

RED SEAL

OCCUPATIONAL

STANDARD

RIG TECHNICIAN



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FOREWORD

***The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this Red Seal Occupational Standard (RSOS) as the Red Seal standard for the Rig Technician trade.***

**Background**

The first National Conference on Apprenticeship in Trades and Industries, held in Ottawa in 1952, recommended that the federal government be requested to cooperate with provincial and territorial apprenticeship committees and officials in preparing standards of a number of skilled occupations. Employment and Social Development Canada (ESDC) sponsors the Red Seal Program, which, under the guidance of the CCDA, develops a national occupational standard for each of the Red Seal trades.

Standards have the following objectives:

* to describe and group the tasks performed by skilled workers;
* to identify which tasks are performed in every province and territory;
* to develop instruments for use in the preparation of Interprovincial Red Seal Examinations and assessment tools for apprenticeship and certification authorities;
* to develop common tools for apprenticeship on-the-job and technical training in Canada;
* to facilitate the mobility of apprentices and skilled workers in Canada;
* to supply employers, employees, associations, industries, training institutions and governments with occupational standards.

Any questions, comments, or suggestions for changes, corrections, or revisions to this standard or any of its related products may be forwarded to:

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This standard was prepared by the Apprenticeship and Regulated Occupations Directorate of ESDC. The coordinating, facilitating and processing of this standard were undertaken by employees of the standards development team of the Trades and Apprenticeship Division and of the Government of Alberta, the host jurisdiction for this trade.

STRUCTURE OF THE OCCUPATIONAL STANDARD

To facilitate understanding of the occupation, this standard contains the following sections:

**Description of the Rig Technician trade:** an overview of the trade’s duties, work environment, job requirements, similar occupations and career progression

**Trends in the Rig Technician trade:** some of the trends identified by industry as being the most important for workers in this trade

**Essential Skills Summary:** an overview of how each of the 9 essential skills is applied in this trade

**Industry Expected Performance:** description of the expectations regarding the level of performance of the tasks, including information related to specific codes, regulations and standards that must be observed

**Language Requirements:** description of the language requirements for working and studying in this trade in Canada

**Pie Chart:** a graph which depicts the national percentages of exam questions assigned to the major work activities

**Task Matrix and Examination Weightings:** a chart which outlines graphically the major work activities, tasks and sub-tasks of this standard and their respective exam weightings

**Major Work Activity (MWA):** the largest division within the standard that is comprised of a distinct set of trade activities

**Task:** distinct actions that describe the activities within a major work activity

**Task Descriptor:** a general description of the task

**Sub-task:** distinct actions that describe the activities within a task

**Essential Skills:** the most relevant essential skills for this sub-task

**Skills**:

**Performance Criteria:** description of the activities that are done as the sub-task is performed

**Evidence of Attainment:** proof that the activities of the sub-task meet the expected performance of a tradesperson who has reached journeyperson level

**Knowledge:**

**Learning Outcomes:** describes what should be learned relating to a sub-task while participating in technical or in-school training

**Learning Objectives:** topics to be covered during technical or in-school training in order to meet the learning outcomes for the sub-task

**Range of Variables:** elements that provide a more in-depth description of a term used in the performance criteria, evidence of attainment, learning outcomes, or learning objectives

**Appendix A – Acronyms:** a list of acronyms used in the standard with their full name

**Appendix B – Tools and Equipment:** a non-exhaustive list of tools and equipment used in this trade

**Appendix C – Glossary:** definitions or explanations of selected technical terms used in the standard

DESCRIPTION OF THE

RIG TECHNICIAN TRADE

“Rig technician” is this trade’s official Red Seal occupational title approved by the CCDA. This standard covers tasks performed by rig technicians whose occupational title has been identified by some provinces and territories of Canada under the following name:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | NL | NS | PE | NB | QC | ON | MB | SK | AB | BC | NT | YT | NU |
| Rig Technician | ◼ | ◼ | ◼ |  |  |  |  | ◼ | ◼ | ◼ | ◼ |  |  |

Drilling is an important phase of oil exploration and extraction in Canada. Drilling is one of the methods used to access hydrocarbon formations. Rig technicians work on drilling rigs and other specialized equipment to drill holes to retrieve these hydrocarbons as well as other applications such as disposal wells.

Drilling rigs are owned by companies specializing in drilling, called drilling contractors. Some contractors are larger than others and some specialize in certain types of operations. However, all contractors offer their drilling equipment and the services of their employees to exploration companies on a contract basis.

A rig crew’s operational structure is organized by a clearly defined set of duties and responsibilities. After gaining entry level experience as a leasehand and floorhand, workers in this trade must progress through the ranks of motorhand and derrickhand in order to become fully qualified rig technicians/drillers. The division of duties in the levels of skilled workers on a rig crew is:

**Motorhands:** maintain drilling rig engines, transmissions, heating systems, diesel electric generators and motors, hydraulic systems and other mechanical equipment; maintain equipment logs and records; monitor fluid and supply levels; participate in rig mobilization (rig up) and demobilization (rig out); supervise and are able to do all duties performed by floorhands and leasehands.

**Derrickhands:** operate drilling fluid systems and pumps during drilling; mix chemicals and additives; handle sections of the drill string assembly from the monkeyboard during tripping operations; monitor and record volume and properties of drilling fluids; supervise motorhands, floorhands and leasehands; and are able to do all duties performed by motorhands.

**Rig technicians (drillers):** operate the drawworks, rotary equipment and pumps; inspect rig; maintain records of drilling operations; use automated equipment; are able to perform all duties performed by any crew member; and are responsible for the safety, training and supervision of the crew members.

Rig technicians report directly to the drilling rig manager. The scope of the rig technician for this standard covers the duties of motorhands, derrickhands and drillers.

A rig crew works with a variety of hand and power tools, as well as motorized equipment, lifting and hoisting equipment, and personal protective equipment (PPE) and safety equipment. Computers are an important tool in this trade to maintain operational records and interpret data related to drilling activities.

The rig is set up and transported to different sites resulting in the rig crew often travelling to remote locations. The work is performed in all weather conditions and workers should be prepared to work in all types of weather and environmental conditions (example: cold, hot, noisy, dirty, dusty, wet and muddy). Drilling activity peaks during the winter months when the ground is frozen. The work pressures and demands may fluctuate depending on world oil and gas supply and demand.

Important attributes for rig technicians are good hand-eye coordination, mechanical inclination, the ability to work well in a team and with third-party service providers, and strong leadership, communication, and organizational skills. Good physical condition is important because the work often requires considerable lifting, long hours and repetitive movement.

Drilling is a 24-hour operation, requiring rig technicians to work shifts and often long hours. The job requires mental alertness due to the inherent work hazards such as moving equipment, exposure to chemicals, risks of explosions and working at heights. Rig technicians work outdoors in all kinds of weather, often in remote and isolated areas away from home.

Rig technicians are expected to perform supervisory duties and training of apprentices and other less experienced crew members. Experienced rig technicians may move into other positions such as rig managers, instructors, well site supervisors, sales representatives or other technical positions within the industry.

TRENDS IN THE  
RIG TECHNICIAN TRADE

TECHNOLOGY

Multi-well pads, swamp mats and fibre roads are increasingly used to allow better access to drilling areas that were previously difficult to access. This increases the possibility of longer drilling seasons.

New technologies are offering new choices of bits, drilling fluids and downhole tools, which increase the speed at which wells are drilled. Top drives are evolving to allow for deeper wells. Also, new types of drilling rigs are being built, such as automated drilling rigs (ADR). Much of the hands-on work on a traditional rig is facilitated by automated systems on the ADR. Walking rigs are able to move on-site without rigging out, which increases the efficiency of drilling multiple wells. With these advances, the rig technician is operating a wider variety of equipment with the purpose of increasing the safety and efficiency of the operations.

There is an increased focus on cost savings which means ramifications for innovation and research and development. For example, oil companies are focusing on their core activities and out-sourcing non-core activities more and more. There is also an increased interest in technology such as casing, specialty drilling tools, and higher output machinery, as this technology can increase production and lower costs simultaneously.

Operations have evolved to allow for drilling into formations which were previously not economically feasible for oil and gas operators. There is a trend to have more specialized drilling operations such as managed pressure drilling (MPD). This requires an increased involvement of third-party service providers.

TRAINING

There is an increasing importance being placed on communication and leadership skills. As part of these skills, computer literacy, the ability to train junior crew members, and the ability to work in a team environment are becoming highly valued qualities in this trade.

SAFETY

New regulations and company policies are impacting drilling rig management and crews, especially in the areas of due diligence, liability issues and safety training. Also, job safety analysis (JSAs) and specific task training are using more modern communication technologies such as tablets. To prove due diligence, there are ever increasing demands regarding the documentation of meetings.

ENVIRONMENT

New, more fuel-efficient rigs that are powered by hybrid technology and natural gas have been introduced to reduce emissions. In some areas, low-impact lease-building is introduced with methods such as ice-pads which limit the disturbance to the ground and vegetation.

ESSENTIAL SKILLS SUMMARY

Essential skills are needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.

Through extensive research, the Government of Canada and other national and international agencies have identified and validated nine essential skills. These skills are used in nearly every occupation and throughout daily life in different ways.

A series of CCDA-endorsed tools have been developed to support apprentices in their training and to be better prepared for a career in the trades. The tools can be used independently or with the assistance of a tradesperson, trainer, employer, teacher or mentor to:

• understand how essential skills are used in the trades;

• learn about individual essential skills strengths and areas for improvement; and

• improve essential skills and increase success in an apprenticeship program.

The tools are available online or for order at: [www.esdc.gc.ca/eng/jobs/les/profiles/index.shtml](http://www.esdc.gc.ca/eng/jobs/les/profiles/index.shtml)

The application of these skills may be described throughout this document within the skills and knowledge which support each sub-task of the trade. The most important essential skills for each sub-task have also been identified. The following are summaries of the requirements in each of the essential skills, taken from the essential skills profile. A link to the complete essential skills profile can be found at [www.red‑seal.ca](http://www.redseal.ca).

READING

Rig technicians read a variety of documents such as drilling logs, mud reports, company memos, engineering handbooks, training and operation manuals, safety data sheets (SDS) and Workplace Hazardous Materials Information System (WHMIS) symbols.

DOCUMENT USE

Rig technicians interpret identification labels on lubricants, salt inhibitors and other fluid additives as well as safety signs and notices posted on the rig. They also reference mud reports and pressure and volume charts to control influxes and optimize drilling performance. They record mud flows and volumes into tables such as trip sheets and tour sheets on a daily basis. They also complete safety-related documentation such as JSA forms, hazard identifications and WHMIS documents.

WRITING

Rig technicians input required information and notes on a variety of forms and reports such as tour sheets and trip sheets. Tour sheets are trade-specific legal documents used for billing, payroll, safety, injury reports and well data, and are the main source of information about all operations on a drilling rig. Rig technicians may also keep a personal log of their own activities in which they may write reminder notes.

ORAL COMMUNICATION

Rig technicians may give and receive warning of safety hazards, or instructions. They talk with co-workers to coordinate their tasks. They also participate in and chair safety meetings to discuss procedures, hazards, potential problems and tools and materials needed. Listening and questioning are important for clarifying instructions.

Rig technicians work in a noisy and fast paced setting, often in harsh weather conditions and with distances and visual blocks between workers. They often communicate with body language and gestures. They wear ear protection and sometimes radio headphones. Communication depends on being vigilant and aware of what is about to happen.

NUMERACY

Rig technicians calculate quantities of chemicals to add to the mud mixture, measure lengths of pipes, determine fluid volume in a tank using coefficients and charts, and calculate the time it will take to pump a volume of fluid into the well. Rig technicians read gauge fluctuations and convert between imperial and metric measurement systems. They also calculate amount of mud loss and pump output. They calculate depth drilled at the end of each tour. It is critical to make sure depth calculations are correct at all times.

THINKING

Rig technicians use problem-solving skills when encountering problems such as a need for well control, and equipment break-downs or malfunctions in order to take necessary actions in a safe and efficient manner. They make decisions about rig setup procedures and maintenance.

Rig technicians apply information from oil company consultants and supervisors about the well's expected conditions, and about processes and procedures. They may consult charts, training manuals and handbooks to look up and interpret relationships between pipe sizes, pressures, volumes and rate of flow.

WORKING WITH OTHERS

Rig technicians work as part of a team on a rig crew. Because they work in remote locations, even between shifts, rig crews develop camaraderie. They mostly perform their tasks independently; however, they coordinate with other workers on a constant basis for activities such as tripping pipe and drilling operations. They often must work with third-party personnel to coordinate activities such as wireline logging, cementing, moving the rig, running casing and pressure testing.

DIGITAL TECHNOLOGY

Rig technicians increasingly are using digital technology in drilling operations, as rigs become more automated. They may enter data in customized programs, such as electronic drilling recorders (EDR) and tour reports. They may also use other custom-designed programs to monitor well condition readings during operation for example. They use directional screens for orientation of downhole tools. They also use portable electronic devices and tablets for electronic documentation such as safety forms and company-specific information.

CONTINUOUS LEARNING

Rig technicians learn continuously through on-the-job experience and talking with co-workers. They are required to maintain safety certifications for first aid, first line well control, and hydrogen sulfide (H2S). In addition, some companies provide on-going training with the possibility of moving into higher supervisory positions. There are continually evolving drilling equipment, methods and practices that rig technicians must adapt to.

INDUSTRY EXPECTED PERFORMANCE

All tasks must be performed according to the applicable industry and jurisdictional codes, standards and recommended practices. All health and safety standards must be adhered to. It is expected that work be done safely, efficiently and at a high quality with minimal material waste or environmental damage. All requirements of the manufacturer, operator and contractors must be met. At a journeyperson level of performance, all tasks must be done with minimal direction and supervision. As a journeyperson progresses in their career there is an expectation they continue to upgrade their skills and knowledge to keep pace with industry and promote continuous learning in their trade through mentoring of apprentices.

LANGUAGE REQUIREMENTS

It is expected that journeypersons are able to understand and communicate in either English or French, which are Canada’s official languages. English or French are the common languages of business as well as languages of instruction in apprenticeship programs.

PIE CHART

OF RED SEAL EXAMINATION

WEIGHTINGS

|  |  |  |
| --- | --- | --- |
| MWA A | Performs common occupational skills | 14% |
| MWA B | Moves rig | 9% |
| MWA C | Performs rig up and rig out procedures | 15% |
| MWA D | Performs rig inspection and maintenance | 24% |
| MWA E | Performs drilling operations | 38% |

This pie chart represents a breakdown of the interprovincial Red Seal examination. Percentages are based on the collective input from workers from the trade from across Canada. The Task Matrix on the next pages indicates the breakdown of tasks and sub-tasks within each Major Work Activity and the breakdown of questions assigned to the Tasks. The interprovincial examination for this trade has 120 questions.

RIG TECHNICIAN

TASK MATRIX

|  |  |
| --- | --- |
| A – Performs common occupational skills |  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Task A-1 Uses tools and equipment |  | A-1.01 Uses hand and power tools | A-1.02 Operates loaders and aerial work platforms | A-1.03 Uses rigging/hoisting equipment | |
| Task A-2 Organizes supplies and materials |  | A-2.01 Maintains parts and supply inventory | A-2.02 Disposes of waste materials |
| Task A-3 Uses documentation and reports |  | A-3.01 Uses personnel documentation | A-3.02 Uses safety and environmental documentation | A-3.03 Completes tour sheets | |
|  |  | A-3.04 Interprets trade documentation | A-3.05 Uses maintenance documentation |  | |
| Task A-4 Supervises crew members and communicates with others |  | A-4.01 Supervises crew members | A-4.02 Trains crew members | A-4.03 Leads crew meetings | |
|  |  | A-4.04 Communicates with third-party service providers |  | |
| Task A-5 Performs safety-related activities |  | A-5.01 Uses personal protective equipment (PPE) and safety equipment | A-5.02 Maintains safe work environment | A-5.03 Performs lock-out procedures | |
|  |  | A-5.04 Participates in journey management |  | |

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| --- | --- |
| B – Moves Rig |  |

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| --- | --- | --- | --- | --- |
| Task B-6 Performs on-pad moves |  | B-6.01 Performs rig walk | B-6.02 Performs rig skidding |  |
| Task B-7 Performs rig moves |  | B-7.01 Moves rig on and off location | B-7.02 Assembles/ disassembles rig components |  |

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| --- | --- |
| C – Performs rig up and rig out procedures |  |

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| --- | --- | --- | --- | --- |
| Task C-8 Performs rig up operations |  | C-8.01 Rigs up air, fuel, water, hydraulic, electrical and communication systems | C-8.02 Starts equipment | C-8.03 Raises derrick |
|  |  | C-8.04 Rigs up rig floor and related equipment | C-8.05 Rigs up mud tanks, pumps and circulation systems | C-8.06 Rigs up boiler and steam circulating systems |
| Task C-9 Performs rig out operations |  | C-9.01 Rigs out rig floor and related equipment | C-9.02 Lays down derrick | C-9.03 Rigs out mud tanks, pumps and circulation systems |
|  |  | C-9.04 Rigs out boiler and steam circulation systems | C-9.05 Rigs out air, fuel, water, hydraulic, electrical and communication systems | C-9.06 Prepares equipment for transport |

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| --- | --- |
| D – Performs rig inspection and maintenance |  |

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| --- | --- | --- | --- | --- |
| Task D-10 Inspects rig equipment |  | D-10.01 Performs daily walk-around and detailed rig inspection | D-10.02 Determines required repairs |  |
| Task D-11 Maintains rig equipment |  | D-11.01 Maintains mechanical and pneumatic systems | D-11.02 Maintains hydraulic systems | D-11.03 Maintains electrical and communication systems |
|  |  | D-11.04 Maintains boiler and steam systems | D-11.05 Maintains overhead equipment | D-11.06 Maintains top drives |
|  |  | D-11.07 Maintains rig floor equipment | D-11.08 Maintains mud pump and high pressure mud system | D-11.09 Maintains mud tanks and low pressure mud system |
|  |  | D-11.10 Maintains water and fuel circulating systems | D-11.11 Performs slip and cut |

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| --- | --- |
| E – Performs drilling operations |  |

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| --- | --- | --- | --- | --- |
| Task E-12 Prepares drill string |  | E-12.01 Takes measurements of bottomhole assembly (BHA) and drill string | E-12.02 Picks up bottomhole assembly (BHA) and drill string | E-12.03 Makes up bottomhole assembly (BHA) |
| Task E-13 Operates blowout preventer (BOP) equipment and associated components |  | E-13.01 Prepares for blowout preventer (BOP) installation | E-13.02 Nipples up blowout preventer (BOP) | E-13.03 Performs blowout preventer (BOP) accumulator functions |
|  |  | E-13.04 Pressure tests blowout preventer (BOP) and components | E-13.05 Nipples down blowout preventer (BOP) and related equipment |  |
| Task E-14  Performs drilling activities |  | E-14.01 Maintains drilling fluids | E-14.02 Operates electrical drive systems | E-14.03 Operates drilling equipment |
|  |  | E-14.04 Monitors drilling operations | E-14.05 Responds to changing well conditions | E-14.06 Performs well control operations |
| Task E-15  Performs tripping activities |  | E-15.01 Prepares for trip | E-15.02 Trips drill string and bottomhole assembly (BHA) | E-15.03 Lays down tubulars |
| Task E-16  Performs casing activities |  | E-16.01 Prepares casing | E-16.02 Installs casing equipment | E-16.03 Runs casing |
|  |  | E-16.04 Circulates casing | E-16.05 Performs cementing operations |  |
| Task E-17  Performs specialized drilling operations |  | E-17.01 Performs coring activities | E-17.02 Performs directional drilling | E-17.03 Performs underbalanced drilling (UBD) and managed pressure drilling (MPD) |
| Task E-18  Performs specialized well operations |  | E-18.01 Performs fishing and stuck pipe operations | E-18.02 Rigs wireline loggers in and out | E-18.03 Performs drill stem testing (DST) |
|  |  | E-18.04 Performs sour well operations | E-18.05 Completes the well |  |

MAJOR WORK ACTIVITY A

Performs common occupational skills

TASK A-1 Uses tools and equipment

TASK DESCRIPTOR

Rig technicians must use tools and equipment to perform most tasks in their trade.

|  |  |
| --- | --- |
| A-1.01 | Uses hand and power tools |

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| --- | --- |
| **Essential Skills** | Thinking, Continuous Learning, Reading |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

|  |  |  |
| --- | --- | --- |
|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-1.01.01P | organize and store ***hand and power tools*** | ***hand and power tools*** are organized and stored in designated locations |
| A-1.01.02P | clean, service and lubricate ***hand and power tools*** | ***hand and power tools*** are cleaned, serviced and lubricated according to manufacturers’ specifications |
| A-1.01.03P | inspect and identify worn, damaged and defective ***hand and power tools*** | worn, damaged and defective ***hand and power tools*** are inspected and identified as removed from service or repair |
| A-1.01.04P | document worn, damaged and defective ***hand and power tools*** taken out of service and inform supervisor | worn, damaged and defective ***hand and power tools*** taken out of service are documented and the supervisor is informed according to company policies |
| A-1.01.05P | dispose of, repair or replace worn, damaged and defective ***hand and power tools*** | worn, damaged and defective ***hand and power tools*** are disposed of, repaired or replaced according to degree of wear or damage and type of tool |

RANGE OF VARIABLES

***hand and power tools*** include: See appendix A

|  |  |  |
| --- | --- | --- |
|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-1.01.01L | demonstrate knowledge of ***hand and power tools***, their applications, maintenance and procedures for use | identify hazards and describe safe work practices and procedures pertaining to the use of ***hand and power tools*** |
|  |  | identify types of hand tools and describe their applications and procedures for use |
|  |  | identify types of power tools and describe their applications and procedures for use |
|  |  | describe the procedures used to maintain ***hand and power tools*** |
|  |  | describe the procedures used to inspect ***hand and power tools*** |
|  |  | identify criteria for replacement or repair of ***hand and power tools*** |
|  |  | describe the procedures used to document worn, damaged and defective ***hand and power tools*** |
|  |  | describe how to use ***hand and power tools*** according to manufacturers’ specifications for use |

RANGE OF VARIABLES

***hand and power tools*** include: See appendix A

|  |  |
| --- | --- |
| A-1.02 | Operates loaders and aerial work platforms |

|  |  |
| --- | --- |
| **Essential Skills** | Thinking, Continuous Learning, Document Use |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

|  |  |  |
| --- | --- | --- |
|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-1.02.01P | perform ***pre-operational inspection activities*** | ***pre-operational inspection activities*** are performed according to manufacturers’ specifications |
| A-1.02.02P | operate loader | loader is operated to move materials according to road and site conditions and manufacturers’ specifications |
| A-1.02.03P | operate aerial work platform | aerial work platform is operated to access work at heights according to manufacturers’ specifications |
| A-1.02.04P | operate material handling equipment | material handling equipment is operated to move material and equipment to locations according to manufacturers’ specifications |
| A-1.02.05P | park loader and aerial work platform and material handling equipment | loader and aerial work platform is parked according to emergency evacuation plan |
| A-1.02.06P | perform ***basic maintenance*** | ***basic maintenance*** is performed according to manufacturers’ specifications |
| A-1.02.07P | change ***loader aerial work platforms and material handling equipment attachments*** according to task | ***loader aerial work platforms and material handling equipment attachments*** are changed according to task |

RANGE OF VARIABLES

***pre-operational inspection activities*** include: checking fluid levels, checking for leaks, checking tires, and chains, checking lights, checking surrounding objects, checking equipment for damage

***basic maintenance*** includes: changing oil, topping up fluid levels, changing lights, greasing, maintaining batteries

***loader, aerial work platforms and material handling equipment attachments*** include: buckets, pallet forks, pipe grapples, stingers

|  |  |  |
| --- | --- | --- |
|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-1.02.01L | demonstrate knowledge ofloaders and aerial work platforms and material handling equipment, their applications, maintenance and procedures for use | identify hazards and describe safe work practices and procedures pertaining to the use of loaders and aerial work platforms |
|  |  | identify types of loaders, aerial work platforms and material handling equipment and describe their applications and procedures for use |
|  |  | identify types of ***loader attachments*** and describe their applications and procedures for use |
|  |  | identify types of ***aerial work platforms and material handling equipment attachments*** and describe their applications and procedures for use |
|  |  | describe the procedures used to inspect loaders, aerial work platforms, and material handling equipment prior to operation |
|  |  | describe the procedures used to maintain loaders, aerial work platforms and material handling equipment |
|  |  | identify loaders, aerial work platform and material handling equipment limitations and capacity |
|  |  | identify the functions of a spotter and taglines |
|  |  | identify service requirements for loaders, aerial work platforms and material handling equipment and their attachments |

RANGE OF VARIABLES

***loader, aerial work platforms and material handling equipment attachments*** include: buckets, pallet forks, pipe grapples, stingers

|  |  |
| --- | --- |
| A-1.03 | Uses rigging/hoisting equipment |

|  |  |
| --- | --- |
| **Essential Skills** | Working with Others, Thinking, Oral Communication |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-1.03.01P | inspect rigging and rigging accessories | describe the rejection criteria for rigging and rigging accessories according to manufacturers’ specifications |
| A-1.03.02P | select ***rigging method*** | ***rigging method*** is selected according to task, job requirements, load size and capacities |
| A-1.03.03P | identify ***potential hazards on moving load*** | ***potential hazards on moving load*** are identified and eliminated |
| A-1.03.04P | select ***rigging/hoisting equipment*** | ***rigging/hoisting equipment*** is selected according to task |
| A-1.03.05P | determine safe lifting point on the load for placing ***rigging/hoisting equipment*** | safe lifting point on the load for placing ***rigging/hoisting equipment*** is determined |
| A-1.03.06P | rig load and attach tag lines | load is rigged according to weight and rating of lifting equipment and tag lines are attached |
| A-1.03.07P | convey ***lift instructions*** | ***lift instructions*** are conveyed according to equipment operator’s requirements |
| A-1.03.08P | store ***rigging/hoisting equipment*** | ***rigging/hoisting equipment*** is stored according to manufacturers’ specifications |

RANGE OF VARIABLES

***rigging methods*** include: basket, choke, bridle, vertical

***potential hazards on moving load*** include: pinch points, slippery surfaces, overhead loads, powerlines, environmental conditions, line of fire

***rigging/hoisting equipment*** includes: slings, come-alongs, chain hoists, spreader bars, shackles, winch lines, tag lines

***lift instructions*** include: oral instructions, using hand signals, critical lift procedures

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-1.03.01L | demonstrate knowledge of ***hoisting/rigging equipment,*** their applications, limitations, rejection criteria and procedures for use | identify types of ***hoisting/rigging equipment*** and accessories, and describe their characteristics, limitations, rejection criteria and procedures for use |
|  |  | identify the ***factors to consider when selecting hoisting/rigging equipment*** |
| A-1.03.02L | demonstrate knowledge of basic hoisting/rigging techniques | describe the procedures used for attaching ***hoisting/rigging equipment*** to the load |
|  |  | describe the ***procedures used to perform a lift*** |
| A-1.03.03L | demonstrate knowledge of safe work practices and procedures pertaining to hoisting and rigging | identify hazards and describe safe work practices and procedures pertaining to the use of ***hoisting/rigging equipment*** |
|  |  | describe the ***procedures used to communicate*** during hoisting and rigging operations |
|  |  | describe rigging hardware and the safety factor associated with each item |
|  |  | identify types of personnel protective equipment (PPE) used for climbing, lifting and load moving equipment |

RANGE OF VARIABLES

***rigging/hoisting equipment*** includes: slings, come-alongs, chain hoists, spreader bars, shackles, winch lines, tag lines

***factors to consider when selecting hoisting/rigging equipment*** include: load characteristics, environment, safety factors, rejection criteria, anchor points, sling angles

***procedures used to perform a lift*** include: load determination, pre-lift checks, placement of load, post-lift inspection

***procedures used to communicate*** include: hand signals, electronic communications, audible/visual

TASK A-2 Organizes supplies and materials

TASK DESCRIPTOR

This task includes maintaining a parts and supply inventory, disposing of waste and hazardous materials, and performing housekeeping activities, all while working within the parameters of company, environmental and jurisdictional policies and regulations.

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| A-2.01 | Maintains parts and supply inventory |

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| **Essential Skills** | Thinking, Document Use, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-2.01.01P | check inventory stock levels | inventory stock levels are checked to identify future needs for rig parts and supplies |
| A-2.01.02P | determine when to order replacement parts | when to order replacement parts is determined according to equipment maintenance log books |
| A-2.01.03P | create a want list | a want list is created according to minimum stock amount |
| A-2.01.04P | receive, organize and store goods | goods are received, organized and stored in inventory |
| A-2.01.05P | store hazardous materials | hazardous materials are stored according to ***codes and regulations*** |

RANGE OF VARIABLES

***codes and regulations*** include: WHMIS, OH&S, provincial energy regulators

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-2.01.01L | demonstrate knowledge of types of parts and supplies, their properties and their handling requirements | identify types of parts and supplies |
|  |  | describe considerations for determining parts and supplies requirements |
|  |  | describe procedures to receive, organize and store inventory |
|  |  | describe managing rig site equipment inventory according to rig specifications |
| A-2.01.02L | demonstrate knowledge of safe handling practices for parts and supplies | describe safety requirements for handling parts and supplies |
| A-2.01.03L | demonstrate knowledge of storing hazardous material | describe regulatory ***codes and regulations*** for storing hazardous materials |

RANGE OF VARIABLES

***codes and regulations*** include: WHMIS, OH&S, provincial energy regulators

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| A-2.02 | Disposes of waste materials |

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| **Essential Skills** | Document Use, Writing, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-2.02.01P | identify ***hazardous waste materials*** for disposal and determine how they should be disposed of | ***hazardous waste materials*** for disposal are identified and determined how they should be disposed of according to ***environmental regulations*** |
| A-2.02.02P | separate ***waste materials*** for disposal and recycling | ***waste materials*** is separated for disposal and recycling according to ***environmental regulations*** |
| A-2.02.03P | handle and discard ***hazardous waste materials*** | ***hazardous waste materials*** are handled and discarded in designated area according to ***environmental*** ***regulations*** |
| A-2.02.04P | document the disposal of ***hazardous waste materials*** | disposal of ***hazardous waste materials*** is documented according to ***environmental regulations*** |

RANGE OF VARIABLES

***hazardous waste materials*** include: used oil, oil filters, oil rags, thread compound (dope), paint, grease tubes, boiler blow down, contaminated cuttings, batteries

***environmental regulations*** include: WHMIS, OH&S, Canadian Environmental Protection Act (CEPA), provincial regulations

***waste materials*** include: wood scraps, metal, plastic, containers, organic waste

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-2.02.01L | demonstrate knowledge of procedures used for disposing of ***hazardous waste materials*** | identify ***hazardous waste materials*** and describe safe work practices for their disposal |
|  |  | describe handling, storing and transporting procedures when dealing with ***hazardous waste materials*** |
|  |  | describe safe venting procedures when working with ***hazardous waste materials*** |
|  |  | explain waste management procedures |
| A-2.02.02L | demonstrate knowledge of regulatory requirements pertaining to the handling of waste materials | explain the role of the employer and employee in regard to ***environmental regulations*** |
|  |  | explain industry practices for hazard assessment and control procedures |
|  |  | describe the use of environmental regulatory documentation |

RANGE OF VARIABLES

***hazardous waste materials*** include: used oil, oil filters, oil rags, thread compound (dope), paint, grease tubes, boiler blow down, contaminated cuttings, batteries

***environmental regulations*** include: WHMIS, OH&S, Canadian Environmental Protection Act (CEPA), provincial regulations

TASK A-3 Uses documentation and reports

TASK DESCRIPTOR

It is critical that rig technicians use documentation to provide a record of the daily operations. Completion of documentation proves due diligence and enforces safe and proper operation of the rig.

Tour sheets are a regulatory requirement and allow the head office to track daily operations.

Rig technicians also interpret trade documentation and complete maintenance documentation.

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| A-3.01 | Uses personnel documentation |

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| **Essential Skills** | Document Use, Writing, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-3.01.01P | complete ***personnel documentation*** | ***personnel documentation*** is completed according to company policies |
| A-3.01.02P | coordinate completion of ***orientation documents*** with new crew members | completion of ***orientation documents*** with new crew members is coordinated |
| A-3.01.03P | verify ***personnel documentation*** | ***personnel documentation*** is verified |

RANGE OF VARIABLES

***personnel documentation*** includes: apprentice record books (Rig Technician Blue Book), personnel and training evaluations, disciplinary actions, incident reports, hydrogen sulfide (H2S), first aid certifications, WHMIS certifications, fall protection, confined space, first line well control

***orientation documents*** include: employee orientation package, rig orientation, site specific orientation

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-3.01.01L | demonstrate knowledge of ***personnel documentation*** and their application | define terminology associated with ***personnel*** ***documentation*** |
|  |  | identify types of ***personnel documentation*** and describe their applications |
| A-3.01.02L | demonstrate knowledge of procedures used to prepare ***personnel documentation*** | explain responsibilities associated with completing and signing and handling ***personnel documentation*** |

RANGE OF VARIABLES

***personnel documentation*** includes: apprentice record books (Rig Technician Blue Book), personnel and training evaluations, disciplinary actions, incident reports, hydrogen sulfide (H2S), first aid certifications, WHMIS certifications, fall protection, confined space, first line well control

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| A-3.02 | Uses safety and environmental documentation |

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| **Essential Skills** | Document Use, Writing, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-3.02.01P | document ***hazards*** and actions taken | ***hazards*** and actions taken are documented according to company policies |
| A-3.02.02P | complete, date and sign documentation for ***safety equipment*** | documentation for ***safety equipment*** is completed, dated and signed according to jurisdictional regulations |
| A-3.02.03P | refer to ***safety documentation*** | ***safety documentation*** is referred to according to company policies |
| A-3.02.04P | complete a safety meeting | organize, lead and record safety meetings according to company policies |
| A-3.02.05P | refer to ***environmental documentation*** | ***environmental documentation*** is referenced to understand environmental impact of incidents, how to recycle and dispose of hazardous waste materials according to regulations |
| A-3.02.06P | complete incident investigation reports | incident investigation reports are completed according to company policies |
| A-3.02.07P | complete documentation for lock-out and tag out | maintenance or repair and reason for lock-out are documented according to company policies and jurisdictional regulations |
| A-3.02.08P | complete and sign off on ***safe work permits*** | ***safe work permits*** are completed and signed off on |
| A-3.02.09P | complete and sign off on rig inspection checklists | rig inspection checklists are completed and signed off on according to regulatory requirements and company policies |
| A-3.02.10P | complete and sign off on job safety analysis (JSA) | JSA is completed and signed off on according to company policies |
| A-3.02.11P | document trip record | trip record is completed according to regulations |

RANGE OF VARIABLES

***hazards*** include: inadequate safety equipment, broken and missing pieces, incorrect assembly of equipment, slip, trip and fall conditions, pinch points, overhead work

***safety equipment*** includes: fire extinguishers, eye wash stations, fall arrest equipment, self-contained breathing apparatus (SCBA), rig rescue equipment, H2S monitoring systems

***safety documentation*** includes: emergency response plan (ERP), WHMIS, management of change document, rig inspections, safety meetings, JSA

***environmental documentation*** includes: environmental impact of incidents, hazardous waste material disposal, recycling regulations and guidelines

***safe work permits*** include: hot work, confined space, third-party orientation, dropped object prevention system (DROPS)

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-3.02.01L | demonstrate knowledge of safetyand ***environmental documentation*** and their application | define terminology associated withsafety and ***environmental documentation*** |
|  |  | identify types of safety and ***environmental documentation*** and describe their applications |
| A-3.02.02L | demonstrate knowledge of procedures used to prepare safety and ***environmental documentation*** | explain responsibilities associated with completing and signing safetyand ***environmental documentation*** |
|  |  | identify the requirements for maintenance logs |
|  |  | describe rig inspection checklists as per company and regulatory requirements |
|  |  | explain responsibilities associated with completing and signing ***safe work permits*** |
|  |  | explain responsibilities associated with completing and signing a JSA |
|  |  | define the purpose of an incident investigation report |

RANGE OF VARIABLES

***environmental documentation*** includes: environmental impact of incidents, hazardous waste material disposal, recycling regulations and guidelines

***safe work permits*** include: hot work, confined space, third-party orientation, dropped object prevention system (DROPS)

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| A-3.03 | Completes tour sheets |

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| **Essential Skills** | Digital Technology, Document Use, Thinking |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-3.03.01P | identify areas on tour sheet to record ***data*** | areas on tour sheet are identified to record ***data*** |
| A-3.03.02P | enter ***data*** into electronic drilling recorder (EDR) tour sheet in the appropriate sections | ***data*** is entered into the EDR tour sheet in the appropriate sections according to regulations |
| A-3.03.03P | proofread input to the tour sheet | tour sheet is proofread before submitting |
| A-3.03.04P | ensure each crew member signs off at the end of each tour sheet | each crew member has signed off at the end of each tour sheet as per regulations |

RANGE OF VARIABLES

***data*** includes: activity and time break down, pipe tally, trip sheet final calculations, payroll, mud checks, products mixed, pump records, drill bit information, boiler information, equipment rentals, tubulars, shaker data, maximum allowable casing pressure (MACP)

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-3.03.01L | demonstrate knowledge of, and the procedures used to complete tour sheets on an EDR | define terminology associated with tour sheets |
|  |  | identify required tour sheet ***data*** |
|  |  | explain responsibilities associated with completing and signing tour sheets |
|  |  | explain the legal responsibility of completing tour sheets |

RANGE OF VARIABLES

***data*** includes: activity and time break down, pipe tally, trip sheet final calculations, payroll, mud checks, products mixed, pump records, drill bit information, boiler information, equipment rentals, tubulars, shaker data, maximum allowable casing pressure (MACP)

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| A-3.04 | Interprets trade documentation |

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| **Essential Skills** | Digital Technology, Document Use, Thinking |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-3.04.01P | refer to and review ***trade documentation*** | ***trade documentation*** is referred to and reviewed |
| A-3.04.02P | refer to ***trade material*** | ***trade material*** is referred to, to obtain understanding of task or to explain task to crew members |
| A-3.04.03P | enter information into ***trade documentation*** | information is entered into ***trade documentation*** |

RANGE OF VARIABLES

***trade documentation*** includes: industry recommended practice (IRPs), JSAs, company policies, OH&S, workers compensation board (WCB), safety data sheets (SDS)

***trade material*** includes: stick diagrams, MACP chart, Canadian Association of Oilwell Drilling Contractors (CAODC) charts, ERP, emergency medical transport plan

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-3.04.01L | demonstrate knowledge of***trade documentation*** and their applications | define terminology associated with ***trade documentation*** |
|  |  | identify types of ***trade documentation*** and describe their applications |
| A-3.04.02L | demonstrate knowledge of ***trade material*** and their applications | identify types of ***trade material*** and describe their applications |

RANGE OF VARIABLES

***trade documentation*** includes: industry recommended practice (IRPs), JSAs, company policies, OH&S, workers compensation board (WCB), safety data sheets (SDS)

***trade material*** includes: stick diagrams, MACP chart, Canadian Association of Oilwell Drilling Contractors (CAODC) charts, ERP, emergency medical transport plan

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| A-3.05 | Uses maintenance documentation |

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| **Essential Skills** | Reading, Digital Technology, Document Use |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-3.05.01P | record ***maintenance activities*** in ***maintenance log books*** | ***maintenance activities*** are recorded in ***maintenance log books*** according to manufacturers’ specifications |
| A-3.05.02P | refer to ***maintenance log books,*** ***maintenance manuals and wall charts*** to perform preventive maintenance | ***maintenance log books, maintenance manuals and wall charts,*** are referred to perform preventive maintenance |

RANGE OF VARIABLES

***maintenance activities*** include: oil changes, fuel filter changes, top drive servicing, lubricating equipment, servicing equipment

***maintenance log books*** include: motor books, pump record books, boiler log, slip and cut program log, mobile equipment log

***maintenance manuals and wall charts*** include: original equipment manufacturer (OEM) manuals, equipment servicing wall chart

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-3.05.01L | demonstrate knowledge of***maintenance log books*** and their applications | define terminology associated with ***maintenance log books*** |
|  |  | identify types of ***maintenance log books*** and describe their applications |
| A-3.05.02L | demonstrate knowledge of interpreting ***maintenance manuals and wall charts*** | use ***maintenance manuals and wall charts*** to determine maintenance requirements |

RANGE OF VARIABLES

***maintenance log books*** include: motor books, pump record books, boiler log, slip and cut program log, mobile equipment log

***maintenance manuals and wall charts*** include: original equipment manufacturer (OEM) manuals, equipment servicing wall chart

TASK A-4 Supervises crew members and communicates with others

TASK DESCRIPTOR

Rig technicians are responsible for supervising crew members to ensure they are doing their jobs safely and efficiently. New crew members must be oriented to the job site so they transition into their job smoothly and can be productive members of the team. Ongoing training is delivered by the rig technician to all crew members on subjects such as new tasks, safety procedures and their duties related to well control procedures. Rig technicians must be able to adapt their leadership style to accommodate a diverse spectrum of personality types in the workforce.

This task also includes communicating effectively with third-party service providers, working within the parameters of company policies, and leading crew activities.

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| A-4.01 | Supervises crew members |

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| **Essential Skills** | Oral Communication, Continuous Learning, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-4.01.01P | assess crew members’ abilities and training needs | crew members’ abilities and training needs are assessed |
| A-4.01.02P | assign tasks to each crew member within crew member’s abilities | tasks are assigned to each crew member within crew member’s abilities |
| A-4.01.03P | manage crew tasks | crew tasks are managed |
| A-4.01.04P | monitor performance and provide constructive feedback | performance is monitored and constructive feedback is provided |
| A-4.01.05P | ensure tasks are being performed | tasks are ensured to be performed according to company policies |
| A-4.01.06P | relay ***information*** to crew members | ***information*** to crew members is relayed |
| A-4.01.07P | address and relay crew members’ concerns to supervisor | crew members’ concerns are addressed and relayed to supervisor |
| A-4.01.08P | take disciplinary actions | disciplinary actions are taken according to company policies |
| A-4.01.09P | adapt leadership styles | leadership styles are adapted when required |

RANGE OF VARIABLES

***information*** includes: task to be performed, new company policies and procedures, incident reports, feedback

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-4.01.01L | demonstrate knowledge of strategies for supervising crew members in the workplace | explain how to adapt leadership styles to accommodate a diverse spectrum of personality types in the workforce |
|  |  | explain the importance of assigning tasks within crew members’ abilities |
|  |  | explain the importance of providing feedback |
|  |  | identify techniques for giving effective feedback |
|  |  | identify techniques for applying disciplinary actions |
| A-4.01.02L | demonstrate knowledge of effective communication practices | describe the importance of using effective verbal and non-verbal communication with ***people in the workplace*** |

RANGE OF VARIABLES

***people in the workplace*** include: other tradespeople, colleagues, apprentices, supervisors, general public

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| A-4.02 | Trains crew members |

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| **Essential Skills** | Oral Communication, Continuous Learning, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-4.02.01P | introduce new crew members and explain the chain of command | new crew members are introduced to other crew members and chain of command is explained |
| A-4.02.02P | show layout of rig and location of ***important reference points*** | layout of rig and location of ***important reference points*** are shown |
| A-4.02.03P | explain duties and expectations of new crew members’ positions | duties and expectations of new crew members’ positions are explained |
| A-4.02.04P | explain company policies and procedures and verify that crew members understand and retain information | company policies and procedures are explained and verified that crew members understand and have retained information |
| A-4.02.05P | conduct ***safety drills*** | ***safety drills*** are conducted according to regulations |
| A-4.02.06P | mentor crew members to recognize and report hazards and deficiencies | crew members are mentored to recognize and report hazards and deficiencies |
| A-4.02.07P | mentor new hands, share personal experiences and use ***training materials*** | new hands are mentored, personal experiences are shared and ***training materials*** are used to enhance training |
| A-4.02.08P | adapt training methods to crew members’ learning styles | training methods are adapted to crew members’ learning styles |
| A-4.02.09P | assess and track progress, and provide constructive feedback | progress is assessed and tracked, and constructive feedback is provided |

RANGE OF VARIABLES

***important reference points*** include: PPE storage, muster points, hazardous areas

***safety drills*** include: blowout preventer (BOP) drills, fire drills, emergency response drills, man-down drills, spill response drills, H2S drills, high angle rescue drills, confined space rescue drills

***training materials*** include: JSA, job procedure manuals, apprentice record book, competency assessment documents

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-4.02.01L | demonstrate knowledge of ***strategies for teaching workplace skills*** | identify different roles played by a workplace mentor |
|  |  | describe ***strategies for teaching workplace skills*** |
|  |  | explain the importance of identifying the purpose of training activity |
|  |  | identify how to choose a good time to present the training activity |
|  |  | explain the importance of linking the training activity |
|  |  | explain the importance of providing feedback |
|  |  | describe a skills assessment |
|  |  | identify techniques for giving effective feedback |
|  |  | identify methods of assessing progress |
| A-4.02.02L | demonstrate knowledge of strategies for orienting new crew members in the workplace | describe the importance of showing new crew members ***important reference points*** |
|  |  | describe the importance of explaining duties and expectations of new crew members’ positions |
|  |  | identify methods of assessing if crew members have understood and retained information |

RANGE OF VARIABLES

***strategies for teaching workplace skills*** include: identifying the point of the training activity, linking the training activity, demonstrating the skill, providing practice, giving feedback, assessing skills and progress, providing mentorship, leading by example, open communication

***important reference points*** include: PPE storage, muster points, hazardous areas

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| A-4.03 | Leads crew meetings |

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| **Essential Skills** | Oral Communication, Continuous Learning, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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| --- | --- | --- |
|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-4.03.01P | determine when meetings are required | meetings are held according to ***factors*** |
| A-4.03.02P | schedule meetings | meetings are scheduled prior to task |
| A-4.03.03P | conduct meetings | meetings are conducted according to task to be performed and using JSA |
| A-4.03.04P | delegate roles and responsibilities | roles and responsibilities are delegated |
| A-4.03.05P | keep meetings on track and focused | meetings are kept on track and focused |
| A-4.03.06P | emphasize dangers and hazards, and how to reduce risks | dangers, hazards and how to reduce risks are emphasized |
| A-4.03.07P | obtain feedback from crew members | feedback is addressed |

RANGE OF VARIABLES

***factors*** include: company policies, IRP, OH&S regulations, third-party service provider involvement, scope of work change

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-4.03.01L | demonstrate knowledge of planning a meeting and its purpose | describe the importance of conducting meetings |
|  |  | explain the importance of advising crew members of dangers, hazards and how to reduce risks |
|  |  | identify methods of assessing if crew members have understood and retained information |
|  |  | describe when a meeting is required |

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| A-4.04 | Communicates with third-party service providers |

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| **Essential Skills** | Oral Communication, Continuous Learning, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-4.04.01P | schedule meeting with rig crew and ***third-party service providers*** | meeting with rig crew and ***third-party service providers*** is scheduled |
| A-4.04.02P | determine roles and responsibilities between rig crew and ***third-party service providers*** | roles and responsibilities between rig crew and ***third-party service providers*** are determined |
| A-4.04.03P | ensure communication between rig crew and ***third-party service providers*** | communication between rig crew and ***third-party service providers*** is ensured by using ***communication methods*** |
| A-4.04.04P | confirm understanding of terminology and job to be performed by ***third‑party service providers*** | understanding of terminology and job to be performed by ***third-party service providers*** is confirmed |

RANGE OF VARIABLES

***third-party service providers*** include: tong hands, cementers, directional drillers, track hoe operators, mudmen, geologists, truck drivers

***communication methods*** include: verbal, two-way radios, rig phones, hand signals, written, electronic

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-4.04.01L | demonstrate knowledge of effective communication practices | describe the importance of using effective verbal and non-verbal communication with rig crew and ***third-party service providers*** |
|  |  | identify the methods of determining roles and responsibilities between rig crewand ***third-party service providers*** |
|  |  | identify the methods of assessing if rig crew and ***third-party service providers*** have understood and retained information |
|  |  | describe the expectations for professional conduct |
|  |  | describe methods used to address client needs and expectations |

RANGE OF VARIABLES

***third-party service providers*** include: tong hands, cementers, directional drillers, track hoe operators, mudmen, geologists, truck drivers

TASK A-5 Performs safety-related activities

TASK DESCRIPTOR

Rig technicians use personal protective equipment (PPE) and safety equipment and engage in work practices to maintain a safe work environment.

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| A-5.01 | Uses personal protective equipment (PPE) and safety equipment |

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| **Essential Skills** | Thinking, Working with Others, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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| --- | --- | --- |
|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-5.01.01P | select and use ***PPE*** and ***safety equipment*** | ***PPE*** and ***safety equipment*** is selected and used according to worksite hazards, regulations, task and company policies |
| A-5.01.02P | inspect ***PPE*** and ***safety equipment*** | ***PPE*** and ***safety equipment*** is inspected before use according to manufacturers’ specifications |
| A-5.01.03P | ensure seal for breathing apparatus | seal test is performed according to manufacturers’ specifications |
| A-5.01.04P | use ***emergency escape devices*** | ***emergency escape devices*** are used according to manufacturers’ specifications |
| A-5.01.05P | use and test gas monitoring equipment | gas monitoring equipment is used and tested |
| A-5.01.06P | tag and remove worn, damaged or defective ***PPE*** and ***safety equipment*** | worn, damaged or defective ***PPE*** and ***safety equipment*** are tagged and removed from service according to manufacturers’ specifications |
| A-5.01.07P | store ***PPE*** and ***safety equipment*** | ***PPE*** and ***safety equipment*** are cleaned and stored in designated areas according to manufacturers’ and rig specifications |

RANGE OF VARIABLES

***PPE*** includes: face masks, aprons, rubber gloves, hard hats, safety boots, safety glasses, fire retardant clothing, armoured gloves

***safety equipment*** includes: high angle rescue kit, SCBA, fall protection equipment, tension limiters, man rated winches, confined space rescue equipment, spill response kit, safety cables, alarm systems, gas detection systems, fire protection and extinguishers, eye wash stations, first aid kits

***emergency escape devices*** include: escape buggies, egress systems, pods, t-bars, controlled descenders

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-5.01.01L | demonstrate knowledge of ***PPE*** and ***safety equipment***, their applications and procedures for use | identify the types of ***PPE*** and ***safety equipment***, their application and procedures for use |
|  |  | identify the procedures used to inspect and test ***PPE*** and ***safety equipment*** |
|  |  | identify standards and regulations pertaining to***PPE*** and ***safety equipment*** |
|  |  | identify hazards and safe work practices related to the use of ***PPE*** and ***safety equipment*** |
|  |  | describe the procedures for use of ***PPE*** and ***safety equipment*** |
|  |  | describe the roles and responsibilities of employers and employees with respect to the selection and use of ***PPE*** |

RANGE OF VARIABLES

***PPE*** includes: face masks, aprons, rubber gloves, hard hats, safety boots, safety glasses, fire retardant clothing, armoured gloves

***safety equipment*** includes: high angle rescue kit, SCBA, fall protection equipment, tension limiters, man rated winches, confined space rescue equipment, spill response kit, safety cables, alarm systems, gas detection systems, fire protection and extinguishers, eye wash stations, first aid kits

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| A-5.02 | Maintains safe work environment |

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| **Essential Skills** | Working with Others, Oral Communication, Document Use |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-5.02.01P | perform job hazard assessment | potential ***hazards*** are identified and reported according to company policies |
| A-5.02.02P | maintain a clean and tidy work site area | a clean and tidy work site is maintained to avoid injuries to self and others |
| A-5.02.03P | install ***temporary safety protection*** when required | ***temporary safety protection*** is installed when required |
| A-5.02.04P | verify that crew is aware of ERP | awareness of crew of the ERP is verified |

RANGE OF VARIABLES

***hazards*** include: slips, trips, falls, pinch and crush points, overhead work, hazardous materials, rotating equipment, high pressure lines

***temporary safety protection*** includes: static lines, temporary barriers

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-5.02.01L | demonstrates knowledge of maintaining a safe work environment | identify ***hazards*** and safe work practices pertaining to maintaining a safe work environment |
|  |  | identify types of ***temporary safety protection*** and their procedures for installation |
|  |  | describe the responsibilities of workers and employers to apply emergency procedures |
|  |  | explain industry practices for hazard assessment and control procedures |
| A-5.02.02L | demonstrate knowledge of ***regulations*** related to a safe work environment | explain the role of the employer and the employee in regard to ***regulations*** |
|  |  | describe procedures used to report incidents and unsafe work environment |
|  |  | identify and interpret workplace safety and health ***regulations*** |
| A-5.02.03L | demonstrate knowledge of procedures used to perform housekeeping | explain the importance of maintaining a clean and organized work environment |

RANGE OF VARIABLES

***hazards*** include: slips, trips, falls, pinch and crush points, overhead work, hazardous materials, rotating equipment, high pressure lines

***temporary safety protection*** includes: static lines, temporary barriers

***regulations*** include: OH&S, WHMIS, fire (NFPA), Workers Compensation Board, related advisory bodies and agencies, Bill C-45

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| A-5.03 | Performs lock-out procedures |

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| **Essential Skills** | Thinking, Document Use, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-5.03.01P | identify equipment to be locked out for ***conditions*** | equipment to be locked out for ***conditions*** is identified |
| A-5.03.02P | advise supervisor and crew members of lock-out | supervisor and crew members are advised of lock-out |
| A-5.03.03P | lock out equipment for servicing | equipment is locked out for servicing according to company policies and OH&S regulations |
| A-5.03.04P | verify lock-out | ensure equipment is locked out and the potential for stored energy is removed |
| A-5.03.05P | tag out equipment | equipment is tagged out until maintenance or repair is completed |
| A-5.03.06P | remove lock-out | lock-out is removed |

RANGE OF VARIABLES

***conditions*** include: rig service, electrical and mechanical failures, hydraulic repairs, steam, water and air systems

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-5.03.01L | demonstrates knowledge of lock-out procedures and their applications | determine when a lock-out procedure is required |
|  |  | identify energy sources to be locked out |
|  |  | identify the potential of stored energy |
|  |  | describe lock-out/tag-out procedures |

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| A-5.04 | Participates in journey management |

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| **Essential Skills** | Digital Technology, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| A-5.04.01P | perform ***pre-operational inspection activities*** | ***pre-operational inspection activities*** are performed according to company policies |
| A-5.04.02P | verify that emergency equipment is functional | emergency equipment is verified to be functional |
| A-5.04.03P | perform a trip plan | trip is planned according to legal subdivision (LSD) location or site specific directions |
| A-5.04.04P | maintain communication as per journey management plan | communication is maintained at various locations along the trip route |

RANGE OF VARIABLES

***pre-operational inspection activities*** include: checking fluid levels, checking for leaks, checking tires, checking lights, checking surrounding objects

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| A-5.04.01L | demonstrate knowledge of journey management | identify hazards and describe safe work practices and procedures pertaining to the use of light duty vehicles |
|  |  | describe journey management |
|  |  | identify types of equipment required in an emergency |
|  |  | describe how to operate vehicles on a radio controlled road |
|  |  | describe driving techniques for various road conditions |

MAJOR WORK ACTIVITY B

MOVES RIG

TASK B-6 Performs on-pad moves

TASK DESCRIPTOR

This is performed when a rig is required to move from well to well on a multi-hole pad. When a pad move is required, third-party equipment can be used to skid the rig, or a self-propelled rig walking system is utilized.

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| B-6.01 | Performs rig walk |

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| **Essential Skills** | Oral Communication, Thinking, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| B-6.01.01P | prepare ***rig components*** for walking | rig is ready to walk according to rig specifications |
| B-6.01.02P | inspect walking system | all components are rigged up and visually inspected |
| B-6.01.03P | perform a pre-plan for route | route is walked to ensure that there are no obstructions, and matting has been laid out |
| B-6.01.04P | walk rig to next well location on pad | monitor walking system and ensure that rig is levelled, centered and positioned properly over next well |
| B-6.01.05P | perform a post-walking inspection of rig systems | rig is positioned correctly and all lines are visually inspected |

RANGE OF VARIABLES

***rig components*** include:supply system (suitcase, umbilical, accordion style, festoon), BOP system, catwalk, transfer tanks, safety equipment

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| B-6.01.01L | demonstrate knowledge of ***types of walking systems*** according to manufacturers’ specifications | explain the ***types of walking systems*** and components of rigs |
| B-6.01.02L | demonstrate knowledge of the limitations of walking systems according to the manufacturers’ specifications | explain the limitations of the walking system according to the manufacturers’ specifications |
| B-6.01.03L | demonstrate knowledge of planning a rig walk | explain the planning of a rig walk with all ***required components*** |
|  |  | explain the ***hazards*** of walking a rig |

RANGE OF VARIABLES

***types of walking systems*** include: stomper types, crawler track systems, wheeled systems, roller systems, rail systems

***required components*** include: matting, radios, level, dunnage

***hazards*** include: un-level ground, ground conditions, pinch and pressure points, existing wells, equipment failure

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| B-6.02 | Performs rig skidding |

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| **Essential Skills** | Oral Communication, Thinking, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| B-6.02.01P | prepare rig to be skidded | required buildings and components are rigged out according to manufacturers’ specifications |
| B-6.02.02P | inspect attachment points and other rig components | attachment points, substructure and derrick are prepared for skid move |
| B-6.02.03P | perform a pre-plan for route | route is walked to ensure that there are no obstructions, and matting is laid out for the pre-planned route |
| B-6.02.04P | skid rig to next location of pad according to operator’s requirements, using third-party equipment | third-party equipment is connected and rig is skidded and ensured that it is centered and positioned over next well |
| B-6.02.05P | move required buildings and components to new well on pad with third-party equipment | buildings and components are positioned and configured according to rig specifications |

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| B-6.02.01L | demonstrate knowledge of ***types of rig skidding systems*** according to rig specifications | explain the ***types of rig skidding*** ***systems*** and components of rigs |
| B-6.02.02L | demonstrate knowledge of the limitations of the ***types of rig skidding systems*** according to the rig specifications | explain the limitations of the ***types of rig skidding systems*** according to the rig specifications |
| B-6.02.03L | demonstrate knowledge to ***communicate*** and work with third-party equipment operators | validate the ability to ***communicate*** with third-party equipment operators |

RANGE OF VARIABLES

***types of rig skidding systems*** include: pad eye systems, roll ends systems

***communicate*** includes: oral communication, radio communication, hand signal communication, pre-move meeting, documentation

TASK B-7 Performs rig moves

TASK DESCRIPTOR

Once the rig components arrive at the drilling site, rig technicians must assemble the rig in order to commence drilling operations. This is performed in conjunction with third-party service providers.

Rig technicians dismantle the rig so that it can be loaded on trucks to move it to another drill site, to a repair shop or to a storage area. This is performed in conjunction with third-party service providers.

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| B-7.01 | Moves rig on and off location |

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| **Essential Skills** | Oral Communication, Thinking, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| B-7.01.01P | place poly and matting | poly and matting are placed according to rig specifications and environmental regulations |
| B-7.01.02P | supervise third-party service provider | third-party service provider is supervised to avoid damages to buildings and equipment |
| B-7.01.03P | spot buildings and equipment | buildings and equipment are positioned according to rig specifications |

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| B-7.01.01L | demonstrate knowledge of tasks for spotting, matting, sub, derrick and buildings in rig assembly/disassembly | describe the procedure of spotting and rigging up rig components |
| B-7.01.02L | demonstrate knowledge of work with third-party service providers | describe the ***third-party service provider equipment*** used to move a rig |
|  |  | describe how to supervise all crew members and third-party operators in all aspects of moving the rig onto a new location |

RANGE OF VARIABLES

***third-party service provider equipment*** includes: pole trucks, cranes, bed trucks, loaders, bulldozers, winch trucks

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| B-7.02 | Assembles/disassembles rig components |

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| **Essential Skills** | Oral Communication, Thinking, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| B-7.02.01P | coordinate work with ***third-party service providers*** | work is coordinated with ***third-party service providers*** according to rig specifications |
| B-7.02.02P | set up sub and ***components***, and follow assembly/disassembly sequence | sub and ***components*** are fit together and assembly/disassembly sequence is followed according to rig specifications |
| B-7.02.03P | set up derrick and ***components***, and follow assembly/disassembly sequence | derrick and ***components*** are pinned together and assembly/disassembly sequence is followed according to rig specifications |
| B-7.02.04P | identify hazards and report deficiencies | hazards associated with assembling/disassembling components are identified and corrected |
| B-7.02.05P | assemble/disassemble components with ***third-party service providers*** | components are assembled/disassembled according to rig procedures |
| B-7.02.06P | supervise ***third-party service providers*** | ***third-party service providers*** are supervised while handling buildings and equipment |

RANGE OF VARIABLES

***third-party service provider equipment*** include: pole trucks, cranes, bed trucks, loaders, bulldozers, winch trucks

***components*** ***with sub*** include: motor house, tables, bird baths, spreader bars

***components*** ***with derrick*** include: monkeyboards, booms, A‑legs, spreader bars, crown sheaves, blocks

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| B-7.02.01L | demonstrate knowledge of assembly of sub, derrick and drawworks | describe the procedures of spotting buildings and placing ***components*** |
|  |  | describe working with third-party personnel to assemble/disassemble rig components |
|  |  | identify derrick types and describe their advantages and disadvantages related to assembly/disassembly |
|  |  | describe the considerations for working at heights and securing tools and equipment |
|  |  | explain ***types of substructures*** and their effects on the assembly/disassembly process |
|  |  | describe the supervision and coordination of crews for assembly/disassembly of rig components |
|  |  | describe the sequence and procedures for assembly/disassembly of all components during a rig move |

RANGE OF VARIABLES

***components*** ***with derrick*** include: monkeyboards, booms, A‑legs, spreader bars, crown sheaves, blocks

***components*** ***with sub*** include: motor house, tables, bird baths, spreader bars

***types of substructures*** include: box on box, scissor, telescopic, step up, trailer, one piece

MAJOR WORK ACTIVITY C

PERFORMS RIG UP AND RIG OUT PROCEDURES

TASK C-8 Performs rig up operations

TASK DESCRIPTOR

Rig technicians prepare equipment, and install and connect components of the drilling rig to enable the rig to drill.

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| C-8.01 | Rigs up air, fuel, water, hydraulic, electrical and communication systems |

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| **Essential Skills** | Working with Others, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-8.01.01P | recognize ***types of fittings, unions and lines*** and their applications and limitations | ***types of fittings, unions and lines*** are identified to match each individual component and system type |
| C-8.01.02P | locate and ensure breakers are off | breakers are off prior to connecting the equipment according to regulations, codes and company policies |
| C-8.01.03P | route and connect lines and unions | lines and unions are routed and connected according to rig specifications |
| C-8.01.04P | clean ***ends*** | ***ends*** are cleaned prior to connecting according to rig procedures |
| C-8.01.05P | hook up air, fuel, water, hydraulic lines, electrical and communication systems | air, fuel, water, hydraulic lines, electrical and communication systems are hooked up according to sequencing priority and environmental conditions |
| C-8.01.06P | verify lines are in operational condition | lines operate according to rig specifications |

RANGE OF VARIABLES

***types of fittings, unions and lines*** include: air, diesel, natural gas, liquefied propane gas (LPG), water, hydraulic, communication cables

***ends*** include: electrical, communication cables, unions, couplers, railway fittings, hammer unions, boss clamps, cam locks

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-8.01.01L | demonstrate knowledge of air, fuel, water and hydraulic lines | describe air, fuel, water and hydraulic lines on drilling rigs |
|  |  | identify rig air, fuel, water and hydraulic components |
|  |  | identify hazards of rigging up air, fuel, water and hydraulic systems |
|  |  | identify pressure ratings and limitations of air, fuel, water and hydraulic systems |
| C-8.01.02L | demonstrate knowledge of procedures for rigging up air, fuel, water and hydraulic lines | describe procedures for routing and connecting lines and unions |
|  |  | identify connection points and labelling requirements |
|  |  | describe procedures for hooking up air, fuel, water and hydraulic lines |
| C-8.01.03L | demonstrate knowledge of rig electrical cables and communication cables | describe electrical systems used on drilling rigs |
|  |  | describe communication systems used on drilling rigs |
|  |  | identify hazards of an electrical system |
|  |  | describe the types of electrical cords and cables used on rig components |
|  |  | describe handling procedures of cables and communication cables |
|  |  | identify chemicals used to clean ends of cables and communication cables |

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| C-8.02 | Starts equipment |

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| **Essential Skills** | Document Use, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-8.02.01P | identify ***equipment*** to be started and warmed up | ***equipment*** to be started and warmed up is identified according to manufacturers' specifications |
| C-8.02.02P | check all ***fluid*** levels in motors | ***fluid*** levels in motors are checked and adjusted according to manufacturers' specifications |
| C-8.02.03P | lock out mechanical systems | mechanical systems are locked out according to rig and manufacturers’ specifications, and company policies |
| C-8.02.04P | lock out electrical systems | electrical systems are locked out according to rig and manufacturers’ specifications, and company policies |
| C-8.02.05P | warm up engines with block or circulating heaters | engines are warmed up with block or circulating heaters according to manufacturers' specifications |
| C-8.02.06P | verify ***auxiliary equipment*** are turned on | ***auxiliary equipment*** are turned on prior to starting up ***equipment*** |
| C-8.02.07P | turn off block and circulating heaters | block and circulating heaters are turned off after start-up of engines |
| C-8.02.08P | recognize and rectify ***problems*** associated with start-up | ***problems*** associated with start-up are rectified according to manufacturers' specifications |

RANGE OF VARIABLES

***equipment*** includes: generators, engines, electric motors, hydraulic systems, shakers, drive systems, mud pumps

***fluids*** include: oils, antifreeze, fuel

***auxiliary equipment*** includes: cooling fans, oil pumps, lubricator pumps, batteries

***problems*** include: loose belt, low battery, low fuel pressures, restricted air flow, temperature extremes

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-8.02.01L | demonstrate knowledge of procedures used to start ***equipment*** | describe the importance of verifying that ***equipment*** is locked out |
|  |  | describe importance of warming up equipment |
|  |  | describe engine start-up procedures |
|  |  | describe the importance of starting up ***auxiliary equipment*** prior to starting up ***equipment*** |
|  |  | identify types of ***auxiliary equipment*** |
|  |  | describe engines and drive systems used to power rig equipment |
|  |  | identify types of ***fluids*** and their applications |
|  |  | describe basic requirements of starting electrical systems |
|  |  | describe types of ***problems*** that could be encountered during start-up and how to rectify them |

RANGE OF VARIABLES

***equipment*** includes: generators, engines, electric motors, hydraulic systems, shakers, drive systems, mud pumps

***auxiliary equipment*** includes: cooling fans, oil pumps, lubricator pumps, batteries

***fluids*** include: oils, antifreeze, fuel

***problems*** include: loose belt, low battery, low fuel pressures, restricted air flow, temperature extremes

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| C-8.03 | Raises derrick |

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| **Essential Skills** | Thinking, Working with Others, Document Use |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-8.03.01P | route ***cables*** to rig in derrick | ***cables*** are routed to rig in derrick according to rig specifications |
| C-8.03.02P | visually inspect derrick | derrick is inspected to confirm it is safe to raise, and results are documented according to IRP |
| C-8.03.03P | select and use ***tools and equipment*** | ***tools and equipment*** are selected according to company policies and used according to manufacturers' specifications |
| C-8.03.04P | recognize, repair and replace worn, damaged or defective ***equipment*** | worn, damaged or defective ***equipment*** is identified, repaired and replaced according to manufacturers' specifications |
| C-8.03.05P | prepare derrick for raising procedure | derrick is prepared for raising procedure according to rig procedures |
| C-8.03.06P | rig up derrick components and racking platform | derrick components and racking platform are rigged up according to rig procedures |
| C-8.03.07P | monitor derrick for ***hazards*** during the raise | derrick is monitored for ***hazards*** during the raise according to rig procedures |
| C-8.03.08P | inspect and install egress system | egress system is inspected and installed according to manufacturers' specifications |
| C-8.03.09P | prepare derrick for drilling operations | derrick is prepared for drilling operations according to rig procedures |

RANGE OF VARIABLES

***cables*** include: drilling lines, tugger lines, boom lines, manriders, escape lines, ladder assists

***tools and equipment*** include: fall arrest equipment, hammers, tie off points, ratchets

***equipment*** include: cables, sheaves, pins, fasteners, secondary securement equipment, anchor points, bridle lines, hydraulic cylinders, drawworks, hoisting equipment

***hazards*** include: over pulling, lines catching, pinch points

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-8.03.01L | demonstrate knowledge of raising derricks | identify ***derrick types*** and describe their advantages and disadvantages related to moving and drilling operations |
|  |  | identify derrick raising ***equipment*** |
|  |  | describe procedures for raising derricks |
|  |  | explain the rating plate on a derrick |
|  |  | describe how different environmental conditions will affect raising the derrick |
|  |  | describe considerations for working at heights and securing tools and equipment |
|  |  | describe the procedures used to inspect derricks |
|  |  | identify criteria for replacement or repair of equipment |
| C-8.03.02L | demonstrate knowledge of derrick egress equipment | identify types of derrick egress equipment |
|  |  | identify the inspection and testing requirements of derrick egress equipment |

RANGE OF VARIABLES

***derrick types*** include: telescopic, cantilever, hydraulic

***equipment*** include: cables, sheaves, pins, fasteners, secondary securement equipment, anchor points, bridle lines, hydraulic cylinders, drawworks, hoisting equipment

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| C-8.04 | Rigs up rig floor and related equipment |

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| **Essential Skills** | Working with Others, Oral Communication, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-8.04.01P | identify ***hazards*** | ***hazards*** are identified |
| C-8.04.02P | install ***rig floor equipment*** | ***rig floor equipment*** is installed according to rig specifications |
| C-8.04.03P | select and use tools and equipment | tools and equipmentare selected according to rig procedures |
| C-8.04.04P | install ***top drive components*** | ***top drive components*** are installed according to rig procedures |
| C-8.04.05P | install kelly bar, rathole and mousehole | kelly bar, rathole and mousehole are installed according to rig procedures |
| C-8.04.06P | install pre-fabs | pre-fabs are installed according to rig specifications |

RANGE OF VARIABLES

***hazards*** include: open holes, working at heights, dropped objects, tripping hazards

***rig*** ***floor equipment*** includes: tongs, slips, hydraulic wrenches, pipe spinners, safety clamps, rotary table, winches, drive shafts, kelly hose, bushing, survey units

***top drive components*** include: service loop, becket, bails, elevators, torque arrest system

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-8.04.01L | demonstrate knowledge of ***rig floor equipment*** and ***top drive components*** their applications and procedures for use | describe types of ***rig*** ***floor equipment*** their application and operation |
|  |  | describe ***top drive components*** their application and operation |
|  |  | identify ***hazards*** and safe operating practices pertaining to rigging up ***rig floor equipment*** and ***top drive components*** |
| C-8.04.02L | demonstrate knowledge of installing kelly bar, ratholes and mouseholes | describe procedures used to install kelly bar, ratholes and mouseholes |
|  |  | identify ***hazards*** and safe operating practices pertaining to kelly bar, ratholes and mouseholes |
| C-8.04.03L | demonstrate knowledge of the procedures used to install pre-fabs | describe the procedures used to install pre-fabs |

RANGE OF VARIABLES

***rig*** ***floor equipment*** includes: tongs, slips, hydraulic wrenches, pipe spinners, safety clamps, rotary table, winches, drive shafts, kelly hose, bushing, survey units

***top drive components*** include: service loop, becket, bails, elevators, torque arrest system

***hazards*** include: open holes, working at heights, dropped objects, tripping hazards

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| C-8.05 | Rigs up mud tanks, pumps and circulation systems |

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| **Essential Skills** | Working with Others, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-8.05.01P | select and use ***tools and equipment*** | ***tools and equipment*** are selected and used according to rig procedures |
| C-8.05.02P | set up mud tanks | mud tanks are set up according to rig procedures |
| C-8.05.03P | set up pumps | pumps are set up according to rig procedures and manufacturers' specifications |
| C-8.05.04P | install ***high pressure mud lines*** | ***high pressure mud lines*** are installed according to manufacturers' specifications and IRP |
| C-8.05.05P | install ***low pressure mud lines*** | ***low pressure mud lines*** are installed according to manufacturers' specifications and IRP |
| C-8.05.06P | perform visual check of ***components*** | ***components*** are visually checked for deficiencies |
| C-8.05.07P | function test circulation system | circulation system is function-tested according to rig specifications |
| C-8.05.08P | set up ***third-party equipment*** | ***third-party equipment*** is set up according to operator’s requirements and third-party specifications |
| C-8.05.09P | install electrical bonding device | electrical bonding device is installed according to rig specifications and regulations |

RANGE OF VARIABLES

***tools and equipment*** include: hammers, grease guns, wire brushes, air tools

***high pressure mud lines*** include: kelly hose, kicker hose, suitcase lines, standpipe, pressure relief lines, discharge lines

***low pressure mud lines*** include: suction lines, flow lines, gun row, hopper lines, mixing systems

***components*** include: valves, bridge gates, rubbers, grease lines, hopper, mix pumps, air bags, shakers, troughs

***third-party equipment*** includes: centrifuges, tank farms, mud tanks

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-8.05.01L | demonstrate knowledge of mud tanks, pumps and circulation systems, their applications and operations | identify types of mud tanks, pumps and circulation systems, and their ***components*** |
|  |  | describe the procedures to rig up mud tanks, pumps and circulation lines |
|  |  | identify the ***hazards*** and safe work practices when rigging up mud tanks, pumps and circulation systems |
|  |  | describe the function of mud tanks, pumps and circulation systems |
|  |  | describe centrifuge components and their set-up |
| C-8.05.02L | demonstrate knowledge of piping, hoses and connections used to rig up mud tanks, pumps and circulation systems | describe connectors and fittings used to rig up mud tanks, pumps and circulation systems |

RANGE OF VARIABLES

***components*** include: valves, bridge gates, rubbers, grease lines, hopper, mix pumps, air bags, shakers, troughs

***hazards*** include: open holes, working at heights, dropped objects, tripping hazards, confined spaces

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| C-8.06 | Rigs up boiler and steam circulating systems |

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| **Essential Skills** | Working with Others, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-8.06.01P | select and use ***tools and equipment*** | ***tools and equipment*** are selected and used |
| C-8.06.02P | set up steam lines | steam lines are set up according to rig procedures |
| C-8.06.03P | set up blowdown tank | blowdown tank is set up according to rig specifications, company policies and regulations |
| C-8.06.04P | recognize ***problems*** associated with boiler start-up | ***problems*** associated with boiler start-up are identified and fixed according to codes, regulations and manufacturers' specifications |
| C-8.06.05P | fire up boiler | boiler is fired up according to manufacturers' specifications and rig procedures |

RANGE OF VARIABLES

***tools and equipment*** include: hammers, wire brushes, grease guns, space heaters, ladders

***problems*** include: improper fueling, improper air flow, low water, faulty pumps, dirty fire eye, faulty sensors, malfunctioning pressure relief valve, poor water quality

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-8.06.01L | demonstrate knowledge of boiler and steam circulating systems and their setup | identify the procedures used to set up boiler and steam circulating systems |
|  |  | describe the functions of a boiler and components |
|  |  | describe steam systems used on drilling rigs |
|  |  | identify operating pressure, fuel pressure and low water shut off function |
|  |  | identify ***hazards*** and safe work practices of setting up a boiler and steam circulating system |
|  |  | describe types of ***problems*** that could be encountered during setup and how to rectify them |

RANGE OF VARIABLES

***hazards*** include: burns, explosions, working at heights, high pressure, slips and trips

***problems*** include: improper fueling, improper air flow, low water, faulty pumps, dirty fire eye, faulty sensors, malfunctioning pressure relief valve, poor water quality

TASK C-9 Performs rig out operations

TASK DESCRIPTOR

Rig technicians dismantle the drilling rig to be able to move it to storage (racking) or relocate it to another drilling site.

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| C-9.01 | Rigs out rig floor and related equipment |

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| **Essential Skills** | Working with Others, Oral Communication, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-9.01.01P | select and use tools and equipment | tools and equipment are selected and used according to rig procedures |
| C-9.01.02P | lay down rathole, mousehole and kelly bar assembly | rathole, mousehole and kelly bar assembly are laid down according to rig procedures |
| C-9.01.03P | rig out ***top drive components*** | ***top drive components*** are rigged out according to rig procedures |
| C-9.01.04P | remove ***rig floor equipment*** | ***rig floor equipment*** is removed according to rig procedures |
| C-9.01.05P | remove pre-fabs | pre-fabs are removed according to rig procedures |
| C-9.01.06P | store and secure equipment | equipment is stored and secured according to rig procedures |

RANGE OF VARIABLES

***top drive components*** include: service loop, becket, bails, elevators, torque arrest system

***rig*** ***floor equipment*** includes: tongs, slips, hydraulic wrenches, pipe spinners, safety clamps, rotary table, winches, drive shafts, kelly hose

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-9.01.01L | demonstrate knowledge of ***rig floor equipment*** and ***top drive components***, their applications and procedures for use | describe types of ***rig*** ***floor equipment***, their application and operation |
|  |  | describe ***top drive components***,their application and operation |
|  |  | identify ***hazards*** and safe operating practices pertaining to rigging out ***rig floor equipment*** and ***top drive components*** |
| C-9.01.02L | demonstrate knowledge of removing kelly bar, ratholes and mouseholes | describe procedures used to removing kelly bar, ratholes and mouseholes |
|  |  | identify ***hazards*** and safe operating practices pertaining to kelly bar, ratholes and mouseholes |
| C-9.01.03L | demonstrate knowledge of the procedures used to remove pre-fabs | describe the procedures used to remove pre-fabs |

RANGE OF VARIABLES

***rig*** ***floor equipment*** includes: tongs, slips, hydraulic wrenches, pipe spinners, safety clamps, rotary table, winches, drive shafts, kelly hose

***top drive components*** include: service loop, becket, bails, elevators, torque arrest system

***hazards*** include: open holes, working at heights, dropped objects, tripping hazards

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| C-9.02 | Lays down derrick |

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| **Essential Skills** | Thinking, Working with Others, Document Use |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-9.02.01P | visually inspect derrick | derrick is visually inspected according to IRP |
| C-9.02.02P | repair and replace worn, damaged or defective ***equipment*** | worn, damaged or defective ***equipment*** are repaired and replaced according to manufacturers' specifications |
| C-9.02.03P | select and use ***tools and equipment*** | ***tools and equipment*** are selected according to company policies and used according to manufacturers' specifications |
| C-9.02.04P | monitor derrick for ***hazards*** during the laydown | derrick is monitored for ***hazards*** during the laydown according to rig procedures |
| C-9.02.05P | rig out derrick components and racking platform | derrick components and racking platform are rigged out according to rig procedures |

RANGE OF VARIABLES

***equipment*** include: cables, sheaves, pins, fasteners, secondary securement equipment, anchor points, bridle lines, hydraulic cylinders, drawworks, hoisting equipment

***tools and equipment*** include: fall arrest equipment, hammers, tie-off points, ratchets

***hazards*** include: over pulling, lines catching, pinch points, suspended load, falling objects, speed of descent

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-9.02.01L | demonstrate knowledge of laying down derricks | identify derrick lowering ***equipment*** |
|  |  | explain procedures for laying down derricks |
|  |  | explain the rating plate on a derrick |
|  |  | describe how different environmental conditions will affect lowering the derrick |
|  |  | describe considerations for working at heights and securing ***tools and equipment*** |
|  |  | describe the procedures used to inspect derricks |
|  |  | identify criteria for replacement or repair of equipment |

RANGE OF VARIABLES

***equipment*** include: cables, sheaves, pins, fasteners, secondary securement equipment, anchor points, bridle lines, hydraulic cylinders, drawworks, hoisting equipment

***tools and equipment*** include: fall arrest equipment, hammers, tie-off points, ratchets

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| C-9.03 | Rigs out mud tanks, pumps and circulation systems |

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| **Essential Skills** | Working with Others, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-9.03.01P | depressurize lines and equipment | lines and equipment are depressurized according to rig procedures |
| C-9.03.02P | transfer volume | volume is transferred to storage tanks according to operator’s requirements |
| C-9.03.03P | select and use ***tools and equipment*** | ***tools and equipment*** are selected and used according to rig procedures |
| C-9.03.04P | disconnect, store and secure ***equipment*** | ***equipment*** is disconnected, stored and secured according to rig procedures |
| C-9.03.05P | winterize ***equipment*** | ***equipment*** is winterized according to rig procedures |
| C-9.03.06P | clean mud tanks | mud tanks are cleaned according to rig procedures following jurisdictional regulations |

RANGE OF VARIABLES

***tools and equipment*** include: hammers, grease guns, wire brushes, air tools, spill containment and prevention systems

***equipment*** includes: tanks, pumps, high pressure and low pressure lines

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-9.03.01L | demonstrate knowledge of mud tanks, pumps and circulation systems, their applications and operations | identify types of mud tanks, pumps and circulation systems, and their components |
|  |  | describe the procedure to rig out mud tanks, pumps and circulation lines |
|  |  | identify the ***hazards*** and safe work practices when rigging out mud tanks, pumps and circulation systems |
| C-9.03.02L | demonstrate knowledge of cleaning mud tanks, pumps and circulations systems | explain the preparation and cleaning of mud tanks, pumps and circulation systems |
|  |  | identify the ***hazards*** and ***safe work practices*** when cleaning mud tanks, pumps and circulation systems |

RANGE OF VARIABLES

***hazards*** include: open holes, working at heights, dropped objects, tripping hazards, confined space

***safe work practices*** include:use of permit system, use confined space rescue plan, locking out and tagging out, atmospheric testing

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| C-9.04 | Rigs out boiler and steam circulation systems |

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| **Essential Skills** | Working with Others, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-9.04.01P | select and use ***tools and equipment*** | ***tools and equipment*** are selected and used according to rig procedures |
| C-9.04.02P | shut down boiler | boiler is shut down according to manufacturers' specifications |
| C-9.04.03P | shut in and cool boiler | boiler is cooled to depressurize according to manufacturers' specifications |
| C-9.04.04P | depressurize steam system | steam system is depressurized according to rig procedures |
| C-9.04.05P | blow out steam lines with air | steam lines are blown out with air according to rig procedures |
| C-9.04.06P | drain boiler | boiler is drained according to rig procedures |
| C-9.04.07P | winterize boiler and steam system | boiler and steam systems are winterized according to rig procedures |
| C-9.04.08P | store and secure steam lines | steam lines are stored and secured according to rig procedures |

RANGE OF VARIABLES

***tools and equipment*** includes: hand tools, ladders, markers

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-9.04.01L | demonstrate knowledge of boiler and steam circulating systems | identify the procedures used to rig out boiler and steam circulating systems |
|  |  | describe the functions of a boiler and components |
|  |  | describe steam systems used on drilling rigs |
|  |  | identify operating pressure, fuel pressure and low water shut off function |
|  |  | identify hazards and safe work practices related to boilers and steam circulating systems |
|  |  | describe types of problems that could be encountered during rig out procedures |
|  |  | explain the procedures to depressurize and cool down a boiler and steam circulating system |
|  |  | explain the procedures to winterize boiler and steam systems |
|  |  | explain the procedures to blow out steam lines |

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| C-9.05 | Rigs out air, fuel, water, hydraulic, electrical and communication systems |

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| **Essential Skills** | Working with Others, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-9.05.01P | select and use ***tools and materials*** | ***tools and materials*** are selected and used according to rig specifications |
| C-9.05.02P | locate and turn off breakers | breakers are located and turned off prior to disconnecting electrical cables according to company policies and regulations |
| C-9.05.03P | depressurize lines and de-energize cables | lines are depressurized and cables are de-energized according to rig procedures |
| C-9.05.04P | blow out water lines | water lines are blown out according to rig specifications |
| C-9.05.05P | disconnect air, water, fuel and hydraulic lines, and electrical and communication cables | air, water, fuel and hydraulic lines, and electrical and communication cables are disconnected according to rig and manufacturers' specifications |
| C-9.05.06P | store and secure ***equipment*** | ***equipment*** is stored and secured in designated area according to rig and manufacturers’ specifications |

RANGE OF VARIABLES

***tools and materials*** include: hand tools, contact cleaners

***equipment*** includes: cords, hoses, manifolds, cables, couplers, batteries

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-9.05.01L | demonstrate knowledge of rig air, fuel, water and hydraulic lines | describe air, fuel, water and hydraulic lines on drilling rigs |
|  |  | identify rig air, fuel, water and hydraulic components |
|  |  | identify hazards of rigging out air, fuel, water and hydraulic systems |
| C-9.05.02L | demonstrate knowledge of procedures for rigging out air, fuel, water and hydraulic lines | describe procedures for depressurizing lines |
|  |  | describe procedures for blowing out water lines |
|  |  | describe procedures for disconnecting lines |
|  |  | describe procedures for winterizing equipment |
| C-9.05.03L | demonstrate knowledge of rig electrical and communication cables | describe electrical systems used on drilling rigs |
|  |  | describe communication systems used on drilling rigs |
|  |  | identify hazards of an electrical system |
|  |  | describe the types of electrical cords and cables used on rig components |
|  |  | describe procedures for disconnecting and storing electrical and communication cables, and batteries |

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| C-9.06 | Prepares equipment for transport |

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| **Essential Skills** | Document Use, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| C-9.06.01P | secure loose ***equipment*** | ***equipment*** is secured according to rig procedures using ***securement equipment*** |
| C-9.06.02P | secure doors in a closed position | doors are secured in a closed position using pins and locks according to rig procedures |
| C-9.06.03P | secure hazardous materials | hazardous materials are secured according to TDG requirements |
| C-9.06.04P | check labels and documentation | all applicable labels and documentation are on the buildings according to regulations |
| C-9.06.05P | recognize, repair and replace worn, damaged or defective ***securement equipment*** | worn, damaged or defective ***securement equipment*** are identified, repaired and replaced according to manufacturers' specifications |

RANGE OF VARIABLES

***equipment*** includes: chemical barrels, hand rails, flow lines, shakers, tongs, pickup subs, tubulars

***securement equipment*** includes: chains and boomers, ropes and ratchet straps, baskets

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| C-9.06.01L | demonstrate knowledge of load securement | identify risks and hazards involved with hazardous materials |
|  |  | identify procedures used to secure ***equipment*** for transport |
|  |  | identify types of ***securement equipment*** |
|  |  | describe regulations pertaining to transporting fuels and other dangerous goods |

RANGE OF VARIABLES

***equipment*** includes: chemical barrels, hand rails, flow lines, shakers, tongs, pickup subs, tubulars

***securement equipment*** includes: chains and boomers, ropes and ratchet straps, baskets

MAJOR WORK ACTIVITY D

Performs rig inspection and maintenance

TASK D-10 Inspects rig equipment

TASK DESCRIPTOR

The inspection of rig equipment is crucial in preventing equipment failure, injury and downtime.

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| D-10.01 | Performs daily walk-around and detailed rig inspection |

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| **Essential Skills** | Thinking, Document Use, Writing |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-10.01.01P | conduct a daily walk-around inspection | daily walk-around inspection is conducted using a ***sensory inspection*** and according to rig procedures |
| D-10.01.02P | conduct a ***detailed rig*** ***inspection*** and ***function tests*** of ***equipment*** | ***detailed rig*** ***inspections*** and ***function tests*** are conducted according to checklists, required intervals, company policies and jurisdictional regulations |
| D-10.01.03P | identify and eliminate ***deficiencies*** | ***deficiencies*** are identified according to manufacturers' specifications and eliminated according to rig specifications |

RANGE OF VARIABLES

***sensory inspection*** includes: visual, smell, auditory, touch

***detailed rig inspections*** include: pre-spud, derrick, site-specific

***equipment*** includes: tongs, slips, overhead equipment, mud tanks, mud pumps, engines, drive systems, well control equipment, tools

***function tests*** include: accumulator tests, crown saver tests, motor kills, volume alarms, choke manifold, flare tank ignitors, gas monitoring systems

***deficiencies*** include: potential equipment failure, worn, damaged or defective equipment, incorrect valve alignment

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-10.01.01L | demonstrate knowledge of procedures used to inspect rigs | describe the procedures used to conduct a daily walk-around inspection |
|  |  | identify rig equipment ***deficiencies*** |
|  |  | describe the procedures used to conduct a ***detailed rig inspection*** and ***function tests*** |

RANGE OF VARIABLES

***deficiencies*** include: potential equipment failure, worn, damaged or defective equipment, incorrect valve alignment

***detailed rig inspections*** include: pre-spud, derrick, site-specific

***function tests*** include: accumulator tests, crown saver tests, motor kills, volume alarms, choke manifold, flare tank ignitors, gas monitoring systems

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| D-10.02 | Determines required repairs |

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| **Essential Skills** | Thinking, Continuous Learning, Reading |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-10.02.01P | use ***tools and equipment*** to diagnose repair requirements | ***tools and equipment*** are used to diagnose repair according to manufacturers' specifications and ***sensory inspection*** |
| D-10.02.02P | confirm repair requirements | repair requirements are confirmed by consulting manufacturers' specifications and rig procedures |
| D-10.02.03P | prioritize repairs | repairs are prioritized according to drilling operations |
| D-10.02.04P | notify personnel of required repair | personnel is notified of required repair |

RANGE OF VARIABLES

***tools and equipment*** include: multimeters, code readers, stethoscopes, temperature guns, glycol testers, pH testers

***sensory inspection*** include: visual, smell, auditory, touch

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-10.02.01L | demonstrate knowledge of procedures for determining the repair of rig equipment | identify types of ***tools and equipment*** required to diagnose equipment repairs and their procedures for use |
|  |  | identify lockout and permit requirements for diagnosing equipment |
|  |  | identify the methods used to troubleshoot and diagnose repairs |
|  |  | describe the procedures used to determine the priority of repairs |

RANGE OF VARIABLES

***tools and equipment*** include: multimeters, code readers, stethoscopes, temperature guns, glycol testers, pH testers

TASK D-11 Maintains rig equipment

TASK DESCRIPTOR

Rig technicians perform preventative maintenance at specific intervals to prevent equipment damage and injury to personnel and avoid downtime. They also perform repairs by replacing worn, damaged or defective equipment to keep the rig operating. Rig technicians are required to have valid special oil well boiler certification in order to maintain boilers.

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| D-11.01 | Maintains mechanical and pneumatic systems |

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| **Essential Skills** | Thinking, Reading, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.01.01P | change oil and filters on ***equipment*** | oil and filters are changed on ***equipment*** according to manufacturers' or rig specifications |
| D-11.01.02P | lubricate ***equipment*** | ***equipment*** is lubricated according to manufacturers' specifications |
| D-11.01.03P | repair or replace ***components*** | ***components*** are repaired or replaced according to repair manuals and manufacturers' specifications |
| D-11.01.04P | tighten, secure and adjust ***components*** | ***components*** are tightened, secured and adjusted according to manufacturers' specifications |
| D-11.01.05P | find and repair leaks in hoses and fittings | leaks in hoses and fittings are repaired according to manufacturers' specifications |
| D-11.01.06P | keep air systems free of water and debris | air systems are free of water and debris by blowing down air tanks and using ***additives*** according to rig procedures |

RANGE OF VARIABLES

***equipment*** includes: mud pumps, centrifugal pumps, clutches, chain drives, drive lines, gear boxes, transmissions, engines, bearings, drawworks, air compressors, radiators, brakes

***components*** include: belts, clutches, bearings, seals, gauges, pumps, air filters, dryers

***additives*** include: methanol, air brake antifreeze, air dryer pellets, oils

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.01.01L | demonstrate knowledge of maintenance of mechanical and pneumatic systems | identify ***equipment*** used to maintain mechanical and pneumatic systems on rigs and describe their function |
|  |  | identify ***components*** used to power rig equipment and describe their function |
|  |  | identify types of lubricants and their application |
|  |  | identify ***additives*** and their application |
|  |  | identify oil sampling techniques and contamination of lubricants |
|  |  | interpret repair manuals |

RANGE OF VARIABLES

***equipment*** includes: mud pumps, centrifugal pumps, clutches, chain drives, drive lines, gear boxes, transmissions, engines, bearings, drawworks, air compressors, radiators, brakes

***components*** include: belts, clutches, bearings, seals, gauges, pumps, air filters, dryers

***additives*** include: methanol, air brake antifreeze, air dryer pellets, oils

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| D-11.02 | Maintains hydraulic systems |

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| **Essential Skills** | Thinking, Reading, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.02.01P | ensure system is de-energized | system is de-energized and confirmed by testing equipment for energy |
| D-11.02.02P | change oil and filters on ***equipment*** | oil and filters are changed on ***equipment*** according to manufacturers' or rig specifications |
| D-11.02.03P | use isolation valves and spill containment | isolation valves and spill containment are used to minimize release of oil during repair |
| D-11.02.04P | repair or replace ***components*** | ***components*** are repaired or replaced according to repair manuals and manufacturers' specifications |
| D-11.02.05P | tighten, secure and adjust ***components*** | ***components*** are tightened, secured and adjusted according to manufacturers' specifications |
| D-11.02.06P | build hoses and install fittings | hoses are built and fittings are installed according to manufacturers' specifications |
| D-11.02.07P | check and clean suction screens on hydraulic pumps | suction screens on hydraulic pumps are checked and cleaned according to manufacturers' specifications |
| D-11.02.08P | check system pressures | system pressures meet rig and manufacturers’ specifications |

RANGE OF VARIABLES

***equipment*** includes: hydraulic pumps, motors, cylinders, hose crimper, tanks, cooling and heating systems

***components*** include: gauges, filters, pulsation dampeners, accumulator bottles, fittings, hoses, valves (e.g. relief valves, counterbalance valves, control valves), couplers

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.02.01L | demonstrate knowledge of maintenance of hydraulic systems | identify ***equipment*** used in hydraulic systems on rigs and describe their function |
|  |  | identify ***components*** used to power rig equipment and describe their function |
|  |  | identify types of lubricants and their application |
|  |  | interpret repair manuals |
|  |  | identify safe operating pressures for hydraulic systems |
|  |  | identify pressure ratings for hoses and fittings |
|  |  | describe cooling and heating systems and their function on hydraulic systems |
|  |  | identify hazards and safe work practices pertaining to maintenance of hydraulic systems |
|  |  | explain importance of preventing hydraulic system contamination |

RANGE OF VARIABLES

***equipment*** includes: hydraulic pumps, motors, cylinders, hose crimper, tanks, cooling and heating systems

***components*** include: gauges, filters, pulsation dampeners, accumulator bottles, fittings, hoses, valves (e.g. relief valves, counterbalance valves, control valves), couplers

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| D-11.03 | Maintains electrical and communication systems |

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| **Essential Skills** | Thinking, Reading, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.03.01P | ensure electrical sources are de-energized | electrical sources are de-energized and confirmed by testing equipment for energy |
| D-11.03.02P | verify wiring configurations | wire configurations are verified according to wiring diagrams |
| D-11.03.03P | lubricate electrical motors | electrical motors are lubricated according to manufacturers' specifications |
| D-11.03.04P | repair or replace damaged ***electrical components*** | damaged ***electrical components*** are repaired or replaced according to manufacturers' specifications and regulations |
| D-11.03.05P | repair and replace damaged ***communication equipment*** | damaged ***communication equipment*** is repaired and replaced according to manufacturers' specifications and regulations |

RANGE OF VARIABLES

***electrical components*** include: cords, plugs, switches, breakers, batteries

***communication equipment*** includes: programmable logic controller (PLC), moxa switches, Ethernet cables, profibus, fiber optic cables, coaxial cables, cameras, variable frequency drive (VFD) key pads, UPS, operating system

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.03.01L | demonstrate knowledge of electrical and communication systems | describe electrical and communication systems and their application |
|  |  | identify ***electrical components*** |
|  |  | identify ***communication equipment*** |
|  |  | identify the regulations on electrical work performed by a rig technician |
|  |  | describe the types of cords and cables and their application |
|  |  | identify amperage and voltage and describe its application |
| D-11.03.02L | demonstrates knowledge of procedures used to maintain electrical and communication systems | describe the inspection of wire connections and panels |
|  |  | describe indicators of problems with electrical motors and generators |
|  |  | describe a ground fault |
|  |  | describe testing and maintenance of batteries |
|  |  | describe procedures for boosting and charging batteries |
|  |  | identify ***hazards*** and safe operating procedures for electrical systems |
|  |  | describe procedures used to maintain electrical systems |
|  |  | describe procedures used to maintain communication systems |

RANGE OF VARIABLES

***electrical components*** include: cords, plugs, switches, breakers, batteries

***communication equipment*** includes: programmable logic controller (PLC), moxa switches, Ethernet cables, profibus, fiber optic cables, coaxial cables, cameras, variable frequency drive (VFD) key pads, UPS, operating system

***hazards*** include: fire, fumes, shock, arc flash, burns

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| D-11.04 | Maintains boiler and steam systems |

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| **Essential Skills** | Thinking, Reading, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.04.01P | check operating control system | operating control system meets specifications and regulations |
| D-11.04.02P | test boiler water | boiler water is tested according to manufacturers' specifications and jurisdictional regulations |
| D-11.04.03P | blow down boiler and maintain boiler water | boiler is blown down and boiler water is maintained using boiler compound according to manufacturers' specifications and rig procedures |
| D-11.04.04P | remove and replace worn, damaged and defective ***boiler*** ***components*** | worn, damaged and defective ***boiler*** ***components*** are removed and replaced according to manufacturers' specifications |
| D-11.04.05P | remove and replace worn, damaged and defective ***steam system*** ***components*** | worn, damaged and defective ***steam system*** ***components*** are removed and replaced according to manufacturers' specifications |
| D-11.04.06P | clean boiler and ***boiler*** ***components*** | boiler and ***boiler*** ***components*** are cleaned according to manufacturers' specifications and rig procedures |
| D-11.04.07P | build steam hoses and install fittings | steam hoses are built and fittings are installed according to manufacturers' specifications |

RANGE OF VARIABLES

***boiler*** ***components*** include: hoses, valves, pumps, sensors, floats, safety valves, unions, hand holes, plates and gaskets, control system components (e.g. low/high water cutoffs, low/high fire control, sequencing control)

***steam system components*** include: hoses, valves, steam traps, heaters, check valves, unions, blowdown tank, steam manifold

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.04.01L | demonstrate knowledge of boilers and steam systems | describe the principles of boilers and steam systems |
|  |  | identify the ***boiler components*** and ***steam system components*** |
| D-11.04.02L | demonstrates knowledge of procedures used to maintain boilers and steam systems | describe procedures used to troubleshoot ***problems*** and maintain boilers and steam systems |
|  |  | identify the ***tools and equipment*** required to maintain boilers and steam systems |
|  |  | describe function and components of boiler control system |
|  |  | identify ***hazards*** and safe operating procedures of a boiler and steam system |
|  |  | describe boiler water maintenance |

RANGE OF VARIABLES

***boiler*** ***components*** include: hoses, valves, pumps, sensors, floats, safety valves, unions, hand holes, plates and gaskets, control system components (e.g. low/high water cutoffs, low/high fire control, sequencing control)

***steam system components*** include: hoses, valves, steam traps, heaters, check valves, unions, blowdown tank, steam manifold

***problems*** include: improper fueling, improper air flow, low water, faulty pumps, dirty fire eye, faulty or stuck sensors, malfunctioning pressure relief valve

***tools and equipment*** include: wash guns, fire tube brushes, hammers, wire brushes, grease guns, ladders

***hazards*** include: burns, explosions, working at heights, high pressure, slips and trips, water hammer

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| D-11.05 | Maintains overhead equipment |

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| **Essential Skills** | Thinking, Document Use, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.05.01P | select and use tools and equipment for working at heights | tools and equipment for working at heights are selected and used according to rig procedures |
| D-11.05.02P | check oil levels in swivels and kelly spinner | oil levels in swivels and kelly spinner are checked according to rig procedures and manufacturers' specifications |
| D-11.05.03P | lubricate ***overhead equipment*** | ***overhead equipment*** is lubricated according to rig procedures and manufacturers' specifications |
| D-11.05.04P | operate and adjust ***overhead equipment*** | ***overhead equipment*** is operated and adjusted according to IRP, regulations and manufacturers' specifications |
| D-11.05.05P | identify and replace worn, damaged and defective ***overhead equipment*** | worn, damaged and defective ***overhead equipment*** is identified and replaced according to manufacturers' specifications |

RANGE OF VARIABLES

***overhead equipment*** includes: crown, wash pipe, tong sheaves, travelling block assembly, swivel, gear boxes, cables, overhead shackles, clamps, elevators, bails, becket

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.05.01L | demonstrate knowledge of ***overhead equipment*** | identify types of ***overhead equipment***, their applications and procedures for use |
|  |  | identify certification requirements and ratings for ***overhead equipment*** |
| D-11.05.02L | demonstrate knowledge of procedures used to maintain ***overhead equipment*** | describe procedures used to maintain ***overhead equipment*** |
|  |  | describe the service requirements for ***overhead equipment*** |
|  |  | describe securement requirements for ***overhead equipment*** |
|  |  | describe safe work practices for working at heights |

RANGE OF VARIABLES

***overhead equipment*** includes: crown, wash pipe, tong sheaves, travelling block assembly, swivel, gear boxes, cables, overhead shackles, clamps, elevators, bails, becket

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| D-11.06 | Maintains top drives |

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| **Essential Skills** | Thinking, Reading, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.06.01P | select and use tools and equipment for working at heights | tools and equipment for working at heights are selected and used according to rig procedures |
| D-11.06.02P | check fluid levels and flow rates in top drives | fluid levels and flow rates in top drive meet manufacturers' specifications |
| D-11.06.03P | lubricate top drives | top drives are lubricated according to manufacturers' specifications |
| D-11.06.04P | operate and adjust ***top*** ***drive components*** | ***top*** ***drive components*** are operated and adjusted according to rig procedures and manufacturers' specifications |
| D-11.06.05P | identify and replace worn, damaged and defective ***top*** ***drive components*** | worn, damaged and defective ***top*** ***drive components*** is identified and replaced according to repair manuals and manufacturers' specifications |

RANGE OF VARIABLES

***top drive components*** include: gear box, wash pipe, drive motor, hydraulic system, grabber box, pipe handling system, control system, service loop, torque arrest system

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.06.01L | demonstrate knowledge of top drives,their applications and procedures for use | identify ***types of top drives*** and their applications |
|  |  | identify top drive ratings and limitations |
| D-11.06.02L | demonstrate knowledge of procedures used to maintain ***top drive components*** | describe the procedures used to maintain ***top drive components*** |
|  |  | describe the service requirements for ***top drive components*** |

RANGE OF VARIABLES

***types of top drives*** include: hydraulic, electric, integrated, articulating

***top drive components*** include: gear box, wash pipe, drive motor, hydraulic system, grabber box, pipe handling system, control system, service loop, torque arrest system

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| D-11.07 | Maintains rig floor equipment |

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| **Essential Skills** | Thinking, Working with Others, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.07.01P | select and use ***tools*** for repair | ***tools*** are selected and used according to rig procedures |
| D-11.07.02P | lubricate ***rig*** ***floor equipment*** | ***rig*** ***floor equipment***is lubricated according to manufacturers' specifications |
| D-11.07.03P | replace worn, damaged and defective ***rig*** ***floor equipment*** | worn, damaged and defective ***rig*** ***floor equipment*** are replaced according to manufacturers' specifications |

RANGE OF VARIABLES

***tools*** include: hammers, tong die punches, wrenches, pipe wrenches, grease guns, wire brushes

***rig floor equipment*** include: iron roughnecks, tong and tong lines, pipe spinners, rotary table, slips, safety clamps, bushings, torque gauges, gauges

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.07.01L | demonstrate knowledge of ***rig floor equipment*** | identify types of ***rig floor equipment*** and their application |
| D-11.07.02L | demonstrate knowledge of procedures used to maintain ***rig floor equipment*** | describe the procedures used to maintain ***rig floor equipment*** |
|  |  | identify service requirements for ***rig floor equipment*** |
|  |  | identify ***hazards*** of maintaining ***rig floor equipment*** |

RANGE OF VARIABLES

***rig floor equipment*** include: iron roughnecks, tong and tong lines, pipe spinners, rotary table, slips, safety clamps, bushings, torque gauges, gauges

***hazards*** include: shattering tong dies, rotating or energized equipment, stuck bushings

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| D-11.08 | Maintains mud pump and high pressure mud system |

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| **Essential Skills** | Thinking, Continuous Learning, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.08.01P | ensure system is de-energized | system is de-energized and confirmed by testing equipment for energy |
| D-11.08.02P | dismantle and reassemble ***fluid end*** ***components*** | ***fluid end*** ***components*** are dismantled and reassembled to inspect and replace worn and damaged parts |
| D-11.08.03P | set pop valve | pop valve is set to pressure rating of liners according to manufacturers' specifications |
| D-11.08.04P | set pulsation dampener | pulsation dampener is set according to rig procedures |
| D-11.08.05P | clean suction and discharge screen | suction and discharge screen is cleaned according to rig procedures |
| D-11.08.06P | check fluid level of ***power end*** ***components*** | fluid level of ***power end*** ***components*** meets manufacturers' specifications |
| D-11.08.07P | replace worn, damaged and defective ***power end components*** | worn, damaged and defective ***power end components*** are replaced |
| D-11.08.08P | replace worn, damaged and defective ***high pressure components*** | worn, damaged and defective ***high pressure components*** are replaced |

RANGE OF VARIABLES

***fluid end*** ***components*** include: valves, caps, heads, liners, gaskets, springs, seats, guides, gauges, sensors, pulsation dampener

***power end*** ***components*** include: pony rods, wiper seals, lube pump, drive gears, sheaves, belt, oil reservoir, water traps

***high pressure components*** include: hammer unions, hoses, valves, piping

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.08.01L | demonstrate knowledge of mud pumps | identify ***fluid end*** ***components*** and their application |
|  |  | identify ***power end*** ***components*** and their application |
|  |  | describe ***types of mud pumps*** and identify their rating |
| D-11.08.02L | demonstrate knowledge of high pressure mud systems | identify the pressure rating of hoses, piping, and fittings |
|  |  | identify connection types |
|  |  | identify the hose bend radius and fluid turn requirements |
| D-11.08.03L | demonstrate knowledge of procedures used to maintain mud pumps and high pressure mud system | describe the procedures used to maintain mud pumps and high pressure mud system and their components |

RANGE OF VARIABLES

***fluid end*** ***components*** include: valves, caps, heads, liners, gaskets, springs, seats, guides, gauges, sensors, pulsation dampener

***power end*** ***components*** include: pony rods, wiper seals, lube pump, drive gears, sheaves, belt, oil reservoir, water traps

***types of mud pumps*** include: triplex (1000°hp, 1300°hp and 1600°hp), quad, hex

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| D-11.09 | Maintains mud tanks and low pressure mud system |

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| **Essential Skills** | Thinking, Continuous Learning, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.09.01P | check oil levels in ***mud tank equipment*** | oil levels in ***mud tank equipment*** meets manufacturers' specifications |
| D-11.09.02P | lubricate ***mud tank equipment*** and ***components*** | ***mud tank equipment*** and ***components*** are lubricated according to manufacturers' specifications |
| D-11.09.03P | replace worn, damaged and defective ***mud tank equipment*** and ***components*** | worn, damaged and defective ***mud tank equipment*** and ***components*** are replaced |
| D-11.09.04P | replace worn, damaged and defective ***low pressure mud system components*** | worn, damaged and defective ***low pressure mud system components*** are replaced |
| D-11.09.05P | operate and adjust ***mud tank equipment*** | ***mud tank equipment*** is operated and adjusted according to rig procedures and manufacturers' specifications |

RANGE OF VARIABLES

***mud tank equipment*** includes: shakers, agitators, centrifugal pumps, mud manifold, desilters/desander

***mud tank components*** include: valves, butterfly valves, bridge gates, skimmers, flood gates, sandtraps, trough, gun lines, hoppers, chemical barrel

***low pressure mud system components*** include: suction lines, air bags, flow lines, butterfly valves, dresser sleeves, flanges

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.09.01L | demonstrate knowledge of mud tanks | identify ***mud tank equipment*** and its application |
|  |  | identify ***mud tank components*** and their application |
| D-11.09.02L | demonstrate knowledge of low pressure mud systems | explain the appropriate application of piping, hoses and connectors on low pressure systems |
|  |  | describe how to identify the pressure rating of hoses, piping, and fittings |
|  |  | identify flange types, gaskets, sealant and fasteners to make connections |
|  |  | identify pipe threads used in low pressure mud systems |
| D-11.09.03L | demonstrate knowledge of procedures used to maintain mud tanks and low pressure mud system | describe the procedures used to maintain mud tanks and low pressure mud system and their components |

RANGE OF VARIABLES

***mud tank equipment*** includes: shakers, agitators, centrifugal pumps, mud manifold, desilters/desander

***mud tank components*** include: valves, butterfly valves, bridge gates, skimmers, flood gates, sandtraps, trough, gun lines, hoppers, chemical barrel

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| D-11.10 | Maintains water and fuel circulating systems |

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| **Essential Skills** | Thinking, Working with Others, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.10.01P | select and use ***tools*** | ***tools*** are selected and used according to rig procedures |
| D-11.10.02P | maintain and repair pressure washers | pressure washers are maintained and repaired according to manufacturers' specifications |
| D-11.10.03P | replace worn, damaged and defective ***components*** | worn, damaged and defective ***components*** are replaced according to manufacturers' specifications |
| D-11.10.04P | replace or adjust packing on pumps | packing on pumps is replaced or adjusted according to manufacturers' specifications |
| D-11.10.05P | repair or replace hoses | hoses are replaced or repaired |
| D-11.10.06P | replace gauges and filters | gauges and filters are replaced according to rig procedures |

RANGE OF VARIABLES

***tools*** include: hammers, wrenches, pipe wrenches, grease guns, wire brushes, screwdrivers

***components*** include: low pressure valves, centrifugal pumps, fittings, hoses, piping, gaskets

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.10.01L | demonstrate knowledge of water and fuel circulating systems | describe water and fuel circulating systems |
|  |  | identify the ***components*** of a water and fuel circulating system |
| D-11.10.02L | demonstrate knowledge of procedures used to maintain water and fuel circulating systems | describe procedures used to maintain water and fuel circulating systems |
|  |  | identify tools used to maintain water and fuel circulating systems and their ***components*** |

RANGE OF VARIABLES

***components*** include: low pressure valves, centrifugal pumps, fittings, hoses, piping, gaskets

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| D-11.11 | Performs slip and cut |

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| **Essential Skills** | Document Use, Oral Communication, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| D-11.11.01P | prepare ***tools for slip and cut*** | ***tools for slip and cut*** are prepared |
| D-11.11.02P | determine drill line to be cut off | drill line to be cut off is calculated according to megajoules on EDR or manual calculation |
| D-11.11.03P | secure ***travelling assembly*** | ***travelling assembly*** is secured according to rig specifications |
| D-11.11.04P | visually inspect drill line | drill line is visually inspected for wear or damage |
| D-11.11.05P | remove drill line section | drill line section is removed from drum and cut following rig-specific procedures according to company policies |
| D-11.11.06P | inspect and function test drawworks | drawworks are tested according to rig-specific procedures and company policies |
| D-11.11.07P | attach drill line drum anchor | drill line drum anchor is attached according to manufacturers' specifications |
| D-11.11.08P | slip and secure new drill line section | new drill line section is slipped and secured following rig-specific procedures according to company policies |
| D-11.11.09P | set and function test crown saver(s) | crown saver(s) are set and function tested according to regulations and rig specifications |

RANGE OF VARIABLES

***tools for slip and cut*** include: cable cutters, wrenches, torque wrenches, hammers, travelling assembly securement devices

***travelling assembly*** includes: top drive, blocks, power swivels

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| D-11.11.01L | demonstrate knowledge of performing slip and cut | explain procedures to perform slip and cut calculations |
|  |  | describe procedures to inspect drill lines |
|  |  | describe the purpose of slip and cut |
|  |  | describe slip and cut procedures |
|  |  | identify types of drum and deadline anchors |
|  |  | describe procedures to remove, fasten and adjust weight sensors |

MAJOR WORK ACTIVITY E

Performs drilling operations

TASK E-12 Prepares drill string

TASK DESCRIPTOR

The drill string consists of the BHA which includes a bit, bit subs, collars, cross-overs, heavy-weight drill pipe and specialized drilling tools such as mud motors, power drive, jars, reamers and shock subs. The BHA is suspended from lengths of drill pipe. The assembly of drill pipe and BHA is called the drill string. The drill string is lengthened by adding sections of pipe. The drill string is used for drilling the surface hole or main hole.

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| E-12.01 | Takes measurements of bottomhole assembly (BHA) and drill string |

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| **Essential Skills** | Oral Communication, Numeracy, Document Use |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-12.01.01P | measure and record length of ***BHA components*** | length of ***BHA components*** is measured and recorded using derrick/strap tape measure according to IRP |
| E-12.01.02P | measure inside diameter (ID)/outside diameter (OD) of ***BHA components*** | ID/OD of ***BHA components*** are measured using callipers and tape measures |
| E-12.01.03P | input measurement data into electronic drilling recorder | measurement data is entered into electronic drilling recorder |
| E-12.01.04P | size drill bit nozzles (jets) | drill bit nozzles (jets) are sized using nozzle gauge according to operator’s instructions |

RANGE OF VARIABLES

***BHA components*** include: drill collars, cross-overs, heavyweights, specialized tools

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-12.01.01L | demonstrate knowledge of procedures used to take measurements of BHA and drill string | explain procedures used to measure and record length of ***BHA components*** |
|  |  | explain procedures used to measure the diameter of ***BHA components*** |
|  |  | identify types of equipment required to measure ***BHA components*** |
|  |  | explain how to record into the electronic drilling recorder |
|  |  | explain procedures used to size drill bit nozzles (jets) and to gauge bits |

RANGE OF VARIABLES

***BHA components*** include: drill collars, cross-overs, heavyweights, specialized tools

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| E-12.02 | Picks up bottomhole assembly (BHA) and drill string |

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| **Essential Skills** | Oral Communication, Working with Others, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-12.02.01P | tighten lifting nubbins, pickup subs and protectors | lifting nubbins, pickup subs and protectors are tightened prior to hoisting |
| E-12.02.02P | hoist BHA to floor | BHA is hoisted to floor using proper holdback procedures with ***equipment*** |
| E-12.02.03P | lower and secure BHA components into mousehole | BHA components are lowered and secured into mousehole according to rig specifications |
| E-12.02.04P | remove nubbins or pickup subs, if necessary | nubbins and pickup subs are removed, if necessary |
| E-12.02.05P | latch elevators onto collar pickup subs or zip grooves, or prepare tubular to be picked up with top drive | elevators are latched onto collar pickup subs or zip grooves, or tubular is prepared to be picked up with top drive according to specifications and compatibility |

RANGE OF VARIABLES

***equipment*** includes: winches, collar slings, rigging/hoisting equipment, snubbing rope, hydraulic catwalks, pickup nubbins and subs, pipe arm, elevators

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-12.02.01L | demonstrate knowledge of procedures used to pick up BHA and drill string | explain procedures used to tighten lifting nubbins, pickup subs and protectors |
|  |  | identify types of thread connections |
|  |  | identify ***equipment*** used to hoist collars |
|  |  | identify hazards and safe operating procedures for hoisting collars |
|  |  | explain procedures used to size and latch elevators onto collar pickup subs or zip grooves |
|  |  | explain procedures used to prepare tubulars to be picked up with top drive |

RANGE OF VARIABLES

***equipment*** includes: winches, collar slings, rigging/hoisting equipment, snubbing rope, hydraulic catwalks, pickup nubbins and subs, pipe arm, elevators

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| E-12.03 | Makes up bottomhole assembly (BHA) |

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| **Essential Skills** | Numeracy, Document Use, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-12.03.01P | install each BHA component | BHA componentsare installed according to IRP using ***tools and equipment*** |
| E-12.03.02P | torque each connection | connections are torqued according to specifications using compatible tongs or iron roughnecks |
| E-12.03.03P | install dog collars on required BHA components | dog collars are installed on required BHA components |
| E-12.03.04P | change bit nozzles | bit nozzles are changed according to operator’s requirements |
| E-12.03.05P | install bits | bits are installed according to manufacturers’ specifications |

RANGE OF VARIABLES

***tools and equipment*** include: pipe spinners, chain tongs, iron roughneck, top drive, rig tongs, dog collars, slips, elevators

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-12.03.01L | demonstrate knowledge of procedures used to make up BHA | identify BHA components |
|  |  | explain procedures used to torque BHA component connections |
|  |  | explain procedures used to install dog collars on BHA components |
|  |  | identify types of bit nozzles used on BHA |
|  |  | explain procedures used to install bit nozzles |
|  |  | identify types of bits and bit breakers |
|  |  | identify threads and torque values |

TASK E-13 Operates blowout preventer (BOP) equipment and associated components

TASK DESCRIPTOR

BOPs are used to control kicks and prevent blowouts. A thorough understanding of the function, operation, maintenance and testing of the BOP is an essential part of crew training and vital in the event of a kick situation. BOPs must be used in drilling operations and tested at specific intervals as per governing regulations.

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| E-13.01 | Prepares for blowout preventer (BOP) installation |

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| **Essential Skills** | Thinking, Working with Others, Numeracy |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-13.01.01P | organize ***tools and equipment*** | ***tools and equipment*** are organized |
| E-13.01.02P | clean BOP component flanges, gaskets, nuts and studs | BOP component flanges, gaskets, nuts and studs are cleaned |
| E-13.01.03P | inspect ***tools and equipment*** and ***components*** | ***tools and equipment*** and ***components*** are inspected |
| E-13.01.04P | remove fluid from casing | fluid from casing is removed by displacing, pumping or using air pressure according to company policies |
| E-13.01.05P | measure out casing bowl height | casing bowl height is measured out for positioning BOP |
| E-13.01.06P | measure and cut casing or back off landing joint | casing is measured and cut or landing joint is backed off according to required height and rig specifications |
| E-13.01.07P | remove flow line, lay down cut-off casing or landing joint and conductor, if necessary | flow line is removed, cut-off casing or landing joint and conductor are laid down, if necessary |
| E-13.01.08P | install casing bowl onto casing using ***methods*** | casing bowl is installed into casing using rigging/hoisting equipment and ***methods*** |
| E-13.01.09P | lay down mousehole, if necessary | mousehole is laid down using rigging/hoisting equipment, if necessary |

RANGE OF VARIABLES

***tools and equipment*** include: nuts, studs, ring gaskets, hydraulic fittings, flow-tees, hammer wrenches, hammers, pneumatic wrench, hydraulic wrench, BOP slings, fall arrest equipment

***components*** include: annular preventer, blind rams, HCR valve, pipe rams, shear rams, drilling spool, casing bowl, kill lines, manually operated valves, flange lines, bleed-off lines

***methods*** include: weld on, screw on, slip on

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-13.01.01L | demonstrate knowledge of procedures used to prepare for BOP installation | identify types of ***tools and equipment*** required for the installation of BOP |
|  |  | describe methods used to remove fluid from casing |
|  |  | explain procedures used to calculate casing bowl space requirements |
|  |  | explain procedures used to cut casing |
|  |  | identify hazards and safe operating procedures when using ***tools and equipment*** and rigging/hoisting equipment |

RANGE OF VARIABLES

***tools and equipment*** include: nuts, studs, ring gaskets, hydraulic fittings, flow-tees, hammer wrenches, hammers, pneumatic wrench, hydraulic wrench, BOP slings, fall arrest equipment

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| E-13.02 | Nipples up blowout preventer (BOP) |

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| **Essential Skills** | Oral Communication, Working with Others, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-13.02.01P | position BOP with rig-specific ***handling equipment*** onto casing bowl | BOP is positioned onto casing bowl with rig-specific ***handling equipment*** |
| E-13.02.02P | fasten BOP to casing bowl | BOP is fastened to casing bowl using ***tools and equipment*** |
| E-13.02.03P | fasten HCR and kill line valves to the BOP stack | HCR and kill line valves are fastened to the BOP stack using rigging/hoisting equipment |
| E-13.02.04P | assemble choke line(s) from HCR valve to choke manifold | choke line(s) is assembled from HCR valve to choke manifold |
| E-13.02.05P | rig in flow-tee, flow line, catch tray and hole fill hose | flow-tee, flow line, catch tray and hole fill hose are rigged in |
| E-13.02.06P | align BOP to rotary table centre using ***aligning tools*** | BOP is aligned to rotary table using ***aligning tools*** |
| E-13.02.07P | route and attach hydraulic lines to BOP components | hydraulic lines are routed and attached to BOP components |
| E-13.02.08P | assemble flare and degasser lines | flare and degasser lines are assembled according to regulations |
| E-13.02.09P | prepare for winter operations, if required | BOP system is prepared for winter operations, if required and according to regulations |

RANGE OF VARIABLES

***handling equipment*** includes: BOP slings, BOP handler

***tools and equipment*** include: nuts, studs, ring gaskets, hydraulic fittings, flow-tees, hammer wrenches, hammers, pneumatic wrench, hydraulic wrench, BOP slings, fall arrest equipment

***aligning tools*** include: turnbuckle straps, chains, boomers, chain hoists

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-13.02.01L | demonstrate knowledge of procedures used to nipple up BOP | identify hazards and safe operating procedures when using rigging/hoisting equipment |
|  |  | identify the tools required to fasten BOP to casing bowl |
|  |  | describe the function of the HCR and kill line valves |
|  |  | identify the tools required to align BOP to the rotary table centre |
|  |  | identify the requirements for cold weather operation |
|  |  | describe hazards and risks associated with nipple up procedures |
|  |  | describe BOP stack classification |
|  |  | explain how to calculate casing bowl space requirements |
|  |  | identify BOP ***handling equipment*** |
|  |  | describe the inspection criteria for a BOP |
|  |  | identify flange types, gaskets, sealants and fasteners to make connections |
|  |  | identify the hose bend radius and fluid turn requirements |
|  |  | identify regulatory requirements of fire rated hoses and fittings and their application |

RANGE OF VARIABLES

***handling equipment*** includes: BOP slings, BOP handler

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| E-13.03 | Performs blowout preventer (BOP) accumulator functions |

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| **Essential Skills** | Thinking, Document Use, Numeracy |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-13.03.01P | visually check accumulator fluid levels in the reservoir and accumulator pre-charge bottle pressures | accumulator fluid levels in the reservoir and accumulator pre-charge bottle pressures are checked |
| E-13.03.02P | visually check nitrogen back-up bottle pressures | nitrogen back-up bottle pressures are checked according to regulations |
| E-13.03.03P | close bleed off valve on accumulator manifold | bleed off valve on accumulator manifold is closed |
| E-13.03.04P | start accumulator pump and record pre-charge pressure | accumulator pump is started and pre-charge pressure is recorded according to regulations |
| E-13.03.05P | record accumulator operating pressure | accumulator operating pressure is recorded according to regulations |
| E-13.03.06P | function test ***BOP components*** and record close/open times, remaining pressure and recharge time | ***BOP components*** are function tested and close/open times, remaining pressure and recharge time are recorded according to regulations |
| E-13.03.07P | visually check hoses and fittings | hoses and fittings are checked for ***problems*** |
| E-13.03.08P | troubleshoot ***accumulator malfunctions*** | ***accumulator malfunctions*** are resolved |
| E-13.03.09P | bleed off accumulator pressure using ***method*** prior to correcting any identified malfunctions | accumulator pressure is bled off using ***method*** prior to correcting any identified malfunctions |

RANGE OF VARIABLES

***BOP components*** include: annular preventer, blind rams, HCR valve, pipe rams, shear rams

***problems*** include: leaks, air-lock, hose disconnect, coupler failure, hose collapse, frozen hose

***accumulator malfunctions*** include: incorrect hose hook-up, faulty PLC, air remotes, loss of pressure, blockage, frozen air line, faulty accumulator manifold valve, plug screen, manifold valve actuator

***method*** includes: accumulator manifold valves to be set in neutral position when opening accumulator manifold bleeder valve to zero system pressure

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-13.03.01L | demonstrate knowledge of procedures used to charge and function test BOP accumulator | explain the purpose and procedures for charging and function testing the BOP accumulator |
|  |  | describe methods used for troubleshooting ***accumulator malfunctions*** |
|  |  | identify the pressures required for the function test to meet regulations |
|  |  | identify close/open and recharge times and relative pressures required to meet regulations |
|  |  | describe the BOP and accumulator function test |

RANGE OF VARIABLES

***accumulator malfunctions*** include: incorrect hose hook-up, faulty PLC, air remotes, loss of pressure, blockage, frozen air line, faulty accumulator manifold valve, plug screen, manifold valve actuator

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| E-13.04 | Pressure tests blowout preventer (BOP) and components |

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| **Essential Skills** | Document Use, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-13.04.01P | make up test plug/cup on bottom of drill pipe to required torque | test plug/cup is made on bottom of drill pipe to required torque |
| E-13.04.02P | run test plug/cup and drill pipe through BOP stack and land in casing bowl | test plug/cup and drill pipe are run through the BOP stack and landed in casing bowl according to operator’s instructions |
| E-13.04.03P | secure drill pipe to offset hydraulicing, if required | drill pipe is secured to offset hydraulicing, if required |
| E-13.04.04P | close each ***BOP component*** and manifold valve separately and apply required pressures (low and high) | each ***BOP component*** and manifold valve is closed separately, and required pressures (low and high) are applied using mud pumps or third-party pressure testers to ensure each component holds the pressure |
| E-13.04.05P | troubleshoot ***pressure testing problems*** | ***pressure testing problems*** are resolved using ***methods*** |
| E-13.04.06P | visually inspect and monitor ***BOP components*** | ***BOP components*** are visually inspected and monitored for pressure loss |
| E-13.04.07P | record ***pressure test data*** | ***pressure test data*** is recorded according to regulations |
| E-13.04.08P | bleed off pressure at casing bowl | pressure is bled off at casing bowl to correct any identified leaks or pressure losses |
| E-13.04.09P | set up or align manifold valves | manifold valves are set up or aligned according to operator’s instructions |
| E-13.04.10P | prepare manifold and kill and bleed-off lines for winter operations, if required | manifold and kill and bleed-off lines are prepared for winter operations according to regulations, if required |
| E-13.04.11P | install kill line hose(s) | kill line hose(s) is installed according to regulations |

RANGE OF VARIABLES

***BOP components*** include: annular preventer, blind rams, HCR valve, pipe rams, shear rams, drilling spool, casing bowl, kill lines, manually operated valves, flange lines, bleed-off lines, stabbing valve, inside BOP, Kelly cocks, manifold gauges

***pressure testing problems*** include: pressure drop, leaks, failed BOP component, by-pass, gauge malfunction

***methods*** include: re-functioning component, flushing component, repositioning pipe, changing component, tightening flange connection

***pressure test data*** includes: high/low test pressures, duration of pressure test, components tested, motor kills, function test, visual inspection of vent and degasser lines

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-13.04.01L | demonstrate knowledge of procedures used to pressure test BOP and components | describe pressure test procedures |
|  |  | explain the importance of conducting a pressure test |
|  |  | explain the procedures used to bleed off pressure |
|  |  | calculate MACP |
|  |  | identify hazards and safe operating procedures associated with pressure testing BOP and components |

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| E-13.05 | Nipples down blowout preventer (BOP) and related equipment |

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| **Essential Skills** | Working with Others, Oral Communication, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-13.05.01P | select and use ***tools and equipment*** | ***tools and equipment*** are selected and used |
| E-13.05.02P | disconnect flow line and remove flow-tee | flow line is disconnected and flow-tee is removed |
| E-13.05.03P | bleed off accumulator and disconnect hydraulic lines | accumulator is bled off and hydraulic lines are disconnected |
| E-13.05.04P | position BOP ***handling equipment*** | BOP ***handling equipment*** is positioned according to rig specifications |
| E-13.05.05P | bleed off HCR and choke system(s) | HCR and choke system(s) are bled off |
| E-13.05.06P | disconnect ***lines***, ***valves*** and bottom drilling spool | ***lines***, ***valves*** and bottom drilling spool are disconnected according to operator’s instructions |
| E-13.05.07P | remove casing, if required and as required | casing is removed, if required and as required |
| E-13.05.08P | perform visual inspection of BOP | BOP is visually inspected for signs of wear and tear |
| E-13.05.09P | store and secure ***BOP components*** | ***BOP components*** are stored and secured in designated area according to rig specifications |

RANGE OF VARIABLES

***tools and equipment*** include: hammer wrenches, hammers, pneumatic wrenches, hydraulic wrenches, BOP slings, fall arrest equipment

***handling equipment*** includes: BOP slings, BOP handler

***lines*** include: kill, bleed-off (sweep, choke, HCR), flare, degasser

***valves*** include: kill, HCR, check, manual, manifold

***BOP components*** include: annular preventer, blind rams, HCR valve, pipe rams, shear rams, drilling spool, kill lines, manually operated valves, flange lines, bleed-off lines, stabbing valve, inside BOP

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-13.05.01L | demonstrate knowledge of procedures used to nipple down BOP and related equipment | identify BOP and related equipment and their functions |
|  |  | identify hazards and safe operating practices for nippling down BOP and related equipment |
|  |  | identify BOP ***handling equipment*** |

RANGE OF VARIABLES

***handling equipment*** includes: BOP slings, BOP handler

TASK E-14 Performs drilling activities

TASK DESCRIPTOR

Drilling activities are done in the search for natural resources. This task covers those drilling activities performed after a surface hole has been drilled. Drilling fluids are constantly pumped through the drill string in order to cool the drill bit, clean the annulus and maintain the condition of the hole. Rig technicians must closely monitor all aspects of drilling. Appropriate well control operations that can prevent release of unrefined product to the atmosphere are critical to ensure safety and environmental protection.

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| E-14.01 | Maintains drilling fluids |

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| **Essential Skills** | Numeracy, Document Use, Working with Others |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-14.01.01P | transfer fluids from ***reserve tanks*** to mud system | fluids are transferred from ***reserve tanks*** to mud system in order to maintain mud properties and volumes using ***equipment*** |
| E-14.01.02P | test drilling fluid for ***properties*** | drilling fluid is tested for ***properties*** and results are documented |
| E-14.01.03P | follow mud program or directions | mud program or directions provided by the operator’s representative are followed |
| E-14.01.04P | adjust mix | mix is adjusted to counter ***problems with drilling fluids*** by adding additives |
| E-14.01.05P | alter density | density is altered by changing shaker screens, running centrifuges and adjusting water rate, dumping and diluting, and adding weight materials |
| E-14.01.06P | maintain system volumes | system volumes are maintained at a consistent rate by monitoring pit volume totalizer (PVT) and adjusting with makeup volume |
| E-14.01.07P | manage wellbore cuttings | wellbore cuttings are managed by ***mechanical means*** |
| E-14.01.08P | calculate circulation times and ***volumes*** | circulation times and ***volumes*** are calculated using standard formulas, charts and specifications |

RANGE OF VARIABLES

***reserve tanks*** include: tank farms, pre-mix tanks, water tanks

***equipment*** includes: transfer pumps, vacuum unit

***properties*** include: pH, weight, viscosity, fluid loss, chloride content, sand content, rheology

***problems with drilling fluids*** include: low or high viscosity, mud rings, dehydration, clobbering (thickening of mud), aerated mud, excessive density, solids content, pH levels

***mechanical means*** include: shakers, centrifuges, dryers, excavators, loaders, trucks

***volumes*** include: surface capacity, annular and pipe capacity, pipe displacement, pump capacity and output

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-14.01.01L | demonstrate knowledge of procedures used to maintain drilling fluids | describe ***types of drilling fluids*** and their uses |
|  |  | describe procedure used to perform calculations and measurement for drilling fluids |
|  |  | identify hazards and ***safe operating procedures*** for maintaining drilling fluids |
|  |  | describe procedure used to test drilling fluids |
|  |  | describe procedure used to alter mud density |
|  |  | interpret mud program/stick diagram |
|  |  | interpret mud report data |

RANGE OF VARIABLES

***types of drilling fluids*** include: gel-chem, invert, potassium, silicates, polymers, water, brine, flocculent water, foam

***safe operating procedures*** include: use of SDS, mixing procedures for specific materials

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| E-14.02 | Operates electrical drive systems |

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| **Essential Skills** | Thinking, Working with Others, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-14.02.01P | synchronize generators | generators are synchronized according to manufacturers’ specifications |
| E-14.02.02P | power up and power down the ***auxiliary power*** | ***auxiliary power*** is powered up and down according to manufacturers’ and rig specifications |
| E-14.02.03P | operate breakers | breakers are operated according to manufacturers’ specifications, codes and regulations |
| E-14.02.04P | check operation of heating, ventilation and air conditioning (HVAC) system | operation of HVAC system is checked on an ongoing basis according to rig specifications |
| E-14.02.05P | operate ***control panel*** | ***control panel*** is operated according to rig specifications and operator’s parameters |
| E-14.02.06P | troubleshoot electrical and communication problems | electrical and communication problems are resolved |

RANGE OF VARIABLES

***auxiliary power*** includes: 110, 220, 480 and/or 600 volt power, supply lighting, heaters, electric motors, cooling systems, hydraulic systems, PLC systems, batteries

***control panel*** includes: VFDs, single board computers (SBC), human machine interface (HMI), driller’s console, EDR, computer system, PLC

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-14.02.01L | demonstrate knowledge of electrical drive systems, their applications and procedures for use | describe the differences between AC and DC drive systems |
|  |  | identify the types of components of a DC drive system and their use |
|  |  | identify the types of components of an AC drive system and their use |
|  |  | explain how generators load share and synchronize |
|  |  | explain how breakers are energized |
|  |  | identify types of ***control panels*** and their use |
|  |  | describe importance and function of HVAC systems |
|  |  | describe power up and power down procedures |

RANGE OF VARIABLES

***control panel*** includes: VFDs, single board computers (SBC), human machine interface (HMI), driller’s console, EDR, computer system, PLC

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| E-14.03 | Operates drilling equipment |

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| **Essential Skills** | Digital Technology, Working with Others, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-14.03.01P | operate ***driller controls*** | ***driller controls*** are operated to control drilling equipment |
| E-14.03.02P | operate ***drawworks controls*** | ***drawworks controls*** are operated to raise and lower drill string |
| E-14.03.03P | operate top drive | top drive is operated to handle and rotate tubulars |
| E-14.03.04P | engage and adjust pump, rotary and auto-driller | pump, rotary and auto-driller are engaged and adjusted to desired ***drilling parameters*** |
| E-14.03.05P | identify ***problems*** if and when they occur | ***problems*** are identified |
| E-14.03.06P | modify ***drilling parameters*** | ***drilling parameters*** are modified to adapt to changing conditions and resolve ***problems*** |
| E-14.03.07P | calibrate ***drilling instrumentation*** | ***drilling instrumentation*** is calibrated to adjust for hook load, threshold, hole depth tracking, and changes in string |
| E-14.03.08P | connect drill string tubulars | drill string tubulars are connected according to rig specifications |

RANGE OF VARIABLES

***driller controls*** include: hydraulic controls, pneumatic controls, electric controls

***drawworks controls*** include: brake handle, joystick, clutch, rheostat, throttle

***drilling parameters*** include: pump rate, weight on bit (WOB), rotary speed, torque limits, differential pressure, rate of penetration (ROP) limits

***problems*** include: torque spikes, sloughing, differential pressure changes, deviation, loss of circulation, kick warning signs

***drilling instrumentation*** includes: pressure gauges, torque sensors, weight indicators, transducers, EDR, auto-driller

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-14.03.01L | demonstrate knowledge of drilling equipment, their applications and procedures for use | identify ***driller controls*** and their procedures for use |
|  |  | identify drawworks and their procedures for use |
|  |  | identify top drives and their procedures for use |
|  |  | identify pumps, rotaries and auto-drillers and their procedures for use |
|  |  | describe how to calibrate and function test ***drilling instrumentation*** |
|  |  | describe the functions and limitations of drilling equipment |
|  |  | identify and describe types of ***braking mechanisms*** |
|  |  | identify ***components of brakes*** |
| E-14.03.02L | demonstrate knowledge of procedures used to operate drilling equipment | describe ***drilling parameters*** and their effect on drilling performance |
|  |  | identify hazards and danger zones while drilling |

RANGE OF VARIABLES

***driller controls*** include: hydraulic controls, pneumatic controls, electric controls

***drilling instrumentation*** includes: pressure gauges, torque sensors, weight indicators, transducers, EDR, auto-driller

***braking mechanisms*** include: band brake, eaton brake, hydrodynamic brake, magnetic brake, AC braking system, emergency brake

***components of brakes*** include: linkages, pads, bands, bearings, cooling systems, equalizer bars, discs, cotter pins, drums, grease nipples (zerks), AC brake components (choppers, resistors)

***drilling parameters*** include: pump rate, weight on bit (WOB), rotary speed, torque limits, differential pressure, rate of penetration (ROP) limits

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| E-14.04 | Monitors drilling operations |

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| **Essential Skills** | Thinking, Digital Technology, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-14.04.01P | interpret ***hole condition indicators*** | ***hole condition indicators*** are interpreted |
| E-14.04.02P | monitor integrity of ***bottomhole assembly*** | ***bottomhole assembly***’sintegrity is monitored so that drilling parameters are adjusted as necessary |
| E-14.04.03P | monitor hole deviation | hole deviation is monitored using ***surveying equipment*** |
| E-14.04.04P | monitor tank volume alarms | tank volume alarms are monitored for gain or loss of flow and volume |
| E-14.04.05P | visually monitor cuttings and fluids | cuttings and fluids are visually monitored for changes in returns |
| E-14.04.06P | monitor gauges and outputs | gauges and outputs are monitored to evaluate drilling performance |
| E-14.04.07P | monitor gas detector | gas detector is monitored for abnormal increases in readings |
| E-14.04.08P | monitor pump gauges for abnormal pressures | pump gauges are monitored for abnormal pressures to identify ***problems*** |

RANGE OF VARIABLES

***hole condition indicators*** include: penetration rate, cuttings, fluid returns, torque, drag, doglegs, pump pressure, geological formations

***bottomhole assembly*** includes: bit, mud motor, stabilizers, jars, agitators, reamers, survey tools

***surveying equipment*** includes: wire line, single shot, measurement while drilling (MWD) tool, MWD screen

***problems*** include: washes in drill string, plugged jets, failures in mud motor, contamination, failures in pump valves, seats, liners and heads, lost circulation

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-14.04.01L | demonstrate knowledge of procedures used to monitor down-hole drilling equipment | explain procedures used to monitor gauges and outputs on equipment |
|  |  | describe ***hole condition indicators*** and their causes |
|  |  | explain procedures used to conduct a deviation survey |
|  |  | identify types of ***surveying equipment*** |
|  |  | identify ***characteristics*** that would signify down-hole drilling equipment issues |
|  |  | explain procedures used to monitor cuttings and fluids |
| E-14.04.02L | demonstrate knowledge of procedures used to monitor ***surface drilling equipment*** | describe the function of mud tanks |
|  |  | explain procedures used to monitor mud tanks and pit volume totalizer (PVT) |
|  |  | describe gas detection systems |
|  |  | describe significance of gain or loss in pump pressure |

RANGE OF VARIABLES

***hole condition indicators*** include: penetration rate, cuttings, fluid returns, torque, drag, doglegs, pump pressure, geological formations

***surveying equipment*** includes: wire line, single shot, measurement while drilling (MWD) tool, MWD screen

***characteristics*** include: loss or gain of differential pressure, loss of rate of penetration (ROP), loss or gain of torque, tight connections, no pulses on MWD screen, loss of ROP while sliding, and the combinations of any or all of these

***surface*** ***drilling*** ***equipment*** includes: mud pumps, drawworks, top drives, swivels, shakers

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| E-14.05 | Responds to changing well conditions |

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| **Essential Skills** | Thinking, Working with Others, Digital Technology |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-14.05.01P | correct lack of ROP | lack of ROP is corrected with ***potential resolutions*** |
| E-14.05.02P | correct tight hole conditions | tight hole conditions are corrected with ***potential resolutions*** |
| E-14.05.03P | correct loss of circulation | loss of circulation is corrected with ***potential resolutions*** |
| E-14.05.04P | correct mechanical pipe sticking issues | mechanical pipe sticking issues are corrected with ***potential resolutions*** |
| E-14.05.05P | correct differential pipe sticking issues | differential pipe sticking issues are corrected with ***potential resolutions*** |

RANGE OF VARIABLES

***potential resolutions*** include:

***for lack of ROP***:increasing or decreasing of WOB, increasing or decreasing rotary, increasing or decreasing pump rate, adding mud additives (e.g. nutshells, detergents, sawdust, lubricants), changing BHA, adjusting mud properties;

***for tight hole conditions***: changing drilling parameters and fluid properties, performing wiper trip, working the pipe prior to connections, and pumping sweeps;

***for loss of circulation***: mixing and spotting loss-of-circulation-material (LCM) pill, decreasing pump rate, decreasing density, lowering water loss, pumping plugs (cement, barite, gunk) and running casing;

***for mechanical pipe sticking issues***: establishing free point, rotating drill string, pulling tension, back reaming, spotting lubricant, spotting acid, washing over, changing mud properties and jarring;

***for differential pipe sticking issues***: spotting oil-based pills, applying weight and torque, displacing wellbore with nitrogen;

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-14.05.01L | demonstrate knowledge of ***problematic well conditions*** and ***potential resolutions*** | identify ***problematic well conditions*** and their causes |
|  |  | describe ***potential resolutions*** |

RANGE OF VARIABLES

***problematic well conditions*** include: loss or gain of differential pressure, lost circulation, loss of ROP, loss or gain of torque, tight connections, loss of ROP while sliding, and the combinations of any or all of these

***potential resolutions*** include:

***for lack of ROP***:increasing or decreasing of WOB, increasing or decreasing rotary, increasing or decreasing pump rate, adding mud additives (e.g. nutshells, detergents, sawdust, lubricants), changing BHA, adjusting mud properties;

***for tight hole conditions***: changing drilling parameters and fluid properties, performing wiper trip, working the pipe prior to connections, and pumping sweeps;

***for loss of circulation***: mixing and spotting loss-of-circulation-material (LCM) pill, decreasing pump rate, decreasing density, lowering water loss, pumping plugs (cement, barite, gunk) and running casing;

***for mechanical pipe sticking issues***: establishing free point, rotating drill string, pulling tension, back reaming, spotting lubricant, spotting acid, washing over, changing mud properties and jarring;

***for differential pipe sticking issues***: spotting oil-based pills, applying weight and torque, displacing wellbore with nitrogen;

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| E-14.06 | Performs well control operations |

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| **Essential Skills** | Document Use, Numeracy, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-14.06.01P | perform ***inspections for well control*** | ***inspections for well control*** are performed according to Canadian Association of Oilwell Drilling Contractors (CAODC) blowout prevention and well control procedure chart |
| E-14.06.02P | function test well control equipment | well control equipment is function tested according to regulations |
| E-14.06.03P | identify primary and secondary ***kick warning signs*** | primary and secondary ***kick warning signs*** are identified |
| E-14.06.04P | determine validity of signs and responses | appropriate responses to the warning signs are determined according to CAODC protocol and jurisdictional regulations |
| E-14.06.05P | select valve alignment | valve alignment is selected according to well control method |
| E-14.06.06P | operate ***BOP controls*** to shut in the well | ***BOP controls*** are operated according to company policies and OEM recommendations |
| E-14.06.07P | light flare stack | flare stack is lit to burn off gas at surface |
| E-14.06.08P | read and record ***well control data*** | ***well control data*** is read and recorded |
| E-14.06.09P | determine ***type of well control method*** to apply | ***type of well control method*** is determined according to well characteristics and regulations |
| E-14.06.10P | increase mud density, if required | mud density is increased as required to achieve required weight to kill well by adding ***additives*** according to operator instructions |
| E-14.06.11P | circulate out contaminated mud while monitoring tank volumes and maintaining drill pipe pressure | contaminated mud is circulated out to reduce the risk of a second influx (kick) |
| E-14.06.12P | troubleshoot ***changing conditions*** | ***changing conditions*** are resolved |
| E-14.06.13P | evaluate conditions to determine next steps | next steps are determined according to evaluation and regulations |

RANGE OF VARIABLES

***inspections for well control*** include: stabbing valve and inside BOP, BOP and related valve handles, flare and degasser lines, flare igniter checks, accumulator (gauges, fluid levels, leaks) and BOP equipment, valve alignment and gauges in choke manifold

***kick warning signs*** include: primary: increase in flow from well, increase in mud tank volume, well flows on its own, hydraulicing pipe; secondary: erratic torque, fluctuations in weight indicator, rapid change in mud properties, change in pump pressure, loss of volume, fluid dropping in the well, drilling break, pulling wet after pulling dry while tripping, improper hole fill volume

***BOP controls*** include: annular preventers, pipe rams, blind rams, hydraulically controlled remote (HCR) valve, remote choke

***well control data*** includes: shut-in drill pipe pressure, shut-in casing pressure, MACP, pit gain, initial circulating pressure (ICP), reduced speed pump pressure (RSPP), final circulating pressure (FCP)

***type of well control methods*** include: driller’s method, concurrent method, circulate-and-weight method, wait-and-weight method, volumetric method, low choke, modified low choke

***additives*** include: barite, bentonite, calcium carbonate

***changing conditions*** include: plugged jets, sloughing hole, loss of circulation, plugged choke, washed choke, wash in drill string

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-14.06.01L | demonstrate knowledge of crew members’ roles in well control procedures | describe the crew members’ roles in well control procedures |
|  |  | identify the warning signs and causes of a kick |
|  |  | describe the function of the stabbing valve and inside blowout preventer |
|  |  | explain MACP |
|  |  | identify correlations between gauge readings |
|  |  | describe the functions of kick detection equipment |
|  |  | describe BOP drill requirements |
|  |  | explain the purpose of kill mud |
|  |  | identify crucial pressures |
|  |  | describe well control methods |
|  |  | identify abbreviations and formulas for well control |
|  |  | explain well control calculations |
|  |  | identify the difference between primary and secondary ***kick warning signs*** |
|  |  | identify the difference between a soft shut-in and a hard shut-in |
|  |  | explain the primary, secondary, and tertiary levels of well control |
|  |  | interpret and use the well control formulas and tables |
|  |  | describe a leak-off test |
|  |  | describe a formation integrity test |
|  |  | calculate accumulator requirements |
|  |  | complete well control kill sheets |
|  |  | identify the advantages and disadvantages associated with each of the secondary methods of well control |
|  |  | explain troubleshooting methods during well control to address ***changing conditions*** |

RANGE OF VARIABLES

***kick warning signs*** include: primary: increase in flow from well, increase in mud tank volume, well flows on its own, hydraulicing pipe; secondary: erratic torque, fluctuations in weight indicator, rapid change in mud properties, change in pump pressure, loss of volume, fluid dropping in the well, drilling break, pulling wet after pulling dry while tripping, improper hole fill volume

***changing conditions*** include: plugged jets, sloughing hole, loss of circulation, plugged choke, washed choke, wash in drill string

TASK E-15 Performs tripping activities

TASK DESCRIPTOR

Tripping (pulling or running tubulars out of, or into, the wellbore) is necessary for multiple reasons. These reasons may include the change of the drill bit or BHA, doing wiper trips, and after achieving total depth (TD).

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| E-15.01 | Prepares for trip |

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| **Essential Skills** | Oral Communication, Thinking, Numeracy |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-15.01.01P | organize tools and equipment for tripping activities | tools and equipment for tripping activities are organized according to rig specifications |
| E-15.01.02P | inspect and prepare ***tripping equipment*** | ***tripping equipment*** is prepared and inspected for missing, damaged or worn components |
| E-15.01.03P | set up catwalks, bird baths, monkeyboard and pipe racks | catwalks, bird baths, monkeyboard and pipe racks are set up according to rig specifications |
| E-15.01.04P | set up trip tank | trip tank is set up to monitor and fill hole with drilling fluid |
| E-15.01.05P | prepare circulating system for winter operations | circulating system is prepared for winter operations according to rig procedures |
| E-15.01.06P | calculate hole fill volumes and record on trip sheet | hole fill volumes are calculated according to trip conditions and recorded on trip sheet |
| E-15.01.07P | prepare and pump high density pill | high density pill is prepared and pumped |

RANGE OF VARIABLES

***tripping equipment*** includes: pipe spinners, iron roughneck, rig tongs, pipe arm, dog collars, catwalk, slips, elevators, pipe wipers (strippers), iron derrickhand, crown saver, safety stops, bails

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-15.01.01L | demonstrate knowledge of motorhand’s role in preparing for trip | identify equipment used for tripping operations |
|  |  | describe the procedures used to inspect tripping equipment |
|  |  | describe preparations on the drill floor for tripping |
|  |  | explain procedures used to set up catwalks, bird baths, pipe racks and trip tank |
| E-15.01.02L | demonstrate knowledge of derrickhand’s role in preparing for trip | describe monkeyboard preparation for tripping |
|  |  | identify hazards and safe operating procedures when tripping |
|  |  | explain procedures used to set up mud tank for tripping |
| E-15.01.03L | demonstrate knowledge of driller’s role in preparing for trip | calculate hole fill volumes/trip data |
|  |  | document trip record |
|  |  | explain flow check requirements during tripping |
|  |  | describe cold weather preparation for tripping |
|  |  | identify hazards and safe operating procedures when tripping |
|  |  | describe procedures to organize pipe placement before tripping |

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| E-15.02 | Trips drill string and bottomhole assembly (BHA) |

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| **Essential Skills** | Oral Communication, Working with Others, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-15.02.01P | monitor fluid volumes for accuracy and record on trip sheet | fluid volumes are monitored while tripping and at flow check intervals and recorded on trip sheet and volume discrepancies are interpreted |
| E-15.02.02P | hoist or lower drill string | drill string is hoisted and lowered while monitoring weight indicator |
| E-15.02.03P | make up and break tubulars | tubulars are made up and broken using ***tools*** |
| E-15.02.04P | handle tubulars with ***equipment***, as required | tubulars are handled with ***equipment*** as required |
| E-15.02.05P | use winches on the rig floor | winches on the rig floor are used to manipulate ***drilling tools*** |
| E-15.02.06P | contain mud to floor area | mud is contained to floor area using mud containment systems |
| E-15.02.07P | perform flow checks | flow checks are performed according to regulations and IRP |
| E-15.02.08P | perform pipe count | pipe count is performed and verified to match the tally |
| E-15.02.09P | change BHA and relative tally, if required | BHA and relative tally are changed, if required, according to operator’s instructions |

RANGE OF VARIABLES

***tools*** include: tongs, iron roughnecks, pipe spinners, slips, pipe arm, top drive

***equipment*** includes: iron derrickhand, launchers, skate, wranglers, pipe arm, top drive

***drilling tools*** include: pickup subs, jars, bits, bit subs, specialized drilling tools

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-15.02.01L | demonstrate knowledge of motorhand’s role in tripping drill string and BHA | explain floor preparation |
|  |  | describe the procedures used to transfer fluid into or out of the trip tank |
|  |  | describe the procedures for use of tools used to trip drill string and BHA |
| E-15.02.02L | demonstrate knowledge of derrickhand’s role in tripping drill string and BHA | describe hand signals and other communication methods used between a derrickhand and a driller |
|  |  | identify hazards and safe operating procedures associated with tripping |
|  |  | describe activities performed at the monkeyboard |
| E-15.02.03L | demonstrate knowledge of driller’s role in tripping drill string and BHA | describe procedures used to monitor fluid levels |
|  |  | identify ***tools*** required to make up and break pipe and collars |
|  |  | perform pipe count/tallies |
|  |  | identify hole conditions for trip speeds |
|  |  | identify hazards and safe operating procedures when using winches |
|  |  | identify hazards and safe operating procedures when tripping |

RANGE OF VARIABLES

***tools*** include: tongs, iron roughnecks, pipe spinners, slips, pipe arm, top drive

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| E-15.03 | Lays down tubulars |

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| **Essential Skills** | Working with Others, Thinking, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-15.03.01P | flush tubular, as required | tubular is flushed to prevent corrosion of tubular and for environmental reasons |
| E-15.03.02P | install lifting nubbins, pickup subs and protectors prior to laying down | lifting nubbins, pickup subs and protectors are installed prior to laying down according to rig specifications |
| E-15.03.03P | lower tubulars | tubulars are lowered using ***equipment*** |
| E-15.03.04P | tier pipe on pipe racks or tubs | pipe is tiered on pipe racks using stripping, chocks and loader |

RANGE OF VARIABLES

***equipment*** includes: hydraulic catwalks, winches, loaders, laydown lines, pipe arm, laydown truck, bumper block

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-15.03.01L | demonstrate knowledge of laying down tubulars | describe types and grades of tubulars |
|  |  | identify types of ***equipment*** used to lower tubulars |
|  |  | describe the procedures used to handle tubulars |
|  |  | identify types of storage used for tubulars |

RANGE OF VARIABLES

***equipment*** includes: hydraulic catwalks, winches, loaders, laydown lines, pipe arm, laydown truck, bumper block

TASK E-16 Performs casing activities

TASK DESCRIPTOR

Rig technicians are responsible for ensuring that casing strings are prepared for running.

Surface casing provides a suitable anchor for the BOP stack and well control, and isolates surface groundwater from the wellbore.

Intermediate casing provides a means of well control and protects against unstable formations such as loss circulation zones and high pressure zones.

Production casing provides the means to transport the hydrocarbons to the surface.

When running casing, rig technicians must work with third-party equipment and contractors.

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| E-16.01 | Prepares casing |

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| **Essential Skills** | Numeracy, Working with Others, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-16.01.01P | unload and tier casing | casing is unloaded and tiered using loader, boom truck (picker) or excavator |
| E-16.01.02P | remove casing protectors to drift and visually inspect threads | casing protectors are removed and threads are visually inspected to identify casing defects and drifted to identify uniform ID |
| E-16.01.03P | number and measure casing, float collars, shoe joints and marker joints | casing, float collars, shoe joints, marker joints and other casing-related tools are numbered and measured |

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-16.01.01L | demonstrate knowledge of procedures used to prepare casing | identify types of equipment used to unload casing |
|  |  | explain the crew members’ roles in preparing casing |
|  |  | describe the setup and preparation of casing |
|  |  | identify hazards and safe operating procedures for preparing casing |
|  |  | describe procedures used to identify casing defects |
|  |  | describe the purpose of running casing |
|  |  | describe casing string design |
|  |  | describe how casing is matched with well control equipment |

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| E-16.02 | Installs casing equipment |

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| **Essential Skills** | Oral Communication, Working with Others, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-16.02.01P | inspect ***third-party service provider equipment*** | ***third-party service provider equipment*** is inspected to ensure that it is certified according to IRP |
| E-16.02.02P | hoist ***third-party service provider equipment*** to rig floor | ***third-party service provider equipment*** is hoisted to rig floor using rigging/hoisting equipment |
| E-16.02.03P | hang up power tongs or rig-in top drive casing running tool | power tongs or rig-in top drive casing running tool are hung up according to rig specifications |
| E-16.02.04P | attach elevators to bails | elevators are attached to bails according to rig specifications |
| E-16.02.05P | hook up casing fill equipment | casing fill equipment is hooked up according to rig specifications |
| E-16.02.06P | hook up pipe alignment tool and stabbing board | pipe alignment tool and stabbing board are hooked up according to rig specifications |
| E-16.02.07P | rig in third-party thread monitoring system, if required | third-party thread monitoring system is rigged in, if required according to operator’s instructions |

RANGE OF VARIABLES

***third-party service provider equipment*** includes: power tongs, elevators, spider, slips, bail extensions, top drive casing running tool, fill hose

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-16.02.01L | demonstrate knowledge of procedures used to install casing equipment | identify types of ***third-party service provider equipment*** required to install casing, their applications and procedures for use |
|  |  | identify the types of certifications that are required on site |
|  |  | identify hazards and safe operating procedures when installing casing equipment |

RANGE OF VARIABLES

***third-party service provider equipment*** includes: power tongs, elevators, spider, slips, bail extensions, top drive casing running tool, fill hose

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| E-16.03 | Runs casing |

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| **Essential Skills** | Working with Others, Oral Communication, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-16.03.01P | raise casing to the rig floor | casing is raised to the rig floor using ***retrieval equipment*** |
| E-16.03.02P | pick up casing with elevators or top drive casing running tool | casing is picked up with elevators or top drive casing running tool and set in previous joint (stump) |
| E-16.03.03P | centre and stabilize casing, if necessary | casing is centred and stabilized, if necessary |
| E-16.03.04P | make up casing joints together | casing joints are screwed together using ***tools and equipment*** according to manufacturers’ specifications or operator’s instructions |
| E-16.03.05P | install ***casing accessories*** | ***casing accessories*** are installed according to operator’s instructions |
| E-16.03.06P | lower casing into wellbore | casing is lowered into wellbore according to operator’s instructions |
| E-16.03.07P | fill casing | casing is filled according to operator’s instructions and rig procedures |

RANGE OF VARIABLES

***retrieval equipment*** includes: winch lines, hydraulic catwalk, pipe arm

***tools and equipment*** include: chain tongs, third-party power tongs, top drive casing running tool, slips, bails, elevators

***casing accessories*** include: centralizers, scratchers, turbolizers, cement basket, spiralizers, stand-off bands, packers, frac ports

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-16.03.01L | demonstrate knowledge of procedures used to run casing | explain the crew members’ roles in running casing |
|  |  | identify types of ***tools and equipment*** required to run casing, their applications and procedures for use |
|  |  | identify hazards and safe operating procedures for running casing |

RANGE OF VARIABLES

***tools and equipment*** include: chain tongs, third-party power tongs, top drive casing running tool, slips, bails, elevators

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| E-16.04 | Circulates casing |

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| **Essential Skills** | Thinking, Numeracy, Oral Communication |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-16.04.01P | install ***circulating equipment*** | ***circulating equipment*** is installed according to operator’s instructions |
| E-16.04.02P | initiate circulation | circulation is initiated with high precautions to maintain wellbore integrity |
| E-16.04.03P | circulate casing | casing is circulated using ***circulating equipment*** according to rig specifications |
| E-16.04.04P | reciprocate casing | casing is reciprocated |
| E-16.04.05P | monitor circulating parameters | circulating parameters are monitored for ***unexpected changes*** and react according to operator’s instructions |
| E-16.04.06P | condition drilling fluid | drilling fluid is conditioned according to operator’s instructions |

RANGE OF VARIABLES

***circulating equipment*** includes: circulating head, chiksan, top drive casing running tool, circulating hoses

***unexpected changes*** include: change in pressure, volumes, string weight, drilling fluid properties, torque

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-16.04.01L | demonstrate knowledge of procedures used to circulate casing | explain the crew members’ roles in circulating casing |
|  |  | identify types of equipment required to circulate casing, their applications and procedures for use |
|  |  | describe potential ***hole conditions*** and how to adjust parameters to correct |
|  |  | describe procedures used to condition drilling fluid |
|  |  | identify formulas related to volumes and circulating times |

RANGE OF VARIABLES

***hole conditions*** include: wellbore packing off (hydraulicing), loss of circulation, sloughing wellbore

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| E-16.05 | Performs cementing operations |

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| **Essential Skills** | Thinking, Working with Others, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-16.05.01P | hoist required ***third-party service provider cementing equipment*** to rig floor | ***third-party service provider cementing equipment*** is hoisted to the rig floor using rigging/hoisting equipment |
| E-16.05.02P | bleed off rig circulation equipment and disconnect | rig circulation equipment is bled off and disconnected according to rig procedures |
| E-16.05.03P | install required ***third-party service provider cementing equipment*** | ***third-party service provider cementing equipment*** is installed according to third-party service provider instructions |
| E-16.05.04P | reciprocate casing | casing string is reciprocated to prevent channelling of cement and to ensure bond |
| E-16.05.05P | monitor casing movement and fluid returns to identify ***cementing problems*** | ***cementing problems*** are identified by monitoring casing movement and fluid returns |
| E-16.05.06P | chain down casing when plug is dropped to counter hydraulicing, if required | casing is chained down when plug is dropped to counter hydraulicing on shallow casing applications, if required |
| E-16.05.07P | transfer drilling fluids to cementers’ equipment, if required | drilling fluids are transferred to cementers’ equipment according to operator’s instructions, if required |
| E-16.05.08P | flush conductor barrel or BOP with water | conductor barrel or BOP is flushed with water to clean cement out of components |
| E-16.05.09P | install and set ***hang-off equipment*** | ***hang-off equipment*** is installed and set with casing string in tension according to operator’s instructions |
| E-16.05.10P | rig out ***third-party service provider cementing equipment*** | ***third-party service provider cementing equipment*** is rigged out |

RANGE OF VARIABLES

***third-party service provider cementing equipment*** includes: cementing head, manifold, hard lines, hoses, wiper plugs, bump plugs, cement pumper

***cementing problems*** include: hydraulicing of casing, loss of returns, over-pull

***hang-off equipment*** include: casing slips, mandrel hangers, hangers

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-16.05.01L | demonstrate knowledge of procedures used to perform cementing operations | explain the crew members’ roles in performing cementing operations |
|  |  | identify types of ***third-party service provider cementing equipment*** used to cement casing |
|  |  | describe procedures used to prevent channelling of cement |
|  |  | describe how to prepare tanks for displacement and cementing casing |
|  |  | describe casing hydraulics and prevention |
|  |  | identify hazards and safe operating procedures for performing cementing operations |
|  |  | identify the types of cement programs |

RANGE OF VARIABLES

***third-party service provider cementing equipment*** includes: cementing head, manifold, hard lines, hoses, wiper plugs, bump plugs, cement pumper

TASK E-17 Performs specialized drilling operations

TASK DESCRIPTOR

These operations require specialized skills. They all may involve third-party contractors.

Coring is done primarily to obtain samples for geological analysis and testing.

Directional drilling curves the well during the drilling process using specialized equipment. It is done to increase production and locate deposits that are not directly beneath the surface location.

Underbalanced drilling is done to prevent damage to formations that may occur using conventional drilling fluid.

Managed pressure drilling (MPD) is done to drill at a higher ROP without increasing the mud weight and maintaining bottomhole pressure for the purpose of well control.

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| E-17.01 | Performs coring activities |

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| **Essential Skills** | Working with Others, Oral Communication, Numeracy |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

|  |  |  |
| --- | --- | --- |
|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-17.01.01P | assemble and disassemble ***coring tools*** | ***coring tools*** are assembled and disassembled according to coring hand’s instructions |
| E-17.01.02P | verify condition of wellbore prior to tripping operations | condition of wellbore is verified to ensure proper coring |
| E-17.01.03P | drill core sample | core sample is drilled with ***coring tools*** according to coring hand’s instructions |
| E-17.01.04P | retrieve, handle and package core | core is retrieved, handled and packaged using methods and procedures according to drilling plan and geologist’s instructions |
| E-17.01.05P | follow third-party service provider parameters and instructions | third-party service provider parameters and instructions are followed |

RANGE OF VARIABLES

***coring tools*** include: coring bits, barrels, catchers, clamps, pickup subs, sleeves, pup joints, wireline unit, core pipe

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-17.01.01L | demonstrate knowledge of ***coring tools*** and coring procedures | identify ***coring tools*** their operation and procedures for use |
|  |  | describe ***coring tool*** assembly |
|  |  | describe ***coring operations*** |
|  |  | explain purpose for coring |

RANGE OF VARIABLES

***coring tools*** include: coring bits, barrels, catchers, clamps, pickup subs, sleeves, pup joints, wireline unit, core pipe

***coring operations*** are wireline retrievable and conventional

|  |  |
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| E-17.02 | Performs directional drilling |

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| **Essential Skills** | Working with Others, Digital Technology, Numeracy |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-17.02.01P | assemble and disassemble directional tools | directional tools are assembled and disassembled |
| E-17.02.02P | follow third-party service provider parameters and instructions while drilling | third-party service provider parameters and instructions are followed while drilling |
| E-17.02.03P | perform surveys with ***directional tools and equipment*** | surveys are performed according to manufacturers' specifications |
| E-17.02.04P | steer mud motor | mud motor is steered using ***equipment*** |
| E-17.02.05P | troubleshoot ***communication issues*** with survey tools | ***communication issues*** are resolved |

RANGE OF VARIABLES

***directional tools and equipment*** include: rotary steering, push-the-bit systems, steer-the-bit systems, MWD equipment, pipe screens

***equipment*** includes: table brake, top drive, automated steering and oscillating systems

***communication issues*** include: magnetism, aerated mud, pulsation problems

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-17.02.01L | demonstrate knowledge of procedures used to perform directional drilling | identify ***directional tools and equipment***, and their procedures for use |
|  |  | describe procedures used to assemble and disassemble directional tools |
|  |  | describe procedures used in directional drilling |
|  |  | describe methods for troubleshooting ***communication issues*** while directional drilling |
|  |  | describe ***profile of deviated wells*** |
|  |  | explain differential pressures related to directional drilling |

RANGE OF VARIABLES

***directional tools and equipment*** include: rotary steering, push-the-bit systems, steer-the-bit systems, MWD equipment, pipe screens

***communication issues*** include: magnetism, aerated mud, pulsation problems

***profiles of deviated wells*** include: S-curves, extended reach, horizontal, long, short and medium radius build sections, multilateral, tangent, build-and-turn

|  |  |
| --- | --- |
| E-17.03 | Performs underbalanced drilling (UBD) and managed pressure drilling (MPD) |

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| **Essential Skills** | Working with Others, Thinking, Numeracy |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-17.03.01P | assemble and disassemble underbalanced and managed pressure tools and equipment | underbalanced and managed pressure tools and equipment are assembled and disassembled according to third-party procedures |
| E-17.03.02P | follow third-party service provider parameters and instructions while drilling | third-party service provider parameters and instructions are followed while drilling |
| E-17.03.03P | use ***communication methods*** | ***communication methods*** are used to ensure timing and procedures are effectively followed according to IRP |
| E-17.03.04P | monitor gas and pressure while performing drilling and tripping operations | gas and pressure are monitored for levels according to the drilling plan and formation pressures |
| E-17.03.05P | shut in and equalize pressure during connections | pressure is shut in and equalized during connections according to formation pressures |
| E-17.03.06P | perform underbalanced tripping operations | underbalanced tripping operations are performed according to operator’s instructions |
| E-17.03.07P | perform snubbing and stripping procedures while underbalanced drilling (UBD) | snubbing and stripping procedures are performed according to jurisdictional regulations |

RANGE OF VARIABLES

***communication methods*** includes: two-way radios, hand signals, written instructions

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|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-17.03.01L | demonstrate knowledge of procedures used to perform UBD | identify tools and equipment used in UBD operations and describe the procedures for use |
|  |  | describe UBD operations |
|  |  | describe snubbing and stripping procedures |
|  |  | identify ***communication methods*** and their procedures for use during UBD |
| E-17.03.02L | demonstrate knowledge of managed pressure drilling (MPD) | identify tools and equipment used in MPD operations and describe the procedures for use |
|  |  | describe MPD operations |
|  |  | explain the effects of gas and pressure while performing drilling and tripping operations |
|  |  | describe MPD tripping operations and considerations for mud displacement |

RANGE OF VARIABLES

***communication methods*** includes: two-way radios, hand signals, written instructions

TASK E-18 Performs specialized well operations

TASK DESCRIPTOR

Fishing and stuck pipe operations are important to deal with unexpected complications during drilling operations.

Wireline logging is done to profile down-hole conditions. Wireline loggers’ readings are used by geologists, and the surface equipment itself is rigged in and out by rig technicians.

Drill stem testing is done to test production in a specific zone. It is performed by rig technicians under the direction of a third-party.

Sour wells, which contain H2S, must be detected because of the extreme danger associated with this noxious gas.

Well completions are important because they set the stage for well production or abandonment.

|  |  |
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| E-18.01 | Performs fishing and stuck pipe operations |

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| **Essential Skills** | Working with Others, Oral Communication, Thinking |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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| --- | --- | --- |
|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-18.01.01P | operate controls to free drill string | controls are operated to free drill string using ***procedures*** according to operator’s instructions, company policies and IRP |
| E-18.01.02P | use ***fishing tools and equipment*** to retrieve stuck, twisted off or dropped pipe and junk | ***fishing tools and equipment*** are used to retrieve stuck, twisted off or dropped pipe and junk according to third-party instructions |

RANGE OF VARIABLES

***procedures*** include: jarring, spotting oil, spotting acid, manoeuvering drill string (working stuck/tight pipe), wireline operations (free pointing, perforating, chemical cutting, tool joint locating, mechanical backoff)

***fishing tools and equipment*** include: washover pipe, magnets, spears, grapples, overshots, surface jars, bumper subs, baskets, junk subs, perforating guns

|  |  |  |
| --- | --- | --- |
|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-18.01.01L | demonstrate knowledge of procedures used to perform stuck pipe operations | describe stuck pipe operations |
|  |  | describe the instruments and controls of the drilling console |
|  |  | describe the ***procedures*** used to free drill string |
| E-18.01.02L | demonstrate knowledge of procedures used to perform fishing operations | describe fishing operations |
|  |  | identify types of ***fishing tools and equipment*** used to retrieve pipe |

RANGE OF VARIABLES

***procedures*** include: jarring, spotting oil, spotting acid, manoeuvering drill string (working stuck/tight pipe), wireline operations (free pointing, perforating, chemical cutting, tool joint locating, mechanical backoff)

***fishing tools and equipment*** include: washover pipe, magnets, spears, grapples, overshots, surface jars, bumper subs, baskets, junk subs, perforating guns

|  |  |
| --- | --- |
| E-18.02 | Rigs wireline loggers in and out |

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| **Essential Skills** | Working with Others, Oral Communication, Document Use |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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| --- | --- | --- |
|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-18.02.01P | operate controls to pick up wireline equipment with winches and blocks | wireline equipment is picked up with winches and blocks by operating controls |
| E-18.02.02P | assist third-party service providers by hanging and anchoring sheaves | sheaves are hung and anchored at height specified by third-party and rig specifications |
| E-18.02.03P | visually monitor well while logging | well is visually monitored while logging for flow or loss |

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| --- | --- | --- |
|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-18.02.01L | demonstrate knowledge of procedures used to rig wireline loggers in and out | describe the procedures used to rig wireline loggers |
|  |  | describe the procedures used to pick up wireline equipment |
|  |  | identify the type of equipment used to pick up wireline equipment |
|  |  | identify ***safety hazards*** specific to wireline loggers |
|  |  | identify certification requirements for wireline equipment |

RANGE OF VARIABLES

***safety hazards*** include: radioactive materials, overhead hazards, wireline truck, catwalk/floor areas

|  |  |
| --- | --- |
| E-18.03 | Performs drill stem testing (DST) |

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| --- | --- |
| **Essential Skills** | Working with Others, Oral Communication, Continuous Learning |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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| --- | --- | --- |
|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-18.03.01P | rig up ***surface test equipment*** | ***surface test equipment*** is rigged up |
| E-18.03.02P | operate controls to bring downhole test tools to rig floor | downhole test tools are brought to rig floor by operating controls |
| E-18.03.03P | assemble downhole test tools onto bottom of drill pipe | downhole test tools are assembled onto bottom of drill pipe according to third-party service provider instructions |
| E-18.03.04P | trip in and position drill string and downhole test tools | drill string and downhole test tools are tripped in and positioned according to company and third-party directions |
| E-18.03.05P | ignite flare stack to burn gas at surface | flare stack is ignited to burn gas at surface |
| E-18.03.06P | open and close tool | tool is opened or closed in order to conduct drill stem test according to operator’s requirements |
| E-18.03.07P | collect test samples | test samples are collected during tests according to operator’s requirements |
| E-18.03.08P | displace formation fluids and/or gases | formation fluids and/or gases are displaced using reverse circulation procedures |

RANGE OF VARIABLES

***surface test equipment*** includes: manifold, tanks, risers, test lines

|  |  |  |
| --- | --- | --- |
|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-18.03.01L | demonstrate knowledge of procedures used to perform drill stem testing | describe types of drill stem testing |
|  |  | explain procedures used to rig up ***surface test equipment*** |
|  |  | explain procedures used to assemble downhole test tool onto bottom of drill pipe |
|  |  | explain the importance and purpose of burning gas at surface |
|  |  | explain reverse circulation procedures used to displace formation fluids and/or gases |

RANGE OF VARIABLES

***surface test equipment*** includes: manifold, tanks, risers, test lines

|  |  |
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| E-18.04 | Performs sour well operations |

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| **Essential Skills** | Thinking, Document Use, Working with Others |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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| --- | --- | --- |
|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-18.04.01P | monitor for sour gas | presence of sour gas is monitored using ***equipment*** |
| E-18.04.02P | operate controls while wearing ***breathing apparatus*** | controls are operated while wearing ***breathing apparatus*** |
| E-18.04.03P | perform ***safety drills*** | ***safety drills*** are performed periodically according to regulations and company policies |
| E-18.04.04P | respond to sour gas release at surface | response to sour gas release is completed according to sour well control procedures |

RANGE OF VARIABLES

***equipment*** includes: hand held units, mounted monitoring equipment

***breathing apparatus*** includes: SCBA, third-party service provider supplied air breathing apparatus (SABA)

***safety drills*** include: man-down, BOP, high angle rescue, evacuation

|  |  |  |
| --- | --- | --- |
|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-18.04.01L | demonstrate knowledge of procedures used to perform sour well operations | define sour gas |
|  |  | describe procedures used to monitor for sour gas |
|  |  | describe procedures used in the event of a sour gas release |
|  |  | identify types of ***equipment*** used to monitor for sour gas and their placement |
|  |  | identify types of ***PPE and safety*** ***equipment*** used around sour gas |
|  |  | explain H2S regulatory requirements |

RANGE OF VARIABLES

***equipment*** includes: hand held units, mounted monitoring equipment

***PPE and safety*** ***equipment*** includes: SCBA, SABA, windsocks, light bars, sirens, air trailers, hoses, egress packs, H2S sensors, flare guns, blowout ignition system, BOP stack

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| E-18.05 | Completes the well |

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| **Essential Skills** | Working with Others, Numeracy, Oral Communication |

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| **NL** | **NS** | **PE** | **NB** | **QC** | **ON** | **MB** | **SK** | **AB** | **BC** | **NT** | **YT** | **NU** |
| NV | NV | NV | ND | ND | ND | NV | yes | yes | yes | NV | ND | ND |

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| --- | --- | --- |
|  | SKILLS | |
|  | **Performance Criteria** | **Evidence of Attainment** |
| E-18.05.01P | set packers and bridge plugs | packers and bridge plugs are set to required depth according to regulations and operator’s instructions |
| E-18.05.02P | run ***production casing*** | ***production casing*** is run according to IRP and well plan |
| E-18.05.03P | position drill string for required cement plug intervals | drill string is positioned for required cement plug intervals according to regulatory requirements |
| E-18.05.04P | install wellhead or bonnet after nippling down BOPs | wellhead or bonnet is installed after nippling down BOPs according to IRP and third-party instructions |

RANGE OF VARIABLES

***production casing*** includes: tubing, slotted liners, blank liners, fracture (frac) assemblies

|  |  |  |
| --- | --- | --- |
|  | KNOWLEDGE | |
|  | **Learning Outcomes** | **Learning Objectives** |
| E-18.05.01L | demonstrate knowledge of procedures used to complete the well | describe the purpose of running ***production casing*** |
|  |  | describe cement plug operations |
|  |  | describe bridge plug operations |
|  |  | describe pressure testing of bridge plug |
|  |  | describe the purpose of installing a well head or bonnet |

RANGE OF VARIABLES

***production casing*** includes: tubing, slotted liners, blank liners, fracture (frac) assemblies

APPENDIX A

ACRONYMS

|  |  |
| --- | --- |
| **ADR** | automated drilling rig |
| **BHA** | bottomhole assembly |
| **BOP** | blowout preventer |
| **CAODC** | Canadian Association of Oilwell Drilling Contractors |
| **DST** | drill stem testing |
| **EDR** | electronic drilling recorder |
| **ERP** | emergency response plan |
| **FCP** | final circulating pressure |
| **H₂S** | hydrogen sulfide |
| **ICP** | initial circulating pressure |
| **ID** | inside diameter |
| **IRP** | industry recommended practice |
| **JSA** | job safety analysis |
| **LCM** | loss-of-circulation-material |
| **MACP** | maximum allowable casing pressure |
| **MJ** | megajoule |
| **MPD** | managed pressure drilling |
| **MWD** | measurement while drilling |
| **OD** | outside diameter |
| **OEM** | original equipment manufacturer |
| **OH&S** | Occupational Health and Safety |
| **PLC** | programmable logic controller |
| **PPE** | personal protective equipment |
| **PVT** | pit volume totalizer |
| **ROP** | rate of penetration |
| **RSPP** | reduced speed pump pressure |
| **SABA** | supplied air breathing apparatus |
| **SCBA** | self-contained breathing apparatus |
| **SDS** | safety data sheet |
| **SRL** | self-retracting life lines |
| **TD** | total depth |
| **TDS** | total dissolved solids |
| **UBD** | underbalanced drilling |
| **WHMIS** | Workplace Hazardous Materials Information System |
| **WOB** | weight on bit |

APPENDIX B

TOOLS AND EQUIPMENT

Hand Tools / Outils manuels

|  |  |
| --- | --- |
| adjustable wrenches | clés ajustables |
| banding tools | outils de cerclage |
| cable cutter | coupe-câble |
| casing cutters | coupe-tubes |
| chain tensioner | tendeur de chaîne |
| chain tongs | clés à chaîne |
| chain, bench and pipe vises | étau à chaîne, étau d’établi et étau à tubes |
| chisels, punches | ciseaux, poinçons |
| cleaning tools (brooms, scrub brushes, etc.) | outils de nettoyage (balais, brosses à laver, etc.) |
| combination wrenches | clés mixtes |
| crowbar, pinch bar | pied-de-biche, barre-levier |
| drill bits | trépans |
| EZ outs | extracteurs de vis |
| files | limes |
| flaring tool | outil à évaser |
| grease gun | pistolet de graissage |
| hammer wrench | clé à frapper |
| hammers (ball peen, sledge hammers) | marteaux (à panne ronde, masses) |
| hex keys | clés hexagonales |
| jacks | crics |
| levels | niveaux |
| limbing saw (swede saw) | scie d’ébranchage (scie à bûches suédoise) |
| oil filter wrench | clé à filtre à huile |
| paint brushes | pinceaux |
| pipe cutter | coupe-tuyau |
| pipe threader | filière à tuyau |
| pipe wrenches | clés à tuyaux |
| pliers (slip-joint, locking, needlenose, channel locks, side cutter, tie-wire pliers) | pinces (à joint coulissant, pince-étau, à bec effilé, multiprise ordinaire, à coupe de côté, à torsader) |
| saws (hacksaw, wood saw, hole saw) | scies (à métaux, à bois, scie-cloche) |
| screwdrivers | tournevis |
| shovels, spades, picks | pelles, bêches, pioches |
| snap ring pliers | pinces pour anneau élastique |
| socket sets | jeu de douilles |
| specialty tools for installing and removing jets | outils spécialisés pour l’installation et l’enlèvement des buses |
| taps and dies | jeu de tarauds et filières |
| torque wrench | clé dynamométrique |
| wire brush | brosse métallique |

Power Tools, Hydraulic Tools and Pneumatic Tools / Outils mécaniques, outils hydrauliques et outils pneumatiques

|  |  |
| --- | --- |
| crimping tools (for hydraulic fittings) | outils de sertissage (pour les raccords hydrauliques) |
| die grinders | meules à rectifier les matrices |
| drills | perceuses |
| grinders (bench and angle) | meuleuses (d’établi, d’angle) |
| heat gun | pistolet thermique |
| hydraulic jacks | crics hydrauliques |
| hydraulic tools (manual tongs, iron roughneck, power tongs, pipe spinner) | outils hydrauliques (clés à tiges manuelles, roughneck en fer, clés à tiges mécaniques, appareil de vissage des tiges) |
| pneumatic impact tools | outils à chocs pneumatiques |
| power saws (chop, chain, circular, jig) | scies mécaniques (à tronçonner, à chaîne, circulaire, sauteuse) |
| seat pullers | extracteurs de sièges |
| transfer pump | pompe de transfert |
| wash gun | pistolet de lavage |

Diagnostic Tools / Outils de diagnostic

|  |  |
| --- | --- |
| air monitoring equipment | équipement de surveillance de la qualité de l'air |
| computers | ordinateurs |
| dry cell tester | appareil de vérification de piles sèches |
| engine diagnostic tools | outils de diagnostic moteur |
| multimeter | multimètre |
| stethoscope | stéthoscope |
| thermometers | thermomètres |

Measuring Tools / Outils de mesure

|  |  |
| --- | --- |
| calipers | compas |
| digital pH meter | pH-mètre numérique |
| measuring tape | ruban à mesurer |
| meter stick | règle d’un mètre |
| mud density scales | balances à boue |
| nozzle gauge | jauge pour buses |
| pit volume totalizer (PVT) | indicateur de niveau de boue |
| pressure gauges | manomètres |
| rulers | règles |
| thread gauges | jauges de filetage |
| torque wrenches | clés dynamométriques |
| total dissolved solids (TDS) meter | appareil de mesure des matières totales dissoutes |
| viscosity cups and funnels | coupes de viscosité et entonnoirs |
| water loss press | filtre-presse pour mesurer les pertes d’eau |
| weight indicator | indicateur de charge |

Rigging, Hoisting and Handling Equipment / Équipement de gréage, de hissage et de manipulation

|  |  |
| --- | --- |
| barrel sling | élingue pour lever des barils |
| chain hoist | palan à chaîne |
| chains | chaînes |
| come-along | palan à levier |
| eye bolts | boulons à œil |
| forklift | chariot élévateur à fourche |
| grip hoist | treuil manuel Griphoist |
| hand boomers, ratchet boomers | tendeurs à chaîne manuels, tendeurs à chaîne à rochet |
| jib cranes | grues à flèche |
| lifting nubbins | têtes de levage |
| loader | chargeuse |
| loader attachments | accessoires de chargeuse |
| man rider | treuil Man Rider |
| mobile crane | grue automotrice |
| nylon and cable slings | élingues en nylon, élingues de câble |
| pickers | camions-grues |
| shackles | manilles |
| snatch block | poulie ouvrante |
| spreader bar | palonnier |
| tugger (vertical winch / boom line) | treuil pneumatique (treuil à tambour vertical, treuil à câble de flèche) |

Personal Protective Equipment (PPE) and Safety Equipment / Équipement de protection individuelle (EPI) et équipement de sécurité

|  |  |
| --- | --- |
| alarm systems | systèmes d’alarme |
| aprons | tabliers |
| barrier cream | crème protectrice |
| burn kits | trousses pour brûlures |
| carabiners | mousquetons |
| danger zone matting | matelas de zone dangereuse |
| emergency and safety documentation | documents relatifs aux urgences et à la sécurité |
| eye wash stations | douches oculaires |
| face shield | écran facial |
| fire extinguishers | extincteurs |
| first aid kits | trousses de premiers soins |
| flame retardant coveralls | combinaisons ininflammables |
| gas detector | détecteur de gaz |
| gloves (rubber, impact) | gants (en caoutchouc, résistants aux chocs) |
| goggles | lunettes étanches |
| ground rods | tiges de mise à la terre |
| hard hats | casques de sécurité |
| harnesses (derrick, full body, working belt) | harnais (pour la tour de forage, harnais complet, ceinture de travail) |
| hearing protection | protecteurs d’oreilles |
| high angle rescue kit | trousse de sauvetage en hauteur |
| horizontal and vertical lifelines | câbles de sécurité horizontaux et verticaux |
| lanyards (work positioning, travel restraint) | cordes de retenue (de maintien au poste de travail, à limitation de déplacement) |
| lock-outs | cadenas |
| reflective clothing | vêtements réfléchissants |
| respirators | respirateurs |
| safety glasses | lunettes de protection |
| self-contained breathing apparatus (SCBA) | appareil respiratoire autonome |
| self-retracting life lines (SRLs) | câbles de sécurité autorétractables |
| signage and barriers | panneaux d’avertissement et barrières |
| spills kits | trousses de lutte contre les déversements |
| steel-toed boots | bottes à embout d’acier |
| stretchers | civières |
| supplied air breathing apparatus (SABA) | respirateurs à adduction d’air |
| tripod and davit arm | trépied et potence |
| wetsuit | combinaison humide |
| windsock | indicateur de direction du vent |

Specialized Trade Equipment / Équipement spécialisé du métier

|  |  |
| --- | --- |
| drifts | diamétreurs |
| float puller | extracteur de robinet à flotteur |
| floats | flotteurs |
| gauge rings | bagues étalons |
| go/no-go ring (hammer unions) | bague étalon entre n’entre pas (raccord union à aillettes) |
| mud can | bouclier antiboue |
| pipe screen | filtre pour tige de forage |
| pipe wiper/stripper | essuie-tiges (balayeur de tiges) |
| pulley pullers | arrache-poulie |
| rubber roughneck | roughneck en caoutchouc |
| shepherd stick | bâton de berger |
| survey barrels | cylindres d’arpentage |
| survey landing rings | anneaux de pose pour l’arpentage |
| wheel pullers | arrache-roue |

APPENDIX C

GLOSSARY / GLOSSAIRE

|  |  |  |  |
| --- | --- | --- | --- |
| **annular preventer** | a large sealing device, installed above the ram preventers, that forms a seal in the annular space between the tubulars and the wellbore or, if no tubulars are present, in the wellbore itself | **obturateur annulaire** | gros dispositif d’étanchéité installé au-dessus des obturateurs à pistons pour former un joint d’étanchéité dans l’espace annulaire, entre les tubulaires et le puits de forage ou, s’il n’y a pas de tubulaires, dans le puits de forage lui-même |
| **bird bath** | used to store stands of tubulars on rig floor | **bain pour tiges** | endroit utilisé pour entreposer les longueurs de tubulaires sur le plancher de forage |
| **blowout** | an uncontrolled kick | **éruption** | venue de gaz non contrôlée |
| **blowout preventer (BOP)** | a series of hydraulically or manually controlled components that are used to control the flow in the event a kick is taken | **bloc obturateur de puits (BOP)** | ensemble de composants à commande hydraulique ou manuelle utilisés pour contrôler le débit en cas de venue de gaz |
| **bumper block** | used to protect the crown from contact with the travelling assembly | **bloc de butée** | dispositif utilisé pour empêcher le moufle fixe d’entrer en contact avec l’assemblage mobile |
| **casing** | a steel liner run down the wellbore and cemented in place | **tubage** | colonne perdue en acier descendue dans le puits et cimentée en place |
| **catwalk** | an elevated platform at the bottom of the V-door where tubulars are placed to be lifted to the rig floor | **passerelle** | plateforme en hauteur située au bas de la porte en V, où les tubulaires sont placés pour être levés jusqu’au plancher de forage |
| **centrifuge** | a mechanical device used to remove solids from drilling fluid using centrifugal force | **centrifugeuse** | dispositif mécanique utilisé pour enlever les matières solides du fluide de forage à l’aide de la force centrifuge |
| **chiksan** | high pressure steel line with swivel ends | **raccord Chiksan** | conduite d’acier haute pression pourvue d’extrémités tournantes |
| **chocks** | wooden blocks used to prevent tubulars from rolling off pipe racks | **blocs d’arrêt** | blocs de bois utilisés pour empêcher les tubulaires de rouler hors des supports à tiges |
| **core barrel** | a tubular device run at the bottom of the drill string used to cut a core sample | **carottier** | appareil tubulaire installé à l’extrémité du train de tiges de forage et utilisé pour couper un échantillon de carotte |
| **cross-over** | a tubular adaptor used to connect components of a drill string that have different thread connections | **raccord de réduction** | adaptateur tubulaire utilisé pour raccorder les composants d’un train de tiges de forage ayant des extrémités à filetage de diamètres différents |
| **crown saver** | an emergency device to stop traveling blocks from hitting the crown | **protecteur de moufle fixe** | dispositif d’urgence servant à empêcher les moufles mobiles de frapper le moufle fixe |
| **deadman** | anchor on the supply end of the drilling line | **point fixe d'amarrage** | ancrage pour l’extrémité alimentation du câble de forage |
| **dogleg** | a high-angle bend in the wellbore profile | **déviation en patte de chien** | grande déviation dans le profil du puits de forage |
| **float** | a valve installed into the drill string to allow the flow of fluids through the drill string in only one direction | **robinet à flotteur** | appareil de robinetterie installé dans le train de tiges de forage pour permettre que les fluides s’y écoulent dans une seule direction |
| **flow tee (flow nipple)** | connects top of BOP to flow line, and directs drilled solids and fluid towards the shaker | **raccord d’écoulement en T (tubulure d’écoulement à claplet)** | raccord reliant la partie supérieure du bloc obturateur de puits (BOP) à la conduite d’écoulement et qui achemine les solides forés et les fluides vers le secoueur |
| **hydraulicing** | drill string moving up in wellbore caused by too much pump pressure in tight hole condition | **remontée par pression hydraulique** | déplacement du train de tiges de forage vers le haut du puits de forage en raison d’une trop grande pression de pompage dans un puits rétréci |
| **iron roughnecks** | a hydraulically operated device used to connect, torque and disconnect tubular connections | **roughneck en fer** | machine à commande hydraulique utilisée pour raccorder, serrer au couple et déconnecter les raccords tubulaires |
| **jarring** | providing a hammering force to loosen stuck drill string from wellbore | **battage** | action de marteler pour dégager du puits de forage un train de tiges de forage coincé |
| **keyseat** | a groove worn in the side of a deviated wellbore from rotating drill string that will not allow tool joints to pass through | **trou de serrure** | rainure formée par usure sur la paroi d’un puits de forage dévié causé par la rotation du train de tiges de forage et qui empêche les joints de tige de passer au travers |
| **kick** | an unplanned gas or fluid influx from a formation in the wellbore | **venue de gaz** | venue non prévue de gaz ou de fluide causée par une formation dans le puits de forage |
| **lifting nubbins** | threaded eyelets attached to tubular used for lifting it to the rig floor | **têtes de levage** | œillets filetés attachés aux tubulaires et utilisés pour lever ces tubulaires jusqu’au plancher de forage |
| **megajoule (MJ)** | the SI unit of service given by a drilling line when it moves 1000 newtons of load over a distance of 1000 metres | **mégajoule** **(MJ)** | unité SI désignant le travail fourni par un câble de forage lorsqu’il déplace une charge de 1 000 newtons sur une distance de 1 000 mètres |
| **monel** | non-magnetic tubular used for directional drilling | **monel** | tubulaire non magnétique utilisé pour le forage directionnel |
| **motor kills** | emergency shutdown for motors | **dispositif d’arrêt de moteur** | dispositif d’arrêt d’urgence d’un moteur |
| **mud ring** | a blockage in the wellbore caused by sticking of clays between the wellbore wall and the drill string | **anneau de boue** | blocage dans le puits de forage causé par une accumulation d’argile entre le mur du puits de forage et le train de tiges de forage |
| **pop valve** | pressure relief valve, that can be set to bypass circulating fluids at a desired pressure | **soupape de sûreté à ressort** | soupape de décharge qui peut être réglée pour permettre la dérivation des fluides en circulation à une pression voulue |
| **shale bin** | three or four-sided tank used to collect cuttings from the wellbore from shale shaker | **bac à schiste** | benne à trois ou quatre côtés utilisée pour recueillir les déblais de forage du puits de forage provenant du tamis vibrant |
| **sloughing** | collapsing of the walls of the wellbore (also called caving) | **éboulement** | écroulement des parois du puits de forage |
| **snubbing** | forcing tubulars into the wellbore using specialized equipment | **curage sous pression** | action de faire entrer de force les tubulaires dans le puits de forage à l’aide d’équipement spécialisé |
| **stab** | to guide the end of a tubular into a coupling or tool joint when making up a connection | **guider** | action de diriger l’extrémité d’un tubulaire dans un raccord ou un joint de tige lorsqu’on effectue un raccordement |
| **stripping** | raising and lowering drill string into or out of wellbore while under pressure | **extraction** | action de remonter du puits de forage et de descendre dans le puits de forage le train de tiges de forage pendant qu’il est sous pression |
| **surface casing** | first stage of casing from the surface to a pre-determined depth; installed to protect ground water, to isolate unstable formations, to provide means for well control, and to provide a platform for the BOPs | **tubage de surface** | première étape du tubage à partir de la surface à une profondeur prédéterminée; le tubage de surface est installé pour protéger la nappe phréatique, pour isoler les formations instables, pour fournir un moyen de contrôler le puits et pour fournir une plateforme pour les blocs obturateurs de puits (BOP) |
| **surface hole** | a hole drilled to allow a shallow string of surface casing to be cemented in the ground. It is the first operation for drilling a wellbore | **trou de surface** | trou foré pour permettre la cimentation dans le sol du train de tiges de forage peu profond d’un tubage de surface; il s’agit de la première opération de forage d’un puits |
| **surging** | an increase of pressure below the bit; occurs during downward movement of the string | **pompage** | augmentation de la pression sous le trépan; le pompage survient durant le mouvement descendant du train de tiges de forage |
| **swabbing** | a reduction of pressure below the bit; occurs during upward movement of the string | **pistonnage** | réduction de la pression sous le trépan; le pistonnage survient durant le mouvement ascendant du train de tiges de forage |
| **tour sheet** | a tour is a working shift for drilling crews. A tour sheet is the standard report that records each event that takes place at the well site | **rapport de quart de travail** | un quart de travail est une période de travail pour une équipe de forage. Un rapport de quart de travail est un rapport type dans lequel sont consignées à chaque quart de travail les activités qui se déroulent à l’emplacement du puits |
| **tubulars** | any kind of pipe. Oilfield tubular goods include tubing, collars, casing, heavyweight drill pipe, drill pipe and line pipe | **tubulaires** | toutes les sortes de tiges; le matériel tubulaire du champ pétrolifère comprend le tubing, les colliers, le tubage, la tige de forage lourde, la tige de forage et le tuyau de conduite |