

RED SEAL

THE INTERPROVINCIAL STANDARDS RED SEAL PROGRAM



National Occupational Analysis

2012 | Rig Technician



Human Resources and
Skills Development Canada

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Développement des compétences Canada

Canada

Rig Technician

2012

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The Canadian Council of Directors of Apprenticeship (CCDA) recognizes this National Occupational Analysis (NOA) as the national standard for the occupation of Rig Technician.

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 analyses of a number of skilled occupations. To this end, Human Resources and Skills Development Canada (HRSDC) sponsors a program, under the guidance of the CCDA, to develop a series of NOAs.

The NOAs 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 curricula for training leading to the certification of skilled workers;
- to facilitate the mobility of apprentices and skilled workers in Canada; and,
- to supply employers, employees, associations, industries, training institutions and governments with analyses of occupations.

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STRUCTURE OF ANALYSIS

To facilitate understanding of the occupation, the work performed by tradespersons is divided into the following categories:

Blocks	largest division within the analysis that is comprised of a distinct set of trade activities
Tasks	distinct actions that describe the activities within a block
Sub-Tasks	distinct actions that describe the activities within a task
Key Competencies	activities that a person should be able to do in order to be called 'competent' in the trade

The analysis also provides the following information:

Trends	changes identified that impact or will impact the trade including work practices, technological advances, and new materials and equipment
Related Components	list of components, items, materials and other elements relevant to the block
Tools and Equipment	categories of tools and equipment used to perform all tasks in the block; these tools and equipment are listed in Appendix A
Context	information to clarify the intent and meaning of tasks
Required Knowledge	elements of knowledge that an individual must acquire to adequately perform a task

The appendices located at the end of the analysis are described as follows:

Appendix A – Tools and Equipment	non-exhaustive list of tools and equipment used in this trade
Appendix B – Glossary	definitions or explanations of selected technical terms used in the analysis
Appendix C – Acronyms	list of acronyms used in the analysis with their full name
Appendix D – Block and Task Weighting	block and task percentages submitted by each jurisdiction, and the national averages of these percentages; these national averages determine the number of questions for each block and task in the Interprovincial exam
Appendix E – Pie Chart	graph which depicts the national percentages of exam questions assigned to blocks
Appendix F – Task Profile Chart	chart which outlines graphically the blocks, tasks and sub-tasks of this analysis

DEVELOPMENT AND VALIDATION OF ANALYSIS

Development of Analysis

A draft analysis is developed by a committee of industry experts in the field led by a team of facilitators from HRSDC. This draft analysis breaks down all the tasks performed in the occupation and describes the knowledge and abilities required for a tradesperson to demonstrate competence in the trade.

Draft Review

The NOA development team then forwards a copy of the analysis and its translation to provincial and territorial authorities for a review of its content and structure. Their recommendations are assessed and incorporated into the analysis.

Validation and Weighting

The analysis is sent to all provinces and territories for validation and weighting. Participating jurisdictions consult with industry to validate and weight the document, examining the blocks, tasks and sub-tasks of the analysis as follows:

BLOCKS	Each jurisdiction assigns a percentage of questions to each block for an examination that would cover the entire trade.
TASKS	Each jurisdiction assigns a percentage of exam questions to each task within a block.
SUB-TASKS	Each jurisdiction indicates, with a YES or a NO, whether or not each sub-task is performed by skilled workers within the occupation in its jurisdiction.

The results of this exercise are submitted to the NOA development team who then analyzes the data and incorporates it into the document. The NOA provides the individual jurisdictional validation results as well as the national averages of all responses. The national averages for block and task weighting guide the Interprovincial Red Seal Examination plan for the trade.

This method for the validation of the NOA also identifies common core sub-tasks across Canada for the occupation. If at least 70% of the responding jurisdictions perform a sub-task, it shall be considered common core. Interprovincial Red Seal Examinations are based on the common core sub-tasks identified through this validation process.

Definitions for Validation and Weighting

YES	sub-task performed by qualified workers in the occupation in a specific jurisdiction
NO	sub-task not performed by qualified workers in the occupation in a specific jurisdiction
NV	analysis <u>N</u> ot <u>V</u> alidated by a province/territory
ND	trade <u>N</u> ot <u>D</u> esignated in a province/territory
NOT COMMON CORE (NCC)	sub-task, task or block performed by less than 70% of responding jurisdictions; these will not be tested by the Interprovincial Red Seal Examination for the trade
NATIONAL AVERAGE %	average percentage of questions assigned to each block and task in Interprovincial Red Seal Examination for the trade

Provincial/Territorial Abbreviations

NL	Newfoundland and Labrador
NS	Nova Scotia
PE	Prince Edward Island
NB	New Brunswick
QC	Quebec
ON	Ontario
MB	Manitoba
SK	Saskatchewan
AB	Alberta
BC	British Columbia
NT	Northwest Territories
YT	Yukon Territory
NU	Nunavut

ANALYSIS

Safe working procedures and conditions, accident prevention, and the preservation of health are of primary importance to industry in Canada. These responsibilities are shared and require the joint efforts of government, employers and employees. It is critical that all parties become aware of circumstances that may lead to injury or harm. Safe learning experiences and work environments can be created by controlling the variables and behaviours that may contribute to accidents or injury.

It is generally recognized that safety-conscious attitudes and work practices contribute to a healthy, safe and accident-free work environment.

It is imperative to apply and be familiar with the Occupational Health and Safety (OH&S) Acts and Workplace Hazardous Materials Information System (WHMIS) Regulations. As well, it is essential to determine workplace hazards and take measures to protect oneself, co-workers, the public and the environment.

Safety education is an integral part of training in all jurisdictions. As safety is an inherent part of all trades, it is assumed and therefore it is not included as a qualifier of any activities. However, the technical safety tasks and sub-tasks specific to the trade are included in this analysis

SCOPE OF THE RIG TECHNICIAN TRADE

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

	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.

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 (level 1) and derrickhand (level 2) in order to become fully qualified rig technicians/drillers (level 3). 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; 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 analysis 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.

OCCUPATIONAL OBSERVATIONS

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 length of the drilling season, making year-round drilling more common.

New technologies are offering new choices of bits, drilling fluids and downhole tools, which increase the speed at which wells are drilled. Also, new types of drilling rigs are being built, such as automated drilling rigs (ADR) and top drives, which change the nature of the work being done by rig technicians. Much of the hands-on work on a traditional rig is replaced by automated systems on the ADR. Therefore, the rig technician is operating a wider variety of equipment with the purpose of increasing the safety of the operations.

New regulations and company policies are impacting drilling rig management and crews, especially in the areas of due diligence, liability issues and safety training. First aid and hydrogen sulphide (H₂S) Alive training are pre-requisites. Also, pre-job hazard assessments (PJHAs), job safety analysis (JSAs) and specific task training are becoming increasingly important. To prove due diligence, there are ever increasing demands regarding the documentation of meetings.

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.

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 casing technology as this technology can increase production and lower costs simultaneously.

There is a trend to have more specialized drilling operations such as directional, underbalanced drilling (UBD) and managed pressure drilling (MPD). This requires an increased involvement of third-party service providers.

There is a greater focus on environmental responsibilities to handle, store and transport waste material and chemicals. There is also more required documentation, and jurisdictional regulations are more stringent. Rig technicians are expected to stay up-to-date on evolving regulations.

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.hrsdc.gc.ca/essentialskills.

The essential skills for the rig technician trade are included in the profile for the oil and gas well drilling workers and service operators, which indicate that the most important essential skills are **numeracy** and **oral communication**. The subject matter experts at the NOA workshop identified that **document use**, **thinking skills** and **working with others** are also important essential skills.

The application of these skills may be described throughout this document within the competency statements which support each sub-task of the trade. 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.

Reading

Rig technicians read a variety of documents such as drilling logs, company memos, engineering handbooks, training and operation manuals, and material safety data sheets (MSDS) and 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 know how much fluid and what density of fluid to pump into a well to keep the oil or gas from coming up. They record mud flows and volumes into tables such as a swab report and a mud sheet on a daily basis. They also complete safety related documentation such as JSA forms and hazard identifications.

Writing

Rig technicians write required information and notes on a variety of forms and reports such as tour sheets and trip sheets. They may also keep a personal log of their own activities in which they may write reminder notes.

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 the imperial and metric measurement systems. They also calculate amount of mud loss.

Oral Communication

Rig technicians may give and receive warning of safety hazards, or instructions. They talk with co-workers to co-ordinate their tasks. They also participate in pre-job 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, gestures and by shouting. They wear ear protection and sometimes radio headphones. Communication depends on being vigilant and aware of what is about to happen.

Thinking Skills

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 find 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 other handbooks to look up and interpret the 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. They mostly perform their tasks independently; however, they co-ordinate with other workers on a constant basis for activities such as tripping pipe and drilling operations.

Computer Use

Rig technicians 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.

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 H₂S. In addition, some companies provide on-going training with the possibility of moving into higher supervisory positions.

Trends	There is more emphasis on completing personnel, safety and environmental documentation. Training and supervision of new crew members is becoming more important because of industry expectations of quality workmanship and emphasis on safety.
Related Components	All components apply.
Tools and Equipment	See Appendix A.

Task 1**Maintains and uses tools and equipment.**

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

Required Knowledge

K 1	types of hand tools such as wrenches, hammers and chain tongs
K 2	types of power tools such as electric drills, chop saws and grinders
K 3	power tool accessories such as wire wheels, grinding discs and drill bits
K 4	jurisdictional regulations related to limitations of use of hand and power tools (use of intrinsically safe tools within designated distances)
K 5	types of mobile equipment such as crew trucks and loaders
K 6	operating requirements for mobile equipment such as a driver's license, defensive driving training and loader certification
K 7	manual rigging/hoisting equipment such as come-alongs, chain hoists, chains and slings
K 8	inspection techniques for rigging/hoisting equipment
K 9	applications and limitations of manual rigging/hoisting equipment such as nylon, cable and chain load ratings
K 10	sling configurations such as basket, choke and belly, and their ratings

Sub-task**A-1.01 Maintains hand and power tools.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-1.01.01	organize and store hand and power tools in designated locations
A-1.01.02	clean, service and lubricate hand and power tools such as pneumatic, electric and hydraulic tools
A-1.01.03	inspect and identify worn, damaged or defective hand and power tools
A-1.01.04	document worn, damaged and defective hand and power tools taken out of service and inform supervisor
A-1.01.05	dispose of, repair or replace worn, damaged or defective hand and power tools depending on degree of wear or damage and type of tool

Sub-task**A-1.02 Uses mobile equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-1.02.01	operate mobile equipment such as crew truck and loader to move personnel and materials
A-1.02.02	operate mobile equipment according to road and site conditions
A-1.02.03	perform pre-inspection activities such as checking fluid levels and leaks, tires, lights and surrounding objects prior to operation
A-1.02.04	park mobile equipment according to emergency evacuation plan
A-1.02.05	perform basic maintenance such as changing oil, topping up fluid levels and changing lights according to manufacturers' specifications
A-1.02.06	change loader attachments such as buckets, pallet forks, pipe grapples and stingers according to task

Sub-task**A-1.03 Uses rigging/hoisting equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-1.03.01	select rigging method such as basket, choke and belly according to task
A-1.03.02	identify worn, damaged or defective rigging/hoisting equipment and remove from service
A-1.03.03	identify potential hazards on moving load such as pinch points and slippery surfaces
A-1.03.04	select rigging/hoisting equipment such as slings, come-alongs, chain hoists and winch lines according to task
A-1.03.05	determine safe lifting point on the load for placing rigging/hoisting equipment
A-1.03.06	rig load according to weight and rating of lifting equipment, and attach tag lines
A-1.03.07	convey lift instructions orally and using hand signals
A-1.03.08	store rigging/hoisting equipment according to rig specifications

Task 2**Performs trade-related activities.**

Context 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.

Required Knowledge

K 1	common rig supplies such as pump parts, oil filters and scrub brushes
K 2	minimum stock amounts for re-ordering
K 3	inventory assignments of rig crew
K 4	types of waste materials such as used oil and filters, plastics, woods, metals and domestic garbage
K 5	governmental regulations, industry recommendations and company policies related to the disposal of waste materials

K 6	spill response actions according to governmental regulations
K 7	housekeeping assignments of rig crew
K 8	MSDS and WHMIS
K 9	PPE for cleaning such as fall arrest equipment, eye protection and rubber gloves
K 10	OH&S regulations related to safe handling and storage of materials

Sub-task

A-2.01 Maintains parts and supply inventory.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-2.01.01	identify future needs for rig parts and supplies by checking inventory stock levels
A-2.01.02	refer to equipment maintenance log books to determine when to order replacement parts
A-2.01.03	create a want list according to minimum stock amount
A-2.01.04	receive, organize and store goods in inventory

Sub-task

A-2.02 Disposes of waste materials.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-2.02.01	identify hazardous waste materials for disposal such as oil filters, oil rags and thread compound (dope) pails and determine how they should be disposed of according to environmental chart
A-2.02.02	handle and discard hazardous waste materials in designated area according to environmental regulations
A-2.02.03	separate waste materials such as wood scraps, drill line and plastic for disposal and recycling according to environmental guidelines
A-2.02.04	discard waste materials in designated areas

Sub-task**A-2.03 Performs housekeeping.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-2.03.01	select tools and equipment such as mops and buckets, brooms and wash guns according to task
A-2.03.02	select cleaning agents such a degreasers, detergents and water according to task
A-2.03.03	clean and organize areas assigned for cleaning

Task 3**Uses documentation and reports.****Context**

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.

Required Knowledge

K 1	company policies and jurisdictional regulations related to personnel documentation
K 2	probationary period procedures
K 3	types of safety documentation such as inspection checklists, and pre-job, weekly and monthly safety meeting documents
K 4	environmental documentation such as spill reports and waste disposal guidelines
K 5	frequency of safety meetings and inspection checklists
K 6	types of inspection checklists such as rig inspection, escape device and fall arrest
K 7	regulatory and original equipment manufacturers (OEM) requirements for inspections

K 8	information recorded on tour sheets such as drilling assembly and pipe tally, daily activities, safety meetings, rig services and payroll
K 9	types of trade documentation such as Industry Recommended Practices (IRPs), first and second line well control documents and JSAs
K 10	training and certification requirements such as well control, H ₂ S, first aid and confined space

Sub-task

A-3.01 Uses personnel documentation.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-3.01.01	complete personnel documentation such as orientation checklists, apprentice record books, personnel and training evaluations, disciplinary actions and incident reports according to company policies
A-3.01.02	coordinate completion of documents such as employee package and rig orientation with new crew members
A-3.01.03	verify personnel documentation such as H ₂ S, first aid and WHMIS certifications

Sub-task

A-3.02 Uses safety and environmental documentation.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-3.02.01	document hazards such as inadequate safety equipment, broken and missing pieces and incorrect assembly of equipment, and actions taken
A-3.02.02	complete, date and sign safety documentation for safety equipment such as fire extinguishers, eye wash stations, fall arrest equipment and self-contained breathing apparatus (SCBA) according to government regulations
A-3.02.03	refer to safety documentation such as emergency response plan (ERP)
A-3.02.04	refer to documentation to understand environmental impact of incidents

A-3.02.05	reference environmental documentation for hazardous waste material disposal and recycling regulations and guidelines
A-3.02.06	complete reference sheet to track disposed hazardous materials
A-3.02.07	complete incident reports
A-3.02.08	document the maintenance or repair and reason for lock-out according to company policies
A-3.02.09	complete and sign off on safe work permits such as hot work, confined space and third-party orientation

Sub-task

A-3.03 Completes tour sheets.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-3.03.01	locate where on tour sheet to record data such as activity and time break down, pipe tally, trip sheet and payroll
A-3.03.02	enter data into appropriate sections on the tour sheet
A-3.03.03	proofread input to the tour sheet before submitting
A-3.03.04	ensure crew members have signed off at the end of each tour

Sub-task

A-3.04 Interprets trade documentation.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-3.04.01	refer to, and review, trade documentation such as IRPs and JSAs
A-3.04.02	refer to material such as stick diagrams, maximum allowable casing pressure (MACP) chart and Canadian Association of Oilwell Drilling Contractors (CAODC) chart to obtain understanding of task, or to explain task to crew members

Sub-task**A-3.05 Uses maintenance documentation.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-3.05.01	record maintenance activities such as oil changes and fuel filter changes in maintenance log books such as motor books and pump books
A-3.05.02	refer to maintenance log books for preventive maintenance

Task 4**Supervises crew members and communicates with others.****Context**

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

Required Knowledge

K 1	crew members such as derrickhands, motorhands, floorhands and leasehands
K 2	duties of each crew member
K 3	orientation checklists
K 4	types of training such as new task and safety procedures
K 5	training methods such as verbal, visual and hands-on demonstrations
K 6	company policies regarding training of crew members
K 7	types of safety procedures requiring training such as lock-out, confined space and fall arrest
K 8	well control training such as duties and positions, and identifying warning signs
K 9	types of meetings such as pre-job, safety and orientation
K 10	work permits such as hot work and confined space

K 11	company and industry requirements for site orientation meetings
K 12	oilfield acronyms and terminology such as "rathole", "monkeyboard", "tripping" and "slips"
K 13	government and company policies, procedures, guidelines and standards
K 14	types of communication such as verbal and written
K 15	role of, and relationship with, third-party service providers

Sub-task

A-4.01 Supervises crew members.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-4.01.01	identify crew members' abilities and training needs
A-4.01.02	assign tasks to each crew member within crew member's abilities
A-4.01.03	coordinate crew members' tasks
A-4.01.04	monitor performance and provide constructive feedback
A-4.01.05	ensure tasks are being performed according to company policies
A-4.01.06	relay information to crew members about items such as task to be performed, new company policies and procedures, and incident reports
A-4.01.07	address and relay crew members' concerns to supervisor
A-4.01.08	take disciplinary actions according to company policies

Sub-task

A-4.02 Orientates new crew members to rig.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-4.02.01	introduce new crew members to other crew members and chain of command
A-4.02.02	explain layout of rig and location of important reference points such as PPE storage, muster points and hazardous areas

- A-4.02.03 explain the duties and expectations of new crew members' positions
- A-4.02.04 explain company policies and procedures and verify that crew members understand and retain information

Sub-task

A-4.03 Trains crew members.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- A-4.03.01 conduct safety drills such as blowout preventer (BOP) drills, fire drills, emergency response drills and man-down drills
- A-4.03.02 mentor others in recognizing and reporting required repairs
- A-4.03.03 mentor new hands and share personal experiences or use training materials such as JSA, job procedure manuals and apprentice record book (blue book) to enhance training
- A-4.03.04 adapt training methods to crew members' learning styles
- A-4.03.05 assess and track progress, and provide constructive feedback

Sub-task

A-4.04 Leads crew meetings.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- A-4.04.01 identify when meetings are required according to factors such as company policies, IRP, OH&S regulations and third-party service provider involvement
- A-4.04.02 schedule meetings prior to task
- A-4.04.03 conduct meeting according to task to be performed and use JSA
- A-4.04.04 keep meeting on track and focused
- A-4.04.05 emphasize dangers and hazards, and how to reduce risks
- A-4.04.06 confirm crew's understanding of task

Sub-task**A-4.05 Communicates with third-party service providers.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-4.05.01	schedule meeting between rig crew and third-party service providers such as tong hands, cementers and directional drillers
A-4.05.02	determine roles and responsibilities between rig crew and third-party service providers
A-4.05.03	ensure communication between rig crew and third-party service providers using communication methods such as verbal, two-way radios, rig phones and hand signals
A-4.05.04	confirm understanding of terminology and job to be performed by third-party service providers

Task 5**Performs safety-related functions.**

Context Rig technicians use PPE and safety equipment and engage in work practices to maintain a safe work environment.

Required Knowledge

K 1	types of PPE such as respiratory, hearing, eye and body protection
K 2	types of safety equipment such as burn kits, eye wash stations, fire extinguishers, stretchers and first aid kits
K 3	types of fall arrest equipment such as lanyards, derrick belts and carabineers
K 4	rig rescue techniques using equipment such as rescue baskets, emergency escape devices, man-rated winches and rope knots
K 5	location and operation of PPE and safety equipment
K 6	workers' rights and responsibilities such as the obligation to refuse unsafe work
K 7	company safety policies and procedures such as fire safety and work permit procedures
K 8	federal, provincial/territorial and municipal health and safety acts and regulations

K 9	training and certification requirements such as fall protection, rig rescue, confined space entry and first aid
K 10	hazards associated with rig equipment
K 11	H ₂ S hazards and response plan and related equipment such as SCBA, supplied air breathing apparatus (SABA) systems and gas detectors
K 12	housekeeping practices
K 13	situations where lock-out is to be used such as during rig service, repairs, electrical replacements and inspection of equipment
K 14	lock-out procedures

Sub-task

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

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-5.01.01	select PPE such as face masks, aprons and rubber gloves according to worksite hazards, task and company policies
A-5.01.02	select safety equipment such as high angle rescue, SCBA and safety harness according to worksite hazards, task and company policies
A-5.01.03	fit test SCBA equipment for each individual
A-5.01.04	use emergency escape devices such as escape buggies, egress systems and pods
A-5.01.05	use and test gas monitoring equipment
A-5.01.06	recognize worn, damaged or defective PPE and safety equipment, and remove from service
A-5.01.07	store PPE and safety equipment in designated area according to rig

Sub-task**A-5.02 Maintains safe work environment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-5.02.01	identify and report potential hazards such as slips, trips and falls
A-5.02.02	ensure work area is tidy, clean and free of hazards
A-5.02.03	install temporary safety protection such as static lines and temporary barriers
A-5.02.04	ensure crew awareness of emergency evacuation plan

Sub-task**A-5.03 Performs lock-out procedures.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

A-5.03.01	identify equipment to be locked out for conditions such as rig service, electrical and mechanical failures, and hydraulic repairs
A-5.03.02	lock-out equipment for servicing according to company policy and OH&S regulations
A-5.03.03	tag-out equipment until maintenance or repair is completed
A-5.03.04	remove lock-out

Trends	Due to liability and safety issues, third-party service providers have greater responsibilities in moving the rig. Rig technicians are less physically involved, but have increased supervisory responsibilities during rig moves.
Related Components	All components apply.
Tools and Equipment	Hand tools, mobile equipment, rigging/hoisting equipment, PPE and safety equipment, access equipment (ladders).

Task 6**Prepares for rig move.**

Context	Rig technicians must clean the drilling rig to comply with environmental regulations and company policies. Although rig technicians may need to prepare buildings, equipment and components for transport, due to liability issues, third-party transportation contractors are responsible for fastening and securing the loads to the trucks.
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Required Knowledge

K 1	cleaning materials and solvents
K 2	cleaning priorities
K 3	buildings, equipment and components that require preparation for transport
K 4	load securement guidelines
K 5	jurisdictional regulations regarding the transportation of loads
K 6	where equipment and their components are stored for transport

Sub-task**B-6.01 Prepares equipment for move.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- B-6.01.01 remove debris using tools such as crowbars, shovels and brooms
- B-6.01.02 clean equipment to remove debris such as contaminated drilling mud, oil-based mud and soil according to transportation and environmental regulations
- B-6.01.03 verify loose equipment such as chemical barrels, hand rails and flow line is secured according to rig layout
- B-6.01.04 secure loose equipment using tie downs such as chains and boomers, ropes and ratchet straps
- B-6.01.05 secure doors in a closed position using pins and locks
- B-6.01.06 ensure that all applicable labels and documentation are on the buildings
- B-6.01.07 recognize, repair and replace worn, damaged or defective securement equipment such as straps, chains and boomers

Sub-task**B-6.02 Organizes loads for transport.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- B-6.02.01 determine order of removal according to rig set-up
- B-6.02.02 determine smaller load combinations for efficient transport
- B-6.02.03 coordinate with third-party service providers
- B-6.02.04 recognize improperly secured buildings, equipment and components, and notify third-party service providers

Task 7

Disassembles rig.

Context 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.

Required Knowledge

K 1	rig components such as buildings, drawworks and derricks
K 2	third-party service provider equipment such as centrifuges, surface tanks and flare tanks
K 3	tubulars such as drill pipe, drill collars and heavyweight drill pipe
K 4	types of equipment required for specific jobs such as cranes, trucks and loaders
K 5	safety meeting requirements
K 6	removal procedures and sequences
K 7	environmental and jurisdictional regulations and policies such as fencing and/or filling ditches, ratholes and mouseholes
K 8	company policies regarding site clean-up and move
K 9	hand signals and clear communication methods

Sub-task

B-7.01 Removes components.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

B-7.01.01	disassemble components with tools and equipment such as hammers, wrenches and tag lines
B-7.01.02	supervise third-party service providers while handling buildings and equipment
B-7.01.03	follow disassembly procedures and sequences according to rig specifications

Sub-task**B-7.02 Cleans site.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

B-7.02.01	remove accumulated refuse
B-7.02.02	ensure removal of rig equipment such as tubulars, pipe racks and conductors

Task 8**Assembles rig.**

Context Once the rig components arrive at the drilling site, the rig needs to be assembled in order to commence drilling operations.

Required Knowledge

K 1	types of terrains such as gravel, sand and muskeg
K 2	site hazards such as existing equipment, overhead power lines and open pits
K 3	access requirements
K 4	company policies and safety meeting requirements
K 5	types of equipment required for assembly such as cranes, trucks and loaders
K 6	types of buildings and equipment
K 7	assembly procedures and sequences
K 8	safe lifting points
K 9	hand signals and clear communication methods

Sub-task**B-8.01 Spots matting, sub, derrick and buildings.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- B-8.01.01 place matting and poly according to rig specifications and environmental regulations using tools and equipment such as crowbars, pole trucks and cranes
- B-8.01.02 adapt drilling rig setup according to the site such as spotting the first mat over the existing rathole and mousehole, and aligning it with well centre
- B-8.01.03 supervise third-party service provider to ensure alignment and avoid damages to buildings and equipment
- B-8.01.04 locate buildings and equipment according to rig specifications

Sub-task**B-8.02 Assembles sub, derrick and drawworks.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- B-8.02.01 fit together derrick and components such as monkeyboards, booms and A-legs, and follow assembly sequence according to rig specifications
- B-8.02.02 fit together sub and components such as motor house, tables and bird baths, and follow assembly sequence according to rig specifications
- B-8.02.03 pin derrick and A-legs to sub
- B-8.02.04 identify hazards associated with assembling components
- B-8.02.05 coordinate and work with third-party service providers

Trends	Rig up and rig out is becoming more complex because there are new equipment and technologies. It makes drilling procedures easier to do, but rig up and rig out procedures more time consuming. Rig technicians need to adapt to new technologies as they become available. Due to the dangers associated with drilling fluids containing hazardous chemicals and new equipment, there is increased awareness of safety standards, leading to better practices.
Related Components	All components apply.
Tools and Equipment	See Appendix A.

Task 9**Performs rig up procedures.**

Context Rig technicians perform rig up procedures to enable the rig to drill.

Required Knowledge

K 1	types of power cables such as 220 volt, 480 volt and 600 volt
K 2	sizes of air, fuel and hydraulic lines
K 3	sequence for hooking up air, fuel and hydraulic lines, and power cables
K 4	routing of air, fuel and hydraulic lines, and power cables
K 5	jurisdictional regulations regarding power cables
K 6	training and certification requirements regarding handling and repairing power cables
K 7	hazards associated with working with power cables and pressurized lines
K 8	start-up procedures for equipment such as boilers, light plants and engines
K 9	start-up of equipment in sequence
K 10	auxiliary equipment required for start-up such as fans and block heaters
K 11	types of derricks such as singles, doubles and triples
K 12	derrick components such as lines and overhead equipment
K 13	derrick raising sequences and procedures according to drilling rig such as telescopic, jackknife and slant

- K 14 lock-out procedures
- K 15 rig floor components needed to be rigged up such as tongs, slips and pipe handlers
- K 16 sequence and procedures for rigging up rig floor according to drilling rig
- K 17 types of pre-fabs such as steel and tarp
- K 18 sequence for setting up pre-fabs
- K 19 types of pumps such as duplex, triplex and submersible
- K 20 mud tank components such as shakers, agitators and lines
- K 21 pump components such as fluid end, power end and pulsation dampeners
- K 22 circulation system components such as lines, valves and hoses
- K 23 pressure ratings of unions and hoses
- K 24 types and ratings of pop valves and pins
- K 25 safety cable requirements on high pressure lines
- K 26 types of conductors such as air bag and weld-on
- K 27 types of flow lines such as steel and polyvinyl chloride (PVC)
- K 28 fasteners such as straps, turnbuckles and chains
- K 29 hand signals and clear communication methods
- K 30 types of boilers
- K 31 boiler components such as burners, relief valves, flue retarders, fuel/water pumps and mercury switches
- K 32 training and certification required to work with boilers
- K 33 steam circulating system components such as lines, safety devices and pop valves
- K 34 hazards associated with working with boilers and steam systems such as superheated high pressure steam and chemicals
- K 35 centrifuge set up and operation
- K 36 purpose and layout of tank farms
- K 37 how to recognize worn, damaged or defective air, fuel, water and hydraulic lines, and power cables
- K 38 types of tanks such as mud, shaker, settling, pre mix, suction and pill tanks

Sub-task**C-9.01 Runs air, fuel, water and hydraulic lines, and power cables.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-9.01.01 recognize types of fittings, unions and lines such as air, fuel, water and hydraulic
- C-9.01.02 route and connect lines and unions according to rig specifications using tools such as hammers, pliers and wrenches
- C-9.01.03 ensure all breakers are turned off prior to connecting the equipment
- C-9.01.04 clean ends such as electrical, unions and couplers prior to connecting
- C-9.01.05 hook up EDR, air, fuel, water and hydraulic lines, and power cables according to priority

Sub-task**C-9.02 Starts and warms up equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-9.02.01 check all fluids such as oils and antifreeze levels in motors prior to start-up
- C-9.02.02 verify lock-out of master switch and drive system clutches prior to start-up
- C-9.02.03 warm up engines with block or circulating heaters
- C-9.02.04 turn off block and circulating heaters after start-up of engines
- C-9.02.05 recognize and rectify problems associated with start-up such as loose belt, low battery and fuel pressures
- C-9.02.06 verify that auxiliary equipment such as cooling fans, oil pumps and lubricator pumps are turned on prior to starting up main equipment
- C-9.02.07 start auxiliary and main equipment

Sub-task**C-9.03 Raises derrick.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-9.03.01 visually inspect derrick prior to raising to confirm it is safe to raise, and document results
- C-9.03.02 prepare derrick for raising procedure
- C-9.03.03 recognize, repair and replace worn, damaged or defective equipment
- C-9.03.04 select and use tools and equipment such as fall arrest equipment, hammers and tie off points
- C-9.03.05 route lines to rig in derrick
- C-9.03.06 verify that no lines are in a pinch point during the raise

Sub-task**C-9.04 Rigs up rig floor and related equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-9.04.01 ensure placement of hold back lines
- C-9.04.02 ensure overhead equipment is connected and secured
- C-9.04.03 select and use tools and equipment such as winches and tag lines
- C-9.04.04 assemble top drive or kelly bar components
- C-9.04.05 place rathole and mousehole
- C-9.04.06 cover all open holes such as main, mouseholes and ratholes
- C-9.04.07 connect all rotary equipment such as chain drives and drive shafts

Sub-task**C-9.05 Installs pre-fabs.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-9.05.01 select and use tools and equipment such as winches, hammers and fall arrest equipment
- C-9.05.02 place framework in pre-determined pockets
- C-9.05.03 secure pre-fabs to framework using fastening devices such as pins, hooks and straps

Sub-task**C-9.06 Rigs up mud tanks, pumps and circulation systems.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-9.06.01 select and use tools and equipment such as hammers, grease guns and wire brushes according to rig set-up
- C-9.06.02 prepare tanks, pumps and circulation systems according to established procedures and sequences to drill
- C-9.06.03 attach and secure all lines such as bleeder line, suction line and pop valve line with safety cables
- C-9.06.04 install ground cable through plastic centrifuge lines when using oil-based drilling fluids to eliminate static electricity

Sub-task**C-9.07 Installs trash pumps, conductor and flow lines to shakers.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-9.07.01 determine length of the conductor to ensure the slope of the flow line
- C-9.07.02 follow installation sequences and procedures according to application
- C-9.07.03 select and use tools and equipment such as winches, hammers and pry bars to install, lift and secure flow lines

Sub-task**C-9.08 Sets up boiler and steam circulating systems.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-9.08.01 select and use tools and equipment such as hammers and space heaters
- C-9.08.02 recognize problems associated with boiler start-up such as over fueling and improper air flow
- C-9.08.03 monitor and adjust pH levels at start-up according manufacturers' and rig specifications
- C-9.08.04 fire up boiler
- C-9.08.05 secure and fence off blowdown line

Sub-task**C-9.09 Rigs up third-party service provider equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

C-9.09.01	identify type of third-party service provider equipment such as centrifuges, and floc, auxiliary and pre-mix tanks
C-9.09.02	spot, install and operate third-party service provider equipment
C-9.09.03	organize third-party service provider equipment during rig-up
C-9.09.04	recognize and report worn and defective equipment

Task 10**Performs rig out operations.**

Context Rig technicians dismantle the drilling rig to be able to move it to storage (racking) or relocate it to another drilling site. They perform this procedure in a safe and efficient manner.

Required Knowledge

K 1	types of fluids such as water and drilling fluids
K 2	winterizing requirements
K 3	jurisdictional regulations and operational requirements regarding the processes of draining and disposing of fluids
K 4	jurisdictional regulations and training requirements for working in confined spaces
K 5	WHMIS labels and MSDS
K 6	hazards associated with cleaning mud tanks
K 7	cleaning sequences and procedures
K 8	types and sizes of flare lines
K 9	components of manifold such as chokes, hoses and valves
K 10	disassembly sequences for manifold and flare lines
K 11	hazards associated with rigging out such as weather, terrain, heavy lifting and pinch points
K 12	floor components needed to be rigged out such as tongs, slips, kelly and pipe handlers

K 13	floor rigging out sequence and procedure according to drilling rig
K 14	types of pre-fabs such as steel and tarp
K 15	sequence of rigging out pre-fabs
K 16	rig out procedure for types of derricks such as singles, doubles and triples
K 17	derrick components such as lines and overhead equipment
K 18	derrick lowering sequences according to drilling rig
K 19	types of pumps such as duplex, triplex and submersible
K 20	types of mud tanks and their components such as shakers, agitators and lines
K 21	pump components such as fluid end and power end
K 22	circulation system components such as lines, valves and hoses
K 23	types of boilers
K 24	boiler shut-down and cooling procedures and sequences
K 25	training and certification required to work with boilers
K 26	components of boilers and steam systems such as lines, safety devices and pop valves
K 27	hazards associated with working with boilers and steam systems such as superheated high pressure steam and chemicals
K 28	types of power cables such as 220 volt, 480 volt and 600 volt
K 29	sequence for disconnecting air, fuel and hydraulic lines, and power cables
K 30	jurisdictional regulations regarding power cables
K 31	training and certification requirements regarding handling and repairing power cables
K 32	hazards associated with working with power cables and pressurized lines
K 33	centrifuge tear down sequence and procedure
K 34	procedure for rigging out tank farms according to environmental regulations

Sub-task

C-10.01 Nipples down blowout preventer (BOP) and related equipment.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

C-10.01.01	select and use tools and equipment such as hammers, hammer wrenches and air/electric/hydraulic impact tools
C-10.01.02	store and secure equipment in designated area

C-10.01.03	depressurize accumulator and lines
C-10.01.04	prepare BOP to lay down or hang according to rig procedures
C-10.01.05	disconnect manifold and flare lines
C-10.01.06	perform visual inspection of BOP

Sub-task

C-10.02 Rigs out rig floor and related equipment.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

C-10.02.01	select and use tools and equipment such as hammers, wrenches and winches
C-10.02.02	store and secure equipment in designated area
C-10.02.03	depressurize hydraulic lines prior to disconnection
C-10.02.04	lay down top drive, mousehole and kelly bar assembly
C-10.02.05	rig out tongs, slips, pipe spinners, drive shafts and chains

Sub-task

C-10.03 Rigs out pre-fabs.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

C-10.03.01	select and use tools and equipment such as hand tools, safety belts and fall arrest equipment
C-10.03.02	unsecure pre-fabs from framework and unfasten devices such as pins, hooks and straps
C-10.03.03	remove framework from pockets
C-10.03.04	store and secure all pre-fabs and related components

Sub-task**C-10.04 Lays down derrick.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-10.04.01 visually inspect derrick for loose equipment and components
- C-10.04.02 repair and replace worn, damaged or defective equipment such as lay-down lines, bridle lines and sheaves
- C-10.04.03 select and use tools and equipment such as hammers, ratchets and winches
- C-10.04.04 identify hazards such as over pulling, lines catching and pinch points
- C-10.04.05 spool lines according to rig requirements
- C-10.04.06 rig out derrick components and monkeyboard

Sub-task**C-10.05 Rigs out mud tanks, pumps and circulation systems.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-10.05.01 identify and depressurize lines
- C-10.05.02 transfer volume to tank farms, storage bins and vacuum (vac) trucks
- C-10.05.03 select and use tools and equipment such as hammers, wrenches and side cutters
- C-10.05.04 store and secure equipment in designated area
- C-10.05.05 disconnect air monitoring devices
- C-10.05.06 perform visual check of components such as valves, bridge gates, rubbers and grease lines
- C-10.05.07 winterize and prepare equipment storage and transport

Sub-task**C-10.06 Rigs out boiler and steam circulation systems.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-10.06.01 select and use tools and equipment such as hammers, wrenches and steam hoses
- C-10.06.02 depressurize and cool boiler
- C-10.06.03 shut down boiler
- C-10.06.04 blow down steam lines
- C-10.06.05 drain water pump and related lines
- C-10.06.06 store and secure equipment in designated area

Sub-task**C-10.07 Rigs out air, water, fuel and hydraulic lines, and power cables.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-10.07.01 store and secure equipment such as cords, hoses and manifolds in designated area
- C-10.07.02 depressurize and blow out lines
- C-10.07.03 select and use tools and materials such as hammers and contact cleaner
- C-10.07.04 locate breakers and ensure they are turned off prior to disconnecting power cables
- C-10.07.05 disconnect EDR, air, water, fuel and hydraulic lines, and power cables

Sub-task**C-10.08 Rigs out third-party service provider equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- C-10.08.01 select and use tools and equipment such as hammers, knives and wash guns
- C-10.08.02 remove, store and secure equipment such as cords, hoses and flow lines in designated area
- C-10.08.03 drain all fluids
- C-10.08.04 winterize equipment such as pumps
- C-10.08.05 disassemble third-party service provider equipment according to company specifications

Trends	There is an increase in documentation and maintenance requirements.
Related Components (including, but not limited to)	<p>Mechanical systems: engines, drawworks, transmissions, cotta boxes, swivels, rotary tables, gears, brake bands and linkages, drive shafts, U-joints.</p> <p>Hydraulic systems: BOPs, kelly spinners, top drives, winches, pipe spinners, catwalks, iron roughnecks.</p> <p>Pneumatic systems: air compressors, air controls, clutches.</p> <p>Electrical systems: electrical top drives, breaker panels, silicone control rectifiers (SCR), motor control centres (MCC), generators, electrical motors.</p> <p>Boilers: burners, relief valves, flues, fuel/water pumps, filters, mercury switches.</p> <p>Overhead equipment: blocks, winches, hooks, swivels, monkeyboards, top drives, elevators, safety cables, emergency escape devices, traveling equipment, crown saver.</p> <p>Floor equipment: slips, tongs, stabbing valves, inside BOPs, spinners, dog collars.</p> <p>Water circulating systems: pumps, unions, hoses, valves, manifolds, hardlines.</p> <p>Fuel circulating systems: pumps, filters, unions, hoses, valves.</p> <p>Steam circulating systems: unions, hoses, manifolds, hardlines.</p> <p>Drilling fluid circulating systems: mud pumps, pulsation dampeners, high pressure hoses and valves, unions, manifolds, washpipe packing, gauges.</p>
Tools and Equipment	See Appendix A.

Task 11

Inspects rig equipment.

Context The inspection of rig equipment is crucial in preventing equipment failure, injury and downtime. It is important for rig technicians to pass on knowledge to less experienced hands by including them in the inspection process.

Required Knowledge

K 1	major and minor deficiencies
K 2	engine requirements and settings
K 3	lubrication requirements
K 4	equipment configuration
K 5	required forms such as company-specific inspection reports, CAODC checklists, and pre-spud and pre-drillout checklists
K 6	jurisdictional rules and regulations
K 7	daily operations and proper functioning of equipment
K 8	accumulator requirements
K 9	repair and maintenance history of equipment
K 10	tools and equipment used to detect required repairs

Sub-task

D-11.01 Performs daily walk-around and detailed rig inspection.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

D-11.01.01	conduct sensory inspection such as visual, hearing and smelling
D-11.01.02	conduct inspection of equipment such as tongs, slips and overhead equipment according to drilling operations
D-11.01.03	conduct inspection in sequence to task at hand such as pre-spud, drill-out and derrick inspection
D-11.01.04	identify and eliminate hazards such as spills, slips, trips and falls
D-11.01.05	identify problems such as potential equipment failure, damaged equipment and incorrect manifold configurations

Sub-task**D-11.02 Determines required repairs.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

D-11.02.01	problem-solve to determine required repair
D-11.02.02	confirm repair requirements by consulting manuals, supervisors and other resources
D-11.02.03	prioritize repairs according to drilling operations
D-11.02.04	adapt procedures to work around needed repairs

Task 12**Maintains rig equipment.**

Context Maintaining rig equipment is done to prevent equipment damage and injury, and to reduce downtime. To make the most efficient use of the crew's time, maintenance can be done during drilling, tripping and logging operations, and during rig moves.

Required Knowledge

K 1	mechanical system components such as engines, drawworks, rotary tables, gears, brake linkages, drive shafts, U-joints and brake bands
K 2	engine requirements such as oil volumes, coolant ratios and air filter indicators
K 3	lubrication and greasing requirements and components
K 4	required belts, chains and tensions
K 5	hydraulic system components such as kelly spinners, top drives, winches, pipe spinners, catwalks and iron roughnecks
K 6	hydraulic system for BOPs and accumulator
K 7	hydraulic filter requirements
K 8	normal operating pressures, temperatures and circulation
K 9	accumulator pressures and pre-charge pressures
K 10	pneumatic system components such as air compressors, clutches, controls, pumps and horns
K 11	air-over-hydraulic systems

K 12	system pressures
K 13	pressure ratings
K 14	electrical system components such as electrical top drives, plug ends, breaker panels, SCR, MCC, generators and electrical motors
K 15	amperage, voltage and electrical testing equipment
K 16	phase specifications such as single and three phase
K 17	training and certification required to work with boilers
K 18	boiler components such as burners, relief valves, flues, fuel/water pumps and mercury switches
K 19	cleaning requirements and boiler additives
K 20	required cool-down procedures
K 21	overhead equipment such as blocks, winches and top drives
K 22	wear points
K 23	location of grease nipples and lubrication points
K 24	floor equipment such as slips, tongs, spinners and dog collars
K 25	drilling fluid circulating systems
K 26	mud pumps and hammer unions
K 27	safety cable requirements
K 28	water and fuel pumps

Sub-task

D-12.01 Maintains mechanical, hydraulic and pneumatic systems.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

D-12.01.01	change oil and filters on equipment on the rig such as hydraulic systems, air compressors and engines
D-12.01.02	maintain and operate engines, motors and pumps according to OEM specifications
D-12.01.03	repair or replace components such as gauges, pumps and air filters
D-12.01.04	check and clean suction screens on accumulator and hydraulic pumps
D-12.01.05	find and repair leaks in hoses and fittings
D-12.01.06	keep air systems free of water and debris by blowing down air tanks and using additives such as methanol, air brake antifreeze and air dryer pellets

Sub-task**D-12.02 Maintains electrical systems.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

D-12.02.01	record wire configurations to ensure proper re-installation
D-12.02.02	lubricate electrical motors by greasing to OEM specifications
D-12.02.03	de-energize electrical sources for repairs
D-12.02.04	repair or replace damaged electrical components such as cords, plugs, switches and breakers according to phase specifications
D-12.02.05	synchronize generators and bring online according to OEM specifications

Sub-task**D-12.03 Maintains boiler.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

D-12.03.01	blow down boiler and check pH and stack temperature
D-12.03.02	add boiler compound to maintain or raise pH level
D-12.03.03	remove and replace worn, damaged and defective boiler components such as hoses, valves and pumps
D-12.03.04	clean boiler and boiler components using tools and equipment such as wash guns and fire tube brushes

Sub-task**D-12.04 Maintains overhead equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- D-12.04.01 check oil levels in top drive, swivels and kelly spinner according to maintenance schedule
- D-12.04.02 lubricate all overhead equipment such as crown, wash pipe, tong sheaves, and travelling block assembly according to maintenance schedule
- D-12.04.03 operate and adjust overhead equipment such as top drive, swivel and gear box
- D-12.04.04 identify and replace defective overhead equipment such as cables, overhead clevises and clamps

Sub-task**D-12.05 Maintains floor equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- D-12.05.01 lubricate floor equipment such as iron roughnecks, tongs, pipe spinners and rotary table
- D-12.05.02 replace make-up and break-out lines, and tong hold back lines depending on wear
- D-12.05.03 replace tong and slip dies, and pipe spinner chain depending on wear
- D-12.05.04 select tools and equipment such as hammers, tong die punches and wrenches
- D-12.05.05 maintain fluid levels in torque gauges

Sub-task**D-12.06 Maintains drilling fluid circulating systems.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

D-12.06.01	replace or rebuild high and low pressure valves due to leaks or washing
D-12.06.02	repair leaks on equipment components such as hammer unions and pump caps
D-12.06.03	service mud pumps such as the power end and the fluid end, and check fluid levels
D-12.06.04	adjust tension on belts and chains according to rig
D-12.06.05	set pop valve to proper pressure rating of drilling operations and equipment according to OEM
D-12.06.06	replace packing for pumps such as trip, lubricating and pre-charge pumps
D-12.06.07	replace or repair gaskets, gauges, sensors and washpipe

Sub-task**D-12.07 Maintains water, steam and fuel circulating systems.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

D-12.07.01	replace or repair service steam heater for deficiencies such as leaking core, burnt motor and damaged fan blade
D-12.07.02	service and maintain wash guns by checking oil, cleaning suction screen and changing valves
D-12.07.03	replace low pressure valves damaged due to leaks or washing
D-12.07.04	replace packing on pumps such as water and fuel pumps
D-12.07.05	repair or replace hoses to fix leaks
D-12.07.06	replace gauges and fuel filters according to pre-determined pressures
D-12.07.07	manipulate water and steam manifold to increase or decrease pressure according to task such as steaming or washing

Trends

In some locations, surface hole drilling is performed by pre-set rigs in advance of the drilling rig moving on to the location.

There are always new technologies being introduced to make drilling operations safer and more efficient such as faster drilling bits and improved mud programs.

New casing technologies such as pipe alignment tools and hydraulic catwalks are increasingly being used for safety and efficiency purposes.

Specialized surveying equipment is increasingly being used because of their accuracy and speed.

**Related
Components
(including, but not
limited to)**

Bottom hole assembly (BHA): drill bits, collars, crossover subs, mud motors, stabilizers, jars, shock subs, monels, heavyweight drill pipe, agitators, specialized directional subs.

Blowout preventer (BOP): accumulators, hydraulic-controlled relief (HCR) valves, manual relief valves, kill line valves, annular preventers and diverters, pipe rams, blind rams, shear rams.

Associated BOP components: degassers, degasser lines, manifolds, flare lines, hydraulic/manual chokes, valves, choke hoses, kill line hoses, gut lines, remote BOP control panels, inside BOP valves.

Drilling fluids: water-based and oil-based drilling fluids, additives.

Drilling components: floor equipment, drilling consoles, mud pumps, drawworks, top drives, swivels and kelly bars, shakers, mud tanks, shale bins.

Tripping components: elevators, mud cans, stabbing valves, slips, tongs, dog collars, blocks, birdbaths, monkeyboards, crown savers, deadman and fastline anchor clamps, driller's controls, iron roughnecks, pipe spinners, iron derrickhands, pipe thread compound (pipe dope).

Casing components: casing, casing protectors, float collars, float shoes, shoe collars, marker joints, stop collars, scratchers, centralizers, turbulizers, stand-off bands, thread lock compound.

**Tools and
Equipment**

See Appendix A.

Task 13

Prepares for drilling operations.

Context The verification and testing of equipment and their components, and the mixing of drilling fluids are activities that, once completed, allow rig technicians to commence drilling operations. Mouseholes and ratholes are drilled as part of the preparation for drilling operations in some instances.

Required Knowledge

- K 1 equipment that requires assessment prior to commencing drilling operations such as circulating equipment, motor kills, crown savers and emergency shut-downs
- K 2 normal operating parameters of equipment such as motor operating temperatures and pressures, rig air pressures and rig fuel pressures
- K 3 application parameters (viscosity, pH, mud weight) of drilling fluids for possible hole trouble such as sloughing, gravel and coal seams
- K 4 types of drilling fluids such as water-based and oil-based
- K 5 mixing systems and components such as hoppers, mixing motors and pre-mix tanks
- K 6 WHMIS labels and MSDS
- K 7 dangers of working with hazardous chemicals associated with drilling fluids
- K 8 BHA required for drilling mouseholes and ratholes
- K 9 hazards associated with drilling mouseholes and ratholes
- K 10 drilling sequence for mouseholes and ratholes
- K 11 lock-out procedures
- K 12 proper use and selection of tools and equipment
- K 13 purpose and effects of various additives on mud programs
- K 14 PPE to be used while mixing
- K 15 procedures for handling and mixing additives such as caustic soda and lime

Sub-task**E-13.01 Checks condition of drilling components.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-13.01.01 function test equipment such as crown savers, and hoisting, rotary and pump clutches to ensure proper operation
- E-13.01.02 reset and adjust equipment as required such as recalibrating the EDR and bleeding off the pumps

Sub-task**E-13.02 Mixes drilling fluid.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-13.02.01 test properties of mud using tools and equipment such as mud scales, funnels and viscosity cups
- E-13.02.02 determine mixing rates by calculating circulation time using volumes and pump rates
- E-13.02.03 follow the mud program or directions provided by the operator's representative
- E-13.02.04 mix different types of drilling fluids according to their application

Sub-task**E-13.03 Drills mousehole and rathole.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-13.03.01	assemble and disassemble BHA components such as collars, bits and cross-overs
E-13.03.02	drill mousehole and rathole using equipment such as kelly spinners, tongs, mud motors and pumps
E-13.03.03	adjust drilling parameters and mud properties according to hole conditions such as gravel, loss circulation and boulders

Task 14**Prepares drill string.**

Context The drill string consists of the BHA which includes a bit, bit subs, collars, cross-overs and, if required, specialized drilling tools such as mud motors, 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, or by uncoiling a continuous length of pipe from a coil (coiled tubing rig). The drill string is used for drilling the surface hole or main hole.

Required Knowledge

K 1	BHA components such as drill bits, collars and cross-over subs
K 2	thread types and torque specifications
K 3	bit and bit breaker sizes, and types
K 4	sizes of collars
K 5	elevator and tong jaw sizing
K 6	safe handling of all tubulars on floor and catwalk
K 7	company policies, procedures and parameters such as for worker placement and mouseholing of drill string components
K 8	measurements of all BHA components such as outside diameter (OD), inside diameter (ID) and total length

K 9	installation procedures for dog collars and slips
K 10	placement of strap tape when measuring tubulars

Sub-task

E-14.01 Takes measurements of bottom hole assembly (BHA) and drill string.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-14.01.01 read and record length of BHA components such as drill collars, cross-overs and drill pipe using strap tape measures
- E-14.01.02 measure ID/OD of BHA components using callipers and tape measures
- E-14.01.03 size drill bit nozzles (jets) using nozzle gauge

Sub-task

E-14.02 Picks up bottom hole assembly (BHA) and drill string.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-14.02.01 tighten lifting nubbins, pickup subs and protectors prior to hoisting
- E-14.02.02 hoist collars to floor using proper holdback procedures with equipment such as winches, collar slings and rigging/hoisting equipment
- E-14.02.03 latch elevators onto collar pickup subs or zip grooves

Sub-task**E-14.03 Makes up bottom hole assembly (BHA).**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-14.03.01	install each BHA component according to company requirements and trade practices using tools and equipment such as pipe spinners and chain tongs
E-14.03.02	torque each connection to specifications using proper size tong jaws
E-14.03.03	install dog collars on required BHA components
E-14.03.04	change bit nozzles according to oil company requirements

Task 15**Installs blowout preventer (BOP) equipment and associated components.**

Context 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. By law, BOPs must be used in drilling operations and tested regularly.

Required Knowledge

K 1	work permits such as hot, cold and confined spaces
K 2	cellar preparation
K 3	BOP components such as accumulators, HCR valves, kill lines, annular preventers, and pipe, blind and shear rams
K 4	associated components such as degassers, degasser lines, manifolds, hoses, chokes, flare lines, gut lines, flare tanks and valves
K 5	safe BOP lifting procedures
K 6	component requirements such as types of ring gaskets, stud tensile ratings, torques and tightening sequences
K 7	National Association of Corrosion Engineers (NACE) stamped equipment
K 8	procedure for hooking up accumulator hoses
K 9	accumulator pressures, pre-charges, operating range and pressure ratings
K 10	BOP remote and manual controls
K 11	nitrogen and air pump backup requirements

K 12	pressure testing procedures
K 13	high/low limits and time to hold tests
K 14	equipment that needs to be pressure tested such as upper and lower kelly cocks, stabbing valves, inside BOP, manifold valves and BOP stacks
K 15	accumulator function tests and requirements
K 16	winterizing manifold process (blowing out and/or filling with antifreeze)
K 17	hand signals and clear communication methods

Sub-task

E-15.01 Prepares for blowout preventer (BOP) installation.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-15.01.01	organize tools for the job
E-15.01.02	remove fluid from casing by displacing, pumping or using air pressure according to company policies
E-15.01.03	measure out casing bowl height for positioning BOP
E-15.01.04	measure and cut casing at required height
E-15.01.05	lay down cut-off casing and conductor
E-15.01.06	install casing bowl onto casing using rigging/hoisting equipment
E-15.01.07	lay down mousehole using rigging/hoisting equipment

Sub-task

E-15.02 Nipples up blowout preventer (BOP).

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-15.02.01	hoist, line up and set down BOP on casing bowl ring gasket using required rigging/hoisting equipment
E-15.02.02	fasten BOP to casing bowl using tools such as impact wrenches and sockets, and/or hammer wrenches and sledgehammers

E-15.02.03	clean BOP component flanges and gaskets
E-15.02.04	fasten HCR and kill line valves to the BOP stack
E-15.02.05	rig in flow-tee, flow line, catch tray and hole fill hose
E-15.02.06	align BOP to rotary table centre using tools such as turnbuckle straps, and chains and boomers

Sub-task

E-15.03 **Pressurizes blowout preventer (BOP) accumulator.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-15.03.01	close bleed off valve on accumulator manifold
E-15.03.02	start accumulator pump and record pre-charge pressure
E-15.03.03	visually check hoses and fittings for leaks
E-15.03.04	record accumulator working pressure
E-15.03.05	visually check accumulator fluid levels on sight glass or dipstick

Sub-task

E-15.04 **Function tests blowout preventer (BOP) accumulator.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-15.04.01	function test BOP components such as blind rams, pipe rams and HCR to ensure they are operating as required
E-15.04.02	troubleshoot accumulator malfunctions such as incorrect hose hook-up, and faulty programmable logic controller (PLC) and air remotes
E-15.04.03	bleed off accumulator pressure prior to correcting any identified malfunctions

Sub-task**E-15.05 Pressure tests blowout preventer (BOP) and components.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-15.05.01	screw test plug/cup on bottom of drill pipe to required torque
E-15.05.02	place test plug/cup and drill pipe inside BOP stack according to oil company specifications
E-15.05.03	close each BOP component and manifold valves separately and apply required pressures (low and high) using mud pumps or third-party pressure testers to ensure each component holds the pressure
E-15.05.04	visually inspect BOP components for leaks
E-15.05.05	bleed off pressure to correct any identified leaks
E-15.05.06	open and close valves to verify manifold, kill line and HCR configuration

Task 16**Performs drilling activities.**

Context Drilling activities are done in the search for oil and gas. 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.

Required Knowledge

K 1	types of drilling fluids such as water-based and oil-based
K 2	drilling fluid additives and their purposes
K 3	mud tanks and circulating systems
K 4	geological formations
K 5	drilling equipment such as kelly bars, top drives, drilling consoles, mud pumps, drawworks, swivels, shakers and shale bins
K 6	floor equipment and their limitations
K 7	tank monitors
K 8	alarm settings

- K 9 set parameters such as weight on bit (WOB), maximum pressure, strokes per minute (spm) and revolutions per minute (rpm)
- K 10 operation of auto-driller
- K 11 kick warning signs and procedures for flow check and shut-in
- K 12 necessary data to be recorded in tour sheet such as reduced speed pump pressure (RSPP), MACP, torque, rpm and off-bottom pressure
- K 13 drilling practices such as drill out procedures and fast drilling
- K 14 pipe grade differences and position in the well
- K 15 pipe specifications such as OD and ID, grades and weights
- K 16 inventory of all tubulars on location
- K 17 documentation of pipe tally in hole
- K 18 wire line surveys (clock or electronic) and specialized survey equipment
- K 19 survey equipment assembly procedures
- K 20 safe practices for running wire line spool
- K 21 survey intervals
- K 22 handling of tubulars
- K 23 procedures for handling and mixing additives such as caustic soda and lime
- K 24 layout and operation of mud tanks and mixing systems
- K 25 functions of controls on the driller's console
- K 26 effect of changes in wellbore conditions such as sloughing holes and mud rings
- K 27 well control methods such as drillers' method, low choke, wait and weight, and volumetric
- K 28 well control equipment such as chokes, manifolds, degassers, flare lines, BOPs and accumulators
- K 29 hand signals and clear communication methods

Sub-task

E-16.01 Maintains drilling fluids.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-16.01.01 test drilling mud for properties such as pH, weight, viscosity and fluid loss
- E-16.01.02 follow mud program or directions provided by the operator's representative

- E-16.01.03 adjust mix to counter problems with drilling fluids such as low viscosity, mud rings, clobbering (thickening of mud) and aerated mud by adding additives
- E-16.01.04 alter mud weight by changing shaker screens, running centrifuges and adjusting water rate
- E-16.01.05 transfer fluids from reserve tanks such as tank farms, pre-mix tanks and water tanks to active mud system in order to maintain mud properties and volumes

Sub-task

E-16.02 Operates drilling equipment.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-16.02.01 engage hoisting clutch to move drill string in an upward motion
- E-16.02.02 disengage hoisting clutch and apply braking mechanism to lower drill string in a controlled manner
- E-16.02.03 engage pump and rotary to desired rates for drilling activities
- E-16.02.04 set up and engage auto-driller to desired rates such as WOB, differential pressure and rate of penetration (ROP) limits
- E-16.02.05 adapt to changing conditions by modifying drilling parameters such as pump rate, WOB and rotary speed

Sub-task

E-16.03 Monitors hole, drilling and equipment conditions.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-16.03.01 monitor tank volume alarms for gain or loss of flow and volume
- E-16.03.02 visually monitor cuttings and fluids for changes in returns
- E-16.03.03 monitor gauges and outputs to evaluate performance of equipment such as mud pumps, drawworks, top drives, swivels and shakers

- E-16.03.04 interpret hole condition indicators such as penetration rate, cuttings, fluid returns, torque, drag and pump pressure
- E-16.03.05 monitor gas detector for abnormal increases in readings
- E-16.03.06 monitor pump gauges for abnormal pressures to identify problems such as washes in drill string and plugged jets
- E-16.03.07 monitor hole deviation using surveying equipment such as wire line, single shot and measurement while drilling (MWD)

Sub-task

E-16.04 Performs well control operations.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-16.04.01 operate BOP controls such as annular preventers, pipe rams and blind rams, following company policies and OEM recommendations
- E-16.04.02 light flare stack to burn off gas at surface
- E-16.04.03 read and record well control data such as shut-in drill pipe pressure, shut-in casing pressure and MACP
- E-16.04.04 increase mud density to achieve required weight to kill well by adding additives such as barite and calcium carbonate
- E-16.04.05 circulate out contaminated mud while monitoring tank volumes and maintaining drill pipe pressure to reduce the risk of a second influx (kick)
- E-16.04.06 adapt to changing conditions such as plugged jets, sloughing hole and loss of circulation

Task 17

Performs tripping activities.

Context 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, breaking up mud rings, doing wiper trips, and after achieving total depth (TD).

Required Knowledge

K 1	tripping equipment such as elevators, bales, mud cans, stabbing valves, slips, tongs, monkeyboards and controls
K 2	hole conditions
K 3	torque requirements
K 4	pipe displacement and capacities for filling out trip sheets
K 5	tong jaw sizing
K 6	shut-in procedures while tripping
K 7	kick warning signs while tripping
K 8	procedures to rack back tubulars in monkeyboard
K 9	rig-specific slip and cut procedures
K 10	rig-specific laydown procedures
K 11	pipe handler / laydown truck rig in procedures and operation
K 12	slings ratings and conditions
K 13	winch load limits
K 14	elevator sizing
K 15	safe handling of tubulars on floor and catwalk
K 16	hazards associated with tripping activities
K 17	documentation of pipe tally in hole

Sub-task**E-17.01 Prepares for trip.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-17.01.01	organize tools and equipment for tripping activities such as pipe spinners, dog collars and pick-up subs
E-17.01.02	visually inspect tripping equipment for missing, damaged or worn components
E-17.01.03	set up catwalks, birdbaths and pipe racks
E-17.01.04	set up trip tank to fill hole
E-17.01.05	circulate fluid or blow back kelly bar or top drive with air in winter
E-17.01.06	perform required pre-trip flow check
E-17.01.07	calculate hole fill volumes required and record on trip sheet

Sub-task**E-17.02 Trips drill string and bottom hole assembly (BHA).**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-17.02.01	install bales and elevators on blocks using winches, slings and wrenches
E-17.02.02	monitor fluid levels while tripping and at required flow check intervals
E-17.02.03	make up and break pipe and collars using tools such as tongs, iron roughnecks and pipe spinners
E-17.02.04	use winches on the rig floor to manipulate drilling tools such as pickup subs, jars, bits and bit subs
E-17.02.05	monitor weight indicator and ream in/out according to changes in hole conditions
E-17.02.06	contain mud to floor area using mud cans
E-17.02.07	verify accuracy of volumes required by completing trip sheets

Sub-task**E-17.03 Performs slip and cut.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-17.03.01 calculate drill line to be cut off according to megajoules on EDR or manual calculation
- E-17.03.02 visually inspect drill line for wear or damage
- E-17.03.03 remove drill line section following rig-specific procedures according to company policies
- E-17.03.04 slip new drill line section following rig-specific procedures according to company policies

Sub-task**E-17.04 Lays down pipe and bottom hole assembly (BHA).**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-17.04.01 tighten lifting nubbins, pickup subs and protectors prior to laying down
- E-17.04.02 lower tubulars using equipment such as bumper blocks, hydraulic catwalks, winches, loaders and laydown lines
- E-17.04.03 store pipe in pipe tubs or tier pipe on pipe racks using stripping and chocks

Task 18

Performs casing activities.

Context

Rig technicians are responsible for preparing and running casing strings. 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.

Required Knowledge

- K 1 sizes and weights of casing
- K 2 hazards of unloading and tiering casing
- K 3 casing equipment such as power tongs, casing fill equipment, elevators and slips
- K 4 hand signals and clear communication methods
- K 5 torque specifications
- K 6 running procedures such as use of snubbing ropes and thread protectors
- K 7 float shoes and thread types
- K 8 casing accessories such as scratchers, centralizers, and float and shoe collars
- K 9 surging pressures
- K 10 hole conditions
- K 11 when to circulate casing
- K 12 cementing equipment such as cement heads, high pressure lines, wiper plugs, chucks and safety cables
- K 13 cementing procedures
- K 14 cement wait times
- K 15 hazards such as cementing equipment and properties of cement
- K 16 levels of casing such as surface, intermediate and production
- K 17 types of production casings such as multi-stage fracture (frac) assembly, slotted liners and blank liners
- K 18 displacement and capacity of casing
- K 19 need for third-party equipment inspection and certification

Sub-task**E-18.01 Prepares casing.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-18.01.01 unload and tier casing using loader or boom truck (picker)
- E-18.01.02 remove casing protectors to drift and visually inspect threads to identify casing defects
- E-18.01.03 measure casing, float collars, shoe joints and marker joints to ensure proper casing stick up and positioning of marker joints and frac tools

Sub-task**E-18.02 Installs casing equipment.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-18.02.01 hoist third-party service provider equipment to rig floor using rigging/hoisting equipment
- E-18.02.02 hang up power tongs, attach elevators to bales and hook up casing fill equipment
- E-18.02.03 hook up pipe alignment tool and stabbing board

Sub-task**E-18.03 Runs casing.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-18.03.01 retrieve casing from catwalk using equipment such as winch lines, hydraulic catwalk skate and pipe handler (lay-down truck)
- E-18.03.02 centre and stabilize casing while working from stabbing board
- E-18.03.03 pick up casing in the elevators using drilling console controls and setting it in the previous joint (stump)
- E-18.03.04 screw casing joints together using tools and equipment such as chain tongs, pipe spinners and third-party power tongs
- E-18.03.05 circulate casing using equipment such as circulating head, chucks and 2-in. standpipe
- E-18.03.06 install and set casing slips to keep casing string in tension and centered with surface casing

Sub-task**E-18.04 Performs cementing operations.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-18.04.01 hoist third-party service provider equipment to rig floor using rigging/hoisting equipment
- E-18.04.02 install cementing equipment such as circulating head, manifold and hard lines
- E-18.04.03 move casing string up and down using drilling controls to prevent channelling of cement
- E-18.04.04 monitor casing movement and fluid returns to identify cementing problems such as hydraulicing of casing, loss of returns and plug not holding
- E-18.04.05 chain down casing when plug is dropped to counter hydraulicing

- E-18.04.06 flush conductor barrel or BOP with water to clean cement out of components
- E-18.04.07 operate controls to pump drilling fluids to cementers' equipment and circulate drilling fluids to flush pipe

Task 19

Performs specialized drilling operations.

Context

These operations require specialized skills. They all 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/air 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 bottom hole pressure for the purpose of well control.

Required Knowledge

- K 1 coring procedures
- K 2 types of core barrels
- K 3 directional drilling procedures
- K 4 directional drilling equipment such as MWD, mud motors and rotary steerable motors
- K 5 hazards involved with table torque
- K 6 parameters such as maximum differential pressure, maximum rpm, WOB and pump rate
- K 7 underbalanced and managed pressure procedures
- K 8 underbalanced and managed pressure equipment such as compressors, rotating heads, float equipment and separator
- K 9 underbalanced materials such as air, nitrogen and foam
- K 10 fluid required on surface for underbalanced drilling
- K 11 snubbing and stripping procedures
- K 12 documentation of pipe tally in hole

Sub-task**E-19.01 Performs coring activities.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-19.01.01	assemble and disassemble coring tools
E-19.01.02	drill with coring tools such as coring bits, barrels and catchers
E-19.01.03	retrieve, handle and store core following methods and procedures according to drilling plan
E-19.01.04	coordinate tasks with third-party service providers
E-19.01.05	follow third-party service provider parameters and instructions

Sub-task**E-19.02 Performs directional drilling.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-19.02.01	assemble and disassemble directional tools
E-19.02.02	follow third-party service provider parameters and instructions while drilling
E-19.02.03	install pop valve pins, and heads and liners according to third-party service provider parameters
E-19.02.04	cycle pumps for surveys
E-19.02.05	steer mud motor using equipment such as steering cable, table brake and top drive

Sub-task**E-19.03 Performs underbalanced drilling (UBD) and managed pressure drilling (MPD).**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

E-19.03.01	assemble and disassemble underbalanced and managed pressure tools and equipment
E-19.03.02	follow third-party service provider parameters and instructions while drilling
E-19.03.03	use communication equipment such as two-way radios to ensure timing and procedures
E-19.03.04	monitor gas and pressure while performing drilling and tripping operations
E-19.03.05	shut in and equalize pressure during tripping procedures while underbalanced drilling
E-19.03.06	perform snubbing and stripping procedures while underbalanced drilling

Task 20**Performs specialized well operations.**

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

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.

Required Knowledge

K 1	situations such as twist-offs, and stuck or tight pipe
K 2	working tight hole and jarring procedures
K 3	stuck pipe situations such as differentially stuck, keyseats and formation faults, and sloughing or swelling formations
K 4	fishing techniques such as free pointing, backing off, performing cut and thread, and spotting acid or oil
K 5	company policies on fishing operations

- K 6 NACE certification requirements for working in sour gas conditions
- K 7 H₂S and H₂S inhibitors
- K 8 shut-in procedures while working with H₂S
- K 9 ERP
- K 10 specific equipment requirements such as shear rams, boosters, well ignition equipment, blanking tools, SABA and SCBA
- K 11 exposure limits
- K 12 fluid requirements
- K 13 drill pipe shearing procedures
- K 14 stripping and snubbing procedures
- K 15 third-party logging equipment
- K 16 hazards associated with radioactive sources
- K 17 restricted areas while logging
- K 18 drill stem testing (DST) equipment such as downhole safety valves (DSV), test plugs, packers and methanol injection tools
- K 19 reverse circulating
- K 20 restrictions while testing
- K 21 pipe tally in order to place packers and bridge plugs
- K 22 perforating equipment
- K 23 wellhead equipment such as rings, valves, studs and hammer wrenches
- K 24 lifting and hoisting techniques
- K 25 cementing equipment such as circulating heads, chucks and hoses
- K 26 hazards of cement and equipment
- K 27 wireline equipment such as wireline tools, elevator hooks and sheaves
- K 28 hazards of running wireline
- K 29 man-down drills and search plans
- K 30 pressure ratings of wellhead equipment such as 2000, 3000 and 5000 pounds per square inch (psi)
- K 31 compatibility of equipment
- K 32 pressure testing procedures for bridge plugs and packers

Sub-task**E-20.01 Performs fishing and stuck pipe operations.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-20.01.01 use fishing tools and equipment such as washover pipe, magnets, spears, grapples, overshots and surface jars to retrieve stuck, twisted off or dropped pipe
- E-20.01.02 operate controls to free drill string using procedures such as jarring, spearing and washing based on third-party service provider instructions

Sub-task**E-20.02 Rigs wireline loggers in and out.**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-20.02.01 operate controls to pick up wireline equipment with winches and blocks
- E-20.02.02 assist third-party service providers by hanging sheaves at required height
- E-20.02.03 visually monitor well for flow or loss while logging

Sub-task**E-20.03 Performs drill stem testing (DST).**

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-20.03.01 operate controls to bring test tools to rig floor
- E-20.03.02 assemble test tool onto bottom of drill pipe following third-party service provider instructions
- E-20.03.03 ignite flare stack to burn gas at surface

- E-20.03.04 operate controls to position drill string and test tools at required intervals according to company directions
- E-20.03.05 displace formation fluids and/or gases by using reverse circulation procedures

Sub-task

E-20.04 Performs sour well operations.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-20.04.01 monitor for sour gas using equipment such as hand held units and mounted monitoring equipment
- E-20.04.02 operate controls while wearing breathing apparatus such as SCBA or third-party service provider supplied SABA

Sub-task

E-20.05 Completes the well.

<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>
NV	NV	NV	ND	ND	ND	yes	yes	yes	yes	NV	ND	ND

Key Competencies

- E-20.05.01 attach packers and bridge plugs onto bottom of drill pipe in order to trip to required depth according to oil company representative's instructions
- E-20.05.02 run tubing and production casing such as slotted liners, blank liners and fracture (frac) assemblies
- E-20.05.03 operate controls to position drill string for required cement plug intervals
- E-20.05.04 install well head or bonnet after nipping down BOPs

APPENDICES

Hand Tools

adjustable wrenches	levels
banding tools	limbing saw (swede saw)
cable cutter	oil filter wrenches
casing cutters	paint brushes
chain, bench and pipe vises	pipe cutters
chain tongs	pipe threader
chisels, punches	pipe wrenches
cleaning tools (brooms, scrub brushes, etc.)	pliers (locking, needlenose, channel locks, side cutters)
combination wrenches	saws (hacksaw, wood saw, hole saw)
crowbars, pinch bars	screwdrivers
drill bits	shovels, spades, picks
EZ outs	snap ring pliers
files	socket sets
flaring tools	specialty tools for installing, removing jets
hammer wrenches	taps and dies
hammers (ball peen, 5 lb. 10 lb. sledge hammers)	torque wrenches
hex keys	vise grips or locking pliers
jacks	wire brushes

Power Tools, Hydraulic Tools and Pneumatic Tools

chop saws	pneumatic impact tools
crimping tools (for hydraulic fittings)	power saws (chain, skill, jig)
drills	seat pullers
grinders	soldering irons
hydraulic jacks	transfer pumps
hydraulic tools (pipe spinners)	wash guns
pneumatic grinders	

Diagnostic Tools

air monitoring equipment	ohmmeters
computers	thermometers
engine diagnostic tools	voltage meters

Measuring Tools

calipers	rulers
measuring tapes	thread gauges
meter sticks	torque wrenches
mud weight scales	viscosity cups and funnels
nozzle gauges	water loss press

Rigging, Hoisting and Handling Equipment

chain hoist	loader
chains	mobile crane
clevises	nylon and cable slings
come-along	shackles
forklift	snatch block
grip hoist	tugger (vertical winch / boom line)
hand boomers, ratchet boomers	

Personal Protective Equipment (PPE) and Safety Equipment

aprons	hearing protection
burn kits	lock outs
derrick harness	respirators
eye wash stations	rubber gloves
face shield	safety glasses
fire extinguishers	self-contained breathing apparatus (SCBA)
first aid kits	self-retracting life lines (SRL)
flame retardant coveralls	steel-toed boots
full body harness	stretchers
goggles	supplied air breathing apparatus (SABA)
hard hats	work positioning lanyards (WPL)

Specialized Trade Equipment

float puller	pipe wiper
floats	rubber roughneck
gauge rings	survey barrels
mud can	survey landing rings

annular	annular blowout preventer: a large valve, usually installed above the ram preventers, that forms a seal in the annular space between the pipe and the wellbore or, if no pipe is present, in the wellbore itself
bird bath	used to store stands of pipe on rig floor
blowout	uncontrolled kick
blowout preventer (BOP)	series of hydraulically or manually controlled valves. that are used to shut a well in, in the event a kick is taken
bumper block	used to stop drill pipe from going off the end of catwalk when lowered from rig floor
catwalk	elevated walkway at the bottom of the V-door where pipe is laid to be lifted to the rig floor by the tugger
chicksan	high pressure steel line with swivel ends
chocks	wooden blocks used to prevent tubulars from rolling off pipe racks
core barrel	tubular device, usually from 3 to 18 metres (10 to 60 feet) long, run at the bottom of the drill pipe used to cut a core sample (it is not put in place of a drill bit, it is used along with a coring bit)
cross-over	steel pipe that has different thread types at either end, usually short in length anywhere from 0.5m – 2.0m
crown saver	emergency device to stop traveling blocks from hitting the crown
deadman	anchor for dead line
float	valve installed into the drill string to allow the flow of fluids through the drill string in only one direction
flow nipple	connects top of BOP to flow line, and directs drilled solids towards the shaker
gen-sets	diesel engine with a generator to produce electricity for the rig
hydraulic	drill string moving up in wellbore caused by too much pump pressure in tight hole condition

iron roughnecks	manufacturer's name for a floor-mounted combination of a spinning wrench and a torque wrench; the iron roughneck moves into position hydraulically and eliminates the manual handling involved with suspended individual tools
jarring	using a hydraulic tool to provide a hammering force to loosen stuck drill string from wellbore
keyseat	groove worn in the side of a deviated wellbore from rotating drill string
kick	unplanned gas or fluid influx from a formation in the wellbore
lifting nubbins	used for lifting tubulars to rig floor (pipe, collars, etc.)
megajoule (MJ)	SI unit of service given by a drilling line when it moves 1000 newtons of load over a distance of 1000 metres
monels	non magnetic drill collar made of monel metal used for directional drilling
motor kills	emergency shut down for motors
mud ring	blockage in the wellbore caused by sticking of clays between the wellbore wall and the drill string
perforating	to pierce the casing wall and cement of a wellbore to provide holes through which formation fluids may enter or to provide holes in the casing so that materials may be introduced into the annulus between the casing and the wall of the borehole
perforating gun	device fitted with shaped charges or bullets that is lowered to the desired depth in a well and fired to create penetrating holes in casing, cement, and formation
pop valve	pressure relief valve, that can be set to bypass and shut down at a desired pressure by using rated pop-valve pins
rigging in	to prepare the drilling rig for making hole, i.e. to install tools and machinery before drilling is started (also called rig up)
rigging out	to dismantle the drilling rig after drilling has been completed, i.e. to dismantle tools and machinery for moving
shale bin	open end tank to collect shale from shale shaker
sloughing	collapsing of the walls of the wellbore (also called caving)

stab	to guide the end of a pipe into a coupling or tool joint when making up a connection
surface casing	placed in a surface hole to protect ground water, isolate unstable formations and provide a platform for the BOPs
surface hole	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
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
tubulars	any kind of pipe; oilfield tubular goods include tubing, casing, drilling pipe, and line pipe

ADR	Automatic drilling rig
BHA	Bottom hole assembly
BOP	Blowout preventer
CAODC	Canadian Association of Oilwell Drilling Contractors
DST	Drill stem testing
DSV	Downhole safety valves
EDR	Electronic drilling recorder
ERP	Emergency response plan
H₂S	Hydrogen sulfide
HCR	Hydraulic-controlled relief
ID	Inside diameter
IRP	Industry recommended practice
JSA	Job Safety Analysis
MACP	Maximum allowable casing pressure
MCC	Motor control centers
MSDS	Material Safety Data Sheet
MWD	Measurement while drilling
NACE	National Association of Corrosion Engineers
OD	Outside diameter
OEM	Original equipment manufacturer
OH&S	Occupational Health and Safety
PJHA	Pre-job hazard assessment
PLC	Programmable logic controllers

PPE	Personal protective equipment
psi	Pounds per square inch
PVC	Polyvinyl chloride
rpm	Revolutions per minute
RSPP	Reduced speed pump pressure
SABA	Supplied air breathing apparatus
SCBA	Self-contained breathing apparatus
SCR	Silicone control rectifiers
spm	Strokes per minute
TD	Total depth
WHMIS	Workplace Hazardous Materials Information System
WOB	Weight on bit

APPENDIX D

BLOCK AND TASK WEIGHTING

BLOCK A COMMON OCCUPATIONAL SKILLS

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	NV	NV	NV	ND	ND	ND	35	20	30	10	NV	ND	ND	24%

Task 1 Maintains and uses tools and equipment.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	15%
%	NV	NV	NV	ND	ND	ND	15	20	10	15	NV	ND	ND	

Task 2 Performs trade-related activities.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	14%
%	NV	NV	NV	ND	ND	ND	15	20	10	10	NV	ND	ND	

Task 3 Uses documentation and reports.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	24%
%	NV	NV	NV	ND	ND	ND	20	15	20	40	NV	ND	ND	

Task 4 Supervises crew members and communicates with others.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	26%
%	NV	NV	NV	ND	ND	ND	25	30	40	10	NV	ND	ND	

Task 5 Performs safety-related functions.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	21%
%	NV	NV	NV	ND	ND	ND	25	15	20	25	NV	ND	ND	

BLOCK B RIG MOVES

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	NV	NV	NV	ND	ND	ND	8	15	5	15	NV	ND	ND	11%

Task 6 Prepares for rig move.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	28%
%	NV	NV	NV	ND	ND	ND	30	20	20	40	NV	ND	ND	

Task 7 Disassembles rig.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	NV	NV	NV	ND	ND	ND	25	40	40	25	NV	ND	ND	32%

Task 8 Assembles rig.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	NV	NV	NV	ND	ND	ND	45	40	40	35	NV	ND	ND	40%

BLOCK C RIG UP AND RIG OUT

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	NV	NV	NV	ND	ND	ND	7	15	15	20	NV	ND	ND	14%

Task 9 Performs rig up procedures.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	NV	NV	NV	ND	ND	ND	50	50	50	50	NV	ND	ND	50%

Task 10 Performs rig out operations.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	NV	NV	NV	ND	ND	ND	50	50	50	50	NV	ND	ND	50%

BLOCK D RIG INSPECTION AND MAINTENANCE

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	NV	NV	NV	ND	ND	ND	10	20	15	15	NV	ND	ND	15%

Task 11 Inspects rig equipment.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	NV	NV	NV	ND	ND	ND	30	40	60	20	NV	ND	ND	38%

Task 12 Maintains rig equipment.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	
%	NV	NV	NV	ND	ND	ND	70	60	40	80	NV	ND	ND	62%

BLOCK E DRILLING OPERATIONS

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	National Average
%	NV	NV	NV	ND	ND	ND	40	30	35	40	NV	ND	ND	36%

Task 13 Prepares for drilling operations.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	9%
%	NV	NV	NV	ND	ND	ND	13	10	10	5	NV	ND	ND	

Task 14 Prepares drill string.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	8%
%	NV	NV	NV	ND	ND	ND	12	10	5	5	NV	ND	ND	

Task 15 Installs blowout preventer (BOP) equipment and associated components.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	16%
%	NV	NV	NV	ND	ND	ND	20	20	15	10	NV	ND	ND	

Task 16 Performs drilling activities.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	26%
%	NV	NV	NV	ND	ND	ND	20	15	40	30	NV	ND	ND	

Task 17 Performs tripping activities.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	18%
%	NV	NV	NV	ND	ND	ND	16	15	15	25	NV	ND	ND	

Task 18 Performs casing activities.

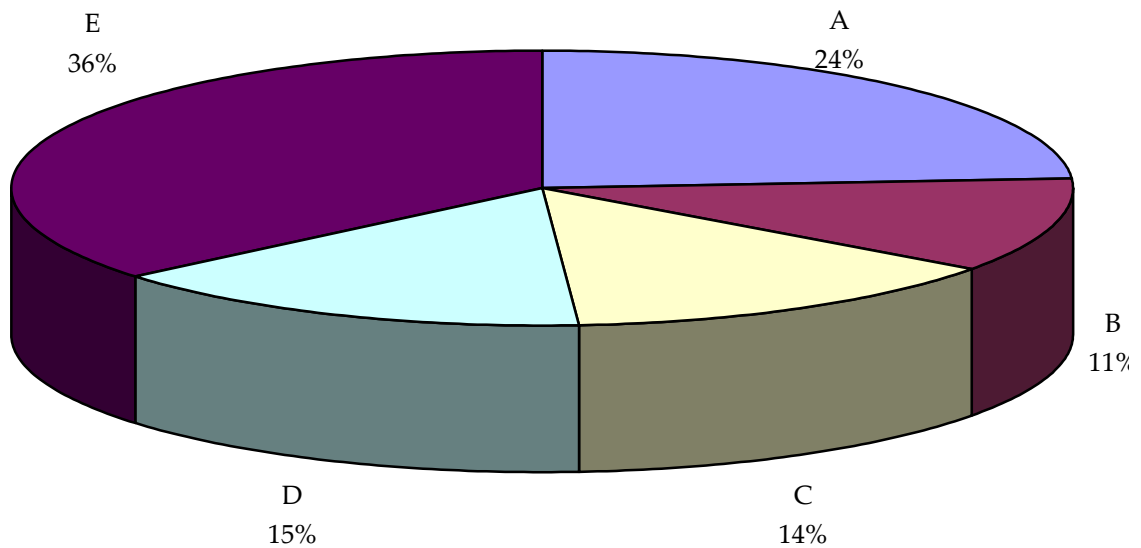
	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	8%
%	NV	NV	NV	ND	ND	ND	8	15	5	5	NV	ND	ND	

Task 19 Performs specialized drilling operations.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	8%
%	NV	NV	NV	ND	ND	ND	5	10	5	10	NV	ND	ND	

Task 20 Performs specialized well operations.

	<u>NL</u>	<u>NS</u>	<u>PE</u>	<u>NB</u>	<u>QC</u>	<u>ON</u>	<u>MB</u>	<u>SK</u>	<u>AB</u>	<u>BC</u>	<u>NT</u>	<u>YT</u>	<u>NU</u>	7%
%	NV	NV	NV	ND	ND	ND	6	5	5	10	NV	ND	ND	



TITLES OF BLOCKS

BLOCK A	Common Occupational Skills	BLOCK D	Rig Inspection and Maintenance
BLOCK B	Rig Moves	BLOCK E	Drilling Operations
BLOCK C	Rig Up and Rig Out		

*Average percentage of the total number of questions on an interprovincial examination, assigned to assess each block of the analysis, as derived from the collective input from workers within the occupation from all areas of Canada. Interprovincial examinations typically have from 100 to 150 multiple-choice questions.

APPENDIX F

TASK PROFILE CHART – Rig Technician

BLOCK	TASKS	SUB-TASKS				
A - COMMON OCCUPATIONAL SKILLS	1. Maintains and uses tools and equipment.	1.01 Maintains hand and power tools.	1.02 Uses mobile equipment.	1.03 Uses rigging/hoisting equipment.		
	2. Performs trade-related activities.	2.01 Maintains parts and supply inventory.	2.02 Disposes of waste materials.	2.03 Performs housekeeping.		
	3. Uses documentation and reports.	3.01 Uses personnel documentation.	3.02 Uses safety and environmental documentation.	3.03 Completes tour sheets.	3.04 Interprets trade documentation.	3.05 Uses maintenance documentation.
	4. Supervises crew members and communicates with others.	4.01 Supervises crew members.	4.02 Orientates new crew members to rig.	4.03 Trains crew members.	4.04 Leads crew meetings.	4.05 Communicates with third-party service providers.
	5. Performs safety-related functions.	5.01 Uses personal protective equipment (PPE) and safety equipment.	5.02 Maintains safe work environment.	5.03 Performs lock-out procedures.		
B – RIG MOVES	6. Prepares for rig move.	6.01 Prepares equipment for move.	6.02 Organizes loads for transport.			
	7. Disassembles rig.	7.01 Removes components.	7.02 Cleans site.			

BLOCK	TASKS	SUB-TASKS				
C – RIG UP AND RIG OUT	8. Assembles rig.	8.01 Spots matting, sub, derrick and buildings.	8.02 Assembles sub, derrick and drawworks.			
	9. Performs rig up procedures.	9.01 Runs air, fuel, water and hydraulic lines, and power cables.	9.02 Starts and warms up equipment.	9.03 Raises derrick.	9.04 Rigs up rig floor and related equipment.	9.05 Installs pre-fabs.
		9.06 Rigs up mud tanks, pumps and circulation systems.	9.07 Installs trash pumps, conductor and flow lines to shakers.	9.08 Sets up boiler and steam circulating systems.	9.09 Rigs up third-party service provider equipment.	
	10. Performs rig out operations.	10.01 Nipples down blowout preventer (BOP) and related equipment.	10.02 Rigs out rig floor and related equipment.	10.03 Rigs out pre-fabs.	10.04 Lays down derrick.	10.05 Rigs out mud tanks, pumps and circulation systems.
		10.06 Rigs out boiler and steam circulation systems.	10.07 Rigs out air, water, fuel and hydraulic lines, and power cables.	10.08 Rigs out third-party service provider equipment.		
D – RIG INSPECTION AND MAINTENANCE	11. Inspects rig equipment.	11.01 Performs daily walk-around and detailed rig inspection.	11.02 Determines required repairs.			
	12. Maintains rig equipment.	12.01 Maintains mechanical, hydraulic and pneumatic systems.	12.02 Maintains electrical systems.	12.03 Maintains boiler.	12.04 Maintains overhead equipment.	12.05 Maintains floor equipment.
		12.06 Maintains drilling fluid circulating systems.	12.07 Maintains water, steam and fuel circulating systems.			

BLOCK	TASKS	SUB-TASKS				
E – DRILLING OPERATIONS	13. Prepares for drilling operations.	13.01 Checks condition of drilling components.	13.02 Mixes drilling fluid.	13.03 Drills mousehole and rathole.		
	14. Prepares drill string.	14.01 Takes measurements of bottom hole assembly (BHA) and drill string.	14.02 Picks up bottom hole assembly (BHA) and drill string.	14.03 Makes up bottom hole assembly (BHA).		
	15. Installs blowout preventer (BOP) equipment and associated components.	15.01 Prepares for blowout preventer (BOP) installation.	15.02 Nipples up blowout preventer (BOP).	15.03 Pressurizes blowout preventer (BOP) accumulator.	15.04 Function tests blowout preventer (BOP) accumulator.	15.05 Pressure tests blowout preventer (BOP) and components.
	16. Performs drilling activities.	16.01 Maintains drilling fluids.	16.02 Operates drilling equipment.	16.03 Monitors hole, drilling and equipment conditions.	16.04 Performs well control operations.	
	17. Performs tripping activities.	17.01 Prepares for trip.	17.02 Trips drill string and bottom hole assembly (BHA).	17.03 Performs slip and cut.	17.04 Lays down pipe and bottom hole assembly (BHA).	
	18. Performs casing activities.	18.01 Prepares casing.	18.02 Installs casing equipment.	18.03 Runs casing.	18.04 Performs cementing operations.	
	19. Performs specialized drilling operations.	19.01 Performs coring activities.	19.02 Performs directional drilling.	19.03 Performs underbalanced drilling (UBD) and managed pressure drilling (MPD).		
	20. Performs specialized well operations.	20.01 Performs fishing and stuck pipe operations.	20.02 Rigs wireline loggers in and out.	20.03 Performs drill stem testing (DST).	20.04 Performs sour well operations.	20.05 Completes the well.