## Standards and Procedures

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- 01-01-103 F1001 Monthly Rig Inspection
- 01-01-103 F1002 Monthly Harness Control
- 01-01-103 F1003 Fall Arrestors Inspection
- 01-01-103 F1004 Monthly Yard and Warehouse Inspections
- 01-01-103 F1010 Weekly Mast Inspection
- 01-01-103 F1011 Monthly Spill Kit Control
- 01-01-103 F1012 Weekly PPE Box Control
- 01-01-103 F1015 Weekly First Aid Kit Control
- 01-01-103 F1015A First Aid Kit Recommended List
- 01-01-103 F1016 Monthly Smoke Detector Control
- 01-01-103 F1017 Weekly Light Vehicle Checklist
- 01-01-103 F1019 Weekly Camp Hygiene Control
- 01-01-103 F1025 Weekly Driller's Inspection
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1.0 GENERAL

The Permit to Work System is a communication tool that authorizes a specific work, at a specific location, for a specific period of time.

A Work Permit is a signed agreement between the issuer and the receiver, which documents the conditions, preparations, precautions and limitations before work commences.

The Work Permit must identify:
- The work to be done - a brief description of it.
- The location where the work will be done - as specific as possible.
- The hazards involved in the work place like:
  - hot work – open flames
  - confined space entry,
  - mechanicals,
  - electrical,
  - pressure in lines and vessels,
  - toxic or dangerous chemicals,
  - explosives,
  - radioactive
  - drop of heavy or unusual lifts,
  - drops due to overhead activities,
  - flying particle due to chipping, paint spray, shot blasting, high pressure water jetting,
  - simultaneous operations that has the potential to interfere each other.
- The length of the work - date and time the work will commence and finish.
- The precautions to be taken to do the work - equipment and/or procedures that must be worn/followed; isolation, ventilation and testing requirements.

All hazards and precautions related to the work have to be determined before the work starts.

2.0 PURPOSE

The purpose of this procedure is to assess and manage risks inherent to potentially hazardous work on a Viking facility with a written authorization before any work that might be hazardous to our employees, contractors, or other parties begin.

When working for Operators with formal Work Permit Systems, the decision on which system to be used will be made and communicated in the Bridging Document for that operation or before start of project.

3.0 SCOPE

Viking Permit to Work System will help to identify hazards, and take the necessary actions to mitigate them.

It will authorize a work team to perform a specific work, at a specific location, for a specific period of time, under specific supervision and control.

The Permit to Work System, will communicate to all other personnel in the area that this specific job is ongoing and the expected length of duration.
4.0 DEFINITIONS

4.1 Cold Work
Hazardous work, non routine operation, and work on critical safety and emergency systems where no open flames or other sources of ignition exist.

4.2 Hot Work
All activities with the potential to create a source of ignition. This definition includes electrical welding, burning, cutting, and using flame or electrical equipment or tools that may generate heat or sparks.

4.3 Explosive Range
Range of flammable containment/air mixture between the lower explosive limit (LEL) and the upper explosive limit (UEL).

4.4 LEL (Lower Explosive Limit)
The Lower Explosive Limit, LEL, is the minimum concentration of vapor or gas in air below which propagation of flame does not occur on contact with a source of ignition. Below the LEL there is too little combustible fuel to sustain a flammable mixture.

4.4 UEL (Upper Explosive Limit)
Upper Explosive Limit (UEL) is the maximum concentration of vapor or gas in air above which propagation of flame does not occur on contact with a source of ignition. Above the UEL there is too little oxygen to sustain a flammable mixture.

4.5 Confined Space
Confined space means a space that:
- Is large enough and so configured that an employee can bodily enter and perform assigned work,
- Has limited or restricted means for entry or exit (for example, tanks, vaults, and pits are spaces that may have limited means of entry.),
- Is not designed for continuous employee occupancy.

4.6 Hazardous Atmosphere
Hazardous atmosphere means an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:
- Flammable gas, vapor, or mist in excess of 10 percent of its Lower Explosive Limit (LEL);
- Airborne combustible dust at a concentration that meets or exceeds its LEL,
- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
- Atmospheric concentration of any substance for which a dose or a permissible exposure limit result in employee exposure in excess of its dose or permissible exposure limit as indicated by local or international regulations,
- Any other atmospheric condition that is immediately dangerous to life or health.

4.7 Permit Applicant:
The person who applies for the permit, often the Supervisor responsible for its execution or planning or the person who will carry out the job. The Permit Applicant shall have full understanding of all work to be carried out (JSA, special procedures and tools, isolations required, etc.).
4.8 Area Authority: The person responsible for a specific area of the workplace i.e.
- Driller – Drill Floor
- Mechanic - Engine Room,
- Electrician - SCR Room,
- Unit Supervisor – Cement/Wireline/Coil tubing/Frac/Well Testing unit
- Crane Operator – Lifting jobs
- Workshop Supervisor/Foreman – Workshop,
- Materials man – Warehouse,
- Transport Supervisor – Truck or Heavy Equipment
- Admin/Financial Manager - Office

This person should be a signatory for all permits issued to work in these areas.

4.9 Issuing Authority: The person who authorizes the permit. This is the Person in Charge (PIC) of the Department/Rig. In a Rig, is the Rig Manager or the Toolpusher / Nightpusher. In other operation units or areas, is the unit Manager (or the most senior Supervisor in charge of the area at the time)

4.10 Operator: The onsite oil company supervisor responsible for her/his company assets and activities on the location. The Company Representative may be asked to sign Viking Work Permit to show her/his awareness of the job to be taken, and the Work Permit opened.
This procedure shall be indicated in the Bridging Document for that particular operation.

4.11 Permit Controller: The person who controls the issue and validation of permits.
In a Rig or Department with a full time HSE Representative, she/he is taking this role. For operations that does not requires a full time HSE Representative, or in her/his absence the Person in Charge (PIC) will perform the duties of the Permit Controller (i.e. Nightpusher, Area Supervisor, Area Manager).

4.12 Watchman A trained, competent person, who maintains a continuous and thorough watch of an area during hot work or potentially hazardous operations to safeguard personnel and equipment.

4.13 Gas Tester A person who is trained, competent, and authorized by Viking International to perform gas tests.

4.14 Stand By Person A competent person assigned to remain on the outside of and close to the confined space. This person is in continuous communication with and, if practical, observes those inside, initiates rescue procedures, and operates equipment to enter the confined space.

4.15 Permit Control Center The Permit Control Center is the PIC-designated location on the Department/Rig from which all permits are issued, monitored, logged, suspended, or canceled.

4.16 Permit Board A board for posting all Work Permits active and type of permit covering the work. It is maintained by the Permit Controller.
4.17 Isolation

Isolation is the process by which a permit space is removed from service and completely protected from the release of energy and material into the space by such means as: electric shut down and grounding; blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

Examples: Blanking, or blinding, is a method of closing off a pipe by installing a solid cap or plate so that the pipe’s bore is completely covered.

4.18 Live Circuit Inspector

A person who has acquired, through a combination of training, education, and experience, the knowledge and skills to perform an inspection and authorize to work on Live Circuits.

4.19 Suspended Permit

Activities in process under a Work Permit that because of an emergency situation or because one of the signatories considers it necessary, are temporary hold. All work covered by that Permit will cease until the Permit is re-instated.

4.20 Cancelled Permit

Activities in process under a Work Permit that because of an emergency situation or because one of the signatories considers it necessary, are ceased.

4.21 Completed Permit

A permit that is properly signed off as completed and one in which all relevant checks have been made to ensure that all necessary procedures have been performed.
5.0 VIKING PERMIT TO WORK SYSTEM

5.1 Work Permit type

There are 7 different Permit to Work (PTW) forms within VIKING SMART Integrated Management System, to manage activities being carried out at the work site.

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<td>Man Rider Permit (Green in Color)</td>
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<td>VIKING Form 01-01-03-101-F04LC</td>
<td>Live Circuit Access Permit (Orange in Color)</td>
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<td>VIKING Form 01-01-03-101-F05CS</td>
<td>Confined Space Entry Permit (Yellow in Color)</td>
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<td>VIKING Form 01-01-03-101-F96RP</td>
<td>Radioactive Permit (Black in Color)</td>
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<td>VIKING Form 01-01-03-101-F07DT</td>
<td>Diesel Transfer Permit (Grey in Color)</td>
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Any activity that needs a Work Permit will be included in one of these 7 (seven) general categories. Some specific activities will require more than one permit to be completed and signed before starting the job.

Example Activity: Cleaning mud pit with high pressure water gun before changing mud type.

This specific activity will require:
- Confined Space Entry Permit to work inside the Mud Pit (confined Space).
- Cold Work Permit to use the high pressure water gun.

In the permit it has to be marked the type of equipment isolation needed.
- Electrical Equipment isolation
  - (Agitators motors needs to be isolated and locked to avoid agitators accidentally start)
  - (Mud pumps needs to be isolated and locked to avoid accidentally mud pump start and filling the pits with fluid when personnel are inside cleaning)
- Mechanical Isolation
  - (Fill in Pit Valves needs to be isolated and locked to avoid start filling the pits with fluid in the event of an accidentally start of the mud pumps when personnel are inside cleaning)

5.2 Issuing a Work Permit

Not all activities will require a Work Permit.

Work permits are typically required for all nonroutine work. Nonroutine work requiring a work permit includes all activities outside the regular operation of the Department/Rig.

Activities that will require a Work Permit at Viking International

- Entry into a confined space
- Hot work in any area except inside welding shop
- Any work that directly affects critical safety systems
- Any construction work, overhauls, or repairs on systems or equipment in classified areas
- Work by contractors in classified areas
- Hydrostatic or pneumatic-pressure testing
- Activities involving radioactive sources such as nondestructive testing
- Activities when a known hazard exists, such as isolation or lockout/tagout
• Man riding Operations
• Special engineered or heavy lifts
• Any work the Person in Charge (PIC) determines is nonroutine and requires a work permit
• Mud Pump maintenance
• Working at heights
• Handling of explosives
• Acid handling
• All work on steam lines
• Sand blasting during any operation
• Scaffold erection
• All Pressure Testing of equipment on the rig
• Diesel Transfer
• Flaring Gas
• Well Control Situations
• Working in high winds

Examples of activities that will need a Hot Work Permit:
– Work involving an open flame.
– Grinding, soldering, or welding, except in the welding shop.
– Grit blasting or needle gunning in classified areas.
– Metal cutting using air, electric or hydraulic power tools.
– Use of unprotected portable diesel engines that are not tied into the fire or gas shutdown systems.
– All work involving explosives or other pyrotechnics

Examples of activities that will need a Cold Work Permit:
– High-pressure water washing that exceeds 1,500 PSI.
– Removal of handrails, grating, hatches, and fixed ladders or back scratches.
– Well-service operations.
– Well shot.
– Erection and dismantling of scaffolding.
– Pressure testing
– Maintenance work on lifesaving/Safety equipment.

Example of activities that will need a Live Circuit Access Permit:
– Work on any electrical equipment with a voltage greater than 50 volts, including the partial or complete shutdown of power generators, electrical isolations, or work on safety-critical systems
– Use of any no intrinsically safe or noncertified electrical or electronic equipment except in designated areas of accommodation and nonhazardous areas. This includes cameras, video cameras, and audio recording equipment
Activities that will not require a Work Permit at Viking International

- Activities which do not involve Hot work.
- Jobs that will not conflict with other work.
- Works in areas that will not require atmosphere monitoring.
- Routine operations including startups, changes in operational modes, and shutdowns.
- Routine work, including first-line maintenance by operations personnel, such as topping up oil or water, tuning controllers, and so on, and that present little or no risk, JSA.
- Work in designated maintenance or construction areas.
- Work that controls or prevents the escalation of an emergency.

5.3 Use of the Work Permit

The use of Permits alerts personnel of activities going on around them. Permits also set out specific work instructions, state restrictions for work activities, outline necessary precautions and ensure all permitted work is structured, coordinated, controlled, traceable, auditable, and most importantly conducted safely. Some activities cannot be performed simultaneously as shown in the Appendix 01-01-03 A1 Simultaneous Permits Matrix.

The Work Permit needs to be completed in full and it is mandatory to have an approved permit in place before starting any activity that requires a Work Permit. All necessary authorizing signatures must be present before the job is started and when the job has been completed. A JSA needs to be done before each permit is issued or whenever a shift handover takes place when a Permit is extended.

The signatories to any issued permit and the permit controller have the ability to SUSPEND or CANCEL all open permits in the event of an emergency or if a suspension is necessary as shown in Appendix 01-01-03 A1 Simultaneous Permits Matrix. Permits that are in use at the time must be returned to the Permit Controller at the Permit Control Center and all work covered by that Permit will cease until the Permit is re-instated. At this point the Permit is considered to be SUSPENDED, and has to be indicated in the Permit Control Center. Whenever an alarm is sounded all open permits are suspended.

When the scope of work has been completed and all permit controls have been rechecked, the suspended permits can then be re-instated and re-issued to the original Permit Holder. However if the conditions have changed the permits will be re-issued with the condition changes reflected in it and a JSA will be held prior to permitted work commencing.

When an activity with a Work Permit has been COMPLETED or CANCELLED the Permit Applicant will return the permit to the Permit Controller at the Permit Control Center who will ensure all signatories for the permit have signed, thereby closing the permit.

Permits will only be issued for 1 tour (12 hrs.), and can be extended 1 additional tour (12 hrs.) to a maximum of 24 hours in total for the permit to be in effect.

The exception to this is Man Rider permits which are only valid for 1 tour (12 hours).

Permits are not considered to be closed out as Cancelled or Completed until it is returned, signed by the Issuing Authority, Area Authority, Permit Controller (and Operator if applicable) in all three copies. Cancelled or Completed Permits shall be filed in the corresponding binder for the month.
All Cancelled or Completed Permits shall be maintained on site for one year and then sent to the local Viking HSE Office where they will be filed for a minimum period of 10 years or the period indicated by local country regulations.

6.0 REFERENCES

VIKING Form 01-01-03-101-F01CW Cold Work Permit Form
VIKING Form 01-01-03-101-F02HW Hot Work Permit Form
VIKING Form 01-01-03-101-F03MR Manrider Permit Form
VIKING Form 01-01-03-101-F04LC Live Circuit Access Permit Form
VIKING Form 01-01-03-101-F01CS Confined Space Entry Permit Form
VIKING Form 01-01-03-101-F01RP Radioactive Permit Form
VIKING Form 01-01-03-101-F01DT Diesel Transfer Permit From
VIKING 01-01-03-402 Isolation Permit Process

7.0 APPENDIX

Appendix 01-01-03 A1 Simultaneous Permits Matrix.
1.0 GENERAL

The following Permit to Work Rules apply to all personnel:

PW1 Work performance (Open/Close a permit)
No work for which a Permit to Work is required can be performed by any personnel on a Viking International facility until a Permit to Work is properly authorized and issued, and they have been formally notified by the Issuing Authority (Person in Charge of the Department/Rig).

PW2 Validity Period for a Permit
Permits will only be issued for 1 tour (12 hrs.), and can be extended 1 additional tour (12 hrs.) to a maximum of 24 hours in total for the permit to be in effect.

The exception to this is Man Rider permits which are only valid for 1 tour (12 hours).

PW3 Permit Suspension
A permit is suspended when any of the following conditions apply:

- Work has halted.
- Conditions change from those stated in the original Permit to Work.
- A rig emergency alarm sounds on the rig.

In any of these situations, the PERMIT APPLICANT has to:

1. confirm that the worksite is safe, secure, and if necessary, zoned off; all equipment and material no longer required are removed from the worksite.
2. write a note on the section “ADDITIONAL COMMENTS” indicating that the Permit is suspended.
3. return the Permit to the Permit Controller at the Permit Control Center where it is placed together with the others copies of the permit.

PW4 Reinstatement of a Suspended Permit
Following the suspension of a permit, request a new work permit and have it approved and issued through the Permit to Work System before restarting work. Attach the new permit to the suspended permit.

When work is suspended because of an emergency, the person in charge of work is responsible for returning all copies of the permit to the Permit Control Center. When conditions return to normal, the permit can then be reinstated through the Permit to Work System.

PW5 Permit Cancellation
The Person in Charge of the Department/Rig has the authority to cancel a Permit to Work after ensuring that it is safe to do so. All copies of the work permit will be returned to the Permit Controller at the Permit Control Center to be properly signed off as cancelled, then closed out and filed.

PW6 Emergency Cancellation/Suspension of a Permit
In an emergency work will cease. The Person in Charge of the Department/Rig has the authority to cancel/suspend a permit to work after ensuring that it is safe to do so.

PW7 Electric and Mechanic Isolation
Before working on electrical or mechanical equipment with working voltage above 50V, lock out the equipment and tag the corresponding main switchgear.

All electrical isolations/de-isolations, shall be recorded on a Hot Work Permit and performed in accordance with Procedure VIKING 01-01-03-402 Isolation Permit Process (Lock Out/Tag Out).

PW8 Permit to Work Control Center
The Permit to Work Control Center VIKING 01-01-03-401 F008 is an up-to-date log of all active Work Permits. When the status of a permit changes, it is to be noted in the Board.
PW9 Permit to Work Training
No person can perform any potentially hazardous nonroutine work unless properly trained in the Permit to Work System.

No person may function as a Permit Applicant, Area Authority, Issuing Authority, or Permit Controller, or undertake work covered by a permit without first successfully completing the Permit to Work Training Course

Appointment of Authorized Permit Signatories and Area Supervisors
No person is authorized to sign permits without first successfully completing the Permit to Work Training Course

Signatories who must be formally appointed
Permit signatories in the following positions or functions must be trained before being appointed to sign permits:

- Area Authority.
- Issuing Authority.
- Permit Controller.

The signatories above are appointed formally using the Appointment of Permit Signatories form VIKING 01-01-03 F009 by their line management.

Before formal authorization, authorizing personnel must ensure that signatories:

- Have completed Permit to Work Training Course.
- Are familiar with their own work area
- Know of other areas that may affect permits they will sign
- Understand Area Supervisor’s boundaries on the department/rig
- Know Person in Charge’s instructions affecting precautions to take for particular tasks
- Know potential hazards on the Department/Rig, paying particular attention to those that are Department/Rig - specific

PW10 Permit to Work System Audit
The Person in Charge of the Department/Rig shall ensure that audits of the Permit to Work System follow the Permit to Work Audit Checklist.

The Person in Charge of the Department/Rig shall ensure that periodic spot checks of compliance with and the effectiveness of the Permit to Work System are completed. These must be frequent enough to maintain control of the Permit to Work System and confirm that:

- Permits are properly displayed at the worksite.
- Permits have been properly completed.
- Required safety equipment is in place.
- Safety precautions listed on the permit are adequate and are in place.

PW11 Yards Specific Permit to Work

- Upon entering a maintenance yard for service, the yard responsible person and the Person in Charge of the Department/Rig (PIC) shall meet to determine who is responsible for issuing a Permit to Work.
- If the yard is responsible, the PIC is advised that a Permit to Work has been issued.
- If the PIC is responsible, the yard is advised that a permit is in effect.
- For work performed outside of the yard scope requiring a Permit to Work, the PIC issues a permit as outlined in the procedure VIKING 01-01-03-01 Permit to Work Process.
1.0 GENERAL

The purpose of this process is to ensure that, before personnel start any potentially hazardous work on Viking International facilities, a formal Permit to Work is issued, hazards are identified, and necessary actions are taken to mitigate the hazards.

2.0 SCOPE

This procedure applies to all work performed on facilities by Viking International personnel, contractors, or third parties.

3.0 RESPONSIBILITIES

The COO and President, is responsible for the administration, interpretation, and maintenance of this Permit to Work Process.

4.0 REFERENCES

VIKING 01-01-03-101 Permit to Work System Description
VIKING 01-01-03-401 F010 Permit to Work Log sheet
5.0 PROCESS MAP

Step #1
Identify type of permit needed – Cold/Hot/Confined Space/Radioactive, etc.

Step #2
Complete SCOPE OF WORK section

Step #3
Identify Special Conditions, complete JOB SAFETY REVIEW

Step #4
Identify tools & Equipment, Complete EQUIPMENT PREPARATION

Step #5
Is isolation needed?
Yes
Isolate equipment & inspect effectiveness.
No

Step #6
Is Atmospheric Testing Required?
Yes
Perform Atmospheric Test.
No

Step #7
Check for all precaution and instruction completed - JSA

Step #8
Obtain Area Authority Approval

Step #9
Obtain Issuing Authority Approval

Permit to Work Process
Permit to Work Process

Step #10
Obtain Permit Controller Approval
(Verify no conflict with other jobs)
- Permit Applicant
- Permit Controller

Step #11
START THE JOB
- Permit Applicant and Crew Members

Step #12
Permit Suspension?
Yes
Mark permit as suspended wait for re-installment
- Permit Applicant
- Area Authority
- Issuing Authority

No

Step #13
Tour Changed?
Yes
Obtain extension approval
Continue the Job
- Permit Applicant
- Area Authority
- Issuing Authority

Need permit extension?
No
Continue the Job

Step #14
Permit Cancelled?
Yes
Mark as cancelled
- Permit Applicant

No

Step #15
JOB COMPLETED
- Permit Applicant and Crew Members

Step #16
Verify that working Area is left in good house-keeping, op. tests performed OK Isolations removed
- Permit Applicant
- Area Authority
- Mechanic/Electrician
- Unit Supervisor
Permit to Work Process

Step #17
Obtain Area Authority close-out signature

2

• Permit Applicant
• Area Authority

Step #18
Obtain Issuing Authority close-out signature

• Permit Applicant
• Issuing Authority

Step #19
Submit to Permit Controller for review, close out & filing, and introduce/track into “Permit to Work Log Sheet” (Form 01-01-03-401 F010)

• Permit Applicant
• Permit Controller
### PROCESS DESCRIPTION

<table>
<thead>
<tr>
<th>Step</th>
<th>Process</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Identify type of permit needed</td>
<td>Permit Applicant</td>
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<tr>
<td></td>
<td>- Cold/Hot/Confined Space/Radioactive, etc</td>
<td>• Identify the need for the work. On the preparation for the job, has to</td>
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<td></td>
<td>identify if the job required a Work Permit and what type of work permit</td>
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<td></td>
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<td>is needed.</td>
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<td></td>
<td>Work permits typically are required for all nonroutine work. Nonroutine</td>
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<td></td>
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<td>work requiring a work permit includes all activities that are outside the</td>
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<td>regular operation of the Department/Rig.</td>
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<td>Work permits are required for the following activities:</td>
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<td>- Entry into a confined space</td>
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<td>- Hot work in any area except inside welding shop</td>
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<td>- Any work that directly affects critical safety systems</td>
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<td>- Any construction work, overhauls, or repairs on systems or equipment</td>
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<td>in classified areas</td>
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<td>- Work by contractors in classified areas</td>
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<tr>
<td></td>
<td></td>
<td>- Hydrostatic or pneumatic-pressure testing</td>
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<td>- Activities involving radioactive sources such as nondestructive testing</td>
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<td>- Activities when a known hazard exists, such as isolation or</td>
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<td>lockout/tagout</td>
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<td>- Man riding Operations</td>
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<td></td>
<td>- Special engineered or heavy lifts</td>
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<td>- Any work the Person in Charge (PIC) determines is nonroutine and</td>
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<td>requires a work permit</td>
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<td></td>
<td>- Mud Pump maintenance</td>
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<td>- Working at heights</td>
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<td>- Handling of explosives</td>
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<td>- Acid handling</td>
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<td>- All work on steam lines</td>
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<td>- Sand blasting during any operation</td>
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<td>- Scaffold erection</td>
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<td>- All Pressure Testing of equipment on the rig</td>
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<td>- Diesel Transfer</td>
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<td>- Flaring Gas</td>
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<td>- Well Control Situations</td>
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<td>- Working in high winds</td>
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<td>Work permits normally are not required for the following type of work:</td>
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<tr>
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<td>- Activities which do not involve Hot work.</td>
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<td>- Jobs that will not conflict with other work.</td>
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<td>- Works in areas that will not require atmosphere monitoring.</td>
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<td>- Routine operations including startups, changes in operational modes, and</td>
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<td>shutdowns.</td>
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<td>- Routine work, including first-line maintenance by operations personnel,</td>
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<td>such as topping up oil or water, tuning controllers, and so on, and that</td>
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<td>present little or no risk, JSA.</td>
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<td>- Work in designated maintenance or construction areas.</td>
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<td></td>
<td>- Work that controls or prevents the escalation of an emergency.</td>
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</tbody>
</table>

| Permit Controller | • Make sure enough blank Work Permit Forms are available on the Permit Control Center for the Permit Applicant to get one. |
## Permit to Work Process

<table>
<thead>
<tr>
<th>Step</th>
<th>Process</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2    | Complete SCOPE OF WORK section | Permit Applicant  
- Starts the Work Permit, completing the heading with Department/Rig, Date of the job, her/his name.  
- Complete the SCOPE OF WORK section with a brief description of the work and the tools to be used, and whether electrical work is involved.  
- Include job planned start and finish time. |
| 3    | Identify Special Conditions, complete JOB SAFETY REVIEW | Permit Applicant  
- Complete the JOB SAFETY REVIEW. Give enough detail for a thorough assessment of the necessary precautions to cover for the potential hazards identified.  
- Indicate the requirements for personal protection equipment and other equipment at the worksite to ensure the safety of personnel. |
| 4    | Identify tools & Equipment, Complete EQUIPMENT PREPARATION | Permit Applicant  
- Mark all the equipment preparation needed prior to the work.  
- Note any special equipment to be used, especially where it may involve hazardous work. |
| 5    | If isolation needed. Isolate equipment & inspect effectiveness. | Permit Applicant and Area Authority  
- Ensure that procedures such as isolation, depressurization, purging, cleaning, scaffolding, gas testing, fire watch, PA announcement, , and others stated, including the provision of special equipment, are on the permit.  
- Electrician / Mecanic / Unit Supervisor  
  - Perform the isolation togeth with the Permit Applicant. Follow VIKING 01-01-03-402 “Isolation Permit Process” |
| 6    | If Atmospheric test required | Permit Applicant and Area Authority  
- Determine if Atmospheric testing is required. If yes, take the permit to the Competent Person to perform Atmospheric test.  
- Competent Atmospheric Tester  
  - Perform the Atmospheric Test.  
  - Enter the result of the test on the Work Permit form.  
  - Sign off and date the gas test, ensuring the area does contain the free-entry percentage permitted, the restricted-entry permit readings, result, and time taken.  
  - List the type of gas, percentage lower explosive limit (LEL) reading, expiration date and time for atmospheric test, time reading was taken and signed.  
  - Return the permit to the Permit Applicant to get other approval signatures. |
| 7    | Check for all precaution and instruction completed - JSA | Permit Applicant  
As part of her/his pre-job preparation she/hi will conduct a pre-job meeting and have the JSA for the job completed to make sure that:  
- The work and precautions are understood  
- All personnel are fully briefed on the work and necessary precautions  
- All precautions have been observed |
<table>
<thead>
<tr>
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</tr>
</thead>
</table>
| 8    | Obtain Area Authority Approval | Permit Applicant  
- Take the permit to the Area Authority for signed authorization to start the job in her/his area of responsibility.  
Area Authority  
- Make sure that all provision for the jobs are in place and effective. |
| 9    | Obtain Issuing Authority Approval | Permit Applicant  
- Take the permit to the Issuing Authority for signed authorization to start the job.  
Issuing Authority  
- Make sure that all provision for the jobs are in place and effective. |
| 10   | Obtain Permit Controller Approval (Verify no conflict with other jobs) | Permit Applicant  
- Take the permit to the Permit Controller for signed authorization to start the job.  
Permit Controller  
- Check that all other authorizing signatures are in place.  
- Inspect the work area and the job preparation.  
- Verify that the isolation procedure was completed following VIKING 01-01-03-402 “Isolation Permit Process and is effective (if required)”  
- Verify that Atmospheric tests have been performed (if required)  
- Issue the Permit Number. |
| 11   | START THE JOB | Permit Applicant and Crew members  
- Start the job as instructed in the Job Procedure and following the safety measures indicated in the JSA.  
- Make sure all personnel working under the Permit to Work issued to them understand the scope of the work and the precautions and limitations stated on the Permit to Work  
- Make sure personnel follow the limitations, precautions, and isolations stipulated on the permit during the work.  
- Post a copy of the Permit to Work at the jobsite.  
- Maintain the worksite in a clean and safe condition at all times.  
- Complete the work under the conditions stated on the permit. |
| 12   | If Permit Suspension required, Suspend the work. | Permit Applicant / Area Authority / Issuing Authority  
- Verify that the suspension is necessary as shown in Appendix 01-01-03 A1 Simultaneous Permits Matrix  
- Make sure that the Worksite is Safe before suspending the work.  
- Decide if Isolation will be Retained Or Continued.  
- Bring permit to Permit Controller and post at the Permit Control Center and mark as suspended (indicate the estimate suspension time). |
| 13   | If extension needed due to tour change, obtain permit extension | Permit Applicant / Area Authority / Issuing Authority  
- All permit signatories for new Tour to sign in the TOUR CHANGE section of the Permit.  
- Permits will only be valid for 1 tour (12 hrs.), and can be extended 1 additional tour (12 hrs.) to a maximum of 24 hours in total for the permit to be in effect.  
- Exception to this is Man Rider permits which are only valid for 1 tour (12 hours). |
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</table>
| 14   | If Permit Cancellation is required, mark as CANCELLED | Permit Applicant  
- Verify that the cancellation is necessary as shown in Appendix 01-01-03 A1 Simultaneous Permits Matrix.  
- Mark the permit as Cancelled.  
- Sign off the permit.  
- Give the permit to the Area Authority and Issue Authority to sign off the permit too.  
- Returns the Permit to the Permit Control Center, where it will be taken out of the board and filed.  
Note: When a permit is suspended, only the isolation section of the permit remains in “open” status (if required). |
| 15   | JOB COMPLETED | Permit Applicant and Crew Members  
- Mark the permit form as Completed, indicating that the work is completed properly and that the area is safe and clean. |
| 16   | Verify that working Area is left in good house-keeping, op. tests performed OK Isolations removed | Permit Applicant and Crew Members  
- Perform all necessary test with the Area Authority, the Unit Supervisor, and end users. Ensure equipment is working as per technical design.  
- Ensure that the equipment and area is in good house-keeping and safe to be operated.  
Mechanic/Electrician  
- Remove isolations (if applicable) |
| 17   | Obtain Area Authority close-out signature | Permit Applicant  
- Take the permit to the Area Authority for signed authorization to close-out the permit and all work in her/his area of responsibility.  
Area Authority  
- Make sure that all equipments and the area are in good house-keeping and safe to be operated. |
| 18   | Obtain Issuing Authority close-out signature | Permit Applicant  
- Take the permit to the Issuing Authority for signed authorization to close-out the permit.  
Issuing Authority  
- Make sure that all equipments and the area are in good house-keeping and safe to be operated. |
| 19   | Submit to Permit Controller for review, close-out & filing and introduce/track into “Permit to Work Log Sheet” (Form 01-01-03-401 F010) | Permit Applicant  
- Take the permit to the Permit Controller to sign closing-out the permit.  
Permit Controller  
- Check that all other closed-out authorizing signatures are in place.  
- Inspect the work area for good house-keeping.  
- Verify that isolations had been removed and the equipments are safe to be operated.  
- Remove all permits from the Permit Control Center Board.  
- File the permit.  
- Introduce and complete all Work Permits into “Permit to work Log sheet” Form 01-01-03-401 F010 |
1.0 GENERAL

Employees servicing or maintaining machines or equipment may be exposed to serious physical harm or death if hazardous energy is not properly controlled.

The standard addresses the practices and procedures necessary to disable machinery or equipment, thereby preventing the release of hazardous energy while employees perform servicing and maintenance activities. The standard also outlines measures for controlling hazardous energies—electrical, mechanical, hydraulic, pneumatic, chemical, thermal, and other energy sources.

2.0 PURPOSE

The purpose of this process is to ensure that when it is time for personnel to work, equipment is properly isolated, de-energized, depressurized, and safe to use.

3.0 SCOPE

This procedure applies to all personnel when servicing and performing maintenance on machines and equipment, in which the unexpected energization, or start up or the release of stored energy could cause injury. This procedure specifies minimum requirements for the control of hazardous energy.

This program does not apply to:

a) Hand held power tools or stationary equipment whose electrical power may be controlled by the unplugging of equipment from the energy source when the plug and cord are under the control of the employee performing the servicing or maintenance.

b) Hot tap operations involving transmission and distribution systems when they are performed on pressurized pipelines, provided it can be demonstrated that:
   i. continuity of service is essential;
   ii. shut down of the system in impractical;
   iii. documented procedures are followed, and
   iv. equipment is used which will provide proven effective protection for employees.

4.0 DEFINITIONS

Authorized Employee: a competent person, authorized to perform Isolations.

Affected Employee: a person who works in an equipment in which the lock-out process has been implemented.

Inspector: A person who is trained, competent, and authorized by Viking International to supervise the isolation process.

Energy Isolating Device: a mechanical device that physically prevents the transmission or release of energy.

Energy Source: an energy source is any electrical, mechanical, hydraulic, pneumatic, gravitational, chemical, nuclear, thermal, or other energy source that could cause injury.
5.0 ISOLATION PROCEDURE

AT Viking International, all energy sources associated with equipment must be locked and/or tagged in the position which isolates the employee(s) from the hazardous energy when maintenance/servicing work is being performed by either company or contract personnel.

If all energy sources have been removed, (i.e., electrical power has been disconnected to a well site location, but a junction box remains), then a lockout device is not necessary.

Whenever contract employees are scheduled to perform work covered by this program, they must comply with the requirements of this procedure.

5.1 Lockout/Tagout Procedures

1. Employees involved in the lockout must be knowledgeable of the type and amount of the energy, the hazards of the energy to be controlled, and the method or means to control the energy before turning off a machine or equipment.

2. Notify all affected employees (before and after) about the lockout/tagout procedure and the prohibition regarding attempts to restart or reenergize equipment locked/tagged out.

3. Machinery or equipment shall be turned off or shut down using the procedures established. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of equipment shutdown.

4. All energy isolating devices which are needed to control the energy to machinery or equipment shall be physically locked to isolate the machinery or equipment from the energy source(s).

5. The Permit Applicant (senior personal supervising the crew performing the job) shall lockout all energy sources to the equipment with Viking pad-lock from the lock out station, in the Permit Control Center. The equipment shall be tagged-out with the isolation date and the signature by the person performing the lockout.

6. Viking Lockout padlocks, and tagout tags must be affixed to each equipment energy source isolating device where a job is performed, by the Permit Applicant. The devices shall be attached in a manner that will hold the energy isolating devices in the equipment “off” position.

7. No lock shall be affixed without a tag stating who locked out the equipment and the date and reason it was locked out.

8. Tagout devices, (when an equipment isolation is required), shall be attached to clearly indicate that the operation or movement of energy isolating devices from the “off” position is prohibited. The tag attachment shall be fastened at the same point at which the lock would have been attached. Where a tag cannot be affixed directly to the energy isolating device, the tag shall be located as closely and safely as possible to the device, in a position that will be immediately obvious to anyone attempting to operate the equipment.

9. If more than one group is working on the same item (including different maintenance crafts) each authorized person from each craft will place a pad-lock on the multiple hasp and will sign and date the Tag-out tag. Each craft or group will test at the start station to determine that the equipment is inoperable.

10. Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, or otherwise rendered safe. If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation shall be
continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

11. After ensuring that all personnel are clear, the equipment must be tested to verify that it is properly locked out and will not operate.
   Note: Be certain to return the switch or START button, which was used to test the lockout, to its OFF or NEUTRAL position.

12. At the beginning of each shift, or after any substantial absence from the job (breaks or meals), any shift who has equipment locked out will check the equipment and the disconnecting device to determine that all equipment is safe for work and has not been returned to service during their absence.

13. All the energy isolations details will be introduced, tracked and maintained into “Energy isolation log”, refer to form:01-01-03-402-F001, by seniors personnel (mechanic/electrician), who got responsibility for this process.

5.2 Specific Energy Isolation Procedures

The following methods and devices will be used either separately or in a combination, depending on the equipment to lockout/tagout the following energy source(s):

5.2.1 Electrical (Motor Controllers, Capacitors, Circuit Breakers, etc.)
   1. Shut down the equipment using the selector switch followed by the master disconnect.
   2. Ensure that all power sources are locked and tagged out.
   3. Stored electrical energy must be bled to obtain zero energy state.
   4. When working on or near exposed de-energized electrical equipment, a qualified person shall use test equipment and shall use a tester to ensure that all circuits are dead.
   5. If additional energy sources are present follow the applicable method of energy isolation listed in this section.

5.2.2 Pneumatic (Starting air, Control Valves, Instrument Air, etc.)
   1. Identify system to be isolated.
   2. Close block valve(s) upstream and downstream of section.
   3. Release pressure to reach zero energy state, utilizing a controlled bleed-off.
   4. Use chains, energy isolation air valves, shut off valves, padlocks and lockouts to lockout energy source. Disconnecting the line is the preferred means of isolation.
   5. If additional energy sources are present, follow the applicable method of energy isolation listed in this section.

5.2.3 Hydraulic (Valve Actuators, Presses)
   1. Identify system to be isolated.
   2. Isolate the system.
   3. Release pressure to reach zero energy state.
   4. Use lockout valves, chains, padlocks, and lockouts to lockout energy source.
   5. If additional energy sources are present, follow the applicable method of energy isolation listed in this section.

5.2.4 Fluids and Gases (Piping systems, Vessels, Production/Process Equipment, and Storage Tanks, etc.)
   1. Identify system to be isolated.
   2. Isolate all inlet and outlet piping by disconnecting, inserting blinds, or use of double block and bleed. (Double block and bleed is not acceptable for confined space entry).
   3. Release pressure to reach zero energy state.
   4. If additional energy sources are present, follow the applicable method of energy isolation listed in this section.
   5. Refer to Confined Space Entry Program.
5.2.5 Mechanical (Pumping Unit, Counter Weights, Flywheels, etc.)

1. Release all stored mechanical energy or block the energy. Be aware of gravity, springs, tension, and other sources of energy that are not always obvious.
2. Use blocks, pins, or chains to restrain energy when equipment cannot be brought to a zero potential energy state.
3. Padlocks, lockouts, and tags should be used to lockout and tagout mechanical energy.
4. If additional energy sources are present, follow the applicable methods of energy isolation listed in this section.

5.3 Restoring Service To Equipment

5.3.1 After each phase of the work is complete, the locks for that crew may be removed. The work area shall be inspected to ensure that nonessential items have been removed and that machine or equipment components are operationally intact. The work area shall be checked to ensure that all employees have been safely positioned or removed. The person authorized by the supervisor in charge will remove the last lock, release the Tag-out Tag and notify the individual responsible for the Area that the repairs are complete and ready for service. After lockout or tag-out devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout and tag-out device(s) have been removed. Contractors will not be authorized to return any equipment to service except when authorized by the Person in Charge (PIC).

5.3.2 Each lockout or tag-out device shall be removed from each energy isolating device by the employee who applied the device except when the authorized employee who applied the lockout and tagout device is not available to remove it, that device may be removed under the direction of the Person in Charge (PIC), (see item 4 below).

The Person in Charge (PIC) shall include at least the following elements:
1. Determine conclusively the job has been completed and no personnel remain in the affected area.
2. Verify that the employee is not at the facility.
3. The supervisor in charge will ensure that the affected employee is notified that his lock has been removed before the employee resumes work at the facility.
4. The Person in Charge (PIC) is the only authorized person to use the above procedure and then remove the lock/tag.

5.3.3 The individual restoring energy to the equipment must:
1. Inspect the work to ensure that nonessential items have been removed.
2. Ensure that the equipment components are operationally intact.
3. Check the work area to ensure all employees are safely positioned or removed from the equipment.

6.0 TRAINING

All employees who participate in the lockout/tagout program or who may be affected by the program must be trained prior to their participation in the program and annually thereafter.

Each authorized employee shall receive proper training and all training documentation shall be filed on the Department/Rig. Training shall cover the recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control. Each affected employee shall be instructed in the purpose and use of the energy control procedure. All other employees whose work operations are or may be in an area where energy control procedures may be utilized, shall be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.
The training shall ensure that the purpose and function of the lockout/tagout program is understood and that the knowledge and skills required for the safe application, usage and removal of energy controls are conveyed to the employees.

Training should specifically encompass recognition of hazardous energy sources, type and magnitude of energy in the workplace, methods and means necessary for energy control and the purpose and use of the lockout/tag-out program. The training shall also include rules and techniques to be used for authorization and the means that will be used for enforcement of the program.

It should be emphasized that the tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace. Tags are essentially warning labels affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a pad-lock.

Retraining shall be provided whenever there is a change in the lockout/tag-out program and whenever job changes or changes in equipment or processes present a new hazard.

All training must be documented, including the date and names of employees attending the training.

7.0 REFERENCES

VIKING 01-01-03-101 Permit to Work System Description
VIKING 01-01-03-402-F001 Energy isolation log
1.0 PURPOSE

The purpose of this document is to provide basic information on the proper use of Multi-Gas Detector, to perform gas tests as required by VIKING 01-01-03-401, “Permit to work Process”. Gas testing must be conducted to determine levels of oxygen, combustible gases, and toxic gases,( e.g., Hydrogen Sulfide) and can also be used in other operational tasks such as verifying nitrogen purging effectiveness inside vessels, finding leaks, etc.

2.0 SCOPE

This procedure applies to all Viking International facilities where there is a presence of harmful, toxic and/or flammable gases that could under certain concentrations cause injuries to personnel and/or damaged to properties.

3.0 RESPONSIBILITIES

3.1 Managers, Superintendents and Supervisors

They are responsible for ensuring compliance with this procedure.

- Insures that appropriate gas test is conducted in accordance with the Work Permit Procedure and prior to issuing a work permit, and for all jobs where toxic gas, combustible gas or oxygen deficiency may exist. The work permit Issuing Authority must determine when periodic, frequent or continuous gas monitoring is required.

- Insure that every two years, gas testing personnel are instructed, tested and qualified in the correct gas testing procedure. Personnel shall carry a valid certificate issued by HSE Department.

3.2 HSE Manager

- HSE manager shall provide training to qualified gas testers by conducting classes on the proper use of the equipment. They shall certify that gas testers have passed the test on the correct and proper use of gas testing instrument.

- Maintains a record of current certified gas testers.

- Maintains service and inventory records of the gas testing instrument including all portable and fixed gas detection system.

- Must insure the availability of all gas testing instruments.

3.3 Certified Gas Testers

- Must be certified and have undergone training on the proper use of gas testing instruments.

- Should conduct a daily pre-use instrument check. These checks shall include, but are not limited to, visual inspection of the equipment, and operationa l checks.

- Should only use an instrument which bears a valid calibration, have the correct sensors for the gases to be detected and which passes all the pre-use checks.
4.0 PROCEDURE

4.1 General Requirements

Gas testing is required in all locations where injury to personnel or damage to property could occur due to the presence of combustible gases, toxic gases or oxygen enriched/deficient atmospheres.

4.1.1 **Oxygen testing shall be conducted in:**

- All confined space entry areas such as valve cellars, columns, drums, electrical duct, manholes, excavation over 1.2 meters deep, roof areas of tanks sewers, sump pits, tanks, vessels & pipelines trenches.
- In all areas not covered above which may have a potential for oxygen enriched or deficient atmospheres.

4.1.2 **Combustible gas testing shall be conducted for:**

- All confined space entries.
- All ‘hot work in process’ areas.
- All work locations not covered and where combustible gases are or may be present, and monitoring is required.

4.1.3 **Hydrogen Sulfide gas testing shall be conducted in:**

- All confined space.
- Jobs in areas of sour crude/gas producing, transporting, storage or processing where operations determine that Hydrogen Sulfide Gas testing is necessary.
- All work locations not covered above where Hydrogen Sulfide is or maybe present and monitoring is required for work or operational purposes.
- Other toxic gas testing shall be conducted for all work locations where other toxic gases or vapors maybe present. Examples of other toxic gases include carbon monoxide (CO), Carbon Dioxide (CO2), Sulfur Dioxide (SO2), Chlorine (Cl2), Ammonia (NH3), Hydrogen Chloride (HCl), mercury vapor (Hg).

4.1.4 **Order of Testing:**

- A test for oxygen is performed first because most combustible gas meters are oxygen dependent and will not provide reliable readings in oxygen deficient atmospheres.
- Combustible gases are tested next because the threat of fire or explosion is both or more immediate and more life threatening in most cases than exposure to toxic gases and vapors.
- If test for toxic gases and vapors are necessary they are performed last.
- The person conducting gas test in an atmosphere known or suspected of being potentially hazardous shall enter the area only after donning the adequate personal protective equipment, including but not limited to appropriate respiratory protection equipment.
- Work is stopped immediately when gas monitor alarms and remedial actions are taken to deal with the situation and to correct the conditions causing the alarm.
Atmospheric Testing Procedure

4.2 Flammable (LEL) Gas Limits

<table>
<thead>
<tr>
<th>Gas Test Reading Results</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 LEL</td>
<td>Hot work allowed.</td>
</tr>
<tr>
<td>Above 0.0 LEL</td>
<td>No hot work allowed.</td>
</tr>
</tbody>
</table>

4.3 Hydrogen Sulfide Gas Toxicity (PPM) Limits

<table>
<thead>
<tr>
<th>Gas Test Results</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 10 ppm</td>
<td>Safe to work, but remember to retest periodically because condition can change. Gas testing instrument set alarm level. (TLV)</td>
</tr>
<tr>
<td>10 to 100 ppm</td>
<td>Work is allowed but appropriate breathing apparatus must be worn. (IDLH)</td>
</tr>
<tr>
<td>More than 100 ppm</td>
<td>No work/entry permitted.</td>
</tr>
</tbody>
</table>

4.4 Oxygen Gas Limits

<table>
<thead>
<tr>
<th>Gas Test Results</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 23.5 %</td>
<td>Oxygen enriched atmosphere. Rapid fire will occur. No work allowed.</td>
</tr>
<tr>
<td>At 21 %</td>
<td>Normal atmospheric level.</td>
</tr>
<tr>
<td>Below 19.5 %</td>
<td>Oxygen deficient atmosphere. Work is allowed but worker must wear the required breathing apparatus.</td>
</tr>
</tbody>
</table>

4.5 Carbon Monoxide Gas Limits

<table>
<thead>
<tr>
<th>Gas Test Results</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 50 ppm</td>
<td>Atmospheric level of CO.</td>
</tr>
<tr>
<td>50 ppm</td>
<td>TLV for an 8 hour exposure.</td>
</tr>
<tr>
<td>100 ppm</td>
<td>Dangerous level, employee must not enter the confine space.</td>
</tr>
</tbody>
</table>

4.6 Limitations on the Use of Multi Gas Detectors:

Before using a Multi Gas Detector the user must be trained on the specific model available, manufacture instructions must be read and understood, a calibration certificate must be valid, although Multi Gas Detector has certain limitations which must be considered to avoid potential dangerous consequences:

- For safety reasons the equipment must be operated by qualified personnel. Read and understand the instructions manual completely before operating.
- When sampling with accessory sampling lines, the shortest possible length should be used to minimize the time needed to obtain a valid reading.
- Acid gases such as carbon dioxide will shorten the service life of the Oxygen sensor.
- Instalation or replacement of sensor, shall be done by the manufacturer representative, and the equipment re-certified.
- Before each day use, perform a calibration check and check the pump.
- Dispose off used batteries in accordance with local health and safety regulations.
4.7 Battery Charging

4.7.1 Charging Factory Supplied Battery:

- Charge the Multi-Gas Detector’s battery by using the factory charger supplied with the instrument.
- Prior to charging, read the manufacturer instruction related to charging the battery.
- Pay attention to the charging cycle listed in the owner manual; also take in consideration temperature variance.

5.0 REFERENCES

VIKING 01-01-03-041, Permit to work Process.

OSHA 1910.146 App B Procedures for Atmospheric Testing

1.0 GENERAL

At Viking International, no one may apply for a permit, or will sign as Area Authority, Issuing Authority, Permit Controller, Atmospheric Tester or Isolation Supervisor or undertake work covered by a permit without first successfully completing the appropriate Permit to Work (PTW) training.

2.0 TRAINING OBJECTIVE

The objective is to train all individuals in the principles of the PTW System and to ensure that they understand the system.

Training methods include:
- Permit to Work Training
- Training in operating procedures that requires a PTW.
- On-the-job training, (Permit to Work Control Center)

3.0 CERTIFICATIONS AND AUTHORIZATIONS

Certification means that personnel have learned the procedures of the PTW system appropriate to their situation and that they understand the reasons for it.

Authorization is the approval of these individuals to apply that knowledge to specific installations.

4.0 ASSESSMENT TESTS

Permit to Work training contains assessment tests to determine whether individuals have achieved the required level of understanding of the system.

Course participants must pass their tests before they can be certified.

All Supervisors must demonstrate knowledge and competence in the following:
- Rig and equipment layout
- The process taking place (e.g., completion, drilling)
- Potential hazards
- Means of mitigating hazards before issuing a permit
- Specific responsibilities associated with issuing permits
- Applicable legal requirements
- Pride and local rules applying to operation of the Permit to Work System
- How to use of all the forms and records associated with the Permit to Work System
- Shift handover requirements
- How to handle an emergency
- Training requirements
- Auditing and monitoring requirements
The **person in charge of work** must demonstrate knowledge and competence in the following:

- Identifying potential hazards existing in the workplace
- Precautions required before beginning work
- Specific responsibilities of a task supervisor
- Shift handover requirements
- Permit to Work training requirements for the job and for members of the work team

All other members of the rig crew acting within the Permit to Work System should receive instructions on the specific procedures as they apply on the rig. This should consist of a general overview of the Permit to Work System and their specific responsibilities.

Key personnel should be reassessed periodically.

Visiting specialists who arrive at the rig for a specific task under the Permit to Work System will be instructed on the PTW System and supervised from a PTW viewpoint until the task is completed and the work site handed back to a Viking Supervisor or Manager.

### 5.0 CERTIFICATIONS

Individuals who successfully complete the course receive a PTW certificate of training. It contains a person’s name and details and is entered in the formal training register; their names have to be recorded on Viking attendance sheet.

Those employees, who will have signed responsibilities in the Permit to Work System, after successfully completing the training, will be formally appointed by the Department/Rig Manager. Their names and signatures will be on the Viking form VIKING 01-01-03-401 F009 Appointment of Permits Signatories Form.

Anybody absent from a Viking field installation for more than 6 months will have to retake the Permit to Work Training.

### 6.0 REFERENCE

VIKING 01-01-03-401 F009 Appointment of Permits Signatories Form
1.0 PURPOSE

The purpose of this procedure is to ensure that Viking Permit to Work System is audited on a monthly base to evaluate the way it is practically used on the field, and make improvement changes if needed.

2.0 GENERAL

The success of the Permit to Work System largely depends on the care and competence of the personnel responsible for authorizing the work, on strict supervision, and on the professionalism in which the work is undertaken.

As with any system, it requires regular supervision and monitoring to ensure it operates at peak effectiveness.

The Permit to Work System Audit Checklist is a guide for people performing the monthly inspection. Please be thorough in your assessment and expand your answers as necessary to make this a meaningful and accurate assessment. When you complete the monthly checklist, forward it to the Person in Charge (PIC) for review.

3.0 RESPONSIBILITY

The Quality Manager is responsible for the administration, implementation, and maintenance of this document.

4.0 REFERENCES

VIKING SMART Form 01-01-03-405 F001 Permit to Work System Audit Checklist
1.0 GENERAL

Viking International employees and outside contractors must be properly trained and equipped to work in hazardous conditions such as permit-required confined spaces. This procedure requires that all permit-required confined spaces to be identified, evaluated, and classified. Written Job Safety Analysis JSA and a Confined Space Permit shall be completed for all work involving entry into these spaces. The hazards and required precautions shall be communicated to all appropriate staff in the Pre-Job Meeting.

2.0 PURPOSE

The purpose of this procedure is to ensure that when the operation requires to work inside a confined space, the personnel had been authorized with a proper permit system, all hazards had been identified and the control measures are in place and an emergency response system is in place to assist the personnel inside the confined space if needed.

3.0 SCOPE

This document addresses the requirements for practices and procedures to protect Viking employees and contractors from the hazards of entry into permit-required confined spaces.

4.0 DEFINITIONS

Acceptable entry conditions means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space entry can safely enter into and work within the space.

Watchman means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant’s duties assigned in Viking’s confined space permit.

Authorized entrant means an employee who is authorized by Viking Supervisor to enter a permit space.

Blanking or blinding means the absolute closure of a pipe, line, or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined space means a space that:
1- Is large enough and so configured that an employee can bodily enter and perform assigned work.
2- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, and pits are spaces that may have limited means of entry.
3- Is not designed for continuous employee occupancy.

Double block and bleed means the closure of a line, duct, or pipe by closing and locking or tagging two inline valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Engulfment means the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry means the action by which a person passes through an opening into a permit-required confined space.
Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant’s body breaks the plane of an opening into the space.

Entry permit means the written/printed document that is provided by Viking to allow and control entry into a permit-required confined space (Viking SMART 01-01-03 101 F05CS Confined Space Entry Permit).

Entry/Job Supervisor means the person (such as Viking, Driller, Assistant Driller, Toolpusher, Chief Mechanic, Chief Electrician, Engineer in charge, Person in Charge, or any Supervisor) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required in Viking SMART 01-01-03 101 F05CS Confined Space Entry Permit.

NOTE: An Entry/Job Supervisor also may serve as a watchman or as an authorized entrant, as long as that person is trained and equipped as required for each role he or she fills. Also, the duties of Entry/Job Supervisor may be passed from one individual to another during the course of an entry operation.

Hazardous atmosphere means an atmosphere that may expose employees to the risk of death, incapacitation, and impairment of ability to self-rescue (that is, escape unaided from a permit space), injury, or acute illness from one or more of the following causes:

1- Flammable gas, vapor, or mist in excess of 10 percent of its lower flammable limit (LFL);

2- 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.

3- Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;

4- Atmospheric concentration of any substance for which a dose or a permissible exposure limit is not accomplishing with the criteria of Viking SMART 01-01-03 403 Atmospheric Testing Procedure, and which could result in employee exposure in excess of its dose or permissible exposure limit; NOTE: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, impairment of ability to self-rescue, injury, or acute illness due to its health effects is not covered by this procedure.

5- Any other atmospheric condition that is immediately dangerous to life or health. NOTE: For air contaminants for which Viking SMART Integrated Management System has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Hot work permit means the employer’s written authorization to perform operations (for example, welding, cutting, burning, and heating) capable of providing a source of ignition.

Immediately dangerous to life or health (IDLH) means any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual’s ability to escape unaided from a permit space.

NOTE: Some materials -- hydrogen fluoride gas and cadmium vapor, for example -- may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse 12-72 hours after exposure. The victim “feels normal” from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be “immediately” dangerous to life or health.

Inerting means the displacement of the atmosphere in a permit space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.
Isolation means the process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lockout or tagout of all sources of energy; or blocking or disconnecting all mechanical linkages.

Line breaking means the intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Non-permit confined space means a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Oxygen deficient atmosphere means an atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen enriched atmosphere means an atmosphere containing more than 23.5 percent oxygen by volume.

Permit-required confined space (permit space) means a confined space that has one or more of the following characteristics:
1- Contains or has a potential to contain a hazardous atmosphere;
2- Contains a material that has the potential for engulfing an entrant;
3- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section;
4- Contains any other recognized serious safety or health hazard.

Permit-required confined space Viking SMART Program means Viking International’s overall program for controlling, and, where appropriate, for protecting employees from, permit space hazards and for regulating employee entry into permit spaces.

Prohibited condition means any condition in a permit space that is not allowed by the permit during the period when entry is authorized.

Rescue Team means the personnel designated to rescue employees from permit spaces and other rescue situation.

Retrieval System means the equipment (including a retrieval line, full-body harness, and a lifting device with tripod and manual winch) used for non-entry rescue of persons from permit spaces.

Testing means the process by which the hazards that may confront entrants of a permit space are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space.

NOTE: Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.
Atmospheric Tests are included in Viking SMART 01-01-03 403 Atmospheric Testing Procedure.
Other Tests are included in Confined Space Pre-entry checklist Viking SMART 01-01-03 401 CSEC Confined Space Entry Checklist
5.0 PROCEDURE

5.1 Permit-required confined space Identification, Evaluation, and Classification.

5.1.1 Confined Space Identification

Each Viking International Rig/Unit/Facility Manager or Person in Charge (PIC) shall ensure that an assessment of spaces with regard to confined space requirements is conducted in her/his Rig/Unit/Facility and document using Viking SMART 01-01-03 406 F001 Confined Space Matrix.

Unit/Facility Manager or Person in Charge (PIC) shall contact their OQHSE Advisor and/or Division QHSE Manager/Supervisor if questions arise. These resources must be contacted any time a hazardous atmosphere is identified or suspected. The assessment must be kept on file in Viking SMART Cabinet.

Spaces that are not confined spaces require no action. Spaces that are determined to be non-permit required confined spaces should be identified and documented. Such spaces meet the three criteria for a confined space but do not have serious hazards (do not meet any of the four criteria) that would classify them as permit-required confined spaces.

Non-permit required confined spaces require no action, but must be reassessed if new hazards are introduced. For example, the Trip tank may be a non-permit required confined space. If a proposed new task includes welding in the trip tank with unhealthy fumes generated as a result of the welding operation, the space would require reassessment. Welding inside the trip tank could lead to development of a hazardous atmosphere, which would cause the space to be classified as a permit-required confined space. Based on the JSA (Viking 01-01-110 Job Safety Analysis), personnel would have to figure out the best safe way to complete the task. One idea would be to provide permanent ventilation. Another idea could involve the use of a supplied air respirator. The point is that non-permit required confined spaces are sensitive to the introduction of new hazards and should be watched accordingly.

Spaces that are determined to be permit-required confined spaces require development of a permit-required confined space program. The program addresses signage, access control, training personnel, coordination with contractors, entry permit and specific Job Safety Analysis. A listing of permit required confined spaces (Viking SMART 01-01-03 406 F001 Confined Space Matrix), shall be maintained on site and filed in the SMART cabinet by the OQHSE Officer.

Entry into a permit-required confined space can be conducted in one of two ways. If the hazards in the space can be eliminated from outside the space, the space can be temporarily reclassified as a non-permit required confined space. If the space cannot be reclassified, entry must be conducted through a Confined Space Entry Permit (Viking SMART 01-01-03 101 F05CS Confined Space Entry Permit).

5.1.2 Confined Space Evaluation

All confined spaces shall be evaluated using Viking SMART 01-01-03 406 F001 Confined Space Matrix. The purpose of the evaluation is to:

- Determine whether or not the space is a permit-required confined space; and
- If so:
  - Evaluate the hazards that may be encountered in the space, including hazards that are created or exacerbated by the work to be performed.
  - Classify the space into one of the categories described in section 5.1.3 (Note: It is possible that a space may be classified one way under one set of entry circumstances, and another way under different circumstances)
  - Collect information on the hazards to facilitate the development of safe entry steps, JSA, to perform the job (Viking SMART 01-01-110 Job Safety Analysis), as indicated in section 5.2 Entry Process
  - Determine whether or not employees or contractors will be permitted to enter the spaces.
5.1.3 Confined Space Classification

Once identified, all permit-required confined spaces will be classified into one of the following classifications:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>These are permit-required confined spaces that cannot be classified as type 2 or 3.</td>
</tr>
<tr>
<td>2</td>
<td>These are permit-required confined spaces in which the only hazard posed is an actual or potential hazardous atmosphere and it can be demonstrated with documented monitoring data that continuous forced air ventilation alone is sufficient to maintain that permit space safe for entry.</td>
</tr>
<tr>
<td>3</td>
<td>These are permit-required confined spaces which pose no actual or potential atmospheric hazards and all hazards within the space are temporarily eliminated without entry into the space. In effect, the space is temporarily reclassified from “permit-required” to “non-permit required”. Control of atmospheric hazards through forced air ventilation does not constitute elimination of the hazards.</td>
</tr>
</tbody>
</table>

The results of the evaluations discussed in this section shall be used to develop a comprehensive, written inventory of all confined spaces and their classifications in Viking International Rig/Unit/Facility. Viking SMART 01-01-03 406 F001 Confined Space Matrix shall be used.

5.1.4 Decision to allow or prohibit entry into spaces

Based on the data collected and the evaluations included in Viking SMART 01-01-03 406 F001 Confined Space Matrix, management will make a decision as to whether or not employees or contractors will be permitted to enter permit-required confined spaces. This decision may be made on a space-by-space basis.

- If employees will not be permitted to enter permit spaces, effective measures shall be provided to ensure employees do not enter prohibited spaces. If the evaluation determines that the place is a permit-required confined space, exposed employees shall be informed by posting danger signs or by any other equally effective means, of the existence and location of and the danger posed. A sign reading "DANGER PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER" or using other similar language shall be used.
- If employers will be permitted to enter permit spaces, all sections of this program shall apply, as applicable based on the classification of the space. Viking SMART 01-01-03 101 F05CS Confined Space Entry Permit shall be completed and signed before starting any work.

5.1.5 Reevaluating/reclassifying spaces

A Permit-Required Confined Space shall be reevaluated when/if there are changes in the use or configuration that might change or increase the hazards to entrants.

The purpose of this reevaluation is to:

- Determine if these changes have an effect on the classification of the space;
- Identify any necessary changes to entry procedures.

A “permit-required” space may also be reevaluated/reclassified as “non-permit required”, when/if it can be demonstrated through documented, historical objective data (i.e. expired permits and atmospheric testing) that hazards are non-existent.

5.2 Entry Process
5.2.1 General

Formal, written Job Safety Analysis (Viking SMART 01-01-110 Job Safety Analysis) shall be developed and utilized for each permit-required confined space into which employees are allowed to enter. A single generic Job Safety Analysis may be developed for an entire class of permit-required confined spaces, when/if those spaces have identical or substantially similar hazards, required precautions, etc. and a single specific JSA will be written with additional information which adequately addresses any subtle differences or particularity of a Job being performed within the confined space, hazards, requirements, etc.

The specific requirements for the Job Safety Analysis content will vary, depending on the type/classification of the space at hand (see below). However, at a minimum, all JSA’s shall address the following considerations:

- Actual or potential hazards of the space, including hazards that are created, or exacerbated by the work to be performed (i.e. hot work);
- Specifying acceptable entry conditions to be maintained throughout the entry;
- Instructions for atmospheric monitoring (except type 3 spaces), including specific contaminants of concern, proper instrumentation to be used, acceptable concentrations, etc.;
- Instructions for ventilation (except type 3 spaces), including ventilation rates, durations, etc.;
- Any necessary fire/explosion prevention methods, including considerations for hot work permits, explosion-proof equipment, etc.
- Necessary personal protective equipment, including respiratory protection (Note: use of respiratory protection may require the implementation of a respiratory protection program.
- Any equipment necessary to safely perform the work including ingress and egress equipment (i.e. ladders), communication equipment, lighting, etc.

5.2.2 Required content for entry procedures for type 1 Permit-Required Confined Spaces

To enter a type 1 spaces a Viking SMART 01-01-110 Job Safety Analysis and Viking SMART 01-01-03 101 F05CS Confined Space Entry Permit shall be completed. These documents must address the following:

- Specifying acceptable entry conditions;
- Providing each authorized entrant or that Viking’s authorized representative with the opportunity to observe any monitoring or testing of permit spaces;
- Isolating the permit space;
- Purging, inerting, flushing, or ventilating the permit space as necessary to eliminate or control atmospheric hazards;
- Providing pedestrian, vehicle, or other barriers as necessary to protect entrants from external hazards;
- Verifying that conditions in the permit space are acceptable for entry throughout the duration of an authorized entry;
- Emergency procedures

5.2.3 Required content for entry procedures for type 2 Permit-Required Confined Spaces

To enter a type 2 spaces a Viking SMART 01-01-110 Job Safety Analysis and Viking SMART 01-01-03 101 F05CS Confined Space Entry Permit shall be completed. These documents must address the following:

- Any conditions making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.
- When entrance covers are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent an accidental fall through the opening and that will protect each employee working in the space from foreign objects entering the space.
- Before an employee enters the space, the internal atmosphere shall be tested, with a calibrated direct-reading instrument, for oxygen content, for flammable gases and vapors, and for potential toxic air contaminants, in that order. Any Viking employee or contractor, who enters the space, shall be provided an opportunity to observe the pre-entry testing.
- Oxygen content,
- Flammable gases and vapors, and
- Potential toxic air contaminants.

- There may be no hazardous atmosphere within the space whenever any Viking employee or contractor is inside the space.
- Continuous forced air ventilation shall be used, as follows:
  - An Viking employee or contractor may not enter the space until the forced air ventilation has eliminated any hazardous atmosphere;
  - The forced air ventilation shall be so directed as to ventilate the immediate areas where a Viking employee or contractor is or will be present within the space and shall continue until all personnel have left the space;
  - The air supply for the forced air ventilation shall be from a clean source and may not increase the hazards in the space.
  - The atmosphere within the space shall be periodically tested as necessary to ensure that the continuous forced air ventilation is preventing the accumulation of a hazardous atmosphere.
  - Any Viking employee or contractor, who enters the space, shall be provided an opportunity to observe the periodic testing required by this paragraph.

- If a hazardous atmosphere is detected during entry:
  - All personnel working inside the confined space shall leave the space immediately;
  - The space shall be evaluated to determine how the hazardous atmosphere developed; and measures shall be implemented to protect personnel from the hazardous atmosphere before any subsequent entry takes place.
  - Viking Supervisor in charge shall make sure and verify that the space is safe for entry and that the pre-entry measures described above have been taken, through the signature of the person providing the certification in Viking SMART 01-01-03 101 F05CS Confined Space Entry Permit. The permit shall be made before entry and shall be made available to each Viking employee or contractor entering the space.

5.2.4 Required content for entry procedures for type 3 Permit-Required Confined Spaces

To enter a type 2 spaces a Viking SMART 01-01-110 Job Safety Analysis and Viking SMART 01-01-03 101 F05CS Confined Space Entry Permit shall be completed. These documents must address the following:

- The Confined Space Entry Permit shall document the basis for determining that all hazards in a permit space have been eliminated, through a certification that contains the date, the location of the space, and the signature of the person making the determination.
- The Confined Space Entry Permit shall be made available to each Viking employee or contractor entering the space.
- If hazards arise, all personnel in the space shall exit. The space shall be reevaluated to determine whether it must be reclassified as a permit space.

5.3 Entry permits and authorization

5.3.1 General

Before entry is authorized, an entry supervisor shall document the existence of measures required by completing Viking SMART 01-01-03 101 F05CS Confined Space Entry Permit.
5.3.2 Approving the permit
Before entry begins, the Area Authority, the Issuing Authority and the Permit Controller shall sign Viking SMART 01-01-03 101 F05CS Confined Space Entry Permit to authorize entry. The completed permit shall be made available to all authorized entrants, by posting it at the work site.

A listing of those employees who are trained and authorized to sign work permits is found in Viking SMART 01-01-03 401-F009 Appointment of Permit Signatories.

5.3.3 Duration of the permit
The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit.

The Job supervisor shall terminate entry and cancel the entry permit when:
- The work covered by the entry permit has been completed; or
- The time period covered by the permit has expired; or
- A prohibited or hazardous condition arises in or near the permit space.

The space shall be evacuated completely and immediately when the permit is cancelled.

5.3.4 Permit form
The permit form found in Viking SMART 01-01-03 Permit to Work Manual.

5.4 Training
Training in regards to the permit-required confined space must be provided for site personnel. Those with a need for access to the space must be trained on the hazards present and the procedures put in place to control the hazards. They must understand entry procedures and be proficient in the use of any special equipment including LOTO equipment.

The training must be documented and records maintained on site. Training records must include the employee names and signatures, name of trainer(s), and dates of training. Personnel who do not access permit-required confined spaces must be made aware of permit-required confined space issues and warned to observe signs and access controls.

Awareness training may be conducted via Meetings, Tool Box Talks, or On-the-Job Training, with each person signing that they have read and understand the hazards. Awareness training shall also be incorporated into the facility's visitor/contractor orientation. Additional training is required when job duties change, there is a change in the permit-confined space program or the permit confined space operation presents a new hazard or when an employee's confined space performance shows deficiencies.

Viking Contractors working in permit-required confined spaces must be briefed on hazards of spaces and furnished a copy of applicable procedures. Verification of this coordination shall be in writing and kept on file at the facility Viking SMART 01-01-110 Job Safety Analysis prepared for that particular job.

5.5 Emergency planning and response
5.5.1 General
Formal emergency response plans must be developed when employees enter type 1 permit-required confined spaces. Emergency planning and response measures must be documented in the entry Permit.
Confined Space entry Procedure

5.5.2 Designating employees to provide emergency response

A Facility/Unit/Rig Emergency Response Team shall be designated to provide permit space rescue and emergency services, the following steps shall be taken:

- Provide affected employees with the personal protective equipment (PPE) needed to conduct permit space rescues safely and train affected employees so they are proficient in the use of that PPE.
- Train affected employees to perform assigned rescue duties. The Facility/Unit/Rig Manager or Person in Charge (PIC) must ensure that such employees successfully complete the training required to establish proficiency as an authorized entrant;
- Train affected employees in basic first-aid and cardiopulmonary resuscitation (CPR). At least one member of the rescue team or service holding a current certification in first aid and CPR shall be available during entry operations.
- Ensure that affected employees practice making permit space rescues following Viking SMART 01-01-102 Emergency Training Drills, by means of simulated rescue operations in which they remove dummies, manikins, from the actual permit spaces. Permit spaces shall, with respect to opening size, configuration, and accessibility, simulate the types of permit spaces from which rescue is to be performed.

5.5.3 Facilitating non-entry rescue (Watchman)

To facilitate non-entry rescue, retrieval systems or methods shall be used whenever an authorized entrant enters a permit space, unless the retrieval equipment would increase the overall risk of entry or would not contribute to the rescue of the entrant. Retrieval systems shall meet the following requirements.

- Each authorized entrant shall use a full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, above the entrant's head which guarantees the successful removal of the entrant in the event of an emergency.
- The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space in such a manner that rescue can begin as soon as the rescuer becomes aware that rescue is necessary.
- A mechanical device shall be available to retrieve personnel from vertical type permit spaces more than 5 feet deep.

5.5.4 Material Safety Data Sheet

If an injured entrant is exposed to a substance for which Material Safety Data Sheet (MSDS) information is required to be kept at the worksite following Viking SMART 01-01-232 Hazardous Materials handling and Storage. That MSDS or written information shall be made available to the medical facility treating the exposed entrant.

6.0 RESPONSIBILITY

It is the responsibility of Facility/Unit/Rig Manager or Person in Charge (PIC) to oversee the implementation of this Procedure.

7.0 REFERENCES

VIKING 01-01-03-101 Permit to Work System Description.
SMART 01-01-03 101 F05CS Confined Space Entry Permit
Viking SMART 01-01-110 Job Safety Analysis
Viking SMART 01-01-232 Hazardous Materials handling and Storage.
PERMIT TO WORK POLICY

All potentially hazardous non-routine jobs to be performed on a Viking International facility by any employee, contractor, or other party, will require a formal, written “Permit to Work” that follows the requirements of the Permit to Work System.

Failure to follow the procedures established by the Permit to Work System will drive immediate disciplinary action, including termination of employment or contractual agreements.

Viking International Permit to Work System is a formal process for controlling these potential hazards. The system requires a written authorization before any work that might be hazardous to Viking International employees, contractors, or other parties begin.

Viking International will ensure that:

- An appropriate Permit to Work System is in place and in use.
- Personnel are properly trained to administer, implement, and use the Permit to Work System.
- A process to audit compliance with and effectiveness of the Permit to Work System is in place and in use.
1.0 HSE MANUAL

This HSE Manual has been produced to describe how Viking International will manage HSE activities in order to ensure its internal and contractual needs are met such that the Company may assist its clients to achieve their project oilfield services objectives.

This document has been produced in line with VIKING SMART Intergrated Management System Procedures and has been structured to ensure specific actions are assigned to individuals for compliance and completion. It is important that each employee understands the goals of the HSE Manual and the manner in which the Company intends to achieve them.

Viking International is committed to ensuring that personnel are adequately trained in order for them to be able to carry out their duties without risk to themselves, others and the environment in which they work. This HSE Manual is intended to increase individual awareness, participation and promote ownership in the safety process with the intention of eliminating all incidents and injuries in the workplace.

2.0 LEADERSHIP AND COMMITMENT

The Executive HSE Leadership Team (Chairman, President and QHSE & Training Manager) for Viking International have defined and endorsed the Company Health, Safety and Environmental Policy.

In addition to the Executive QHSE Leadership Team, Viking International has a QHSE Department that includes

- Quality Engineer
- HSE Representative’s & Training Coordinator

Rigs have QHSE Officers and Medics either part time or full time, to provide sound HSE advice and guidance to Viking International Operations.

Viking International requires visible management HSE commitment to be demonstrated by Senior Management, Rig Management and HSE Staff by regularly holding/attending structured HSE meetings, making site visits, performing HSE Audits, leading incident investigations, reviewing audit reports and demonstrating an active role in QHSE Management Review Meetings.

HSE is the initial agenda item on all business and operational meetings.

The Company will continuously strive to create and sustain a Company culture that supports the VIKING SMART Integrated Management System by instilling:

- A belief throughout the workforce that the Company can achieve HSE performance excellence by operating incident-free.
- Individual motivation to improve personal HSE performance.
- Understanding and acceptance of individual HSE roles, responsibilities and accountabilities.
- Participation at all levels in the VIKING SMART Integrated Management System.
- Management Commitment to an effective VIKING SMART Integrated Management System.

Demonstration of commitment from management includes:

- Attending and chairing HSE meetings
- Timely response to HSE reports/issues
- Promoting HSE topics in Company meetings and in any Company publications
- Conducting HSE audits, inspections and site visits personally and regularly
- Emphasizing plans for achieving HSE objectives
- Participating in the review and execution of HSE Manuals
- Including HSE performance data, etc. as the primary agenda item for board/high level meetings
- Spending time in the field discussing HSE issues with personnel
- Actively participating in incident investigations
- Communicating with sub-contractors on HSE matters
- Communicating with the customers/clients on HSE matters
- Attending HSE meetings/conferences outside the Company
- Allocating experienced and competent personnel to develop and maintain VIKING SMART Integrated Management System
- Allocating adequate resources, such as personnel, time and finance to HSE issues/projects
- Leading by example in their everyday actions both in and away from their workplace.
- Putting HSE matters high on the agenda of meetings, from the Board downwards.(See above)
- Being actively involved in HSE activities and reviews, at both local and remote sites
- Communicating the importance of HSE considerations in business decisions
- Recognition of HSE performance when objectives are achieved
- Encouragement of employees’ suggestions to improve HSE performance

In summary, to foster an active and continued involvement of all employees in improving HSE performance, management must demonstrate by leadership and encouragement, a culture of:

- Belief
- Motivation
- Individual Responsibility
- Participation
- Commitment
- Accountability.

3.0 POLICY AND STRATEGIC OBJECTIVES

The Viking International Health, Safety and Environmental Policy will be outlined to all Viking International personnel on any given project and will be prominently displayed at strategic locations on Viking Rigs and facilities. They are initially presented to all employees during induction training and are continuously reinforced as a required agenda topic in HSE meetings at least once per quarter. The original policies have been dated and endorsed by the Executive HSE Leadership Team responsible for HSE at Viking International.
3.1 Overview of HSE MANUAL
The Viking International Health, Safety and Environment Manual reflect the basic management principles of:

- Planning
- Organizing and Implementation
- Auditing, Measuring and Performance Benchmarking
- Continual Improvement

These principles are based on the following elements:

- Leadership and Administration
- Planned Audits and Inspections
- Task Analysis and Observations
- Incident Investigations and Analysis
- Emergency Preparedness
- Company HSE Rules
- Personnel Protective Equipment
- Training and Competence
- Program Evaluation
- Engineering Design and Change Control
- Road Safety
- HSE Meetings
- Safety Culture Promotions
- Purchasing Controls
- Management Review
- Personnel Communications

This format aims to ensure that all activities within Viking International, and the hazards associated with these activities, have been systematically identified, organized and controlled in a proactive manner.

The HSE Manual includes performance standards that are audited against on a regular basis. Continuous improvement is achieved by making changes based on the audit findings, measured and evaluated results, legislation, operational changes and employee feedback.

3.2 HSE Standards and Procedures
The responsibility for implementing the HSE Manual Standard and Procedures lies directly and individually with Line Managers, from the Chairman down to every employee.

3.3 HSE Responsibilities
The responsibility for HSE rests upon all personnel and is an integral part of, and inseparable from, the daily operations of the Company and its Rigs. All Viking International employees are issued with an agreed job description that overviews their individual general responsibilities for HSE. The descriptions are reviewed and improved on a regular basis. Detailed HSE responsibilities by position are listed in 4.2 of this document and in addition, are imbedded throughout the VIKING SMART inside specific Procedures.

3.4 HSE Goals and Objectives
All Viking International personnel are responsible for protecting the health and safety of employees, customers, subcontractors, third party contractors, communities and the environment wherever the Company operates. The Health, Safety and Environmental Policies are supported by an infrastructure of
procedures, standards, resources and facilities aimed at planned identification and elimination or management of hazards. To ensure the effective application of infrastructure the organizational responsibilities have been defined and are communicated to all personnel. Effectiveness of the HSE arrangements are assured and measured in two ways – HSE preparedness (i.e. audit and review, pre-job communications and pre-tour meetings) and delivered HSE performance (i.e. against goals, targets and Area HSE ranking).

Viking International is committed to continually improving everything it undertakes and no job is so urgent or important that the Company will pursue it at the cost of the safety of its people, those working with the Company or the protection of the environment. In support of its commitment, Viking International has established the following HSE Improvement Principles:

- All incidents and injuries can be prevented
- All incidents, injuries and high potential near misses must be investigated
- Auditing is an absolute requirement
- Training is an essential element of safety
- Safety off the job is just as important as safety on the job
- Safety is smart business
- All deficiencies must be corrected promptly
- Safety is a condition of employment
- People are the most critical element of performance
- Environmental compliance is a condition of employment
- Keeping people safe is the right thing to do
- Minimum Specific targets for any Viking International operations/project are:
  - Zero Fatalities
  - Zero Lost Time Incidents
  - Zero Recordable incidents
  - Zero High Potential Incidents
  - Zero Environmental Incidents
  - Zero Vehicle Incidents
  - 100% Completion of HSE Annual Plans

4.0 ORGANISATION, RESPONSIBILITIES, RESOURCES, STANDARDS AND DOCUMENTATION

4.1 Organization
The organization chart in Appendix 9.1 indicates that structure of the QHSE Department.

4.2 Empowerment to Stop Work
It is the responsibility and obligation of all personnel to Stop Work and communicate the same to the responsible parties (with authority to sustain the work stoppage), if it is perceived as unsafe or if the task is not understood. Viking International supports a culture where no one has to prove it's unsafe to stop the job, rather we have to prove that it's safe to start or re-start the job. (See STOP WORK Authority Policy VIKING 01-PXX)

4.3 Responsibilities
Management recognizes that onsite supervisors are directly responsible for the safe performance of the operation and of the employees under their supervision. Management’s role is to provide those supervisors with clear direction and support for operational and safety requirements.
4.3.1 Chairman / President / HSE Manager / Operations Manager / Field Superintendents

- Implement Company HSE Manual and monitor progress. Ensure that the HSE Manuals continuously monitored, reinforced and reviewed.
- Instill in all employees HSE awareness and ensure that safe work practices are carried out in accordance with both Company and statutory requirements.
- Ensure proper and applicable training of employees to enable them to recognize hazards and observe HSE requirements their work may require.
- Ensure equipment provided by Company is of good quality and suitable for its intended function.
- Ensure HSE critical tasks are carried out by having the responsibilities clearly assigned to persons with the right competencies and that completion can be verified.
- Ensure HSE critical equipment is maintained and inspected regularly as per regulatory, Client and Company requirements in an auditable manner.
- Participate in the review of proposed operations involving Company equipment and personnel; and highlight any HSE risk that is not adequately addressed in the plan or existing procedures.
- Ensure agreed to client procedures are adhered to where they supersede Company procedure.
- Continually motivate employees to think and work safely.
- Ensure written evidence of compliance to procedures is documented where appropriate.
- Monitor the Viking Observation Card Program, VOC and ensure outstanding items are recorded on the Viking Preventive / Corrective Action Register for follow-up.
- Ensure that safe operating procedures are in place for all hazardous work carried out.
- Ensure action items arising out of the HSE weekly meetings and audits are recorded on Viking Preventive / Corrective Action Register for follow-up.
- Ensure that all incidents and near misses are reported to the client and QHSE Department as defined in incident reporting procedures.
- Ensure the investigation of incidents, implementation of preventive strategies and publication of information regarding incidents is communicated to all personnel.
- Ensure written evidence of compliance to procedures is documented where appropriate.
- Continue ongoing training and development of rig personnel.

4.3.2 Rig Managers, Toolpushers, Person in Charge (PIC)

- Assume a leadership role in the safety of the location by modeling safe behavior, encouraging safety “best practices” both on and off site, and developing a positive safety culture.
- Ensure all work performed under their supervision is carried out in a safe manner and in accordance with Viking International and client standards, policies and procedures.
- Ensure a constant focus on the VOC program is maintained.
- Ensure crew members comply with all Viking International and client standards, policies and procedures.
- Ensure that pre-tour meetings are held with 100% participation of rig personnel, third party contractors and client supervisors.
- Ensure that adequate supervision is provided for all work.
- Ensure that all incidents are reported and assist in any investigation as requested.
- Ensure all Emergency Training Drills are conducted and recorded on a regular basis.
- Ensure written evidence of compliance to procedures is documented where appropriate.

4.3.3 Maintenance Team

- Under the supervision of the Rig Managers, Toolpushers and Person in Charge (PIC) the Mechanics and Electricians shall ensure that all work performed by them or under their supervision comply with Viking International and client policies, procedures and standards.
• They will rectify any unsafe equipment, hazardous work or machinery and report to the Rig Manager when unable to do so.
• They will attend and contribute to daily pre-tour and weekly safety meetings.
• They will participate in the VOC program.
• Ensure written evidence of compliance to procedures is documented where appropriate.

4.3.4 QHSE Representatives
• Perform daily and weekly surveys of rig operations and activities.
• Coordinate Job Safety Analysis (JSA) reviews and advise Supervisors of recommendations for safe management of critical or non-routine tasks.
• Coordinate safety training and identify and conduct special needs training.
• Assist with audits and inspections.
• Liaise between clients, third parties and area management on safety and training matters.
• Ensure that all personnel working on, or visiting, a rig receive a comprehensive briefing and tour of emergency facilities and hazardous areas.
• Provide new employees with the proper induction program, including the VOC program and convey the importance of our HSE program in daily operations.
• Ensure written evidence of compliance to procedures is documented where appropriate.

4.3.5 All Other Personnel
• Each crew member shall comply with Viking International and the client safety policies, procedures and standards.
• Crew members shall cooperate with their supervisors to ensure that all work is performed in a safe manner, giving due regard to the environment.
• All personnel should bring to the attention of their immediate supervisors any potential hazards to Health, Safety or Environment which come to their attention in the course of their work and report all incidents or near misses immediately to Company and client supervisory staff.
• Each crew member shall participate in the VOC program.
• Each crew member shall attend the daily pre-tour safety meeting and weekly safety meetings.
• Ensure written evidence of compliance to procedures is documented where appropriate.

4.4 Management Team
The Management Team can demonstrate the following:
• Assume a safety leadership role by modeling safe behavior, encouraging safety “best practices” both on and off site and developing a positive safety culture.
• Ability to communicate effectively in written and spoken English
• Ability to conduct and report HSE audits
• Training ability in incident prevention and control
• Ability to conduct incident investigations and identify root causes
• Knowledge of health requirements/regulations, and ability to monitor compliance
• Knowledge of environmental requirements/regulations, and ability to monitor compliance and identify ways of reducing environmental impact
• Are fully conversant with techniques used in the management of hazards and advising on suitable control measures which can be used for preventing and ultimately recovering from post-incident situations
• Are able to facilitate and develop Contract HSE Management Plans
• Are fully conversant with client HSE documents and emergency procedures
4.5 HSE Meetings
Meetings are regularly held to review, monitor, report and communicate relevant HSE issues. The meetings will be scheduled and conducted at different levels throughout Viking International and, at the field level, should encompass client and sub-contractor personnel on site.

To achieve a successful HSE meeting, a plan will be developed to typically include the following:

- **Prepare in advance** – A HSE meeting agenda will be published in advance detailing points that will be presented and discussed during the meeting.
- **Promote group discussions** – A reasonable time limit will be set for the meeting. Meeting techniques should be used during the meeting to ensure consensus building and discussion to progress in a way where all attendees have the opportunity to speak and be heard by all other attendees.
- **Follow through** – Action items will be agreed. Minutes of the meeting will be kept and posted to give all attendees the same information base for follow-up actions. All action items arising from HSE meetings shall be entered into the rig’s Viking Preventive/Corrective Action Register (PCAR).

A special HSE Meeting shall be arranged at site, subsequent to:

- The receipt of a Safety Bulletin via HSE Department, management or client.
- The receipt of a Hazard or a Product Alert covering any product/equipment used by the operation.
- Discussion(s) with the Operator after a rash of incidents or high potential Near Misses on site or in the Area, a “Safety Stand Down” meeting will be held at the rig.

All staff members have a commitment to uphold the corporate HSE policies and procedures in accordance with contractual specifications in their applicable area of work and within VIKING SMART Integrated Management System requirements.

- **A Monthly Safety Review Meeting (MSRM)** meeting is by Viking International and invites are sent to Clients. At a minimum, HSE Manager, Operations Managers, Field Superintendents and Safety Representatives required to participate. The previous months HSE performance is reviewed, high potential incidents are identified at the Weekly Incident Review Meeting and are presented by the respective Field Superintendents and Safety Officers. Training Statistics, New Initiatives, and Progress of recently initiated programs as well as any other current HSE issues that have come to light (from audits, incidents, industry alerts, etc.). The Rig Safety Champion of the Month and Viking Safety Champion of the Month winners are also announced and presented with awards if present.

- **Site Weekly HSE Meetings** will be held for both shifts with all crews participating. Preferably, the Operator’s well site supervisor shall also participate in these meetings. The HSE meeting should be led by the Rig Manager/Person in Charge. (PIC)

- **Pre Tour Meeting** will be held prior to each crew tour. All personnel are to attend these meetings, where HSE, operational issues, potential hazards, VOC observations and other relevant issues shall be discussed.

4.6 Environmental Management
Viking International personnel will maintain high levels of environmental awareness and consideration that is equal to or greater than those established onsite. This commitment is underpinned by the Viking International HSE Policy.

Viking International will undertake all client environmental requirements in accordance with legislative requirements and an Environmental Management Plan shall be established for field operations.

4.7 Resource Management
Viking International management is responsible for ensuring the provision of sufficient resources, infrastructure and facilities to all levels of operations to ensure the effective management of the VIKING SMART Integrated Management System. All staff is responsible for reporting any of the above
requirements to their direct management as, when and where necessary. Please see attached HSE Department chart for resources dedicated to oversee the implementation of the HSE Manual. Specialist QHSE trainers have been deployed to the rigs to get the rig management staff acclimated to the VIKING SMART Integrated Management System thus working towards achievement of the QHSE goals and objectives.

4.8 Training & Competency
Viking International’s training & competency programs are based on internally developed needs and are supplemented by client and regulatory requirements. Training is performed by in-house accredited trainers as well as through external training providers. Viking International has established a comprehensive Training Matrix which indicates the training requirements by position and the frequency of that training. Each rig is benchmarked monthly on the level of compliance against the matrix. Specially trained personnel will be arranged on an as needed basis.
As necessary, subcontractors will be made aware of Viking International training/competency requirements to ensure consistency in HSE awareness and competency.

4.9 Rig Site Reports
In order to maintain consistent reporting, all members of Well Site Supervision shall regard the following as the minimum reporting.

**DAILY Requirements**

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**WEEKLY Requirements**

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### AS NEEDED Requirements

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</tbody>
</table>
5.0 HAZARDS & EFFECTS MANAGEMENT PROCESS

5.1 Methods and Procedures for Hazard and Effects Management

Drilling of wells in many areas, under specific conditions such as high H2S concentration, concurrent drilling and producing operations etc. can represent a fundamental change to conventional operations. Viking International recognises that hazards specific to these operations must be identified; the associated risks assessed and risk control measures put in place to ensure that risk levels are kept to As Low As Reasonably Practicable (ALARP). The overall process as to how this is achieved encompasses various techniques including Viking International’s Risk Assessment (HAZID, HAZOP) procedure, etc. performed jointly with our clients. Extensive HAZID/HAZOP studies should be done on these types of operations, and the full reports of each of these studies will be contained in the supporting documentation, see 5.2. These reports will detail the hazards identified, an assessment of the risks and the actions to be taken to reduce those risks to an ALARP status.

5.2 Implementation of the Hazards and Effects Management Process

- Job Safety Analysis
- Hazard identification workshops
- Behavior based program
- Training and awareness of personnel
- Job Safety Analysis
- Hazard assessment and risk ranking
- Formal Safety Assessment
- Hierarchy of controls
- Management of critical activities (implementation awareness and training)
- Management of critical elements (inspection, testing and maintenance)
- Management of Change procedures
- HSE Management Systems and procedures
- HSE Manual
- Bridging documents
- Permit to work system
- Training
- Emergency response plans and procedures
- Emergency response exercises and drills
- Bridging documents

Record
- Audits
- Management reviews
- Hazard registers
- Incident/near miss reporting & trend analysis
- Document control procedures
- Inspection, testing and maintenance records
- Training records
- Completed VOC cards
- HSE Manual
5.3 Assessment of Exposure of the Work Force to Hazards and Effects
Viking International will apply risk assessment procedures for all at risk activities undertaken. Specific and adequate training, where necessary, will be provided to staff, crew members and sub-contractors. The risk assessments shall take into account the permit-to-work system where necessary. Viking International also utilises its existing Job Safety Analysis (JSA) programme to discuss and assess job related risks immediately prior to the job taking place. Crew members who will be working on site will have access to a master list of compiled JSA’s. All JSA’s are available for reference and modification as the work progresses.

5.3.1 BOC Behaviour Based Safety Observation Program
To help ensure a continuous Hazard and Effect Management Process (HEMP) takes place, Viking International will utilize the BBS VOC program. Refer Viking Observation Card Procedure

5.4 Permit to Work
One of the main tools used to ensure that non-routine tasks or tasks that may inadvertently affect other work are properly planned and executed is the Permit to Work (PTW) system. VIKING 01-01-03 Permit to Work Manual, supported by the Job Safety Analysis program, shall be used. All crews will attend training on the Viking International Permit to Work training module. These activities will be discussed with client representatives to ensure they are aware of the operations, the safe system of work and their role in the permit system. Refer to VIKING 01-01-03 Permit to Work Manual.

5.5 Handling of Dangerous Goods and Hazardous Materials
Viking International’s HSE Manual defines the responsibility and procedure to ensure the proper control, storage, handling and disposal of dangerous goods and hazardous materials in accordance with the applicable Material Safety Data Sheets (MSDS).
A manifest of dangerous goods and hazardous materials will be maintained together with access to the Material Safety Data Sheets (MSDS) at site. Viking International shall make every effort to minimize the use of dangerous goods and hazardous materials wherever possible by using engineering controls, isolation or substitution of these products.
All new chemicals brought to the Viking International worksite will be introduced in a controlled manner. Viking International shall assess the hazards of the transport, storage, handling, use and disposal of all manifested items. Hazard assessments shall also be maintained on site for the transport, storage, handling, use and disposal of all manifested items.
Refer to HSE-032, Handling and Storage of Hazardous Materials, located in HSE manual.

5.6 Assessment of PPE Requirements
Viking International has an extensive catalogue of PPE. In addition to the standard PPE issue (i.e. hard hat, safety glasses, coveralls, safety footwear, gloves and hearing protection) specific work related tasks have been identified and suitable PPE specified and provided, with appropriate stock levels maintained. Detail of the PPE requirements was, and will continue to be, identified during the Viking International JSA process. Viking International policy mandates the use of hard hats, safety glasses and safety boots at all times while on the worksite. Approved coveralls/work wear and gloves are to be worn by all working crews and hearing protection is to be used in high noise. Hearing protection is provided at specified points throughout the rig site for use by all crew members and visitors.
The correct use of the appropriate PPE is an important tool in the prevention of personal injuries.

5.6.1 PPE Instruction / Training
Suitable training will be provided in the proper use and maintenance of PPE, as required. Where specialised or task specific PPE is essential, competent Viking International HSE & Training personnel or approved third party instructors will carry out relevant training. All relevant HSE training will be carried out as stipulated in the Training matrix which can be found VIKING 01-06 Training Manual.

5.6.2 PPE Renewal and Replacement
PPE will be maintained and fit for purpose at all times, and will be replaced when it no longer affords the protection for which it was designed or at any time the condition of the equipment is questionable.
PPE with specific inspection, test and maintenance requirements will be monitored and all work performed will be to the manufacturers recommendations and records maintained of the work. All PPE usage and storage shall be tracked. **Maintaining sufficient PPE stock levels is critical.** Orders of new stock shall be approved by the Rig Manager whenever the pre-determined minimum stock levels of any PPE items are reached.

The following is Viking International's PPE usage policy:

PPE will be required to be worn as the specific task requires and Viking International will provide PPE where necessary. However, if an employee's use of PPE is greater than the minimum allotment shown in the table below, and no evidence of wear and tear is observed, a charge (payroll deduction) shall be made for the additional items provided. PPE displaying evidence of normal wear and tear must be returned (same size as issued) for replacement.

<table>
<thead>
<tr>
<th>PPE ITEM</th>
<th>Replacement Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Hat</td>
<td>1 per year</td>
</tr>
<tr>
<td>Safety Glasses (non-prescription)</td>
<td>1 every 2 weeks</td>
</tr>
<tr>
<td>Safety Glasses (prescription)</td>
<td>1 per year</td>
</tr>
<tr>
<td>Coveralls</td>
<td>4 per year</td>
</tr>
<tr>
<td>Cloth Gloves</td>
<td>7 pairs per week</td>
</tr>
<tr>
<td>Safety Footwear</td>
<td>2 pairs per year</td>
</tr>
</tbody>
</table>

VIKING 0-01-105 Personal Protective Equipment (PPE)

5.7 **Management of Change (MOC)**
The Viking International MOC procedure provides a systematic method of introducing change into the Company in a controlled manner. The process ensures that changes are evaluated, approved and documented prior to implementation. From an HSE perspective, this process will ensure that any potential new hazards resulting from the change(s) are identified and addressed.

Refer to VIKING 01-01-108, Management of Change, located in the Quality Manual

5.8 **Risk Assessment (Hazid / Hazop)**
The purpose of this procedure is to define a method of risk assessment to be used when it is proposed to introduce new, or make significant changes to an existing operation or equipment configuration. The procedure may be applied at the rig or project level.

5.9 **Shift Handovers**
Passing on of critical information during a shift change shall be through a written and a verbal handover. The written handover shall be documented in a dedicated handover book for each supervisory job group, and records shall be retained on file for a period of two years.

The shift handover logbook does not replace face-to-face communication during handovers to clarify ambiguity. The outgoing and incoming personnel share a mutual responsibility to effectively communicate and exchange task-relevant information. The incoming personnel have an additional responsibility of cross-checking and confirming information as they assume responsibility for their shift. The purpose of shift handover is the accurate and reliable communication of task-relevant information across shift changes, thereby ensuring the continuity of safe working conditions and effective operations.

The handover logbooks shall, at a minimum, cover the following information:

- Any hazards identified during the previous shift that could not be eliminated
- Any alarms tripped over the shift
- Any troubleshooting of operational processes that took place, including remedial action taken and the final status
6.0 PLANNING & PROCEDURES

6.1 Emergency Response Procedures
Emergency Response Procedures (ERP) has been developed by Viking International for all of our operations. The purpose of these procedures is to define a command and control structure in order that in the event of an emergency, personnel will respond in a timely manner to mitigate the effects and control the situation with the objective of preventing escalation. The ERP shall also recognize the role that the client and Viking International office would play in the event of an emergency. This is one of several key areas defined in bridging documentation and is critical to ensure a coordinated and time efficient response.

HSE related emergency rig site situations may include but are not limited to the following:

- Well Kick Duties and Responsibilities
- Blowout Duties and Responsibilities
- Procedures in case of Fire
- H2S Readiness
- Injury Incidents
- Medical Emergency Evacuation Plan
- Medical Evacuations
- Spill Prevention Control and Countermeasures Plan

Refer to VIKING 02-02-09 Emergency Responsive Manual.

Security related emergency rig site situations may include but are not limited to the following:

- Security Evacuations
- Missing Persons / Vehicle Procedures
- Natural Disaster
- Security / Civil / Political / Military Emergencies Security / Civil / Political / Military Emergencies

6.2 Emergency Training Drills
Viking International Operations conduct training drills on a scheduled basis. The Rig Management are responsible for overseeing the coordination, reporting and assessments of the drills, in addition to ensuring the identification of any specific PPE, equipment and training required by rig emergency crews which will enhance their effectiveness. Training drill reports and assessments will document the frequency of drills in addition to evaluating the effectiveness of rig emergency crews, their training and equipment and the preparedness of all other rig personnel.

All personnel on site are expected to actively participate in these drills, which should be coordinated with the Operator. As part of the Viking International induction process, personnel will be made aware of their roles and responsibilities during these drills.
Emergency training drills include but are not limited to the following:

<table>
<thead>
<tr>
<th>LAND RIGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Well Control Drills</td>
</tr>
<tr>
<td>Simulated Fire Fighting Drills</td>
</tr>
<tr>
<td>First Aid and Rescue Exercises</td>
</tr>
<tr>
<td>Confined Space Rescue Drills</td>
</tr>
<tr>
<td>H2S Drills</td>
</tr>
<tr>
<td>Muster Drills</td>
</tr>
<tr>
<td>Spill Drills</td>
</tr>
</tbody>
</table>

Refer to VIKING 01-01-102 Emergency Training Drills.

6.3 Viking Contractors

6.3.1 Management
Viking contractors are required to meet the same standard of HSE excellence as Viking International. Implicit in the selection of any sub-contractor is their demonstrable HSE commitment and ability. Dependent on the nature and scope of supply, Viking contractors will be expected to develop an HSE Plan complementary to this document and/or comply with this document. Viking International shall make this document available to its sub-contractors and reference the detail in site-specific inductions to increase awareness.

Verification of the acceptable implementation of the sub-contractors HSE arrangements is, in the first instance, by the sub-contractors own programme of audits and inspections. Viking International will confirm the effectiveness of the sub-contractors verification system. The preferred method of improvement is to promote improvement by the sub-contractor; however, Viking International will reinforce where necessary with their resources.

6.3.2 Compliance and Monitoring
Contractors will be audited as part of the ongoing rig audit schedule of all Areas that Viking International operates in. Additionally, stand alone subcontractor and vendor audits are to take place.

7.0 IMPLEMENTATION, MONITORING AND CORRECTIVE ACTION

7.1 Communication
HSE communication that will be used to make personnel aware of HSE issues include:
- **Meetings** - see Section 4.5
- **Personal Contact** - The primary language within Viking International is English and thereby all communication during an emergency will be conducted in English.
- **Handovers** - see Section 5.8
- **Notice Boards** - On site at various locations.
- **Safety Bulletins (Including IADC, Third Party and internally produced)**
- **Promotions** - The VOC behaviour based observation program is used on all Viking International locations. The program is designed to train employees to recognise both safe and unsafe or at-risk behaviours and conditions within their workplace. The communicated observation is reinforced with documentation on a VOC card. By focusing on these behaviours and conditions, near misses, incidents and injuries can and will be prevented.
7.2 Critical Items for HSE Inspection
Section 4.9, Rig Site Reports, outlines the requirements for safety critical equipment inspection frequencies. The Rig Manager is responsible for ensuring that the equipment is inspected in line with this schedule. The daily HSE walkabout will be the initial visual inspection mode for the site crew.

All deficiencies will be recorded and monitored until close out on the Viking Preventative/Corrective Action Register (PCAR)

7.3 Incident Management
ALL INCIDENTS ARE REPORTABLE. However, the form, timing and level of the reporting of an incident varies with the actual and potential consequences. Dependent upon the type of incident, Rig Managers / Toolpushers shall ensure the incident site is secured, if required. Viking International QHSE staff shall provide assistance to the Rig Manager / Toolpusher and Client Representative(s) by ensuring that relevant Client and Company reports are correctly completed, then forwarded to the President. The Viking International QHSE Department shall also participate with the Operations Department and Client Representative(s) in the investigation and analysis of any serious injury incidents or high potential Near Miss incidents.

Incident Action Items will be addressed through the Viking Preventive / Corrective Action Register or formal Change Process and will be distributed in the form of industry-wide bulletins, as required. In the event of Supplier Action Item requirements Viking International will liaise directly with the supplier to pursue close-out.

For further details and requirements, refer to VIKING 01-01-107 Incident Report and Investigation.

7.4 Vehicle Selection and Use
Viking International will be responsible for planned maintenance for all Viking International owned and contracted vehicles used on site. All approved safety equipment is to be installed and functioning. Viking plans to install In-Vehicle monitoring to closely manage its growing fleet of vehicles.

The Viking International journey management system will be utilised. This will cover awareness of route, verification of drivers’ standards and realistic schedules.

Viking International will ensure that any contracted drivers will conform to the same requirements as Viking International personnel and that they apply all Viking International Road Safety and Procedure HSE-028 located in the HSE Manual.

7.5 Performance
HSE performance ranking against objectives and targets, including incidents, leading and lagging indicators and statistical analysis will be summarised and presented as indicated in VIKING 01-01-104 Monthly HSE Report.

8.0 AUDITS AND REVIEW

Inspections, internal and external audits and reviews of VIKING SMART Integrated Systems will be undertaken at regular scheduled intervals.

Continuous review of QHSE performance takes place at all levels in various ways. There are tour meetings with the crews, the morning meetings of all senior personnel on site, the morning calls with office management, weekly HSE meetings on site, monthly HSE meetings, regular meetings between Company management and client and contract performance meetings. There are also more formal audits by both client and Company.
8.1 Scope
It is the intention to audit the activities of, but not limited to, the application of the Viking International HSE Management System as broken down below (also for selected sub-contractors):

- Demonstrated HSE Leadership and Commitment
- Health & Safety Management
- Environmental Management
- Operational HSE Management

8.2 Follow Up
The Audit Team and the Rig Management will review each audit and set targets dates for completing remedial actions and agree on a tentative date for a follow-up audit and inspection. Audit reports and agreed corrective/preventative actions are then to be tracked on site via VIKING 01-106-F001 Preventative and Corrective Action Register (PCAR)

8.3 HSE Management Review
A QHSE Management Review, held throughout the year, shall critically examine the overall management strategy, and the effectiveness and continuing suitability of the HSE Management System, by discussing the following topics as agenda items:

- Internal and External Audit Reports and the effectiveness of any preventative or corrective actions taken
- The effectiveness of any recent revisions to the VIKING SMART Integrated Management System
- Contractor performance
- Suggestions and Feedback to develop and improve the VIKING SMART Integrated Management System.
- Review the adequacy training programs and revise them where necessary
- Trends and common features of incident, hazard and inspection data, accompanied by analysis of causes and remedies
- Any recent changes, or imminent changes, in legislation and technology
- Evaluate overall staff understanding of the VIKING SMART Integrated Management System, its purpose and objectives
- Evaluate overall staff commitment toward continuous improvement in performance
- Review the Status of set QHSE Goals and Targets
9.0 APPENDICES

APPENDIX 9.1: EXECUTIVE QHSE TEAM

APPENDIX 9.2 Quality, Health, Safety & ENVIRONMENT ORGANIZATION CHART
1.0 PURPOSE

The purpose of this standard is to set out guidelines with regards to emergency training drill types, requirements and frequency.

Training drills shall be held on a regular basis as per the minimum requirements set out in the Frequency of Drills (1.1) and all personnel present on the rig / facility at the time of the drill are required to participate in these drills/training exercises. Crew members and visitors shall receive a rig induction upon arrival to the rig/facility which will include instructions to be followed in the event of an emergency and their mandatory participation in emergency drills. The induction will also include the actions each crew member is required to take during or in the event of a real emergency. All crew members must adhere to these instructions.

1.1 Frequency of Drills

Regional regulations for emergency drills and exercises on Company rigs determine the frequency of drills. The frequency of drills is generally as follows, but may be modified for a specific rigs based on special needs or contract requirements.

<table>
<thead>
<tr>
<th>Drill Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muster Drills</td>
<td>Once a Week</td>
</tr>
<tr>
<td>First Aid and Rescue Drills</td>
<td>Once a Month</td>
</tr>
<tr>
<td>Confined Space Rescue Drill</td>
<td>Once a Month</td>
</tr>
<tr>
<td>H₂S (gas) Drills</td>
<td>Once a Month within 24 hours after duty begins and once a week by each crew when drilling in suspected or known H₂S area.</td>
</tr>
<tr>
<td>Fire Fighting Drills</td>
<td>Once a Month</td>
</tr>
<tr>
<td>Spill Drills</td>
<td>Last Saturday of the Month</td>
</tr>
<tr>
<td>Pit Drills and Blowout Drills</td>
<td>Once per Hitch as Well Control Manual</td>
</tr>
<tr>
<td>Other emergency response drills</td>
<td>As determined by PIC</td>
</tr>
</tbody>
</table>

2.0 APPLICATION

This procedure applies to all Viking International rigs. Fire fighting and stretcher drills will be applicable to base camps.

All personnel must participate in emergency exercises and drills. The Person-In-Charge (PIC) must specifically approve exemption from these drills. Personnel regularly assigned to the rig must attend at least one drill or emergency exercise during their regular tour of duty. Drill participation is recorded on the Drill Form (VIKING 01-01-102-F001) and in the IADC Drilling Report Form “Emergency Response Exercises and Drills Report.”

3.0 RESPONSIBILITIES

It is the responsibility of the Rig Manager / Tool pusher to ensure emergency training drills are conducted in accordance to this procedure and as per the requirements of the Frequency of Drills. It is also his responsibility to increase the frequency of the drills depending on the well conditions. He shall also ensure an updated POB is readily available at all times which will be used for taking a headcount.

The Safety Rep is responsible for designing the rig specific Drill Plan identifying various scenarios, Emergency Response Team members and training all personnel to execute their responsibilities in the event of a real emergency. He is responsible for completing the Emergency Training Drill Report VIKING 01-01-102-F001 and to submit it to the Rig Manager for his approval.

It is the responsibility of all personnel (Viking employees, visitors, sub-contractors and third party contractors) on the rig to familiarize themselves with the muster stations, actively participate and follow the
instructions of the Rig Manager and Safety Rep during training drills. It is the responsibility of each crew member to be aware of and be able to operate the rigs safety equipment i.e. they must know how to activate the fire alarms, fire extinguishers, fire hoses etc.

All visitors shall fill in the ‘Visitors Log’ when they arrive and leave the rigs.

4.0 PROCEDURE

Training Drills will be conducted to effectively simulate conditions that may be experienced during a real emergency. The Safety Rep will design the Drill Plan simulating as many scenarios as possible building confidence of the rescue team in rescue operations.

4.1 Drill Scenario

Drill scenarios should include but are not limited to the following:

- Evacuation and muster
- Fire or explosion
- Blowout of a well
- Leak or spillage of any oil or gas
- Rig structural failure
- Failure of equipment affecting safety of personnel
- Accident involving a vehicle
- Death or serious injury or illness
- Rescue Team response

4.2 Planning Drills

One of the best ways to ensure that the emergency response organization responds properly during a real emergency is frequent practice. Effective practice drills can increase the chances of survival during an emergency. A properly planned drill is more effective and should follow these general steps:

- Select a realistic drill scenario that participants believe could happen.
- Vary the scenario by incorporating operational problems.
- Describe the emergency situation and write up the story line details.
- Markup copies of the applicable emergency procedures, noting which actions to perform and which to simulate by a walk-through, talk-through.
- Identify important actions to observe.
- Select appropriate training props and aids.

To be effective, all emergency drills should accomplish the following:

- Teach the crew to do a task that may be required in a real emergency.
- Test and review the crew’s ability to carry out tasks learned in past drills.
- Inspire confidence in the crew so they can respond effectively to any emergency on their rig.
Emergency Training Drills

Drills should prepare the crew to respond to major events such as large fires, gas leaks without fire, inoperable equipment or the absence of key personnel. Drills should also test emergency equipment and emergency communications.

An effective drill must be carefully planned, realistically conducted, and thoroughly reviewed in order to meet these goals. A Drill Form (VIKING 01-01-102-F001) is provided to aid in performing these steps.

![Diagram of Drills]

Goals of Drills:
- Test Emergency Response
- Train Crew in Proper Response
4.3 Conducting Drills
The drill should be conducted according to the following guidelines to maximize safety and effectiveness. The Drill Form (VIKING 01-01-102-F001) contains spaces in which to record critical times and actions during the drill.

- Use planned walk-through, talk-through type exercises as well as unannounced drills to increase the training value.
- Once the drill begins, make sure that all hands are aware that a drill is in progress.
- Ensure drill evaluators know which actions to perform and which to simulate based on marked up copies of the applicable emergency procedures.
- Maximize use of real conditions while ensuring crew and rig safety are not compromised.
- Drill evaluators should generally be observers only; however, they should stop the drill if important critical actions are not taken or if they observe poor practices that require immediate correction for training or safety reasons; the drill should be reinitiated from the beginning only after corrective actions have been completed.
- All drill evaluators should take detailed notes during the drill to aid in reviewing drill performance.

4.4 Post Drill Assessment
Upon completion of each Training Drill a meeting will be held and a Post Drill Assessment review will be conducted with the personnel involved in the exercise to determine the overall effectiveness of the Training Drill. Revisions to the Drill Plan & methods to improve on weaknesses will be discussed during this assessment. The Drill plan & revisions will be documented and included in the new, revised, Drill Plan.

4.5 Preventive/ Corrective Action
All non-compliance items listed in the findings of the Post Drill Assessment that can be corrected to improve the effectiveness of the emergency response should be entered on VIKING 01-01-106-F001 Preventive / Corrective Action Register and tracked until the action has been completed & the item is closed out.

4.6 Drill Reporting
Emergency Training Report VIKING 01-01-102-F001 must be completed after each drill, detailing the description of the drill, the high / low points and lessons learned. The Training Drill must be noted on the IADC Report and a copy of the report kept on file for future reference.

4.7 Emergency Response Team
All rigs and base camps should have (1) designated Emergency Response Team (ERT), composed of four to six reliable crew members. The Ideal Candidates for this position would be the Assistant Driller, Derrickman, Mechanic, Electrician, Lead Floorman and Lead Roustabout. The Emergency Team will be called upon in the event of a fire or any other emergency. The ERT will be supervised by the Rig Manager / Toolpusher who will be the ERT Team Leader. During all drills, the team should train together, developing and rehearsing a set plan for fighting a fire and rescue operations anywhere on the rig site. They should be thoroughly trained in the use of all firefighting equipment and the Self Contained Breathing Apparatus (SCBA) units. The training will include Rescue and First Aid techniques and handling and transportation of injured personnel, using stretchers and any other available firefighting equipment. Additional requirements may be necessary as designated by the Rig Manager. Each crew / shift should have a designated ERT.
4.8 Well Control Drills
One of the major factors that influence the wellbore pressures after a kick is taken is the volume of the influx. The smaller the influx, the less severe will be the pressures during the well kill operation. In this respect, it is important that the drill crew react quickly to any sign that an influx may have occurred and promptly execute the prescribed control procedure.

Drills should be designed to reduce the time that the crew takes to implement these procedures. The relevant drills should be carried out as often as necessary, and as hole conditions permit, until the Rig Manager is satisfied that every member of the drill crew is familiar with the entire operation. The drills need to be conducted as per the Frequency of Drills H2S at a minimum.

Every effort must be made to ensure that the drill is carried out in the most realistic manner possible. All Well Control Drills shall be recorded on the IADC tour sheet including the time taken to fill sheet in.

4.9 Pit Drills
The purpose of this drill is to familiarize the crew with control procedure that will be utilized in the event that a kick is detected when drilling. Pit drills are designed to train the driller to be constantly aware of the fluid level in the mud pits and the return mud flow. This training is expected to prepare the driller to detect a kick at the first surface indication and with a minimum of reservoir fluid influx.

4.10 Pit Drill Outline
While drilling on bottom, without prior notice to the crew but with complete knowledge of the Operator’s representative, the Rig Manager / Toolpusher shall gradually raise the pit level by manually raising the mud pit level float. The goal is to have the Driller, Drill Crew and Mud Loggers to recognize a 10 bbl. pit gain or less within 1 minute and shut in the well within an additional 1 minute by performing the following:

- Detect the kick and sound the alarm.
- Record the time to detect the pit level gain (goal is 1 minute or less).
- Pick up the Kelly or top drive until the tool joint clears the rotary table and is not in the BOP.
- Shut down the mud pump(s) and check for flow. (Since this is a drill it will be assumed that the well is flowing).
- Shut in the well by closing the annular preventer unless instructed by the Operator to use the pipe rams.
- Open the HCR valve. Choke in closed position assuming a hard shut-in.
- Record the time to completely shut in the well.
- Notify the Operator representative, Rig Manager/Toolpusher that the well is shut in.
- Report the pit gain and time to the Rig Manager or Toolpusher.
- Assess and review the proficiency of the drill with the crew members. Log the drill and reaction time on the Daily Drilling Report/IADC Report and the Emergency Training Drill Report (F1031).

4.11 Trip Drills
The purpose of this drill is to reduce the time required for the Driller to detect and react to an influx while making a trip.
4.12 Trip Drill Outline

While tripping and after the drill string has been pulled into the casing, without prior notice to the crew but with complete knowledge of the Operator’s representative, the apparent trip tank level is to be gradually decreased/increased by manually raising/lowering the mud pit level float or verbally notifying the Driller from the trip tank or the mud logging unit that an increase/decrease in the trip tank level has occurred. The goal is to have the Driller, Drill Crew and Mud Loggers to recognize a 10 bbl. pit gain/loss or less within 1 minute and shut in the well within an additional 1 minute by performing the following:

- Detect the kick and sound the alarm.
- Record the time to detect the pit level gain/loss (goal is 1 minute or less).
- Pick up tool joint to above rotary table, make sure the tool joint is not across the BOPs then set slips.
- Shut down the trip tank pump and check for flow back into the trip tank.
- Make up the full open safety valve (‘stabbing valve’) on the drill pipe. Close the valve.
- Check the well for flow. (Since this is a drill it will be assumed that the well is flowing).
- Shut in the well by closing the annular preventer unless instructed by the Operator to use the pipe rams.
- Open the HCR valve. (Choke will be in the closed position assuming we are doing a hard shut-in.)
- Record the time to completely shut in the well.
- Notify the Operator representative, Rig Manager/Toolpusher that the well is shut in.
- Report the pit gain/loss and time to the Rig Manager or Toolpusher.
- Assess and review the proficiency of the drill with the crew members. Log the drill and reaction time on the Daily Drilling Report/IADC Report and the Emergency Training Drill Report (VIKING 01-01-102 F001).
- Flush the drilling mud from the HCR valve before returning to tripping operations using inhibited drill water with a corrosion inhibitor.

**NOTE:** Time is critical in these drills therefore the time required to secure the well must be noted. The equipment and crews must function perfectly at this time to avoid a possible well control incident.

4.13 Muster Drills

All Rigs must hold muster drills to familiarize the crew members with the various alarm signals, the location of muster stations. Headcount is to be taken as a part of this drill and emphasis to be laid on the importance of signing in and out of the visitor log. This drill should be conducted as frequently as possible to get personnel familiar in selection of muster points and their responsibilities in the event of an emergency. Once the Rig manager is satisfied with the response to muster drills, this drill shall be conducted less frequently and combined with other drills. **It is mandatory to conduct a Muster Drill within 2 days of R/U on new location.**

All personnel must respond to the alarm signals by proceeding to their muster station appropriately dressed. They must report to the muster station and obey instructions.

Personnel excused from attending muster drills must have written permission from the Rig Manager. Exemptions from muster drills must be kept to a minimum i.e. it might be necessary for the Driller to remain at the rig floor due to the well status/conditions etc.
4.14 First Aid and Rescue Drills
First Aid and rescue exercises will be held monthly, at both, rigs and base camp facilities, to simulate the recovery of and first aid treatment given to injured personnel from various areas of the rig or camp.

The drills should include the use of various lifesaving equipment such as ambulance, first aid equipment, stretcher, etc.; this will be conducted in a realistic manner. A man down scenario at various locations on the rigs and the correct transportation and use of stretcher will be practiced by the ERT. This drill can be combined with Firefighting or H₂S drills. The Rig Manager, Safety Rep and the rig medic will exercise a leadership role as part of the drill. Before concluding the drill the Rig Manager and the rig medic are responsible for clearly indicating what additional actions would be taken in the event of a real incident.

4.15 Confined Space Rescue Drills
To ensure adequate competencies and adequate response times, drills will be conducted as per Frequency of Drills requirements and using the type of rescue equipment required for confined space entry. These drills will only be conducted after a risk assessment has been conducted to ensure that rescue drills are conducted safely & efficiently.

All personnel involved in confined space entry operation shall be trained as rescuers and shall be competent in the use of personal protective equipment and the type of rescue equipment required in removing personnel from a confined space. Personnel must have basic first aid and cardiopulmonary resuscitation (CPR) training.

The minimum equipment required in confined space entry rescue will consist of:

- A safety harness and life-line of sufficient length, correctly attached to each rescue team member required to enter the confined space.
- Each rescue team member entering a confined space shall wear an approved self-contained breathing apparatus (SCBA) or supplied air breathing apparatus (SABA).
- If the rig has a confined space rescue tripod assembly, then personnel will be trained in its use.
- An approved atmospheric testing device, with a valid calibration certificate, for testing hazardous toxic/flammable and oxygen content in the confined area.
- Entry Attendant who will be in constant contact with the confined space team. This person will have the necessary means to note & monitor each individual who is in the confined space & the status of his SCBA
- The Rig Manager, Safety Rep and Rig Medic will participate in all confined space rescue drills and will ensure that this exercise/drill is conducted safely & efficiently.

Equipment used during confined space entry rescue drills will be checked, repaired, if required, or replaced immediately after the drill & must be in a fully operational condition, before being returned to the rescue team equipment locker. All faults or defects discovered during the drills shall be reported immediately to the Rig Manager. For further information refer to VIKING 01-01-03 Permit to Work Manual; Confined Space Entry.

4.16 H₂S (Gas) Drills
H₂S (Hydrogen Sulfide) gas drills will be held as a minimum, once per month as required by the Frequency of Drills Schedule, per crew or more frequently if drilling wells containing any potential concentration of H₂S. All personnel working in H₂S areas will, as a minimum, are trained on the basics of H₂S and the use of SCBA (Self Contained Breathing Apparatus) and SABA (Supplied Air Breathing Apparatus) use. . All H₂S drills will be supervised by the Rig Manager and Safety Rep. A H₂S drill shall include:
• Sounding the alarm.
• Simulating a man down scenario
• ERT to prepare for duties
• Checking, donning and returning an SCBA or SABA. Checking all personnel rescue equipment.
• The use and testing of approved atmospheric gas detection equipment for H₂S gas.
• The necessary checks and safe guards required prior to entering an area suspected of containing H₂S.
• A mock search and rescue exercise. Moving or mustering personnel to a safe area on the rig.
• Checking the plan and necessary arrangements for subsequent abandoning of the rig.
• The Rig Medic shall participate in all H₂S (gas) drills.

All equipment used during the H₂S drills will be checked, repaired and returned to the designated location in a fully operational condition. All faults or defects discovered during the drills must be reported immediately to the Rig Manager. Training in the use and care of breathing apparatus must be conducted frequently to ensure all crew members are familiar with the care and use of this equipment. As a minimum, one different item of emergency equipment should be reviewed during each H₂S drill.

4.17 Simulated Fire Fighting Drills
Fire drills will be conducted & all crew members are required to attend these drills on a monthly basis, in accordance with the Frequency of Drill schedule, Fire drills are to be recorded on the IADC Daily Drilling report and the Emergency Training Drill Report, VIKING 01-01-102 F001.

Training in the use & care of the firefighting equipment, available on site should be conducted during the fire drill. As a minimum, one different item of firefighting equipment should be reviewed during each fire drill.

Fire drills should be planned in such a way that other drills/training exercises can also take place to cover the various types of emergencies that may occur.

Each fire drill shall include:

• Sounding of the alarm or by shouting “Fire, Fire” and others to repeat.
• Reporting to muster stations
• Headcount
• ERT to suit-up for firefighting and rescue duties.
• Starting the fire pump & demonstrate that the system is functioning correctly.
• Checking the fireman’s outfit and the rescue equipment.
• Checking the communications & alarm systems
• Checking the arrangements for subsequent actions for abandoning the rig.

The equipment used during the drills will be checked, repaired if required, lubricated or protected and returned to its designated location. All defects will be reported to the Rig Manager and will be remedied immediately or the defective tools or missing equipment replaced as soon as possible.
Emergency Training Drills

4.18 Spill Drills

Spill drills are to be held each month on the last Saturday to ensure that crew members are aware of their role in response to all types of environmental spills. These drills will ensure that equipment used to clean-up a spill is in good working order and that there are sufficient supplies of materials to contain or collect the spill. Crew members should be trained and become familiar with the contents & use of the materials in an Emergency Spills Containment kit. These spills kits must be placed and be available for immediate use in designated areas around the rig.

Spill prevention briefings are held by the Rig Manager during rig-up operations and when the drilling unit is operating. These briefings and/or meetings are held in conjunction with the safety meetings. In these meetings, employees are instructed on how to maintain containment ditches, sumps, levees, etc. and to ensure that these containment ditches and sumps are free of obstruction. All spill drills will be recorded on the Emergency Training Drill Report form VIKING 01-01-102- F001 and should be recorded on the IADC Daily Drilling Report.
1.0 PURPOSE

The purpose of this standard is to ensure that all Viking operations retain a safe, healthful and efficient work environment through the control of the physical plant and equipment against established technical standards, codes, and specifications.

Viking Planned Equipment and Facility Controls, integrated with Viking standard 01-106 Preventive and Corrective Action Report (PCAR) is a management tool to detect deficiencies and to put in place a follow up system, to ensure that corrective actions are promptly taken to bring plant and equipment back to Viking standards.

2.0 SCOPE

This standard applies to all Viking operations including contractors. The requirements of this procedure are to be observed by all personnel involved in either the administration of the program or the execution of the individual planned controls.

3.0 DEFINITION

Planned Equipment and Facilities Controls (or Planned Inspections) are the systematic examination of worksite facilities, tools and equipment against Viking standards, summarized in a controlled checklist. The timing of Planned Equipment and Facilities Control Lists and the responsible person is detailed in section 5.0 PLANNED EQUIPMENT AND FACILITY CONTROL SCHEDULE of this document.

4.0 GENERAL

Planned Equipment and Facility Controls shall be scheduled in accordance with the detailed in the table below. Control must be undertaken by operating personnel in the Department who are competent to identify substandard conditions, the relevant hazards and risks. Finding shall be reported to the Person in Charge (PIC) of the facility and equipment. The Person in Charge (PIC) will complete the inspection assessment by including the finding on her/his area of responsibility in the Preventive and Corrective Action Register PCAR. It is imperative that all equipment and major parts of the facility are included in the Control Lists.

5.0 FREQUENCY OF CONTROL AND RESPONSIBILITIES

5.1 HSE Equipment and Facilities

<table>
<thead>
<tr>
<th>Weekly Controls</th>
<th>Inspection Form</th>
<th>Control Type</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIKING Form 01-01-103 F1019</td>
<td>Weekly Camp Hygiene Control</td>
<td>PIC / HSE / Medic</td>
<td></td>
</tr>
<tr>
<td>VIKING Form 01-01-103 F1015</td>
<td>Weekly First Aid Kit Control</td>
<td>PIC / HSE Rep.</td>
<td></td>
</tr>
<tr>
<td>VIKING Form 01-01-103 F1012</td>
<td>Weekly PPE (Personal Protective Equipment) Box Control</td>
<td>PIC / HSE Rep.</td>
<td></td>
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<tr>
<td>VIKING Form 01-01-103 F1017</td>
<td>Weekly Light Vehicle Checklist</td>
<td>Assign Driver</td>
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</table>
### Monthly Controls

<table>
<thead>
<tr>
<th>Inspection Form</th>
<th>Control Type</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIKING Form 01-01-103 F1002</td>
<td>Monthly Harness Control</td>
<td>PIC / HSE Rep</td>
</tr>
<tr>
<td>VIKING Form 01-01-103 F1029</td>
<td>Monthly SCBA Control</td>
<td>HSE Rep.</td>
</tr>
<tr>
<td>VIKING Form 01-01-103 F1030</td>
<td>Monthly Fire Extinguisher Control</td>
<td>HSE Rep.</td>
</tr>
<tr>
<td>VIKING Form 01-01-103 F1011</td>
<td>Monthly Spill Kit Control</td>
<td>HSE Rep.</td>
</tr>
<tr>
<td>VIKING Form 01-01-103 F1012</td>
<td>Monthly Fire Fighting Cabinet Control</td>
<td>HSE Rep.</td>
</tr>
<tr>
<td>VIKING Form 01-01-103 F1003</td>
<td>Monthly Fall Arrestors Inspection</td>
<td>HSE Rep.</td>
</tr>
<tr>
<td>VIKING Form 01-01-103 F1016</td>
<td>Monthly Smoke Detector Control</td>
<td>Electrician / HSE Rep</td>
</tr>
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</table>

### 5.2 Lifting Equipment and Accessories

#### Pre-starts Controls

<table>
<thead>
<tr>
<th>Control Forms</th>
<th>Control Type</th>
<th>Responsible</th>
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<tbody>
<tr>
<td>VIKING Form 01-01-109 F1038</td>
<td>Fork-lift Pre-start checklist</td>
<td>Forklift Operator</td>
</tr>
<tr>
<td>VIKING Form 01-01-110 F1039</td>
<td>Crane pre-start checklist</td>
<td>Crane Operator</td>
</tr>
</tbody>
</table>

#### Regular/routinely Controls

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Control Type</th>
<th>Responsible</th>
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</thead>
<tbody>
<tr>
<td>VIKING 01-01-115</td>
<td>Lifting Equipment</td>
<td>Job Supervisor</td>
</tr>
<tr>
<td>VIKING 01-01-109</td>
<td>Fork Lift Operation and Control</td>
<td>Forklift Operator</td>
</tr>
<tr>
<td>VIKING 01-01-106</td>
<td>Crane Operation</td>
<td>Crane Operator</td>
</tr>
</tbody>
</table>
5.3 Operation Units

5.3-a Drilling & Workover

All Drilling, Workover and Pulling Rigs, will follow Viking Procedure VIKING 02-01-401 Planned Drilling Equipment Control.

<table>
<thead>
<tr>
<th>Control Forms</th>
<th>Inspection Type</th>
<th>Responsible</th>
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<tbody>
<tr>
<td>VIKING Form 01-01-103 F1024</td>
<td>Weekly Mast Inspection</td>
<td>Derrickman</td>
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<tr>
<td>VIKING Form 01-01-103 F1025</td>
<td>Weekly Driller's Inspection</td>
<td>Driller</td>
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</table>

<table>
<thead>
<tr>
<th>Control Form</th>
<th>Inspection Type</th>
<th>Responsible</th>
</tr>
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<tbody>
<tr>
<td>VIKING Form 02-01-103 F1001</td>
<td>Monthly Rig Inspection</td>
<td>Rig Manager</td>
</tr>
</tbody>
</table>

5.3-b Underbalance Operations
(To be developed)

5.3-c Directional Drilling Operations
(To be developed)

5.3-d Drilling Fluids Operations
(To be developed)

5.3-e Mud Logging Services
(To be developed)

5.3-f Wireline Operations
(To be developed)

5.3-g Coil Tubing Operation
(To be developed)

5.3-h Well Testing Operation
(To be developed)

5.3-i Geophysical Services
(To be developed)
5.3-i Heavy Equipment Operation  
(To be developed)

5.3-k Cementing Operation  
(To be developed)

5.3-l Frac-Acidizing Operation  
(To be developed)

5.3-m Tool Rental Operation  
(To be developed)

5.3-n Warehouse and Yards  
VIKING Form 01-01-103 F1004 Monthly Yard and Warehouse Inspection

5.4 Management Inspections

In order to capture management comment and to formalize the management visit to Viking Facilities, VIKING SMART included the procedure VIKING 01-01-105 Management Inspections

<table>
<thead>
<tr>
<th>Management Inspections</th>
<th>Control Form</th>
<th>Inspection Type</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIKING Form 01-01-105 F1000</td>
<td>Management Inspection Card</td>
<td>Directors / Managers / Superintendents</td>
<td></td>
</tr>
</tbody>
</table>

6.0 REFERENCES

VIKING Form 01-01-103 F1019 Weekly Camp Hygiene Control  
VIKING Form 01-01-103 F1015 Weekly First Aid Kit Control  
VIKING Form 01-01-103 F1010 Weekly PPE (Personal Protective Equipment) Box Control  
VIKING Form 01-01-103 F1017 Weekly Light Vehicle Checklist  
VIKING Form 01-01-103 F1002 Monthly Harness Control  
VIKING Form 01-01-103 F1029 Monthly SCBA Control  
VIKING Form 01-01-103 F1030 Monthly Fire Extinguisher Control  
VIKING Form 01-01-103 F1011 Monthly Spill Kit Control  
VIKING Form 01-01-103 F1012 Monthly Fire Fighting Cabinet Control  
VIKING Form 01-01-103 F1013 Monthly Fall Arrestors Control  
VIKING Form 01-01-103 F1016 Monthly Smoke Detector Control  
VIKING Form 01-01-109 F1038 Fork-lift Pre-start checklist  
VIKING Form 01-01-110 F1039 Crane pre-start checklist  
VIKING Form 02-01-103 F1024 Weekly Mast Inspection
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<tr>
<th>Form Number</th>
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<tbody>
<tr>
<td>01-01-103 F1025</td>
<td>Weekly Driller’s Inspection</td>
</tr>
<tr>
<td>01-01-103 F1001</td>
<td>Monthly Rig Inspection</td>
</tr>
<tr>
<td>01-01-105 F1000</td>
<td>Management Inspection Card</td>
</tr>
<tr>
<td>01-01-103 F1004</td>
<td>Monthly Yard and Warehouse Inspection</td>
</tr>
<tr>
<td>01-01-104</td>
<td>Lifting Equipment and Accessories Operation and Control</td>
</tr>
<tr>
<td>01-01-105</td>
<td>Fork Lift Operation and Control</td>
</tr>
<tr>
<td>01-01-106</td>
<td>Crane Operation and Control</td>
</tr>
</tbody>
</table>
7.0 PROCESS MAP

Step #1
Identify Required Controls
- Facility PIC/Manager

Step #2
Perform Control and Complete Inspection Checklist
- Responsible Person

Step #3
Implement Corrective Actions immediately
- Facility PIC/Manager
- Area Supervisor

Step #4
Can Corrective action be implemented straightaway?
- Facility PIC/Manager

Yes
- Enter Corrective Actions that cannot be implemented straightaway into the Rig/Unit PCAR
- Facility PIC/Manager

Step #5
Notify Management
- Facility PIC/Manager

Step #6
Implement PCAR Actions
- Facility PIC/Manager
- Area Supervisor

Step #7
Notify Crew
- Facility PIC/Manager

Step #8
Review Implementation Plan Progress and Update PCAR
- Facility PIC/Manager
- Department Director

End
## 8.0 PROCESS DESCRIPTION

<table>
<thead>
<tr>
<th>Step #</th>
<th>Process Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1      | Identify Required Controls                                    | **Facility PIC/Manager:**  
Identify and ensure that appropriate Controls are performed as required in section 5.0 “Frequency of Control and Responsibilities”. |
| 2      | Perform Control and Complete Inspection Checklist              | **Facility PIC/Manager:**  
- Get all Control Checklist completed on time and by the responsible person assigned on each particular procedure or checklist.  
- Delegate Control checklist items to competent rig personnel as desired (example: drill floor to Driller/Toolpusher, mechanic or electrical to Maintenance, etc.)  
- Items requiring corrective action will be clearly noted on each checklist. |
| 3      | Can Corrective Action be implemented straightaway?             | **Facility PIC/Manager:**  
Evaluate if the Corrective Action can be implemented straightaway.  
If Yes: Corrective actions noted on the checklist that can be fixed immediately will be delegated to the proper supervisor or crew member. Review standard job preparations and controls if applicable. Go to Step # 7 “Notify Crew”  
If No: Go to Step # 4 “Enter Corrective Actions that cannot be implemented straightaway into the Rig/Unit PCAR” |
| 4      | Enter Corrective Actions that cannot be implemented straightaway into the Rig/Unit PCAR | **Facility PIC/Manager:**  
Place onto PCAR all items requiring remedial and corrective action.  |
| 5      | Notify Management                                             | **Facility PIC/Manager:**  
Transmit the PCAR to Operations/Rig Manager and QA Manager as indicated in VIKING Standard 01-106 “Preventive and Corrective Action Record” |
| 6      | Implement PCAR Actions                                        | **Facility PIC/Manager:**  
Delegate to the proper supervisor or crew member the action to be performed. Review standard job preparations and controls if applicable. |
Planned Equipment and Facilities Controls

<table>
<thead>
<tr>
<th>Step #</th>
<th>Process Step</th>
<th>Description</th>
</tr>
</thead>
</table>
|        |                                                  | **Facility PIC/Manager:**  
| 7      | Notify Crew                                      | • Notify crew of serious deficiencies or nonconformance.  
|        |                                                  | • Utilize safety meeting, pre-tour meetings, and other opportunities to communicate issues with crew. |
| 8      | Review Implementation Plan Progress and Update PCAR | **Facility PIC/Manager:**  
|        |                                                  | • Coordinate, Monitor, and track closure of corrective actions, as necessary.  
|        |                                                  | **Department Director:**  
|        |                                                  | • Weekly review of the PCAR Update and action Taken.  
|        |                                                  | Review PCAR implementation efficiency during Field visits. |
1.0 PURPOSE
The purpose of this procedure is to ensure accurate monthly reporting of specific HSE activities and information through the use of form Viking 01-01-104 F1028 Monthly HSE Report and their direct Manager’s revision and feedback through the use of from VIKING 01-01-104 F001 Manager Review of Monthly HSE Report.

2.0 SCOPE
2.1 This procedure applies to all Rigs/Units, whether or not under contract, and to all rig support locations (including but not limited to warehouses, yards, and bases).
2.2 Applies to the completion of form Viking 01-01-104 F1028, Monthly HSSE Report (generated by each Rig/Unit).
2.3 Applies to the completion of form VIKING 01-01-104 F001 Manager Review of Monthly HSE Report.

3.0 DEFINITIONS
3.1 Total Recordable Incidents (TRI): The sum of Fatalities, Permanent Total Disabilities, Lost Time Incidents, Restricted Work Cases and Medical Treatment Cases.
3.2 Lost Time Incident (LTI): A work-related incident (injury or illness) to an employee in which a physician or licensed health care professional recommends days away from work due to the incident. 

Note: Time away from work on the day of the incident is not considered in determining Lost Time Incidents (LTI). Time spent traveling, undergoing evaluation, awaiting medical evaluation results, or otherwise seeking medical treatment should not be counted as a Lost Time Incident (LTI) when considering LTI classification.

3.3 Days without TRI: Each Working Day without a Recordable Incident.
3.3 Days without TRI: Each Working Day without a Lost Time Incident.

4.0 GENERAL
4.1 Rig Manager/Person in Charge (PIC)
Is responsible for ensuring that the Monthly HSE Report Form, (VIKING 01-01-104 F1028) from the Rig or Unit under her/his supervision is accurately completed and submitted before the 3rd of the month to the Op. Superintendent/Manager for her/him to complete the Manager Review and provide feedback to the Rig/Unit Manager. (VIKING 01-01-104 F001 Manager Review of Monthly HSE Report)

The Rig Manager/Person in Charge (PIC) shall discuss within his Rig/Unit the feedback sent from the Op. Superintendent/Manager in the VIKING 01-01-104 F001, note any reported non-compliance items or comment, and develop corrective actions to ensure compliance with the relevant standards and procedures of Viking SMART 01-01 HSE Manual. Corrective actions will be included in the Rig/Unit PCAR (Preventive and Corrective Action Register, VIKING 01-106 F001 for proper tracking and follow-up.

The Rig Manager/Person in Charge (PIC) will send the Monthly HSE Report (VIKING 01-01-104 F1028) together with the Management Review of Monthly HSE Report (VIKING 01-01-104 F001) to the QHSE Department before the 5th of the month.
4.2 **QHSE Department**

Is responsible for obtaining the Monthly HSE Report, (VIKING 01-01-104 F1028) and the Management Review of Monthly HSE Report (VIKING 01-01-104 F001) from each Rig/Yard/Unit and verifying that each report is complete and accurate.

4.3 **Operation Superintendent/Manager**

Is responsible to review the Monthly HSE Report for the Rigs/Yards/Units under their responsibility and to provide feedback by completing the Management Review of Monthly HSE Report (VIKING 01-01-104 F001).

Op. Superintendent/Manager will ensure that the Monthly HSE Report, process from the Rigs/Yards/Units under their responsibility is accurately completed, revised, and submitted to the QHSE Department in time.

4.4 **QHSE Representative**

Is responsible for assisting the Rig Manager/Person in Charge (PIC) to complete the Monthly HSE Report, (VIKING 01-01-104 F1028).

---

**5.0 PROCESS MAP**

<table>
<thead>
<tr>
<th>Process Number</th>
<th>Flow Chart</th>
<th>Responsible Parties</th>
</tr>
</thead>
</table>
| STEP #1        | Prepare Monthly HSE Report Form, (VIKING 01-01-104 F1028) | - Rig Manager/Person in Charge (PIC).  
- QHSE Rep. (to assist) |
| STEP #2        | Submit Monthly HSE Report Form, (VIKING 01-01-104 F1028) for review and feedback before 3rd of the month | - Rig Manager/Person in Charge (PIC). |
| STEP #3        | Review Monthly HSE Report and send Forms, (VIKING 01-01-104-F001) Management Review of Monthly HSE Report, and revised VIKING 01-01-104 F1028 Monthly HSE Report) with her/his feedback and comments to Rig Manager / Person in Charge (PIC). | - Operation Superintendent/Manager |
| STEP #4        | Include Observations and Corrective Actions from Operation Superintendent / Manager in the Rig/Unit PCAR (Preventive and Corrective Action Register, VIKING 01-106 F001) | - Rig Manager/Person in Charge (PIC).  
- QHSE Rep. (to assist) |
| STEP #5        | Send the Monthly HSE Report (VIKING 01-01-104 F1028) together with the Management Review of Monthly HSE Report (VIKING 01-01-104 F001) to the QHSE Department before the 5th of the month. | - Rig Manager/Person in Charge (PIC). |
| STEP #6        | Obtain the Monthly HSE Report, (VIKING 01-01-104 F1028) and the Management Review of Monthly HSE Report (VIKING 01-01-104 F001) from each Rig/Yard/Unit | - QHSE Manager/QHSE Supervisor |
6.0 REFERENCES

- Monthly HSE Report Form (VIKING 01-104 F1028)
- Management Review of Monthly HSE Report (VIKING 01-104 F001)
- Control of Quality Records (VIKING 01-118)
- Corrective and Preventive Actions (VIKING 01-105)
- Preventive and Corrective Action Report Database (PCARD) (VIKING 01-106)
- Permit to Work Manual (VIKING 01-103)
- HSE Meeting (VIKING 01-109)
- Planned Equipment and Facility Control (VIKING 01-103)
- Job Safety Analysis (VIKING 01-110)
- Incident Report and Investigation (VIKING 01-107)
- Viking Observation Card Program (VIKING 01-101)
- Emergency Training Drills (VIKING 01-102)
- Waste Management Program (VIKING 01-108)
1.0 PURPOSE

The purpose of this document is to set Viking International guidelines for Personal Protective Equipment (PPE) requirements. Personal Protective clothing and Equipment (PPE) is intended to shield or isolate personnel from chemical, environmental and physical hazards. Engineering controls, such as use of closed systems, ventilation, and proper equipment isolation, should be implemented where possible before PPE is used. These controls may not be feasible in emergency situations. Supervisors are responsible for implementing and enforcing this program.

2.0 OBJECTIVE

PPE is supplied by the Company to provide a level of protection for employees while on duty. It should always be borne in mind that PPE is the last line of defense. PPE is necessary when a hazard cannot be completely eliminated and we need to be able to adequately protect ourselves.

3.0 APPLICATION

This Work Instruction applies to all company field operation and yard facilities.

Wearing correct PPE as required by this procedure or a task specific JSA is a condition of employment at Viking International.

All PPE shall be visually inspected prior to use. It is the responsibility of each individual to check her/his PPE before use and if there is any failure or deficiency she/he will have to inform her/his supervisor to get a new PPE.

PPE must be used and maintained in a sanitary and reliable condition.

4.0 HAZARD ASSESSMENT

A Job Safety Analysis of the workplace must be performed before staring any job, and to determine the proper PPE needed for that particular job. Refer to VIKING 01-01-110 Job Safety Analysis for more details.

5.0 PERSONAL PROTECTIVE EQUIPMENT IN THE OPERATION

5.1 Hard Hat:

It is mandatory for all personnel to wear hard hat when not in crew's quarters or in offices, this applies also to third party personnel.

• When working at height, care must be taken to ensure that the hard hat is on and secured. A short lanyard to attach the hard hat to the worker's clothing, or a chin-strap, is recommended.
• Metal hard hats and bump caps are not allowed (they are banned on all Viking International sites). Neither are hard hats which have been modified or customized.
A set of approved hard hats will be kept on hand at the workplace, in each crew, for visitors.

- Hard hats must be less than two years old.
- Hard hat liners must be changed out annually.
- Stickers should not be affixed to the hardhats. Do not paint or scratch the shell with sharp objects.
- In addition to everyday wear and tear, ultraviolet (UV) radiation can pose a problem for hard hats constructed of plastic materials. Damage caused by UV radiation is easy to spot: the hat will lose its glossy finish and eventually take on a chalky appearance. Further degradation could cause the shell to actually start flaking away. Once the effects of UV radiation are detected, the hard hat shell should be immediately replaced.

5.2 Full Body Safety Harness, Lifelines, Lanyards and Self Retracting Lifeline Devices:
Harnesses, Lifeline, Lanyards and Self Retracting Devices shall be certified type, inspected by the Company Safety Representative or Job Supervisor, on a monthly period and re-certified as per manufacturer instructions. (See Viking SMART Procedure VIKING 01-01-103 Planned Equipment and Facility Control, and Viking SMART Forms VIKING Form 01-01-103 F1002 Monthly Harness Control, and VIKING Form 01-01-103 F1003 Monthly Fall Arrestors Inspection)

Full Body Safety Harness
- A full body safety harness with proper lanyard or fall restrain accessory will be used any time an employee is exposed to a fall at different level. The level difference is not limited to any height and the type of fall restrain will have to be considered for each particular job based on the Job Safety Analysis performed before starting the activity.
- Safety Harness shall be of the type approved by OSHA 29 CFR 1926.502, Fall Protection systems criteria and practices and/or European Union Council Directive dated 24.06.1992, EN 361 EN 358, or local government laws/regulations or standards agencies.
- All approved full body safety harnesses will be kept clean, using fresh water only to prevent corrosion, and inspected regularly for serviceability.
- If a full body safety harness is found to be unsafe, it shall be destroyed and discarded immediately to prevent it from being used in the future.
- Safety Belts are not allowed to be used in Viking Operations.

Lifelines and Lanyards
- Lifelines, and lanyards shall be of the type approved by OSHA 1926.104 and in accordance with OSHA 29 CFR 1926.502, Fall Protection systems criteria and practices and/or European Union Council Directive dated 24.06.1992, EN 361 EN 358, or local government laws/regulations or standards agencies.
- Lifelines and lanyards shall be used only for employee safeguarding. Any lifeline, or lanyard that is actually use or had been used, to hang in-service loading, shall be immediately removed from service and shall not be used again for employee safeguarding.
- It is recommended to use double-leg 100% tie-off lanyards.
- Lifelines and lanyards shall be secured above the point of operation to an anchorage or structural point capable of supporting a minimum dead weight of 5,400 lbs. or 2450 Kg.
- All lifeline and lanyard hardware shall be drop forged or pressed steel, cadmium plated in accordance with type 1, Class B plating specified in Federal Specification QQ-P-416. Surface shall be smooth and free of sharp edges.
- Snap links will be the type of a triple action carabiner.
Self-Retracting Lifeline Devices
- Self-Restraining Lifelines (SRL's), also referred to as Inertia Reels, will be provided in areas where there are not sufficient tie off points for lanyards. Common applications of this device are: BOP stack, stabbing board, in mast or derrick, Cement or Chemicals storage tanks, Mixers and blenders, etc.
- SRL's shall be rated as minimum load capacity of 420 lbs. or 190Kg. so large workers with lots of gear may find this to be a safe solution.
- The internal mechanical working parts shall be protected in a sealed section of the housing to keep dirt and other crud away.
- The standard reserve lifeline retention system keeps several wraps of cable on the drum for added safety.
- It will be fitted with a swiveling self-locking snap hook with impact indicator.
- The rope shall be stainless steel type to provide additional durability and reliable fall protection.

5.3 Safety Glasses, Goggles and Face Shields
The use of this Personal Protective Equipment will be considered while working with flying particles, molten metal, liquid chemical, acids or caustic chemicals, chemical gases or vapors, or potentially injurious light radiation.

It is mandatory for all personnel to wear Safety Glasses when not in crew's quarters or in offices, this applies also to third party personnel.

Eye and face protection equipment that has been previously used should be disinfected before being issued to another employee.

Do not wear contact lenses when safety glasses, goggles or face shield are required.


Safety Glasses
- Approved safety glasses with side shields that meet ANSI Z87.1 / EN 166. 170.171.172 (or equivalent international standard), shall be used at all times while on-site.
- It is mandatory for all personnel to wear safety glasses at all times, no eye protection is required in crew's quarters or in offices, unless indicated in the Job Safety Analysis prepared for the jobs to be carried in those areas. This applies also to third party personnel.
- Prescription safety glasses will be provided by the Company when needed or may be purchased by the employee.

Safety Goggles
- Approved Safety goggles will be used to form a protective seal around the eyes, preventing objects or liquids from entering under or around the goggles if this potential hazard is identified in the Job Safety Analysis for a specific task, especially important when working with or around molten metals that may splash.
- Safetyoggle frames shall be chosen in order to properly fit to the worker's face to form a protective seal around the eyes. Poorly fitted goggles will not offer the necessary protection.
- Safety Goggles shall be used when performing oxy-cutting jobs. Goggles for oxy-cutting jobs shall accomplish with EN 175 welding work equipment or The ANSI Z49.1:2005 Safety in Welding, Cutting, and the protective shade number as per OSHA/EN standard should not be less than 5, with a plate thickness of minimum 1 inch or 25.4 mm.
Face Shield

- Approved Face shields complying with EN 166 or ANSI Z87.1-1989 standard will be used as a secondary protectors complementing safety goggles and safety glasses, intended to protect the entire face against exposure when working with chemicals and when working on piping or systems in which pressure could be trapped and released unexpectedly, such as air systems, hydraulics, the circulating system, well heads, flow lines, etc. if this potential hazard is identified in the Job Safety Analysis for a specific task.
- Face shield shall always be used together with Safety Glasses or Goggles.

5.4 Ear plugs and Muffs

Proper approved ear protection shall be worn by personnel working for prolonged periods in the motor rooms or any other areas where there is a noise level above 85 dB A, (such as during cementing, Frac operations, running in 30" (762 mm) casing operations or others).

High noise areas, as indicated in the Noise Map drawing, shall be marked with warning signs.


The noise reduction level of the ear plug or muffs, will be chosen during the Job Safety Analysis to reduce the noise level that personnel are exposed to a value below 85dBA.

As a reference, ear muffs will be preferred over the plugs in those jobs where personnel are continuously exposed for time periods longer than 30 minutes or where practically applicable. Final decision will be taken by the Crew Supervisor with the assistance of the HSE rep.

5.5 Breathing Apparatus (SCBA's & Respirators):

SCBA's (Self Contained Breathing Apparatus)

- Breathing apparatus will be readily available at all Viking facilities, will be maintained such that they are ready to use and will be kept in a sanitary condition.
- Rig Manager or Toolpusher will ensure that employees know how to operate self-contained breathing apparatus (SCBA) equipment. Training will be included as part of drills and safety meetings.
- All SCBA's will be inspected on a monthly basis and recorded on the VIKING Form 01-01-103 F1029 Monthly SCBA Control.
- Unless protected by an approved breathing apparatus, no employee shall enter any area where:
  a) A deficiency of oxygen may exist.
  b) The atmosphere may be contaminated by the presence of toxic or flammable gases, vapor or dust in sufficient quantities.
- Before operating in known hydrogen sulfide areas, the Job Safety Analysis will indicate the number of respiratory protective equipment needed.


The product Material Safety Data Sheet (MSDS), or OSHA equivalent, shall be consulted for the selection of respirator type.

Each respirator wearer shall be given training which shall include explanation, discussions and demonstrations of:

  a) The respiratory hazard and what happens if the respirator is improperly worn.
b) The reason for selecting a particular type of respirator.
c) The functions, capabilities, and limitations of the selected respirator.
d) The method of donning the respirator and checking its fit and operation.
e) The proper wearing of the respirator.
f) Respirator maintenance.
g) Recognizing and handling emergency situations.

- Respirators cleaning, maintenance, and inspection shall be performed on a regular basis
- Where respiratory protective equipment is or may be required to be worn in areas which are or may be contaminated with substances immediately dangerous to life or health, the Rig/Unit Manager shall ensure that excess head or facial hair shall be removed by employees.

5.6 Protective work clothes (Coveralls - Coats)

The company work clothes standard is comprised of the following major work ensemble categories:

a) Standard Coverall
b) Welder Coverall
c) Coat

It is mandatory for all personnel to wear the company work clothes when not in crew's quarters or in offices.

5.6 a) Standard Coverall

- The Standard Oil field service coverall issued to all Viking personnel is made of fabric gabardine, 255 gr/m2 100% cotton 20/1.
- The fabric gabardine material shall be treated with a special product to make it repellent to oil, water and dirt, and guarantee a minimum of 40 washing cycles.
- Work clothes will include Reflective Stripes for better personnel identification after daylight. (See 5.6.1 Reflective Striping)
- Zippers will be of Metal type (YKK Brand or similar quality), with protective wind flap and snap closure.
- This standard coverall is for hot/tropical weather operations, or summer season.
- In cold weather operations or winter season, the standard coverall will include an internal insulation to keep personnel warm and comfortable.
- Section 5.6.2, Figure 1, indicates standard coverall model and details.
- Section 5.6.3, Figure 2, indicates Viking work clothes fiber color.
- Section 5.6.4, indicates chest patch specifications.
- Section 5.6.5, indicates back patch specifications.
- Section 5.6.6, indicates arm patch specifications.
- Section 5.6.7-a-standard, indicates standard coverall sizes and measurements.
- Section 5.6.7-a-cold weather, indicates cold weather coverall sizes and measurements.

5.6 b) Welder Coverall

- The work clothes issued to Viking welders is standard heavy duty 100% cotton coverall complying with NFPA 2112, EN 340 and ISO 11611:2007 and ANSI Z49.1 standards.
- NO Reflective Stripes in welding work clothes.
- Zippers will be of Metal type (YKK Brand or similar quality), with protective wind flap and snap closure.
- This standard coverall is for hot/tropical weather operations, or summer season.
• In cold weather operations or winter season, the standard coverall will include an internal insulation to keep personnel warm and comfortable.
• Section 5.6.2, Figure 1, indicates standard coverall model and details.
• Section 5.6.3, Figure 2, indicates Viking work clothes fiber color.
• Section 5.6.4, indicates chest patch specifications.
• Section 5.6.5, indicates back patch specifications.
• Section 5.6.6, indicates arm patch specifications.
• Section 5.6.7-a-standard, indicates standard coverall sizes and measurements.
• Section 5.6.7-a-cold weather, indicates cold weather coverall sizes and measurements.

OPTIONAL WELDER WORKING CLOTHES
It is accepted as optional for welders to use standard coverall with a welding jacket on top of it. The welding jacket shall:
  - allow freedom of movement.
  - protect your arms and neck from radiation exposure and skin burns (caused by ultraviolet radiation from the arc).
  - covers all areas of exposed skin.
  - be made of chrome split leather with metal press stud opening.
  - button the cuffs, pockets, and collar.
  - Have a minimum length of 90 cm.

5.6 c) Coat
In addition to previous working clothes, for cold weather operations or winter season, it is included a coat.
• The Standard Oil field service coat issued to all Viking personnel is made of fabric gabardine 255 gr/m2 100% cotton 20/1, with an internal insulation to keep personnel warm and comfortable.
• The fabric gabardine material shall be treated with a special product to make it repellent to oil, water and dirt.
• The Coat will include Reflective Stripes for better personnel identification after daylight. (See 5.6.1 Reflective Striping)
• Zippers will be of Metal type (YKK Brand or similar quality), with protective wind flap and snap closure.
• Section 5.6.2, Figure 3, indicates standard coat model and details.
• Section 5.6.3, Figure 2, indicates Viking work clothes fiber color.
• Section 5.6.4, indicates chest patch specifications.
• Section 5.6.5, indicates back patch specifications.
• Section 5.6.6, indicates arm patch specifications.
• Section 5.6.7-c, indicates coat sizes and measurements.

5.6.1 Reflective Striping:
A 3M Scotch lite™ 8935 or equivalent 1” minimum width silver reflective striping material should be permanently affixed to both the protective clothes and coat ensembles as indicated on Figure 1.
5.6.2 Model and details

5.6.3. Color
Companies major colors are Pantone® Matching System [PMS 1797(Red)] and Pantone® Matching System [PMS Cool Gray 9(Gray)].

Pantone® Matching System [PMS 1797(Red)] is approved protective clothing color. Please see explanation at Figure 2.

Figure 1

5.6.4 Chest Patch Specifications
Size: 4” wide x 1.5” tall
Color: White patch with the Viking International logo stitched to match PMS 1787 and PMS Cool Gray 9
Logo size: The logo measures to 3.31” wide x 1.14” tall

Figure 2
5.6.5 Back Patch Specifications

Size: 9” wide x 3.5” tall
Color: White patch with the Viking International logo stitched to match PMS 1787 and PMS Cool Gray 9
Logo size: The logo measures to 7.40” wide x 2.56” tall

5.6.6 Arm Patch Specifications

Size: 4.51” wide x 1.76” tall
Color: White patch with the Target Zero logo stitched to match PMS 1787 and PMS Cool Gray 9
Logo size: The logo measures to 3.81” wide x 1.33” tall
5.6.7 Sizes

5.6.7-a  standard coverall

A  Recommended height range of wearer
B  Recommended chest girth of wearer
C  Recommended waist girth of wearer
D  Recommended inside leg measurement

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5.6.7-a  cold weather coveralls
### Personal Protective Equipment (PPE)

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## 5.6.7-b Coat

**A** Recommended height range of wearer  
**B** Recommended chest girth of wearer  
**C** Recommended waist girth of wearer

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**Figure 3**

### 5.7 Chemical Aprons
It is mandatory for all personnel to wear Chemical Aprons on top of the standard coverall when handling chemicals or hazardous substances.

Chemical aprons will:

- Work Supervisor will choose the proper apron based on the Job Safety Analysis (Viking SMART 01-01-110 Job Safety Analysis) and follow the recommendations indicated in the Material Safety Data Sheet (MSDS) for the chemical or hazardous substance used. The Data Sheet shall include as a minimum technical chemical information, including chemical and physical properties, health effects, exposure limits, and recommendations for medical monitoring, personal protective equipment (PPE), and control procedures.

5.8 Safety Gloves

It is mandatory for all personnel to wear Safety Gloves if hand or any part of the hand is exposed to a hazard during a specific job.

- As a minimum requirement safety gloves will have to accomplish with standard EN 420: 2003, General requirements for protective gloves or OSHA 3151-12R 2003 Personal Protective Equipment.
- Hazard identification will be covered on Job Safety Analysis (Viking SMART 01-01-110 Job Safety Analysis) for each specific job.
- The job Supervisor and the Rig/Unit Manager will select the safety gloves for the activities performed by her/his Team with the assistance of the QHSE Representative assigned to her/his Rig/Unit.
- When selecting safety gloves, they will ensure that not only adhere to the above Directive and relevant safety standards, but also are demonstrably of good quality and fittest for the intended task.

5.9 Safety Footwear

It is mandatory for all personnel to use safety footwear when out of the accommodation area, crew's quarters or offices. Personnel performing any job within the accommodation area, crew's quarters or offices, that expose her/his foot to any type of hazard shall wear foot protection (i.e. electrician, painters, cleaning personnel, catering crew, etc.).

The hazard and the type of Footwear chosen shall be indicated in the specific task Job Safety Analysis (Viking SMART 01-01-110 Job Safety Analysis).

As minimum requirements safety footwear shall as a minimum:

- have a 200J toecap.

Other characteristics to be considered and specific for each job will include:

a) SB - basic requirements for safety footwear met
b) S1 - basic requirements plus closed and energy absorbing seat region, and antistatic
c) S2 - as S1 plus water penetration and absorption
d) S3 - as S2 plus penetration resistance and cleated sole
   S4 - basic requirements plus energy absorbing seat region, antistatic

e) S5 - as S4 plus penetration resistance and cleated sole

Additional detail characteristics will cover for:
- P - penetration resistance
- C - conductive
- A - antistatic
- I - electrically insulating
- HI - insulating against heat
- CI - insulating against cold
- E - energy absorbing seat region
- M - metatarsal protection
- AN – ankle protection
- HRO - outsole resistant to hot contact
- CR – cut resistant upper
- Slip resistance rating – one of:
  - SRA – on ceramic surface with “soap”
  - SRB – on steel with glycerol
- WR – whole footwear resistant to water penetration / absorption
- WRU – water resistant upper only
- FO – fuel oil resistant
- Markings for chemical permeation resistance level as per EN 13832-2
  - Level 1 – 121 to 240 minutes
  - Level 2 – 241 to 480 minutes
  - Level 3 – 481 to 1440 minutes
  - Level 4 – 1441 to 1920 minutes
  - Level 5 - >1921 minutes

6.0 PPE ISSUE and REPLACEMENT

- PPE will be issued by the Company, free of charge to employees.
- These items are the property of the Company and any willful misuse will result in disciplinary action.
- Any item of PPE will be replaced by the Company free of charge upon surrender of the damaged or worn out PPE.
- All Rigs/Units and yards will maintain a “PPE Distribution Records” register (Viking 01-01-105 F001) to monitor usage. Original document once completed shall be sent to HR Department, and copy kept on the Rig/Unit or Yard.
- Rig/Unit Managers are responsible to ensure the PPE Distribution Record register process is completed.
- Rig/Unit Managers are responsible for maintaining an adequate inventory of PPE on hand to meet the issuing requirements of their operation and to ensure sufficient quantities are on order to maintain inventory levels.

Below is the PPE Replacement Guideline:
7.0 PPE CARE AND MAINTENANCE

It is the responsibility of the user to maintain the PPE supplied by the company. Suitable training on PPE care and maintenance will be covered as a part of the HSSE Rig Pass Training module on PPE. PPE should be inspected prior to use by the employee. PPE will be replaced as per the above table by the company. PPE should be inspected prior to use by the employee.

8.0 TRAINING

Each employee required to use PPE shall be initially trained to know the following:
   a) when PPE is necessary;
   b) what PPE is required;
   c) how to properly put on, remove, adjust, and wear the PPE;
   d) the limitations of the PPE; and
   e) The proper care, maintenance, useful life, and disposal of the selected PPE.

The employee must demonstrate an understanding of the training, and the ability to use PPE properly before being allowed to perform work requiring the use of PPE. Retraining must be performed when: (a) there are changes in the workplace which makes previous training obsolete; or (b) when there are changes in the types of PPE to be used; or (c) there are inadequacies in the employee’s knowledge of or use of the chosen PPE; or (d) the employee’s relocation to a different area.

9.0 REFERENCES

VIKING 01-01-110  Job Safety Analysis

10.0 APPLICABLE FORMS

VIKING 01-01-105-F001 PPE Distribution Records
VIKING 01-01-110-F001 Job Safety Analysis Form
1.0 PURPOSE

The objective of the Viking Observation Card Program is to prevent injuries through the elimination of at-risk behaviors in the workplace. It is built on the belief that all injuries and occupational illnesses can be eliminated when line management and employees take responsibility to ensure a safe work environment.

Viking Observation Card Program prepares all employees, from line supervisors through upper management, to observe, analyze, correct, and prevent unsafe acts and conditions.

Viking’s Observation Card principles are as follows:

- All injuries and occupational illnesses can be prevented.
- Safety is everyone’s responsibility.
- Line management is directly accountable for preventing injuries and occupational injuries.
- Working safely is a condition of employment.
- Training is an essential element for safe workplaces.
- Safety audits must be conducted.
- Safe work practices should be reinforced and all at-risk behaviors and unsafe conditions must be corrected promptly.
- It is essential to investigate injuries and occupational illnesses, as well as incidents with the potential for injury.
- Safety off the job is an important element of the overall safety effort.
- Preventing injuries and occupational illnesses is good business.
- People are the most critical element in the success of a health, safety, and environmental program.

2.0 OBJECTIVE

The Viking Observation Card Program (V.O.C.P.) shall apply to all of Viking’s worldwide operations, projects, employees, and contractors.

3.0 PROCEDURE

All Viking rig based, project based, or support function employees will receive V.O.C.P. training.

Supervisors should ensure that employees transferred to their crew have completed the appropriate VOCP program.

When any Viking Employee and Contractor sees an at-risk behavior or unsafe condition he/she is expected to stop the unsafe act, then use the questioning attitude to coach the employee towards identifying the safest way to do the job now and in the future. Supervisory coaching is a critical responsibility that must be given a high priority at all times.

Completed observation cards will be reviewed by the Person In Charge (PIC) and QHSE Representative, then used as a learning component in all pre- and post-tour meetings. During pre- and post-tour meeting VOCP cards should be shared by the person who wrote the card with an explanation of what they saw and how it was corrected. All VOCP cards should be trended, analyzed, and charted by the rig safety team. The rig/unit safety team should identify trends and develop an action plan to eliminate at-risk behaviors. The rig/unit PCAR report shall be used to track all V.O.C.P. cards which observation could not be closed out immediately. The PIC should review the PCAR report each hitch and provide comments/feedback to the crew on remedial actions to prevent recurrence.
Rigs should maintain adequate supplies of employee and supervisor V.O.C.P materials.

4.0 TRAINING

A refresher course that reviews all the main principles and techniques of V.O.C.P. should be administered six to eight months after the entire facility has completed the initial V.O.C.P. training. Supervisory V.O.C.P leadership training should be conducted every six months to ensure competency in management of the V.O.C.P. program.

Group Discussion (Supervisors Edition Only)

Group discussions form an integral part of the training program.

The group discussions offer the opportunity to review key concepts and techniques of the V.O.C.P Program and consider the benefits of the V.O.C.P process for your specific facility, and to contemplate the challenges in applying the V.O.C.P techniques to the job.

The group discussion sessions also provide the opportunity to share experiences and attitudes about the techniques and to improve the use of the skills presented in the V.O.C.P Program.

The purpose of the discussion sessions is:

- To help every member of supervision become a skilled observer
- To learn ultimately to be effective teachers of those skills

On-the-Job Application (Observation Tours)

Observation Tours are carried out in order for trainees to develop the habit of skillfully observing, correcting, and preventing recurrence of unsafe acts.

During these supervisor lead Observation Tours, the supervisor’s role is to let the trainee do the actual observation and to direct the trainee’s attention to any unsafe acts the he or she may miss.

Employees shall submit completed V.O.C.P cards on a daily basis to their immediate supervisor who in turn will submit them to the PIC. Immediate supervisors must involve crew members in identifying and correcting at-risk behaviors and unsafe conditions. All crew members MUST be involved in the V.O.C.P process and should generate the majority of the V.O.C.P cards generated each hitch.

Supervisors and crew members should make every effort possible to correct the at-risk behavior or unsafe condition as soon as it has been identified to avoid any accident or injury. Items that could not be corrected during the tour should be brought to the attention of the PIC or QHSE Representative. The PIC will add these items to the regular Safety Action Item List (SAIL). Supervisors should check to see that these conditions are being corrected PCAR Registar.

5.0 RESPONSIBILITIES

5.1 HSSE Department

- Implementation of Viking Observation Card (VOC)
- Review and encourage the use of the Viking Observation Card (VOC) program and VOC cards in order to continuously improve safety behavior.
• Lead by example – demonstrate the Viking Observation Card (VOC) program by using it regularly at the worksite.

5.2 Field and Rig Management
• Encourage proactive and positive observations to eliminate unsafe acts.
• Lead by example – demonstrate the Viking Observation Card (VOC) program by using it regularly at the worksite.
• Review all VOC cards for any significant corrective actions or learning opportunities. Learning opportunities should be shared with all crews during safety meetings. All corrective actions that cannot be immediately closed-out should be recorded on the Preventive and Corrective Action Report PCAR Viking Standard 01-106.

5.3 All Employees
• Encourage proactive and positive observations to eliminate unsafe acts
Lead by example – demonstrate the Viking Observation Card (VOC) program by using it regularly during day-to-day tasks.

6.0 VOC AWARDS

6.1 Rig Safety Champion of the Month Award:
• Every week the Rig Manager / Toolpusher and Safety Officer will select the best card from all the VOC cards turned in by the crew for that week. The Rig Manager/PIC will select one best card per rig and the card winner will receive the ‘Rig Safety Champion of the Month’ award.

6.2 Viking Safety Champion of the Month’ Award:
• Every month 1 outstanding VOC card will be selected by the QHSE Department among the ‘Rig Safety Champion of the Month’ winners. The winner will receive the ‘Viking Safety Champion of the Month’ award and a letter signed by the President of the Company.
• The winners will be announced and wherever possible awards will be presented to the individuals during the Monthly Safety Review Meeting.

7.0 RECORDS

7.1 Completed VOC cards should be kept at the worksite for three months.

7.2 Safety Officer to complete a Monthly VOC Summary Report. A copy needs to be forwarded to the QHSE Department and the original filed at the rig site.

8.0 REFERENCES

Viking Standard 01-106 Preventive and Corrective Action Report-PCAR

9.0 APPLICABLE FORMS

Viking Form 01-106-F001 Preventive and Corrective Action Register
10.0 PROCESS MAP

<table>
<thead>
<tr>
<th>Process Number</th>
<th>Flow Chart</th>
<th>Responsible Parties</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEP# 1</td>
<td>Ensure all employees are VOCP Trained</td>
<td>Regional QA/HSE Manager</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HSE OFFICER</td>
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<tr>
<td></td>
<td></td>
<td>Facility PIC</td>
</tr>
<tr>
<td>STEP# 2</td>
<td>Maintain Supply of VOCP Cards</td>
<td>HSE OFFICER</td>
</tr>
<tr>
<td>STEP# 3</td>
<td>Complete VOCP for Supervisors</td>
<td>Supervisors</td>
</tr>
<tr>
<td>STEP# 4</td>
<td>Complete VOCP for Employees</td>
<td>Non-Supervisory Personnel</td>
</tr>
<tr>
<td>STEP# 5</td>
<td>Provide VOCP Coaching</td>
<td>Supervisors</td>
</tr>
<tr>
<td>STEP# 6</td>
<td>Conduct Observation Tour</td>
<td>Supervisors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Non-Supervisory Personnel</td>
</tr>
<tr>
<td>STEP# 7</td>
<td>Submit Completed VOCP Cards</td>
<td>Non-Supervisory Personnel</td>
</tr>
<tr>
<td>STEP# 8</td>
<td>Review/Submit completed VOCP Cards</td>
<td>Supervisors</td>
</tr>
<tr>
<td>STEP# 9</td>
<td>Add Items to PCAR</td>
<td>Facility PIC</td>
</tr>
<tr>
<td>STEP# 10</td>
<td>Ensure Items are Corrected</td>
<td>Facility PIC</td>
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<tr>
<td>STEP #11</td>
<td>Schedule and Complete Refresher Training</td>
<td>Supervisor</td>
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<tr>
<td></td>
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<td>Non-Supervisory Personnel</td>
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<td></td>
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<td>Facility PIC</td>
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<td></td>
<td></td>
<td>HSE OFFICER</td>
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</table>
11.0 PROCESS DESCRIPTION

<table>
<thead>
<tr>
<th>Step #</th>
<th>Process Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| STEP #1| Ensure All Employees Are Trained on VOCP | Regional QA/HSE Manager, PIC, HSE OFFICER  
• Ensure all non-supervisory personnel complete the VOCP Training.  
• Ensure all supervisory personnel complete the VOCP Training.  
• Ensure new-hires start the VOCP Training within the first two days of their hitch.  
• Ensure supervisors start the VOCP Training within the first two days of their being hired or promoted to a supervisory position. |
| STEP #2| Maintain Supply Of VOCP Cards       | HSE Officer:  
• Maintain an adequate supply of VOCP cards.  
• Order VOCP cards when needed |
| STEP #3| Complete VOCP For Supervisors       | Supervisors:  
• Complete VOCP Training at designated time and place.  
• Complete group discussion sessions at appropriate times during the training. The following are the goals of these sessions:  
  – Share experiences and attitudes about techniques to improve the skills presented in the Training  
  – Help every supervisor become a skilled observer.  
  – Learn ultimately to be an effective teacher of the VOCP skills |
| STEP #4| Complete VOCP For Employee Program  | Non-Supervisory Personnel:  
• Complete VOCP Training at the designated time and place. |
| STEP #5| Provide VOCP Coaching               | Supervisors:  
• Stop unsafe acts when at-risk behaviors are observed.  
• Coach employee using a questioning attitude to identify the safest way to do the job now and in the future.  
• Give high priority to coaching at all times. |
### Viking Observation Card Program

<table>
<thead>
<tr>
<th>Step #</th>
<th>Process Step</th>
<th>Description</th>
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</table>
| STEP# 6 | Conduct Observation Tour Training     | Supervisors and Non-Supervisory Personnel:  
  - Carry out observation tours to develop the habit of skillfully observing, correcting, and preventing recurrence of unsafe acts.  
  - Supervisors lead the observation tour, letting the trainee do the actual observation and directing his or her attention to any unsafe acts they may miss.  
  - Spend approximately two hours after each tour (for a total of 14 hours), with the training spread over a period of 3 months. |
| STEP# 7 | Submit Completed VOCP Cards           | Non-Supervisory Personnel:  
  - Submit completed VOCP cards on a daily basis to immediate supervisor. |
| STEP# 8 | Review /Submit Completed VOCP Cards   | Supervisors:  
  - Review VOCP cards for clarity and completeness  
  - Submit VOCP cards to the Facility PIC. |
| STEP# 9 | Add Items To PCAR                     | Facility PIC or HSE OFFICER:  
  - Add items that could not be immediately corrected to the Preventive and Corrective Actions Register (PCAR) |
| STEP# 10| Ensure Items Are Corrected            | Supervisors:  
  - Check to see that unsafe conditions are being corrected. |
12.0 APPENDICES

Viking Observation Card Sample

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**Safe, Stop Work or At Risk Comments:**

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**Near Miss Report:**

- Personal Injury
- Property Damage/Loss
- Vehicle Accident
- Spill or Release

**Description of Incident:**

---

**Supervisor Review:**

---

**Near Miss Clarification:**

---

**Risk Assessment:**

- Low Risk
- Medium Risk
- High Risk

---

**Viking Observation Card Sample**

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**Viking Observation/Near Miss SWA Card**

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1. **Personal Protective Equipment**
   - Head
   - Eyes
   - Ears
   - Mouth
   - Hands
   - Feet
   - Other

2. **Slips, Trips & Falls**
   - Housekeeping
   - Floor
   - Proper Access
   - Weather
   - Equipment
   - Other

3. **Material Handling**
   - Manual Lifting
   - Mechanical Handling
   - Other

4. **Tools**
   - Proper Tool
   - Proper Condition
   - Proper Use
   - Other

5. **Procedures**
   - Welding
   - Grinding/Shaping
   - Layout/Cutting
   - Other
1.0 PURPOSE

The purpose of this standard is to ensure that all near-miss incidents, injuries/illnesses, and property and environmental damages are reported and investigated to an appropriate level of detail so that risk can be identified, effective corrective actions implemented, and lessons learned promulgated across the organization.

This procedure details incident reporting timelines, incident investigation levels, and all relevant forms. Incident data is collected, systematically analyzed to identify trends in order to prevent repeated loss exposure, and communicated to promote the improvement of safety performance.

2.0 APPLICATION

The standard applies to all Viking International installations and sites. The reporting and investigation processes are divided into the following separate process maps and descriptions:

- Near-Miss Reporting and Investigation.
- Injury/Illness Reporting and Investigation.
- Property and Environmental Loss Reporting and Investigation.

3.0 OVERVIEW

ALL INCIDENTS SHALL BE REPORTED. However, the form, timing and level of the reporting of an incident varies with the actual and potential consequences. The International Association of Drilling Contractors (IADC) “INCIDENT STATISTICS PROGRAM - Official Rules and Guidelines” shall be followed when classifying incidents.

3.1 Definitions

Following are the definitions of key words and terms used in Viking International.

**Incident**: any event, which is not part of the standard operation of a service (a substandard condition) and which causes or may cause an interruption to, or a reduction in, the quality of that service.

**Accident**: an unplanned, uncontrolled incident which has led to or could have led to injury to people, damage to machinery or the environment and/or some other loss

**Work-Related**: an incident or accident case is work-related anytime an event or exposure in the work environment is the discernible cause or contributes to an injury or illness or significantly aggravates a pre-existing injury or illness.

The work environment includes the establishment and other locations where one or more employees are working or are present as a condition of their employment.

For the purposes of this Management System, and in-line with recognized international and local regulations, the following types of incidents are NOT considered to be work-related:

- Off-duty injuries occurring in crew accommodations, camp, galley, or away from the work site.
- Symptoms arising on premises totally due to outside factors such as injuries, illnesses, or fatalities due to a natural disaster (hurricane, earthquake) that is otherwise not related to Viking operations.
- The injury or illness involves signs or symptoms that surface at work but result from a non-work related event or exposure that occurs outside the work environment.
- Member of the general public, visitors, regulatory agents, employee(s) off duty waiting
Incident Report and Investigation

for transportation to or from the work location.

- An injury or illness that results solely from voluntary participation in a wellness program or in a medical, fitness, or recreational activity such as blood donation, physical examination, flu shot, exercise class, racquetball, or other sports activity.

- The injury of illness is the result of the employee eating, drinking, or preparing food or drink for personal consumption. Note: An injury to a person assigned by the company to prepare food for company personnel is work-related.

- The injury or illness is the result of an employee doing personal tasks, (unrelated to their employment) at the establishment.

- The injury or illness is the result of personal grooming, self-medication for a non-work related condition, or is intentionally self-inflicted. The injury or illness is caused by a motor vehicle accident while the injured is commuting to or from work even if the accident occurs on company property. Note: An injury to an individual that is caused by a motor vehicle accident while the individual is performing his duties associated with work would be recordable.

- Cold or flu.

Recordable Incident (Injury or Illness): Regardless of where signs or symptoms surface, a case is recordable only if a work event or exposure is a discernible cause of the injury or illness or of a significant aggravation to a pre-existing condition.

An injury or illness that is work-related and results in one of the following:

- Fatality (FTL)
- Lost time from work (LTI) Days away from work (DAFWC)
- Restricted work activity (RWC)
- Medical treatment other than first aid (MTO)

Injuries or illnesses should not be evaluated on the time spent seeking medical treatment or undergoing evaluation.

If an examination reveals that no medical treatment is required, and / or the case is not diagnosed as significant by the treating physician or licensed health care professional, the case is not recordable.

A person who sustains a work-related injury or illness requiring treatment that meets recordable incident criteria, and is terminated for drug use based on a post-incident drug test, the incident is recordable.

Illness: A work related illness that is determined by a physician or licensed health care professional to have resulted from exposure to factors related to the employee’s occupation and meets general recording criteria. For example: Hydrogen sulfide poisoning, welder exposure to fumes created from heating galvanized material, exposure to workplace chemicals, heat stress, heat exhaustion, heat stroke, sun stroke, frostbite, etc.

Significant Incident: A significant diagnosed work-related injury or illness that is recordable under the general criteria even it does not result in death, days away from work, restricted work or job transfer, or medical treatment beyond first aid.

The following incidents would be recordable, even if no medical treatment was given: Note: For record keeping purposes, these incidents are to be classified as “Medical Treatment” unless they result in death, days away from work or days of restricted work or job transfer.

- Work Related Cancer.
- Work Related chronic irreversible disease.
- Positive x-ray diagnosis of fractures cracked or broken bones, etc. regardless of type of treatment
The following incidents would be recordable, but the type of Recordable Incident will depend on the severity of the injury or illness:

- Any work related injury or illness requiring medical care or treatment beyond First Aid (regardless of the provider of such treatment).
- Any first, second, or third degree burn that results in one or more outcomes such as medical treatment, work restrictions, or days away from work.
- Removal of foreign bodies embedded in the body, including the eyes.
- Admission to hospital or equivalent medical facility for treatment.
- Needle sticks and ‘sharps injuries’ – Record all needle stick and injuries that result from sharps potentially contaminated with another person’s blood or other potentially infectious material.
- Use of sutures or surgical glue.
- Massage treatment given by a Physical Therapist or Chiropractor.
- Intravenous administration of fluids to treat work-related stress.
- Administration of one dose of prescription medication for treatment of the injury or illness.
- Use of non-prescription medication (over the counter medication) at prescription strength for treatment of the injury or illness.

Employee: Employee is any person engaged in activities for the benefit of Viking International and who receives payment, even on a temporary basis, from Viking International.

Employment: Employment means all work or activity performed in carrying out an assignment or request of Viking International including related activities not specifically covered by the assignment or request. Employment also includes activities, even outside working hours, where Viking International has the Prevailing Influence.

IADC: International Association of Drilling Contractors.

(PPD) Permanent Partial Disability: Permanent Partial Disability is any Work Injury which results in the complete loss, or permanent loss of use, of any member or part of the body or any permanent impairment of functions of parts of the body, regardless of any pre-existing disability of the injured member of impaired body function.

(PTD) Permanent Total Disability: Permanent Total Disability is any Work Injury which permanently incapacitates an employee.

Prevailing Influence: Influence would be considered prevailing where persons are required to adhere to safety rules, regulations or conditions laid down by Viking International or to use methods, processes or other techniques provided by Viking International.

Exposure Hours (Man Hours): Exposure Hours represent the total number of hours of Employment including overtime and training but excluding leave, sickness and other absences (See IADC ASP Program Guides for further references). Exposure to hazard of industrial injuries should be measured by the total number of Employment Hours of:

- All Employees of Viking International.
- All Employees of Contractors engaged in work for Viking International.
Exposure Hours should be calculated from time sheets or other records. When this is not possible they may be estimated by multiplying the total number of days worked for the period by the number of worked or exposed per day.

**(DAFW) Days Away From Work:** The number of Days Away From Work is the total number of calendar days (consecutive or not) on which the injured person was temporarily unable to work as a result of a work-related injury or illness, regardless of whether or not the employee was scheduled to work on those days.

Days Away From Work are counted from the day after the incident, injury, or illness began until the employee is able to return to restricted duty or normal duty. Weekend days, holidays, vacation days and days off rotation are included in the total number of days recorded if the employee would not have been able to work on those days because of a work-related injury or illness.

For statistical purposes, 180 days is the maximum number of Days Away From Work that should be recorded for any incident.

**Restricted Workdays:** The number of Restricted Workdays is the total number of calendar days on which the injured person is temporarily unable to perform one of more of the routine functions of his or her job, or work the full workday that he or she would otherwise have been scheduled to work as a result of a work-related injury or illness, regardless of whether or not the employee was scheduled to work on those days.

Restricted Workdays are counted from the day after the incident, injury, or illness began until the employee is able to return to normal duty. Weekend days, holidays, vacation days and days off rotation are included in the total number of days recorded if the employee would not have been able to perform their normal duties on those days because of a work-related injury or illness. The maximum number of Restricted Workdays that should be recorded for any incident is 180 days.

When Restricted Work is provided following a period of Days Away From Work as a result of a Lost Time Incident, the Restricted Workdays are to be recorded in addition to the number of Days Away From Work; however, the injury is to be recorded as a Lost Time Incident only.

**(EQPD) Equipment / Property Damage:** Denotes work related equipment and property damage.

**(MVA) Motor Vehicle Accident:** Denotes work related motor vehicle accident.

**Road Traffic Incident:** An Incident which has involved a vehicle and which has resulted in actual Injury, Illness and/or Damage (Loss) to Assets, the Environment or Third Parties regardless of the cost involved or responsibility for cause.

**Third Parties:** Third Parties are persons or organizations which are not employed by or contracted to Viking International (such as service companies hired by the Operator).

**Environmental Incident:** Is one that has caused, or has the potential for causing, one or more of the following:

- Adverse impact on the quality of air, land or water, wildlife, aquatic species or species at risk.
- Exceedance of permit or external reporting requirement.
- Notification of external agencies due to emergency/beyond normal circumstances.
- Adverse publicity with respect to environment.
- Legal or regulatory action with respect to violation of statutes or environmental damage.
- Alteration of, or damage to, heritage or archaeological resources.

Criteria for what constitutes a severe Environmental Incident can be viewed at section 4.2.

Examples of Environmental Incidents include, but are not limited to:

- Spills of oil, fuel, or chemicals.
- Visible damage to equipment where the public may believe there is an environmental effect.
3.2 Incident Categories

3.2.1 Viking International Category 1 Incidents (NM – FRO – IADC Non Recordable)

Near-Miss (NM)
An undesired event, which, under slightly different circumstances, could have resulted in harm to people, damage to property, or loss to the environment.

For Report Only (FRO) or Administrative Recordable
An FRO is an accident or illness that occurs in the normal course of work but no medical attention is required. An FRO may also be used for documenting injuries or illnesses not caused specifically by work-related activities (See Viking International Work-Related definition at chapter 3.1 Definitions), which may include:

- Injuries or illnesses that originally occurred off the job.
- Injuries or illnesses that are not work related but manifest themselves at the workplace.
- Accidents that are being investigated as false claims or fraudulent reports.

An FRO is used to internally document and prevent accidents but is not included in safety statistics reported to the IADC or operator unless investigative results warrant change of the incident ranking to a Recordable or Lost Time Incident.

IADC Non Recordable
The record-keeping and reporting requirements of Viking International will include ALL INCIDENTS. (See Viking International Incident definition at chapter 3.1 Definitions).

Since Viking International participates on the IADC ISP (Incident Statistic Program), under IADC Official Rules and Guidelines, non-recordable incidents are a subset of reportable accidents. First Aid cases are not considered to be recordable and should not be included in the IADC participating company’s reporting data.

First Aid Case (FAC)
Any treatment of minor scratches, cuts, burns, splinters and so forth, and any follow-up visit for the purpose of observation. The following are generally considered first aid treatment:

- Using a non-prescription medication at non-prescription strength (for medications available in both prescription and non-prescription form, a recommendation by a physician or other licensed health care professional to use a non-prescription medication at prescription strength is considered medical treatment for recordkeeping purposes).
- Administering tetanus immunizations (other immunizations, such as Hepatitis B vaccine are considered medical treatment).
- Cleaning, flushing or soaking wounds on the surface of the skin. Using wound coverings such as bandages, Band-Aids™, gauze pads, etc.; or using butterfly bandages or Steri-Strips™
(other wound closing devices such as sutures, staples, etc., are considered medical treatment).

- Using hot or cold therapy.
- Using any non-rigid means of support, such as elastic bandages, wraps, non-rigid back belts, etc. (devices with rigid stays or other systems designed to immobilize parts of the body are considered medical treatment).
- Using temporary immobilization devices while transporting an incident victim (e.g. splints, slings, neck collars, back boards, etc.).
- Drilling of a fingernail, or toenail to relieve pressure, or draining fluid from a blister.
- Using eye patches.
- Removing foreign bodies from the eye using only irrigation or a cotton swab.
- Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means.
- Using finger guards.
- Using massages (physical therapy or chiropractic treatment are considered medical treatment) for record keeping purposes.
- Drinking fluids for relief of heat stress.

3.2.2 Viking International Category 2 Incidents (IADC Recordable)

IADC Recordable

Work Injury which results in the following list are IADC recordable:

- Fatality (FTL).
- Lost Time Incidents (LTI).
- Restricted Work Case (RWC).
- Medical Treatment Only (MTO).

Any injury which progresses from one category to a category higher on the above list shall be recorded in the higher category only.

Fatality (FTL)

A work-related injury or illness that results in death. Fatalities are included when calculating the Lost Time Incident (LTI or DAFWC) incidence rate and frequency rate.

Lost Time Incident (LTI)

A work-related incident (injury or illness) to an employee in which a physician or licensed health care professional recommends days away from work due to the incident.

Note: Time away from work on the day of the incident is not considered in determining Lost Time Incidents (LTI).

Time spent traveling, undergoing evaluation, awaiting medical evaluation results, or otherwise seeking medical treatment should not be counted as a Lost Time Incident (LTI) when considering LTI classification.

Restricted Work Case (RWC)

A Restricted Work Case (RWC) occurs when an employee cannot perform all of the routine job functions, but does not result in days away from work. A RWC occurs when, as a consequence of a work related injury or illness:

- The employee is temporarily assigned to another job.
- The employee cannot perform all of his routine job functions for all or part of his work shift.
- The employee works his regularly assigned job but cannot work the full shift / tour.

Restricted or light duty the day of the injury or illness does not make the incident a recordable Restricted Work Case (RWC). If the employee continues under restricted duty the day after the incident, the case becomes a recordable Restricted Work Case (RWC).

Should an employee experience minor musculoskeletal discomfort such as muscle pains or strains, a
physician or licensed health care professional determines that the employee is fully able to perform all of his routine job functions, and the employer assigns work restriction to that employee or restricts the employee’s job functions, for purpose of preventing a more serious condition from developing, the case is not recordable as a restricted work case.

Medical Treatment Only (MTO)
Any work related injury or illness requiring medical care or treatment beyond first aid (regardless of the provider of such treatment) that does not result in a Restricted Work Case (RWC) or Lost Time Incident (LTI). Medical treatment does not include first aid treatment (See First Aid) even though provided by a physician or registered professional personnel.

For record keeping purposes Medical Treatment Only (MTO) does not include:
- Visits to a physician or other licensed health care professional solely for observation or consulting.
- Diagnostic procedures such as x-rays and blood tests, including the administration of prescription medications used solely for diagnostic purposes (e.g., eye drops to dilate pupils).
- Any treatment contained on the list of first-aid treatments.

3.2.3 Viking International Category 3 incidents (Property and Equipment Loss or Damage)

Property or Equipment Damaged
An incident which property or equipment is lost or damaged is a Category 3 incident.

MVA (Motor Vehicle Accidents)
Motor Vehicles Accidents are included within this category. Exposure to Motor Vehicle Accidents shall be measured by the total number of motor vehicle accidents of:
- All motor vehicles of Viking International.
- All motor vehicles of Contractors engaged in work for Viking International.

3.2.4 Viking International Category 4 incidents (Environmental Incidents)

Incidents involving release into the environment of fluids or solids such as junk, refuse, waste or any material whether intentional or unintentional is a Category 4 incident. (Accidental loss of tools, equipment or useful property is a Category 3.) Dumping either into water or land is strictly forbidden. (See Viking International Environmental Incident definition at chapter 3.1 Definitions).

3.3 Rate Calculations

The QHSE Manager (or their designated representative) is responsible for calculating the safety statistics on a monthly basis. The statistics shall be calculated using the standardized IADC formulas detailed in this section of the document.

Note: The "200,000" used in the calculations, is an industry constant that represents the hours worked by 100 workers (each worker works a 40 hour week), in one year, and is only used to determine incidence rates.

Viking International will keep the following incident statistics (Total Operation):

<table>
<thead>
<tr>
<th>Incident Rate</th>
<th>Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost Time Incident Rate (month)</td>
<td>Month LTIR</td>
</tr>
<tr>
<td>Lost Time Incident Rate (Rolling Average last 12 months)</td>
<td>Roll. Avg. LTIR</td>
</tr>
<tr>
<td>Lost Time Incident Severity Rate (month)</td>
<td>Month LTISR</td>
</tr>
</tbody>
</table>
Lost Time Incident Severity Rate (Rolling Average last 12 months) Roll. Avg. LTISR

Total Recordable Incident Rate (month) Month TRIR

Total Recordable Incident Rate (Rolling Average last 12 months) Roll. Avg. TRIR

Total Recordable Severity Rate (month) Month TRISR

Total Recordable Severity Rate (Rolling Average last 12 months) Roll. Avg. TRISR

Motor Vehicle Accident Incident Rate (month) Month MVAIR

Motor Vehicle Accident Incident Rate (Rolling Average last 12 months) Roll. Avg. MVAIR

**LTIR (Lost Time Incident Rate):** is the number of Lost Time Incidents which occurs in every 200,000 man-hours worked during the period.

LTIR is calculated as follows:

\[
\text{LTIR} = \frac{\text{Number of (LTI’s + FTL)} \times 200,000}{\text{Total Manhours Worked}}
\]

**LTISR (Lost Time Incident Severity Rate):** Identifies the number of man-days away from work (DAFW) through LTI’s which occur in every 200,000 man-hours worked.

LTISR is calculated as follows:

\[
\text{LTISR} = \frac{\text{Number of DAFW From LTI’s} \times 200,000}{\text{Total Manhours Worked}}
\]

**TRIR (Total Recordable Incident Rate):** is the number of Total Recordable Incidents (TRI) which occurs in every 200,000 man-hours worked during the period. TRI = FTL’s + LTI’s + RWC’s + MTO’s

TRIR is calculated as follows:

\[
\text{TRIR} = \frac{\text{Number of TRI’s} \times 200,000}{\text{Total Manhours Worked}}
\]

**TRISR (Total Recordable Severity Rate):** Identifies the number of man-days away from work (DAFW) through Total Recordable Incidents, which occur in every 200,000 man-hours worked.

TRISR is calculated as follows:

\[
\text{TRISR} = \frac{\text{Number of DAFW From TRI’s} \times 200,000}{\text{Total Manhours Worked}}
\]

**MVAIR (Motor Vehicle Accident Incident Rate):** is the number of Total Motor Vehicle Accidents (MVA) which occurs in every 1000 Kilometers driven during the period.

MVAIR is calculated as follows:

\[
\text{MVAIR} = \frac{\text{Number of MVA’s} \times 1,000}{\text{Total Kilometer Driven}}
\]
4.0 GENERAL

This procedure details the reporting and investigation of near-miss incidents, illnesses and injuries, and property and environmental losses to improve the safety, health and environmental care, as well as operation quality and efficiency at workplace.

To achieve these objectives, it is essential that:

- All incidents and illnesses are reported.
- Reports are legible, comprehensive, and of a high quality.
- Personnel who participate in accident, incident, and illness investigations are trained in investigation techniques.
- Investigations are carried out openly and professionally.
- Findings, recommendations, and corrective actions are promptly implemented and fed back into and incorporated within the Safety Management System.
- Any resulting changes are managed in accordance with Viking International change management system.

All incidents reported shall be:

Accurate – Accurate incident reporting ensures that all levels of management receive a clear, detailed description of the incident and its consequences. Incidents should be reported on the proper forms, according to the potentiality of the incident (refer to Section 4.1). Every effort should be made to provide a thorough and understandable description of the incident, and the accuracy of all facts, information, and details requested in the report form. The reader should be able to “see a picture in their mind’s eye” of what took place.

Complete – Each form used for incident reporting provides information essential for the proper recording and processing of incidents, statistical tracking of information, and analysis of HSSE performance. All sections of all required forms should be completed in their entirety.

Timely – Timely reporting of all incidents is essential for efficient management response, initiation of an investigation (if required), development of correction actions, and distribution of safety information to our entire fleet. Every incident should be reported to line management, area management, and corporate management according to the guidelines listed in Section 5.1 of this procedure.

Signed – The personal signature of all levels of line and area management confirms that every supervisor takes a personal interest in and assumes responsibility for maintaining a safe working environment. Signature of each incident report form is required before submitting the report to the corporate office. If unable to obtain signatures before the reporting deadline, the report must be resubmitted once all signatures have been obtained.

Closed Out – Incident reporting is only the first step toward the development of a safe working environment. All incidents should be examined for Root Causes and Corrective Actions using the tools provided for incident investigation, to the level required by this procedure. Incident reporting can be considered complete only after all required investigations, and the implementation of all corrective actions, have been concluded and properly reported.
4.1 Incident Potentiality Matrix

The Potential Incident Matrix for Viking International is as follows

<table>
<thead>
<tr>
<th>LIKELIHOOD</th>
<th>Very Unlikely</th>
<th>Unlikely</th>
<th>Possible</th>
<th>Likely</th>
<th>Very Likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Unlikely</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>M</td>
</tr>
<tr>
<td>Unlikely</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>Possible</td>
<td>L</td>
<td>M</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Likely</td>
<td>M</td>
<td>M</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Very Likely</td>
<td>M</td>
<td>H</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

**CONSEQUENCES**

- **Slight**
  - L
- **Minor**
  - L
- **Moderate**
  - M
- **Serious**
  - M
- **Major**
  - H

**Low Potential Incidents**

**Medium Potential Incidents**

**High Potential Incidents**

**Consequences rating**

<table>
<thead>
<tr>
<th>Injury to People</th>
<th>Low Potential Incidents</th>
<th>Medium Potential Incidents</th>
<th>High Potential Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slight</td>
<td>FAC, non-disabling injuries, non-lost time injuries</td>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>Minor</td>
<td>MTO, RWC, full recovery within a few days</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>Moderate</td>
<td>LTI, lost time injuries (&lt; 7 DAFW)</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>Serious</td>
<td>LTI, lost time injuries (&gt; 7 DAFW)</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Major</td>
<td>Medical treatment injuries which require hospitalization, fatalities</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Asset Damage</th>
<th>Low Potential Incidents</th>
<th>Medium Potential Incidents</th>
<th>High Potential Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; $5k</td>
<td>FAC, non-disabling injuries, non-lost time injuries</td>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>$5k - $50k</td>
<td>MTO, RWC, full recovery within a few days</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>$50k - $250k</td>
<td>LTI, lost time injuries (&lt; 7 DAFW)</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>$250k - 500k</td>
<td>LTI, lost time injuries (&gt; 7 DAFW)</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>&gt;$500k</td>
<td>Medical treatment injuries which require hospitalization, fatalities</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental Impact</th>
<th>Low Potential Incidents</th>
<th>Medium Potential Incidents</th>
<th>High Potential Incidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential environmental non-compliance (no actual spill)</td>
<td>FAC, non-disabling injuries, non-lost time injuries</td>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>On-site Release immediately of chemicals, oil - contained with no impact</td>
<td>MTO, RWC, full recovery within a few days</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>On-site release of chemicals, oils - no contained but no detrimental impact</td>
<td>LTI, lost time injuries (&lt; 7 DAFW)</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>On-site release of chemicals, oil with detrimental impact</td>
<td>LTI, lost time injuries (&gt; 7 DAFW)</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Off-site release of chemicals, oil with detrimental impact</td>
<td>Medical treatment injuries which require hospitalization, fatalities</td>
<td>H</td>
<td>H</td>
</tr>
</tbody>
</table>
4.2 Guide for incident potentiality classification

This table shall be taken only as a guide. To classify the incident potentiality always refer to Viking International Potentiality Matrix in section 4.1 of this procedure.

<table>
<thead>
<tr>
<th>Low Potential</th>
<th>Medium Potential</th>
<th>High Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result or most likely result of this incident will only have short term minor effects on the individual or the operation.</td>
<td>Result or most likely result of this incident will have substantial effects on the individual or the company - full recovery expected.</td>
<td>Result or the most likely result of this incident will have long term or major effects on the individual or the operation.</td>
</tr>
<tr>
<td><strong>Injury</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- non-disabling injuries</td>
<td>- disabling injuries</td>
<td>- disabling injuries (serious &gt; 7 days)</td>
</tr>
<tr>
<td>- non-lost time injuries</td>
<td>- lost time injuries</td>
<td>- lost time injuries (serious &gt; 7 days)</td>
</tr>
<tr>
<td>- boot rub</td>
<td>- lacerations requiring sutures</td>
<td>- amputations</td>
</tr>
<tr>
<td>- dust in eye</td>
<td>- fractures</td>
<td>- head injuries with permanent reduction in function</td>
</tr>
<tr>
<td>- splinter</td>
<td>- dehydration with symptoms</td>
<td>- electric shocks with no ill effects</td>
</tr>
<tr>
<td>- minor burn (burns with full recovery within a few days)</td>
<td>- electric burns to eye</td>
<td>- chemical burns to eye</td>
</tr>
<tr>
<td>- superficial laceration</td>
<td>- noise induced hearing loss</td>
<td></td>
</tr>
<tr>
<td>- muscle sprains/strains with full recovery within a few days</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- dehydration no symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Potential environmental non-compliance (no actual spill of chemical reagents).</td>
<td>- On-site release of chemicals, oils - immediately contained.</td>
<td>- On or off-site release of chemicals, oil with detrimental impact.</td>
</tr>
<tr>
<td><strong>Damage/Other</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- &lt;$5K.</td>
<td>- $5K - $250K</td>
<td>- Motor Vehicles Accidents (MVA)</td>
</tr>
<tr>
<td>- Fire that was extinguished prior to reporting to Fire Brigade.</td>
<td>- Fire that was still burning at the time of reporting to Fire Brigade.</td>
<td>- Breakage of lifting equipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Fire that required emergency services personnel to extinguish</td>
</tr>
</tbody>
</table>
5.0 INCIDENT REPORTABILITY AND RESPONSIBILITIES

Line management must comply with the Incident Reporting Schedule detailed in this section of the procedure. Employees shall supply accurate witness information, as required, to line management.

5.1 Incident Reporting Schedule

The following schedule shall be followed for the reporting of all incidents.

<table>
<thead>
<tr>
<th>Incident Potentiality</th>
<th>Low Potential</th>
<th>Medium Potential</th>
<th>High Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Notification</strong></td>
<td><strong>Low Potential</strong></td>
<td><strong>Medium Potential</strong></td>
<td><strong>High Potential</strong></td>
</tr>
<tr>
<td>Direct Supervisor: Immediate to PIC/Rig Manager</td>
<td>Direct Supervisor: Immediate to PIC/Rig Manager</td>
<td>Direct Supervisor: Immediate to PIC/Rig Manager</td>
<td></td>
</tr>
<tr>
<td>Op Manager/Sup: within 12hs. to: Op Director – QHSE Manager</td>
<td>Op Manager/Sup: Immediate to: Op Director – QHSE Manager</td>
<td>Op Manager/Sup: Immediate to: Op Director – QHSE Manager</td>
<td></td>
</tr>
<tr>
<td><strong>Written Incident First Report</strong></td>
<td><strong>Written Incident First Report</strong></td>
<td><strong>Written Incident First Report</strong></td>
<td></td>
</tr>
<tr>
<td>Form 01-01-107-F001</td>
<td>Form 01-01-107-F001</td>
<td>Form 01-01-107-F001</td>
<td></td>
</tr>
<tr>
<td>Op Manager/Sup: within 24 hs. to Incident Distribution List</td>
<td>Op Manager/Sup: within 24 hs. to Incident Distribution List</td>
<td>Op Manager/Sup: within 24 hs. to Incident Distribution List</td>
<td></td>
</tr>
<tr>
<td><strong>Written Incident Investigation Report</strong></td>
<td><strong>Written Incident Investigation Report</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Form 01-01-107-F002</td>
<td>Form 01-01-107-F002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Op Manager/Sup: within 3 days to Incident Distribution List</td>
<td>Op Manager/Sup: within 5 days to Incident Distribution List</td>
<td>Op Director: when investigation finishes, or within 7 days to Incident Distribution List</td>
<td></td>
</tr>
<tr>
<td><strong>Written, Incident Closed-out Report</strong></td>
<td><strong>Written, Incident Closed-out Report</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Form 01-01-07-F003</td>
<td>Form 01-01-07-F003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QHSE Sup: After auditing that all corrective actions (PCAR items due to the Incident) are effective implemented.</td>
<td>QHSE Sup: After auditing that all corrective actions (PCAR items due to the Incident) are effective implemented.</td>
<td>QHSE Sup: After auditing that all corrective actions (PCAR items due to the Incident) are effective implemented.</td>
<td></td>
</tr>
</tbody>
</table>

5.2 Managing an Injury

Any injury should be immediately cared for at a level dictated by the injury or potential impact to the injured person(s). Should it become necessary to transport the injured person(s) to a medical facility off location, every effort should be made to keep the person(s) comfortable and to ensure that they will not be adversely affected by transportation. In addition, a Viking representative should accompany the injured person(s) to ensure that they receive the best care available.
5.3 Restricted/Modified/Alternate Work Following Injury

Every effort should be made to allow an injured worker to remain within the workforce to ensure his ability to take part in current training programs or other meaningful alternative duties while they are recovering. This may be accomplished by informing the treating physician that Viking will make accommodations for the employee within the physical guidelines set out by the physician. The Viking representative accompanying the injured employee should request a physician report of injury.

5.4 Crew Members Responsibilities

Crew members must ensure that ALL incidents are reported. The crew is generally the first responder in case of emergency and as such must immediately take action to notify the Direct Supervisor to begin the appropriate emergency response. Crew shall provide other information when necessary.

5.4.1 Direct Supervisors (Drillers, Mechanics, Electricians, Op. Sup.)

Supervisors must ensure activities are secure and then take necessary action, based upon the type of incident. The first line supervisor is the responders for the incident and shall notify PIC/Rig Manager or Toolpusher of the incident.

5.4.2 PIC/Rig Managers or Toolpusher

PIC/Rig Manager or Toolpusher shall ensure the incident site is secured, if required (based upon the type of incident). All additional forms & documents related to a given incident shall be completed and forwarded to the Area Office / Manager or Superintendent timely as indicated in section 5.1 Incident Reporting Schedule. If an incident, believed initially to be Low Potential, turns into a Medium or High Potential Class, then the reporting requirements for the new class apply immediately. The client representative must also be notified of the incident and provided with a copy of the incident first report as indicated in section 5.1 Incident Reporting Schedule.

The PIC/Rig Manager is the team leader for Low Potential investigations and along with the QHSE Representative shall begin the investigation as soon as possible.

5.4.3 Op. Manager/Superintendent

Op. Managers/Superintendents shall verbally inform the Department Director and the QHSE Manager of incident, based upon type of incident as indicated in section 5.1 Incident Reporting Schedule. The Op. Managers/Superintendents is the team leader for Medium Potential Incidents investigations and along with the QHSE Department shall begin the investigation, when required, as soon as possible.

5.4.4 Op. Director

Op. Directors shall verbally inform the COO/President of incident, based upon type of incident as indicated in section 5.1 Incident Reporting Schedule. She/he is the overall responsible for the accident Report and Investigation in the Department, and will ensure that all reports are completed correctly, accurate and timely. The Operation Director is the team leader for High Potential Incidents investigations and along with the QHSE Department shall begin the investigation, when required, as soon as possible.

5.4.5 QHSE Manager

The QHSE Manager shall dedicate the corresponding personnel to participate with the Operations Department in the incident investigation and analysis. The QHSE Manager shall also provide assistance and training to the PIC/Rig Manager or Toolpusher by ensuring the reports are completed correctly. QHSE shall follow up on incident by auditing the facility providing Form 01-01-07-F003, Incident Close-out Report of the incident and ensure all corrective actions are effectively implemented.
5.4.6 President
The President shall ensure that:

- resources are available to complete the Incident Report and Investigation process.
- the proper authorities are notified when required.
- investigations and analysis are completed as required.
- all corrective actions and follow up activities on the incident are carried out as required.

6.0 INCIDENT INVESTIGATION AND REVIEW

At Viking International ALL incidents will be investigated with the correct level of attention according to the Incident Potentiality Matrix (Section 4.1 of this document), and the Incident Reporting Schedule (Section 5.1 of this document)

The Investigation Team shall be formed as indicated in the Incident Reporting Schedule (Section 5.1), by competent team members with knowledge in the particular operation that was taking place at the time of the incident. The leader of the investigation team is the area responsible person and will show commitment to the QHSE within his area of responsibility by leading the investigation. The leader will be assisted by a trained QHSE employee on incident investigation techniques and can also nominate other people as she/he will consider necessary.

Once the correct level of investigation, coordination, and direction has been determined, the investigation should proceed with the following goals:

- To identify the root causes of incidents so that actions can be taken to prevent recurrence.
- To establish the facts surrounding the incident for use in relation to potential insurance claims or litigation.
- To meet relevant statutory, client or Company requirements on injury and incident reporting.
- To complete the Incident Investigation Report (Form 01-01-107 F002) and send by e-mail to the incident distribution list.

The incident investigation process is comprised of the following consecutive stages:

a. Notification
b. Appointment of investigators
c. Preparation
d. Fact-finding
e. Analysis of investigation findings
f. Recommendations
g. Investigation report
h. Management endorsement
i. Implementation of recommendations
j. Distribution of investigation findings
k. Generation of a local safety bulletin
l. Follow-up

6.1 incident review

All Incidents will be reviewed weekly on the weekly safety meeting. All incidents that have occurred within the previous week will be presented to the crew members, the conclusions of the investigation team, and corrective action will be discussed among the people attending the meeting.

Each Area Manager will present a summary of her/his department's incidents for the month on the Manager Monthly Safety Meeting with a description of the corrective actions that had been taken to avoid recurrence. (See VIKING Procedure 01-01-209 HSE Meetings)
Progress and effectiveness of the corrective actions that come out of the Incident Investigation for High Potential Incidents will be reviewed on the Monthly QHSE Manager’s meeting.

7.0 INCIDENT RECORD KEEPING

Incident Record Keeping Guidelines:

All incident reports & associated forms, documentation, investigations, analysis will be kept on the Rig/Unit filing system for the calendar Year.

At the end of the calendar year (end of December) the Rig/Unit files will be stored in an archiving area assigned for Document Filing on Viking International Offices

8.0 REFERENCES

Viking Smart Form 01-01-107 F001 “Incident First Report”
Viking Smart Form 01-01-107 F002 “Incident Investigation Report”
IADC Website – www.iadc.org
OSHA Website – www.osha.org
1.0 PURPOSE

The purpose of this standard is to reinforce good practices by highlighting the safety rules and precautions related to crane operations on rig facilities.

2.0 OPERATOR CERTIFICATION

Crane Operators must hold a current and valid crane operating certificate recognized by Viking International and the relevant local regulatory requirements.

3.0 OPERATOR RESPONSIBILITIES

Only the Crane Operator will operate the cranes at Viking International locations. The Crane Operator is responsible for all crane operations under his/her control including the following:

- Stopping any crane operation when safety is in doubt; resuming only when safe working conditions have been established
- Maintaining applicable classification society inspection and testing documentation
- Ensuring all lifting gear, shackles, and slings are certified in accordance with local requirements and VIKING 01-01-115 Lifting Equipment, are maintained in good working condition, and are properly color coded
- Ensuring all safety and operational checks are made
- Supervising crane testing performed by maintenance personnel
- Operating within manufacturer’s recommended limitations, particularly with regard to wind speed, safe working load, and maximum working radius
- Maintaining the Crane Operator’s log book and detailing maintenance activities on crane mechanisms, wires, and procedures
- Obeying the emergency stop signal given by any person at any time; otherwise responding only to signals given by the designated rigger
- Making known to the supervisor any concerns related to weather, visibility, or any other conditions affecting safe crane operation

4.0 PRE-OPERATION CHECKS

The crane operator will conduct pre start checks using VIKING Form 01-01-110-F1039 Crane Pre-Start Checklist to ensure that the following items are checked prior to commencing crane operations:

- Be aware of the weight of all loads, in particular heavy or unusual loads.
- Hook is equipped with a working retaining spring or safety latch.
- Effective communications are established between the Crane Operator and banks man
- Lighting and safety measures are adequate for the operations to be conducted.
- Daily safety and operational checks are completed and crane is mechanically sound and free of defects affecting safe operation.
- Hand-signal charts are posted in all rigging and loading areas, and new personnel have been familiarized with the signals being used.
- There is clear and safe access to and from the control cab.
Crane Operation

- Control cab area and all controls are free from obstructions and no fire hazards are present; all loose items are properly stowed.
- Handrails, steps, running boards, safety guards, and equipment covers are in place and secure.
- Tools, lifting tackle, and other loose equipment is properly stored and secured.
- Safe working loads (SWLs) are clearly marked and visible at various radii and crane load chart posted in control cab.
- Control cab windows are clean, clear, and not cracked or broken.
- Overhead sheaves and lines are properly secured.

5.0 PRE-LIFT SAFETY MEETING

The Crane Operators must conduct a safety and planning meeting before offloading supplies. The roustabouts and all other personnel involved in the operation will attend this meeting. Discussion will include placement, weights, types of cargo, unusual or hazardous lifts, individual positions and responsibilities, communications protocol, and reinforcement of safe operating practices.

6.0 GENERAL PRECAUTIONS

Follow these general precautions:

- Do not allow anyone to stand or walk under a suspended load or between the lifted load and fixed structures or equipment to avoid pinching, crushing, or entrapment hazards.
- Inform the Crane Operators if the serviceability of any crane equipment is in doubt.
- Follow the Safety Procedure for Working at Heights when crane access or operations require unguarded climbing or work in areas that are not protected by handrails.
- Follow the Permit to Work Manual VIKING 01-01-103 for any work on or around the cranes.
- Do not conduct crane operations when the wind speed exceeds 40 knots, except with permission of the supervisor.
- Suspend crane operation if wind speed exceeds 50 knots.
- Do not leave the crane unattended with a load suspended.
- Keep crane running tracks clear of all debris, including rags, cables, wires, and ropes.

7.0 CRANE OPERATION

Follow these guidelines for crane operation:

- Use locally recognized crane signals; see Figure 1 for typical hand signals and review the signals to be used following changes in personnel or country of operations. Only a trained and qualified person shall give signals.
- Do not lift loads over personnel, moving machinery, or wire lines.
- Be aware of overhead obstructions such as sheaves, snatch blocks, air hoist lines, and tensioner lines.
Crane Operation

- Monitor the pay out and recoil of crane electric cables and hydraulic lines during operation; observe for snagging, trapping, and stretching.
- Use hoist motion for vertical lowering and rising only; any other motion such as slewing may damage the crane.
- Do not exceed the safe working load (SWL) of the crane except under the supervision of a qualified test engineer and conforming to the crane manufacturer’s specifications and recommendations.
- Do not exceed the working radius of the crane boom with a load on the hook.
- Stop heavy loads (loads that are equal to or near the SWL) to check for balance, security of the load, and effectiveness of the brake.
- Do not use motion limit switches for stopping movement.
- Do not run cable off the drum to less than seven turns remaining.
- Suspend crane operation if the cable becomes slack on the drum, cross-coiled, or trapped; pay out sufficient cable to examine for possible damage and re-spool correctly.
- Do not lift loads higher than necessary.
- Only one person may give signals at any given time. However, any person can give the signal to stop.

8.0 LOADING OPERATIONS

- Follow these load handling operations:
- Use locally recognized crane signals; see Figure 1 for typical hand signals and review the signals used following any changes in personnel or country of operation.
- Station a minimum of two load handlers when the Crane Operators does not have a clear unobstructed view of the load. At least one must be a trained and competent rigger.
- Trained riggers are to relay hand signals to the Crane Operators when radio communications are not possible.
- Preparing and slinging of loads will be performed only by a qualified rigger who has been instructed in the correct techniques.
- Check equipment thoroughly for loose parts before lifting overhead.
- Use tag (restraining) lines at any time a lift is made use extra lines in windy or rough conditions.
- Tape the ends of tag lines to prevent unraveling.

9.0 APPLICABLE FORMS

01-01-108 F1039 Crane Pre-Start Checklist
10.0 APPENDIX

Figure 1 – Typical Crane Signals.

<table>
<thead>
<tr>
<th>Hoist</th>
<th>Lower</th>
<th>Move Slowly</th>
<th>Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raise Boom</td>
<td>Lower Boom</td>
<td>Use Main Hoist</td>
<td>Retract Boom</td>
</tr>
<tr>
<td>Swing and Pick Up Load</td>
<td>Swing and Lower Load</td>
<td>Use Auxiliary Hoist (Whip Line)</td>
<td>Extend Boom</td>
</tr>
<tr>
<td>Swing Boom</td>
<td>Travel Both Tracks</td>
<td>Lock Track Turn Travel Track</td>
<td>Dog Everything</td>
</tr>
</tbody>
</table>
1.0 PURPOSE

The purpose of this guide is to reinforce good practices by highlighting the safety rules and precautions related to forklift operations.

2.0 OPERATOR CERTIFICATION

All forklift operators must pass Viking International-approved forklift operator’s training or be in possession of a current valid forklift operator’s certificate recognized by Viking International, and be trained in accordance with the VIKING 01-01-103 Planned Equipment and Facility Control.

3.0 PREOPERATION CHECKS

Ensure the vehicle is in safe and efficient working order. Perform the following checks prior to each operation or at the beginning of tour when in regular use. Report any faults noted to a Viking supervisor. Do not operate an unsafe vehicle.

- Fuel, oil, and cooling water levels; add proper fluid to correct levels and do not overfill
- Forks and mast for distortions, cracks, and excessive wear
- Rollers adequately lubricated and move freely
- Load chain plates, pins, and anchor points for excessive wear and broken or missing parts
- Wheels and tires for proper pressure, tread, and tightened lug nuts
- Horn, lights, safety devices, and gauges are working
- Batteries are charged at proper levels and connections are clean and tight
- Foot, hand, and emergency (parking) brakes are working
- Steering and hydraulic controls not too tight or too loose
- All guards and covers are in place; no evidence of leaks
- Safe working load (SWL) capacity plate is visible; note SWL

4.0 OPERATION

4.1 General

The following are general precautions to observe:

- Be familiar with the manufacturer’s instructions and recommendations for the forklift prior to operating.
- Check front and rear safety zones before starting.
- Do not drive over loose objects, lines, hoses, or cables.
- Use forklifts for lifting and transporting loads in the approved manner only; do not attach ropes, chains, slings, or other rigging equipment to the hydraulic frame or forks.
- No passengers are allowed on forklifts.
- Do not allow anyone to stand or walk between the forks and any object, beneath raised forks, or in the fall zone of the load.
- Raise the heel of the forks no more than 6 inches (15 centimeters) off the ground before moving an unloaded forklift.
- Approach turns cautiously, stop at blind corners, and sound horn to alert others.
- Drive with the load upgrade (going up – load is in front, going down – load is trailing); ensure forks are raised high enough and tilted back to clear the top of the incline.
• Do not drive across the slope of an incline.
• Keep arms and legs within the forklift frame and fasten seat belts.
• Be aware of all surroundings, including ramps, platforms, overhead clearance, protrusions, curbs, and bumps; do not proceed without a clear and unobstructed view.

4.2 Loading

The following are loading and unloading safe practices:

• Do not overload the forklift; check the weight of the load and its center of gravity.
• Do not block access to any emergency equipment or evacuation route.
• Do not exceed the manufacturer’s recommended load height.
• Keep the mast vertical and space forks to distribute the weight evenly.
• Approach the load and drop-off area at right angles.
• Apply backward tilt to the mast to stabilize the load once properly supported.
• Transport the load just above floor level; do not drag the forks.
• Approach and back away from the load slowly; watch the rear when backing.
• Lower and retract the forks to the travel position and check stability before transporting the load.
• Stop and apply brakes before raising, lowering, or adjusting the height and tilt of the load.

4.3 Parking

The following are parking and refueling safe practices:

• Do not exit forklift or leave unattended with the motor running or with a suspended load.
• Set parking/hand brakes, tilt the mast forward, lower fork tips to the floor, set controls to neutral, turn off ignition/circuit switch, and remove the key when parking and refueling.
• Do not overfill tanks; clean up spilled fuel

5.0 REFERENCE

VIKING 01-01-103 Planned Equipment and Facility Control
VIKING 01-01-109-F1038 Fork-lift Pre-start Checklist
PURPOSE

The purpose of this procedure is to set out the responsibility, requirements and steps in performing a Job Safety Analysis (JSA).

A JSA’s is a tool utilized to systematically review:
- the job steps,
- the hazards associated with each of the job steps,
- the controls in place to eliminate or to lower the risk to personnel, property, or the environment expose to those hazards.

1.0 APPLICATION

JSA’s are performed prior to undertaking any job on the rig to make crew members undertaking the job aware of the job steps, potential hazards and controls in place to mitigate them. A JSA shall be performed:

a. Prior to any job
b. Mandatory to use a JSA as a part of the Permit to Work process

- Each Rig/Unit should have a Master JSA Workbook containing Rig Specific JSA’s for all tasks undertaken on the rig.
- Tasks that experience changes to the existing Rig Specific JSA (different set-up, or tools, or changes in the process), a new JSA has to be written to capture all new hazards and the new controls that needs to be put in place.
- For jobs where a JSA has not been previously done and is not available in the JSA Workbook, a JSA must be performed by the rig crew as stated in section 4.0.
- All newly created JSA’s shall be filed in the JSA Workbook for future reference.

2.0 RESPONSIBILITIES

2.1 Rig Manager/PIC:
- Must ensure that the JSA procedure is being utilized on the rig by all rig/Unit personnel.

2.2 Line Supervisors:
- Are responsible for creating, reviewing, and performing a JSA with all crew team members and documenting the review.
- The line Supervisor is responsible to get all participants signature and file them in the proper Rig folder.

Example: Making up Drill Pipe:

Rig Manager/PIC must ensure that a JSA will be performed for this job. Rig Manager must sign off on the JSA when completed and ensure that the JSA is filed in the JSA Workbook for future reference.

The Driller must lead JSA and ensure his crew members involved in the job is present. Driller must ensure that the JSA Procedure is carried out as outlined in the following procedure section. Driller must also ensure a complete understanding of the JSA by the crew performing the job. Driller files the signed JSA.
Crew members must participate in JSA and provide Driller with information of specific tasks involved with job. Crew must also comply with JSA steps.
3.0 PROCEDURE

There are three basic steps to a JSA.

3.1 Write down the job steps.
Keep it simple. Begin each job step with an action word, i.e., pick up, push, carry, hammer, disconnect, etc. Usually 5 to 10 steps for each job are all that are needed.

3.2 Identify the hazard.
A hazard is anything causing a potential danger or injury. To identify a hazard, ask yourself these 'what could go wrong' questions for each identified step:
   a. Is there a danger of being struck by the equipment?
   b. Can I get caught in, by or between objects?
   c. Is there a potential for a slip, fall or strain?
   d. Is there a danger from chemicals?
   e. Is there a danger from electrical, air or hydraulic pressure?

3.3 Recommendations to eliminate / reduce hazards
For each identified hazard, there needs to be controls in place to eliminate the hazard and at the least reduce it to As Low as Reasonably Possible (ALARP)

Key Points
1. A JSA shall be completed by the person or persons who have the basic responsibility for conducting or completing the job task.
2. The Rig Manager is responsible for ensuring compliance
3. All employees involved in performing the job shall be present when the JSA is reviewed and should be encouraged to actively participate in the creation / revision / review.
4. New employees shall be made aware of any JSA relevant to the job they are required to perform.
5. JSA’s are to be filed in the JSA Workbook by subject and in alphabetical order
6. All employees participating in the JSA process are required to sign on the JSA acknowledging their understanding of the activity undertaken and the associated hazards and controls

5.0 RECORDS

5.1 Master file containing all rig specific JSA’s.
5.2 A record of reviewed JSA’s with signatures of all participants.

6.0 REFERENCE

VIKING Form 01-01-110 F001 Job Safety Analysis
1.0 PURPOSE

The purpose of this procedure is to ensure effective and efficient continuity of operations between tours and hitch changes as well as supporting any special rig activities or projects by establishing communication briefings with their relief person.

2.0 APPLICATIONS

Viking has developed procedures to be completed by off going personnel at tour (scheduled daily work periods) and hitch (scheduled worker rotations on and off of the rig) changes to ensure continuity of operations. The personnel coming on tour must be given all the information necessary to allow them to perform their job responsibilities in an effective and efficient manner. Both normal operations and special activities are to be recorded during the handover so that personnel on the following tour or hitch are fully briefed when they take over the operation. These procedures are to ensure that the information that needs to be transferred from one tour or hitch to another is properly recorded, discussed, and communicated between the off going rig personnel and their relief.

Off going personnel are each responsible for completing the Handover Report (VIKING-01-01-105-F001), ensuring that the content of that report communicates to their relief all relevant information that their relief needs to safely assume those responsibilities. Similarly, it is the responsibility of the personnel taking over a tour or hitch to ensure that they understand the information that has been prepared.

3.0 RESPONSIBILITIES

The following personnel are required to complete a handover report at the conclusion of the tour or hitch as indicated below. This does not preclude other persons from using this report to hand over to their relief or from continuing informal handovers such as Crane Operators or Motormen.

- Rig Manager/PIC to Rig Manager/PIC (end of hitch)
- Toolpusher to Toolpusher (end of tour)
- Driller/AD to Driller/AD (end of tour)
- Mechanical Supervisor to Mechanical Supervisor (end of hitch)
- Electrical Supervisor to Electrical Supervisor (end of hitch)
- Derrickman to Derrickman (end of tour)
- Mechanic Supervisor (days) to Mechanic (nights) (end of tour)
- Electrician Supervisor (days) to Electrician (nights) (end of tour)
- QHSE Representative QHSE Rep. to QHSE Rep. (end of hitch)

4.0 RESPONSIBILITIES

The COO and President of Viking International are responsible for the administration, interpretation, and maintenance of this document.

5.0 REFERENCES

Handover Report VIKING-01-01-111-F001
1.0 PURPOSE

The purpose of this procedure is to provide guidelines on road safety procedures, desert driving and journey management procedures. The aim is to control travel to and from field or rig locations; defining responsibilities for coordinating the traveler movements, and responsibilities for implementing search & rescue operations.

2.0 APPLICATION

This procedure applies to all company owned and rented vehicles and employees using these vehicles.

3.0 RESPONSIBILITIES

- Driver: It is the responsibility of the vehicle driver to adhere to the instructions set out in this procedure. Vehicle checks in accordance to Viking International procedures need to be carried out prior to journey.
- Rig/ Operation Manager / Toolpusher / PIC: is responsible for ensuring that road safety rules are adhered as per the requirements of this procedure.
- Safety Representative: is the responsibility to ensure that a Journey Management Plan is in place and track its close out.
- Logistics Manager: is responsible to ensure that Journey Management Plans are approved and tracked.

4.0 PROCEDURE

General:
Vehicles are utilized in all facets of the Company’s operations and constitute a major accident exposure for the Company and its employees.

Factors relating to road safety can be divided into three main areas:
1) The Driver.
2) The Vehicle.
3) The Driving Environment.

In most vehicle accidents, defects and mechanical failures contribute to only a small percentage of the accidents and the environment is mostly beyond the control of management. Thus, while high standards for vehicle maintenance are essential and will be adhered to, most of management’s accident prevention efforts should be focused on influencing the driver’s performance.

Road Safety Rules:

1. The Driver must:
1.1 Possess a valid driver’s license for the type of vehicle she/he is driving.
1.2 Ensure that the vehicle registration, documentation, tax, authorization, etc. are according to local regulations.
1.3 Attend and pass a defensive driving course every two years.
1.4 Observe all traffic laws and speed limits. No Company vehicle is to be driven in excess of 90 kilometers per hour at any time. If in doubt, the speed must be adapted to:
   • the vehicles using the route;
   • the types of load carried and how it is stowed;
   • the driving surface;
   • the route layout, including how tight the bends are, and visibility at junctions;
   • hazards along the way;
   • the work being done on or near the route.
1.5 Maintain a safe distance with the vehicle ahead of him, minimum 2 seconds in acceptable weather/road conditions and increase them to 5 seconds in adverse conditions.

1.6 Not drive after consuming any amount of alcohol or any drug which might impair or adversely affect her/his ability to drive.

1.7 Make sure that all persons in the Company vehicle that she/he will drive are wearing seat belts.

1.8 Shut off the engine when refueling and make sure that nobody is smoking nearby the vehicle or the fueling bay.

1.9 Do not conduct any verbal or data communications on a company or personal cellular phone, while driving any company motorized vehicle without the use of an approved vehicle hands-free device.

1.10 Ensure that no one remain inside an idling vehicle without the use of an approved vehicle hands-free device.

1.11 Perform the vehicle inspections and complete VIKING 01-01-103 F1017 Weekly Light Vehicle Checklist.

1.12 In severe weather conditions (ice, snow, heavy rails or flooding) travel will be avoided except in emergency. Follow Viking Journey Management Guidelines and complete VIKING 01-01-112 F1032 Journey Management Form before starting the journey.

Recommended hours of work for drivers:
- No driver should work more than 12 hours per working period.
- No driver should drive a vehicle for a total of more than 10 hours in any one working period.
- Eight clear hours of uninterrupted rest should be taken on completion of the driver’s working period.
- After a 4 hours period of driving, a rest break of at least one hour duration should be taken for drivers of heavy vehicles and buses and at least half hour duration for drivers of light vehicles.
- No person employed in the capacity of driver should undertake any other major task during their rest break(s).
- Any driver who experiences tiredness, fatigue or loss of concentration while driving should stop and take a minimum 10 minutes rest.

2. The Vehicle shall:

2.1 Have all the permits, certificates, inspections, etc. required by the local law and regulations.

2.2 Be of adequate capacity and of a design suitable for the work to which they are allocated.

2.3 Be maintained original without any modification (this include tyres, seats, lights, bumpers or any other accessory).

2.4 Have all the routine maintenance done as per manufacturer recommendations and manuals. Viking or 3rd Party drivers are responsible for the maintenance of the vehicle.

2.5 Be equipped with a safety cage if a vehicle is used for carrying goods/freight in a compartment which forms part of the passenger carrying section of the vehicle.

2.6 Be fitted with a seat belt for each seat. All seat belts shall be 3 point fixing only and of the inertia type in the front seats of all vehicles. Two point fixing seat belts are acceptable in the rear seats of commercial vehicles only where it is impossible to fit 3 point fixing belts. For private vehicles, 2 point fixing belts are acceptable in rear seats, but it is strongly recommended that 3 point inertia belts are fitted to the outer seats.

2.7 Be equipped with a spare tyre and tools, including those to change a tyre. For travels more than 500 Km, vehicles should be equipped with a minimum of two spare tires.

2.8 Be fitted with powder type fire extinguishers of quantity and capacity suited to the size and purpose of the vehicles. At last one powder type extinguisher of 1.5 kg shall be installed in light vehicles.

2.9 Contain as a minimum an approved first aid kit.

2.10 Have all head lights, tail lights, brake lights, and turn signal lights maintained in good working condition at all times.

2.11 Have windshields clean and replaced or repaired when cracked.
Journey Management Guidelines:
The following journey management rules are applicable for both light and heavy company vehicles, for any journey, which exceeds 50 km, with the exception the rig moves, where journey management does not apply.
- Journey Manager to complete a journey management plan VIKING 01-01-F1032 by filling in all the sections of the form except for the vehicle inspection section and hand the form to the driver
- The driver shall complete the Weekly Light Vehicle Checklist VIKING 01-01-F1032.
- Heavy Vehicle Drivers shall complete Heavy Vehicle Inspection Report VIKING 02-11-103 F001
- The driver will hand the form back to the Journey Manager who will take it to the supervisor for authorization
- Once authorization has been obtained, the Journey Manager shall fax a copy of F1032 to the destination point and follow up with a call informing the Journey Manager at destination of the journey and give all the details, (driver's name, ETA, ETD, number of passengers etc.).
- The Journey Manager shall post the open journey plan details on the journey management board and hand a copy of the form to the driver
- The Driver MUST inform the Journey Manager at the origin point on any change of plan/route/delays & Safe Arrivals
- Driver to inform the Journey Manager at the point of origin upon arrival at destination
- Journey Manager to close the journey plan
- If no calls are received from the driver within 1hr from ETA, an inquiry call has to be initiated by the JM Duty Officer at the point of origin to the destination. If a confirmation is not received, he should immediately inform his supervisor and should initiate the Loss Comms procedure.(2hr from ETA which involves primary steps for search & rescue operation involving the local police)

In-Vehicle Monitoring Program
All Viking International commercial vehicles will be equipped with an IVMS System (In-Vehicle Monitoring System). The implementation of this type of systems had been proved to report benefits like:
- Targets high risk driver behavior then reducing the number of vehicular accidents.
- Contributes to increase the level of social responsibility in the driver.
- Reduces maintenance costs.
- Can be used to verify hours of work for drivers.
- Reduces insurance premiums, claims, citations

The IVMS system shall be able to records data such as date, time, speed, and any other relevant information to measure and evaluate driver’s performance against a predetermined set of parameters.
The System will include an online web based GPS Tracking Software.

Driver’s classification
For the purposes of the IVMS Program, Viking Driver’s Performance is divided in three groups; Green, Yellow and Red drivers. The key to Driver’s classification will be as follows:

<table>
<thead>
<tr>
<th>Key to Driver's classification</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Green</td>
<td>No over speeding or only to overcame other vehicle not exceeding 10% of the speed limit</td>
</tr>
<tr>
<td>Yellow</td>
<td>Over speeding up to 25% of the speed limit for short period of time</td>
</tr>
<tr>
<td>Red</td>
<td>Over speeding above 25% of the speed limit repeatedly</td>
</tr>
</tbody>
</table>

Vehicle Monitoring Report
The IT Department will coordinate and administer the web base GPS Tracking Software.
The QHSE Department will generate a daily Vehicle Monitoring Report as indicated in VIKING 01-01-112 F003 Vehicle Monitoring Report.
The Report will be distributed to Rig/Unit and other Operation Managers that have commercial Viking vehicles assigned within her/his team.
Road Safety Procedure

Speed Limits

The speed limits recommended for all Viking commercial vehicles are listed below unless Local Traffic Regulations indicates different. Adverse weather or journey evaluation by the Manager or Person in charge may indicate a lower speed. Client speed limits shall take precedence when driving on client concessions.

VIKING will take any over speeding as a serious violation to our road safety procedure.

Managers or Person in Charge will have to take the corrective actions that they deem necessary to avoid over speeding. It may include disciplinary actions to the driver.

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Urban areas</th>
<th>Skid/Gravel/Dirty Roads</th>
<th>Black Top Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trucks (up to 3.5 Tons)</td>
<td>50 Km/h – 30 M/h</td>
<td>60 Km/h – 35 M/h</td>
<td>90 Km/h – 55 M/h</td>
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<tr>
<td>Trucks (more than 3.5 Tons)</td>
<td>50 Km/h – 30 M/h</td>
<td>40 Km/h – 25 M/h</td>
<td>80 Km/h – 50 M/h</td>
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<tr>
<td>Minibus (up to 15 seats)</td>
<td>50 Km/h – 30 M/h</td>
<td>40 Km/h – 25 M/h</td>
<td>80 Km/h – 50 M/h</td>
</tr>
<tr>
<td>Buses (more than 15 seats)</td>
<td>50 Km/h – 30 M/h</td>
<td>40 Km/h – 25 M/h</td>
<td>80 Km/h – 50 M/h</td>
</tr>
<tr>
<td>Cranes, Motorized Rigs</td>
<td>20 Km/h – 12 m/h</td>
<td>20 Km/h – 12 m/h</td>
<td>20 Km/h – 12 m/h</td>
</tr>
</tbody>
</table>

5.0 APPLICABLE FORMS

VIKING 01-01-112 F1032 Journey Management Form
VIKING 01-01-103 F1017 Weekly Light Vehicle Checklist
VIKING 01-01-112 F003 Vehicle Monitoring Report

6.0 APPENDIX

Journey Management Monitoring Board

<table>
<thead>
<tr>
<th>Date</th>
<th>Departure Time</th>
<th>ETA</th>
<th>Vehicle</th>
<th>Passengers</th>
<th>Destination</th>
<th>Company</th>
<th>Special Notes</th>
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</table>
1.0 PURPOSE

To identify fall hazards, minimize exposure, and determine which equipment will best safeguard the individual working on that system, and to assure a proper fall protection system is in place and in use whenever an employee is required to work at height. These procedures have been developed as a guideline to be used for worker fall protection during, and are specifically designed to help the supervisors better protect their workers by use of proper fall protection equipment and techniques.

2.0 APPLICATION

These procedures will apply at any time an employee is carrying out routine or non-routine activities on a walking/working surface with an unprotected side or edge 6 feet (1.8 m) or more above a lower surface. These workers must be protected from falling by the use of a fall restraint, or personal fall arrest system, and must be 100% tied off at all times.

3.0 DEFINITIONS

The definitions are shown at the end of the document as ANNEX 1 – List of Fall Protection Definitions.

4.0 RESPONSIBILITIES

It shall be the responsibility of the Supervisors to recognize fall hazards and to provide all necessary approved Fall Protection Equipment for employee use whenever deemed necessary. It will also be the responsibility of the supervisor to provide required Fall Protection Training for their employees so that workers will possess enough knowledge to implement fall protection techniques in an effort to reduce the risk of injury due to fall.

Workers should be knowledgeable of:

- the nature of fall hazards in the work place
- correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems used
- the use and operation of guardrail systems, personal fall arrest systems, safety net systems, and other protection to be used
- the limitations on the use of mechanical equipment, and the correct procedures for handling and storage of equipment and materials and the erection of overhead protection
- dealing with the rescue of an employee after a fall arrest

It will be the responsibility of the employee to follow Viking International Fall Protection Procedures and Techniques given them, and to assure all equipment used for fall protection is well maintained.
5.0 PROCEDURE

Any fall protection program must be designed to identify fall hazards, minimize exposure to those hazards, and determine which equipment will best safeguard the individual worker on that system. A fall protection plan must be set in place for each Viking International location.

Requirements of a Fall Protection Plan:

- May be prepared or modified only by a qualified person
- Must be prepared for the specific site where it is to be applied
- The plan must be available at the site
- Must include precise details of work procedures that must be followed (JSA, HSSE Procedures) to make the work as safe as possible
- Must designate controlled work zones at the rig or facility
- Designate safety monitors who will oversee the Fall Protection Program
- A hazard risk analysis must be made for each fall hazard and consequences must be taken under consideration. It should be assumed that human factors, uncontrollable environmental factors, and working condition factors should be measured when making the analysis.

Worker fall protection plan should be organized into four protection methods based on the risk and level of knowledge required by the worker. All four of these methods must provide near 100% protection against fall injury.

5.1 Hazard Elimination

The best means of providing fall protection is to eliminate the need for a worker to be exposed to a fall hazard. Design engineers and supervisors must make every effort to design or redesign rigs and structures to eliminate the exposure. In the event full hazard elimination is not possible the partial elimination of the hazard should be considered.

Examples:

- Lights – Use longer life bulbs
- Lower lights to the ground for maintenance
- Valves - Locate at safe location on the ground
- Use remote controls to operate valves form a safe location
- Construction - Fabricate as much as possible on the ground level and set in place mechanically

5.2 Traditional Fall Protection

The second best system of providing fall protection is to erect a passive barrier (secondary system) that prevents workers, regardless of their recognition of the hazard from reaching it. This method should only be applied when hazards cannot be eliminated.

Examples:

- Guardrails
- Catwalks (with guard rails)
- Gates and chains
- Grates and covers
- Man lifts
5.3 **Fall Restraint (work restraint)**
The third best means of providing fall protection is to connect workers to a secure anchorage using a short enough tether that they cannot reach the hazard, thereby falling to the next level. Work Restraint Systems may utilize permanent or temporary anchorage, adjustable lanyards, and a Full Body Harness.

**Examples:**
- While working on round structures such as fuel tanks
- Working on roofs or decks adjacent to an unprotected edge or opening
- Inside man lifts where workers may over-reach.

The use of belts in elevated cabs where workers may open doors of windows for ventilation or visibility.

5.4 **Guardrail System**
Guardrail Systems shall comply with the following provisions:

- Top edge height of the top rail shall be 42 inches (1.1m) plus or minus 3 inches (8cm) above the walking/working surface.
- Intermediate members (such as balusters), when used between posts, shall not be more than 19 inches (48cm) apart. Other structural members such as mid rails shall be installed such that there are no openings in the guard rail system that are more than 19 inches wide.
- Guardrail systems shall be capable of withstanding, without failure, a force of at least 200lbs (90 kg) applied within 2 inches (5.1cm) of the top edge, in any outward or downward direction, at any point along the top edge. When the 200lb (90 kg) force is applied in a downward direction the top edge of the guardrail shall not deflect to a height less than 39 inches (1.0m) above the working surface.
- Mid rails, and equivalent structural members shall be capable of withstanding, without failure, a force of at least 150lbs (68 kg). Applied in any downward or outward direction at any point along the mid rail.
- When Guardrail Systems are used around holes, they shall be erected on all unprotected sides. Guardrail Systems used around holes used for the passage of materials shall not have more than two sides that are removable and must be closed when not in use.
- Toe Board must be installed in all elevated walkways and stairs. The height of the Toe Board shall be between 100-150mm.

5.5 **Fall Arrest System**
In the event that fall hazards cannot be eliminated, guarded, or protected by a Work Restraint System then a Fall Arrest System must be provided to stop or minimize injury after a fall. With the exception of a safety netting device all fall arrest systems must have at least the following components.

- ANCHORAGE SYSTEM – temporary or permanent
- CONNECTING MEANS – self locking snap hooks, auto locking carabineer
- FALL ARRESTER – shock adsorbing lanyard, rope grab, ladder device, SRL’s
- BODY SUPPORT – full body harness
- RESCUE PLAN - assisted rescue and self-rescue

5.5.1. **Anchorage System**
Anchorage systems are one of the most important components of any fall arrest system. The anchorage system will consist of a secure structure which will safely withstand the forces expected by a fall arrest, work restraint, and rescue. It will also have some type of connector attached. Anchorage must be able to withstand a force of 5000 lbs. (2267 kg). An anchorage system should exclusively be used for fall protection.

- **Anchorage Strap** may be used as a temporary and moveable means by which a fall protection system is secured to a structure. The anchor strap wraps around the structure with the small d-ring passing through the large d-ring (choker configuration). Anchor straps are made of polyester webbing with forged steel d-rings integrally connected to both ends. Straps must meet ANSI Z359.1 requirements. All straps used for this purpose must be inspected monthly under normal conditions and more often under extreme working conditions. Inspections must be recorded. Damaged or questionable anchor straps should be removed from service.

- **Engineered or Permanent Anchor Systems** should be used when possible and may be connected to a beam, wall or some other strategic location where connections can be safely made. As above, these anchors must be tested to 5000 lbs (2267 kg).

### 5.5.2 Connective Means

The connective means is the devise or combination of devises between the anchor system and body holding devise. The connecting means in a fall arrest system includes devices such as shock absorbing lanyards, attached by double locking snap hooks and carabiners’ that attempt to limit the distance and or reduce the impact force of free fall. Compatibility among all components is extremely important to avoid disconnection.

1. **Snap Hooks** – Used to connect the lanyard to the anchorage and full body harness must be self-locking due to hazards associated with roll-out (accidental disengagement of the connector). Snap hooks must be made from high tensile steel. (Reference ANSI Z359.1). Manual-locking snap hooks do not carry ANSI approval and should not be used. Snap hooks should be inspected on a regular basis and before each use.

2. **Carabiners’** – A connective component generally comprised of a trapezoid or oval shaped body with a normally closed gate which may be opened to permit closing on a body. Carabiners’ used in fall protection should be auto-locking, steel, and capable of withstanding 5000 lbs (2267 kg), and proof tested to 3600 lbs (1633 kg). Two basic examples where carabiners’ can be used are when connecting the front d-ring of a harness to a ladder-climbing sleeve and connecting a self-retracting lifeline to an anchor hook or strap. Manual or non-locking carabiners will not be allowed. Inspections of the carabiner should be carried out each time it is used.

### 5.5.3 Fall Arrester

1. **Lanyards** – Components used in fall protection consisting of a flexible wire rope or strap which generally has a connector at each end for connecting the body support to a fall arrester, energy absorber, of anchorage connector. Lanyards are the most common means of connecting fall restraint and fall arrest systems. Length of the lanyard will vary according to the operation, but are generally 6ft (1.8m). The lanyard should be made as short as practical to reduce the free fall distance. When connecting a lanyard to an anchorage point two distances must be considered, free fall distance and total fall distance. The free fall distance is critical in that the greater the free fall distance the greater the impact force. If a 6ft.(1.8m) lanyard is attached to an anchorage at a workers feet (for this example, the worker is 6ft. tall and the dorsal d-ring is five feet above the standing surface the free fall distance will extend to 11ft.(3.4m). Free fall distance can be minimized by using the shortest possible lanyard, and connecting to an anchorage above the
worker. Total fall distance incorporates all aspects of the fall protection system including free fall distance, activation distance and deceleration distance plus a two foot safety margin. A lanyard is typically anchored by attaching into an anchorage connector with a snap hook. Avoid girth hitching the lanyard around the anchorage and attaching it back into itself. This practice reduces the strength of the lanyard, may cause forced roll-out, and also sharp edges may sever the lanyard during a fall.

2. **Dual Lanyards required** - If it becomes necessary to move beyond the reach of one lanyard while working at height, two lanyards or a dual “Y” lanyard must be worn. One lanyard must remain tied off to a secure anchor point at all times. With one lanyard attached, place the body in a stable position and attach the second lanyard before unclipping the first. Care must be taken to ensure that the second lanyard does not become a trip hazard, or caught in moving machinery. The second lanyard can be attached to a d-ring on the harness to keep it secure.

3. **Steel Cable Lanyards** - Steel cable lanyards may only be used for hot work such as welding of when certain chemicals may be present that could damage a strap. Because steel cable has a limited ability to absorb shock, if must be used with an energy absorber attached. Exercise caution when using steel lanyards as it will conduct electricity.

4. **Lanyard Inspections** - Lanyards must be inspected before use and retired under the following conditions:
   - after a hard fall
   - when the integral energy absorber has been expanded even slightly
   - If the lanyard has been used for any purpose other than that of fall protection.

5. **Energy Absorbers** - are component parts of the fall arrest system that functions to dissipate energy and limit deceleration forces during a fall and should be attached to the dorsal d-ring. Common energy absorbers are made of flat folded webbing, folded and stitched in a way to cause a controlled tare thereby absorbing energy.

**Note:** With the use of an energy absorber, one must take into account the extended fall distance with elongation and deployment. The deployment of this device may add an additional 3.5ft to the total fall distance.

5.5.4 **Body Support**

The body support is a component of the fall arrest system comprised of straps suitably arranged and assembled to support the workers body during and after a fall arrest. A Full Body Harness is the accepted standard body support devise and is designed to fasten around a person in a manner so as to contain the torso and distribute the fall arrest forces over the upper thighs, pelvis, chest and shoulders. The “personal fall arrest system” when stopping a fall shall limit the maximum arresting force on an employee to 1,800 lbs (816 kg).

**Note:** A Waist Belt/Body Belt are not be used as a part of the Fall Restraint System. Waist belts are designed for positioning only, and never for fall arrest. These belts do not distribute impact forces well, increases chances for injury, and is intolerable for a person suspended and awaiting rescue.

1. **Proper Harness Adjustments**

   Adjustment of the full body harness is critical to proper function. Always refer to manufacturer’s recommendations for proper fit and adjustment. The following is a typical donning sequence for a fall arresting harness.
### Working at Heights

- Spread harness out on a flat surface with the Dorsal D-ring down. Undo and lay out the chest strap, leg loops and waist belt (if it has one). The color of the straps located at the dorsal D-ring will denote shoulder of upper straps.
- Put the harness on with the upper straps over the shoulder. Locate the sub-pelvic strap.
- Adjust the sub pelvic strap to fit snugly below the buttocks by adjusting the front adjuster buckles.
- Be sure that the shoulder strap ends are equally balanced.
- Pull the leg strap (from behind) between the legs, around the front of the groin and through the harness adjuster buckle located on the front of the hip and adjust to a snug fit. Do not over tighten. Repeat on the other leg.
- Thread the chest strap through the friction buckle and adjust for a snug fit. Do not over tighten. Shoulder straps should be parallel to one another after the adjustment. The chest strap is positioned over the sternum and held in place by strap keepers.
- The rear Dorsal D-ring should be located between the shoulder blades. This is adjusted by a buddy pulling the D-ring while moving it back and forth in a “walking” motion.
- Buckle keepers are positioned under the edge of the buckles to minimize creep. Strap end keepers should be pushed as close to the end of the strap as possible.

### 2. Safety checks

The buddy system should be used to do a “head-to-toe” methodical inspection of the equipment remembering to check the entire system for errors.

This check is most effective when done in this order:

- a) Hard Hat with secured chin strap
- b) Safety Glasses
- c) Radio (if applicable)
- d) Harness (front):
  - i) keepers positioned
  - ii) shoulder straps snug and even
  - iii) leg loops snug
  - iv) chest strap fixed in place
- e) Harness (rear):
  - i) dorsal D-ring between shoulder blades
  - ii) sub pelvic strap between buttocks
  - iii) straps flat and not twisted
  - iv) no loose clothing or straps
  - v) proper footwear
  - vi) proper attachment to fall protection system

### Note:

All components of a Fall Protection System should be from the same manufacturer to ensure compatibility. Incompatible components can result in “roll out” where the components can slip out with the potential of releasing the person. Equipment must not be modified.

### 3. Inspection and Maintenance

A visual inspection of all component parts of the fall arrest system should be performed and recorded on Form VIKING 01-01-103-F1013 Monthly Fall Arrestors Control by the user each time the equipment is to be used. Equipment with any noted deficiencies must be immediately taken out of service. The equipment then must be repaired and re-certified or destroyed.
Working at Heights

Detailed Inspection:

- Inspect hardware of harness (i.e. buckles, d-rings, back pad, keepers, etc,) for damage, distortion sharp edges, burns, cracks worn parts and corrosion. Make sure buckles work freely.
- Inspect webbing for fray, cuts and broken fibers. Check for tears, abrasions, and discoloration. Broken stitches may be an indication that the equipment has seen an impact and should be removed from service.
- Inspect labels to check year of manufacture and ensure that they are all present and legible.
- Check tongue and buckle grommets to ensure that they are still circular.
- Inspect webbing keepers to ensure they are still intact.
- Damaged or questionable webbing or parts must be immediately replaced.

Cleaning and Maintenance

All full body harnesses and other webbing should be cleaned on a regular basis with water and a mild detergent. Wipe off the hardness with a clean dry cloth, and hang out to air dry. Do not apply heat to the harness and other webbing. Equipment should then be stored in a dry storage locker away from chemicals.

5.5.5. Rescue Plan

There are no specific regulations that dictate how rescues should be performed. Regulatory agencies do require that prompt rescue should be provided should a fall occur. Research has shown that when a person is suspended by the d-ring of a fall protection harness, serious medical problems will develop after 30 minutes. This suspension time should be reduced if the worker was injured during a fall.

The best form on rescue is self-rescue. This form of rescue is possible if the worker has no serious injury, is using proper equipment and has assessed the hazard prior to the fall.

Assisted rescue is the next best option for rescuing a fallen worker. This form of rescue will involve other workers using equipment and procedures to raise or lower a person to the ground. Assisted rescue should be pre planned and assigned to a qualified person who is skilled in the use of rescue techniques and equipment.

A rig specific rescue plan must be written and made available before the rescue is performed.

5.6 Ladder Climbing System

A ladder climbing system is a fall arrest system that enables a worker to safely climb or descend a fixed ladder such as the derrick ladder, or other similar climbing structure. The system consists of two components: a ladder climbing sleeve and a cable assembly. The cable assembly is permanently affixed to the ladder according to manufacturer’s instruction. Typically the cable will run vertically along the middle of the ladder. This cable is mounted at the top rungs through connecting hardware, fastening at the ladder’s base where tensioning devices are used for tensioning. A ladder climbing system may accommodate two or more climbers when properly installed.

Ladder-Climbing Sleeve: Part of the Ladder Climbing System is a sleeve which is connected from a 3/8 inch diameter solid core ladder cable (stainless steel or galvanized) to the frontal D-Ring of the workers full body harness with a carabineer. When connecting to the climbing sleeve a maximum length from the cable to the front D-Ring on the full body harness shall be no greater than 9 inches (23 cm). Lengths over 9 inches will add to the freefall distance and generate higher impact forces on the system and the worker. The Ladder Climbing Devise slides vertically up and down a cable and is designed to lock off by inertia or by cam-action in the event of a fall. Compatibility among all components and connectors is extremely important.

WARNING: Only full body harnesses shall be used with this system.
Visual inspections should be performed by the user prior to each use:

- Check for obvious defects such as corrosion of the cable carrier sleeve for loose or missing fasteners, or other damage.
- Inspect the sleeve and connecting carabineer for proper operation. Inspect full body harness in accordance with instructions.
- Attach the sleeve to the cable and slide it up and down to ensure smooth movement. Pull down sharply on the arm to confirm that the sleeve locks on the cable.
- Visually inspect the cable going up the ladder for bends, entanglements with the climb assist and other hazards.

A detailed formal inspection of the entire ladder system should be done at least annually by a competent person. Formal inspections should be scheduled and conducted based on the amount of use this device may encounter. Inspections must be documented.

5.7 **Self-Retracting Lifelines (SRL)**

Self-Retracting Lifelines or Fall Arrest Blocks perform a tethering function which allows unrestricted vertical movement while arresting a fall. The SRL has a housing normally attached to an anchorage and contains a drum-wound lifeline. The retracting end of the lifeline will unwind from the drum under slight tension during normal work movement and retract automatically. Quick movement as in the onset of a fall will lock the drum and arrest the fall. SRL’s will lock when the user falls at more than approximately 4.5 ft. (1.2 m) per second.

SRL’s should be strategically located on all rigs in locations where there are not sufficient tie off points for lanyards or when more freedom of movement is desired. Common applications of these devices are BOP stacks, stabbing boards, over the side work, in the mast or derrick, derrick stands, and scaffolding. Other areas that SRL’s may apply are above A-legs, and crown section.

All monkey boards shall include a fixed self-retracting lifeline above the board to be used by the derrick man while working on the monkey board. A SRL static line system will also be used as a secondary means of fall protection for any personnel being raised on man rider wenchs or air hoist or any other lifting devise. Freedom of movement afforded by SRL’s may cause workers to wander too far away from the anchor point. SRL’s are anchored directly above the worker and movement away from the center line should not exceed 30 degrees to eliminate the hazard of swing fall. General advice suggests that the distance should be evaluated on a case by case basis in accordance with the observed hazard. An auto-locking carabineer or snap hook is integrally connected to the retractable lifeline which the user attaches directly to the dorsal D-ring of the full body harness. The lifeline must be attached to the D-ring and not to a lanyard.

When using retractable devices when the device is out of the workers reach, a small diameter rope tagline should be used to retrieve the connector for attaching to the harness. The device’s spring memory will be affected if tied down to an object while extended for long periods, preventing the lifeline from feeding back into the housing.

A visual inspection should be performed prior to each use:

- Inspect the impact indicator to ensure impact loading has not occurred
- Grab the snap hook and firmly pull down on the lifeline. The self-retracting lifeline should lock.
- Visually check the length of the lifeline and the anchor to which it is connected.

A detailed inspection should be performed by a competent person of a regular basis and no less than one time per year. Under extreme working conditions, frequency may need to be increased.
WARNING: Do not attempt to service a self-retracting lifeline “in-house.”

5.8 Horizontal Lifelines
Horizontal Lifelines consists of a flexible line with connectors at both ends for securing it horizontally between two anchorages. Horizontal Lifelines are designed to support a worker while working on a horizontal plane. Depending on the nature of use, this system may be permanent or temporary. If an area requires frequent access the lifeline should be permanent. Horizontal Lifelines may be applied for fall protection on engine sheds, down the mast on rig up/rig down operations, and while working on the rig floor before the floor plates have been installed.

The forces generated by a fall onto a horizontal lifeline are much greater than those generated on the vertical. Such forces are exerted on the anchorage point and may be 15 times greater than those generated on vertical. It is therefore very important that adequate safety margins are designed into the system. Every Horizontal Lifeline is designed different and one line will very significantly from another. Horizontal Lifelines must be designed by a professional engineer to fit the need and avoid all hazards associated with design.

Horizontal Lifeline Design:

• Lifelines should be rigged up with a slight sag in the line to help reduce forces on the anchorage while arresting a fall.
• In line energy absorbers should be used with a full body harness.
• Wire rope of ½ inch diameter or greater should be used for strength.
• Regulatory agencies require a designed safety factor of two, and a minimum strength of 5,000 lbs.

5.9 Covers
Covers for holes in floors, roofs, and or other working/walking surfaces shall meet the following requirements:

• Covers shall be capable of supporting, without failure, at least twice the weight of employees and their equipment.
• All covers shall be secured so as to prevent accidental removal by wind, equipment, or employees.
• All covers shall be marked or color coded to provide warning of a hazard.

7.0 REFERENCES
VIKING 01-01-103-F103 Monthly Fall Arrestors Control
Viking International Standard Safety Equipment & PPE Catalog (Currently under development)
ANNEX 1
List of Fall Protection Definitions

**Adjustable Lanyard** - A lanyard with special hardware, which allows the user to change its length according to the task.

**Anchorage** - A secure connecting point capable of safely withstanding the impact forces applied by the Fall Arrest System. In Vertical Fall Arrest Systems, the anchorage must be capable of supporting 5,000 lbs.

**Auto Locking** - A devise that will automatically lock when released and will not unlock without at least two deliberate motions by the user.

**Automatic Fall Arrester** - A fall arrester that will freely travel up and down a Vertical Lifeline, smoothly following the movement of the user. In the event of a fall, the device will lock into the Vertical Lifeline. Automatic Arresters must meet the requirements of the ANSI Z359.1 standard.

**Body Support Device** - A strap or assembly of straps that securely encircle a user’s body and provide hardware for the attachment of Connecting Means between the user and an anchorage. A Full Body Harness is the best body support device.

**Boatswain’s Chair** - A simple Body Support Device used for work positioning, typically incorporating a rigid seat and a suspension bridle. Users sit on the seat, which is suspended from a higher Anchorage. A Fall Arrest system separate from the Boatswain’s Chair must be provided in case the Boatswain’s Chair system fails or the user falls out.

**Carabineer** – An oval ring with a gate on one side that, when open, allows objects to pass into and out of the interior of the Carabineer ring. A Carabineer allows users to couple and uncouple components of a Fall Protection System. Carabiners’ used for fall protection systems should meet the requirements of the ANSI Z359.1 standards.

**Certified** – Approved in writing, by a qualified and responsible authority as meeting applicable regulations or standards.

**Compatible Connection** – A connection that uses hardware that eliminates the possibility of accidental roll-out. Compatible Hardware must be locking or auto-locking and be sized so that gates on carabiners’ and snap hooks cannot be loaded in a manner that might cause or force roll-out.

**Connecting Means** – A device or component used in a fall protection system to couple a body device (preferably a full body harness) to an anchorage point. Connecting means include Lanyards Self Retracting Lifelines, Vertical Fall Arresters, and Carabiners’.

**Deceleration Distance** – the distance fallen between the engagement of a fall arrest system and the point of fall arrest.

**Dorsal “D” Ring** - the mandatory fall arrest connection point on a full body harness located between the shoulder blades on the back of the harness.

**Energy Absorbing Lanyard** – A lanyard that incorporates a personal energy absorber or other means to reduce the impact force on the user and the Fall Arrest System during a fall. They must meet the requirements of the ANSI Z359.1 standard (1800lbs. (816 kg) maximum impact and 3.5 ft. (1.1 m) maximum extension).

**Engineered Anchorage** – An anchorage that has been designed and approved by a professional engineer, maintaining a factor of safety of at least two.

**Fall Arrest System** – A system designed to stop one of more persons from striking a lower level or obstruction if a fall occurs.

**Fall Protection** – The means employed to prevent or reduce the severity of injury due to accidental falls.

**Fall Restraint** – The prevention of a fall by using a tether attached to a user’s body holding device that prevents him/her from reaching an unprotected edge or unprotected opening.
Forced Roll-Out – the unexpected disengagement of a locking connector from an anchorage, or other component due to overload and structural failure of the locking mechanism caused by forces acting on the gate of the connector.

Free Fall – The vertical distance from the onset of a fall to that point where a fall arrest system begins to engage.

Full Body Harness – A body support device, similar to a parachute harness, designed to transfer suspension forces or impact during a fall arrest to the buttocks.

Hazard Elimination - The best choice for protecting workers from fall hazards is to change the task, process, controls, or other means to eliminate the reason to be at the hazard.

Horizontal Lifeline System – A flexible line made from rope, wire or wire rope, which spans horizontally between two end anchorages.

Improvised Anchorage - An anchorage that has been created by temporarily attaching portable connectors (such as anchor slings, beam clamps or tie-off adapters) to a secure point. Improvised anchorages must be strong enough to withstand at least 5,000 lbs. (2267 kg.) of impact force per person connected to the system.

Lanyard – A length webbing with connecting hardware (usually a Snap hook) at each end. Most Lanyards incorporate a personal energy absorber to reduce the impact forces when arresting free fall.

Personal Energy Absorber – A connecting means component that sacrificially dissipates energy generated during a fall.

Primary System – In fall protection, the primary system is the first mechanism that prevents a person from falling. Fall protection is the secondary system of protection.

Rescue – The process of evacuating an injured or incapacitated person to a safe location where they may receive needed medical attention. This includes persons inside confined spaces or anyone who has fallen and is suspended from a fall arrest system. The tolerable suspension time in a full body harness is approximately 30 minutes.

Self-Rescue – When a person is not incapacitated, the ability to evacuate themselves to a safe location.

Self Retracting Life line (SRL) – A connecting means that automatically adjusts its length as the user moves towards and away from the Anchorage. The SRL housing contains a spring loaded drum on which a line (made of rope, wire rope, or webbing) is wound or unwound.

Snap hook – A hook with a spring loaded gate that, when open, allows objects to pass into and out of the interior of the hook. Snap hooks are used to connect to Anchorages, “D” Rings and other components of a fall protection system.

Swing Fall – A pendulum motion experienced by the user of a fall arrest system that occurs when the anchorage is not directly above the user at the onset of a fall.

Tagline – A length of cord used to control personnel while being raised in a boatswain chair.

Y - Lanyard – A lanyard that is manufactured in a “Y” configuration to provide continuous fall protection when transferring between anchorages. The stem of the “Y” is connected to the user’s full body harness.

100% Tie-Off - A method of transferring from one anchorage or fall arrest system using a “Y” lanyard or two connecting means. The user must remain connected to at least one anchorage/fall arrest system while advancing to connect to the next.
1.0 PURPOSE

The purpose of this procedure is to reinforce good practices by highlighting the general safety rules and precautions related to reducing the risk of personnel injury, fire, and explosion on Viking International facilities resulting from the storage and handling of compressed gas cylinders.

The industrial gases referred to in this procedure can be divided into three categories; Combustible, non-combustible and oxidant.

It is important that personnel have a basic understanding of the properties of these gases if they are to be used, stored and handled in a safe manner.

1) **Acetylene**: Is naturally odorless, but is odorized to give it a distinctive smell. It is very easily ignited and has a wide explosive range. It is lighter than air.

2) **Propane**: Is odorized industrially to give it a distinctive fish-like smell. It will ignite and burn instantly from a spark or piece of hot metal. It is heavier than air and may collect in ducts, trenches, drains and sumps. These accumulations can spread considerable distances, and if ignited the flame can travel back to the original source.

3) **Hydrogen**: Has no smell and is non-toxic. It is much lighter than air and will collect at the highest point in any enclosed space without adequate ventilation. Although hydrogen has a narrower explosive range than acetylene, a spark of very low energy is sufficient to cause ignition.

4) **Argon**: Has no smell and is heavier than air. It is an inert gas, non-toxic and does not burn.

5) **Oxygen**: Has no smell and is not toxic. It will not burn but supports and accelerates combustion. The normal oxygen content of air is 20.9%. Oxygen content above this increases the speed at which materials will burn. Materials not normally considered combustible may be ignited by sparks in oxygen rich atmospheres.

<table>
<thead>
<tr>
<th>Gas</th>
<th>Characteristics</th>
<th>Cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen</td>
<td>No smell – nontoxic. Will not burn but supports and accelerates combustion. Combustibles may be ignited by sparks in oxygen-rich atmospheres.</td>
<td>Black/white neck</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>No smell – does not burn. Inert except at high temperatures. Nontoxic but does not support life so could cause asphyxiation in high concentrations.</td>
<td>Gray</td>
</tr>
<tr>
<td>Argon</td>
<td>No smell – heavier than air – does not burn – inert. Will cause asphyxiation.</td>
<td>Peacock blue</td>
</tr>
<tr>
<td>Acetylene</td>
<td>Distinctive garlic-like smell. Fire and explosion hazards are more severe than those of propane.</td>
<td>Reddish brown/maroon</td>
</tr>
<tr>
<td>Propane</td>
<td>Distinctively fish-like smell. Will ignite and burn instantly from a spark or piece of hot metal. Propane is heavier than air and will collect in ducts, drains, and low points.</td>
<td>Normally bright red and bearing words of “Propane” and “Highly Flammable”</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>No smell – nontoxic. Much lighter than air. Will collect at the highest point in any enclosed space unless ventilated there. Extreme fire and explosive hazard.</td>
<td>Normally bright red</td>
</tr>
<tr>
<td>CO₂</td>
<td>No smell – heavier than air – does not burn. Will cause asphyxiation in absence of sufficient oxygen to support life.</td>
<td>Black</td>
</tr>
</tbody>
</table>
2.0 STORAGE REQUIREMENTS

Follow these storage requirements:

- Store cylinders only in locations approved by the certifying authority as shown on the rig hazardous area drawings; areas must be open and well ventilated.
- Store gas cylinders with the safety cap on unless connected to a gas supply system.
- Store gas cylinders securely fastened in racks, in the upright position, and in a safe, dry, well-ventilated place not exposed to heat sources or direct sunlight.
- Ensure storage racks have individual restraints for each bottle.
- Gas cylinder storage should be conveniently located so that gauges and hoses may remain attached and not required to be moved from place to place.
- Vent, tag, and return damaged cylinders to the supplier.
- Store cylinders containing oxygen or oxidants as far apart as possible from flammable gases (e.g., acetylene cylinders); the minimum separation distance is 20 feet (6.4 m).
- Protect all gas cylinders from moisture, corrosive chemicals, and fumes.
- Verify that safe storage is available before accepting gas cylinders on the rig.
- Do not accept gas cylinders on the rig without the relevant certification documentation package including material safety data sheets (MSDS).
- Do not lift loads over the top of gas cylinder storage areas.
- Label empty cylinders as “EMPTY.”

3.0 SAFE HANDLING PRACTICES

Follow these gas cylinder safe handling practices:

- Obtain and review the MSDS before using any gas product.
- Gas cylinder hookup and change-out will only be performed by authorized personnel.
- Do not move or transport cylinders without the safety cap on and never lift or pull using the cylinder valve.
- Keep in-use gas cylinders upright, secured to a fixed structure, and outside vessels and enclosed spaces; do not use ropes for securing gas bottles.
- Use only approved gas cylinder carts and racks for on-loading, offloading, and on-rig movement.
- Do not stand in front of, or place the hand over, the unprotected valve opening at any time.
- Ensure that no ignition source is present prior to opening the cylinder valve.
- Clean out the cylinder valve opening before connections are made.
Compressed Gas Cylinders

- Ensure valve threads are free of contaminants, including oil, grease, and dirt, before making connections to the cylinder valve.

- Check that fittings are compatible before attempting to make connections to the cylinder valve; different types of bottles use different threads; do not force on incompatible connections.

- Ensure the cylinder valve is fully open when in use and closed securely immediately after use, unless the cylinder is in a centralized gas distribution system with means of remote isolation.

- Ensure that all gas cylinders used for cutting, welding, and burning are fitted with a suitable flashback arrester.

- Handle “empty” cylinders with the same precautions as cylinders filled with gas; empty cylinders still contain residual gas and pressure.

- Do not use gas cylinders as rollers or supports of any kind.

- Gas cylinder storage areas must be clear of all sources of ignition and well ventilated preference should be given to open-air sites, but with some protection from the environment. Good ventilation is essential to ensure the dispersal of potential gas leaks. Storage on wet soil or on a permanently damp base will cause corrosion, so cylinders should be stored on a stable grating or on a drained concrete or compacted base. Cylinders should be stored away from corrosive chemicals. Adequate fire-fighting equipment, which can be quickly and efficiently operated in an emergency should be provided at storage areas.

- Fuel gas and oxygen cylinders, whether they are full or empty must be segregated. In addition, full cylinders, those in use and empty cylinders must be stored separately and some means for identification provided. The valves of empty cylinders must be kept closed.

- Single cylinders, particularly those having a round base, must be adequately secured during storage, preferably in specially designed racks or quads. Fuel gas cylinders (e.g. acetylene or propane) must always be stored vertically. Should the cylinders be stored horizontally, liquid may be forced out of the valve on opening.

- Review the chart below illustrating the various types of cylinders and color codes used that are posted around the rig before gas cylinder handling operations; typical color codes and gas characteristics are included in the following chart.

4.0 GAS CYLINDERS DESIGN AND IDENTIFICATION

Compressed gas cylinders are subject to statutory regulations and standards. These define the construction material, the method of construction, and the details of tests and inspections. Marks appropriate to particular cylinders are on the neck of the cylinder and include:

- Manufacturer’s name, mark and serial number, together with an indication of the specification to which the bottle is constructed and its year of manufacture.
- Date of last hydro test
- Test pressure
- Minimum capacity of cylinder
- Tare weight
The valve outlets of oxygen and non-combustible gas cylinders have conventional right hand threads. The valve outlets of combustible gas cylinders have left hand threads. The actual valves in all gas cylinders whether they contain combustible or non-combustible gas are opened by turning anti-clockwise and closed by turning clockwise.

Cylinders have safety devices built into them to release energy in a controlled manner in abnormal circumstances. A common safety device is a burst disc constructed so that it withstands the pressure of the cylinder under normal conditions, but will rupture or burst if the pressure becomes abnormally high. Acetylene cylinders are fitted with two bursting discs, one on the back of the valve opposite the spindle and the other in a plug on the base of the cylinder shell.

Propane cylinders are normally fitted with a pressure relief device that operates at approximately 382psi.

5.0 EMERGENCY PROCEDURE

All personnel must be aware of the action to be taken in an emergency. Immediate remedial action should only be taken by operators when it is safe to do so.

If cylinders are in the vicinity of a fire immediate action should be taken to cool the cylinders to prevent a further incident through excessive heating. Cylinders which have been exposed to excessive heat should be clearly marked and returned to the supplier.

If a cylinder is heated accidentally, or becomes hot due to a flashback (or in the case of acetylene cylinders due to a mechanical shock) it must be dealt with promptly as follows:
1) Shut the valve.
2) Detach the regulator or fitting if possible.
3) Drench the cylinder with water.
4) When cold, store outside in a safe place until it can be returned to the supplier.

If a cylinder or fitting shows a minor leak that cannot be stopped it should be moved outside to a safe area.

In the event of a flashback, the following action should be taken:
1) Shut both valves, closing oxygen first.
2) If the torch has overheated plunge it in cold water.
3) Check that regulator settings are correct.
4) Check cylinder pressures.
5) Purge both hoses individually.

6.0 OXIGEN ACETYLENE SET

- Flashback arrestors are required at both ends of both hoses.
- Sets should be mounted securely in a specially designed holder such that the bottles remain upright.
1.0 PURPOSE

The purpose of this procedure is to reinforce good practices by highlighting the requirements related to the registration, inspection, and marking of lifting equipment used on Viking facilities. These requirements help ensure that the margin of safety designed into lifting equipment is maintained to minimize the risk to personnel safety.

Users of lifting equipment must be suitably skilled and competent through the required training. Persons without the required training should not attempt to select or apply rigging equipment unless supervised by a competent person. Adhering to safe working practices will greatly assist in ensuring safety in lifting operations but it is the user’s responsibility to select, inspect, correctly use, maintain and properly store all items of lifting equipment.

2.0 SCOPE

The procedure applies to all Viking International installations and sites.

3.0 DEFINITION

Lifting Equipment: The term “Lifting Equipment” in this context is a general term that includes loose lifting gear e.g., slings, wire ropes, shackles, load binders, turnbuckles, hooks, swivels, carabineers, elevators, etc. Fixed lifting equipment includes equipment such as winches, runaway beans, pad eyes and drilling and lifting equipment such as slips, hooks, skid lifting points etc.

4.0 GENERAL PROCEDURES

4.1 Lifting Equipment:

Lifting Equipment Register: All equipment must be logged into the lifting equipment register shown below. The lifting equipment register must be kept up to date at all times. Original purchase certificates as well as recertification of the lifting equipment must be kept on-site and logged in the lifting equipment register. Scanned backup copies of the lifting equipment certificates should be sent to the purchasing department and filed in the proper asset folder.

- Manufacturer: The manufacturer of the lifting equipment must be a recognized and certified company. Please refer to the purchasing department for concerns regarding approved vendors.
- Item Description: The item description should contain the information as to the type of lifting equipment, size, and material.
- Identity: Unique identifying number, most commonly the manufacturers’ serial number. The identity number needs to be maintained and visible at all times. Loss of the identity number could result in the inability to track the inspection record. All lifting equipment that cannot be traced or certified safe must be destroyed.
- SWL: SWL refers to the safe work load and is written on the inspection sheet. The SWL is not necessarily the lifting equipment rating. Refer to the certification for the SWL as well as taking into consideration the lifting angles which could reduce the SWL capacity. Refer to the lifting plan procedure.
- Date first put into use: Refers to the day the lifting equipment was commissioned.
• Inspection date and certificate number: The newest certificate number should be the one listed in the lifting register. **All lifting equipment must be inspected, certified, and color coded every 6 months.**

• Status: The status refers to the current usage and location of the lifting equipment. If the equipment is located on the pressure pumps it should be noted in the status section. If the equipment has been destroyed it should be listed as such in the status section.

• Remarks: The remarks section allows the inspector and keeper of the register to make comments on the condition, location, status, or other information that is necessary for other users of the equipment to know and understand.

4.2 **Color Coding:** Color coding is used to identify the lifting equipment that has been inspected and certified by a qualified, 3rd party inspector. Equipment that has been inspected and certified should be painted or tagged with the appropriate color according to the lifting chart below. Lifting equipment that has not been certified shall not be painted or tagged. Any new equipment that has been purchased and comes with a certificate is permitted to be painted or tagged upon its commissioning in the work site.

<table>
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<th>EVEN YEARS</th>
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<th>July to December</th>
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<table>
<thead>
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<tr>
<td></td>
<td>2018 YELLOW</td>
<td>2019 GREEN</td>
</tr>
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</table>

Every six months all lifting equipment should be inspected and certified. The color coding is then updated during the recertifying process. Lifting equipment that is improperly colored should not be used until the equipment has been recertified and colored appropriately.

4.3 **Pre Job Inspection:** A pre-job inspection is required before any lifting equipment is to be used. The user of the equipment should look for any defects or abnormalities in the equipment. Refer to Annex 2 of this procedure for examples of what to look for during a visual inspection. Any deficiencies that are found during the inspection are to be noted and the equipment is to be tagged out for repair and recertification or destroyed.

The visual inspection is to be documented and filed in the applicable inspection binder in the SMART Cabinet filing system.

4.4 **Usage:** The user of lifting equipment is to be trained and/or certified per Viking International training requirements. The operator is to refer to the lifting plan if one is available. Should a pre-determined lifting plan not be available, a work permit is required to complete the lift. A specific JSA is to be conducted as well as the plan on how to properly rig the lift.

4.5 **Storage:** Properly storing the lifting equipment is essential to both the reliability of the SWL and the life of the equipment. All equipment is to be stored according to the manufacturer’s recommendations. All equipment is to be properly stored when not in use. Never leave idle lifting equipment sitting in the elements (sun, water, etc.). All items are to be properly cleaned prior to placement in the storage
facility to reduce the corrosion possibilities. If the lifting equipment has to be stored outside, ensure that it is set off the ground and is protected from the elements.

4.6 Maintenance: All equipment is to be maintained per the manufacturers’ recommendations. Regular maintenance is to be performed on all lifting equipment as well. Maintenance includes, but is not limited to, cleaning, lubricating, polishing, and minor repairs. Items that are used more frequently will require more maintenance. Items that have been left idle for an extended period of time should have maintenance performed on it prior to being approved for field use. Refer to the maintenance engineer at Viking International for further maintenance information and/or recommended schedules.

5.0 Frequency of Control and Responsibilities

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<td>Forklift pre start checklist</td>
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<tr>
<td>VIKING Form 01-01-110 F1039</td>
<td>Crane pre-start checklist</td>
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<td>VIKING Form 01-01-115 F1013</td>
<td>Lifting Equipment Register</td>
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<td>Fork Lift Operation</td>
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<tr>
<td>VIKING 01-01-106</td>
<td>Crane Operation</td>
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<tr>
<td>VIKING 01-01-115</td>
<td>Lifting Equipment-Certifications</td>
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</table>

6.0 References

1. VIKING XX-XX-XXX FXXXX Lifting Plan Procedure: Under Development
2. VIKING XX-XX-XXX FXXXX Maintenance Procedure: Under Development
3. VIKING 01-01-104 Lifting Equipment and Accessories Operation and control
4. VIKING 01-01-105 Forklift Operation and Control
5. VIKING 01-01-106 Crane Operation and Control
6. ANNEX 1 Approved Lifting Equipment
7. ANNEX 2 Lifting Devices
7.0 PROCESS MAP

Step #1  Purchase approved and certified equipment

Step #2  Inspect and certify each piece of lifting equipment every 6 months

Step #3  Properly color code each piece of lifting equipment

Step #4  Visually inspect lifting equipment and fill out applicable inspection form

Step #5  Did the equipment pass inspection?

   No

   Tag and remove for repair or destruction

   Crane or Equip. Operator

   Yes

Step #6  Return equipment to proper storage facility

Step #7  Refer to lifting plan for proper usage

Step #8  Maintain equipment per the maintenance schedule

Crane or Equip. Operator

Crane or Equip. Operator

PIC
8.0 PROCESS DESCRIPTION

<table>
<thead>
<tr>
<th>Step #</th>
<th>Process Step</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1      | Purchase approved and certified equipment             | Person in Charge (PIC)/Purchasing Department  
- Purchase equipment that is ISO certified or equivalent LOLER, PUWER, LEEA                                                                    |
| 2      | Inspect and certify each piece of lifting equipment   | Person in Charge (PIC)  
- Ensure that all lifting gears are inspected by a certified inspector and SWL determined.                                                   |
| 3      | Properly color code each piece of lifting equipment.  | Person in Charge (PIC)  
- Ensure that the equipment is color coded in accordance with section 4.2 of this procedure.                                                 |
| 4      | Visually inspect lifting equipment and fill out       | Crane or Equip. Operator  
- Inspect all lifting equipment before lifting is to commence. JSA is also required if the lift is out of the norm of operation. Ensure that the lifting equipment is the correct type for the job. |
| 5      | Did the equipment pass inspection?                    | Crane or Equip. Operator  
- Ensure that all equipment that has visible signs of failure must be tagged and removed from the operation. Refer to pages 8-12 and 17-19 for visual signs of failure and proper use. |
| 6      | Tag and remove for repair of destruction              |                                                                                                                                             |
| 7      | Refer to lifting plan for proper usage                | Crane or Equip. Operator  
- Ensure the weight of the material being lifted is known and reference the lifting register for the SWL of the selected lifting equipment. Reference pages 13-14 to determine the angle of the lift and the corresponding changes in SWL. |
| 8      | Return equipment to proper storage facility           | Crane or Equip. Operator  
- Store all equipment according to the manufacturer’s recommendations. Avoid the lifting equipment coming in contact with water or direct sunlight for extended periods of time. |
| 9      | Maintain Equipment per the maintenance schedule       | Person in Charge (PIC)  
- Ensure all lifting equipment should be maintained according to the manufacturer’s specification to ensure the SWL and longevity of the lifting equipment. |
ANNEX 1

APPROVED/DISAPPROVED EQUIPMENT

Approved Equipment

1. Ratchet Type load binders
2. Factory fitted eye slings
3. Air hoists
4. Cranes
5. Forklifts
6. Certified, clearly inspected and marked pad eyes
7. Chain hoists and chain falls
8. Certified barrel lifting devices
9. Grade “S” or greater Bolt and Chain type Shackle
10. Wire Rope Clamps- Installed properly per instructions below
11. Eye bolts
12. Slings

Disapproved Equipment

1. Chains- chains are only allowed for securing loads.
2. Lever type load binders
3. U-bolt or bulldog clips when subject to dynamic loading
4. Flame cut pad eyes
5. Equipment without serial numbers
6. Homemade barrel lifting devices
7. Screw pin shackles as mentioned below
8. Webbing slings- not allowed for lifting or for handling and control
Mono rails should be inspected for signs of corrosion. In particular in the points to which they are welded or bolted to other structural support members. If any damage such as bending, buckling or twists are noted that may affect the safe operation of the monorail it shall not be used until repairs and/or testing have been effected.

Only use monorail that are clearly marked with SWL and are within currency of testing requirements. Push type and hand geared travel monorail trolleys should only be used on a suitably rated beam that is purpose designed as a lifting beam with the approved SWL painted on the beam. The push type must be pushed or pulled along the lifting beam. This type is generally used for lighter lifts and does not offer the control that a geared type provides.

Monorail trolleys should be inspected for signs of corrosion, wheel damage, security of through bolts and in the case of geared trolleys, the operating chain and chain wheel should be inspected for signs of damage and for freedom of operation. The trolley should be correctly adjusted to fit the beam or joist on which it is to operate. The trolleys are fitted with a series of spacers and washers on the through bolts to provide for a variety of steel member widths.

All fixed lifting equipment should have a unique identifying serial number, data plates displaying SWL and testing dates and traceability to an original test certificate as per relevant International Standards. All items found in unsatisfactory condition or missing original test certification must be tagged and removed from service until replaced/repaired and recertified by an authorized inspection authority.

All runway beams, winches, swing jibs and similar lifting equipment should be inspected for conformity with the relevant International Standards and visually examined and tested. Visual inspections are to be conducted every six months and recorded on the rig Lifting Equipment Register. Periodically, load testing and magnetic particle inspections will be required.

**Fixed Location Pad Eyes**

Permanently attached lifting points should be designed to a recognized standard and be subject to examination and testing. The design of lifting points such as pad eyes should incorporate the magnitude, direction and effects of load distribution. Adequate clearances should be provided between the pad eye and the connecting device.

Valid certified pad eyes which have undergone proof loading and non destructive testing should be identifiable at point of location with the pad eye centrally positioned in a 30cm x 30cm contrasting color painted square. The SWL and the identification number should be stenciled in a contrasting color within the square. If a pad eye does not have the required load rating marked, it should not be used for lifting activities until verified as safe for the intended load.

Pad eyes should be either supplied by an approved supplier or machined as per an approved design using the correct construction and materials, tested and certified accordingly to the relevant standard (API RP2A).

**FLAME CUT, HOME MADE OR DAMAGED PAD EYES SHOULD NOT BE USED**

Visual inspections of all pad eyes for corrosion and/or deformation are to be conducted prior to use and every six months. Magnetic particle inspections of pad eyes will be carried out annually.

It is an unsafe work practice to sling plain wire rope around beams for the purpose of suspending equipment such as Self Retracting Lines, sheave blocks or derrick man escape units. Correctly sized and certified fixed location or clamp type pad eyes should be installed for suspending all equipment in the mast.
Chain Hoists & Chain Falls

Safe working loads for chain hoists are generally pressed or cast into the chain wheel covers. If the rating is not clearly apparent, the chain hoist should not be used until tested and marked by an accredited testing authority.

Each hoist should be inspected for signs of corrosion, chain damage, distortion of covers etc that may affect operation. Always inspect the hook and safety latch before using. Never use a safety latch that is distorted or bent and always make sure the spring will force the latch against the tip of the hook.

Each hoist should be suspended and the chains operated prior to applying any load. Chains are to be pulled through a distance sufficient to rotate the slowest moving part through not less than one complete rotation. Ensure that all hook safety latches are in place and working correctly. If any damage is noted that may affect the safe operation of the hoist it is to be tagged and taken out of service.

Cautions:

- Never overload a chain hoist.
- Ascertain the weight of the load to be lifted prior to choosing the chain hoist for the task.
- If the effort to operate a hoist requires more than one person it is most probably overloaded, do not continue!
- Always ensure that the point of attachment to a structure will take the load to be suspended from the hoist.
- Ensure that all slings, shackles etc used in conjunction with the hoist are suitably rated and within currency of test frequency requirements.
- Check that the rigging and slinging equipment is identified with the correct safe working load and test dates. If that information is not available, tag the item and remove from service until equipment item is re-tested and certified.

Care should be taken when choosing a suspension point for lifting with chain hoists. The load on the hoist should, where practical be kept directly below the attachment point. Valid certified pad eyes which have undergone proof loading and non-destructive testing should be identifiable at point of location. If a pad eye does not have the required load rating marked, it should not be used for lifting activities until verified as safe for the intended load.

All chain hoist devices should have a unique identifying serial number, data plates displaying SWL and testing dates and traceability to an original test certificate as per relevant International Standards. All items found in unsatisfactory condition or missing original test certification must be tagged and removed from service until replaced/repaired and recertified by an authorized inspection authority.

Chain hoists should be stored under cover with the chain lightly oiled to prevent corrosion forming. There are no requirements for an annual inspection as pre-use inspection should be comprehensive and identify any faults.
All chain hoists should be proof load tested every 24 months and be documented on the rig’s Lifting Equipment Register. The servicing and proof loading that takes place at this time is mandatory for all hoists even if not used within the preceding 24 month period. Many chain hoists are found to have corrosion in brake assembly’s etc. merely from the harsh environment in which they may be stored. If the condition of the unit is doubtful it should not be used and must be tagged and removed from service for inspection.

**Barrel Lifting Devices**

Homemade barrel lifting devices are prohibited in Viking International Operations. Only certified lifting devices should be used and should only be fitted by a competent person. All lifting equipment for suspending loads must be compliant with international standards such as LOLER, PUWER and LEEA.

**Ratchet Load Binders**

The load binder is used to cinch down loads during transportation of equipment or pipe. All load bearing parts of the ratchet binder are forged. High tensile carbon steel Grade 7 Transport Chain is to be used in conjunction with these binders. **Only ratchet type load binders are permitted within VIKING INTERNATIONAL operations.**

Failure to use a load binder properly has resulted in serious injuries and even death. When releasing a load binder, remember there is a great deal of energy in the tensioned chain. Routinely check load binders for wear, bending, cracks, nicks or gouges. If bending or cracks are present do not use the load binder. If the unit is damaged tag it and remove it from service for disposal and/or repair. Routinely lubricate pawl part and screw threads of Ratchet Binders to extend equipment life and reduce friction wear.

![Ratchet Load Binder](image1)

![Standard Lever Type Binder](image2)

**Shackles**

All shackles shall be Grade “S” minimum. Large Dee or Bow, Alloy, safety pin shackles shall be used for all lifts which are transported by sea and permanent attachment of slings to loads. Safety pin shackles installed on equipment such as containers where the use is of a “permanent” nature must always have split pins fitted to secure the nut.
Lifting Equipment

TYPICAL SHACKLE MARKINGS

Working Load Limit
Grade of Steel
Graded Pin
Body Diameter

Screw Pin Shackles

Screw Pin Shackles must **not be** used for:

- Use in masts or derricks
- Anchoring of wire ropes etc. from a tugger where the anchorage will be for an extended period.
- Rigging of loads for transportation with the exception of use on loads where space limitation prevents the use of a safety pin shackle. In such instances, the head of the shackle pin must be moused to the shackle body using stainless steel tie wire.

While in service, do not allow the screw pin to be rotated by a live line, such as a choker application as this could cause the pin to unscrew. The shackle should be turned so the line tension is not on the pin side.

**Screw Pin Shackle**

DO NOT ALLOW SLING TO PULL ON SCREW PIN

CORRECT ORIENTATION OF SHACKLE

Bolt Type Shackles

Bolt-Type Shackles can be used in any application where round pin or screw pin shackles are used. In addition, they are recommended for permanent or long term installations and where the load may slide on the shackle pin causing the pin to rotate and unscrew.

**Improper Replacement of Pins in Shackle**

- Line for choker run length of pin.
- Replace pins with bolts or other fasteners.
Testing Requirements

All shackles (or batch of shackles) should have a unique identifying serial number and traceability to an original test certificate as per relevant International Standards. All items found in unsatisfactory condition or missing original test certification must be tagged and removed from service and destroyed.

Wire Rope Clamps

Rig fabricated lifting gear, unless properly engineered, designed, tested, certified and regularly inspected is prohibited in Viking International operations.

The distance between clamps should be equal to six rope diameters. The U-bolts of all clamps should always be in contact with the short (dead) end of the rope. When three or more clips are required, space additional clips equally between first two, take up rope slack and tighten nuts on each U-Bolt evenly, alternating from one nut to the other until reaching recommended torque, see Table 1 below. The saddle piece should be in contact with the live end / loaded part of the rope as shown in figure 3 below.
Incorrect Method

**WARNING** – Wire rope grips should not be used for lifting purposes and are not intended for the permanent fastening of a rope that is subject to high dynamic loading. Wire rope grips should not be used on hoist wires, break-out line and hang off wires. International Standards do not recommend Wire Rope clip (U-bolts) terminations for elevator, personnel hoist and scaffold applications. Double saddle grips should be used on static lines and life lines. Safety slings on high pressure lines must be certified for applicable working load limit and should have factory fitted smelter socket ends and be of correct length.

Note: Hand spliced slings (as depicted in the above photograph) are not permitted in Viking International operations. Note the wire rope grips on this sling are incorrectly fitted and the bolt type shackle nut is secured in place by twisted wire in lieu of a safety/split pin.
SLINGS WITH WIRE ROPE CLIPS SHOULD NOT BE USED FOR HIGH PRESSURE LINES OR FALL ARREST EQUIPMENT

Apply first load to test the assembly. This load should be of equal or greater weight than loads expected in use. Next, check and retighten nuts to recommended torque.

Failure to read, understand, and follow the manufacturer’s instructions may cause death or serious injury. Read and understand those instructions before using clips. Match the same size clip to the same size wire rope and prepare wire rope end termination only as instructed. Do not use with plastic coated wire rope.

In accordance with good rigging and maintenance practices, the wire rope end termination should be inspected periodically for wear, abuse, and general adequacy.

A minimum of three (3) clips should be used.
Table 1

<table>
<thead>
<tr>
<th>Clip Size (Inches)</th>
<th>Rope Size (Inches)</th>
<th>Minimum No. of Clips</th>
<th>Amount of Rope to Turn Back in Inches</th>
<th>* Torque in Ft. Lbs.</th>
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<td>3</td>
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</tr>
<tr>
<td>2-1/2</td>
<td>2-1/2</td>
<td>9</td>
<td>84</td>
<td>750</td>
</tr>
<tr>
<td>2-3/4</td>
<td>2-3/4</td>
<td>10</td>
<td>100</td>
<td>750</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>10</td>
<td>106</td>
<td>1200</td>
</tr>
<tr>
<td>3-1/2</td>
<td>3-1/2</td>
<td>12</td>
<td>149</td>
<td>1200</td>
</tr>
</tbody>
</table>

If a pulley (sheave) is used for turning back the wire rope, add one additional clip.

If a greater number of clips are used than shown in the table, the amount of turn-back should be increased proportionately.

*The tightening torque values shown are based upon the threads being clean, dry, and free of lubrication.

Eye Bolts

When using Eye bolts, loads may slip or fall if proper eye bolt assembly and lifting procedures are not used. A falling load can seriously injure or kill.

Always inspect eye bolt before use and never use an eye bolt that shows signs of wear or damage. Never use eye bolt if eye or shank is bent or elongated and always be sure threads on shank and receiving holes are clean. Never machine, grind, or cut eye bolt.

Never use regular nut eye bolts for angular lifts. Always use shoulder nut eye bolts / machinery eye bolts for angular lifts.
For angular lifts, adjust working load as follows:

<table>
<thead>
<tr>
<th>Direction of Pull</th>
<th>Adjusted Working Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 degrees</td>
<td>30% of rated working load</td>
</tr>
<tr>
<td>90 degrees</td>
<td>25% of rated working load</td>
</tr>
</tbody>
</table>

Where an eyebolt is used in an untapped hole, the thread shall engage with at least the full thickness of a standard sized nut.

Where an eyebolt is used with tapped hole in a plate, the length of thread engagement shall be at least the nominal diameter of the thread. Where the undercut precludes sufficient engagement, a parallel washer beneath the collar shall be used.

Where a single eyebolt is used, care should be taken to ensure that it is screwed tight throughout the lifting operation.

Eyebolts should be screwed fully down to the face of the lifted load; however, excessive tightening of the eyebolt should be avoided. It should not be possible to enter a 0.04 mm feeler gauge at any position between the collar of an eyebolt and its seating. Where this condition is not achieved, any non-axial loading may overstress the screw thread. Care also must be taken when considering the alignment of the eye in regards to both machining allowance and the use of a shim. The eye bolts must be in line with each other or on the same axis as the slings to eliminate bending or side loading. After the first fitting it may be necessary to use shims or a machined washer under one of the eyebolts to achieve correct alignment.

**Cautions:**
- Do not run a sling through a pair of eye bolts. This will reduce the effective angle of lift and will put more strain on the rigging.
- Do not use eye bolts that have been ground, machined or stamped.
- Do not paint an eye bolt. The paint could cover up flaws.
- Do not use eye bolts that have worn threads or other flaws.
- Do not insert the point of a hook in an eye bolt. Use a shackle.
- Do not use eye bolts as anchor points for safety slings on high pressure lines.
Regular inspections of all eyebolts need to occur with the care required in ensuring correct matching of threads.

**Slings – General**

Slings are generally one of six types: chain, wire rope, metal mesh, natural fiber rope, synthetic fiber rope, or synthetic web. In general, use and inspection procedures tend to place these slings into three groups: wire rope & mesh, fiber rope web and Chain (Chains are only to be used to secure loads). Each type has its own particular advantages and disadvantages. Factors that should be taken into consideration when choosing the best sling for the job include the size, weight, shape, temperature, and sensitivity of the material to be moved, as well as the environmental conditions under which the sling will be used.

**Wire Rope**

The most common type of sling is made of wire rope. Wire rope is composed of individual wires that have been twisted to form strands. The strands are then twisted to form a wire rope. When wire rope has a fiber core, it is usually more flexible but is less resistant to environmental damage. Conversely, a core that is made of a wire rope strand tends to have greater strength and is more resistant to heat damage.

**Rope Lay**

Wire rope may be further defined by the "lay." The lay of a wire rope can mean any of three things:

**A. One complete wrap of a strand around the core:** One rope lay is one complete wrap of a strand around the core. See figure below.
B. **The direction the strands are wound around the core**: Wire rope is referred to as right lay or left lay. A right lay rope is one in which the strands are wound in a right-hand direction like a conventional screw thread (see figure below). A left lay rope is just the opposite.

![Right Lay](image)

C. **The direction the wires are wound in the strands in relation to the direction of the strands around the core**: In regular lay rope, the wires in the strands are laid in one direction while the strands in the rope are laid in the opposite direction. In lang lay rope, the wires are twisted in the same direction as the strands. See figure below.

![Right Lay, Regular Lay](image) ![Right Lay, Lang Lay](image) ![Left Lay, Regular Lay](image) ![Left Lay, Lang Lay](image)

In regular lay ropes, the wires in the strands are laid in one direction, while the strands in the rope are laid in the opposite direction. The result is that the wire crown runs approximately parallel to the longitudinal axis of the rope. These ropes have good resistance to kinking and twisting and are easy to handle. They are also able to withstand considerable crushing and distortion due to the short length of exposed wires. This type of rope has the widest range of applications.

Lang lay (where the wires are twisted in the same direction as the strands) is recommended for many excavating, construction, and mining applications, including draglines, hoist lines, dredge-lines, and other similar lines.

Lang lay ropes are more flexible and have greater wearing surface per wire than regular lay ropes. In addition, since the outside wires in lang lay ropes lie at an angle to the rope axis, internal stress due to bending over sheaves and drums is reduced causing lang lay ropes to be more resistant to bending fatigue. A **left lay rope** is one in which the strands form a left-hand helix similar to the threads of a left-hand screw thread. Left lay rope has its greatest usage in oil fields on rod and tubing lines, blast hole rigs, and
spudders where rotation of right lay would loosen couplings. The rotation of a left lay rope tightens a standard coupling.

**Wire Rope Sling Selection**

When selecting a wire rope sling to give the best service, there are four characteristics to consider: strength, ability to bend without distortion, ability to withstand abrasive wear, and ability to withstand abuse.

1. **Strength** - The strength of a wire rope is a function of its size, grade, and construction. It must be sufficient to accommodate the maximum load that will be applied. The maximum load limit is determined by means of an appropriate multiplier. This multiplier is the number by which the ultimate strength of a wire rope is divided to determine the working load limit. Thus a wire rope sling with strength of 10,000 pounds (4.5 tons) and a total working load of 2,000 (0.9 ton) pounds has a design factor (multiplier) of 5. New wire rope slings have a design factor of 5. As a sling suffers from the rigors of continued service, however, both the design factor and the sling’s ultimate strength are proportionately reduced. If a sling is loaded beyond its ultimate strength, it will fail. For this reason, older slings must be more rigorously inspected to ensure that rope conditions adversely affecting the strength of the sling are considered in determining whether or not a wire rope sling should be allowed to continue in service.

2. **Fatigue** - A wire rope must have the ability to withstand repeated bending without the failure of the wires from fatigue. Fatigue failure of the wires in a wire rope is the result of the development of small cracks under repeated applications of bending loads. It occurs when ropes make small radius bends. The best means of preventing fatigue failure of wire rope slings is to use blocking or padding to increase the radius of the bend.

3. **Abrasive Wear** - The ability of a wire rope to withstand abrasion is determined by the size, number of wires, and construction of the rope. Smaller wires bend more readily and therefore offer greater flexibility but are less able to withstand abrasive wear. Conversely, the larger wires of less flexible ropes are better able to withstand abrasion than smaller wires of the more flexible ropes.

4. **Abuse** - All other factors being equal, misuse or abuse of wire rope will cause a wire rope sling to become unsafe long before any other factor. Abusing a wire rope sling can cause serious structural damage to the wire rope, such as kinking or bird caging which reduces the strength of the wire rope.

![](wire_rope_fatigue_failure.png)

A permanent kink in a wire rope sling causes loss of strength. Discard the sling.

![](wire_rope_bird_cage.png)

Wire Rope ‘Bird Cage’
In bird caging, the wire rope strands are forcibly untwisted and become spread outward. Therefore, in order to prolong the life of the sling and protect the lives of employees, the manufacturer’s suggestion for safe and proper use of wire rope slings must be strictly adhered to.

5. Corrosion - Severe corrosion of the rope or end attachments which has caused pitting or binding of wires should be cause for replacement. Slight external rusting usually does not affect the strength of a sling.

Webbing Slings

Webbing slings are used for special applications and may be used for loads where the use of a wire rope or chain sling may cause damage to a load. Examples could be, chrome pipe, generator rotors or pump shafts etc. Webbing slings could also be considered for lifts where their use provides increased safety of the lift, or where webbing slings reduce the risk of manual handling injury. Webbing slings are not to be used for general purpose slinging or lifting.

The material used in the manufacture may be one of several different types. To assist the user in identifying the fiber material, the label attached to the sling will serve as an indicator by color. The label colors used are as follows:

BLUE LABEL – Polyester, PREFERRED FOR USE. Extremely high chemical resistance except to hot, strong alkaline conditions. Also damaged by exposure to concentrated sulphuric acid.

GREEN LABEL – Nylon, NOT PREFERRED FOR USE. Suffers a significant reduction in strength when wet.

BROWN LABEL – Polypropylene, NOT PREFERRED FOR USE. Whilst unaffected by most acids or alkalis, they are attacked by some organic solvents such as white spirit.

Webbing slings shall be shortened, lengthened, or adjusted only by methods approved by the sling manufacturer and must be shortened or lengthened by knotting. Sharp corners in contact with the sling should be padded with material of sufficient strength to minimize damage to the sling. Slings should not be pulled from under a load when the load is resting on the sling. Color coding of webbing slings should be by an attached tag. **DO NOT PAINT SYNTHETIC SLINGS** – the paint will damage the sling and could cause serious failure.

Frequent inspection of these slings shall be made by the person handling the sling each day the sling is used. Webbing slings should not be cleaned with high pressure washer machines. Webbing slings should be removed from service if any of the following are identified:

- Acid or caustic burns
- Melting or charring of any part of the sling
- Broken, tears, cuts, or snags
- Broken or worn stitching in load bearing splices
- Excessive abrasive wear
- Knots in any part of the sling
- Excessive pitting or corrosion, or cracked, distorted, or broken fittings
- Other visible damage that causes doubts as to the strength of the sling

Slings should be stored in a cool, dry and dark place to prevent environmental damage. Nylon and polyester slings shall not be used at temperatures in excess of 194°F (90°C), or at temperatures below -40°F (-40°C). When extensive exposure to sunlight or ultraviolet light is experienced by nylon or polyester web slings, the sling manufacturer should be consulted for recommended inspection procedures. This may be indicated by powdering of the outer layers.

Slings caked with mud and dirt should be hung up and hosed down, the aim being to get the grit to flow off the sling rather than forcing it into the fibers. Do not use a high pressure wash down machine to clean these slings.

All Flat Webbing Slings should have a unique identifying serial number, data tags displaying SWL and testing dates and traceability to an original test certificate as per relevant International Standards. All items found in unsatisfactory condition or missing original test certification must be tagged and removed from service and discarded.

**Round Synthetic Slings**

Round synthetic slings are made of continuous loops of high tenacity polyester strands with balanced yarn twist for the load bearing core of the sling. The densely woven tubular cover which is woven round and free from a sewn splice acts solely as the protective covering (i.e. non-load bearing). It protects both the core and the load and conforms to the contours of machinery and equipment which can be difficult to lift with conventional slings. Round slings are not to be used for general purpose lifting or sling ing.

The material used in the manufacture may be one of several different types. To assist the user in identifying the fiber material, the label attached to the sling will serve as an indicator by color. The label colors used are as follows:

**BLUE LABEL** – Polyester, PREFERRED FOR USE. Extremely high chemical resistance except to hot, strong alkaline conditions. Also damaged by exposure to concentrated sulphuric acid.

**GREEN LABEL** – Nylon, NOT PREFERRED FOR USE. Suffers a significant reduction in strength when wet.

**BROWN LABEL** – Polypropylene, NOT PREFERRED FOR USE. Whilst unaffected by most acids or alkalis, they are attacked by some organic solvents such as white spirit.

Select a polyester round sling having suitable characteristics for the type of load, hitch and environment. Polyester round slings shall not be loaded in excess of the rated capacity. Round slings with fittings which are used in a choking hitch shall be sufficient length to assure that the chocking action is on the round sling, and never on the fittings.
Polyester round slings used in a basket hitch shall have the load balanced to prevent slippage. Always protect synthetic slings from being cut by sharp corners, sharp edges, protrusions, or abrasive surfaces and they should never be dragged on the floor or over an abrasive surface.

As Round Slings are ‘endless’ wear is distributed evenly along their entire length, ensuring a longer, useful life. The narrow diameter of the Round Slings means that they can be used on a wide range of attachment points simply by backlooping through the attachment point around the load, or directly on to the crane hook. Polyester round slings shall not be twisted, shortened, lengthened, tied into knots, or joined by knotting and shall not be pulled from under loads when the load is resting on the polyester round sling.

Frequent inspections shall be made by a qualified person handling the polyester round sling each time the round sling is used. Webbing slings should not be cleaned with high pressure washer machines.

A polyester round sling shall be removed from service if any of the following are visible:

- If polyester round sling identification is missing or unreadable
- Melting, charring or weld spatter on any part of the polyester round sling
- Holes, tears, cuts, embedded particles, abrasive wear, or snags that expose the core fibers of the polyester round sling
- Broken or worn stitching in the cover which exposes the core fibers
- Fittings when damaged, stretched or distorted in any way
- Polyester round slings that are knotted.
- Acid or alkali burns of the polyester round sling
- Oil or grease soaked
- Any condition which cause doubt as to the strength of the polyester round sling

**Round Sling SWL Color Code Chart:**

<table>
<thead>
<tr>
<th>Color</th>
<th>SWL</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIOLET</td>
<td>1 Tonne</td>
</tr>
<tr>
<td>GREEN</td>
<td>2 Tonne</td>
</tr>
<tr>
<td>YELLOW</td>
<td>3 Tonne</td>
</tr>
<tr>
<td>GREY</td>
<td>4 Tonne</td>
</tr>
<tr>
<td>RED</td>
<td>5 Tonne</td>
</tr>
<tr>
<td>BROWN</td>
<td>6 Tonne</td>
</tr>
<tr>
<td>BLUE</td>
<td>8 Tonne</td>
</tr>
<tr>
<td>ORANGE</td>
<td>10 Tonne</td>
</tr>
</tbody>
</table>

All Round Synthetic Slings should have a unique identifying serial number, data tag displaying SWL and testing dates and traceability to an original test certificate as per relevant International Standards.
Synthetic Round slings do not have a designated inspection and re-testing frequency period defined in applicable standards. It is generally felt that pre-use inspection should pick up any faults in the slings. However, no synthetic round slings should be used at VIKING INTERNATIONAL sites for a period greater than 2 years without replacement or re-test. Do not paint the color code directly on to the sling as it will cause damage to the fabric and render the sling unsafe for further use.

Due to the relative low cost it is often more economical to discard synthetic slings than to re-test. Large sizes may be economical to retest.

Proper storage is essential for the prevention of deterioration of or damage to the slings. Slings shall be stored in locations that are:

- Clean, off the ground and floor with no dirt or grit
- A dry and ventilated area that prevents condensation. Do not store in an area that is sealed from air circulation.
- Away from direct sunlight and ultra violet rays including fluorescent lighting
- Away from extreme heat such as exhaust systems and hot engine surfaces
- Away from chemicals which may degrade the sling. (Whilst the polyester sling has a high chemical resistance it is a good policy to store away from all chemicals).