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OCCUPATIONAL SAFETY - ONSHORE OIL AND GAS PRODUCTION OPERATIONS – REQUIREMENTS

PUBLIC REVIEW DRAFT



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Foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Trade, Industry and Cooperatives established under Cap 327, of the Laws of Uganda. UNBS is mandated to co-ordinate the elaboration of standards and is

- (a) a member of International Organisation for Standardisation (ISO) and
- (b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and
- (c) the National Enquiry Point on TBT/SPS Agreements of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of representatives of consumers, traders, academicians, manufacturers, government and other stakeholders.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

Committee membership

The following organisations were represented on the Management Systems' Standards Technical Committee, UNBS/TC 10/SC3, during the development of this standard:

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DUS 1575: 2016

The requirements in this Draft Uganda Standards are intended to ensure that the oil and gas industry implements occupational safety practices concentrating on personal protection and safe workplace, to include: owners, operators, contractors, and service providers during oil and gas operations and production.

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Occupational Safety for Onshore Oil and Gas Production Operation – Code of Practice

1 Scope

This Draft Uganda Standard covers Occupational safety practices that apply to production operations, drilling, well servicing and work over operations to ensure occupational safety of personnel within the oil and gas sector and or industry.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Occupational Safety and Health Act 2006 and US 534:2008, Occupational health and safety management systems — Specification

The Petroleum (Exploration and Production) Act

US ISO 4007:2012 Personal Protective Equipment – Eye and face protection – vocabulary

US ISO 4007:2012, Personal protective equipment — Eye and face protection — Vocabulary

US ISO 20345: 2011, Personal protective equipment — Safety footwear

US ISO 20346:2014, Personal protective equipment — Protective footwear

US ISO 20347:2012, Personal protective equipment — Occupational footwear

US 402:1993 Standard specification for portable reflective triangles

US 1554:2015 Personnel Protective Equipment – Code of Practice

US ISO 14693:2014, Petroleum and natural gas industries – drilling and well servicing equipment

3 Terms and definitions

For the purposes of this standard, the following terms and definitions shall apply.

3.1 Adequate Ventilation

Adequate ventilation is for the prevention of fire and explosions. Adequate ventilation is ventilation (natural or artificial) that is sufficient to prevent the accumulation of significant quantities of vapor-air mixtures in concentrations above 10% of their lower explosive limit (LEL).

3.2 Authorized Person

A qualified person assigned by an employer to perform or supervise the performance of a specific type of duty or duties at the work site.

3.3 Cellar

Excavation around the wellhead to provide space for items of equipment at the top of the wellbore.

3.4 Christmas tree

The valves and fittings assembled at the top of a completed well to control the flow of hydrocarbons and other fluids.

3.5 combustible liquid

Any liquid having a flash-point at or above 37.78°C.

3.6 Contractor

Any person or company that contracts or subcontracts to perform all or any part of oil and gas well production operations.

3.7 Critical Equipment

Equipment and other systems determined to be essential in preventing the occurrence of, or mitigating the consequences of an uncontrolled event.

3.8 Electrical Classification of areas

Locations are classified.

3.9 Flammable Liquid

Any liquid having a flashpoint below.

3.10 Full Body Harness

Straps which may be secured about a person in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest, and shoulders, with means for attaching it to other components of a personal fall arrest system.

3.11 Guarded

Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers or casings, barrier rails, or screens to eliminate the possibility of accidental contact with or dangerous approach by persons, animals, or objects.

3.12 Hazardous Substance

Any substance that, by reason of being explosive, flammable, toxic, corrosive, oxidizing, irritating, or otherwise harmful, has the potential to cause injury, illness, or death.

3.13 Hot oil treatment:

The process of heating oil and pumping it into piping, tubing, casing, or a formation to remove paraffin.

3.14 Hot Tapping (pipe tapping)

The process of drilling a hole through the wall of pipe that is under pressure. A special saddle is used to attach a valve and lubricator to the pipe.

3.15 hot work

Work involving electric or gas welding, cutting, brazing, grinding or similar flame or spark producing operations.

3.16 lanyard

A flexible line of rope, wire rope, or Strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage.

3.17 lockout/tag out

A procedure to control hazardous energy.

3.18 Operator

The entity responsible for managing operations in a field or undeveloped acreage position

3.19 Personal Fall Arrest System (PFAS)

A system designed to provide protection to a person from falls. The PFAS should consist of an anchorage, connector and a synthetic webbing full body harness which may include a lanyard and a deceleration device.

3.20 Personal Protective Equipment (PPE).

Includes all equipment, (including clothing affording protection against the weather) which is intended to be worn or held by an employee and which protects against one or more risks to health or safety.

3.21 Pumping Unit

Surface equipment used for the purpose of mechanically lifting fluids from a well.

3.22 Qualified Person

Means, in respect of a specified duty, a person who, because of his knowledge, training and experience, is qualified to perform that duty safely and properly

3.23 Rated Working pressure

The maximum internal pressure that equipment is designed to contain and/or control. Working pressure is not to be confused with test pressure.

3.24 Simultaneous Operations

Two or more of the following activities being performed in close proximity: production, drilling, and completion, work over, wire line (except routine operations), major construction operations, well testing and maintenance.

3.25 Supervisor

Person who has been given the control, direction, or supervision of work performed by one or more personnel.

3.26 Well servicing

Well work involving pulling or running tubulars or sucker rods, to include but; not limited to re-drilling, completing, recompleting, work-over, and abandoning operations.

4 Safety

4.1 Safety practices

4.1.1 Personnel shall be properly trained in relation to their job duties. Additionally, pre-job safety meetings that include all affected personnel, including contractors, should be held to review responsibilities for the operation(s) to be performed.

4.1.2 Personnel should receive instruction in correct work methods to reduce chance of injury to themselves or fellow personnel.

4.1.3 A safety program shall be established and maintained.

The following elements shall be considered when developing a comprehensive safety program:

- a) confined space entry
- b) contractor safety
- c) electrical safety
- d) emergency response
- e) Fire prevention and protection
- f) First aid
- g) general safety rules
- h) hazard communication

- i) hazardous environment
- j) hot working/welding
- k) housekeeping
- l) hydrogen sulphide and sulphur dioxide
- m) lifting
- n) lockout/tag out
- o) other equipment safety (hoists, cranes, etc)
- p) periodic reviews
- q) personal protective equipment
- r) personnel training
- s) production equipment safety
- t) roles and responsibilities
- u) safe use of hand tools
- v) safety meetings
- w) transportation
- x) trenching and excavation

4.1.4 Unsafe and potentially dangerous conditions shall be eliminated immediately, if possible, or reported to the supervisor in charge for corrective action.

4.1.5 The off going supervisor shall inform the incoming supervisor of any known special hazards or work in progress that may affect the safety of the crew. Incoming personnel shall be alerted to work in progress that could affect their safety.

4.2 Hazard communication

4.2.1 A Hazard Communication Program that evaluates the presence and potential hazards of chemicals found in the workplace shall be established for onshore oil and gas production operations. Workers shall be provided with information concerning the hazard of chemicals and appropriate measures to protect themselves while working with hazardous chemicals.

4.2.2 The program shall be written and include information about hazard evaluation, labelling, material safety data sheets, employee training and methods to review and update changes in the program based on chemical usage.

Elements of a program include:

- a) Hazard Evaluation and inventory of all the hazardous chemicals in the work area shall be completed. An evaluation of the potential hazard of a chemical shall be conducted before the hazardous chemical is handled.

- b) Generally applicable measures including engineering controls, safe work practices and PPE shall be considered for safe handling and use of a hazardous chemical. This information shall be communicated to the workers, contractors and the general public .
 - c) Labelling system shall be developed that warns of the potential hazards of working with a hazardous chemical.
 - d) Hazardous chemicals shall identify (at minimum) the material or substance and the physical and health hazards.
 - e) Material Safety Data Sheet (MSDS) Chemical manufacturers are normally responsible for developing MSDSs.
 - f) A MSDS shall be available and readily accessible for each hazardous chemical used in the workplace. A system to collect, maintain and inform workers about the chemical hazard information found on a MSDS shall be part of the program.
 - g) Personnel shall be provided with hazard communication training upon:
 - 1. Initial assignment to a work area.
 - 2. When a new chemical has been introduced.
 - 3. A new physical or health hazard has been identified or a process change has occurred that involves a hazardous chemical.
- At minimum the training shall include:
- 1. Information regarding the method and observations that can be used to detect the presence of a release of a hazardous chemical in the work area.
 - 2. Physical and health hazard information.
 - 3. Measures to protect the worker from harmful exposure, including, engineering control, safe work practices, emergency procedures, PPE use, etc.
 - 4. Specific details on how to recognize and understand labels in the work area, MSDS interpretation, and safe procedures when working with hazardous chemicals. Non-Routine Task special considerations shall be developed to handle non-routine work (e.g., upset or emergency conditions, cleaning out vessels).
- i) Contractors Hazard communication information shall be shared with contractors and their employees.

4.3 Personal Protective Equipment (PPE)

4.3.1 General

- a) Employers shall assess their work sites to evaluate the types of hazards present at their onshore oil and gas production operations. When it is impractical to reduce a hazard to

acceptable levels by administrative or engineering controls, personal protective equipment appropriate for the hazard shall be selected for use.

- b) Personal protective equipment for hearing, eyes, face, head, extremities, protective clothing, respiratory protection and fall protection shall be considered for use to protect personnel.

4.3.2 Wearing Apparel

4.3.2.1 When identified as part of the employer's PPE assessment, a safety hard hat shall be worn by each person in the work area. The safety hard hat shall meet the requirements of US 1554:2015 Personnel Protective Equipment – Code of Practice

4.3.2.2 Eye protection equipment appropriate for the work being done shall be worn by personnel where there is a reasonable probability of injury to the eyes from flying objects, chemicals, or injurious light or heat that can be prevented by such equipment. This protective equipment shall meet the requirements of US 1554:2015 Personnel Protective Equipment – Code of Practice.

4.3.2.3 When identified as part of the employer's PPE assessment, safety shoes, safety boots, or toe guards shall be worn. Safety-toe footwear shall meet the requirements of US 614:2005 Industrial safety footwear - Specification for leather protective and safety footwear for general and heavy-duty use.

4.3.2.4 The employers PPE assessment shall include possible chemical exposures that may necessitate the use of gloves, aprons, boots, or other protective equipment, as appropriate. The assessment shall also evaluate the need for gloves or other protective clothing to provide protection from temperature extremes or sharp objects.

4.3.2.5 Appropriate clothing shall be worn at all times.

Loose or poorly fitted clothing shall not be worn.

4.3.2.6 Personnel shall not work in clothing that is saturated with any flammable, hazardous, or irritating substance(s).

4.3.2.7 Personnel shall not wear jewellery or other adornments subject to snagging or hanging and causing injury while in the work area.

4.3.2.8 Personnel with hair of such length as to be a hazard in work areas should keep it contained in a suitable manner while performing their duties. Hair and beard styles shall not interfere with the effective functioning of head, eye, face, or respiratory protective equipment, if such equipment is required at the work site.

4.3.2.9 Personnel working over or near water where a danger of drowning exists shall be provided with approved personal floatation devices in serviceable condition.

4.3.3 Hearing Protection

4.3.3.1 Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table 1. For guidance on measuring sound levels, see the National Environment (Noise standards and Control Regulations 2009)

4.3.3.2 When personnel are subjected to sound levels exceeding those listed in Table 1, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table 1, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table. For guidance on hearing protection equipment, see US 1554:2015 Personnel Protective Equipment – Code of Practice..

4.3.3.3 Employers shall implement the elements of a hearing conservation program as appropriate to protect the hearing of personnel.

Table 1—Maximum Permissible Noise Exposures

Duration per day, hours	Sound levels dBA slow response
12	85
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

a) When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect shall be considered rather than the individual effect of each. Exposure to impulsive or impact noise should not exceed 140 dBA peak sound pressure level.

b) Measured on the A scale of a standard sound level meter at slow response.

4.3.4 Respiratory Protection

4.3.4.1 An assessment of the work area shall be done to identify the potential hazards that may require respiratory protection.

a) Employees shall wear respiratory protection appropriate for potential workplace atmospheric hazards.

4.3.4.2 For respiratory protection practices, including equipment selection, use medical surveillance, fit testing, storage, inspection, maintenance, and training.

4.3.4.3 Tight-fitting air purifying respirators shall be used only in areas where sufficient oxygen exists.

4.3.4.4 Approved self-contained or supplied-air breathing equipment shall be used for those atmospheres where tests indicate toxic or hazardous gases are present in quantities immediately dangerous to life or health (IDLH) or oxygen content is less than necessary to sustain life. Air from the utility system shall not be used as the source for breathing air supply.

4.3.4.5 Cartridge type respirators shall not be used for protection from hydrogen sulphide or sulphur dioxide.

4.3.4.6 Personnel who may be expected to use breathing equipment shall be trained in the use and operation of breathing equipment available at the work site. Personnel shall be advised of the potential dangers of flammable, hazardous, and insufficient oxygen atmosphere while conducting Oil and Gas Producing and Gas Processing Plant Operations Involving Hydrogen Sulphides’.

4.4 Fall Protection

4.4.1 All personnel, when engaged in work 6 ft or higher above the ground or adjacent working surfaces, shall be protected at all times from falling by guardrail systems, safety net systems, or personal fall arrest systems (PFAS). When the employer can demonstrate that it is unfeasible or creates a greater hazard to use these systems, the employer shall develop and implement an alternative fall protection plan that provides for personnel safety. When PFAS are used, the following shall apply:

- a) Personnel shall use a full body harness.
- b) PFAS shall be inspected prior to each use.
- c) The full body harness shall be attached by means of a lanyard with double-locking snap-hooks to an anchor or structural member capable of supporting a minimum dead weight of 2450 kgs
- d) A separate lanyard shall be used by each person requiring lanyard.
- e) The lanyard shall be adjusted to permit a maximum drop of 5ft in case of a fall. d
- f) Manufacturer’s instructions for inspection and replacement of PFAS should be followed.

4.5 Housekeeping

4.5.1 Work areas shall be maintained clean and free of debris and tripping hazards.

4.5.2 Leaks or spills shall be promptly cleaned up to eliminate personnel slipping and Fire hazards.

4.5.3 If personnel are required to work in a cellar, it shall be kept reasonably clear of water or oil accumulation. No loose equipment or materials shall be in the cellar except those in use or about to be used.

4.5.4 Care shall be taken to leave egress routes open.

4.5.5 Tools and equipment shall be securely placed and stored in a position or manner so they will not fall.

4.5.6 Clear access to control devices, emergency shutdown system, emergency equipment, etc shall be maintained.

4.6 machinery and Tools

4.6.1 Personnel shall only operate machinery that they are qualified to operate.

4.6.2 All belts drive chains, gears, and drives shall have guards installed to prevent personnel from coming in contact with moving parts.

4.6.3 Machinery shall not be operated unless all guards are in position and are in properly maintained condition. During maintenance or repair work limited operation of the equipment can be done during testing by qualified personnel without guards in place.

4.6.4 Maintenance personnel shall report to the supervisor prior to beginning repairs. They shall report hazards that may be introduced. They shall report when repairs are completed.

4.6.5 Personnel shall not clean, lubricate, or repair any machinery where there is a hazard of contact with moving parts until such machinery has been stopped or such parts have been properly guarded. See Lockout/Tag out.

4.6.6 Hand power tools and similar equipment shall be maintained in a safe condition.

4.6.7 Electric hand tools shall be double insulated or grounded.

4.6.8 Electric or pneumatic hand tools shall be arranged so that the starting switch cannot be locked in.

4.6.9 When personnel are climbing ladders, any tools or other such materials they are carrying should be secured rather than hand held.

4.7 Welding and cutting equipment

4.7.1 Apparatus such as torches, regulators, hoses and arc welding machines shall be in good operating condition and repair. Only approved oxygen and acetylene cylinders shall be used.

4.7.2 Oxygen and acetylene torches shall be equipped with flash-back arrestors.

4.7.3 All cylinders shall be equipped with a valve protection cap, a collar, or recess to protect the valve. Valve caps should be in place except when cylinders are connected for use.

4.7.4 Cylinders should be stored in assigned places and shall be secured to prevent accidental overturning.

4.7.5 Cylinders shall not be kept in unventilated enclosures, such as lockers and cupboards.

4.7.6 Oxygen cylinders in storage shall be separated from fuel gas cylinders or combustible materials a minimum distance of 20 ft (6.1 m) or by a non combustible barrier at least 5 ft (1.5 m) high.

4.7.7 Acetylene cylinders shall be stored valve end up with protective caps affixed and properly secured. When a job using acetylene devices is completed or prior to transporting acetylene cylinders, the valve on the acetylene cylinder shall be closed and pressure on the hoses bled to zero.

4.7.8 When transporting cylinders by a crane or derrick, a cradle, bin, or other suitable platform shall be used. Slings alone shall not be used on a cylinder being transported or lifted. Also, cylinders shall not be dropped, struck, or permitted to strike each other.

4.7.9 On arc welding machines, the control apparatus shall be enclosed except for the operating wheels, levers, or handles.

4.7.10 Input power terminals, top charge devices, and electrically energized metal parts shall be completely enclosed and accessible only by means of tools.

4.7.11 Terminals from welding leads shall be protected from accidental contact by personnel or metal objects.

4.7.12 The frame or case of an electrically driven arc welding machine shall be grounded.

4.7.13 Cables with splices within 10 ft (3.1 m) of the rod holder shall not be used. The welder shall not coil or loop welding electrode cables around parts of his body.

4.8 Contractor Safety and Training

4.8.1 When selecting contractors, operators shall obtain and evaluate information regarding a contractor's safety policies and practices, and performance there under, and the contractor's procedures for selecting subcontractors.

4.8.2 Contractors shall train their personnel in the work practices necessary to perform their jobs in a safe manner.

4.8.3 The training provided to contract personnel shall include applicable site specific safety procedures and rules pertaining to the facility and the applicable provisions of emergency

action plans. This section applies to contractors performing operating duties, maintenance or repair, turnaround, major renovation, or specialty work at the facility.

4.8.4 Except for transportation safety orientation, emergency evacuation training, and other applicable safety training, this paragraph does not apply to contractors providing incidental services that do not influence operation of the facility, such as, janitorial work, food and drink services, laundry, delivery, other supply services, etc.

4.8.5 The operator shall verify contractor training utilizing a variety of methods, which may include audits of the contractor's safety training programs; worksite checks of individual contractor employees training; and operator observation of contractor work performance.

4.8.6 A major step in achieving acceptable contractor performance is selecting a safe contractor. Therefore, it is appropriate for operators to request that contractors submit specific performance information in their contract response proposals.

Such information shall include but not be limited to:

- a) Assurance of a contractor's written safety policies and practices endorsed by the contractor's top management.
- b) A statement of commitment by the contractor to comply with all applicable safety regulations and provisions of this standard.
- c) Recordable injury and illness experience for the previous 3 years.
- d) Experience Modification Rates (EMR) for Worker's Compensation Insurance for the previous three years.
- e) An outline of the contractor's initial employee safety orientation.
- f) Evidence of the existence of a disciplinary action procedure dealing with safety and environmental related infractions.
- g) Descriptions of the contractor's various safety programs, including: accident investigation procedures; how safety inspections are performed; safety meetings; safety incentive programs; substance abuse prevention programs.
- h) Description of the safety and environmental training that each contractor employee has received and the contractor's programs for refresher training.

5 Safe Work Practices

5.1 Load Lifting

5.1.1 The manufacturer's rated load capacity shall not be exceeded on cranes or other load lifting devices. This equipment should be operated and maintained in accordance with

manufacturers recommendations. Tag lines should be used to guide and steady all loads being lifted.

5.2 Confined space, excavations, and hazardous environments

5.2.1 Where hydrogen sulphide, sulphur dioxide, carbon dioxide or other hazardous atmosphere is known or suspected to exist, the operator shall ensure that personnel, contractor, and service company supervisors are advised of the potential hazards.

5.2.2 A confined space is an area which:

- a) Has adequate size and configuration for people to enter.
- b) Has limited means of entry or exit.
- c) Is not designed for continuous employee occupancy.

5.2.3 Examples of confined spaces that can be found at onshore producing facilities are:

- a) Well cellars
- b) Electrical vaults
- c) Fin fan coolers
- d) Tanks
- e) Vessels
- f) Some diked areas
- g) Valve pits

5.2.4 Confined space hazards shall be identified for all facilities in the workplace and safe work practices should be established for working in the confined spaces.

5.2.5 A confined space entry permit shall be used to enter any confined space that has atmospheric, engulfment or configuration hazards. Attendant and emergency rescue services shall be provided for all permit required confined spaces.

5.2.6 When preparing the confined space for entry, precautions must be in place to ensure the space remains safe. This may include forced air ventilation, equipment isolation or other measures. For equipment isolation, consideration should be given to blinding, double block and bleed, or other equipment and energy isolation controls.

5.2.7 Trenching and Excavations

When operations require excavating and preparing trenches, persons shall be knowledgeable regarding the hazards and precautions necessary for preparing and working in trenches.

5.2.7.1. Underground Hazards

When preparing an excavation, consider the hazards of underground installations. These include electrical equipment, oil and gas transmission, sewers, water lines, telephone lines and other utilities.

5.2.7.2. Toxic Gas and Low Oxygen Hazards Any trench 4 ft or greater in depth is usually considered a confined space. Entry into these spaces shall be controlled by special safety procedures where oxygen deficient or toxic gas hazards can reasonably be expected, such as near landfills or near where hazardous materials are used or stored. There is concern that heavy gases can collect inside a trench.

5.2.7.3. Vehicle Traffic and Falling Loads Vehicles on nearby roadways and construction equipment can present hazards at an excavated site. Ensure that barricades and warnings are in place.

Construction equipment shall not lift material over people in the trench or excavation.

The soil from the trench is also a hazard to personnel inside the trench, for this reason it must be piled at least 2 ft from the edge of the trench.

5.2.7.4. Stability of Nearby Structures

Before beginning an excavation consideration shall be given to nearby buildings, light poles or other structures in the area. Additional support, installed by professionals, may be needed.

5.2.7.5. Escape means from trenches a stairway; ladder or ramp shall be located in any trench that is at least 4 ft (1.2m) deep. The escape means shall be placed so that a person is never more than 25 ft away from an escape means.

5.2.7.6. Inspections

A qualified person shall inspect the trench at least daily and more frequently if needed, such as after a rainstorm or other hazardous occurrence.

5.2.7.7. Prevention of Cave-Ins

Any trench 5 ft or deeper, that is not in entirely stable rock, must be sloped or shored in accordance with recognized engineering practices.

5.3 Lockout/Tag out

5.3.1 A lockout/tag out program shall be established to control hazardous energy as follows:

- a) Locks and/or tags should be placed to plainly identify the equipment or circuits being worked on. systems locked or tagged should include the identity or job title of person installing the lock or tag.

- b) Personnel shall be trained and disciplined in the use of this system to prevent unexpected operation of any equipment that stores any type of energy that might inflict injury to personnel.
- c) The lock or tag shall be removed by the person who installed it. In the event the individual is not available, the lock or tag may be removed by the supervisor after ensuring that no hazard will be created by energizing the locked or tagged equipment or circuit(s).

5.3.2 Well Pumping Units

5.3.2.1 Power to the pumping unit shall be de-energized and locked or tagged out to eliminate potential hazards during well servicing operations. In confined locations, overhead electric power to the pumping unit control panel should be de-energized. Where necessary, power service should be de-energized while moving the rig in or out and during rig-up and rig-down operations. See Lockout/Tagout.

5.3.2.2 During well servicing operations, the pumping unit shall be secured to prevent unintended movement. Use of the brake only or the brake and brake pawl are not acceptable means of securing the pump unit

5.3.2.3 Chain or wire rope sling of suitable strength should be used to handle the horse head if removal or installation operations are necessary. On installation, the horse head should be bolted or latched in accordance with the manufacturer's specifications.

5.3.2.4 Upon completion of well servicing operations and before energizing the power source, precautions shall be taken to ensure that all personnel and equipment are clear of the weight and beam movement.

5.3.2.5 Brake systems on all pumping units in service shall be maintained in safe working order.

5.3.2.6 After well servicing operations are completed all pumping unit guards and enclosure guards (belt and motor sheaves) should be reinstalled prior to start-up. Guards need not be in place until all Final adjustments (pump, spacing, etc.) are made, so long as the safety of personnel is not compromised.

5.4 Hot work, Welding, and flame cutting operations

5.4.1 General

5.4.1.1 A written safe work permit (hot work permit) system covering welding and flame cutting operations shall be observed. See Occupational Health and Safety regulations 2006. In

general, a safe work permit system shall consist of authorization to do the work along with the following:

- a) Simultaneous operations.
- b) Air/gas testing.
- c) Equipment isolation.
- d) Equipment preparation.
- e) Identification of hazards.
- f) Emergency procedures.
- g) b. Work-in-Progress Stage:
- h) Posting of permit.
- i) Air/gas testing.
- j) Personal protective equipment requirements.
- k) Fire watch.
- l) Special procedures/precautions.

5.4.1.2 The supervisor shall hold a pre-job meeting with the crew and other involved persons to review responsibilities for the operation to be performed.

5.4.1.3 Welding and flame cutting operations shall not be permitted close to flammable liquids, accumulations of crude oil, escaping gas, or locations where sparks, flames, heat, or hot slag could be sources of ignition.

5.4.1.4 Only qualified persons shall perform welding or flame cutting operations on equipment used to contain hydrocarbons or hazardous materials.

5.4.1.5 Appropriate personal protective equipment shall be utilized for hot work operations.

5.4.2 Welding and Flame Cutting Operations

5.4.2.1 If the object to be cut or welded cannot readily be moved, all movable Fire hazards in the vicinity shall be taken to a safe place.

5.4.2.2 If the object to be welded or cut cannot be moved, and if all the Fire hazards cannot be removed, guards shall be used to confine the heat, sparks, and slag and to protect the immovable Fire hazards.

5.4.2.3 A safe welding area may be designated. In this area, welding and flame cutting operations can be conducted with minimal concern of providing an ignition source for flammable hydrocarbons or combustible materials. A safety work permit is not normally required for welding operations in an approved safe welding area.

5.4.2.4 Properly maintained fire extinguishing equipment shall be available for immediate use. A minimum of at least one 30-lb dry chemical Fire extinguisher shall be immediately available during welding or cutting operations. This equipment is in addition to the general Fire protection equipment.

5.4.2.5 Fire watches with extinguishing equipment shall be required whenever welding or cutting is performed in locations other than designated safe welding areas.

5.4.2.6 A Fire watch shall be maintained for at least one half hour after completion of welding or cutting operations.

5.4.2.7 Before cutting or welding is permitted in areas outside a designated safe welding area, the area shall be inspected by the individual responsible for authorizing cutting or welding operations. This individual shall designate the precautions to be followed in granting authorization to proceed.

5.4.2.8 Cutting or welding shall not be permitted in the following situations:

- a) In areas not authorized by the supervisor.
- b) In the presence of an explosive atmosphere.
- c) In areas near storage of large quantities of exposed readily-ignitable materials.
- d) Where ignition can be caused by heat conduction, such as on metal walls or pipes in contact with combustibles on the other side.
- e) On used containers such as drums unless properly cleaned.

5.4.2.9 Welding Fumes and Ventilation

5.4.2.9.1 Toxicity depends on the composition and concentration of the fumes. The composition and quantity of fumes depends on the materials being welded, the composition of the welding rods, any coatings or paints encountered in the welding operations, the process used, and the circumstances of use. Toxic fumes can be generated from welding on metals coated with or containing alloys of lead, zinc, cadmium, beryllium, and certain other metals. Some paints and cleaning compounds may also produce toxic fumes when heated. The potential health effects range in type and severity, depending on these factors; and some effects can be extremely serious.

5.4.2.9.2 For more information on the toxicity and health hazards of welding fumes and the appropriate protective measures, consult the following references: Occupational Health and Safety Regulations 2006.

5.4.2.9.3 Mechanical ventilation at the minimum rate of 2,000 ft³/min (0.944 m³/s) per welder shall be provided when welding:

- a) In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross ventilation.
- b) Where the nature of the welding, cutting, or brazing work is such that the release of toxic fumes or gases is possible.
- c) This includes work on stainless steel, zinc, lead, and degreasing or cleaning compounds containing hydrocarbons.

5.4.2.9.4 Adherence to confined space entry procedures shall be followed prior to any re-entries. For example, releases from acetylene cutting equipment could change the atmosphere within the confined space.

5.5 Work in proximity to exposed energized power sources

5.5.1 Neither equipment nor machines on rigs (includes guy lines) shall be operated closer to power lines than the recommended minimum clearances shown in Table 2, except when such lines have been de-energized and visibly grounded or when barriers are present to prevent physical contact with the lines.

5.5.2 An individual shall be designated to observe equipment clearance as defined in Table 2. The operator should notify the observer if he is having any difficulty in determining the clearance. The observer shall sound a warning at any time the clearance is not maintained.

5.5.3 When cage-type boom guards, insulating guy lines, insulating links, or proximity warning devices on rigs or guy lines are used, the recommendations of Table 2 are applicable.

5.5.4 Overhead wires shall be considered energized (live) unless either the electrical system owner reports them to be non-energized, or a qualified electrical person tests and finds them to be non-energized.

Table 2—Recommended minimum clearances between power lines and derricks, masts, or guy lines:

Equipment	Line Voltage, Volts	Minimum Clearance
Operating	All	10 ft plus 4 in. For each additional 10 kV over 50 kV
In transit (lowered mast)	less than or equal to 50 kV	4 ft
	greater than 50 kV	4 ft plus 4 in. for every additional 10 kV

6 Design

6.1 Emergency eye or body wash stations

Where the eyes or body of personnel may be exposed to injurious materials, eyewash and shower equipment for emergency use shall be provided.

6.2 Critical equipment

Critical equipment is defined as equipment and other systems determined to be essential in preventing the occurrence of, or mitigating the consequences of an uncontrolled event.

Such equipment shall include pressure vessels, pressure relief devices, compressors, alarms, interlocks, and emergency shutdown systems.

6.2.1 Critical equipment shall be periodically inspected and tested as recommended by the manufacturer or in accordance with recognized engineering practices.

6.2.2 When using non-destructive testing (NDT) methods, qualified persons shall conduct the tests in accordance with recognized methodology and acceptance criteria.

6.2.3 Other types of inspection should be conducted by qualified persons.

6.2.4 When critical equipment is removed from service, a program shall be in place to ensure equivalent protection is provided.

6.3 Changes to critical equipment

Procedures to manage changes (except for Replacements in kind) to critical equipment shall be implemented, as appropriate. These procedures should address the following prior to making the change:

- a) The basis for the proposed change.
- b) Impact of change on safety and health.
- c) Modifications to operating procedures.
- d) Authorization requirements for the proposed change.

Employees whose job tasks will be affected by the change in the critical equipment shall be informed of the change prior to start-up.

6.4 Fire prevention

6.4.1 Safe storage and location of combustible and flammable materials and the prevention of accumulation of rubbish are important to fire prevention.

6.4.2 Smoking shall be prohibited at or in the vicinity of operations that constitute a fire hazard. Such locations should be conspicuously posted with a sign, **NO SMOKING OR OPEN FLAME** or equivalent.

6.4.3 Smoking shall be permitted only in areas designated for smoking.

6.4.4 Change rooms and other buildings where smoking is permitted shall be located in areas designated safe for smoking.

6.4.5 No source of ignition should be permitted in an area where smoking has been prohibited, unless it is first determined safe to do so by the supervisor in charge or his designated representative.

6.4.6 Potential sources of ignition shall be permitted only in designated areas located at a safe distance from the wellhead or flammable liquid storage areas.

6.4.7 Equipment, cellars, ground areas around and adjacent to the facility shall be kept free from oil and gas accumulations that might create or aggravate fire hazards.

6.4.8 Combustible materials such as oily rags and waste shall be stored in covered metal containers and the covers kept in place.

6.4.9 Natural gas or liquefied petroleum gas shall not be used to operate spray guns or pneumatic tools.

6.4.10 Material used for cleaning shall have a flash point of not less than 100°F.

6.5 Fire protection

6.5.1 Fire fighting equipment shall not be tampered with and shall not be removed for other than fire protection, Fire fighting purposes, and services. A fire fighting water system may be used for wash down and other utility purposes so long as its fire fighting capability is not compromised.

6.5.2 Fire extinguishers and other fire fighting equipment shall be suitably located, readily accessible, and plainly labelled as to their type and method of operation.

6.5.3 Fire suppression equipment (extinguishers, fixed systems, etc.) shall be periodically inspected and maintained in operating condition at all times. A record of the most recent equipment inspection should be maintained.

6.5.4 Portable fire extinguishers shall be tagged with a durable tag showing the date of the last inspection, maintenance, or recharge or accomplished using other acceptable recordkeeping media. Inspection and maintenance procedures should comply with NFPA 10.

6.5.5 Personnel should be familiar with the location of fire control and selected personnel trained in the use of such equipment. Fire fighting equipment shall be accessible and free of obstructions.

6.6 Grounding and bonding

Production facilities are subject to various forms of electrical hazards that shall be protected against. Static electricity can be generated by fluid movement in vessels, piping and tankage. Results in static sparks being generated which can be an ignition source. Lightning strikes to a facility are also an ignition source. Electrical equipment failure can occur exposing personnel to shock hazards.

7.7 Flammable liquids

7.7.1 Containers

7.7.1.1 Hand portable containers for storing flammable liquids shall be Underwriters Laboratories (UL) listed or Factory Mutual (FM) approved, or equivalent.

7.7.1.2 Tanks, drums, and other containers containing flammable liquids shall be properly labelled to denote their contents and shall be properly stored when not in use.

7.7.1.3 Metal or other conductive material containers shall be used in handling, storing, or transporting flammable liquids. The handling of flammable liquids in plastic containers is potentially dangerous due to static charge build up.

Metal parts on any plastic containers used in such service shall be bonded to the fill connection. If plastic containers are used, the conductive fill connection or a grounded rod should be inserted prior to filling the container with any flammable liquid.

7.7.2 Fuel and Oil Transfers and Refuelling

7.7.2.1 Hydrocarbon-fuelled engines shall be shut down during refuelling operations.

7.7.2.2 Fuel tanks should be monitored while they are being filled to prevent over fill and spillage.

7.7.2.3 During refuelling operations, the filling nozzle shall be kept in contact with the intake pipe to ensure bonding and prevent fuel spillage.

7.7.3 Liquefied Petroleum Gas (LPG) and Compressed Gas

7.7.3.1 Handling, connecting, and transfer operations involving liquefied petroleum gas (LPG) shall conform to Liquefied Petroleum Gas Part 4; Product Specifications.

7.7.3.2 Ignition Source Control. Ignition source controls shall be established in any area where flammable or oxidizing compressed gases are stored or used.

7.7.3.3 Protective Caps. Where compressed gas cylinders are designed to accept valve protective caps, the user should keep such caps on compressed gas cylinders at all times except when being filled or connected for use.

7.7.3.4 Where gas-tight valve outlet caps or plugs are provided, the user shall keep such devices on the valve outlet at all times except when compressed gas cylinders are being filled or connected for use.

7.7.3.5 Compressed or liquefied gas cylinders in use or in storage shall be secured to prevent them from falling or being knocked over.

7.7.3.6 Compressed gas cylinders should be transported, stored and used in an upright position.

7.7.3.7 Compressed gas cylinders exposed to fire shall not be used until they are re-qualified in accordance with the pressure vessel code under which they were manufactured.

7.7.3.8 Containers that show denting, bulging, gouging, or excessive corrosion should be removed from service.

7.7.3.9 Repair or alteration of containers shall comply with the regulations, rules, or code under which the container was fabricated.

7.7.3.10 Compressed gas cylinders shall be marked or labelled in accordance with CGA C-7 Guide to the Preparation of Precautionary Labelling and Marking of Compressed Gas Containers. Such markings or labels should not be removed.

7.7.3.11 Compressed gas cylinders shall not be placed where they could become a part of an electrical circuit.

7.7.3.12 Compressed gas cylinders should not be exposed to temperatures exceeding 125°F. Cylinders shall not be subjected to direct heating to increase vapour pressure.

7.7.3.13 Stoves and heaters used with LPG fuel should only be used in well-ventilated areas. Personnel should ensure proper ventilation exists before lighting the heater/ stove. All hoses and connections on LPG stove or heater systems should be checked frequently to ensure they do not leak.

7.7.3.13.1 Only qualified personnel shall be allowed to fill LPG bottles. Protective gloves should be worn when refilling or replacing LPG bottles. There is a possibility of freeze burns if propane comes in contact with skin.

7.7.4 Storage

7.7.4.1 Flammable liquids storage areas within any building or shed shall:

- a) Be adequately vented.
- b) Have unobstructed exit(s) leading from the building.
- c) Be maintained with due regard to fire potential with respect to housekeeping and materials storage.

- d) Be identified as a hazard and have appropriate warning signs posted.
- e) Have a Class BC fire extinguisher readily available.
- f) Be properly classified for electrical installations..

7.7.4.2 Paint and solvents shall be stored in an adequately vented area safely away from heat and ignition sources.

7.7.4.3 Flammable liquids shall not be stored within 50 ft (15.2 m) of the wellbore, except for fuel in the tanks of operating equipment. Where terrain and location configuration do not permit maintaining this distance, equivalent safety measures should be taken.

7.8 Equipment

7.8.1 Generators, Motors, and Lighting

7.8.1.1 All electrical conductors and switch gear shall be sized in accordance with NFPA 70.

7.8.1.2 All generators should have an overload safety device that will provide protection from shorting and burnout.

7.8.1.3 When adequate fixed illumination cannot be made available, temporary portable lights approved for the electrical classification shall be provided. Where possible, floodlights in use should be placed in positions so as not to impair vision of persons in the work area. Operations should not be performed using vehicle headlights as a substitute for lighting.

7.8.1.4 All electrical extension cords shall be properly insulated and plugs and receptacles shall be in good condition.

7.8.1.5 Light fixtures should be placed and maintained to provide illumination for work areas.

7.8.1.6 Repairs to electrical equipment shall not be performed unless the power source has been isolated and the control has been locked out/tagged out, and the person making the repairs is authorized to do so.

7.8.1.7 Electric motors, generators, and control panels shall be grounded.

7.8.2 Electrical Systems

7.8.2.1 Electrical Systems Equipment

7.8.2.1.1 Electrical equipment used in hazardous locations shall be designed for such locations, and listed or approved by a nationally recognized testing laboratory. All wiring components and electrical equipment should be maintained in accordance with the manufacturer's recommendation.

7.8.2.1.2 Wiring shall be replaced or properly repaired and sealed as necessary when insulation damage is detected.

Because of fire and other hazards, makeshift wiring components and installations should not be used.

7.8.3 Classification of Areas

7.8.3.1 Classification of areas shall be in accordance with relevant Uganda Standard.

7.8.4 Tanks, Separators and Heater Treaters

7.8.4.1 Tanks, separators and heater treaters should be installed and maintained in accordance with accepted engineering practices or manufacturer's recommendations.

7.8.4.2 Walking directly on the roof of a tank is discouraged.

However, if personnel are required to access the roof of a tank, roof integrity shall be checked and appropriate walking surfaces, guardrails or fall protection shall be provided.

7.8.5 Vapor Recovery Systems (systems designed to minimize vapor releases to the environment)

7.8.5.1 This section describes the safety guidelines for vapor recovery systems, especially thermal combustion systems and carbon absorption systems.

7.8.5.2 Vapour recovery systems shall be considered potential sources of ignition; facility design shall consider system location with respect to potential sources of hydrocarbon vapours.

7.8.5.3 Procedures shall be developed for switching carbon beds and changing out the activated carbon in the absorbers.

7.8.5.4 Devices shall be installed to prevent a flame from propagating from the vapour recovery unit into the production equipment.

8 Training

8.1 All personnel should be trained to work safely in accordance with their duties and responsibilities. Personnel should understand the safety and health hazards associated with the chemicals and processes they work with.

8.2 Contractor personnel performing operating duties, maintenance or repair, turnaround, major renovation or specialty work should be knowledgeable of site-specific safety procedures and rules pertaining to the facility and the applicable provisions of emergency action plans.

8.3 Persons assigned to operate the facility or maintain the integrity of the equipment shall possess the required knowledge and skills to carry out their duties and responsibilities and shall be evaluated periodically to determine if the necessary skills and knowledge are adequate.

8.4 Any major change that requires modification of existing operating practices may require additional training before personnel are expected to operate or maintain the facility.

9 Procedures

9.1 Well Start-up

9.1.1 Introducing a new or worked-over well to a separation process, pipeline or storage facility may create additional hazards to the operation.

9.1.1.1 The properties of the well shall be reviewed to determine the extent of the hazards. Depending upon the risks of the hazards the following elements should be considered.

9.1.2 Design Review

9.1.2.1 A design review shall be performed to verify that the facility's equipment can safely process the well stream.

9.1.2.2 The design information shall include, as appropriate, a simplified process flow diagram and acceptable upper and lower limits, where applicable, for items such as temperature, pressure, flow and hydrocarbon composition.

9.1.2.2.1 Where process flow diagrams no longer exist, similar information may be developed in conjunction with a hazards analysis in sufficient detail to support the analysis.

9.1.3 Pressure Relief

Pressure relief systems shall be properly sized, installed, maintained and operated to minimize overpressure.

9.1.4 Start-up Procedures

9.1.4.1 Oil and gas wells have varying characteristics as follows:

- a) Shallow vs deep
- b) Low vs high pressure
- c) Sweet vs sour

9.1.4.1.1 Start-up procedures shall be tailored to the particular well characteristics. Well start-ups are classified as initial start-up, normal or routine start-ups, and start-up after an extended shutdown.

9.1.4.2 Pre Start-up Safety Review

Prior to start-up of a new facility, or after modification of an existing facility, certain activities shall be conducted to prepare the facility for safe operations. The following areas should be considered:

- a) Construction has been completed according to design requirements.
- b) Piping and valves are properly installed.
- c) All safety and control devices are set and operate properly.
- d) Applicable safety and control devices are functioning properly.
- e) Eliminate potential ignition sources.
- f) Pre-job safety meeting.

9.1.4.3 Initial Start-up

9.1.4.3.1 The following procedures shall be considered:

- a) Pressure test from well to choke at maximum wellhead pressure.
- b) Pressure test from choke to production equipment, including flow lines, at expected line pressure.
- c) Pressure relief systems are operable.
- d) Valves are set correctly.
- e) Purge air from the well and associated equipment using hydrocarbons or other acceptable means.
- f) Monitor flow and bring well online.
- g) Pre-job safety meeting.

9.1.4.4 Normal or Routine Start-up

The following procedures shall be considered:

- a) Pressure relief systems are operable.
- b) Valves are set correctly.
- c) Monitor flow and bring well online.
- d) Pre-job safety meeting.

9.1.4.5 Start-up After Extended Shutdown

9.1.4.5.1 After an extended shutdown, an equipment assessment shall be conducted prior to well start-up.

9.1.4.5.2 This assessment shall include inspections for corrosion, missing or modified equipment, and overall integrity of the facility.

9.1.4.5.3 After the assessment is completed, and repairs and corrections are made, well start-up shall follow initial start-up procedures or normal start-up procedures, as applicable.

9.1.5 Training of Employee and Contractor Personnel

Personnel conducting well start-up operations shall be properly trained, qualified, and familiar with well start-up procedures for the specific facility.

10 Maintenance

10.1 The maintenance supervisor shall hold a pre-job meeting with his crew, and others if applicable, to review responsibilities for the operation(s) to be performed.

10.2 Tank cleaning

Tank cleaning shall be completed following, guidance, safe practices and additional information covering specific aspects of tank entry and cleaning, including a comprehensive tank cleaning checklist.

10.3 Drilling and well servicing

Drilling and well servicing shall be performed in accordance with US ISO 14693:2015

11 Incident Investigation

11.1 All incidents with the potential for serious safety consequences shall be investigated to determine causal factors and steps taken to prevent a recurrence.

11.2 The results of the investigation should be communicated to affected personnel including contractors as appropriate.

12 Emergency Response

12.1 Written action plans shall be established for production facilities to assign authority to the appropriate qualified person(s) for initiating effective emergency response and control.

These plans shall also address emergency reporting and response requirements.

12.1.1 Every occupational injury or illness shall be immediately reported to the supervisor. The supervisor shall arrange for any necessary medical or first aid treatment.

12.1.2 A report shall be prepared as soon as practical, to record information (or the circumstances) surrounding the injury or illness. Additional reports to regulatory agencies and others may be required.

12.2 Medical services

12.2.1 Telephone numbers, location, and other relevant information pertaining to availability of medical personnel, transportation, and medical facilities shall be available.

12.2.2 Provisions shall be made for medical attention in case of injury.

12.3 First Aid

12.3.1 An individual trained in first aid and Cardiopulmonary resuscitation (CPR) techniques shall be available to render aid. This individual shall be trained using approved courses or equivalent training.

12.3.2 A first aid kit shall be available at the worksite shall contain appropriate materials for the potential injuries, and shall be inspected at frequent intervals, replenished as necessary, and be immediately available at all times.

13 Special Operations

13.1 Well Testing

13.1.1 A cleanup tank shall be used instead of a work over pit during well testing. Testing of casing relief valves using fluids other than fresh water shall have the relief piped to a catch tank.

13.1.2 When pressure testing surface equipment, use a 50/50 mixture of glycol and 2% potassium chloride (KCl) water or equivalent to prevent ice formation.

13.1.3 During well testing, the equipment shall be pressure tested to maximum expected formation pressure. The following equipment shall be included during the pressure testing:

- a) Test tree and casing for 10 minutes and record.
- b) Secure and pressure test lines upstream of choke prior to flow back.
- c) Test lubricator.
- d) Test surface lines.

13.2 Pumping and hot oil operations (flow lines)

13.2.1 All trucks and tanks shall be located a minimum of 100 ft (30.5 m) upwind from the wellhead, or equivalent safety measures shall be taken where terrain, location, or other conditions do not permit. At locations where this recommendation may be impractical, appropriate safety measures should be implemented.

13.2.2 All lines connected from the pumping equipment to the Christmas tree or wellhead shall have a check valve installed as close to the well as practicable. In addition, when a multi-pump manifold is used, a check valve shall be placed in each discharge line as close to the manifold as possible.

13.2.3 When used, recording equipment shall be located a safe distance from the wellhead and discharge line.

13.2.4 When pumping flammable fluids, all blending equipment used shall be grounded and all equipment unloading sand into the hopper should be bonded to the blending equipment.

13.2.5 When pumping flammable fluids, all charged suction hoses shall be covered with hose covers to deflect fluids in case of rupture.

13.2.5 Lines containing flammable fluids shall not be placed under any vehicle.

13.2.6 A pre-treatment pressure test on the pump and discharge lines shall be made at a pressure no less than the maximum expected treating pressure specified by the operator, but not to exceed the rated working pressure of the equipment with the lowest rated working pressure.

13.2.7 Personnel not directly involved in the operations shall remain beyond a designated minimum distance during all pressure testing and pumping operations.

13.2.8 The supervisor or the person he designates shall check to see that all valves in discharge lines are open prior to pumping.

13.2.9 Pump operators shall remain at the controls while the pump is in operation, unless relieved as directed by the special services supervisor. Pump operators shall remain alert for communications from the special services supervisor.

13.3 Pigging operations

13.3.1 Procedures shall be developed for launching and receiving pigs, scrapers, swabs, and internal inspection pigs (smart pigs). These procedures shall address the following elements:

- a) Description of the process fluids and vapours, personnel hazards, and PPE.
- b) Selecting and verifying the proper pig is available.
- c) Preparing the pig launcher/receiver, including isolation, de-pressuring, and setting pig indicators.
- d) Verifying that the vessel is not pressurized.
- e) CAUTION: Gauges alone may not insure that the vessel is fully depressurized. Intentionally opening a pig launcher/receiver under pressure using any style of opener is prohibited.
- f) Opening the pig launcher/receiver
- g) CAUTION: Ensure all personnel are positioned at the side of the pig launcher/receiver. Do not stand in front of the pig launcher/receiver closure when the closure is being opened.
- h) Inserting and removing pigs, including isolation of ignition sources, containment of liquid wastes and exposure to toxic compounds.
- i) Inspecting and repairing as necessary pig launcher/receiver closures, valves, pressure gauges, pig indicators, and other ancillary components each time the closure is opened.

j) Closure of the pig launcher/receiver and returning it to service.

k) A procedure to take in event the pig is stuck or any of the valves do not operate properly.

13.3.2 Only qualified persons in pig launching/receiving should perform pigging operations.

13.3.3 A pre-job safety review shall be performed prior to all pig launching/receiving operations.

Pig launchers/receivers shall be depressurized whenever left isolated from the pipeline.

13.3.4 Fire extinguishing equipment shall be positioned near the pig launcher/receiver when pigging operations are being performed.

13.4 Hot tapping on equipment in service

13.4.1 Hot tapping operations should be conducted with Welding or Hot Tapping on Equipment in Service.

13.4.2 Hot tapping operations shall be under the direct supervision of a qualified person.

The rated working pressure of all equipment used in hot tapping operations should be equal to or greater than the rated working pressure of the equipment to which it is being attached.

13.4.3 After necessary equipment has been rigged up to perform hot tapping operations, it should be pressure tested for a minimum of three minutes to a level not exceeding the rated working pressure of either the equipment being tapped or the tapping equipment and not to exceed 1.5 times the expected maximum pressure. The possibility of carrier or untapped pipe collapse from external pressure may dictate a reduction in test pressure.

13.4.4 During the hot tapping operation, pressure inside the lubricator should not exceed the pressure inside the equipment penetrated.

13.4.5 Hot taps or other hot works are not permitted on the roof of a tank or within the gas vapour space of the tank.

Certification marking

Products that conform to Uganda standards may be marked with Uganda National Bureau of Standards (UNBS) Certification Mark shown in the figure below.

The use of the UNBS Certification Mark is governed by the Standards Act, and the Regulations made thereunder. This mark can be used only by those licensed under the certification mark scheme operated by the Uganda National Bureau of Standards and in conjunction with the relevant Uganda Standard. The presence of this mark on a product or in relation to a product is an assurance that the goods comply with the requirements of that standard under a system of supervision, control and testing in accordance with the certification mark scheme of the Uganda National Bureau of Standards. UNBS marked products are continually checked by UNBS for conformity to that standard.

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