to Work accepting accountability to work within the parameters of the permit.<br>▪ *Permit Holder* holds JRA discussion or Toolbox Meeting to discuss plan and expectations with work team and assign actions from JRA, all members of the work team shall add their names to the *Permit to Work*.<br>▪ *Permit Holder* retains *Permit to Work* and associated documentation at work site.<br>▪ *Permit Holder* to stop work immediately and contact the *Permit Issuer* at any time the work scope changes or cannot be carried out in compliance with the permit conditions. | *Permit Holder* **accepts** *Permit to Work*, acknowledging accountability to work within the parameters of the permit.<br>▪ *Permit Holder* holds JRA discussion or Toolbox Meeting to discuss plan and expectations with work team and assign actions from JRA, all members of the work team shall add their names to the *Permit to Work*.<br>▪ *Permit Holder* retains *Permit to Work* and associated documentation at work site.<br>▪ *Permit Holder* to stop work immediately and contact the Permit Issuer at any time the work scope changes or cannot be carried out in compliance with the permit conditions. |
| **Suspending and Re-Issuing the Permit to Work** | |
| **Suspension** | |
| *Permit Holder* to engage the *Permit Issuer* to suspend the Permit to Work under the following conditions:<br>▪ work is not complete by the end of the shift, but it is intended to restart.<br>▪ work scope changes or cannot be carried out in compliance with the permit conditions. | *Permit Holder* to engage the *Permit Issuer* to suspend the *Permit to Work* under the following conditions:<br>▪ work is not complete by the end of the shift, but it is intended to restart.<br>▪ work scope changes or cannot be carried out in compliance with the permit conditions. |

| Permit to Work Requirements (*Paper-based Permit Systems*) | Permit to Work Requirements (*Electronic Permit Systems*) |
|---|---|
| ▪ a SIMOPs issue is identified that prevents the work scope being executed safely.<br>▪ *Permit Holder* and *Permit Issuer* (or qualified delegate) to visit the job site and confirm it is left in a safe condition.<br>▪ Permit Issuer and Permit Holder sign the 'Permit Suspension' section of the permit and then provide it to the *Ultimate Work Authority*.<br>▪ *Ultimate Work Authority* initials the 'Permit Suspension' section and then returns the Permit to Work to the *Permit Issuer* and *Permit Holder* in preparation for when work recommences.<br>**Note:** *Permit Issuer* can extend a Permit to Work for up to 14 hours total without suspension if deemed safe. | ▪ a SIMOPs issue is identified that prevents the work scope being executed safely.<br>*Permit Holder* and *Permit Issuer* (or qualified delegate) to visit the job site and confirm it is left in a safe condition.<br>*Permit Issuer* and *Permit Holder* sign the 'Permit Suspension' section of the permit. |
| **Suspension for emergency** | |
| The Permit to Work will automatically be considered suspended in the case of a site emergency:<br>▪ *Work team* is to make the job site safe if they are not in imminent danger.<br>▪ Where deemed necessary, the *Permit Issuer* or qualified delegate with the *Permit Holder* will visit the job site and verify that controls have not been adversely affected by the emergency before authorizing work to restart.<br>▪ *Permit Holder* to hold a Toolbox Meeting to discuss restart considerations with the work team. | The Permit to Work will automatically be considered suspended in the case of a site emergency:<br>▪ *Work team* is to make the job site safe if they are not in imminent danger.<br>▪ Where deemed necessary, the *Permit Issuer* or qualified delegate with the *Permit Holder* will visit the job site and verify that controls have not been adversely affected by the emergency before authorizing work to restart.<br>▪ *Permit Holder* to hold a Toolbox Meeting to discuss restart considerations with the work team. |
| **Suspension for Change in Work Scope** | |
| ▪ If the Permit was suspended for a change in work scope, *Permit Issuer* and *Permit Holder* review changes to *Safe Work Plan* before re-submitting to the *Permit Authorizer* **(Step 4)**. | ▪ If the Permit was suspended for a change in work scope, *Permit Issuer* and *Permit Holder* review changes to *Safe Work Plan* before re-submitting to the *Permit Authorizer* (**Step 4**). |
| **Reissue of Suspended Permit** | |
| Where deemed necessary, *Permit Issuer* or qualified delegate and *Permit Holder* to walk-down the job site to verify conditions have not changed prior to authorizing work to begin at the next scheduled | Where deemed necessary, the *Permit Issuer* or qualified delegate and *Permit Holder* will walk-down the job site to verify conditions |

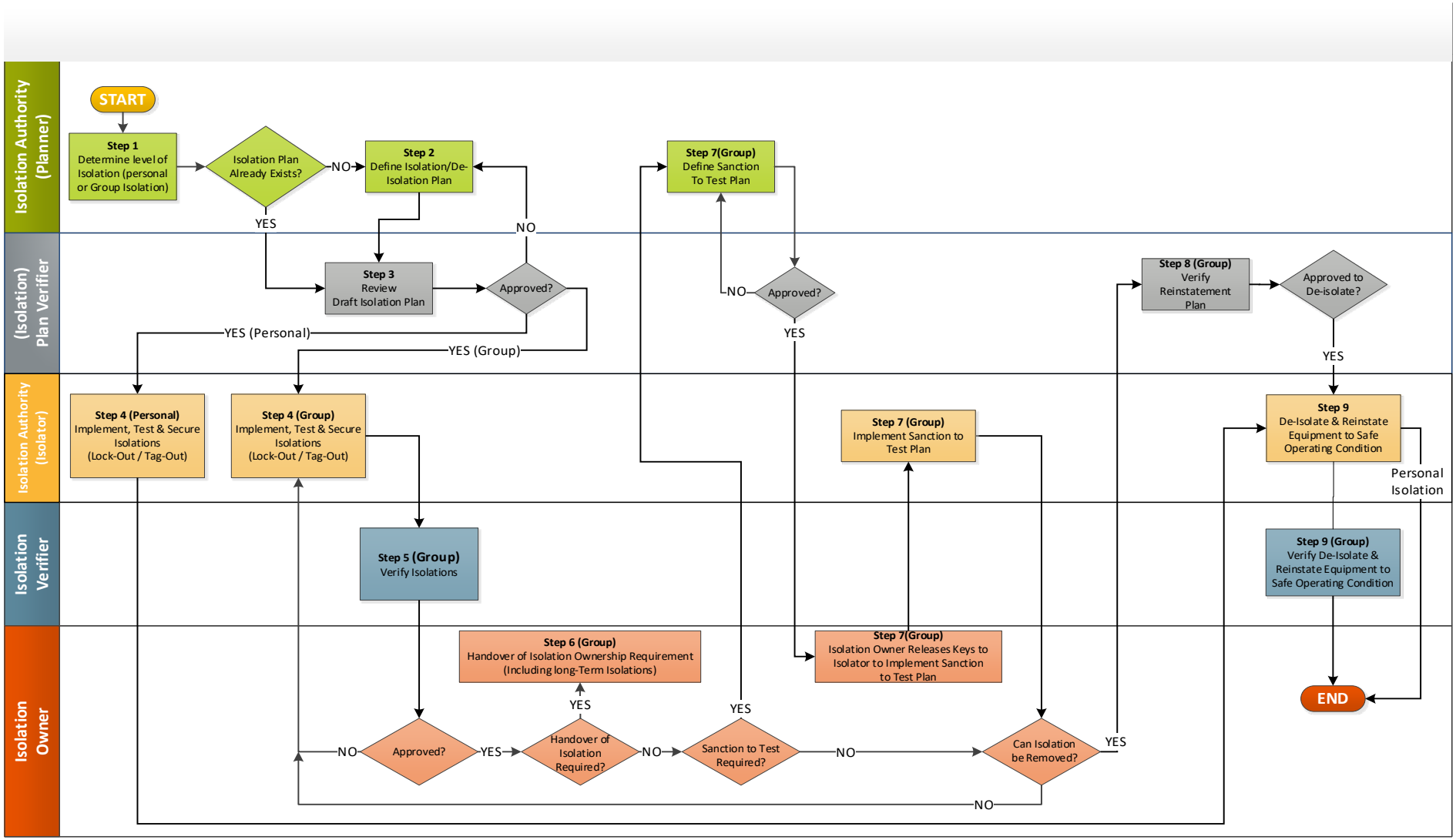
| Permit to Work Requirements (*Paper-based Permit Systems*) | Permit to Work Requirements (*Electronic Permit Systems*) |
|---|---|
| time:<br>▪ *Ultimate Work Authority* to initial 'Permit Re-Issue' section of the permit if there are no SIMOPs issues.<br>▪ *Permit Issuer* to sign the 'Permit Re-Issue' section of the permit.<br>▪ *Permit Holder* to sign the 'Permit Re-Issue' section of the permit accepting accountability to work in compliance with the permit conditions.<br>▪ Permit Holder holds Toolbox Meeting to discuss plan and expectations with work team before restart.<br>▪ *Permit Issuer* or qualified delegate to periodically visit the job site to verify work and controls remain within the permit parameters.<br>**Note: Paper-based** Permits have a maximum validity period of 14 cycles (based on a normal cycle being 12 hours), after which a new permit must be created for ongoing jobs. | have not changed prior to authorizing work to begin at the next scheduled time:<br>▪ *Permit Authorizer* to initial 'Permit Re-Issue' section of the permit if there are no SIMOPs issues where work was suspended due to an emergency.<br>○ **Note**: This step will also be used where the location/facility requires re-authorization of suspended Permits.<br>▪ *Permit Issuer* or qualified delegate to sign the 'Permit Re-Issue' section of the permit.<br>▪ *Control Room Operator* to review for current state SIMOPS and then releases permit if there are no issues.<br>▪ *Permit Holder* to sign the 'Permit Re-Issue' section of the permit accepting accountability to work in compliance with the permit conditions.<br>▪ *Permit Holder* holds Toolbox Meeting to discuss plan and expectations with work team before restart.<br>▪ *Permit Issuer* or qualified delegate to periodically visit the job site to verify work and controls remain within the permit parameters.<br>**Electronic** Permit systems have a maximum validity period of 4 x 7-day cycles (based on a normal cycle being 12 hours), after which a new permit must be created for ongoing jobs. |
| **Permit to Work Closure** | |
| ▪ *Permit Holder* to conduct an ***after-action review*** (AAR) upon completion of work to identify learning opportunities. ***Note****: The AAR can be a simple conversation at close out through to a formal review.*<br>▪ *Permit Holder* with *Permit Issuer* or qualified delegate to walk-down the job site to confirm work completion is to plan and site is safe before signing the 'Permit Closure' section of the permit.<br>▪ *Permit Holder* to communicate Lessons Learned from the ***after-action review*** to the *Permit Issuer*. | ▪ *Permit Holder* to conduct an ***after-action review*** (AAR) upon completion of work to identify learning opportunities. ***Note****: The AAR can be a simple conversation at close out through to a formal review*<br>▪ *Permit Holder* with *Permit Issuer* or qualified delegate to walk-down the job site to confirm work completion is to plan and site is safe before signing the 'Permit Closure' section of the permit.<br>▪ *Permit Holder* to communicate lessons learned from the ***after-action review*** to the *Permit Issuer*. |

| Permit to Work Requirements (*Paper-based Permit Systems*) | Permit to Work Requirements (*Electronic Permit Systems*) |
|---|---|
| ▪ *Permit Issuer* or qualified delegate signs 'Permit Closure' section of the permit acknowledging that the job has been completed and the area left in a safe condition.<br>▪ *Ultimate Work Authority* is made aware of and signs 'Permit Closure' section of the permit when it is used to manage SIMOPs.<br>▪ *Permit Issuer* to archive the permit and supporting records in accordance with the Petroleum records retention schedule. | ▪ *Permit Issuer* or qualified delegate signs 'Permit Closure' section of the permit acknowledging that the job has been completed and the area left in a safe condition.<br>▪ *Permit Authorizer* is made aware of the 'Permit Closure' when it is used to manage SIMOPs.<br>▪ *Permit Issuer* to archive the permit and supporting records in accordance with the Petroleum Records Retention requirements. |
| **Field Auditing** | |
| ▪ Complete periodic and random field audits throughout the life cycle of the permit (for example *Control of Work Field Assessment*. Frequency and quantity of audits are determined locally.<br>▪ Local leadership to use field audit outcomes to improve the Permit to Work process by closing non-conformance gaps and communicating design deficiencies to the *PTW Process Owner*. | ▪ Complete periodic and random field audits throughout the life cycle of the permit (for example *Control of Work Field Assessment)*. Frequency and quantity of audits are determined locally.<br>▪ Local leadership to use field audit outcomes to improve the Permit to Work process by closing non-conformance gaps and communicating design deficiencies to the *PTW Process Owner*. |

| Role | Definition |
|---|---|
| **Permit Authorizer** | A nominated and trained individual who is the single point of accountability (SPA) for the safe execution of work within a defined work area:<br>▪ Responsible for authorizing the *Permit to Work* before it is issued by the *Permit Issuer*.<br>▪ Must have completed the *Permit to Work Application* training and be approved by the facility as a Permit Authorizer.<br>▪ May also fill the *Permit Issuer* or *Plan Verifier* role and responsibilities for a given Permit, but not the *Permit Holder* role.<br>▪ The onsite person who is accountable for managing SIMOPs (also designated as Ultimate Work Authority). |
| **Control Room Operator *(Electronic Permit Systems)*** | A nominated and trained individual who is the single point of accountability (SPA) for the safe execution of work within a defined work area:<br>▪ Responsible for authorizing the *Permit to Work* before it is issued by the *Permit Issuer*.<br>▪ Must have completed the *Permit to Work Application* training and be approved by the facility as a Permit Authorizer.<br>▪ May also fill the *Permit Issuer* or *Plan Verifier* role and responsibilities for a given permit, but not the *Permit Holder* role.<br>▪ The onsite person who is accountable for managing SIMOPs (also designated as Ultimate Work Authority). |
| **Permit Issuer** | A nominated and trained individual with authority and responsibility to issue work permits, and verify conformance with permit conditions, for activity executed within their defined work area:<br>▪ Responsible for confirming requirements of the documented *Safe Work Plan* are in place before issuing the *Permit to Work* to the *Permit Holder*.<br>▪ Must have completed the *Permit to Work Application* training and be approved by the facility as a *Permit Issuer*.<br>▪ May also fill the *Permit Authorizer* or *Plan Verifier* role and responsibilities for a given permit, but not the *Permit Holder* role. |
| **Plan Verifier *(Electronic Permit Systems)*** | A nominated and trained individual with authority and responsibility to verify Safe Work Plans and associated work permits:<br>▪ Responsible for initial review of the *Safe Work Plan*.<br>▪ Must have completed the *Permit to Work Application* training and be approved by the facility as a Plan |

| | |
|---|---|
| | Verifier.<br>▪ Cannot fill the *Work Planner* role.<br>▪ May also fill the *Permit Authorizer* or *Permit Issuer* role and responsibilities for a given permit, but not the *Permit Holder* role. |
| **Permit Holder** | A nominated and trained work team leader, where the task involves more than one person, or the individual performing the work for a single person task:<br>▪ Responsible for the safe execution of the work scope, including adherence to the requirements of the documented *Safe Work Plan* and associated *Permit to Work*.<br>▪ Must have completed the *Permit to Work Application* training and be approved by the facility to receive and work under a Permit to Work.<br>▪ Cannot fill the *Permit Authorizer*, *Plan Verifier* or *Permit Issuer* role for a given *Permit to Work*. |
| **Work Planner** | ▪ Individual with sufficient knowledge of the *Permit to Work* process and supporting tools to build a *Safe Work Plan*.<br>▪ Cannot fill the *Plan Verifier* role. |
| **Ultimate Work Authority** | ▪ The onsite person who is accountable for managing SIMOPS. The UWA may also fill the role of Permit Authorizer or Permit Issuer. |
| **Qualified Delegate** | ▪ Individual who has completed the relevant training and is approved by the facility to fulfill the role for which they have been delegated. |

## Appendix 3.1 Isolation Flowchart



## Appendix 3.2 Isolation Requirements

| Determining the Level of Isolation any Pre-Existing Isolation Plans |
|---|
| *The Isolator Authority (Planner) shall* determine the level of isolation required to cover the specific scope of work that will be performed:<br><br>**Personal Isolation**<br>▪ See Personal Isolation definition in Table 1.<br>○ **Note:** An Isolation Certificate is not required if an approved Isolation Plan already exists (e.g., work instruction)<br><br>**Group Isolation**<br>▪ See Group Isolation definition in Table 1.<br>○ **Note:** An Isolation Certificate required in all cases.<br><br>*Isolator Authority (Planner)* shall determine if an approved Isolation Plan already exists for the equipment to be isolated for the defined scope of work (e.g., defined in approved Procedure, previously completed isolation plan, database of approved isolation plans):<br>○ Where an Isolation Plan already exists, go to “Reviewing the Draft Isolation Plan” to confirm suitability for reuse<br>○ Where an Isolation Plan does not exist, go to “Developing the Isolation Plan and the Minimum Isolation design Requirements”. |
| **Developing the Isolation Plan and the Minimum Isolation Design Requirements** |
| *Isolator Authority (Planner)* shall develop an Isolation Plan using the guidance provided in Appendix 3.3 “Isolation Planning and Reinstatement” and the *Isolation Certificate.*<br>When the Isolation Plan does not meet the requirements defined in the “Isolation Design Matrix” contained in Appendix 3.3, it will be considered a ***non-standard isolation***:<br>– Where a ***non-standard isolation*** is required, alternative controls must be identified through a formal risk assessment approved by the *UWA* (e.g., local “person in charge”). The risk assessment should include, as a minimum, representation from Operations, Engineering (technical competency in the system to be isolated and the type of Isolation to be implemented), HSE and, where appropriate, support from the affected OEM/vendor.<br>– Where an acceptable means of isolation cannot be identified through the formal risk assessment, the job must be postponed until a plant shutdown, or equivalent, when the risk can be effectively managed.<br>– Where a locked open/locked closed (LO/LC) valve is required to form part of an Isolation, the designation of the isolation point as a LO/LC or car-seal open/car-seal closed (CSO/CSC) point and the states (initially found and isolated) shall be included on the Isolation Certificate. The LO/LC Valve Register will remain an identification of the appropriate operational locked state. The de-isolation process shall ensure that the LO/LC or CSO/CSC valve is returned to the state found, verified as correct in the LO/LC register and original tagging replaced.<br>*Isolator Authority (Planner)* shall document a risk-based Reinstatement Plan using the guidance provided in Appendix xx “Isolation Planning and Reinstatement”<br>*Isolator Authority (Planner)* shall document the Isolation Plan on the *Isolation Certificate* and mark-up current versions of associated drawings (e.g., P&IDs) with the location of isolation points. |
| **Reviewing the Draft Isolation Plan** |
| *Isolation (Plan Verifier)* shall review draft Isolation Plan with input from subject matter experts where required:<br>• Assesses suitability of the Isolation Plan to manage the risk of the associated energy sources<br>• Checks completeness and quality of the Isolation Plan<br>• Approves Isolation Plan for implementation at appropriate time. |
| **Implementing, Testing and Securing Isolation Points** |
| *Isolation Authority (Isolator)* shall implement isolations as per the approved Isolation Plan.<br>*Isolation Authority (Isolator)* shall test the integrity of isolations. (See Appendix 3.3 for guidance on testing integrity of common isolations).<br>*Isolation Authority (Isolator)* shall apply Lock-Out/Tag-Out as per applicable conditions described in Table 1 below |

**Table 1 Isolation and Lock-Out/Tag-Out Requirements**

| Personal Isolation (Lock-Out/Tag-Out) | Group Isolation (Lock-Out/Tag-Out) |
|---|---|
| ▪ *Individual(s)* working under the isolation to attach the applicable isolation devices (e.g., valve handle covers, chain, cable, breaker covers) and apply their own ***personal lock***(s) to the isolation point(s) and retain the key (do not give the key to anyone else).<br>▪ *Individual(s)* working under the isolation to affix a Danger Tag, unique to energy isolation, containing the following minimum information to each isolation point:<br>– Warning “Danger: Do Not Operate”<br>– Isolation point identification<br>– Personal isolations for small bore valves on instruments of two inches or less shall be secured and tagged, but do not require personal locks.<br>▪ Maximum of two people working under the isolation of the same craft/trade.<br>▪ Able to complete the task in one shift.<br>▪ Approved by local management as an inherently low risk isolation.<br>▪ Four or fewer isolation points, except if the isolation involves double block and bleed where six isolation points are acceptable.<br><br>**NOTE: A *Personal Isolation* must only be applied by the individual(s) who will carry out work under that isolation. Under no circumstance can an individual apply a *Personal Isolation* for another person. Car seals are not an acceptable isolation device.** | ▪ *Isolation Authority* to attach applicable isolation devices (e.g., valve handle covers, chain, cable, breaker covers) and ***isolation locks*** to the isolation points.<br>▪ Bleeds to be secured and tagged only and not key locked to allow operation (manage of leaks etc.).<br>▪ *Isolation Authority* to affix a Danger Tag, unique to energy isolation, containing the following information to each isolation point, including the ***lock box***:<br>– Warning “Danger: Do Not Operate”<br>– Isolation point identification (i.e., for cross-referencing back to the number on the *Isolation Certificate*)<br>▪ *Isolator Owner* to place the ***isolation lock*** key(s) into the ***lock box*** before being the first to attach a ***personal lock*** to the box and retain the key (do not give the key to anyone).<br>▪ *Isolation Authority* to record the isolation in a log or register so that active and long termlong-term isolations can be tracked.<br><br>**NOTE: The use of hasps that allow multiple people to lock-on to individual isolation points is permitted, however daisy chaining hasps are not.** |

**Verifying Isolations**

*Isolation Verifier*, with the *Isolation Authority (Isolator)*, shall confirm isolations have been made as per the Plan and confirm isolation integrity.

*Isolation Authority (Isolator)* transfers custody of ***lock box*** to *Isolation Owner*.

*Isolation Authority (Isolator)* shall confirm the isolation with the *Work Crew* before each member attaches ***personal lock*** to the ***lock box,*** or other group device, and retains key (do not give the key to anyone).

**Note:** In the USA, OSHA requires that affected employees be made aware of the isolation.

**Handover of Isolations (to include Long-Term Isolations)**

*Isolation Owner* shall discuss isolation with accepting *Isolation Owner* before handing over control (where deemed necessary, this may include a walk down of the physical isolation):

- *When there are changes in the Work Crew, the outgoing crew will* remove their ***personal lock*** and tag from the ***lock box*** and the oncoming *Work Crew* will apply their ***personal lock*** and tag to the ***lock box***.

**Long Term Isolations**

*Person-in-Charge* (e.g., *Supervisor*) shall assume ownership for an isolation where the work associated with that isolation has been suspended for the long-term:

- Transfer to Long-Term Isolation is recorded in a Long-Term Isolation Register
- Long-term isolations must have integrity verified and documented every 90 days and immediately before recommencing work.

| Establishing, Performing and Closing Out of Sanction to Test |
|---|
| **Establish Sanction to Test**<br>*Isolation Authority (Planner)* shall develop a ***Sanction to Test*** plan in circumstances where a partial change in the isolation status is required to enable testing of equipment before full de-isolation which:<br>– Defines isolation changes required with supporting documentation, where appropriate<br>– Identifies additional controls in the *Job Risk Assessment* to address any new hazards created (e.g., rotating equipment with guards removed).<br>*Isolation (Plan Verifier)* reviews and approves of Sanction to Test with input from subject matter experts where required.<br>*Isolation Owner* shall arrange for the suspension of all *Permits to Work* cross referenced to the isolation.<br>*Isolation Owner* passes Sanction to Test plan to Isolation Authority and releases lock box to Isolation Authority.<br>*Isolation Authority (Isolator)* shall have work crew remove all **personal locks** and then implements the **Sanction to Test** plan.<br>*Isolation Authority (Isolator)*, following completion of the ***Sanction to Test***, shall either fully reinstate the isolation or de-isolate in accordance with Step 8. If reinstating the full isolation, all isolations are to be re-verified by the *Isolation Verifier*.<br>**Close-Out Sanction to Test**<br>*Isolation Authority (Isolator),* if required, shall fully reinstate the isolation and verify isolations as per Step 4 if required:<br>– *Isolation Owner* signs shall confirm testing complete and the isolation status (restored and verified, or ready to progress to de-isolation) at the end of the ***Sanction to Test***.<br>– *Isolation Owner* shall approve completion of Sanction to Test. |
| **Verifying a Reinstatement Plan** |
| *Isolation (Plan Verifier)* shall review draft Reinstatement Plan with input from subject matter experts where required:<br>– Assess suitability of the Reinstatement Plan to manage the associated risks<br>– Check completeness and quality of the Reinstatement Plan.<br>*Isolation (Plan Verifier)* shall confirm suitability of the Reinstatement Plan and confirm that each Permit to Work associated with the isolation is closed prior to authorizing de-isolation and reinstatement. |
| **De-Isolating and Reinstating Equipment to a Safe Operating Condition** |
| **De-Isolate**<br>***Personal isolations:***<br>– *Individuals* to remove ***personal lock***(s) from isolation point(s) after confirming work area is in a safe condition.<br>***Group isolations:***<br>– *Work crew* to remove their ***personal lock*** from the perimeter of the ***lock box*** or other group device<br>– *Isolation Owner* to remove his/her ***personal lock*** from the ***lock box*** and access isolation keys<br>– *Isolation Authority (Isolator)* to remove ***isolation locks*** and isolation devices after confirming the equipment is safe to de-isolate<br>– *Isolation Verifier* confirms de-isolation in accordance with the Reinstatement Plan.<br>*Isolation Owner* to instigate the following steps if a ***personal lock*** remains in place and that person is not on site:<br>– Engage the *Supervisor* or *Superintendent* who must verify that the individual(s) who installed the lock(s) are no longer on site by direct contact with the individual(s) or detailed search of the site if they cannot be contacted<br>– Under the authorization of the *Local Manager* (i.e., Operations Manager, Superintendent, Supervisor) cut off the lock and report the event using the 1SAP Event Management process<br>– Unauthorized removal of a ***personal lock*** or an ***isolation lock*** will lead to disciplinary action, including potential dismissal.<br>**Reinstate**<br>*Isolation Authority (Isolator)*, with relevant operations personnel, shall implement Reinstatement Plan, including leak testing if applicable. |

**Table 2 Roles and Responsibilities**

| Role | Definition |
|---|---|
| **Isolator Authority (Planner)** | Individual assessed as competent to plan isolations for a given facility or item(s) of equipment.<br>▪ Must have completed relevant isolation training and be authorized by the facility as an Isolator.<br>▪ Must be a different person than the Isolation (Plan Verifier). |
| **Isolation (Plan Verifier)** | An individual trained to evaluate and approve an isolation plan prior to isolation being applied. This individual needs to know how different types of isolations are executed.<br>▪ Must have completed relevant isolation training and be authorized by the facility as an Isolation (Plan Verifier).<br>▪ Must be a different person than the Isolation Authority (Planner). |
| **Isolation Authority (Isolator)** | Individual who conducts the isolation for a given machine or item(s) of equipment in order to perform servicing or maintenance. The individual may have assistance in applying craft/trade-specific isolation (e.g., electrical, mechanical). These individuals must be qualified in the relevant craft/trade for the jurisdiction of operation (e.g., licensed electrician in Australia).<br>▪ Must have completed relevant isolation training and be authorized by the facility as an Isolation Authority.<br>▪ Must be a different person than the Isolation (Plan Verifier). |
| **Isolation Verifier** | Individual trained to evaluate and physically verify that isolations are applied in accordance with the approved isolation plan. They need to know how different types of isolations are executed.<br>▪ Must have completed relevant isolation training and be authorized by the facility as an Isolation Verifier.<br>▪ Must be a different person than the Isolation Authority (Isolator)*. |
| **Isolation Owner** | Individual who assumes ownership of completed Isolations.<br>▪ Must have completed relevant isolation training and be authorized by the facility as an Isolation Owner.<br>▪ May have undertaken any of the previous roles:  Isolator Authority (Planner); Isolation (Plan Verifier); Isolation Authority (Isolator); Isolation Verifier |
| **All Above Roles** | ▪ Perform field assessments of isolations on a frequency and volume defined by local management records assessment findings on the *Control of Work Field Assessment*. |
| **Work Crew** | Employees and contractors working to complete a given scope of work. In relation to isolation, these are the people working under the isolation.<br>**Note:** In the USA, OSHA defines authorized employee as a person who establishes an isolation, or works under an isolation, or can be directly exposed to the isolated energy source in the event of an unexpected release (note: this can be people working adjacent to an isolated plant or equipment). |
| * The *Isolation Verifier* can become the *Isolation Owner* after the Isolation verification process is complete. The *Isolation Verifier* cannot verify isolations that he/she has installed. | |

# Appendix 3.3 Isolation Planning and Reinstatement

## Isolation Planning

Information defined in "Table 3*:* Isolation Planning Considerations" is provided to guide the preparation of an Isolation Plan. The final details of the Isolation Plan will depend on the nature and complexity of the work to be performed and the associated energy sources present.

| Item | Isolation Planning Considerations | |
|---|---|---|
| **Purpose of isolation** | ▪ Breaking containment<br>▪ Hot work | ▪ Confined space entry (***positive isolation*** required)<br>▪ Work on electrical equipment |
| | **Note:** When planning an isolation for a job that involves breaking containment, seek to minimize the volume within the isolation boundary to minimize the risk presented by potential residual vapors and gas within the system. | |
| **Potential hazards to be isolated** | ▪ Electrical<br>▪ Motion (kinetic energy)<br>▪ Pressure and temperature | ▪ Gravity/stored energy<br>▪ Hazardous materials |
| **Isolation method required** | ▪ Process/utility value isolation<br>▪ Positive isolation (e.g., spade, blind) | ▪ Electrical<br>▪ |
| **Documents required** | ▪ Process and instrument diagrams<br>▪ Electrical single line/loop diagrams | ▪ Procedure/work instructions<br>▪ Material safety data sheets |
| **Isolation design** | ▪ Isolation conforms to minimum isolation design requirements (see Table 4)?<br>▪ Formal risk assessment for ***non-standard isolation*** required? | ▪ Isolation points to be applied in specific sequence (e.g., to allow each barrier in a double barrier isolation to be proven independently)? |
| **Safety device override or inhibit** | ▪ Safety devices within isolation boundary (determine alternative protection required for equipment outside isolation boundary) | ▪ Safety devices inhibited/overridden that affect isolation, breaking containment, or re-instatement (determine alternative protection required) |
| **Lock out devices required to secure isolations** | ▪ Padlocks and hasps<br>▪ Cable or chain | ▪ Value handle covers<br>▪ Lock box |
| **Isolation verification method/equipment** | ▪ Pressure build-up (PBU) with pressure gauge<br>▪ Multiple PBUs required to prove isolations (e.g., to allow each barrier in a double barrier isolation to be proved) | ▪ PBU with vent/drain to safe location<br>▪ Local/remote start attempts<br>▪ Multi-meter/non-contact voltmeter |
| **Isolation integrity checks required** | ▪ Before starting work<br>▪ Beginning of each shift | ▪ After each break<br>▪ Continually |

**Table 1: Isolation Planning Considerations**

| Operating Pressure | | < 150 psig<br>< 10.3 barg | 150 psig to 800 psig<br>10.3 barg to 55.1 barg | > 800 psig<br>> 55.1 barg |
|---|---|---|---|---|
| Material Type | Process and Hazardous Material | V = SVI | V = SVI | V = DBB |
| | | I = SVI | I = DBB | I = DBB |
| | Non-Hazardous Material | V = SVI | V = SVI | V = SVI |
| | | I = SVI | I = SVI | I = DBB |

| | | | |
|---|---|---|---|
| V | Valve isolation required for installation of blind flange or spade. | SVI | Single Valve Isolation |
| I | Valve isolation required to carry out intrusive work without positive isolation. | DBB | Double Block with Bleed |

**Table 2: Isolation Design Matrix**

## Reinstatement Planning

Information defined in “Table 5: Reinstatement Planning Considerations” is provided to guide the preparation of a Reinstatement Plan.

The final detail of the Reinstatement Plan will depend on the nature and complexity of the work to be performed and the associated energy sources present.

| Item | Reinstatement Planning Considerations | |
|---|---|---|
| **Work completion and quality checks** | ▪ Reinstatement of safety devices (e.g., PSV’s, trips, equipment guards) | ▪ Equipment function test before de-isolation<br>▪ Equipment function/service test after de-isolation |
| **Sanction to Test**<br>(a partial change of the isolation prior to full de-isolation) | ▪ For equipment function test<br>▪ For leak test | ▪ To flush, purge, or fill<br>▪ Return safety devices to service |
| **De-isolation** | ▪ Isolation points to be removed in specific sequence | ▪ Isolation points can be removed in any sequence |
| **Process/equipment start-up** | ▪ Use existing Operating Procedure | ▪ Develop job-specific start-up sequence |
| **Pre-start checks/walk downs** | ▪ Covered in Operating Procedures<br>▪ Flare, vent and drain valve line-up<br>▪ Locked valve status | ▪ Process valve line-up<br>▪ Utility supplies |

**Table 3: Reinstatement Planning Considerations**

# Appendix 3.4 Guide to Testing Integrity of Common Isolations

## Double Block with Bleed Integrity Test (two valves)

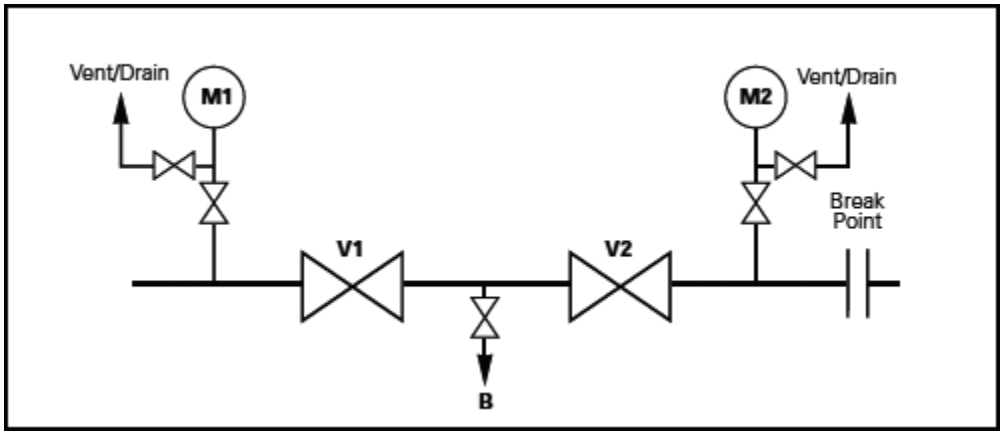



**Figure 1: Double Block with Bleed Integrity Test (two valves) Schematic**

1. Verify that taps at M1, M2 and B are not blocked and that pressure gauges, where installed, are operating.
2. Close downstream valve V2 and lock in closed position.
3. Note pressure at monitoring points M1 and M2.
4. Vent/drain section of line to be broken into and monitor at M2 until the pressure is near zero.
5. Close vent/drain at break point and monitor at M2 for a minimum of 10 minutes. No pressure build-up at M2 indicates the integrity of the downstream valve V2.
6. Close upstream valve V1 and secure in closed position.
7. Note pressure at M1 and B.
8. Vent/drain between V1 and V2 (B) and monitor at B until pressure is near zero.
9. Close vent/drain (B) and monitor at M1 and B for a minimum of 10 minutes. No pressure build up at B indicates integrity of upstream valve V1.
10. Leave vent/drain (B) open and locked to a safe location to allow further monitoring.

**NOTE:**

- If not equipped with upstream or downstream pressure indicators, integrity shall be verified by closing vents/drains then re-opening vents/drains after the required pressure build-up test duration to confirm zero pressure build up.
- Isolation can only be considered to be of Double Block Double Prove standard if the integrity of both valves has been proven. If Vent B is the only test point available, this would be considered a double block single prove.
- In the event of a double block single prove, a risk assessment should be performed to determine if this is an acceptable level of protection.

## Double Isolation and Bleed Integrity Test (single valve, double seal)

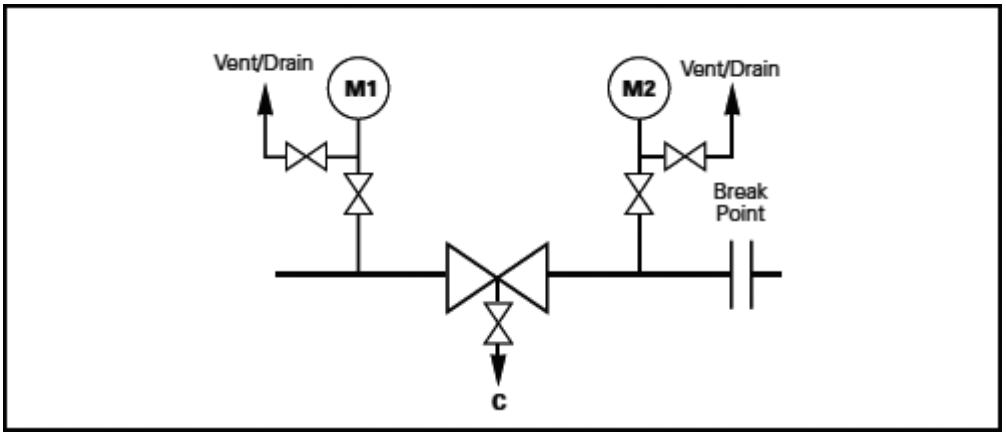



**Figure 2: Double Isolation and Bleed Integrity Test (single valve, double seal) Schematic**

1. Verify that taps at M1, M2 and C are not blocked and that pressure gauges, where installed, are operating.
2. Close isolation valve and secure in closed position.
3. Note pressure at M1, C (in cavity) and M2.
4. Vent/drain downstream section of line to be broken into and monitor pressure at M2 until pressure is near zero.
5. Close vent/drain at break point and monitor at M2 and C for a minimum of 10 minutes. No pressure build up at M2 and no pressure fall-off at C, indicates integrity of downstream seal.
6. Note pressure at M1 and C.
7. Vent/drain off fluid in cavity (between seals) and monitor at C until the pressure is near zero.
8. Close cavity vent/drain (C) and monitor at M1 and C for a minimum of 10 minutes. No pressure build-up at C indicates integrity of upstream seal.
9. Leave vent/drain (C) open and locked to a safe location to allow further monitoring.

**NOTE:**

- If not equipped with upstream or downstream pressure indicators integrity must be verified by closing, then re-opening vents/drains after the required pressure build up test duration to confirm zero pressure build-up.
- Isolation can only be considered to be of double block and double prove standard if the integrity of both seals are proven.
- In the event of a double block single prove, a risk assessment should be performed to determine if this is an acceptable level of protection.

## Single Valve Integrity Test

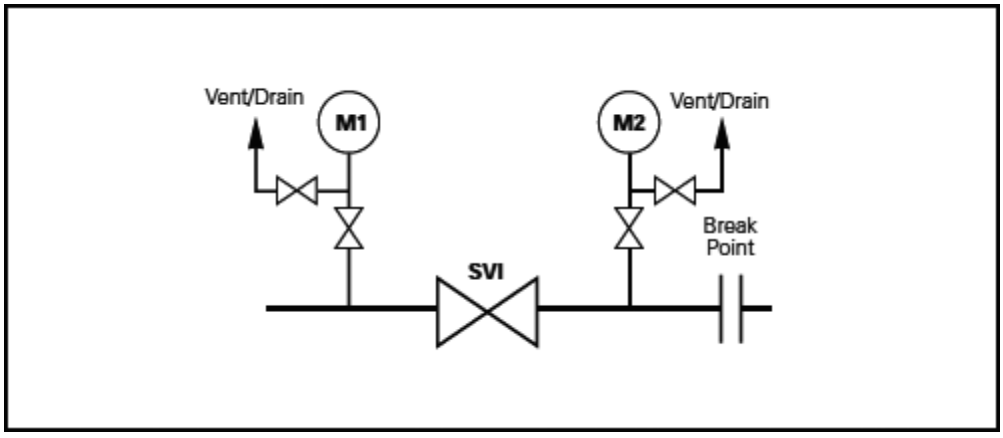



**Figure 3: Single Valve Integrity Test Schematic**

1. Verify that taps at M1 and M2 are not blocked and that pressure gauges, where installed, are operating.
2. Close isolation valve and secure in closed position.
3. Note pressure at M1 and M2.
4. Vent/drain downstream section of line to be broken into and monitor at M2 until pressure is near zero.
5. Close downstream vent/drain and monitor at M2 for a minimum of 10 minutes. No pressure build up at M2 indicates integrity of single valve.
6. Leave downstream vent/drain at break point open to safe location to allow further monitoring.

**NOTE:**

- If not equipped with upstream or downstream pressure indicators integrity must be verified by closing, then re-opening vents/drains after the required pressure build up test duration to confirm zero pressure build-up.

## Electrical Isolation Integrity Test

Electrical isolations must be proven by the following methods:

- When performing work on machinery that has the potential to start and cause personnel injury from moving/rotating parts, isolation integrity must be proven by attempting to start the equipment locally and/or being given a command to start from all remote locations (if available).
- When the potential exists for a worker to come into contact with live electricity, isolation integrity must be proven by using tested voltage meters.
- When de-energizing high voltage equipment, isolation integrity must be proven by testing with non-contact voltage meters and equipment grounding must be conducted to ensure any stored electrical energy is released.

## Appendix 4.1 Road Going Vehicles

| | |
|---|---|
| **Journey Management Plan** | ▪ Expected journey duration of two hours driving at any time, excluding any planned stops.<br>▪ Expected journey duration of 30 minutes or more, in a rural environment, occurring between 2300-hours and 0500-hours when not part of a standard shift pattern[1];<br>▪ Driver operating a vehicle after the 14th hour from start of work including commute time (no driver is permitted to operate a vehicle after the 16th hour<br>▪ Travel on roads that are affected by snow, ice, flooding or other severe weather[1];<br>▪ Travel on roads in remote locations (i.e. area where you would not expect to see another vehicle more than once every two hours or where emergency service response time is likely to be more than 1 hour) or where communication systems are unlikely to work[1];<br>▪ In a high or extreme security risk country: required for all expatriate business and commute travel and for national personnel when travelling on Company business.<br>**Notes:**<br>▪ Minimum rest break of 15 minutes every two hours of continuous driving, with no journey involving continuous driving to exceed eight hours (sole driver) or 12 hours (shared driving)<br>[1] Excludes journeys where the driver is in commute status as per OSHA definition. |
| **High Risk Road Travel Criteria** | Driving for business related travel shall be considered high risk where a combination of the below criteria are met:<br>▪ Roads are known to have challenging infrastructure (roads poorly maintained, potholes, narrow, winding, unpaved, off-road).<br>▪ Driving is the individual's primary role.<br>▪ Roads are typically affected by challenging environmental conditions (snow, ice, flooding, or other severe weather).<br>▪ Roads with continuous high traffic volume and congestion.<br>▪ Travel of long durations, complex routes, remote locations, isolated roadways, limited communication access.<br>▪ Travel at night or on roads with limited visibility conditions.<br>▪ Unfamiliar roads (driver is not familiar with the road conditions or traffic patterns).<br>▪ Roadways under significant construction, other vehicles being sub-standard, roadways with high incident statistics and fatality rates, absence of signage or signage in language unfamiliar to driver,<br>▪ Roadways with high levels of wildlife crossings<br>▪ Travel in a high or extreme security risk country |
| **Driver Training** | In-vehicle (coached) defensive driver training:<br>▪ Person's requiring training shall be nominated by the one-up leader (supervisor/manger)<br>Online driver training:<br>▪ Mandatory one-time training, refreshers at the discretion of the leader and/or driver.<br>All driver training will be coordinated by the relevant Business Group HSE support. |
| **Traffic Management Plan** | ▪ Create a site-specific traffic schematic which:<br>– Establishes site traffic flow and pedestrian segregation to minimize interaction between pedestrians and vehicles. |

| | |
|---|---|
| | – Designates safe parking area(s) and how vehicles should park (e.g. reverse, straight in, pull through)<br>– Designates safe loading / unloading area(s).<br>▪ Implement controls to segregate vehicles from hydrocarbon bearing equipment, including a minimum 35 feet (10.5 metres) exclusion zone without the use of additional controls, such as Permit to Work.<br>▪ Set site speed limits no greater than 12mph (20kph)<br>▪ Establish traffic priority rules meeting the following minimum requirements:<br>– Pedestrians have priority over all mobile equipment and vehicles<br>– Mobile Equipment has priority over all vehicles<br>– HOVs have priority over haulage trucks and light vehicles<br>– Haulage trucks have priority over light vehicles |
| **In-Vehicle Monitoring System Functionality** | ▪ Vehicle and driver specific reporting provided to the driver and direct supervisor<br>▪ Tracking minimum requirements with specific KPIs determined to suit vehicle class and location:<br>– Excessive speed (i.e.: Company maximum speed)<br>– Over the speed limit<br>– Hard acceleration<br>– Hard braking<br>▪ Functionality for system connectivity (WiFi, satellite, or GSM)<br>– Can be installed, 'plug and play' or mobile application based. |

| | |
|---|---|
| **Ground Travel Mode Principles** | **North America / Canada (as informed by risk assessment):**<br>▪ Where available and appropriate for the intended journey (typically airport transfer), a WOODSIDE ENERGY Contracted Ground Transportation Service is the preferred option<br>▪ Alternatives are:<br>– UBER (where available): Premium cars **only** (e.g. Black, Black SUV, Lux, Berline)<br>– LYFT (where available): Premium cars **only** (e.g. Lyft Lux, Lux Black, Lux Black XL)<br>– Rental vehicles subject to WOODSIDE ENERGY criteria (not to be used immediately following international flights >5 hours or as advised by SEM team)<br>– Personal vehicle within agreed operational radius (not to be used immediately following international flights >5 hours)<br>– Hotel provided / managed transport<br>▪ Public taxi is the least preferred option.<br><br>**Australia Region:**<br>▪ Business travel to Australia shall comply with the Global Business Travel Guideline ground transportation requirements:<br>– Uber for Business (U4B) is the preferred method of ground transportation and is available globally to all Woodside employees.<br>– Cost codes are required to book through the Uber app.<br>– Premium services (e.g., Uber Black, Lyft Lux) or other small chartered vehicles (SCVs) are only to be used by exception.<br>▪ Exceptions include: |

| | |
|---|---|
| | – Local taxis or non-premium ride-share services are considered a risk to safety or are unreliable (as informed by a Pre-trip Advisory or risk assessment).<br>– An existing in-country risk assessment has identified a safety or security risk (obtain guidance from local HSE support or country representative).<br>– Uber does not operate in the region.<br><br>**High and extreme security risk countries:**<br>▪ UBER, LYFT, and local taxis are not to be used in high and extreme security risk countries without prior approval of Principal Security and Country Manager (where appointed) |

## Appendix 5.1 Mobile Equipment

| Requirement | Criteria |
|---|---|
| **Traffic Management Plan** | Establish traffic flow and pedestrian zones to minimize interaction between pedestrians, mobile equipment, and road-going vehicles. (physical barriers shall be in place to prevent interaction)<br>Define safe parking area(s) and require reverse or pull-through parking for light vehicles.<br>Implement controls to segregate mobile equipment and road-going vehicles from hydrocarbon bearing equipment, including a minimum 35 feet (10.5 metres) exclusion zone without the use of additional controls, such as Permit to Work.<br>Set speed limits.<br>Establish passing rules, that include the following minimum requirements:<br>Mobile equipment and vehicles must yield to pedestrians<br>Road going vehicles must yield to mobile equipment.<br>Designate loading area(s).<br>Create a site specific traffic schematic. |
| **Pedestrian/Mobile Equipment Interaction Controls** | Install proximity detection equipment to alert the forklift operator that an object or pedestrian is approaching (e.g., active proximity detection, passive proximity detection and/or video analytics, with operator alarm/alert).<br>Install visual and audible warning devices on mobile equipment to alert pedestrians of moving equipment (e.g., back up alarms, reversing lights, side halo lights).<br>Establish a ***positive communication process*** for interaction between mobile equipment operators and pedestrians (e.g., hand signals, 2-way radio communication) or other vehicle/mobile equipment operators.<br>Maintain a minimum 15 feet. (5 metres) pedestrian exclusion zone around operating mobile equipment, using barricading tape (or similar) wherever practical. Consideration should be given to operational factors such as speed and confinement of area to determine the need for larger exclusion zones.<br>Require mobile equipment operators to shut-down and de-energize mobile equipment whenever there has been a breach of segregation controls and report this to supervision. |

## Appendix 6.1 Management of Explosives

| Activity | Requirement |
|---|---|
| **All activities involving explosives** | ▪ Processes to control access to explosives activities, including exclusion zones.<br>▪ Controls to manage access and security of storage locations.<br>▪ Processes to manage misfires and disposal of old/used explosives.<br>▪ Processes to prevent premature denotation from identified risks such as, but not limited to:<br>– radio frequency within the exclusion zone<br>– lightning<br>– stray voltage |
| **Downhole** | ▪ In addition to regulatory requirements, adopt the industry practice defined in American Petroleum Institute RP 67. |
| **Surface** | ▪ In addition to regulatory requirements, adopt the standards defined by the Mines Safety and Health Administration (MSHA) or Australian Standards.<br>▪ Process for identifying and managing the risks of blasting in hot or reactive ground.<br>▪ Process to mitigate the risks associated with operating equipment in the vicinity of loaded holes or explosive remnants. |

## Appendix 7.1 Dropped Objects Threat Mapping

| Threat | Bowtie | HSE Standard |
|---|---|---|
| Loose equipment/corrosion/ vibration of permanent and temporary structures | ▪ Loss of Structural Integrity | ▪ Dropped Objects<br>▪ CENG-ST-PET-MT-0002 Materials Selection and Corrosion Control |
| Severe weather compromising integrity of structural components | ▪ Loss of Structural Integrity | ▪ Dropped Objects |
| Failure of lifting and rigging equipment | ▪ Lifting and Cranage Incident | ▪ Lifting Operations |
| Improper rigging leading to loss of load (selection, configuration, or application | ▪ Lifting and Cranage Incident | ▪ Lifting Operations |
| Objects dropped while performing work at height or left at height | ▪ Fall from or Object Falling from | ▪ Working at Heights |
| Object dropped to lower level while traversing location or when stored on a deck or structure | ▪ Fall from or Object Falling from | ▪ Working at Heights |
| Object falls to lower level due to helicopter rotor wash | ▪ Aviation | ▪ Aviation |

## Appendix 8.1 Lift Categories

| Category | Criteria | Minimum Documentation[1] |
|---|---|---|
| Routine Lift | ▪ Lifts carried out on a regular basis by competent personnel, involving the use of a single crane or lifting device and using basic rigging practice.<br>▪ Use of boom tip camera to see lift.<br>▪ Lifts of loads with no lifting points/or a load difficult to sling (i.e., choked loads) with known center of gravity (becomes non-routing if oddly shaped or unknown center of gravity). | ▪ *Routine Lift Work Plan* (PET-HSE27-SF-FRM- 00001), or equivalent[1] (can be documented on Job Risk Assessment)<br>▪ Job Risk Assessment<br>▪ JRA Discussion / Toolbox Talk |
| Non-Routine Lift | ▪ Lifts over hydrocarbon bearing equipment<br>▪ Lifts involving more than one lifting device (i.e. chain falls)<br>▪ Lifts of a fragile load (could be damaged by rigging)<br>▪ Lifts of loads with offset / high center-of-gravity<br>▪ Lifts into a confined space<br>▪ Blind lifts<br>▪ Sub-sea lifts not involving divers<br>▪ Lifts of personnel using a crane | ▪ *Non-Routine Lift Work Plan* (PET-HSE27-SF-FRM-00002), or equivalent[1]<br>▪ Job Risk Assessment<br>▪ JRA Discussion / Toolbox Talk |
| Complex/Critical Lift | ▪ Lifts where the loads exceed 100 metric tons<br>▪ Lifts where the load is above 75% of equipment lift capacity<br>▪ Any lifts that could potentially involve divers<br>▪ Lifts performed using heavy lift vessels, jack up lift boats or lift barges<br>▪ Lifts involving more than one crane<br>▪ Loads which require engineering input (Center of Gravity, Contingency, Dynamic Amplification Factor calculations)<br>▪ Lifts using friction reliant lifting devices (e.g., plate and screw clamps)[2].<br>▪ Lifting and/or rigging operations combined with rope access activities[3]. | ▪ ***Lift Plan*** prepared and reviewed by *competent person* and endorsed by Subject Matter Expert (i.e. third-party lifting expert, lifting engineer, etc.).<br>▪ Work pack with method statement, including calculations where necessary<br>▪ Job Risk Assessment<br>▪ JRA Discussion / Toolbox Talk |

1 For repeated lifts, personnel may reuse Lift Plans or an equivalent such as a Lifting Work Instruction or Operating Procedure.

2 Use friction reliant lifting devices is prohibited without documented approval from Woodside Lifting OA and Lifting TA.

3 Person in Charge, Facility Lifting Focal, and Level 3 Rope Access Supervisor approval required.

## Appendix 8.2 Lift Plan Requirements

| Lift category | Requirements |
|---|---|
| **All Lift Plans** | When using a Lift Plan, Lifting Work Instruction or Operating Procedure, it must include:<br>▪ The size and weight of the load to be lifted (the weight of any hoisting components must also be taken into account).<br>▪ If not readily apparent, the location of the center of gravity (estimate is acceptable).<br>▪ The crane load chart maximum load limits.<br>▪ The lift geometry for the entire range of the lift. This consists of the crane's position, the load radius, and the boom length and angle.<br>▪ The hoisting hardware required (e.g., slings, shackles), the exact pick points, and any special procedures involved.<br>▪ The safe use of taglines where they are deemed necessary to support the lifting activity. If handling the load with any part of the body is considered necessary, then this must be explicitly documented in the Job Risk Assessment (where on the load and when) and then communicated.<br>▪ An evaluation of the ground founding the crane and outriggers or crane and pedestal, and if necessary, the configuration of mats or other means to provide sufficient bearing capacity.<br>▪ A communication plan for communicating between individuals involved in the task (e.g., radios/hand signals) and any affected stakeholders in the immediate area of the lift.<br>▪ Weather conditions |
| **Complex/Critical Lift** | In addition to the requirements for all lift plans, complex/critical lifts must include:<br>▪ A step-by-step procedure.<br>▪ Copy of lifting appliance capacity at given radius (i.e., crane load charts).<br>▪ Copy of certification and relevant inspections for all lifting appliances and accessories.<br>▪ Elevation/Plan view, showing routes, obstructions, and all lifting equipment.<br>▪ Engineering calculations for engineered lifting components.<br>▪ Soil condition report of crane setup site.<br>▪ Training documentation for the operator, rigger, and signal personnel involved in the lift. |

## Appendix 8.3 Lift Training and Competency Requirements

| Role | Training and Competency Requirements |
|---|---|
| Lift Planner | • The person planning the lifting operation must have adequate practical experience and theoretical knowledge of planning and executing lifting operations. |
| Crane Operator Offshore | • In addition to being qualified in rigging/dogging the offshore crane operator shall be trained, assessed and certified in accordance with a national and industry-accepted standard of competence.<br>• Where a national standard does not exist, then initial training will follow or exceed the requirements documented in the latest edition of API RP 2D and shall include both a written and practical assessment.<br>• Each business unit should develop a process for accepting newly qualified or new to facility operators. As a minimum they should be mentored and assessed by an approved person prior to operating asset cranes.<br>• A register of crane operators and their approval rating will be kept on the facility and made available for inspection on request.<br>• All operators will require re-assessment every 4 years minimum, unless local regulations dictate a shorter time frame. |
| Crane Operator Onshore | • In addition to being qualified in rigging/dogging the onshore crane operator shall be trained, assessed and certified in accordance with a national and industry-accepted standard of competence.<br>• Where a national standard does not exist, the initial training will meet or exceed the requirements documented in the latest edition of the USA National Commission for the Certification of Crane Operators (NCCCO) or an equivalent standard (e.g. ASME B30.5, Crane Institute of America, CIA, National Center for Construction Education & Research NCCER) which all include both a written and practical assessment.<br>• Re-certification must be completed every 5 years minimum unless local regulations require a shorter refresher period. |
| Lifting Appliance Operator (Manual or Powered) | • In addition to being qualified in rigging, the person who is operating the lifting appliance (e.g., powered/manual chain or wire rope hoist, small truck mounted cranes i.e., less than 2te/ 4,400lbs) must have appropriate training and authorization consistent with the local jurisdiction and the lifting appliance being operated.<br>• They must at a minimum have been given practical instruction in the operation and safety features of the equipment and provide evidence that they have received such training.<br>• Offshore a register of operators and their approval rating will be kept on the facility and made available for inspection on request. |

| | |
|---|---|
| Rigger | • Person who specializes in the lifting and movement of loads not normally accessible by crane, hooking and disconnecting loads, using lifting appliances, hand operated chain and lever hoists, slings, shackles and other load moving devices.<br>• Must be trained, assessed and certified in accordance with a national and industry-accepted standard of competence.<br>• Where a national standard does not exist, training of at least 16 hours minimum that will meet or exceed the latest edition of the OPITO rigging standard or API RP 2D will be acceptable. |
| Banksman / Signal Person / Single Point Accountability | • Person who specializes in the movement of loads using cranes, whose primary task is the hooking and disconnection of loads, attachment of loads using slings and shackles (while crane is stationary), maintaining communications with the operator, maintaining overview of the operation, controlling loads during the lift, communicating with the operator, landing loads lowered by the crane in designated areas.<br>• Must be trained, assessed and certified in accordance with a national and industry-accepted standard of competence.<br>• Where a national standard does not exist, the training of at least 16 hours will meet or exceed the requirements documented in the latest edition of the OPITO rigging standard or API RP 2D.<br>• Offshore a register of operators and their approval rating will be kept on the facility and made available for inspection on request. |
| Forklift Lifting Attachment Operator | • In addition to being qualified in rigging, the person who is operating the forklift with lifting attachment must have appropriate training and authorization to use the specific device fitted to the forklift being operated.<br>• They must at a minimum have been given practical instruction in the operation and safety features of the equipment and provide evidence that they have received such training. |
| Rigging Loft (Storage) Controller | • The Rigging Loft Controller shall have sufficient knowledge and skill to examine and identify defective equipment and shall be responsible for withdrawing it from service, placing it in quarantine to prevent further use and maintaining the records appropriately. |
| Subject Matter Expert (SME) | • Must have adequate practical experience and theoretical knowledge of planning and executing lifting operations specific to the complexity of the lift being planned. (i.e., lifting engineer, contract lifting specialist, etc.). |

## Appendix 8.4 Lifting Equipment Maintenance Requirements

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) 6 | 12 | 24 | 60 | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| **Lifting Appliances** | | | | | | | | | | | | | | |
| Crane (Pedestal / Mobile) <20t (Note 6) | ◆ | ● | ◆ | ● | ✓ | | | | ASMEB30.4/B30.5/30.8/30.22 / API RP 2C | Cranes - Mobile (lattice and telescopic boom)<br>CSA Z150 / ASME B30.5 / BS EN 13000<br>**NOTES:**<br>Required to be certified by the Certifying Authority for use onboard a Marine Installation or Structure requiring a Certificate of Fitness.<br>Mobile Cranes should not be used onboard a floating Marine Installation or Structure without conducting a risk assessment to identify additional measures to be implemented (e.g. measures to prevent overturning) | AS 1418 | BS2452 / BS7121 | | OEM Pre-Use Checklist |
| Crane (Pedestal / Mobile) 20t to 50t (Note 6) | ◆ | ● | ◆ | ● | ✓ | | | | ASMEB30.4/B30.5/30.8/30.22 / API RP 2C | Offshore Cranes (Type A) & Shipboard Cranes (Type B)<br>Any of the following standards are acceptable for this type of crane:<br>ABS Guide for Certification of Lifting Appliances<br>API Spec 2C – Specification for Offshore Pedestal Cranes<br>DNVGL-ST-037 – Standard for Shipboard Lifting Appliances (Type B)<br>DNVGL-ST-0378 – Standard for Offshore and Platform Lifting Appliances (Type A)<br>EN 13852-1 Cranes, Offshore Cranes, Part 1—General Purpose Offshore Cranes<br>Lloyd's Register, Code for Lifting Appliances in a Marine Environment. | AS 1418 | BS2573 / BS2452 / BS7121 | | OEM Pre-Use Checklist |

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) 6 | 12 | 24 | 60 | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| Crane (Pedestal / Mobile) >50t (Note 6) | ◆ | ● | ◆ | ◆ | ✓ | | | | ASMEB30.4/B30.5/30.8/30.16/30.22 / API RP 2C | Offshore Cranes (Type A) & Shipboard Cranes (Type B)<br>Any of the following standards are acceptable for this type of crane:<br>ABS Guide for Certification of Lifting Appliances<br>API Spec 2C – Specification for Offshore Pedestal Cranes<br>DNVGL-ST-037 – Standard for Shipboard Lifting Appliances (Type B)<br>DNVGL-ST-0378 – Standard for Offshore and Platform Lifting Appliances (Type A)<br>EN 13852-1 Cranes, Offshore Cranes, Part 1—General Purpose Offshore Cranes<br>Lloyd's Register, Code for Lifting Appliances in a Marine Environment. | AS 1418 | BS2573 / BS2452 / BS7121 | | OEM Pre-Use Checklist |
| Crane (Overhead) | ◆ | ● | ◆ | | ✓ | | | | ASME B30.2/30.11 | Crane - Overhead and Gantry<br>ASME B30.2/B30.16/B30.17 / CSA B167 / BS EN 15011<br>LR Code for Lifting Appliances in a Marine Env.<br>DNVGL-ST-0377<br>DNVGL-ST-0378<br>DNVGL-OS-E101<br>ABS Guide for Certification of Lifting Appliances<br>SWL ≥ 10 Tonne: To be certified by the Certifying Authority on a Marine Installation or Structure with a Certificate of Fitness. | AS 1418.3 | BS466 / BS7121 | | OEM Pre-Use Checklist |
| Forklift truck | ◆ | ● | | | ✓ | | | | ANSI/ITSDF B56.6 | CSA B335<br>DNVGL-ST-0377 | AS 2359 | BS.ISO 5057 / BSEN 1726-1/2 | | OEM Pre-Use Checklist |

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) | | | | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| | 6 | 12 | 24 | 60 | | | | | | | | | | |
| Pallet Stacker (Electric) | | ☐ | | | ✓ | | | | | | | BS5777 / 5778 / ISO 5766 | | |
| Pallet truck (Manual) | | ☐ | | | ✓ | | | | | | | BS ISO 509 (1996) | | |
| Marine boat davits | ☐ | | | | ✓ | | | | | | | BS MA41 | | |
| Chain Hoist (Electric) | ◆ | ● | | | ✓ | | | | ASME B30.16 | Hoists - manual chain, lever chain, manual trolleys, beam trolleys | AS 1418.2 | BS466 / BS EN 13001 | | |
| Chain Hoist (Pneumatic) | ◆ | ● | | | ✓ | | | | ASME B30.16 | ASME B30.16 / B30.21 / B30.17 | AS 1418.2 | | DIN F.E.M. 9.751 | |
| Chain Block (Manual) | ◆ | ● | | | ✓ | | | | ASME B30.21 | | AS1418.2 | BS3243 | | |
| Chain Lever Hoist | ◆ | ● | | | ✓ | | | | ASME B30.21 | | AS1418.2 | BS4898 | | |
| Wire Winch (Electric) | ◆ | ● | | | ✓ | | | | ASME B30.16 | ASME B30.7 / ISO 16625<br>ABS Guide for Certification of Lifting Appliances<br>DNVGL OS E101<br>LR Code for Lifting Appliances in a Marine Environment<br>**NOTE**:<br>Required to be certified by the Certifying Authority on a Marine Structure or Structure with a Certificate of Fitness. | | | | |
| Wire Winch (Pneumatic) | ◆ | ● | | | ✓ | | | | ASME B30.16 | | | BS MA31 | ISO 3078 | |
| Wire Winch (Hydraulic) | ◆ | ● | | | ✓ | | | | ASME B30.7 | | | | | |
| Wire Winch (Davit) | ◆ | ● | | | ✓ | | | | ASME B30.7 | | | BS MA55 | | |
| Wire Winch (Man-riding) | ◆ | ● | | | ✓ | | | | ASME B30.23 | ASME B30.23<br>ABS Guide for Certification of Lifting Appliances<br>DNVGL OS E101<br>LR Code for Lifting Appliances in a Marine Environment<br>**NOTE:**<br>Required to be certified for manriding by the Certifying Authority | Type approved | | | |
| Wire Hoist (Manual) "Tirfor" | ◆ | ● | | | ✓ | | | | ASME B30.21 | | AS1418.2 | | | |

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) 6 | 12 | 24 | 60 | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| Jack (Hydraulic) | ◆ | ● | | | ✓ | | | | ASME B30.1 | ASME B30.1 | AS 2615 | | | |
| Jack (Mechanical) | ◆ | ● | | | ✓ | | | | ASME B30.1 | ASME B30.1 | | | | |
| Drum lifter | ◆ | ● | | | ✓ | | | | ASME B30.20 | ASME B30.20 | AS 4991 | | | |
| Lifts (personnel and goods) | ◆ | ● | | | ✓ | | | | | ASME A.17.1 / CSA B44, Safety Code for Elevators and Escalators (Bi-National standard, with ASME A17.1);<br><br>CSA Standard CAN/CSA B311, Safety Code for Manlifts; | | BS2655 / BS5655 / BS5656 | | |
| **Fixed equipment** | | | | | | | | | | | | | | |
| Runway beams (Note 1) | | ☐ | | | | | | ✓ | ASME B30.11/30.17 | ASME B30.16 / B30.21 / B30.17 | AS 4991 / AS 3990 | BS2853 | | |
| Lifting beams (Note 1) | | ☐ | | | | | | ✓ | ASME B30.20 | BS 2853 / ASME B30.20<br>LR, Code for Lifting Appliances in a Marine Environment<br>DNVGL-ST-0378 - Standard for offshore and platform lifting appliances<br>ABS Guide for the Certification of Lifting Appliances | AS 4991 / AS 3990 | BS2573 PT 1/2 | | |
| Padeyes (Note 1) | | ☐ | | | | | | ✓ | ASME B30.20 | CAN/CSA ISO 19900 for loads and load combinations, CAN/CSA ISO 19900 for general requirements, and CSA S16 for design check; or<br>API RP2A and AISC for design check.<br>**NOTES:**<br>SWL ≥ 10 Tonne: To be certified by the Certifying Authority on a Marine Installation or Structure with a Certificate of Fitness.<br>Pad-eyes and anchorages used for man-riding operations should be designed with a factor of safety against breaking of 10. | AS 4991 / AS 3990 | BS2573 | | Flame cut holes prohibited |

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) 6 | 12 | 24 | 60 | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| Equipment designated lift points (Note 1) | | ☐ | | | | | | ✓ | ASME B30.20 | CAN/CSA Z19902 for loads and load combinations, CAN/CSA ISO 19900 for general requirements, and CSA S16 for design check or<br>API RP2A and AISC for design check | | | | |
| Stabbing boards (Note 1) | | ☐ | | | ✓ | | | | | | | | | |
| **Accessories** | | | | | | | | | | | | | | |
| Single Sheave / Snatch Blocks | ☐ | | | | ✓ | | | | ASME B30.26 | ASME B30.26 / BSI EN 13157<br>DNVGL-ST-0378 - Standard for offshore and platform lifting appliances | | BS4536 / 4018 | | |
| Sheave Blocks | ☐ | | | | ✓ | | | | ASME B30.26 | | AS 2089 | BS4536 / 4018 | | |
| Wire rope (Note 4) | ☐ | | | | | ✓ | | | ASME B30.5 | API Spec 9A / API RP 9B / BS EN 13414 / ISO 10425<br>DNVGL-ST-0378 - Standard for offshore and platform lifting appliances<br>LR, Code for Lifting Appliances in a Marine Environment<br>ABS Guide for Certification of Lifting Appliances<br>**Cranes:**<br>API Spec 2C / API RP 2D / ISO 4309<br>**Lifeboat Falls:**<br>SOLAS and latest IMO circulars<br>Lifesaving Equipment Regulations (Transport Canada) for Construction Vessels and Installations | AS 3569 | BS302 / BS EN 12385 | | |
| Freight containers | | ☐ | | | ✓ | | | | ISO 6346 | | | SI 1984 No.1890 | | |
| Offshore transit containers (Note 2) | | ☐ | | ☐ | ✓ | | | | API 2CCU | DNVGL-ST-E271, DNV GL Standard for Offshore Containers (E271)<br>ISO 10855 Offshore Containers and Associated Lifting Sets – Part 1, 2, and 3 or | AS 10855 | BS EN ISO 10855 | DNV 2.7-1 | |

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) 6 | 12 | 24 | 60 | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| | | | | | | | | | | DNVGL-ST-E273, DNV GL Standard for Portable Offshore Units (E273). | | | | |
| **Load indicators** | | | | | | | | | | | | | | |
| Dynamometers / Crane Weighers | ◆ | ● | | | ✓ | | ✓ | | ASTM E4/74 | | | BS1610 / BS EN 10002 | | |
| Load Cells | ◆ | ● | | | ✓ | | ✓ | | ASTM E4/74 | | | BS1610 / BS EN 10002 | | |
| Safe load indicators / RCI's | | ☐ | | | | | ✓ | | ASTM E4/74 | NOTES: An electronic safe load indicator with the following features:<br>• A display showing SWL at any hook radius<br>• A display showing a percentage of SWL on hook at any hook radius<br>• Alarm settings programmed in the SLI determined by the installation owner's Competent Person and agreed by the Certifying Authority<br>• Load curves programmed in the SLI reflecting all operating modes, for example, static (onboard), dynamic (outboard) and personnel as determined by the installation owner's Competent Person as determined by the installation owner's Competent Person and agreed by the Certifying Authority.<br>• Programmed using International System (SI) of Units<br>• A data recorder for continuous logging of main operational data for the purpose of tracking usage, events, overload alarms, changes in operational parameters, etc. for the purposes of determining duty and load cycles or for reviewing events. | | BS7262 (1990) | | Annual calibration |

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) 6 | 12 | 24 | 60 | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| **Loose rigging gear (Note 5)** | | | | | | | | | | | | | | |
| Synthetic sling | ◆ | ● | | | | ✓ | | | ASME B30.9 | **Slings—round man-made fiber**<br>ASME B30.9 / EN 1492-2<br>• DNVGL-ST-0378 - Standard for offshore and platform lifting appliances<br>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment<br>• LR, Code for Lifting Appliances in a Marine Environment<br>**Slings - flat woven webbing**<br>ASME B30.9 / EN 1492-1<br>• Standard compiled by the "Web Sling & Tie Down Association, Inc. 1993 (WSTDA)<br>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment | AS 4497.1 | BS EN 1492 Pt 1&2 | | |
| Webbing sling | ◆ | ● | | | | ✓ | | | ASME B30.9 | **Slings—round man-made fiber**<br>ASME B30.9 / EN 1492-2<br>• DNVGL-ST-0378 - Standard for offshore and platform lifting appliances<br>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment<br>• LR, Code for Lifting Appliances in a Marine Environment<br>**Slings - flat woven webbing**<br>ASME B30.9 / EN 1492-1<br>• Standard compiled by the "Web Sling & Tie Down Association, Inc. 1993 (WSTDA)<br>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment | AS 1353.1 | | | |

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) 6 | 12 | 24 | 60 | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| Beam Clamp | ◆ | ● | | | ✓ | | | | ASME B30.20 | ASME B30.20 (clamps below hooks) / B30.16 (beam clamps)<br>DNVGL-ST-0378 - Standard for offshore and platform lifting appliances<br>Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment | AS 4991 / AS 3990 | | | |
| Plate Clamp | ◆ | ● | | | ✓ | | | | ASME B30.20 | ASME B30.20 (clamps below hooks) / B30.16 (beam clamps)<br>DNVGL-ST-0378 - Standard for offshore and platform lifting appliances<br>Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment | AS 4991 / AS 3990 | | | |
| Girder (Beam) trolley | ◆ | ● | | | ✓ | | | | ASME B30.9 | ASME B30.16 / B30.21 / B30.17<br>**NOTE**: Charpy Impact Test results at a temperature suitable for local environmental conditions. | | | | |
| Wire rope stinger | ◆ | ● | | | ✓ | | | | ASME B30.9 | | | | | |
| Wire rope slings | ◆ | ● | | | ✓ | | | | ASME B30.9 | API Spec 9A / API RP 9B / ASME B30.9 / BS 463-1 / BS EN 12385 / BS EN 13414<br>DNVGL-ST-0378 - Standard for offshore and platform lifting appliances<br>ISO 2408 / ISO 8792 / ISO 7531 / ISO 17893<br>Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment<br>LR, Code for Lifting Appliances<br>in a Marine Environment<br>NOTE: All termination fittings to be quenched and tempered material. | AS 1666.1 | BS1290 / BS EN 13414/1-3 | | |

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) 6 | 12 | 24 | 60 | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| Chain sling - Grade 80 / T | ◆ | ● | | | ✓ | | | | ASME B30.9 | ASME B30.9 / ASTM A391/A391M-07 / ASTM A 906/A906M-02 / BS EN 818-1 / BS EN 818-7 / BS EN 818-5 / ISO 3056<br>LR, Code for Lifting Appliances in a Marine Environment<br>DNVGL-ST-0378 - Standard for offshore and platform lifting appliances<br>Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment<br>**NOTES:**<br>Charpy Impact Testing results at a temperature suitable to the local environmental conditions.<br>Master link sub-assembly and shackles to be individually serialized and load proof tested. | AS 3775 | BS EN 818-1 | ISO 3076 | |
| Chain hooks and fittings - Grade 80 / T | ◆ | ● | | | ✓ | | | | ASME B30.9/B30.10 | | AS 3776 | | ISO 8539 | |
| Basket / Net / Bag | ◆ | ● | | | ✓ | | | | | | | | | |
| Eye-bolts | ◆ | ● | | | ✓ | | | | ASME B30.26 | Eye bolts and Swivel Hoist Rings<br>• ASTM A-574 and UNC-3A<br>ASME B30.26 / ISO 4762 / DIN 582 / ISO 3266 / ISO 527-4<br>• DNVGL-ST-0378 - Standard for offshore and platform lifting appliances<br>• Lifting Equipment Engineers Association Code of Practice for the Safe Use of Lifting Equipment<br>• LR, Code for Lifting Appliances in a Marine Environment | AS 2317 | BS4278 | | |
| Shackles | ◆ | ● | | | ✓ | | | | ASME B30.26/RR-C-27 1D TYPE IV | Sling termination and rigging hardware, i.e. shackles, ferrules, shackle pins links<br>ASME B 30.9 / ASME B30.26 / EN 1677-4 / EN 13889 / BS 3551 / ISO 2415 | AS 2741 | | ISO 2415 | Safety shackles preferred |

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) 6 | 12 | 24 | 60 | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| | | | | | | | | | | • DNVGL-ST-0378 - Standard for offshore and platform lifting appliances —Loose Gear<br>• Federal Specifications (US) RR-C-271D<br>• LR, Code for Lifting Appliances in a Marine Environment<br>**NOTES**: Charpy Impact Test results at a temperature suitable to the local environmental conditions.<br>Only shackles fitted with locking nuts and pins (four part or bolt type) should be used where possible.<br>CNSOPB Notice-Safety Alert Nov 30, 2018, Safety Notice – Bolt Type Shackle Inspection.<br>https://www.cnsopb.ns.ca/publications/notice-safety-alert-bolt-type-shackle-inspection | | | | |
| Rigging screws (Turnbuckles) | ◆ | ● | | | ✓ | | | | FF-T-791-TYPE 1 FORM 1 | ASTM F1145 / ASME B30.26 / BS 4429<br>DNVGL-ST-0378 - Standard for offshore and platform lifting appliances | AS 2319 | BS4429 | | |
| Open wedge socket | ◆ | ● | | | ✓ | | | | RR-S-55OD TYPE C | **Sockets—wedge**<br>API Spec 2C / ASME B30.26 / API RP 2D / BS EN 13411-6<br>**Sockets—poured**<br>API Spec 2C / API RP 9B / ASME B30.9 / BS 463 Part 1 & 2 / ISO 17558<br>• DNVGL-ST-0378 - Standard for offshore and platform lifting appliances<br>• LR, Code for Lifting Appliances in a Marine Environment | AS 2740 | BS7166 / BS EN 13411-6 | | |
| **Miscellaneous Items** | | | | | | | | | | | | | | |
| Personnel Transfer Devices (Note 3) | □ | | | | ✓ | | | | | DNVGL-ST-0377 / DNVGL-ST-0378 | | | | Per Manufacturer Recommendations |

| Lifting Appliances | Periodic Examination Intervals | | | | | | | | Acceptable Manufacturing Codes / Standards | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Equipment Type | Period (months) 6 | 12 | 24 | 60 | Certificate of Conformity / Test | Destructive Sample Certificate | Calibration Certificate | Engineering Calculations | USA | Canada (CAPP SLP) | Australian | British | International | Instructions / Limitations |
| | | | | | | | | | | LR Code for Lifting Appliances in a Marine Environment<br>ABS Guide for Certification of Lifting Appliances<br>**NOTES:**<br>The unit(s) shall consider the following:<br>• Have certification which states "Suitable for Personnel Transfer" along with any operating limitations.<br>• Be fabricated using corrosion-resistant materials suitable for use in marine environment<br>• Have a design temperature suitable for the local environmental conditions (-20 degC or as defined in Environmental Assessment).<br>• At least two Personnel Transfer devices should be provided on an installation engaged in production or Petroleum Deepwater (Woodside Energy)l operations | | | | |

| Legend | |
|---|---|
| ◆ | Australia, British, International |
| ● | American (USA) |
| ○ | Canada |
| □ | All locations |
| ✓ | Required Documentation |

| Notes | |
|---|---|
| Note 1: | Lifting support steelwork (such as runway beams, lifting beams, lifting frames, pad-eyes) with no moving parts can have the inspection period extended by 12 months under the following conditions:<br>• they are not used for supporting personnel<br>• their use is infrequent to the extent that wear is not an adverse factor, and<br>• they are coated/ protected so that corrosion is not present |
| Note 2: | Must be designed, fabricated, inspected, and tested to code |
| Note 3: | Transfer Basket Requirements:<br>• Carriers used for personnel transfer operations should be designed to minimise the risk of persons being crushed, trapped, struck or falling from the carrier<br>• Basket must be designed with a ridged structure (no collapsible baskets allowed)<br>• The carrier is provided with slip-resistant floors and adequate drainage.<br>• Items carried on the floor of the carrier are effectively secured.<br>• The primary load line has the requisite safety factor. Where secondary or backup lines are used, a risk assessment should ensure that these do not increase risk.<br>• Load lines should be selected to ensure that the carrier does not spin or turn when lifted. All connections between the carrier and the lifting appliance should be unable to self-release under any circumstances<br>• In case the carrier should fall or be placed in the sea, it should be self-righting in all operational sea-states and with the most adverse passenger distribution on board.<br>• There should be procedures for the emergency recovery of people from the carrier or from the sea. |

- Carriers should be of a type which has been approved for use by a competent person and all necessary inspection, examination and test certificates should be current and be readily available for the regulatory authority if so required.
- crane and winch operators have been specifically trained in transferring people by carrier and have experience of the type and use of the lifting equipment;
- People who have not been involved in this kind of operation before are accompanied by someone who is familiar with the operation;
- a risk assessment has been carried out. This should include consideration of environmental hazards;
- during transfer over the sea, passengers are provided with life jackets of an approved type. Additionally, effective emergency arrangements must be in place throughout the transfer
- the rescue and recovery arrangements must be capable of recovering people from the sea within specified performance standards.
- Where transfer operations over water are carried out in harbours, passengers should be provided with life jackets as a minimum requirement;
- You avoid raising or lowering the personnel carrier near the propellers of a vessel. If this is not possible, the master of the vessel must terminate all propulsion if required;
- where carriers are designed to lift a stretcher, the injured person must be accompanied by at least one other non-injured person during the transfer operation;
- If seats are provided in the carrier, they are equipped with safety harnesses and instructions given for their use before commencing any transfer.

Training

- The Deck Foreman is to ensure that the personnel to be transferred are fully briefed on the use of the basket
- The Deck Foreman will ensure the transferees are fully aware of all safety precautions and safety clothing they will be required to wear during the transfer.
- Deck Foreman will demonstrate the correct standing position to be adopted during the transfer and describe the Banksman / Dogman / Flagman's signals i.e.
- The transferees should stand on the floatation collar facing the netting and looking towards the centre of the transfer basket. They shall establish a firm and stable footing on the collar. The arms are to be placed through the netting at chest level and shoulder width apart. The arms should then be folded across the chest and the vertical ropes of the netting firmly gripped with the hands.
- Paying attention to the Banksman / Dogman / Flagman's they should prepare for the crane to lift the basket from the deck, by bracing the legs with the knees slightly bent (if preferred, with one foot on the floatation ring and one on the deck).
- As the basket approaches the vessel / facility they should pay attention to the Banksman / Dogman / Flagman's instructions and prepare for landing by bracing themselves with the knees slightly bent. Once landed, they should step from the floatation collars the Banksman / Dogman / Flagman's instructs.
- All luggage and tools etc are to be placed in centre platform of the basket for transfer.
- On arrival on the vessel / installation, safety / survival equipment should be removed on instruction from the Deck Foreman.

Note 4: Wire rope must be managed in accordance with recognized standards for discard (i.e. BS EN 12385-1:2002+A1:2008)

Note 5: Proof of load testing for Loose Rigging Gear is conducted via batch sampling and not on an individual basis.

Note 6: 60 months examination relates to load testing

## Appendix 8.5 Lifting Equipment Requirements

| Equipment | Requirement |
|---|---|
| **Cranes** | ▪ Cranes, electric overhead travelling cranes, must have:<br>– Electrical/mechanical overload protection, and except for automated cranes, calibrated load cells with a display clearly visible to the operator.<br>▪ Gantry/overhead cranes must have end limit switches and/or mechanical stops.<br>▪ Hooks must have spring loaded safety catches that lock in the closed position or that are otherwise designed to prevent inadvertent opening.<br>▪ Load chart shall be placed in cab and visible.<br>▪ Shall have history recording device.<br>▪ Must be fitted with Emergency Stop<br>▪ Canada: Cranes must be certified by the Certifying Authority on a Marine Installation or Structure holding a Certificate of Fitness (as per the Code of Practice: Atlantic Canada Offshore Petroleum Industry Safe Lifting Practice Respecting the Design, Operation and Maintenance of Materials Handling Equipment). |
| **General Purpose Winches** | ▪ Must have a clearly visible data plate.<br>▪ Must have controls that automatically return to neutral on release in any operating position.<br>▪ Must have automatic brakes which apply when the operating lever is returned to neutral or on loss of power.<br>▪ Must have no clutch or other device capable of disengaging the drive (this does not include facility mooring winches).<br>▪ Must be capable of lowering the load in an emergency, including loss of power.<br>▪ Must have a brake holding less than the minimum breaking load of the rope and more than the maximum line pull of the winch (if a high load is applied to the winch, the brake must submit before the breaking load of the rope is reached).<br>▪ Must have a guard over the drum to protect the operator.<br>▪ Deck-mountings must:<br>– be subject to an appropriate level of testing and a design check prior to being placed into service<br>– not be altered without the approval of the certifying authority.<br>▪ Canada: Winches must be certified by the Certifying Authority on a Marine Installation or Structure holding a Certificate of Fitness (as per the Code of Practice: Atlantic Canada Offshore Petroleum Industry Safe Lifting Practice Respecting the Design, Operation and Maintenance of Materials Handling Equipment). |

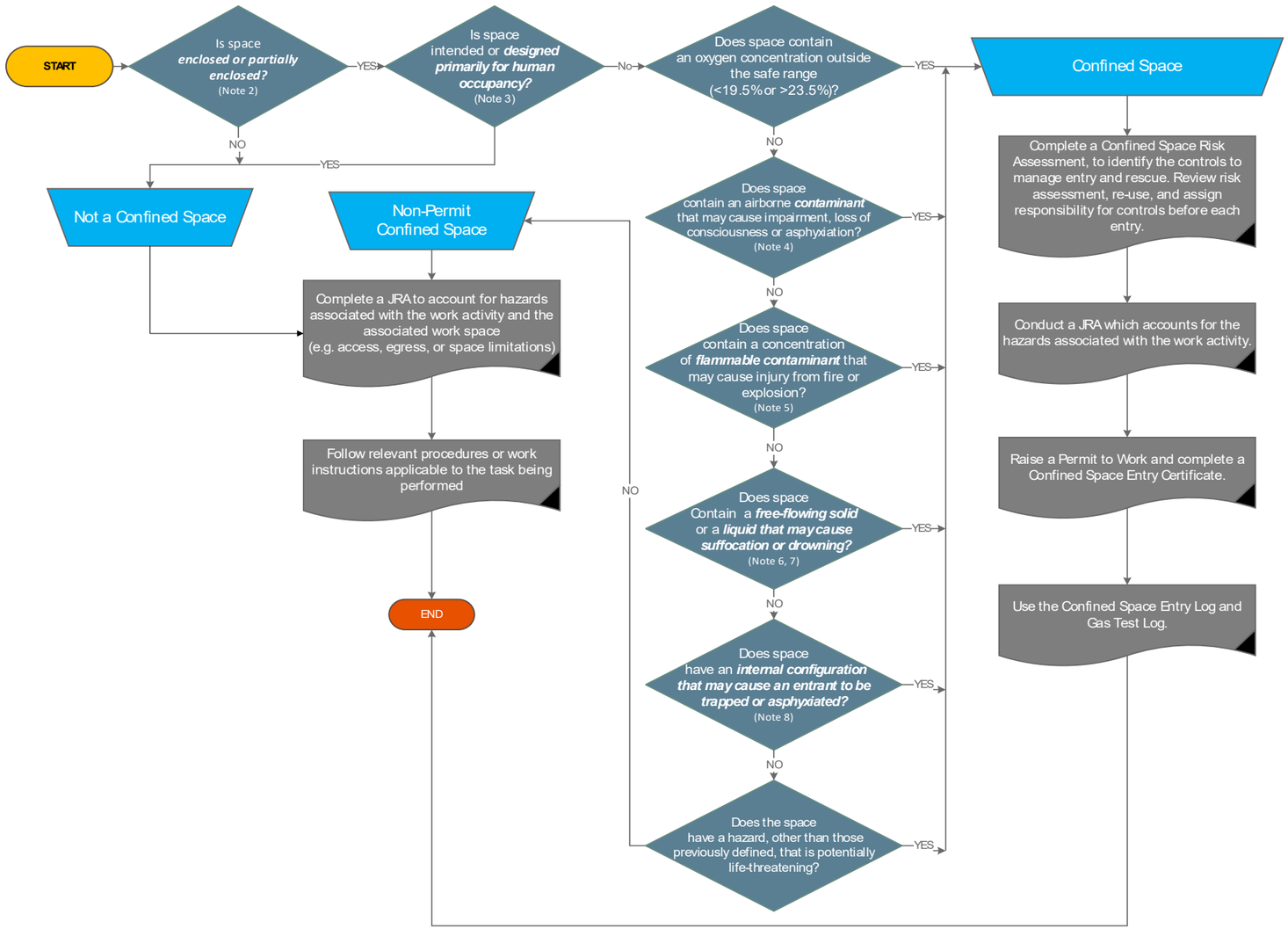
| Equipment | Requirement |
|---|---|
| **Man-Riding Winches** | ▪ Must have an over hoist limit<br>▪ Must have, for air-operated man-riding winches, a shutdown valve in the air supply located close to the winch-operating handle.<br>▪ Canada: Hoist system shall have independent shut-off mechanism located between power source and hoist unit to ensure that all hoist motion can be stopped quickly.<br>▪ Must have a secondary brake which may be manual in operation or be designed to provide adequate holding of the load in the event of primary brake failure.<br>▪ Must be designed so that the raising and lowering mechanism has a design safety factor not less than 10:1 (minimum breaking load / 10).<br>▪ Must have emergency load lowering capability<br>▪ Canada: Overspeed limit safety device shall be installed on electric powered winches. Drum guards and spooling devices shall be fitted.<br>▪ Must be clearly labeled 'suitable for man-riding.<br>▪ Canada: Manufacturer certificate of conformity required stating winch is suitable for man-riding. Winch shall be certified by a CA for man-riding. |
| **General Rigging** | ▪ Coated taglines<br>▪ Utilize locally agreed upon color code to identify current inspection<br>▪ Utilize appropriate shackle for the task (e.g. two part for short term use as long as pin cannot be impacted or rotated during lifting operation, 4 part shackle for long term use or short term use where the pin can be impacted or rotated during lifting operation).<br>▪ Free rigging to parts of moving machinery (e.g., forklift trucks, earthmoving plant) is prohibited unless documented approval is provided by the Original Equipment Manufacturer (OEM).<br>▪ In drilling and completions operations chain slings are only approved for use:<br>– for removing or replacing rotary table bushings from a rotary table<br>▪ Broken wires are not permitted in any wire rope that may be handled by personnel. |
| **Wire Rope (Installed)** | ▪ Wire ropes must be issued with a unique identification number, which will follow the rope through its service life. This number must be shown on certification for the rope.<br>▪ Wire rope certification documentation must include information on the rope's construction; tensile strength, minimum breaking load, safe working load, identification number, original manufacturer, country of origin and date of manufacture.<br>▪ Wire rope suppliers must provide a means of identifying the rope, either by hard stamp on the talurit / ferrule or where the rope is plain ended, position an identity ferrule or tag at the end of the rope with the certification number (if applicable) and Safe Working Load.<br>▪ Wire ropes must have their date of installation recorded. Copies of electromagnetic graphs for the crane ropes, where available, are to be held in the maintenance management system.<br>▪ The original certification and or electronic endorsed copies must be available on location. |

| Equipment | Requirement |
|---|---|
| **Transit Containers** (Offshore) | ▪ All containers must be accompanied by full dossiers (cert packs) demonstrating that the unit was designed, fabricated, inspected, and tested to DNV 2.7-1, EN ISO 10855 or API 2CCU<br>▪ Canada: Containers certified to DNV 2.7-1 Appendix J Offshore Containers for Use in Temperate Climates should not be accepted for general use in the Atlantic Canada Offshore Petroleum Area.<br>▪ Must have four lifting points as standard. Two or three lifting points are acceptable on the condition that they meet the requirements above as confirmed by a qualified engineer.<br>▪ Must have a working stress design based on 1/3 yield.<br>▪ Connex containers must be engineered and reinforced to include pad-eyes (flame cut pad-eyes are prohibited).<br>▪ Pad-eyes must meet the following:<br>– be drilled or bored, with cheek plates (if fitted) also drilled or bored after fitting to the pad-eyes<br>– have a maximum eye hole size equal to the diameter of the shackle pin plus 10%, with minimum pad-eye thickness equal to the jaw gap of the shackle less 25%<br>– be oriented in alignment with the direction of the lift, unless certified as suitable by a qualified engineer<br>– be positioned accurately for even loading of slings, whilst also minimizing the risk of the sling fouling on the transit container<br>– not substituted with ISO locks<br>▪ Must be designed to minimize the risk of trapped debris in areas such as the forklift pockets or open-end tubing (to mitigate dropped object risk).<br>▪ Must have forklift pockets of a sufficient size to enable the forks to enter fully. If forklift pockets are only for empty handling, then this must be clearly marked on the container.<br>▪ Cargo baskets must have solid floors (not of mesh construction), with drainage holes. Drainage holes must small enough to prevent the potential for dropped objects. If mesh is used on the sides, a minimum of a 4-inch (10-cm) kicker plate must be fitted. |

| Equipment | Requirement |
|---|---|
| **Transit Containers** (Offshore),<br>Cont. | ▪ Bolted connections, if used as part of the load bearing structure must be made from Grade 8 or equivalent stainless steel charpy tested and referenced in the design drawing. At intervals of annually, 25% of the bolts shall be removed and visually inspected. After 60 months in service, they shall be replaced. Bolted end extensions are not permitted. (all inspections shall be documented and provided)<br>▪ Top rails (minimum of four areas) must be painted with contrasting colors of high visibility. Open topped Cargo Carrying Units must be painted with cross-hatching of a contrasting color of high visibility.<br>▪ Containers shall be designed with the intent of eliminating potential snag hazards keeping all internal securement devices protected inside the smooth periphery walls of the container<br>▪ Open top baskets or boxes shall have no hooks, tag lines (must be coated style), tie down points or sharp jagged uneven edges that could snag on slings during the lift operation. Similarly, the sides must be smooth and free of protrusions to avoid potential of snagging lift slings or other adjacent items during the lift operation.<br>▪ Top opening doors shall be identified as pinch points and have dampening system to prevent lid slamming |
| **Tool/Gang Boxes** | ▪ Tool/gang boxes and any other container with hinged doors shall have robust primary and secondary locking devices/latches (excluding top opening). |
| **Transit Container Wire Rope Slings** | ▪ Must have sling assembly with a Working Load Limit (WLL) of 1.3 times the maximum gross weight of the container (safety factor of 6.5 to 1), unless manufactured in accordance with DNV2.7-1, where the slings has a co-efficient given within DNV2.7-1.<br>▪ Canada: Lift sets are considered to be part of the container and cannot be removed, repaired or modified without the agreement of the Certifying Authority or third party who has issued the certification for the Offshore Container.<br>▪ A master link with sub-links must be used where a sling assembly has three or more legs and a rated capacity greater than 25,000 lbs. On tall transit containers the D-ring should rest between 3 – 5 feet from the ground. A stinger (5th leg) can be used to achieve.<br>▪ The following must be on a metal identification tag or stamped on the ferrule of slings (if not marked to API2CCU, DNV2.7-1 or BSEN-12079) (Canada: DNV E271 or ISO 10855-2):<br>– Unique identification number or tag number<br>– Working Load Limit (WLL) / Rated Capacity<br>– Date of manufacture<br>– Date of last inspection. |

| Equipment | Requirement |
|---|---|
| **Transit Container Shackles** | ▪ Shackles fitted to a transit container must be Bolt Type shackles (four-part, body, bolt, nut, and cotter pin or other fit for purpose design). Permanently captive shackles are also acceptable; however, welding rods, nails, and R clips must not be used.<br>▪ Each pair of shackles must be able to support the container maximum gross weight.<br>▪ Must be individually identified by either hard stamping using low stress stamps on the shackle body or an identification tag. Shackles that are captivated in the thimble do not need to be marked, but evidence of this must be on the load test certificate. |
| **Vessel Tanks for Transporting Liquids** (Offshore) | ▪ Vessels and tanks for transporting liquids must be labelled to International Maritime Dangerous Goods (IMDG) requirements and must have:<br>– a crash frame completely enclosing the container/vessel (In the US this excludes metal tote tanks that are built and certified to DOT 49 CFR 178.813)<br>– valves accessible from ground level<br>– valves cable-tied closed (or similar) with caps or plugs installed<br>– a vent/pressure relief system appropriate for the liquid being transported<br>– an accurate and reliable level measurement system to aid in filling and decanting vessel<br>– drip trays under any valves or other outlets (required if in crash frame)<br>– drain plug shall have secondary retention<br>– an air inlet valve (vacuum protection)<br>– guards on any protrusions where damage to those protrusions could lead to a spill of the product being transported<br>– grating on the top of the tank to protect the manhole (required if in crash frame)<br>– chemical tanks for hazardous goods and marine pollutants must meet the International Maritime Dangerous Goods (IMDG) Code. They must be lift tested as required by the IMDG code (Volume 1 parts 1, 2 and 4-7). Small volumes of non-hazardous or non-marine pollutant chemicals can be transported in tote type tanks. For tote tanks, crash frames must be provided at the shore base prior to transportation.<br>– cuttings boxes must meet DOT-CFR 49 176.40 (US only) |
| **Forklift Trucks** (lifting attachments) | ▪ Lifting Attachments must:<br>– have both a primary and secondary (i.e. double securement chains, chain and fork bolt, etc.) means of securing to the forklift truck and be fitted as directed by the manufacturer<br>– be maintained and lubricated as per the recommendations of the manufacturer or a qualified person<br>– be inspected at least annually. |

## Appendix 9.1 Confined Space Entry Decision Tree




### Notes

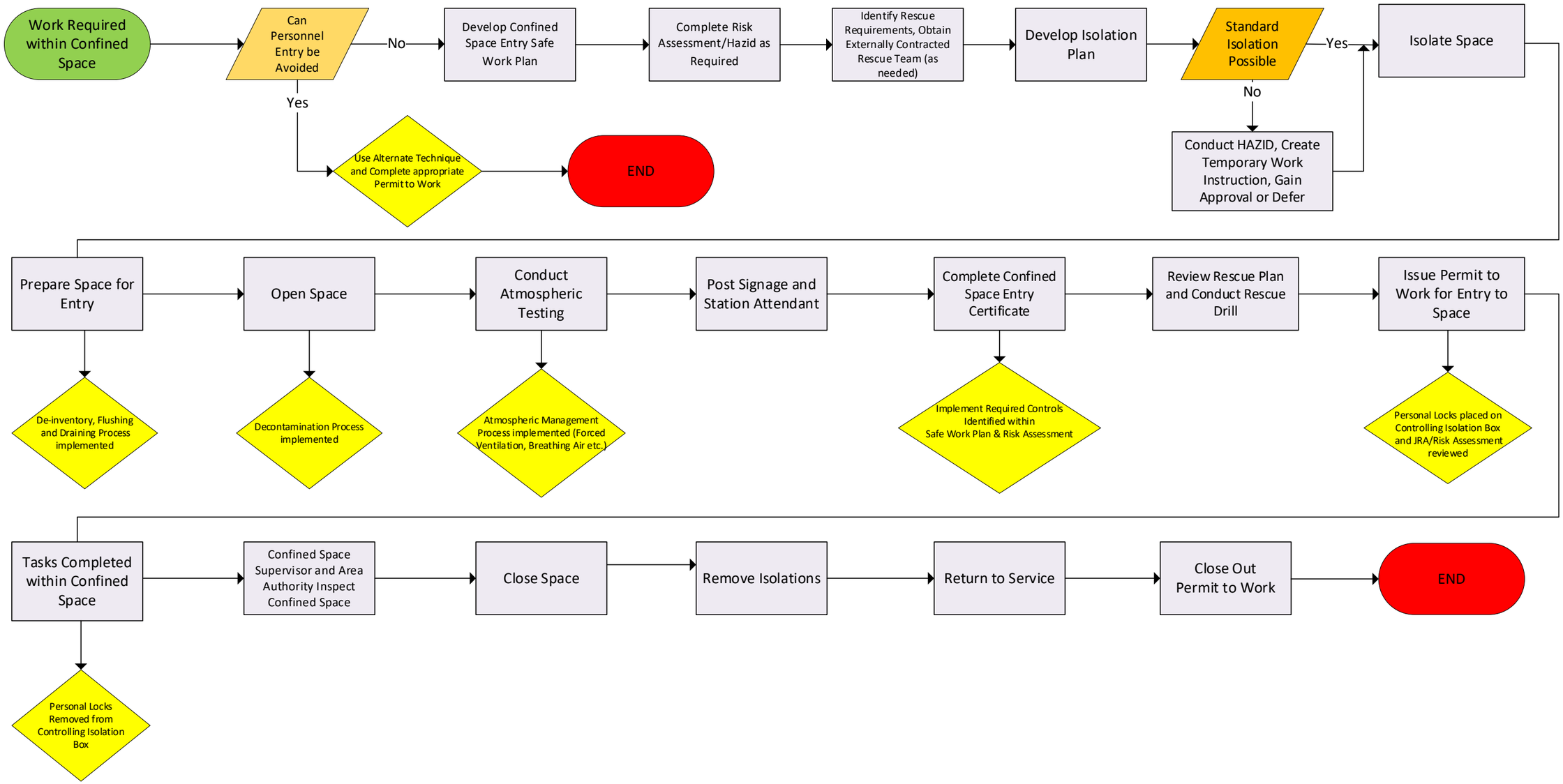
1. **Confined Space Entry**: When a person's head or upper body breaks the plane of an opening into a space. Inserting an arm for the purpose of atmospheric testing is not considered as entry to a confined space.
2. **Enclosed or partially enclosed** spaces that may meet the definition criteria for a confined space are:
   - Spaces that are large enough, or so configured that a person can bodily enter and perform assigned work
   - Storage tanks, tank cars, process vessels, boilers, pressure vessels, silos and other tank-like compartments;
   - Pipes, sewers, shafts, degreaser and sullage pits, ducts, and similar structures; and
   - Any shipboard spaces entered through a small hatchway or entry point, cargo tanks, cellular double bottom tanks, duct keels, ballast and oil tanks, and void spaces.
3. A confined space may, or may not, have restricted means of entry and exit. Appropriately sized entry and exit points are important for the safe entry and exit or retrieval of a person(s) in an emergency. However, a restricted means of entry or exit is not a consideration in identifying an enclosed or partially enclosed space as a confined space.
4. **Designed for human occupancy**: Intended as a place of regular work and supplied with ventilation and other conditions necessary to support life.
5. **Contaminant**: Any dust, fume, mist, vapor, biological matter, gas or other substance in liquid or solid form, the presence of which may be harmful to persons.
6. **Flammable contaminant**: Any dust, fume, mist, vapor or gas present in the air at concentrations that can propagate a flame on contact with an ignition source.
7. **Free-flowing solid**: Airborne combustible dust at a concentration that meets or exceeds its LFL. NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.
8. **Liquid that may cause suffocation**: A rising level of a liquid in an enclosed or partially enclosed space may cause engulfment through the inability of a person to readily exit the space.
9. **Internal configuration that may cause an entrant to be trapped or asphyxiated**: Any space where an occupant must crawl, climb, twist, be constrained in a narrow opening, follow a lengthy path or otherwise exert unusual effort to enter or leave, or where the entrance may become sealed or secured against opening from inside. Additionally, a space where the internal configuration may cause an entrant to be trapped (e.g., by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section) causing asphyxiation by physical constraint.

### Applicable Documents:

**Permit to Work Procedure**

**Job Risk Assessment Form**

## Appendix 9.2 Confined Space Safe Work Flow Process



## Appendix 9.3 Permit-Required Confined Space Control Requirements Matrix

| **Confined Space Entry Safe Work Plan** |
|---|
| Use the Confined Space Entry Certificate in conjunction with the Permit to Work process.<br>Safe Work Plan shall consider:<br>• Nature of the confined space configuration (e.g., access/egress, confinement, equipment layout)<br>• Isolation of the confined space (from process and other hazardous materials and rotating or moving equipment)<br>• Hazards from substances within the confined space (e.g., atmospheric hazards, toxic substances, temperature – hot or cold, lighting levels)<br>• Type of work to be conducted (e.g., washing, flushing, de-scaling, hot work)<br>• Ventilation requirements and methods<br>• Communication systems<br>Emergency Response (rescue team and equipment) |
| **Confined Space Risk Assessment (PET-HSE27-SF-FRM-00015)** |
| Assess potential hazards and identify controls required to provide safe entry conditions for the confined space. Note: This should include hazards from the planned work activity that have the potential to affect the breathability and atmospheric conditions within the Confined Space.<br>Confined Space Risk Assessment shall consider:<br>• Liquids or solids ingress (from process or external source)<br>• Poisonous gases, fumes or vapor ingress (from process or external source)<br>• Oxygen deficient, flammable or explosive atmosphere (improper vessel preparation or equipment failure)<br>• Hazards introduced by work activities<br>Confined space configuration (restriction from internal equipment or configuration) |
| **Isolation** |
| Isolation of the confined space shall be in accordance with the Petroleum Isolation Procedure<br>• Confined space activities shall be conducted behind positive isolation points:<br>  ○ Physical disconnection from the confined space (default position)<br>  ○ Full pressure space blinds or spectacle blinds in lines between flanges and the confined space (blinds shall be marked with their duty/purpose)<br>  ○ Deviation shall be considered “non-standard” and require formal risk assessment and approval by the UWA/PIC (e.g. local person in charge of the facility) |

| **Permit to Work** |
|---|
| Permit to Work shall be developed that is specific to the management of the confined space (pre-requisite for issue of separate PTW for the planned work activity).<br>The confined space will be considered “Permitted” for entry following:<br>• Isolation of the confined space from hazardous materials and energy sources<br>• Completion of the decontamination process<br>• Confirmation of acceptable atmospheric conditions within the confined space and process for maintaining said conditions<br>• Testing and acceptance of communication processes to be used for entry into the confined space<br>  ○ Personnel communications processes<br>  ○ Signage and barriers<br>• Confirmation of training and competency of personnel for inclusion on:<br>  ○ Approved entrant and attendant lists<br>  ○ Planned work activity within the confined space<br>  ○ Confined space rescue team.<br>• PPE requirements for entry into the confined space<br>  ○ Full body harness for all confined space entrants (mandatory)<br>  ○ Respiratory equipment (where specified).<br>Identification and acceptability of simultaneous operations in the area of the planned confined space entry. |
| **Decontamination** |
| An assessment shall be conducted and a specific “decontamination process” developed to identify hazardous conditions that will be present relating to the contents of the confined space, and processes developed to remove these substances and decontaminate the confined space prior to approving the confined space acceptable for entry.<br>The decontamination process shall include:<br>• Washing, steam cleaning and/or ventilating to reduce the presence of liquids, solids (e.g., pyrophoric iron sulfide, asphaltene, calcium scale, etc.) or gaseous contaminants<br>• Purging of the confined space using inert gases (nitrogen)<br>• De-enerting the confined space using forced air ventilation<br>• Atmospheric gas monitoring (gas monitors shall have the capability of detecting within flammable, toxic, or inert atmospheres) during the decontamination process<br>Use of positive ventilation systems |

**Atmospheric Monitoring**

Atmospheric gas monitoring shall be formally recorded on the gas test log at a frequency determined by the permit to work for the confined space entry.

Where 0% LEL cannot be achieved within the confined space, approval for entry shall not be approved until completion of a formal Risk Assessment and Controls identified have been fully implemented. In instances where suitable and sufficient Controls cannot be identified, access to the confined space shall not be approved.

Gas Testing shall be implemented during each phase of the confined space entry program and shall include:

- Initial isolation and containment breaks
- Decontamination process
- Prior to Initial Entry (Where the confined space atmosphere has been managed to ensure a breathable atmosphere is in place, initial entry shall be conducted with the use of self-contained breathing apparatus (SCBA) or a cascade air system)
- At pre-determined intervals whilst personnel are within the confined space
- Prior to subsequent entry after breaks, meals, alarms etc.
- De-Isolation and re-instatement

Atmospheric gas monitoring shall include, but not be limited to:

- Continuous monitoring whilst personnel are within the confined space (in addition to formally recorded gas monitoring above)

Use of gas detection/monitoring equipment that is capable of use within inert or toxic atmospheres

**Temporary Equipment Management**

Temporary Equipment for use within the confined space as part of the work activity or confined space atmospheric/life support shall be rated for operation within the relevant hazardous area classification and shall comply with the following:

- Be inspected and tested prior to use
- Develop a temporary equipment register to record and demonstrate approval for use
- Internal combustion equipment must not be operated in or near the confined space
- Electrical equipment and temporary lighting for use within the confined space shall be inspected, tested, of low voltage and comply with electrical classification for the area
- Gas cylinders shall remain outside the confined space at all times and associated hoses, cutting and welding equipment removed from the confined space when not in use
- Hoses and cables shall be protected from chaffing and damage and be positioned to allow safe access/egress during work activity or emergency situations

Portable fire extinguishers shall be of a type that will not impact the breathability within the confined space

**Communication**

Signage shall be in place to identify the confined space and associated hazards.

Communication systems shall provide effective 2-way communication between the entry attendant and the work party within the confined space. Communication system shall be in place between the entry attendant and confined space rescue team. Radio/Intercom systems shall comply with the electrical hazardous area classification for the location and meet the following criteria:

- Communications equipment shall be tested prior to each entry and after breaks, meals, alarms etc.
- Where possible line of sight (LoS) should be maintained by the entry attendant and personnel within the confined space

| **Confined space rescue plan** | |
|---|---|
| A confined space rescue plan shall be developed that is specific to each confined space entry process.<br>The confined space rescue plan shall consider the requirements for both entry and non-entry rescue scenarios (e.g. tripod and mechanical retrieval systems for non-entry rescue) and equipment required for both scenarios procured. The rescue plan shall include the following requirements:<br>• Rescue team shall be independent of the confined space work program and be 100% dedicated to the rescue team.<br>• Make–up of the rescue team shall be determined prior to the work execution, with team members being assigned specific roles and responsibilities within the rescue ream.<br>• Rescue plan shall be integrated into the facility emergency response and tested prior to authorization for commencement of confined space entry work activity.<br>• Rescue and medical equipment locations shall be identified and staged appropriately for the recue team response.<br>Consider potential incidents and emergencies from the facility that could impact the confined space and associated activities, including the impacts from a fire close to the confined space. | |
| ▪ **Rescue team Requirements for confined space categories** | |
| • Confined space poses no actual or potential atmospheric hazards and all hazards within the space are eliminated without entry into the space (i.e. entry into partially enclosed crawl space under vessels, etc.).<br>Note: Completion of rescue procedure still required (see Petroleum Confined Space Entry Risk Assessment). | **No externally contracted rescue team required** |
| • The only hazard present within a confined space is that of a potentially hazardous atmosphere that can be effectively controlled by continuous forced air ventilation and verified by atmospheric testing. | **The need for the on-site presence of an externally contracted rescue team during the entry must be reviewed by the Permit Requestor, the Area Authority and the Site Controller to determine if required.** |
| • Confined space with atmospheric and other inherent hazards that can only be managed by a variety of controls to the point that entry is only allowed through the use of a rigorous set of controls or procedures (i.e., respiratory protection, washing/steaming, etc.). | **The on-site presence of an externally contracted rescue team during the entry is required prior to allowing entry** |

**Roles and Responsibilities**

Personnel that are required to enter and work within the confined space or who have a role in the confined space entry activities (approved entrant, entry attendant, entry supervisor) shall be trained and approved for the activity and their role.

**Approved Entrants**

- Competent in the wearing and/or use of emergency equipment (e.g full body harness, respirators and escape sets, communication devices)
- Regularly communicates with the entrant attendant and alerts the attendant if conditions change or emergency evacuation is required

**Entry Attendant**

- Monitors condition of personnel within the confined space and understands the possible behavioral effects from exposure to hazardous substances that may be present within the confined space
- Operates atmospheric gas testing equipment
- Mobilizes the confined space rescue team and facility emergency response team
- Understands the controls and conditions of the confined space /entry permit to work, including thresholds for cancelling the activity and removing the confined space entrants
- Understands record keeping requirements for gas testing, entry/exit log and communication protocols
- Must remain stationed outside the enhance to the confined space and is responsible for:
- Allowing only approved entrants into the confined space
- Communicates with and continuously monitors entrants
- Relays orders to evacuate to entrants as needed
- Completes entry/exit Log and relays information to control room (or equivalent)
- Continuously monitors and periodically records atmospheric readings
- Understands process to initiate emergency response and rescue teams
- Monitors conditions outside the confined space and assess impacts on entrants

- **Entry Supervisor**
  - Designated position and responsible for authorizing, overseeing and terminating entry as required
    - Ensures acceptable entry conditions are present and understands rescue plans
    - Ensures rescue teams/services are available and activates when required

## Appendix 9.4 Non-Permitted Confined Space Control Requirements Matrix

| **Non-Permitted Confined Space** |
| --- |
| ○ Use the confined space entry decision tree (Appendix 1) to determine if the work area is classified as a permit required or non-permitted confined space.<br>○ Where the work area is classified as a non-permitted confined space:<br>○ Conduct the work under a cold Work or spark potential permit to work<br>○ Conduct gas testing and record on the gas test log prior to accessing the location and maintain continuous gas monitoring for the duration of the activity (both cold work and spark potential permit to work)<br>○ Develop and implement a documented rescue plan for the confined space<br>Note: The confined space risk assessment, Confined Space Certificate and Confined Space Entry Log are not required for non-permitted confined spaces, however the training and isolation requirements still apply. |

## Appendix 10.1 Working at Heights Process Summary

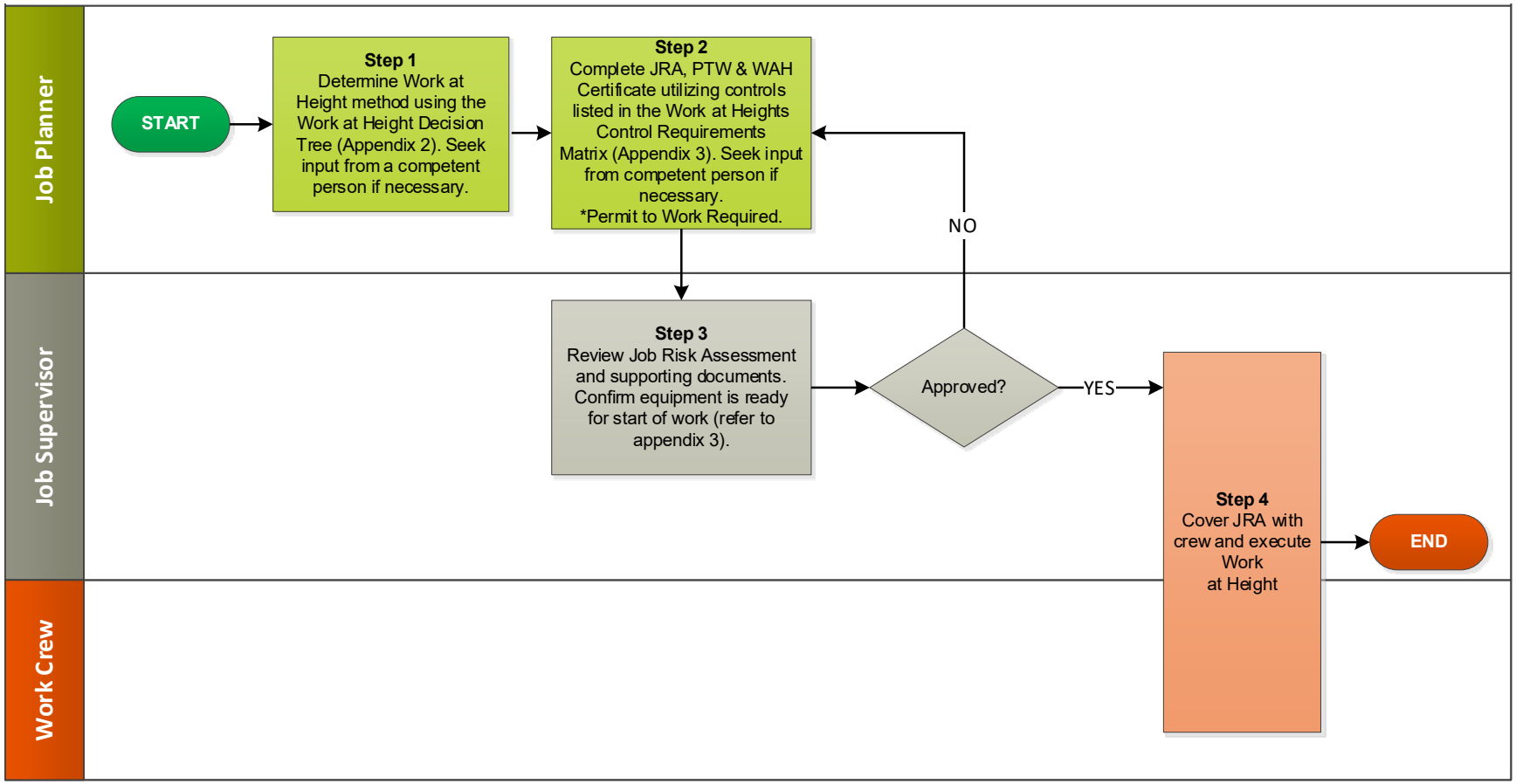



**Figure 4: Working at Heights Process Summary**

## Appendix 10.2 Working at Heights Decision Tree

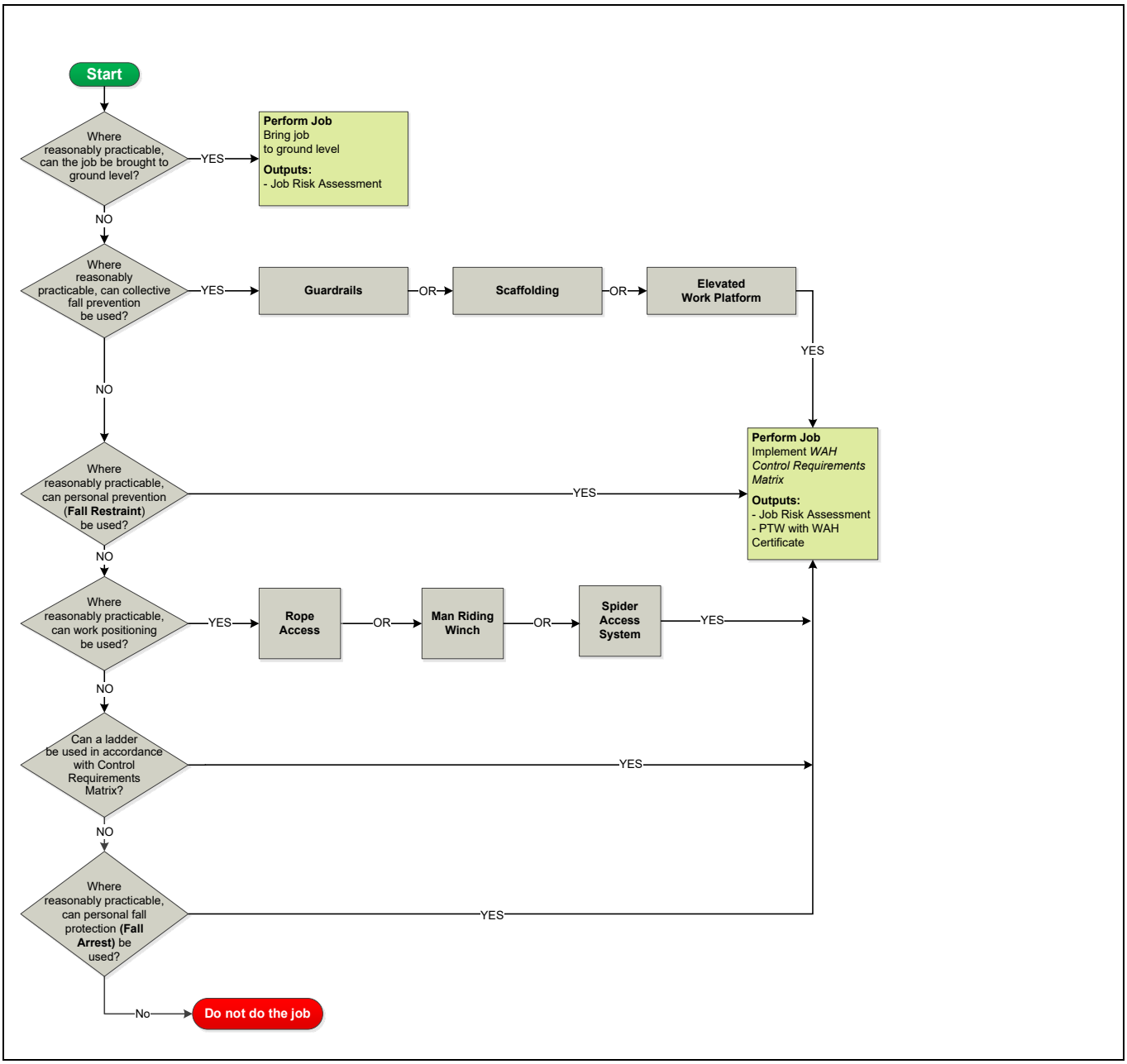



**Figure 5: Working at Heights Decision Tree**

## Appendix 10.3 Working at Heights Control Requirements Matrix

| | |
|---|---|
| **General Requirements** | ▪ *Work Crew* to protect personnel from dropped objects by using barricades and warning signs.<br>▪ All tools and equipment brought aloft must be secured. Choker style lanyards are not allowed unless the tool has an eye, tie-off point, etc., that prevents slippage (i.e., eye of crescent wrench).<br>▪ Inspect work area and equipment to be worked on for potential dropped objects and safety systems to protect from dropped objects prior to starting work and after work is completed to ensure safety systems are reinstalled and nothing was left behind.<br>▪ Consumables (such as bolts, nuts, etc.) must be placed in a tool bag or similar which must be secured.<br>▪ Once the Working at Heights activity is complete, all items taken aloft, that were not consumed, shall be brought down. Verification of this shall be documented on tools-a-loft register (in the WCC, AAR, or similar).<br>▪ When fall protection system is to be used, 100% tie off to approved anchor points required at all times.<br>▪ A register of all fall protection/restraint equipment shall be maintained on each facility and include unique identifiers, equipment type/use, date of manufacture and date of last inspection.<br>▪ Suspension trauma straps are required on harnesses.<br>▪ Develop a rescue plan and rescue team members shall have training to the level and type of rescue they are to perform.<br>▪ Refer to manufacture's recommendations for storage, inspection criteria, maintenance, disposal, etc.<br>▪ Working at heights alone is prohibited. |

**Scaffolding**

| *General Requirements* | *Competency Requirements* | *Inspection Intervals* | *Anchorage* | *Body Wear* | *Connecting Device* |
|---|---|---|---|---|---|
| ▪ Scaffolding must be erected, altered and dismantled in accordance with local regulatory requirements and only by a competent person(s) or under the supervision of a competent person.<br>▪ Warning signs and barriers for incomplete scaffolds must be displayed when erecting or dismantling scaffold, and scaffolding must be effectively isolated from entry.<br>▪ Edge protection (handrails, mid-rails and toe boards) must be provided at every open edge of the work platform.<br>▪ Work is only performed from scaffolds tagged as fit for use with date of last inspection on the tag.<br>▪ Any scaffold structure that remains erected for more than 90 days shall be reviewed and a determination made on whether a permanent fixture would be more viable. If so, the engineering change process (MOC) shall be followed.<br>▪ Scaffolds shall not be fitted with a lifting device unless risk assessed and approved by an Engineer.<br>▪ The following scaffolding needs require design by a registered, professional engineer.<br>– For suspension scaffolds, the direct connections of masons' multi-point adjustable suspension scaffolds<br>– Scaffolds that are to be moved when employees are on them<br>– Pole scaffolds over 60 feet (18.3 meters) in height<br>– Tube and coupler scaffolds over 125 feet (38 meters) in height<br>– Fabricated frame scaffolds over 125 feet (38 meters) in height above their base plates<br>– Brackets on fabricated frame scaffolds used to support cantilevered loads in addition to workers<br>– Outrigger scaffolds and scaffold components | ▪ Scaffolding builders shall have at least a minimum of six (6) months experience erecting scaffolding and shall be supervised (can be scaffold crew member with PETROLEUM DEEPWATER (WOODSIDE ENERGY) experience) by a competent person for the first 90 days working with PETROLEUM DEEPWATER (WOODSIDE ENERGY).<br>▪ Scaffolds shall be designed by a competent person and shall be constructed and loaded in accordance with that design.<br>▪ The competent person is designated by the employer and must have had specific training in and be knowledgeable of the structural integrity of scaffolds and the degree of maintenance needed to maintain them.<br>▪ The competent person must also be able to evaluate the effects of occurrences such as a dropped load, or a truck backing into a support leg that could damage a scaffold. Must be knowledgeable about the | ▪ A competent person must inspect the scaffold and scaffold components for visible defects daily before each shift (not required if not utilizing) or after any occurrence that could affect structural integrity, affixing/updating the inspection tag as appropriate. (Date and initials required on tag).<br>▪ Competent person shall report any wear, damage and other deterioration observed. | **Scaffold Building**<br>▪ Anchorage point must be capable of withstanding a force of 5,000 lbs. (2,267 kg) for each employee attached.<br>▪ Anchorage points to be determined by a competent person. | ▪ Full-body harness with back D-ring.<br>▪ Refer to manufacturer for disposal guidelines. | ▪ Shock-absorbing lanyards, self-retracting lifeline, or vertical life line, and<br>▪ Snap hooks with a secondary locking mechanism. |

| Elevated Work Platforms (EWP) | | | | | |
|---|---|---|---|---|---|
| ***General Requirements*** | ***Competency Requirements*** | ***Inspection Intervals*** | ***Anchorage*** | ***Body Wear*** | ***Connecting Device*** |
| ▪ Must be equipped with anchor point(s) provided by the manufacturer.<br>▪ Only one person is allowed to attach to a single anchorage unless the anchorage has been rated for more than one person.<br>▪ Verify equipment is maintained per manufacturer's recommendations. | ▪ Operated only by persons who are proficient in the operation, safe use, and inspection of the platform.<br>▪ Personnel must have knowledge of fall arrest system inspection, care, use, and performance. | ▪ Competent person to conduct inspection before each use.<br>▪ Inspect using manufacturer's recommendations. | ▪ Anchorage point must be capable of withstanding a force of 5,000 lbs. (2,267 kg) for each employee attached. | ▪ Full-body harness with back D-ring. | ▪ Adjustable-length restraint lanyard rigged as short as practical.<br>▪ Self-retracting lanyard (SRL).<br>▪ Snap hooks with a secondary locking mechanism. |

| Scaffolding | | | | | |
|---|---|---|---|---|---|
| ***General Requirements*** | ***Competency Requirements*** | ***Inspection Intervals*** | ***Anchorage*** | ***Body Wear*** | ***Connecting Device*** |
| – Over water work requires pre-approval from the fast rescue craft (FRC) team, FRC team on standby at all times (may be provided by support vessel), and the worker(s) must wear a personal flotation device (PFD) and position locator beacon (only during adverse weather conditions i.e. high seas, storms, high wind, fog, etc.)<br>Note: Any work off of the deck within four (4) feet of a handrail (that protects from fall into the water) is considered over water work and the same controls above must be in place. Exception: Where no potential to fall overboard exists (i.e., blocked by piping or structure) and/or through the use of fall restraint equipment. | requirements of this standard. A competent person must have training or knowledge in these areas in order to identify and correct hazards encountered in scaffold work. | | | | |
| | | | ▪ **Scaffold Use** | | |
| | | | ▪ Green Tag Scaffold - The primary means of fall protection are the handrails and mid-rails.<br>▪ Yellow Tag Scaffold – 100% Tie-Off Required<br>▪ Red Tag Scaffold – Do Not Use | | |

| Man Riding | | | | | |
|---|---|---|---|---|---|
| ***General Requirements*** | ***Competency Requirements*** | ***Inspection Intervals*** | ***Anchorage*** | ***Body Wear*** | ***Connecting Device*** |
| ▪ Winches used for man riding must be certified by the manufacturer and approved for that purpose.<br>▪ A secondary fall protection device must be used independent of the winch.<br>▪ Verify that equipment is maintained per manufacturer's recommendations and the *Lift Equipment Requirements Matrix* (PET-HSE27-SF-MTX-00001). | ▪ Personnel working from/operating man rider must be specifically Trained on operation, inspections, and safe work practices.<br>▪ Have a minimum of six (6) months experience operating man riding systems. | ▪ Only a competent person who has been trained in the operation, hazards, safe Use and inspection criteria should conduct inspection before each use. | ▪ Anchorage point shall be capable of withstanding a force of 5,000 lbs. (2,267 kg) for each employee Attached. | ▪ Full-body harness with back D-ring (optional: May require specialty harness). | Secondary fall protection<br>▪ Adjustable-length restraint Lanyard rigged as short as practical, self-retracting life line, or shock absorbing lanyards, and<br>▪ Snap hooks with a secondary locking mechanism. |

| Rope Access | | | | | |
|---|---|---|---|---|---|
| ***General Requirements*** | ***Competency Requirements*** | ***Inspection Intervals*** | ***Anchorage*** | ***Body Wear*** | ***Connecting Device*** |
| ▪ For overwater work, an inertia reel and/or secondary 4:1 retrieval system should be used to assist in recover in case of a fall.<br>▪ A minimum of two (2) technicians are required for working at heights activities, one of whom must be a level 3 technician.<br>▪ When there is a minimum of two (2) technicians, the level 3 technician should be on the deck and in constant contact with the technician at heights.<br>▪ For all over-the-water activities, a minimum of three (3) technicians are required; Level 1, Level 2, and a Level 3 as the Supervisor.<br>▪ The Level 3 shall not work at heights unless during rescue operations.<br>▪ Over water work requires pre-approval from the fast rescue craft (FRC) team, FRC team on standby at all times (may be provided by support vessel), and the worker(s) must wear a personal flotation device (PFD) and position locator beacon (only during adverse weather conditions i.e. high seas, storms, high wind, fog, etc.).<br>▪ Note: Any work off of the deck within four (4) feet of a handrail is considered over water work and the same controls above must be in place. Exception: Where no potential to fall overboard exists (i.e., blocked by piping or structure) and/or through the use of fall restraint equipment. | ▪ Rope Access Technicians shall be certified – and work in accordance to – the Society of Professional Rope Access Technicians (SPRAT) or Industrial Rope Access Trade Association (IRATA) work practices.<br>▪ Shall have at least 6-month post certification work experience or a minimum of 500, Category 1, hours logged while employed in the industry. Logbooks should be provided upon request.<br>▪ The trade skills, training, and competencies of rope access technicians must be suited to the scope undertaken.<br>▪ Technicians with 90 days or more of inactivity shall not be accepted without a re-assessment verifiable by the Contract Owner or Principal Contractor Performance . | ▪ Competent person to conduct inspection before each use.<br>▪ Inspect using manufacturer's recommendations. | Per SPRAT or IRATA | | |

| Spider Access/Suspended Scaffolding | | | | | |
|---|---|---|---|---|---|
| ***General Requirements*** | ***Competency Requirements*** | ***Inspection Intervals*** | ***Anchorage*** | ***Body Wear*** | ***Connecting Device*** |
| ▪ Supporting wire between the scaffolding and the suspension device/anchor point must be kept vertical unless:<br>– The rigging has been designed by a competent person<br>– The scaffolding is accessible to rescuers<br>– The supporting wire is protected from rubbing during direction changes<br>– The scaffolding is positioned so swinging cannot bring it into contact with other surfaces. | ▪ Personnel working from/operating single-point suspended scaffolding (spiders) must be specifically trained on single-point suspended scaffolding operation, inspections and safe work practices.<br>▪ Have a minimum of 6 months experience operating single-point suspended scaffolds. | ▪ Four Inspection certification(s) must be maintained onsite. Pre-use inspections shall be performed prior to each use with formal inspections conducted annually. | ▪ All suspension scaffold support devices shall rest on surfaces capable of supporting at least 4 times the load imposed on them by the scaffold operating at the rated load of the hoist (or at least 1.5 times the load imposed on them by the scaffold at the stall capacity of the hoist, whichever is greater).<br>▪ Anchorage for personnel tie-off must be capable of supporting a minimum of 5000 lbs. | N/A | N/A |

| Fixed Ladders | | | | | |
|---|---|---|---|---|---|
| ***General Requirements*** | ***Competency Requirements*** | ***Inspection Intervals*** | ***Anchorage*** | ***Body Wear*** | ***Connecting Device*** |
| ▪ While ascending or descending a ladder, personnel must maintain three points of contact at all times without the need to hold, push or pull any part of the device, leaving both hands free for climbing.<br>▪ Fixed ladders must be constructed in accordance with local regulatory requirements. Fixed ladders longer than 20 ft (6 m), except those used solely for emergency access/egress, must be fitted with ladder safety devices or self-retracting lanyards<br>▪ Fixed ladder opening shall be equipped with self-closing swing gate (double arm gates required). | ▪ Capable of identifying the correct ladder to be utilized, inspecting the ladder for defects (removing from service if deficient) and utilizing the ladder in the manner in which the manufacturer intended. | ▪ Competent person to conduct inspection before each use.<br>▪ Inspect using manufacturer's recommendations. | ▪ Must be capable of sustaining static loads in the direction permitted by the system to 2 times the maximum arresting force or in the absence of certification 5,000 lbs. (22.2 kN).<br>▪ Limits the maximum free fall distance to 2 ft. (0.6 m) and limits the maximum arrest force to 900 lbs. (4 kN). | ▪ Full-body harness with front or back D-ring. | ▪ Shock absorbing lanyards or Self-retracting life line.<br>▪ Snap hooks with a secondary locking mechanism. |

| Portable Ladders | | | | | |
|---|---|---|---|---|---|
| ***General Requirements*** | ***Competency Requirements*** | ***Inspection Intervals*** | ***Anchorage*** | ***Body Wear*** | ***Connecting Device*** |
| ▪ While ascending or descending a ladder, personnel must maintain three points of contact at all times without the need to hold, push or pull any part of the device, leaving both hands free for climbing.<br>▪ Portable ladders may only be utilized as per manufacturer's recommendation (i.e., no working from top rung, following weight limits, etc.).<br>▪ Any portable ladder used must be no more than 30 ft (9 m).<br>▪ Personnel using an extension ladder must confirm that the ladder is properly extended and, where fitted, the extension sections are locked in position.<br>▪ Single or extension ladders must be tied off, when possible, to prevent movement any time they are standing upright and must have non-slip secure footing. A second person must be used to secure the ladder during the initial climb and tying off the ladder.<br>▪ Never climb past the second rung from the top of a stepladder or the fourth rung from the top of an extension ladder.<br>▪ Select ladder type (e.g., material, load rating) based on intended service).<br>▪ Portable ladders must be:<br>– Elevated at an appropriate angle (horizontal distance from base to vertical plane of support should be one-quarter the ladder height)<br>– Set up on a surface that is solid and stable, and set to prevent the ladder slipping<br>– Positioned away from power lines. | ▪ Capable of identifying the correct ladder to be utilized, inspecting the ladder for defects (removing from service if deficient) and utilizing the ladder in the manner in which the manufacturer intended. | ▪ Competent person to conduct inspection before each use.<br>▪ Inspect using manufacturer's recommendations.<br>▪ Removed from service immediately if damage is identified. | ▪ A person may work from a portable ladder without fall protection, provided that:<br>– The worker's center of gravity (body mass) is maintained between the ladder side rails<br>– The worker will have one hand available to hold on to the ladder or other support<br>– The worker's feet are not more than 6 feet from the ladder support surface<br>– The ladder is not positioned near an edge or floor opening that would significantly increase the potential fall distance.<br>▪ If any of the conditions above do not exist, implement Fall Arrest requirements. | | |

| Guardrail System (Edge Protection – i.e., missing/removed guardrail, grating removed, etc.) | | | | | |
|---|---|---|---|---|---|
| ***General Requirements*** | ***Competency Requirements*** | ***Inspection Intervals*** | ***Anchorage*** | ***Body Wear*** | ***Connecting Device*** |
| ▪ Minimum height of 42 in (106 cm) to the top of the guardrail.<br>▪ Guardrail must have a standard toe board (shall meet local regulatory requirements) and mid-rails, screens, mesh, or other intermediate members.<br>▪ Access ways into a guarded area must be controlled where there is a risk of personnel accidently falling through the opening (e.g. off-set access, self-closing swing gate). | ▪ Operated only by persons who are proficient in the operation, safe use, and inspection of the guardrail system.<br>▪ Personnel must have knowledge of fall arrest system inspection, care, use and performance. | ▪ Personnel using guardrail system should visually inspect scaffold daily and report any wear, damage and other deterioration observed. | ▪ Top rail or corresponding member must be capable of withstanding a force of 200 lbs. (90 kg) applied in any direction (except upward) at any point.<br>▪ Mid-rails, screens, mesh, and other intermediate members must be capable of withstanding at least 200 lbs. (90 kg) of force applied in any direction at any point along the mid-rails or other member. | ▪ The guardrail provides fall protection. Additional personal fall protection is not required unless any component of the guardrail is not in place. (fall restraint is required if component is missing). | ▪ No |

| Fall Restraint System | | | | | |
|---|---|---|---|---|---|
| ***General Requirements*** | ***Competency Requirements*** | ***Inspection Intervals*** | ***Anchorage*** | ***Body Wear*** | ***Connecting Device*** |
| ▪ System must allow a person access to conduct their duties but prevent them from reaching a point where a fall could occur.<br>▪ Equipment that has reached the end of its lifespan, as identified by the manufacturer, shall be discarded | ▪ Capable of identifying the correct fall restraint system, how to inspect for defects (removing from service if deficient), how to utilize and how to maintain/store | ▪ Inspect systems visually before each use for wear, damage and other deterioration, removing defective components from service (as per manufacturer's recommendation.<br>▪ System shall be worn, stored and cleaned per manufacturer's recommendation.<br>▪ Detailed/Documented inspection every 6 months. Inspection should be completed by competent third party annually. | ▪ Anchorage point shall be capable of withstanding a force of 5,000 lbs. (2,267 kg) for each employee attached. | ▪ Full body harness with back D-ring.<br>▪ Front D-ring may be used with certain climb assist systems. | ▪ Adjustable length restraint lanyard rigged as short as practical, and<br>▪ Snap hooks with a secondary locking mechanism. |

| Fall Arrest System | | | | | |
|---|---|---|---|---|---|
| ***General Requirements*** | ***Competency Requirements*** | ***Inspection Intervals*** | ***Anchorage*** | ***Body Wear*** | ***Connecting Device*** |
| ▪ System must be rigged such that a person can neither free fall more than 6 ft. (1.83 m), nor contact any lower level (shall account for potential impacts due to swing).<br>▪ System shall bring person to a complete stop and limit maximum deceleration distance to 3.5 ft. (1.06 m).<br>▪ Prohibit personnel working alone while using a fall arrest system.<br>▪ Equipment shall be discarded if it has been subjected to forces of fall<br>▪ Equipment that has reached the end of its lifespan as identified by the manufacture shall be discarded | ▪ Capable of identifying the correct fall arrest system, how to inspect for defects (removing from service if deficient), how to utilize and how to maintain/store. | ▪ Inspect systems visually before each use for wear, damage and other deterioration, removing defective components from service (as per manufacturer's recommendation.<br>▪ System shall be worn, stored and cleaned per manufactures recommendation.<br>▪ Detailed/Documented Inspection per manufactures recommendation but no less than every 6 months. Inspection should be completed by competent third party annually. | ▪ Must be able to withstand a force of 5,000 lbs. (2,267 kg) for each employee attached<br>▪ Must be in a position that limits free fall distance to no more than 6 ft. (1.82 M)<br>▪ CANNOT be fluid/process piping, ladder rungs, handrails, cable trays. | ▪ Full body harness with back D-ring.<br>▪ Front D-ring may be used with certain climb assist systems. | ▪ Shock absorbing lanyards or self-retracting lifeline, and<br>▪ snap hooks with a secondary locking mechanism,<br>▪ Dual lanyard (where the work method requires persons to detach and re-attach at height).<br>▪ |

## Appendix 11.1 Electrical - Personal Protective Equipment & Control of Work

PPE appropriate for the task shall be worn by persons working on or near live electrical equipment to protect them from the potential hazards of electrical shock and arc flash. All PPE rating must be in accordance with specific task requirements. As a minimum, the following PPE will be used for work involving electrical energy:

Approved wrist to ankle electrical coverall 8 cal/cm2

Approved electrical insulating gloves.

Arc shield visor and flash suit hood if required.

**Miscellaneous protective electrical equipment**

Hot stick

Insulating mat

Portable high voltage sensing device (Tic Tester, Modiwark)

Grounding leads.

### Control of Work

Isolations - all work will be governed by PETROLEUM DEEPWATER (WOODSIDE ENERGY) Isolation procedure.

### Training and Competency

All competent electrical persons and appointed electrical persons: Senior Authorized Switching Person (SASP), Authorized Switching Person (ASP) shall complete training and have the required experience to perform their respective job duties with regards to electrical work. The appointed persons must be assessed by the Electrical SME for the region. The training differs in each region but as a minimum the following must be completed:

TTPU - Fundamentals of the Safe Operation of High Voltage Systems

GOM – Shall have experience in power engineering, power systems and arc flash hazard analysis, must undertake awareness program about NFPA 70E

APU - Must be certified as an Authorized Licensed Electrician in Australia, complete and pass PETROLEUM DEEPWATER (WOODSIDE ENERGY) Electrical Isolation competency assessment (AOHR-CMS-0014)

# Appendix 11.2 Electrical - High Voltage Equipment & Low Voltage Equipment

## Operation High Voltage (HV) Test and Safety Equipment

For energized electrical work, insulating matting shall not be relied upon to provide primary protection. Matting is only used to provide additional protection, in conjunction with other mitigating barriers such as insulating tools and gloves.

Insulating matting shall be subject to in-service inspection by a competent person (Electrical) such that they remain effective in mitigating the risk of electric shock.

Only certified hot sticks, gloves, insulating mats, earthing trucks, and voltage detection equipment shall be used.

All equipment used on high voltage electrical equipment, and which require regular testing to prove the effectiveness of insulation shall be tested at specific intervals and marked to show the date of the next routine test.

Equipment shall not be used after the specified date until retesting is affected.

Hot sticks shall have a handle distinguishable from the effective insulating section. The insulating section shall be appropriate to the voltage concerned, and the stick shall be designed to permit the operator to observe the necessary safe clearances for working in the vicinity of high voltage equipment.

## Switching Operations

For work defined as high voltage electrical work: above 480 volts, a switching party of two shall carry out the isolations and de-isolations. The party shall consist of one Senior Authorized Switching Person (SASP) and one Authorized Switching Person (ASP). During the switching operation, the SASP shall carry out the switching duties while the ASP will verify that the correct switching procedures are carried out and also act as a safety observer to provide assistance in the event of an emergency.

## Access to HV Enclosures and HV Electrical Equipment

Access Control barriers that prevent access to enclosures and equipment shall be maintained and kept locked at all times, only a Competent Electrical person (e.g., SASP and ASP) shall have authority to enter these enclosures with strict adherence to the Permit to Work (PTW) procedure as stated above.

## Arc Flash

To reduce the effect of rapid release of energy during an arcing fault between electrical conductors an arc flash calculation must be carried out; NFPA 70E or IEEE 1584 can be used to determine potential for arc flashes and required safe working distances. Arc flashes are also possible from following below:

Hot surfaces, fire and explosion

Battery cells – stored electrical energy

Electromagnetic fields (EMF)

## Approaches to High Voltage and Live Equipment

These are the minimum clearance distances which shall be observed by persons normally approaching exposed live high voltage conductors. For 4.16 and 6.6kV this distance shall be 500mm. These limits shall be the distance beyond reach of any part of the person's body or any conducting or unapproved object touching any part of the person's body

For **MOBILE EQUIPMENT**, the minimum distance which shall be observed for any mobile plant approaching live high voltage conductors shall be as follows -

| | |
|---|---|
| Exposed conductors | 6.4 metres |
| Insulated conductors | 2 metres |

## Operation Low Voltage (LV) Test and Electrical Equipment

All persons engaged in the repair, maintenance, cleaning, and testing on LV (below 480 Volts) electrical equipment must do so under the following conditions:

Electrical equipment switched off from all possible power supply

Have power supply isolated via circuit breakers or switches or removal of fuses

Have equipment proved dead with an approved LV testing device suitable for the rated circuit, this unit must be tested for functionality prior to use

Have proper barriers and screens where necessary to prevent danger to any adjacent live electrical equipment

Have competent electrical person verify electrical system is dead.

## "Live" Conductors

Conductors that have been isolated and exposed shall be immediately checked for voltage and the necessary earthing installed to discharge and render the exposed conductors dead.

In order to limit access to the area by non-essential personnel, suitable notices and "DANGER" tape barriers shall be installed. The provision and positioning of notices and tape barriers shall take into account all likely and unlikely approaches to the work area.

Work to be executed in low voltage electrical panels, junction boxes and other similar enclosures shall be examined for multiple sources of voltage. The integrity and location of the guarding installed in and around the multiple sources shall be examined to ensure that inadvertent contact between personnel and source is prevented.

Work on high voltage (above 480 volts) systems that require the installation of temporary guards to protect personnel from high voltage conductors, shall be installed by de-energizing, isolating and earthing the system to be guarded. Once the necessary guard has been installed, the system can be de-isolated and re-energized. Guards should be installed to prevent any part of a person's body approaching within 500 mm of an exposed conductor.

# Appendix 11.3 Electrical - Tools & Equipment

## Tools and Equipment

All tools and equipment shall be considered conductive unless they have been verified as being safe for that particular voltage involved in the task.

For work on equipment, which may be energized and not considered high voltage, all tools must be rated and insulated for the application.

Tools should be inspected prior to each use and retested or replaced if any visible damage beyond the manufacturer specifications.

Guarding may also be the use of screens, mats, barriers, or covers to minimize the possible inadvertent contact to energized equipment.

## Arc Flash

All tools and equipment shall be considered conductive unless they have been verified as being safe for that particular voltage involved in the task.

For work on equipment, which may be energized and not considered high voltage all tools must be rated and insulated for the application.

Guarding may also be the use of screens, mats, barriers, or covers to minimize the possible inadvertent contact to energized equipment.

## Voltage Detectors (Contact & Non-Contact)

Non-contact voltage detectors (Tic Tracer, Modiwark) can be used to determine the presence or absence of an electrical source.

Correct operation of the detector must be verified by placing it near a known active source.

Once the voltage detector indicates the presence of an energized source it can then be placed near the equipment to be tested. Gradually move the detector towards the equipment until it either detects a source or comes into physical contact with the equipment. (Contact with the equipment indicates the absence of any significant voltage levels).

Once the voltage detector indicates the absence of any voltage, verify its correct operation by again placing it near a known active source.

Contact type voltage detectors (phasing sticks, live line testers) can be used to determine the presence or absence of an electrical source by being placed in direct physical contact with the conductor.

The Senior Authorized Switching Person (SASP) or other suitably qualified trained personnel shall perform testing on high voltage equipment.

Personnel shall be clothed in appropriate PPE (high voltage gloves, face shield, rubber mats, etc.) and associated test equipment shall have valid certification.

Correct operation of the detector must be verified by placing it on a known active source.

Perform phase to ground and phase-to-phase measurement on all conductors of the equipment to be tested. In the event that no voltage is detected, verify the correct operation of the detector by again placing it on a known active source.

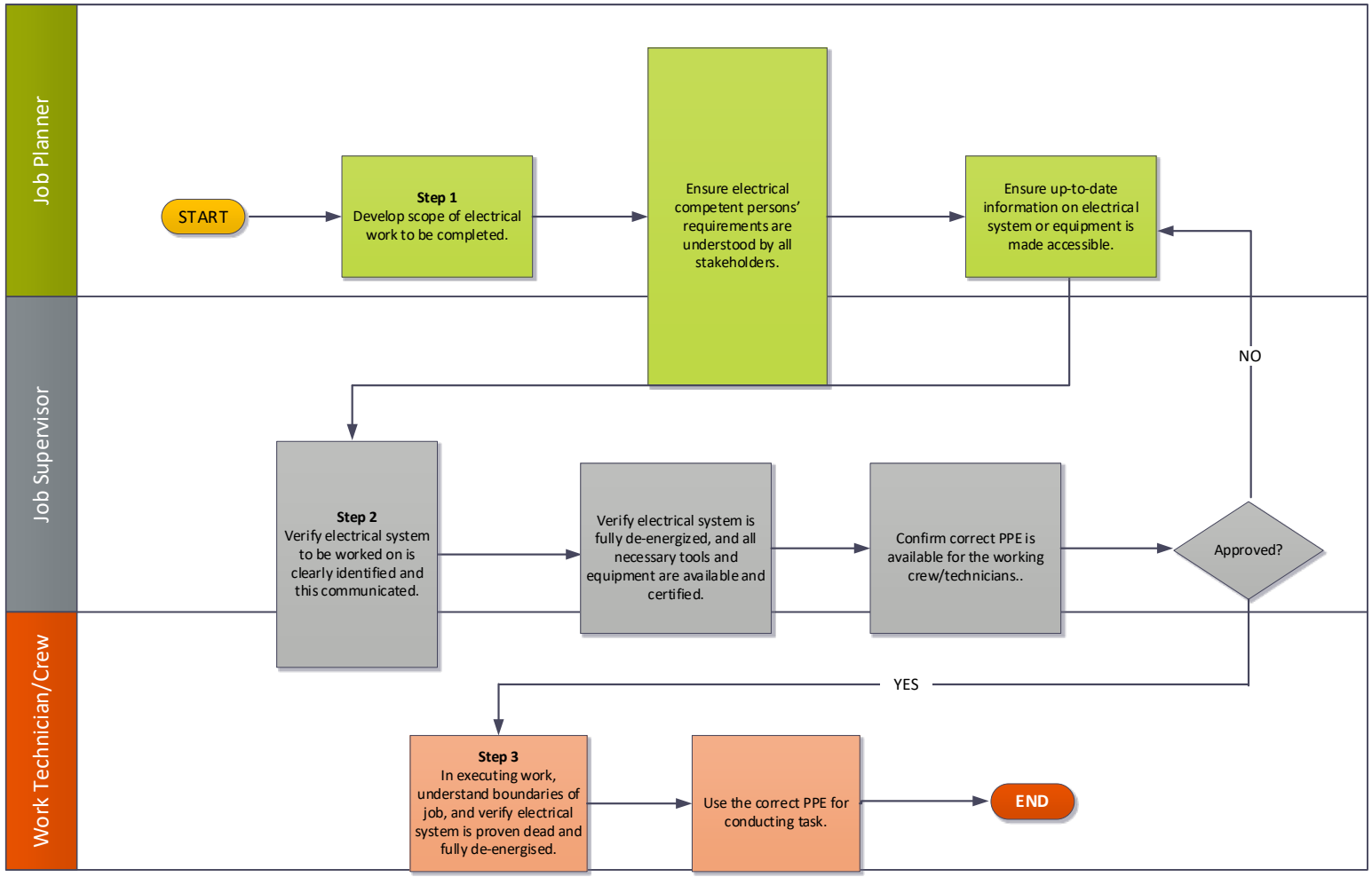
## Temporary Electrical Installations

Temporary changes to electrical installations are implemented and managed in accordance with PETROLEUM DEEPWATER (WOODSIDE ENERGY) Management of Change Procedure.

Temporary electrical installations shall:

- be designed to the same standards as any permanent installation, where necessary to provide safe operation for the period of operation
- be suitably certified, installed and inspected for the location
- be periodically inspected where necessary to maintain safe operation
- not be connected to the electrical system or energized until deemed safe by competent electrical person.

## Appendix 11.4 Working with Electrical Energy Process Summary



## Appendix 11.5 Electrical - Supporting Regulations

- APU - Electricity Act 1945
- APU - Electricity (Licensing) Regulations 1991
- APU - Electricity Regulations 1947
- APU – AS/NZS3000 – Electrical Installation (Wiring Rules)
- GOM - NFPA 70E Standard for Electrical Safety in the Workplace
- Electrical Safety Manual GOMPU-BHP-00-EL-MAN-0001

This procedure governs all electrical work in Petroleum Deepwater (Woodside Energy).

Exceptions are made only in the case of regional regulatory requirements.

## Appendix 12.1 Minimum Requirements for Marine Operations

| Control | Minimum Requirements |
|---|---|
| **Establish a Facility Safety Zone for offshore installations** | ▪ Detail responsibilities of key Company positions and vessel Masters, for vessel movements and general marine operations.<br>▪ Define general details of operational area including installation layout, operational area bathymetry, pipelines, subsea structures, anchorage areas, and metocean data.<br>▪ Create a minimum distance of 550-yards (500-metres) from the facility and associated activities or as required by regulations.<br>▪ Establish a process to monitor the safety zone.<br>▪ Define allowable activities within the safety zone, including controls to manage these activities and potential Simultaneous Operations (SIMOPs).<br>▪ Outline communication methods and protocols. |
| **Manage activities within the Facility Safety Zone** | ▪ Require vessels to operate in accordance with the Guidelines for Offshore Marine Operations (G-OMO) section 8 when entering, working in or departing the safety zone. Include the use of a Safety Zone Checklist aligned to the G-OMO example.<br>▪ Require dynamically positioned vessels to operate in Equipment Class 2, or higher, as per the International Maritime Organization MSC Circular 645. |
| **Manage vessel voyage with detailed plans** | ▪ Require vessels to develop passage plans, from berth to berth, for each voyage in accordance with the International Maritime Organization – Guidelines for Voyage Planning. |
| **Control personnel transfer to, from and between marine vessels** | ▪ Conduct transfers in accordance with the G-OMO section 7.1 and 7.9.<br>▪ Implement a process to verify gangways, temporary bridges, landing platforms and securing arrangements are fit for service. |
| **Manage transfer of bulk cargo (does not apply to tanker offtake / loading activities)** | ▪ Control transfer of bulk cargo in accordance with the G-OMO section 10.<br>▪ Require bulk transfer hoses to single substance use only (e.g., diesel, potable water).<br>▪ Use bulk transfer hoses that remain afloat at all times (except for in-line bunkering operations), employing additional flotation devices where hose buoyancy is insufficient to support a particular product. In the case of acid fracturing / stimulation vessels, the use of flex-steel type hose is to be risk assessed to determine the need for additional controls.<br>▪ Illuminate hoses and support vessels where transfers take place in darkness, including use of reflective material on hoes when illumination cannot be maintained. |

| Control | Minimum Requirements |
|---|---|
| | ▪ Maintain direct line of sight during cargo transfer activities between the conning position and the bulk hose(s).<br>▪ Use dry break couplings on bulk transfer hoses for petroleum-based products and brines (e.g., Avery Hardoll or TODO couplings).<br>▪ Require hose strings to have a weak-link breakaway coupling (e.g., KLAW coupling). |
| **Implement controls for facility / tanker off-take operations at offshore terminals** | ▪ Define terminal details; including location, approach, waiting areas, anchorage and prohibited anchorage areas (i.e., Berthing and Terminal Handbook).<br>▪ Establish controls for pollution prevention and preparedness.<br>▪ Describe operating limits and requirements at the berth / terminal (e.g. max deadweight tonnage and displacement, vapor recovery, ballast).<br>▪ Require engine and steering gear tests prior to commencement of approach.<br>▪ Document pilotage and pilot boarding controls.<br>▪ Define mooring processes, including inspection requirements prior to mooring.<br>▪ Establish hose connection and disconnection protocols.<br>▪ Create processes for managing static tow where the off-take tanker requires assistance by a vessel on static tow during off-take.<br>▪ Define restrictions on crew transfers, if any.<br>▪ Document availability of bunkers, potable water and stores.<br>▪ Communicate berthing and terminal requirements to key stakeholders including, Offtake Tanker Masters prior to vessel berthing. |

## Appendix 13.1 Emergency Response Plan Inputs

<table>
<tr><th>Area</th><th colspan="2">Requirement</th></tr>
<tr><td>Scope and objectives</td><td colspan="2">▪ Document the scope and objectives of the response plan.</td></tr>
<tr><td>Activation and mobilization process</td><td colspan="2">▪ Describe the framework to guide the activation of the response team, including:<br>– use of the Emergency Crisis Center to support team call out<br>– notification to the one-up team Leader upon current team activation.</td></tr>
<tr><td>Command center</td><td colspan="2">▪ Detail the Command Center location (primary and secondary), contact details and key resources (e.g., communication devices, break-out rooms).<br>▪ Define Command Center set up and role of first person to arrive.</td></tr>
<tr><td rowspan="2">Roles and responsibilities</td><td colspan="2">▪ Define key roles and responsibilities, with the following minimum roles:</td></tr>
<tr><td>Incident Management Team (IMT)<br>– Incident Commander<br>– Safety Officer<br>– Liaison Officer<br>– Public Information Officer<br>– Finance Section Chief<br>– Logistics Section Chief<br>– Operations Section Chief<br>– Planning Section Chief</td><td>Emergency Management Team (EMT)<br>– Leader<br>– Human Resources<br>– Legal<br>– Corporate Affairs</td></tr>
<tr><td>Manage Worker and Public Exposures</td><td colspan="2">Exposure Monitoring:<br>▪ Define the triggers for the assessment of worker exposure to harmful agents.<br>– Where IH sampling is required the primary approach must be real time monitoring followed by full shift personal monitoring.<br>– All exposure monitoring to be performed by appropriately trained personnel in accordance with a recognized standard using accredited laboratories for the analysis of any personal samples.<br>– Personal monitoring field sheets shall be used to collect consistent quality information about each sample, consolidated and provided to the incident command center in a timely manner to allow decision making.</td></tr>
</table>

| Area | Requirement |
|---|---|
| | **Exposure Control**<br>▪ Define a process for the use of real time monitors to deploy controls and continually reassess the controls needed as the emergency progresses.<br><br>**Public Exposures:**<br>▪ If there is a risk of public exposures to harmful agents - define the process for assessing this risk and alerting appropriate authorities to respond and protect public health. |
| **Resources** | ▪ List critical resources available to support credible emergency response scenarios. |
| **Notification and communication protocols** | ▪ Document the notification and communication protocols for internal and external responders. |
| **Documentation protocols** | ▪ Provide the documentation protocols to be used during a response. |
| **Shift-change and handover protocols** | ▪ Define the shift-change and handover protocols for incidents requiring a protracted response. |
| **Demobilization and post-incident debrief** | ▪ Describe the demobilization process and associated post-incident debrief requirements. |

## Appendix 13.2 Emergency response training and exercises

### Emergency response team member training

| Requirement | Who | Minimum Frequency |
|---|---|---|
| **General induction**<br>▪ Provide new team members an overview of:<br>– the emergency response structure<br>– activation and mobilization process<br>– response plan and resources. | ▪ Emergency Management Team (EMT), Incident Management Team (IMT) and Field Response Team (FRT) members | ▪ Prior to inclusion on team roster |
| **Role specific**<br>▪ Review of role requirements and applicable plans. | ▪ EMT, IMT (including source control) and FRT | ▪ Prior to inclusion on team roster<br>▪ Annually when participation in an exercise has not occurred |
| **Table top exercise involvement** | ▪ EMT, IMT (including source control) and FRT | ▪ Once every 2 years unless a ***major exercise*** participant<br>▪ Annually for Legacy Assets |
| **Major exercise involvement** | ▪ EMT, IMT (including source control) and FRT | ▪ Once every 3 years[7] |
| **Incident Command System (ICS) 100** | ▪ EMT[8] and IMT (including source control) | ▪ Within 12-months of joining the team |
| **Incident Command System (ICS) 200** | ▪ IMT | ▪ Within 12-months of joining the team |

[7] Participation in a Live EMT event qualifies as a major exercise

[8] ICS 402 can be used as an alternative course

### Emergency response team exercises[9]

| Requirement | Applies to | Minimum Frequency |
|---|---|---|
| **Table top exercise** | ▪ IMT and FRT | ▪ Twice per annum, in addition to a ***major exercise*** <br>▪ Annually for Legacy Assets |
| **Table top exercise (contractor)** | ▪ Primary Contractor, when they manage the work location | ▪ Annually |
| **Major exercise** | ▪ EMT, IMT and FRT | ▪ Annually <br>▪ Three Yearly for Legacy Assets |

## Appendix 14.1 HSE Governance

### HSE Content Simplification Principles

**Principles**

- Only create documents to meet legislated requirements, control a significant risk or tangibly improve efficiency and effectiveness.
- Do not duplicate or contradict requirements in a Group Level Document, Petroleum or Asset Standard, Procedure or process.
- Only create forms and templates associated with a procedure to prevent error or achieve consistency in the required output.
- Keep it short and simple. Do not include detailed guidelines, detailed context, unnecessary steps or complex instructions.
- Where an approval is absolutely needed, set approval levels as close to the workface as possible, given due consideration to the risk associated with the decision.

[9] The IMT must, at a minimum, involve the EMT in at least one exercise each year.