



CANADIAN ASSOCIATION
OF PETROLEUM PRODUCERS

*LABOUR MARKET ASSESSMENT
OF THE
OFFSHORE OIL AND GAS INDUSTRY
SUPPLY AND SERVICE SECTOR
IN
NEWFOUNDLAND AND LABRADOR*



Canada



GOVERNMENT OF
NEWFOUNDLAND
AND LABRADOR

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ET LABRADOR

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Strategic Directions Inc. (SDI) has prepared this Report for the Petroleum Industry Human Resources Committee and Newfoundland Ocean Industries Association based in part upon information provided by industry representatives through an interview process. While SDI believes such information to be reliable, it cannot warrant it. The reader assumes responsibility for decisions made or actions taken based upon this Report.

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Executive Summary

The study *Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador* was commissioned by the Petroleum Industry Human Resource Committee (PIHRC) in December 2002.

Based on interviews with representatives of more than 45 companies in the offshore oil and gas sector in the province, the results of a mail survey sent to an additional 42 companies and a review of secondary labour market research, a profile of the labour demand and supply for the upstream production phase of the offshore oil and gas industry was developed.

The production phase of the oil and gas industry is less cyclical, i.e., employment is more stable and longer term than the exploration phase and does not experience the same magnitude of significant short term demands for large numbers of trades, technicians and engineers experienced during the construction and commissioning phases. The scope of the study did not include the exploration, construction or commissioning phases.

The study identified more than three hundred and forty positions in the production phase. The total current employment for the companies interviewed was approximately 2,285. Although the study was not a census of all companies in the industry, it is estimated it did capture approximately 80% of employment in the industry, which supports the production of the Terra Nova and Hibernia fields.

More than eighty positions were identified by industry representatives as “difficult to recruit”. The most common reasons identified for recruitment difficulties were:

- i. Lack of or insufficient experience in the oil industry;
- ii. Occupational shortages recognized industry-wide such as marine engineering and nautical science positions;
- iii. Short-term/project employment opportunities;
- iv. Very limited employment opportunities and limited occupational supply;
- v. Unavailability of occupational specific training programs; and
- vi. Additional projects which may lead to occupational shortages.

The cyclical nature of the industry internationally has also resulted in the loss of many experienced people.

Positions identified as difficult to recruit are categorized by industry sub-sector. A summary of the types of positions identified as “difficult to recruit” positions includes:

- i. Senior engineering and science positions with project owners/operators such as Reservoir Engineer and Geophysicist;
- ii. Marine positions for floating production storage and offloading systems and semi-submersible drilling rigs;
- iii. Marine positions for supply vessels, shuttle tankers, etc. due to the international shortage of marine navigation and engineering positions;
- iv. Senior drilling positions such as Offshore Drilling Superintendent, Toolpushers and Drillers;

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- v. Well services positions which for the most part are “offshore as needed” positions;
- vi. Engineering positions including reservoir, well planning, drilling, process, loss control, structural, instrumentation, electrical, mechanical, piping, inspections, and subsea construction. The lack of or insufficient oil industry experience, in the range of 10 to 15 years remains a concern;
- vii. Panel and process operators, technicians, quality control and quality assurance managers who require industrial/heavy industry experience;
- viii. Emerging occupations such as Health, Safety and Environment professionals;
- ix. Trades such as welders and pipefitters with recent experience in exotic metals;
- x. Senior technical managers with experience in electrical, instrumentation and piping;
- xi. Environmental consulting positions such as weather forecasters, marine biologists;
- xii. Inspection services positions such as experienced Non-Destructive Testing (NDT) Technicians and Tubular Drill Pipe Inspectors;
- xiii. Specialty services positions such as experienced Offshore Radio Operators, and IT/Telecommunications Technicians; and
- xiv. Supply and service positions such as Account Managers and Freight Forwarders.

Several recruitment strategies for “difficult to recruit” positions are predominant in the industry:

- i. Internal recruitment/secondment from companies’ offices internationally; and
- ii. Career progression programs which recruit for entry level positions and then, through internal training programs and supervised experienced and promotion, develop the necessary competencies required for “difficult to recruit” positions.

Industry and educational institutions have collaborated to address occupational shortages in engineering, business, technician, technology, and marine positions. The institutions are providing solid entry level qualifications. The challenge is to determine whether there are ways to address the lack of, or insufficient, offshore oil industry experience which impacts many of the occupations identified as “difficult to recruit”.

Industry also uses internal recruitment/secondment i.e., employees from their national or international locations, to address sporadic labour demand or “offshore as needed” positions. For example, in the absence of a greater number of production systems and greater volume of sustained exploration activity, the utilization of well services employees is not sufficient to support the requisite number of people solely to service the demands of the province or the region.

Summary of Findings

- i. The study provides valuable input for future labour market and human resource planning and career counselling including information on:
 - Approximately 340 occupations in the offshore oil and gas industry;
 - Career progression for selected offshore occupations;
 - Occupational shortages in various sub-sectors of the industry including approximately 80 “difficult to recruit” positions;

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- ii. Labour demand from increased exploration, construction, commissioning and start-up of new projects will challenge the existing labour pool. This study and a number of other studies conducted by PIHRC and others, have identified occupations that are difficult to recruit. With the prospect of growth of the oil and gas industry in the province there is a need for a more comprehensive labour market assessment for the Atlantic Canada region as the labour pool is mobile within the region;
- iii. Many of the “difficult to recruit” positions are addressed through internal recruitment and promotion;
- iv. Entry level qualifications for engineering, business, technician, technologist and marine positions are being adequately addressed by the education and training institutions in the province;
- v. The trend toward increasing technical requirements for offshore positions such as drilling and well services positions will increase the qualifications required for entry level positions;
- vi. The labour market issues experienced often differ depending on the sub-sector, size of the company, company training and recruitment practices and duration of employment offered;
- vii. Implementation of work experience programs in areas such as Instrumentation Technician was suggested by industry as beneficial as the graduates gain work experience and the employers have an opportunity to assess their work performance for potential career opportunities;
- viii. Companies suggested early career orientation should be provided for students in training programs for occupations which usually lead to positions offshore in the petroleum or the marine industry. The orientation should identify offshore work requirements including lifestyle factors. This would help students make decisions earlier in their academic programs regarding their suitability to work offshore;
- ix. The oil and gas industry operates in an international labour market and therefore occurrences in that market affect the province. For example, it is well-recognized that there is a growing worldwide shortage of navigation and marine engineering officers. Companies have indicated it is critical that efforts be made to educate and encourage young adults to consider marine occupations as a desirable career option;
- x. Similarly, the short supply of engineers with 10 to 15 years oil and gas experience is reported to be an issue for the industry internationally;
- xi. There are emerging occupational shortage areas such as the increasing difficulty being experienced in recruiting Health Safety and Environment (HSE) professionals;
- xii. Development of bursary programs which provide college and university students with funding to gain experience in the oil and gas industry internationally may assist in encouraging students to pursue careers in the industry; and
- xiii. Other studies on labour demand and supply for the offshore oil and gas industry have recognized the requirement for workplace training in order to meet increasing employer demands for ‘relevant workplace experience’. Building on the results of this study and previous studies, and the suggested comprehensive labour market assessment for the region, consideration should be given to developing a strategic human resource plan for the industry.

1.0 Introduction

The Petroleum Industry Human Resources Committee (PIHRC) was established in December 1998 by the Federal government, the province and industry stakeholders. The members of the Committee are representatives of key stakeholders in the oil and gas sector including the Canadian Association of Petroleum Producers (CAPP), oil and gas operators and contractors, Newfoundland Ocean Industries Association (NOIA), Department of Youth Services and Post Secondary Education, Department of Human Resources and Employment, Department of Mines and Energy, and Human Resources Development Canada. The committee's mandate is to review the employment, training and other human resource issues related to the emerging provincial petroleum sector over a ten-year period.

In December 2002 the Petroleum Industry Human Resources Committee (PIHRC) commissioned this study, *Labour Market Assessment of the Oil and Gas Industry Supply and Services Sector in Newfoundland and Labrador*.

The purpose of the study is to:

- Identify job positions, both offshore and onshore, related to the production operations in the oilfield and provide a mechanism that can be used to estimate the number of positions in an area depending on the number of rigs or installations;
- Identify, describe and categorize gaps and issues concerning labour supply and demand, taking into account, but not limited to, factors such as experience, recruitment, retention and training;
- Identify how those human resources issues relate to NOIA members' ability to successfully compete for work in the emerging petroleum industry in Newfoundland and Labrador; and
- Identify potential actions that key stakeholders may undertake to address identified human resources gaps and issues.

Information from the study may be utilized as inputs for:

- Curriculum enhancement;
- Post secondary education course development;
- Institutional capacity requirements;
- Career planning and counselling;
- Business strategy and planning for future human resource needs; and
- Petroleum sector policy and program evaluation and development.

Strategic Directions Inc., a management consulting firm located in St. John's, was engaged by NOIA and PIHRC to carry out the study.

2.0 Methodology

The scope of the study was to assess labour demand and supply for the production phase of Newfoundland and Labrador's emerging offshore oil industry, including the supply and service sector. More than 45 key informant interviews were conducted with managers/executive of companies involved in upstream activities in the oil and gas industry. The companies chosen to participate are currently engaged by the project operators for Hibernia and/or Terra Nova or their prime contractors to support the production facilities and are representative of the following sub-sectors:

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- Project owner/operator;
- Drilling;
- Well services;
- Subsea;
- Marine logistics and transportation;
- Warehousing and logistics;
- Catering and accommodations;
- Operations, maintenance and construction personnel;
- Electrical/instrumentation personnel and services;
- Offshore/marine fabrication;
- Engineering and design consultants;
- Environmental consultants;
- Testing and inspection;
- Remotely operated vehicle support;
- Health and safety;
- Medical services;
- Seismic and survey;
- Tubular goods;
- Leak detection; and
- Oil shipment and storage.

It is important to note that while the more than 45 companies interviewed represent a significant proportion of the activity in the province's offshore oil and gas sector there are many other companies in each of the sectors with some portion of work. It is estimated the study captured approximately 80% of the industry that supports the production of the Terra Nova and Hibernia fields.

The key informant interview guide presented in Appendix A and the employment matrix presented in Appendix B, were developed to collect information to identify:

- The core occupations employed in the production phase of offshore related activities;
- The current employment profile for each of the Hibernia and Terra Nova production facilities and companies providing services and products to them;
- Any existing or potential occupational shortage areas, based on companies' experience in recruiting and retaining staff in core positions;
- Strategies utilized by companies in various sub-sectors to address difficulties in recruiting and/or retaining staff in core positions;
- Other oil or industrial projects that may impact the supply and demand of core occupations; and
- The impacts on occupational demand of various scenarios of increasing numbers of production facilities.

Many of the companies interviewed are members of NOIA. They represent a significant portion of the companies whose primary business, or a substantial portion of their business, is conducted in the oil and gas sector. The current employment profile is used as a proxy for occupational demand for a floating production storage and offloading (FPSO) system and a fixed production platform (FPP) and their related support and service network of companies. This scenario approach to the occupational demand provides a template for estimating occupational demand for future production scenarios.

A mail survey of industrial service and product suppliers was also undertaken. The survey is presented in Appendix C. Ten responses were received to the 42 surveys mailed, a response rate of 24%. The responses received provide valid input regarding the respondents' labour market experience related to core positions for the offshore oil and gas industry.

The limitations and advantages of the research methodology are presented in sections 4.2 and 4.3, respectively.

A stakeholder forum sponsored by PIHRC and NOIA is planned for May 2003. The objectives of the forum are to validate the results of the study and to develop strategies and an action plan to address the occupational gaps and issues identified in the study.

3.0 Occupational Supply

To identify shortages in occupational supply, companies were asked to identify positions for which they experienced difficulties recruiting and the reasons for these difficulties. While many of these positions do not represent large "gaps" in terms of the number of people required, they do represent gaps in required experience and/or competencies. Many of the positions have unique requirements and thus require a targeted approach to labour supply development. As noted in other studies, many of the positions involving an advanced level of education and training are only required in small numbers.¹

3.1 "Difficult to Recruit" Positions

More than eighty positions were identified as "difficult to recruit". There are many reasons why recruitment for these positions may be challenging including any one or several of the following reasons:

- i. Lack of sufficient experience;
- ii. Occupational shortage recognized industry-wide;
- iii. Short-term employment/project opportunities;
- iv. Very limited employment opportunities and limited occupational supply. These are highly specialized positions in terms of education and/or experience. Often it is a small international labour pool, and requires international recruitment;
- v. Unavailability of occupational specific training programs; and
- vi. Additional projects which may lead to occupational shortages.

Internationally, the cyclical history of the oil industry has caused many experienced people to leave the industry. After being laid off several times, they have sought more stable employment and will not return to the oil industry. The boom and bust cycle of the industry is recognized as a key factor contributing to the industry's human resource issues.²

While a high number of positions were identified as "difficult to recruit", many of these positions are addressed through internal recruitment and promotion. Many of the companies actively plan for their human resource requirements and have implemented career progression ladders, hiring

¹ PIHRC, Analysis of Gaps and Issues Related to Labour Supply and Demand in Offshore Exploration and Production in Newfoundland, February 2001, p.10.

² Human Resources: The Missing Piece of the Energy Puzzle, Dr. William L. Fisher and Sarah J. Seals, Interstate Oil and Gas Compact Commission; p. 4.

at the entry level and providing the training and experience to develop the competencies necessary for higher level positions which are difficult to recruit internally or externally. A number of career progression diagrams are presented in Appendix D. To fill “difficult to recruit” positions with experienced personnel from outside the companies often requires several months of focused recruitment activity.

At present, the human resource needs of the oil and gas industry in the province are being met i.e., few vacancies, however, growth of the industry requires growth of the labour pool in a planned manner to provide sufficient time to acquire the necessary experience to meet the unique requirements of the province’s offshore environment.

Many companies indicated Memorial University, the Marine Institute, the College of the North Atlantic and private training institutions provide relevant programs and their graduates are being placed in entry level positions in the offshore oil and gas industry. This finding is consistent with other studies such as the *Offshore Petroleum Engineering Task Force Report* and the *Analysis of Gaps and Issues Related to Labour Supply and Demand in Offshore Exploration and Production in Newfoundland*.

The positions identified as “difficult to recruit” are presented by sub-sector in the following subsections of this report. A brief job description is provided for each of the positions identified as “difficult to recruit” in Appendix E.

3.1.1 Project Owner/Operator

The occupational shortages identified by the project owners/operators as well as the reasons for these shortages are presented in Table 1. The occupational shortages experienced by the project owners/operators are predominantly senior reservoir engineering and science positions including Reservoir Manager, Reservoir Engineer, Petrophysicist, Geophysicist and Geologist (Petroleum). In part, the reservoir engineering shortages are attributed to past downturns in the oil industry, which resulted in the smaller current labour supply with 10 to 15 years experience. These shortages are primarily being addressed through internal recruitment i.e., seconding employees from other jurisdictions for several years. Other studies such as the *Estimate of Direct Human Resource Requirements Offshore Exploration and Production Newfoundland and Nova Scotia 2000-2010* prepared by CAPP identified the same occupations. Other areas of recruitment difficulty are the drilling positions Drilling Manager, Rig Superintendent and Offshore Drilling Superintendent.

Production Operations

Process/Field Operator and Panel Operator are anticipated to be shortage areas, with the commissioning of the White Rose FPSO as it will have an immediate requirement for experienced individuals for these positions. To address this shortage, other owner/operators have been recruiting entry level employees and providing training.

The marine occupations, Master Mariner, First Mate, Chief Engineer and Second Engineer have proven to be difficult to hire and retain for the Terra Nova FPSO. Some of the issues are:

- i. A highly competitive international market for navigation and engineering officers;
- ii. The marine roles on a FPSO are different while the vessel is on location, from those on a ship. For example, Master Mariner is not in-charge unless the vessel disconnects;

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- iii. The shift rotation is different. The workload is greater on the FPSO in terms of 12 hours a day for 21 days and the work assignments are more varied than marine positions;
- iv. Career progression opportunities are limited in a “one of” environment; and
- v. The work experience gained does not qualify for sea time required for successive Transport Canada marine certificates.

Table 1 – Project Owner/Operator – Reasons for Recruitment Difficulty

Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements creates occupational shortage
Project Owner/Operator						
Reservoir Manager	10-15 years reservoir experience	✓				
Reservoir Engineer	10-15 years reservoir experience	✓				
Petrophysicist		✓				
Geophysicist	10-15 years reservoir experience	✓				
Geologist (Petroleum)	10-15 years reservoir experience	✓				
Drilling Manager		✓				
Rig Superintendent		✓				
Offshore Installation Manager		✓				
Process/Field Operator					✓	✓
Panel Operator					✓	✓
Offshore Drilling Superintendent (ODS)	Mid-career ODS					
Master Mariner		✓ and barriers specific to the industry				
First Mate		✓ and barriers specific to the industry				
Chief Engineer		✓ and barriers specific to the industry				

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Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements creates occupational shortage
Second Engineer		✓ and barriers specific to the industry				

3.1.2 Drilling

Several positions identified by the drilling sub-sector as challenging to recruit and the reasons why they are challenging to recruit are presented in Table 2. The utilization rate of rigs worldwide impacts the available labour pool and therefore directly contributes to recruitment difficulties.

Technicians

Drilling companies report difficulty in recruiting experienced Instrumentation Technicians. To overcome this, the companies recruit new graduates, provide training programs internally and promote them as they gain sufficient experience and demonstrate appropriate competencies. Several companies suggested implementation of a work experience program for Instrumentation Technicians would be beneficial as the graduates gain work experience and the employers have an opportunity to assess their work performance for potential career opportunities.

Electrical and mechanical technicians with industrial/heavy industry experience e.g., pulp and paper mills, refinery and mining are difficult to recruit.

Internationally, Subsea Technicians are reported to be difficult to recruit. These technicians require knowledge of the specific subsea equipment being used by the facility and as a result entry level recruitment with an internal training program is used. Appendix D presents a typical career progression for Subsea Technicians.

Drillers and Toolpushers

Companies are addressing requirements for drillers and toolpushers through internal training and promotion. However, from an international perspective the demographic profile of drillers, toolpushers and trades people, barring a downturn in the oil industry, indicates there will be ample career opportunities in these occupations arising from retirements. While this issue is well-recognized with respect to the trades, it is no less an issue for senior drill floor positions such as drillers and toolpushers. In the US “relatively few oil and gas extraction workers are in their teens or early 20’s. Over 65% of the workers in this industry are between 35 to 54 years of age. On average 40% of the industry’s workforce is expected to reach retirement during this decade.”³

Material Coordinators

Material Coordinators are difficult to recruit. In the offshore environment, they are usually recruited from the marine or drilling crew as they know the rig, the equipment and the materials system. The preferred qualifications are a two or three year college business diploma and

³ Human Resources: The Missing Piece of the Energy Puzzle, Dr. William L. Fisher and Sarah J. Seals, Interstate Oil and Gas Compact Commission, p. 5.

information technology experience. Several companies suggested this is another occupation that would benefit from a subsidized work period as it would encourage and facilitate companies' hiring of Assistant Material Coordinators.

Drilling Facilities – Shorter Term Drilling Contracts

Recruitment for drilling facilities under short term drilling contracts is more challenging than long term contracts, for the reasons presented in Table 2. However, there are several other reasons that contribute to recruitment challenges for short-term positions including:

- i. The high rate of utilization of rigs worldwide, as noted earlier;
- ii. The cyclical nature of the industry reduces its attractiveness as a career choice; and
- iii. The short-term nature of the work is not attractive to persons in long term positions in the oil and gas industry and other industry sectors;

The positions identified as difficult to recruit include Offshore Installation Manager, Toolpusher, Driller, Assistant Driller, Ballast Control Operator, Stability Technician, Chief Engineer, Offshore Crane Operator and Chief Steward. As a note of interest, the position of Chief Steward is difficult to recruit for a short-term position because of the high level of combined competencies required. The Chief Steward position requires qualifications both as a “hotel manager” and a chef. The recruit must have skills and experience in budget preparation and management, administration and people management.

A career progression diagram for drilling positions is presented in Appendix D.

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Table 2 - Drilling Occupations – Reasons for Recruitment Difficulty

Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements creates occupational shortage
Drilling						
Instrumentation Technician	Industrial/heavy Industry experience					
Electrical Technician	Industrial/heavy Industry experience					
Mechanical Technician	Industrial/heavy Industry experience					
Subsea Technician		Internal training and promotion				
Onshore and Offshore Material Movement Coordinator	Offshore experience					
Drilling Facilities – Shorter Term Drilling Contracts						
Offshore Installation Manager	Offshore experience	International recruit	✓			
Toolpusher			✓			
Driller			✓			
Assistant Driller	Offshore experience					
Ballast Control Operator			✓			
Stability Technician	Stability experience on a semi-submersible		✓	✓		
Chief Engineer	Rig experience					
Offshore Crane Operator	Offshore experience		✓			
Chief Steward			✓			

3.1.3 Well Services

Generally, well services employees are hired at an entry level position and through in-house training and accumulation of experience are promoted through several levels to supervisory positions. Several entry level strategies were identified. Entry level recruits may be:

- i. Transferred to land rig operations for a six month period and then progress to an entry level position offshore; or
- ii. Assigned to an onshore tool technician position for a couple of years and then be promoted to a junior technician position on an offshore team.

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A typical well services career progression is presented in Appendix D.

Table 3 presents the offshore tool technician positions, which were identified as difficult to recruit in the well services area. Additional information regarding these positions follows:

- i. Fishing Tools and Services Supervisor;
The entry level position for Fishing Tools and Services Supervisor is Driller or other drill floor position. Typically, they are trained on-the-job with fishing tools on land rigs and then progress to offshore rigs. The position requires at least fifteen years of offshore experience, most of it being international experience. Companies are likely to fill the Fishing Tools and Services Supervisor position through internal recruitment;
- ii. Completions and Liner Hanger Technicians;
Some companies reported it is difficult to recruit Completions Technicians and Liner Hanger Technicians with experience and training. It was noted because offshore experience is limited to 3 or 4 months a year in total it takes a long time to accumulate the necessary experience.
- iii. Thread Inspectors and Casing Running Technicians;
Some companies indicated it is difficult to recruit Thread Inspectors and Casing Running Technicians with oil field experience.

It has also been challenging to hire for the entry level positions. The educational requirement for tool technicians is high school graduation however, they have had difficulty identifying people who view the position as a “career”. Many applicants have been university students looking for temporary employment. Training for these positions is specialized and provided in-house.

- iv. Other Well Services Technicians Positions;
Other well services technicians positions identified as difficult to recruit are Cementing Engineer, Coil Tubing Supervisor, Completions Supervisor, Directional Drilling Supervisor, Permanent Downhole Gauges Coordinator, Slickline Supervisor and Well Planning/Drilling Engineer. The primary reason for the recruitment difficulty is lack of, or insufficient offshore oil industry experience.

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Table 3 - Well Services – Reasons for Recruitment Difficulty

Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements creates occupational shortage
Well Services						
Fishing Tools and Services Supervisor	Generally international offshore experience, 15 years+			✓		
Completions Tool Technician (Well Bore Cleanout)	5-10 years offshore experience			✓		
Liner Hanger Technician	5-10 years offshore experience			✓		
Thread Inspector	3-5 years offshore experience			✓		
Casing Running Technician	2-5 years offshore experience			✓		
Cementing Engineer	5-10 years offshore experience			✓		
Coil Tubing Supervisor	5-10 years offshore experience			✓		
Completions Supervisor	5-10 years offshore experience			✓		
Directional Drilling Supervisor	5-10 years offshore experience			✓		
Permanent Downhole Gauges Coordinator	5-10 years offshore experience			✓		
Slickline Supervisor	5-10 years offshore experience			✓		
Well Planning/Drilling Engineer	5-10 years offshore experience			✓		

Essentially in the province there is a very limited labour pool with well services experience. There are several contributing factors:

- i. These positions are “offshore as required” positions, and the total time spent offshore in the province during a calendar year may in fact be very small. As a result, many employees in these roles are transferred for short periods (days or weeks) to areas where their specific specialty is required on an “as needed basis”. It tends to be a very mobile workforce; and
- ii. Due to the short term duration of the assignments, many employers recruit their technician teams internally as needed. They do not develop all the competencies in each office location as it is not economic without a much greater level of exploration and production activity within the province or the region.

3.1.4 Marine Logistics and Transportation

Table 4 presents the marine logistics and transportation positions identified as “difficult to recruit”.

As noted in section 3.1.1, there is a growing worldwide shortage of navigation and engineering officers. Companies have indicated it is critical that efforts be made to educate and encourage young adults to consider marine occupations as a desirable career option. The marine sector companies are offering cadet placements to provide sea experience to students and participating in graduate recruitment programs with the Marine Institute.

Recruitment for experienced helicopter pilots is conducted internationally in order to find individuals with specific aircraft and offshore experience.

Table 4 – Marine Logistics and Transportation – Reasons for Recruitment Difficulty

Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements creates occupational shortage
Marine Logistics and Transportation						
Captain/Master Mariner		✓				
Mates (all levels)		✓				
Engineers (all levels)		✓				
Helicopter Pilot	Offshore experience			✓		

3.1.5 Offshore Operations - Engineering and Fabrication

The short supply of engineers with oil and gas experience is reported to be an issue for the industry internationally. This issue was raised by many of the companies participating in this study. The shortage is the experience gap in the range of 10 to 15 years.

Memorial University’s engineering program is well regarded. Many of the companies are participating in the Engineering Co-operative program and hiring new graduates. Some of the companies reported they are hiring new graduates not only for their offices in the region, but also to meet international recruitment requirements for their firms.

Tables 5 (below) and 6 (section 3.1.6) identify specific engineering positions including Process, Loss Control, Structural, Instrumentation, Electrical and Piping Engineers, which are difficult to recruit. The 1999 Report of the Offshore Petroleum Engineering Task Force noted “there were significant shortages of local skilled persons in Loss Control, Process Engineering and Piping”.⁴

⁴ Offshore Petroleum Engineering Task Force May 1999 Report, p. 18. (Task Force members included the Canada-Newfoundland Offshore Petroleum Board, the Department of Industry Trade and Technology, the Association of Professional Engineers and Geoscientists of Newfoundland, the Consulting Engineers of Newfoundland and Labrador, Husky Oil, Mobil Oil, Norsk Hydro and Petro-Canada.)

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Table 5 presents a number of occupations in the metal fabrication sector which are difficult to recruit. Welders and pipefitters experienced in welding exotic metals are difficult to recruit by companies where the nature of the work is project oriented. As a result, skilled labour is moving from project to project primarily due to the short-term project nature of the work. One of the larger fabrication companies, indicated it is very difficult to recruit positions such as QA/QC Manager, QC Inspector, QA Inspector and Fabrication Shop Manager as there is limited opportunity locally for individuals to acquire the necessary experience in these disciplines in an industrial/heavy industry environment.

It appears there is increasing difficulty in recruiting Health Safety and Environment (HSE) professionals. Some of the factors contributing to recruitment difficulties are:

- i. These are relatively new positions, so there is not a large labour pool from which to recruit;
- ii. There is increasing emphasis on compliance with occupational health and safety standards in industries generally; and
- iii. The preferred qualification is an engineering degree.

Table 5 – Offshore Operations - Engineering and Fabrication – Reasons for Recruitment Difficulty

Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements create occupational shortage
Offshore Operations - Engineering and Fabrication						
Process Engineer	10-15 years offshore experience	✓			Subset of chemical engineering which is not offered at Memorial	✓
Loss Control Engineer	10-15 years offshore experience	✓				✓
Structural Engineer	10-15 years offshore experience	✓				✓
Instrumentation Engineer	10-15 years offshore experience	✓				✓
Instrumentation and Control Technician	10-15 years offshore experience	✓				✓
CAD	Structural experience					
Welders	Current experience with exotic metals		Project oriented employment – not long term		✓	
Structural Fitters	Current experience sheet metal workers, pipefitters, ironworkers (fitters)		Project oriented employment – not long term			

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Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements create occupational shortage
Pipefitters & Pipe welders	Experience with exotic metals		Project oriented employment – not long term			
Industrial Painter	Experience in specialty paints for the offshore		Project oriented employment – not long term			
Technical Supervisor	Experience in industrial/heavy industry setting					
QA/QC Manager	Experience in industrial/heavy industry setting					
QC Inspector	Experience in industrial/heavy industry setting					
QA Inspector	Experience in industrial/heavy industry setting					
Health, Safety Environment (HSE) Manager	Experience in industrial setting				✓	✓
Fabrication Shop Manager	Experience in industrial setting					

3.1.6 Electrical and Instrumentation

Table 6 presents the occupations in the electrical and instrumentation sector which are difficult to recruit.

As noted in the previous section, it is difficult to recruit experienced electrical, instrumentation and piping engineers.

Senior Technical Managers with ten to fifteen years experience in electrical, instrumentation and piping are also difficult to recruit.

Several specialist positions namely, Motor Specialist, Power Turbines Specialist and Vibration Specialist were identified as “difficult to recruit”. Motor Specialist is an electrical and/or mechanical journeyman with years of experience in motor repair. On-the-job training is required to develop the required competencies. Power Turbines Specialist is a “one of” position requiring knowledge of specific manufacturer turbines. A brief position description is provided for each of these positions in Appendix E.

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Table 6 – Electrical and Instrumentation – Reasons for Recruitment Difficulty

Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements create occupational shortage
Electrical and Instrumentation						
Electrical Engineer	5-10 years offshore experience	✓				
Instrumentation Engineer	5-10 years offshore experience	✓				
Piping Engineer	5-10 years offshore experience	✓				
Senior Technical Managers	10-15 years experience					
Motor Specialist	Experience in motor repair			✓		
Power Turbines Specialist				✓		
Vibration Specialist				✓		

3.1.7 Environmental Consulting

Table 7 presents the difficult to recruit positions identified in the environmental consulting and monitoring services. Some of these positions are highly specialized namely, Physical Oceanographer and Acoustic Engineer and might be described as rare. Marine biologists specializing in fish health, particularly toxicology and marine habitat management are difficult to recruit.

One of the contributing factors to the challenge of hiring weather forecasters is access to occupational specific training programs. While degrees in meteorology are offered by Dalhousie University, University of Toronto and McGill University, a work experience program is not available. Additional information is provided in Section 12.0 Potential Training Opportunities.

Table 7 – Environmental Consulting – Reasons for Recruitment Difficulty

Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements create occupational shortage
Environmental Consulting						
Weather Forecaster					✓	
Physical Oceanographer				✓		
Marine Biologist				✓		
Acoustic Engineer				✓		

3.1.8 Inspection Services

Table 8 presents occupations identified as difficult to recruit in the inspection services sector. As noted in a previous section, experienced mechanical and inspection engineers are in short supply.

Non-Destructive Testing (NDT) Technicians with at least 5 years experience are difficult to recruit. NDT Technicians conduct non-destructive testing on plant, equipment and structures, and prepare test reports.

Some companies indicated it is difficult to recruit Tubular Drill Pipe Inspectors with the required 3 to 4 years experience.

As with many of the positions that are difficult to recruit, service companies recruit for entry level positions and provide the necessary training and experience for promotion.

Table 8 – Inspection Services – Reasons for Recruitment Difficulty

Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements create occupational shortage
Inspection Services						
Mechanical Engineer	Industrial experience	✓				
NDT Technician	4-5 years offshore experience					
Tubular Drill Pipe Inspectors	3-4 years to reach a senior position					
Inspection Engineer	Offshore experience			✓		

3.1.9 Specialty Services

Also as noted in section 3.1.1, Geophysicist and Geologists (Petroleum) are well-recognized occupational shortages within the offshore oil and gas industry.

Offshore Radio Operator is reported to be in short supply. There is no local, formal training program for offshore radio operators. The qualifications are high school graduation and a radio operator's license (2 week course) and experience. Experience in an offshore environment is important because it is a remote location, and radio communications are critical from a safety and operational perspective. While the number of positions required is not high, it has been suggested that a course offered every two or three years would provide a useful resource pool for Atlantic Canada.

Individuals with entry level qualifications for Remotely Operated Vehicle (ROV) technician positions, a mechanical or electronics technician program, are readily available. Experienced ROV technicians are not available.

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IT/Telecommunications Technicians require a two year electronics diploma and several years onshore work experience with satellite and other communications equipment before being assigned to an offshore position with a senior technician.

Table 9 – Specialty Services – Reasons for Recruitment Difficulty

Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment/project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements create occupational shortage
Specialty Services						
ROV Technician	ROV experience					
Offshore Medic			✓			
Marine Geologist		✓				
Geophysicist		✓				
Offshore Radio Operator	Offshore experience				✓	
IT/Telecommunications Technician	Telecommunications industry experience and offshore experience					

3.1.10 Supply and Service

Supply and service companies identified two positions as difficult to recruit, namely Account Manager and Freight Forwarder.

Account Managers sell products such as equipment and chemicals to the oil and gas industry and therefore must be knowledgeable about the product requirements of the industry. The Account Manager position often requires a degree in engineering or chemistry or a technical college diploma and experience in the offshore oil industry.

The Freight Forwarder position requires a college diploma and experience in project materials, schedule management and logistical constraints. This position is readily available in manufacturing and heavy industry environments such as the US. It is more difficult to find qualified candidates in Canada, especially Atlantic Canada.

Table 10 – Supply and Service – Reasons for Recruitment Difficulty

Occupation	Lack of or Insufficient experience	Occupational shortage recognized industry-wide	Short-term employment /project opportunities	Very limited employment opportunities and limited occupational supply	Unavailability of occupational specific training programs	Addition of White Rose Project requirements create occupational shortage
Supply and Service						
Account Manager	Offshore oil industry experience					
Freight Forwarder	Lack of industry knowledge, small market opportunities			✓		

4.0 Demand Scenarios

4.1 Approach/Methodology

The existing fields in production, Hibernia and Terra Nova, are using a fixed production platform (FPP) and a floating production storage and offloading (FPSO) vessel respectively. The local oil and gas industry has the experience to determine with a reasonable degree of confidence the number of personnel and occupations required to manage the development and production of the oil fields and to operate and support the production facilities in the unique environmental climate of the East coast.

The following research methodology was implemented:

- i. Identified the companies providing service to the existing FPP and/or the FPSO;
- ii. Through interviews with the companies identified the:
 - a. Occupations/positions employed by the companies;
 - b. Number of people employed in each occupation/position;
 - c. Approximate allocation of positions to the FPP or the FPSO;
 - d. Location of each position either onshore, offshore, or “offshore as needed”;
 - e. Change in the number of occupations/allocations based on multiple facilities; and
 - f. Other companies also providing services or supplies to the facilities.

4.2 Limitations of the Research Methodology

The limitations of the research methodology are:

- i. While the current employment profile represents average activity for the last twelve months, companies’ employment profiles are dynamic, and may change due to changing business practices, circumstances in the field development, contractual arrangements, etc.;

- ii. The companies interviewed represent a substantial portion of the direct employment arising from the production phase in the province at this point in time, however they do not represent a substantial proportion of the indirect or induced employment generated by the industry;
- iii. Several companies did not provide estimates of the employment required for multiple facilities. Where possible, estimates were allocated however it should be noted there is probably a small portion of labour demand missing from the multiple facilities scenarios. For example, where services are provided on an ad hoc basis it was difficult to estimate the number of people required;
- iv. The employment profiles of subsequent, similar facilities may be different. For example, a FPSO will be utilized for the production of White Rose. This a smaller FPSO than the one used for Terra Nova and will have a lower crew requirement. In the future the scenarios could be extended to include a range of scenarios, based on the size of the smaller facility;
- v. Although it clearly exists it is difficult to quantify the amount of underutilized capacity in the industry, thus it is difficult to be precise in the scenarios for multiple facilities;
- vi. The scenarios do not address attrition; and
- vii. The study scope addressed “steady state” production only.

4.3 Advantages of the Research Methodology

The advantages of the research methodology are:

- i. It identified a comprehensive occupations/positions list, identifying approximately 340 positions employed in the province’s upstream offshore oil and gas industry. This is a more detailed view of the occupational composition of the industry and related sub-sectors than has been available to date;
- ii. It identifies current employment numbers at a relatively stable operating phase for both production platforms;
- iii. It utilizes current employment numbers as the basis for the development of the scenarios;
- iv. Many of the allocations for the occupations/positions identified for each scenario were provided by representatives from each of the identified industry sub-sectors;
- v. The representation of sub-sectors, including the supply and service sub-sectors is a wider scope than other studies to date; and
- vi. It represents a substantial proportion of the direct employment generated by Hibernia and Terra Nova during the production phase.

4.4 Findings

4.4.1 Occupations List

A comprehensive list of approximately 340 occupations/positions was identified for the production phase of the province’s offshore oil and gas activity. The occupations list is presented in Appendix F.

One of the objectives of this study was to expand the knowledge of occupations in the offshore oil and gas industry in the province, beyond the operators and their prime contractors to the supply and service community.

As noted in a previous section, the occupations identified are categorized according the following sub-sectors:

- Project owner/operator;
- Drilling;
- Well services;
- Subsea;
- Marine logistics and transportation;
- Warehousing and logistics;
- Catering and accommodations;
- Operations, maintenance and construction personnel;
- Electrical/instrumentation personnel and services;
- Offshore/marine fabrication;
- Engineering and design consultants;
- Environmental consultants;
- Testing and inspection;
- Remotely operated vehicle (ROV) support;
- Health and safety;
- Medical services;
- Seismic and survey;
- Tubular goods;
- Leak detection; and
- Oil shipment and storage.

4.4.2 Current Employment Profile

The total current direct and indirect employment⁵ related to work to support Hibernia and/or Terra Nova production for the companies participating in interviews is 2,285 persons. This includes onshore, offshore, and “offshore as needed” positions. Appendix F presents each occupation and the current number of people employed in each occupation.

The current employment profile already has synergies factored into it, as many companies particularly service companies, which provide personnel “offshore as needed” often provide services to multiple facilities.

The current employment profile is in the range of the base case scenario reported in the 1999 Canadian Association of Petroleum Producers report, *Estimation of Direct Human Resource Requirements Offshore Exploration and Production Newfoundland and Nova Scotia 2000 – 2010*. This report developed activity scenarios based upon the number of rigs drilling exploration or development wells and the number of staffed offshore installations producing oil and gas. The base case for Newfoundland assumed two projects in production, Hibernia and Terra Nova, and one mobile rig active on Terra Nova. The direct employment forecast for the base case in 2003 was 2,153.

⁵ Induced employment was not addressed.

4.5 Background for the Demand Scenarios

The Newfoundland and Labrador oil and gas industry is relatively small, and it is difficult to forecast with any precision how it will develop, or the number and type of production and drilling facilities which will be used. One of the objectives of the study was to provide a capability to identify “most likely scenarios” for personnel requirements by providing the personnel requirements for one, two and three of each of the following facilities:

- i. Floating production storage and offloading vessel;
- ii. Fixed production platform; and
- iii. Semi-submersible.

The scenarios presented in Appendix G allow this report’s users to estimate the personnel requirements for various combinations of facilities, taking into account the differences in personnel requirements based upon whether the facilities are operated by one or separate companies. These scenarios reflect these understandings, which were supported by the research:

- i. Full-time rotational offshore positions increase proportionally to the number of facilities operated by a company; and
- ii. Offshore positions that are utilized offshore on an “as needed basis” and onshore supervisory and support positions will not increase proportionally with the number of contracts obtained by an individual company. These “synergies” provide an important indication of the underutilization or overcapacity that exists in some of the areas.

The following examples demonstrate how to utilize the scenarios presented in Appendix G:

- i. If one company is operating or has contracts related to one FPSO, choose 1 FPSO;
- ii. If one company is operating or has contracts related to two FPSOs, choose 2 FPSO; and
- iii. If two companies are operating or has contracts related to one FPSO each, the personnel requirement is twice 1 FPSO.

With regard to the FPSO, it is also necessary to add at least one semi-submersible (choose 1 SS) to provide the necessary development drilling capability.

It should be noted:

- i. The scenarios do not account for different sizes of facilities. For example, the FPSO planned for White Rose is smaller and will have a lower “personnel on board” (POB) count than the FPSO utilized for the Terra Nova field; and
- ii. The scenarios are extrapolated from the current employment profiles. In other words, because many companies work for both Hibernia and Terra Nova, personnel were allocated between the facilities.

4.5.1 Demand Scenarios

Appendix G provides the occupations/positions and labour demand for a fixed production platform. The total labour demand is approximately 1080, including offshore, “offshore as needed” and onshore personnel.

The labour demand for the production platform, and related facilities such as supply vessels, shuttle tankers, tugs and helicopters are standard as they all governed by vessels person on board requirements/limitations and/or Transport Canada regulation.

For “offshore as needed” positions it is harder to determine labour demand as time offshore is not predictable – it is dependent on the type of activity occurring offshore. Offshore as needed personnel are on call and may work on several facilities at different intervals. As well these personnel often move among offshore Newfoundland and Labrador, Nova Scotia and other jurisdictions. As a result, the use of the number of people for these positions implies some over capacity as they are not fully employed for that particular facility. However, this overstatement diminishes in the subsequent scenarios for two or three facilities. An example of a sub-sector where the occupations are predominantly in the “offshore as needed” category is well services.

It should be noted there is a finite capacity in this pool of “offshore as needed” as simultaneous demands from both offshore facilities and other industrial operations such as the oil refinery places stress on some occupations within this aspect of the labour pool.

Onshore positions include office staff and onshore service personnel. The current capacity of onshore staff is generally not fully utilized in the supply and service sectors. Other strategies such as overtime come into play. While overtime is not an option in the 12 hour shift environment offshore, it is an option onshore.

Appendix G also provides the occupations/positions and labour demand for a floating production storage and offloading vessel including owner/operator, marine, helicopter transportation, warehousing and logistics, offshore operations, maintenance and modifications, operations engineering and fabrication, catering, medical services, specialty services, onshore support personnel, and others. The FPSO scenario also includes supply vessels, onshore support, helicopters, shuttle tankers and tugs personnel. The total employment is approximately 736 personnel.

The occupations/positions and employment profile for a semi-submersible drilling rig is also presented in Appendix G. This scenario includes owner/operator, drilling, well services, offshore operations, catering, medical services, specialty services and onshore support personnel. The total employment is approximately 320 personnel.

4.5.2 “Offshore as Needed” Occupations

Companies whose employees are predominantly “offshore as needed” indicated several points for consideration:

- i. The 21 day rotation requirement increases the number of people that must be available – for example a 26 day job would require that a two crew capacity be available i.e., one crew working for 21 days and another working for the remaining five days; and

- ii. It takes a longer period of time to acquire the requisite offshore experience required for internal promotion because the periods offshore are short and occur on an ad hoc basis. In an area where there are many production facilities this is less of an issue.

5.0 Deviations from Stable Operating Conditions

Hibernia's FPP and Terra Nova's FPSO system have been in operation for six years, and one and a half years, respectively.

Several foreseeable events over the next 10 years in the life of the Hibernia and Terra Nova fields will impact the current employment profile. While specific timing of the events is not predictable, a general time line has been provided where possible.

- i. Reduction in Production Drilling Activity;

As the number of required production wells are completed and the field reserves decline, a reduction in drilling is anticipated. This may result in a reduction of the number of:

- Rig Supervisors;
- Drilling crews;
- Well services crews;
- Some reduction in the maintenance crew for the rig; and
- Some reduction in deck crew positions due to less requirement for bulk material movement, people movement, etc.

Any reductions may be eliminated or mitigated as the project owners/operators will be looking for other acreages to tie into the production systems.

- ii. Well Workovers and Incremental Drilling;

Within 7 to 10 years as production drilling activity decreases, Hibernia and Terra Nova will continue to do well workovers and incremental drilling but on a declining basis.

On the positive side, improvements in technology and enhanced oil recovery methods may allow increased recoverable reserve which could increase production or extend the life of individual wells.

6.0 Potential Impacts on Labour Demand

Over the next 10 years, the following potential activities may impact labour demand for the province's emerging offshore oil and gas industry:

- i. Development of New Fields;

Several field developments are possible:

- The development of White Rose is proceeding;
- Operators are investigating whether there are sufficient reserves in the Far East block for production. If so, this field would be tied into the Terra Nova field by 2005. This activity would result in an increased requirement for engineering work and therefore an increase in the demand for engineers over the next two

years. Once the field is tied in, it will not require significantly more people to operate than the existing operation;

- Hebron/Ben Nevis may be developed at some point in the future;
- Beyond 2007, stepouts (extensions) to smaller discovered fields such as Mara, Springdale, Nautilus, King's Cove and North Dana that are not solely viable may be tied back to the existing fields; and
- New zones which may be discovered based on exploration and delineation drilling such as the Flemish Pass, Laurentian Basin.

Stepout activity for Terra Nova from 2003 to 2005 and for Hibernia and White Rose from 2007 to 2010 will positively impact all sub-sectors of the industry.

In summary, new projects increase work for all sub-sectors of the industry.

- ii. Petroleum Product Transportation:
No change is expected in the next 10 years in the number of shuttle tankers serving Hibernia and Terra Nova;
- iii. Helicopter Transportation:
The demand for helicopter transportation is affected by a number of factors including the number of operators, the number of people required offshore, the scheduled shift rotation, the passenger capacity of the helicopters used, distance travelled and hours flown per day. Changes in any of these variables can impact the aircraft and support crewing requirement;
- iv. Completion of Production Drilling:
The possible impact on labour demand of the completion of production drilling is identified in section 5.0;
- v. New Capital Projects:
New capital projects, major expansions of existing facilities, annual shutdowns, capacity upgrades, and de-bottleneck efforts increase the demand for engineering design services and ad hoc requirements for shutdowns;
- vi. Technology Developments:
Advances in technology can reduce occupational demand. For example, Hibernia's ability to access remote areas of the reservoir reduced the tie backs required and decreased demand for engineering services;
Because the FPSO does not have a drilling capability, fewer modifications are required than for the fixed production platform, and therefore there are fewer opportunities for support people;
Technology has already reduced the number of roughnecks on a drilling rig. Further reductions are not anticipated in the next 10 years;
- vii. More Exploration Activity:
Increased exploration activity increases occupational demand as it increases the scope of work available to the industry participants generally;
- viii. Declining Production Rates:
As reservoir production rates begin to decline, and secondary recovery commences the POB numbers will decrease. This is reported as the experience in the North Sea. For example, for Terra Nova declining production will start in years 6 to 8 for the original field, however if the Far East is developed the life of the field will be extended. Similarly, the Hibernia field's life may be extended if drilling is successful in the Avalon reservoir and/or satellite fields are tied in; and

- ix. Increased Maintenance in Some Services:
During the secondary recovery phase of the reservoir, equipment replacement may be less frequent and repairs more frequent. Regular maintenance and upgrade maintenance will be required.

7.0 Potential Impacts on Occupational Supply

The following offshore activities may impact occupational supply:

- i. New Offshore Projects:
New offshore oil and gas projects within the region often result in loss of employees from existing projects, as employees leave to join the new project to avail of promotional opportunities or to accept lateral positions. These projects put pressure on the labour pool and would impact all the existing shortage areas;
The development of a natural gas field or the export of gas from existing fields in production would also impact all the existing occupational shortage areas;
- ii. Increased Exploration Activity:
Increased activity from exploration and/or production drilling can result in occupational shortages in the drilling sub-sector;
More drilling activity will increase well services work, and will affect all the existing shortage areas;
- iii. Changes in Technology:
The shift from conventional well completion to “smart well” completion will increase the demand for Electronic Technologists. Smart wells are wells with fundamental process control downhole that enables surveillance, interpretation and actuation. Adaptation to this change in technology will occur in the oil and gas industry worldwide over the next 10 years. The skills required for smart well completions will likely be supplied by the Permanent Downhole Gauge or the Electric Wireline Specialist;
Smart well technologies enable real time data transmission regarding downhole conditions and facilitate remote management of the well, which could reduce the number of offshore drilling positions for the Operators as interventions are avoided. Engineers onshore could remotely manage the field, thus creating efficiencies in staffing;
- iv. Workover:
During workover there will be an increase in slickline, completions, electric wireline and coil tubing services. Engineering support will increase due to workovers as there may be a need for additional planning;
Workover also requires the re-installation of tubing in the wells due to corrosion, etc. These assignments are very short, usually less than one week of work per well depending on the well depth, etc.;;
Long term production projects increase demand for tubing and casing services and thread inspection. Increased exploration drilling does not have an impact as there is enough capacity to accommodate it;
The number of well services jobs occurring at the same time has an impact, as the companies cannot maintain the level of staffing required in the province for these short periods of high demand. Workover jobs should be coordinated between the projects to take advantage of the synergies and share resources;

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- v. Increased Competition:
Increased competition without an increase of the work available will impact occupational supply;
- vi. Turnaround and Shutdown Activities:
The labour supply is stressed, if short-term activities such as turnaround and shutdown activities are not co-ordinated among multiple platforms. Adding other industrial activities such as the refinery shutdown to this mix, greatly stresses the available labour supply; and
- vii. Modifications:
Modifications to the platforms tend to be ongoing through the life of the platforms.

International Oil and Gas Industry

Changes in labour demand in the oil and gas industry internationally will impact the labour supply for the province's emerging offshore oil and gas industry.

As previously mentioned, the rate of rig utilization worldwide affects the recruitment of senior positions for drilling operations. In most sub-sectors of the industry, experienced, highly skilled personnel can avail of employment opportunities internationally. This results in upward pressure on salaries in order to remain competitive. One often cited disadvantage or barrier to recruitment for positions in Newfoundland is the high personal tax rate. Within Canada, workers moving from Alberta to Newfoundland and Labrador move from the lowest tax rates in the country to the highest. Also the demand for engineers and environmental scientists is very high in Alberta due to developments in the north, the oil sands and pipeline projects. Internationally drilling off Africa, in deep water, is drawing many of the specialist skills in the industry.

Onshore Oil Development Projects

The development of onshore oil projects on the province's west coast would increase the demand for drilling crew and well services positions.

8.0 Other Non-Oil Projects that Impact Labour Demand

Depending on the timing of the projects, several non-oil projects such as the Voisey's Bay and Lower Churchill projects, could impact labour demand for certain occupations utilized by the province's offshore oil and gas industry.

Voisey's Bay project will impact:

- i. Marine officer occupations as there is the opportunity to ship materials, equipment and supplies required for the site, and eventually to ship ore;
- ii. Seismic activities through its requirements for marine mapping, charting, examination of the dock location, etc.;
- iii. Trades employed by metal fabricators and project managers, CAD and Certified Engineering Technologists (CET) as their skills will be in demand. Salaries for positions with large projects tend to be higher than those with local fabrication shops;
- iv. Medical services will be required for Voisey's Bay and the Lower Churchill projects; and

- v. Operations and maintenance occupations such as Electrical and Instrumentation Technicians, Panel Operators and Field Operators when the mine is operating.

The Lower Churchill project remains a possibility, but the timing of the project start continues to be uncertain. The pre-construction and construction phases of the Lower Churchill project which are estimated to span a 10 year period will impact the labour supply. Occupations such as engineers, contractor supervisors, heavy equipment operators, construction trades, mechanics and others will be in demand. With the exception of engineers, the increased demand for these occupations will not impact the production phase of the oil and gas industry.

In the operations phase of the Lower Churchill project there would be a demand for power plant operators, maintenance staff, electrical and instrumentation technicians, occupations which are also in demand with the offshore oil and gas industry.

9.0 Recruitment Strategies

The Canada-Newfoundland Atlantic Accord Implementation Acts require companies to submit a Canada-Newfoundland benefits plan which means a plan for the employment of Canadians and, in particular, members of the labour force of the Province. The Act further states “individuals resident in the province shall be given first consideration for training and employment in the work program for which the plan was submitted.”⁶

A number of recruitment strategies are used by the oil and gas industry in the province, including:

- i. Companies with entry level positions that require high school graduation only, often have enough résumés dropped off to their offices that they can select recruitment candidates from those submitted;
- ii. Companies with entry level positions that require undergraduate or college diplomas for the most part participate in co-operative education programs and/or graduate recruitment programs with Memorial University, the Marine Institute and the College of the North Atlantic. Engineering undergraduates are clearly a point of focus at this time. Some companies indicated they recruit from these institutions not only for their local office, but for international placements as well. The co-operative education programs provide students and employers an opportunity to assess their interest in longer term employment offers;
- iii. It is a common practice throughout the industry to hire at the entry level and train people internally to facilitate career progression. This practice is particularly evident in the well services and drilling sub-sectors;
- iv. For occupational shortage areas, or for temporary or highly specialized positions which necessitate international recruitment, international companies, often recruit internally and second the candidates to the local office for two or three years;
- v. The emerging oil and gas industry in this province is essentially a small community, so word of mouth is often used to recruit personnel;
- vi. A number of companies indicated local newspaper advertising is not an effective medium for recruitment. Such advertisements often result in either a low number of responses or a high number of responses from people with inadequate experience;

⁶ Canada-Newfoundland Atlantic Accord (Newfoundland) Implementation Act 1992, clause 45 (3) (b).

- vii. Several sub-sectors maintain a casual labour pool to fill temporary absences of permanent employees, due to illness, family responsibility leave, etc. Generally, recruitment for vacancies then occurs internally first from the casual labour pool and then from the external market;
- viii. For very difficult to recruit positions some companies reported they use recruitment companies;
- ix. Many companies publish career information and opportunities on their websites; and
- x. Most companies use a combination of some, or all of, newspaper advertising, word of mouth, recruitment companies, receipt of unsolicited résumés, and websites to recruit for positions based in the province.

10.0 Employee Retention

The majority of the companies interviewed are not experiencing retention issues.

In general, retention issues are less frequent when:

- i. The companies have long term contracts in place as it offers a stable employment environment, e.g., drilling; and/or
- ii. There is limited competition within the sub-sectors. The offshore oil and gas industry in the province is relatively small, so there is limited opportunity for employees who wish to remain in the province to move within the industry.

Companies that did report retention issues identified several occupations, namely:

- i. Offshore Drilling Superintendent:
Offshore Drilling Superintendent is one of the positions identified in section 3.1.1 as an occupational shortage. The relatively small group of people in this occupation have years of international experience in the offshore oil and gas industry and are in demand. There are likely to be sufficient employment opportunities available that they can choose the part of the world in which they wish to work. Some companies have indicated working on the Canadian East coast is not attractive to this group due to the tax situation, lifestyle, etc;
- ii. Marine Crew:
It is difficult to retain marine crew on:
 - A FPSO because the:
 - i. Marine roles on a FPSO are different while the vessel is on location, from those on a ship. For example, the Master Mariner is not in-charge unless the vessel disconnects;
 - ii. Shift rotation is different; The workload is greater on the FPSO in terms of 12 hours a day for 21 days and the work assignments are more varied than marine positions;
 - iii. Career path is limited in a “one of” environment; and
 - iv. International market for these positions is highly competitive.
 - A semi-submersible because:
 - i. They cannot progress with regard to marine certificates; and

- ii. There are a lot of employment opportunities in the marine sector generally.
- iii. Engineering Technologist/Technician and CAD Technicians:
Experienced Engineering Technologists and Technicians are in short supply. Some companies in the Offshore Operations – Engineering and Fabrication sub-sector indicate individuals in these occupations often prefer to be contractors rather than employees and thus acquire a higher rate of compensation; and
- iv. Environmental Monitoring:
Shift rotations i.e., 12 hour shifts four days on and four days off, for onshore weather forecasters are found to be difficult to work and are an issue for staff.

Some companies raised the issue of upward pressure on salaries for those occupations that are in demand across the sub-sectors or have specialist skills that are in short supply in the local market. For example, generally the larger and/or international companies pay higher salaries, so to retain those employees that have opportunities such as engineering technologists or technicians the smaller companies increase salaries.

A number of companies raised the issue of the difficulty they experience retaining people recruited from outside the province. Several reasons are given for these retention difficulties:

- i. Compensation is often lower than other international areas;
- ii. Lifestyle issues, in terms of climate, isolation from other major urban centres;
- iii. Family preferences, and
- iv. High rates of taxation.

As a result of the retention difficulties experienced with people recruited from outside the province, many companies indicated their preference is to hire people from the province or with a close family connection to the province.

11.0 Current Initiatives to Address Occupational Shortages

Companies and educational institutions have undertaken initiatives to address some occupational shortages. The following initiatives are offered as examples, and form only a partial list of the initiatives undertaken by companies, institutions and governments.

11.1 Company Initiatives

Many of the participating companies indicated they use internal training programs to develop the requisite competencies for positions where labour supply is short. They hire entry level positions and provide the experience and appropriate internal training programs to facilitate the progression of the employees to positions which are difficult to fill.

For occupations in short supply which require an undergraduate degree or a college diploma program at the entry level, many of the companies participate in the co-operative education programs at Memorial University, the Marine Institute, and the College of the North Atlantic. The

companies most often recruit from the engineering, business, technology, technician and marine programs. The project operators, drilling companies, well services companies, electrical and instrumentation companies, marine companies, environmental consulting, and others participate in the co-operative programs and graduate recruitment.

Many of the international companies, have internal development and promotional programs, and transferring employees to projects around the world is common practice. Many companies indicated they recruit new graduates, particularly in engineering, not just to meet the needs of local projects but to address shortages in other areas of operation.

Other companies have partnered with the educational institutions to develop programs specifically to train their recruits. For example, one company worked with the Centre for Nursing Studies at Memorial University to develop a course in remote medicine for registered nurses who had accepted positions as offshore medics or in other remote areas. The four month course was offered in part through Distance Education with two weeks practical training for each medic in a laboratory setting. Developing and providing customized specialist training is an expensive undertaking for companies.

In anticipation of increased demand due to the addition of new projects, the owners/operators identified a possible shortage in Process Operators, particularly the Field Operator and Panel Operator positions. The FPSO planned for the White Rose field will require 12 of these positions. One of the strategies in place to address this shortage has been to hire entry level instrumentation technicians from the College of the North Atlantic in each of the last two years and develop specific required competencies through work experience and internal training programs.

11.2 Other Initiatives

Established in the fall of 2000, the Oil and Gas Development Partnership is a partnership between Memorial University of Newfoundland, the oil and gas industry, associated service companies and all levels of government. The Oil and Gas Development Partnership is stimulating oil and gas research initiatives and initiating new education programs.

“Two new areas of aggressive, innovative research are being undertaken, one in Reservoir Characterization and Management and the other in Asset Integrity Management. With the introduction of the Master of Oil and Gas Studies in September 2003, Memorial University of Newfoundland will be in the forefront of executive education for high potential employees of the oil and gas industry. The Master of Oil and Gas Studies and the above mentioned research initiatives, will ensure that Memorial becomes a world leader in the upstream sector of oil and gas education and research.”⁷

12.0 Potential Training Opportunities

Two occupational shortage areas, which have unique training program circumstances are remote nurses and weather forecasters. Health Canada may not continue to provide its 12 to 14 week course for northern/remote nurses. Provision of training for northern/remote nurses may warrant additional research to determine if this is an opportunity to participate in providing

⁷ Memorial University website, www.mun.ca/OGDP

training on a national basis. While the demand for offshore medics is insufficient to sustain such a program, there remains demand in the North, Alberta and Labrador for nurses with this specialized training.

Memorial University offers a Nurse Practitioners post-graduate degree through the Centre for Nursing Studies. Nurses entering the program directly after graduation from an undergraduate nursing degree, lack the practical experience required for employment in remote locations upon graduation as a Nurse Practitioner.

Another area identified which may warrant additional research is weather forecaster training. The Federal Department of Environment trains their own weather forecasters and until several years ago also provided practical training for private companies' staff. This was essentially an apprentice program. To replace the apprenticeship, one of the options for local employers is to send their staff to the UK British Meteorological Office. However, this is an expensive solution. Degrees in meteorology are offered by Dalhousie University, University of Toronto and McGill University.

13.0 Observations, Findings and Recommendations

The following observations, findings and recommendations are offered for consideration:

i. Comprehensive Occupational List

The comprehensive list of positions in the province's oil and gas industry and the career progression information for offshore positions provides valuable input for future human resource and career planning.

More than 340 different positions have been identified in the offshore oil and gas industry in the province. This includes positions which are achieved through completion of an established career progression from an entry level position through a series of intermediate positions to a senior position. Career progression in these positions requires accomplishment of a prescribed set of competencies, which is usually gained through completion of internal training programs and work experience under the supervision and guidance of senior personnel in a particular discipline. Career progression in the offshore aspects of the oil and gas industry is very structured, and is reportedly less well defined for onshore positions.

Career progression diagrams for offshore positions are included in Appendix D for:

- i. Drilling Floor, Deck Crew, Marine Engineering Crew, Maintenance Crew, and Electrical Crew;
- ii. Highly specialized positions such as Directional Driller;
- iii. Well services positions including:
 - Well Services Engineering;
 - Mud Logging;
 - Slickline and Completions;
 - Liner Hangers and Downhole Production Tool Technicians; and
- iv. Specialty services such as Remotely Operated Vehicle Crew.

A career progression diagram is provided for Subsea Construction Engineer, which is an onshore position. The *Offshore Petroleum Engineering Task Force Report* provides information on the experience levels required for several types of engineering positions.

ii. Detailed Information for Occupations

The focused, detailed view of occupations provided by the study is important for future labour market planning.

The level of detail provided for occupations is greater than a broad occupational classification. For example, the study provides information regarding engineering disciplines including reservoir, well planning, drilling, process, loss control, structural, instrumentation, electrical, mechanical, piping, inspections, and subsea construction. This provides a more definitive or focused view of the occupations as each of these specialties is developed based on an entry level qualification of an engineering undergraduate degree and five to 10 years of experience. The specialties are not interchangeable.

iii. Need for Comprehensive Labour Market Assessment and Plan

Labour demands from increased exploration, construction, commissioning and start-up of new projects will challenge the existing labour pool.

The scope of the study was the production phase (stable operations) of the oil and gas activity in the province. The other phases of offshore oil and gas activity including exploration, construction, commissioning and start-up also create significant demands for many of the occupations identified. Given that this study, and others referenced in earlier sections, report there are occupations that are difficult to recruit indicates that there is a need for a comprehensive labour market assessment for the oil and gas industry. For example, on the immediate horizon is the construction and commissioning of the White Rose project. This will impact many of positions identified in this study. Looking further along the time horizon, any new projects, which commence at exploration and proceed through construction and commissioning to production would challenge the existing labour pool.

Consideration should be given to extending the labour market assessment to include the Atlantic Region as some percentage of the labour pool is mobile within the region.

At present, the human resource needs of the oil and gas industry in the province are being met i.e., few vacancies. However, growth of the industry requires growth of the labour pool in a planned manner to provide sufficient time to acquire the necessary experience to meet the unique requirements of the province's offshore environment.

iv. Internal Recruitment and Promotion

Many of the "difficult to recruit" positions are addressed through internal recruitment and promotion. External recruitment for specialized positions may take several months.

While a high number of positions were identified as difficult to recruit, many of these positions are addressed through internal recruitment and promotion. Many of the companies actively plan for their human resource requirements and have implemented career progression ladders, hiring at the entry level and providing the training and

experience to develop the competencies necessary for higher level positions which are difficult to recruit internally or externally.

v. *Entry Level Qualifications*

Entry level qualifications for engineering, business, technician, technologist, and marine positions are being adequately addressed by the education and training institutions in the province. Many companies indicated Memorial University, the Marine Institute, the College of the North Atlantic and private training institutions provide relevant programs and their graduates are being placed in entry level positions in the offshore oil and gas industry. This finding is consistent with other studies such as the *Offshore Petroleum Engineering Task Force Report* and the *Analysis of Gaps and Issues Related to Labour Supply and Demand in Offshore Exploration and Production in Newfoundland*.

vi. *Increasing Technical Qualifications for Entry Level Positions*

The trend toward increasing technical requirements for offshore positions such as drilling and well services positions will impact entry level position requirements. The minimum educational requirement for entry level positions in such areas as drilling, well services and others may increase from high school graduation to include computer courses. This is in response to advances such as smart tool technologies.

vii. *Work Experience Programs*

Several companies suggested implementation of work experience programs in areas such as Instrumentation Technician would be beneficial as the graduates gain work experience and the employers have an opportunity to assess their work performance for potential career opportunities.

viii. *Career Orientation*

Several companies suggested early career orientation should be provided for students in training programs for occupations which usually lead to positions offshore in the petroleum or the marine industry. The orientation should identify offshore work requirements including lifestyle factors. This would help students make decisions earlier in their academic programs regarding their suitability to work offshore.

ix. *Sub-Sector Differences Influence Recruitment Difficulty*

Labour market issues experienced often differ depending on the sub-sector, size of the company, company training and recruitment practices and duration of employment offered.

For example, short term drilling contracts increase the difficulty to recruit for drilling positions which are in demand. Another example, local supply and service companies often have a narrow and shorter career path, i.e., less opportunity for advancement and this can increase the difficulty in recruiting, particularly in a highly competitive labour market.

x. *International Labour Market Impacts Recruitment*

The oil and gas industry operates in an international labour market and therefore occurrences in that market affect the province. For example, it is well-recognized that there is a growing worldwide shortage of navigation and marine engineering officers.

Companies have indicated it is critical that efforts be made to educate and encourage young adults to consider marine occupations as a desirable career option.

xi. Shortage of Engineers

The short supply of engineers with oil and gas experience in the range of 10 to 15 years is reported to be an issue for the industry internationally. This issue was raised by many of the companies participating in this study.

Memorial University's engineering program is well regarded. Many of the companies are participating in the Engineering Co-operative program and hiring new graduates. Some of the companies reported they are hiring new graduates not only for their offices in the region, but also to meet international recruitment requirements for their firms.

xii. Emerging Occupational Shortages

There are emerging occupational shortage areas such as the increasing difficulty being experienced in recruiting Health Safety and Environment (HSE) professionals.

xiii. Encouraging Consideration of Oil and Gas Industry Careers

Development of bursary or other programs which provide students with funding to gain experience in the oil and gas industry internationally may assist in encouraging students to pursue careers in the industry. These programs should be available to students in college and university programs, which lead to entry level qualifications for oil and gas industry positions. The Atlantic Accord Career Awards program, which had awards of up to \$5,000 per student was an example of this type of student career funding.

xiv. Meeting Offshore Experience Requirements

Other studies on labour demand and supply for the offshore oil and gas industry have recognized the requirement for workplace training in order to meet increasing employer demands for 'relevant workplace experience'. Several strategies are being utilized to meet these demands in part:

- a. Individuals are moving elsewhere such as Alberta to gain experience on land rig operations which improves their qualifications to gain a position offshore;
- b. Employers are hiring for some entry level positions and providing the training and experience necessary for progressing to positions identified as difficult to recruit; and
- c. Institutions are partnering more with industry to provide work placements for students in relevant programs.

While these strategies are being implemented on an ad hoc basis, the challenge is to develop necessary human resources planning capability and processes. The progression of Newfoundlanders to high level positions in the industry is highly desirable. Consideration should be given to developing a strategic human resource plan for the industry – to be developed by industry, institutions and government, to identify:

- a. The key positions;
- b. The roles each of the stakeholders should play;

- c. Ways to encourage students to consider careers in the oil and gas industry such as bursary programs; and
- d. Ways to support or collaborate with other stakeholders to address labour shortage areas. As noted earlier, many of the positions requiring higher education are limited in number, but their value in the industry is substantial. This strategy is aligned with strategies for development of “centres of excellence” and more recently Memorial University’s Oil and Gas Partnership.

Appendix A – Key Informant Interview Guide

Name of Organization:	
Contact Person's Name:	
Contact Person's Title:	
Telephone Number:	
E-Mail Address:	
Date(s) of Interview:	

- Verify the primary sub-sector(s) in which the company conducts business in the oil and gas industry in Newfoundland and Labrador.

<input type="checkbox"/> Operator/Owner	<input type="checkbox"/> Operations, Maintenance, and Construction Personnel
<input type="checkbox"/> Drilling/Well Development	<input type="checkbox"/> Electrical/Instrumentation Personnel and Services
<input type="checkbox"/> Well Services	<input type="checkbox"/> Offshore/Marine Fabrication
<input type="checkbox"/> Subsea Operations	<input type="checkbox"/> Engineering and Design
<input type="checkbox"/> Marine Logistics and Transportation	<input type="checkbox"/> Environmental Consulting
<input type="checkbox"/> Warehousing and Logistics	
<input type="checkbox"/> Catering and Accommodations	
<input type="checkbox"/> Specialty Services	
- Verify the different phases of offshore oil and gas activity in which the company is active.

<input type="checkbox"/> Exploration	<input type="checkbox"/> Well Development	<input type="checkbox"/> Production/Processing
--------------------------------------	---	--
- For other than Operator/Owner companies, determine the degree to which the company's supply and service business is related to the oil and gas sector.

<input type="checkbox"/> More than 75%	<input type="checkbox"/> 50-75%	<input type="checkbox"/> Less than 50%	<input type="checkbox"/> Less than 25%
--	---------------------------------	--	--

Employment and Demand

- Review the company's Oil and Gas Employment Matrix.
 - Confirm the company's "core positions". A core position is a position which is:
 - Essential to the company's operations; and,
 - Either *Exclusively Related* or *Secondarily Related* to the oil and gas sector.

Exclusively Related means the position is exclusively or primarily employed in the offshore oil and gas industry or in a related supply and service sector.

Secondarily Related means the position is not exclusively employed in oil and gas related activities, but the oil and gas industry accounts for a significant share of the employment in that occupation, either directly or indirectly.

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Essential to operations means the position represents one of the company's core competencies or is for some other reason essential to the company's ability to sustain its operations on a long-term basis. Typically, these will include positions at the front-line supervisor level and above, as well as skilled positions at the trade, technical or professional level requiring as a minimum the completion of a multi-year post-secondary training program.

- Verify any other core positions not listed on the Oil and Gas Employment Matrix.
 - Verify the company's current FTE complement in each core position.
 - With Operators/Owners and key Tier 1 companies ...
 - **Synergies** -- identify positions where synergies would be achieved with two or three facilities.
 - **Deviations from "steady state"** – identify any significant stages in the evolution to steady state employment patterns, or factors which would be expected to cause deviations from this pattern over a 10 year post-startup period.
 - **Impact on indirect employment** – identify any particular sub-sectors and/or occupations from the Oil and Gas Employment Matrix which would be expected to experience employment growth with two or three facilities. Estimate multiplier impact if possible.
5. Identify any future offshore activity scenarios which are expected to significantly affect either occupational demand ...
- a) Anticipated hot skills areas – occupational areas where demand is expected to increase:
 - Contributing factors
 - b) Occupational areas where demand is expected to weaken:
 - Contributing factors

Occupational Supply

6. In the case of all core positions, verify the following through discussion ...
- a) Whether the position is entry level, if so, to what other position(s)
 - b) Typical recruitment sources
 - i. Internal vs. external (or both)
 - ii. High school vs. college vs. university
 - iii. Local vs. regional vs. national vs. international
 - If outside the province, **why** is this so? Are there any opportunities for improving the local availability of required skills through new training, or other programs, etc.?
 - Are there any particular positions in which there are skills and competency concerns related to the adequacy or quality of local training?
 - c) Typical employment status (e.g., permanent/full-time, part-time, temporary ad hoc, temporary project-based, etc.)
 - d) Verify whether supply is typically person or FTE based
 - i. If FTE, estimate person to FTE ratio if possible

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

- e) Degree of difficulty in recruiting ... if HIGH ...
 - i. Identify causal factors
 - ii. Identify recruitment strategies and best practices
 - iii. Specify those positions in which there are current vacancies, and the number
- f) Degree of difficulty in retaining ... if HIGH ...
 - i. Identify causal factors
 - ii. Identify retention strategies and best practices
 - iii. Specify those positions in which there are current vacancies, and the number
- 7. Identify any special current initiatives designed to address current and/or anticipated employment supply issues (e.g., bridging or employer-based apprenticeship programs for Instrumentation).
- 8. Identify future offshore activity scenarios which are expected to significantly affect occupational supply ...
 - a) Anticipated shortage areas – occupational areas where supply is expected to shrink:
 - i. Contributing factors
 - b) Anticipated surplus areas -- occupational areas where supply is expected to improve or exceed requirements:
 - i. Contributing factors
- 9. Determine if companies have any specific ideas as to how identified recruitment/retention problem areas might be addressed through programs delivered at the following levels:
 - a) Industry association(s) specific to the company's sub-sector
 - b) NOIA
 - c) Government – Educational Institutions
 - d) Government - Other
- 10. Obtain copies of internal job descriptions for core positions if available.

Appendix B – Employment Matrix

Purpose of Matrix

The purpose of this matrix is twofold:

1. To document those occupations which are employed in oil and gas-related activities in the province. This is intended to include those positions employed directly in oil and gas operations, as well as those employed more indirectly in supplying goods and services to the oil and gas sector; and
2. To document a current baseline of both direct and indirect employment in the oil and gas sector in the province.

Our focus in relation to the above is on **core positions**. A position is a core position if:

- a) The position represents one of your company's core competencies or is for some other reason essential to your company's ability to sustain its operations on a long-term basis. Typically, these will include positions at the front-line supervisor level and above, as well as skilled positions at the trade, technical or professional level requiring as a minimum the completion of a multi-year post-secondary training program;

and

- b) The oil and gas industry accounts, either directly or indirectly, for greater than 25% of the work performed by employees in that position.

Instructions for Completion

1. ***Refer to the shaded section of the Employment Matrix.*** These are the core positions we have tentatively identified as being most relevant to your organization.
2. Record the number of full-time equivalent (FTE) positions you currently employ in each case. Where the listed position is not a ***core position*** for your organization, leave blank.
3. Review the entire Matrix to see if there are any ***core positions*** listed in other sections which are employed by your organization. If so, indicate the relevant FTE data.
4. Consider whether there are any other positions, which you feel, are core to your company's operations that are not listed within the Matrix. If there are, please indicate under the "Other" line in the shaded section and indicate the relevant FTE data.
5. Retain your completed Matrix for review and discussion with the consultant.

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Oil and Gas Sector Employment Matrx

Well Services	Warehousing and Logistics	Catering/Accommodations	Specialty Services
Bulk Plant Operator	Warehouse Coordinator	Chef	Weather/Ice Observer
Cementing (field)	Warehouse Technician	Cook	NDT Engineer
Cementing Engineer	Receiver/Shipper	Catering/Accommodations Coordinator	NDT Technician
Coil Tubing (field)	Crane Operator	Steward	Diver
Coil Tubing Engineer	Pipeyard Technician	Other:	Survival Training Instructor
Completions (field)	Other:	Other:	Medical Consultant
Completions Engineer	Other:	Other:	On-call Medevac RN
Coring	Other:		On-call Medevac MD
Directional Drilling (field)			Thread Inspector
Directional Drilling Engineer	Engineering, Design & Fabrication		ROV Specialist
Drill Bit Engineer	Project Manager		Seismic Survey Engineer
Drilling Fluids (field)	Structural/Facilities Engineer		Seismic Technician
Drilling Fluids Engineer	Naval Architecture Engineer		Seismic Interpreter
Electric Line (field)	Mechanical Engineer		Other:
Electric Line Engineer	Electrical Engineer		Other:
Fishing Tools & Services	Instrumentation/Controls Engineer		Other:
Liner Hanger	Materials/Welding Engineer		
Mud Logging (field)	Engineering Technologists/Technician		
Mud Logging Sample Catcher	CAD/CIS Technician		
MWD/LWD (field)	Electrician		
Nitrogen	Welder		
Permanent Downhole Gauges	Pipefitter		
Service Tools	Steelworker		
Slickline	Other:		
TCP (Tubing Conveyed Perforating)	Other:		
Tubular Handling	Other:		
Warehouse Technician	Environmental Consulting		
Well Head Systems	Environmental Project Manager		
Well Planning	Geologist		
Well Testing Engineer	Seabird Biologist		
Other:	Fisheries Biologist		
Other:	Marine Biologist		
Other:	Plant Biologist		
	Hydrology Engineer		
	Environmental Technician		
	Other:		
	Other:		

Company Name:
Contact Person:
Telephone Number:
Date:

Appendix C – Mail Survey

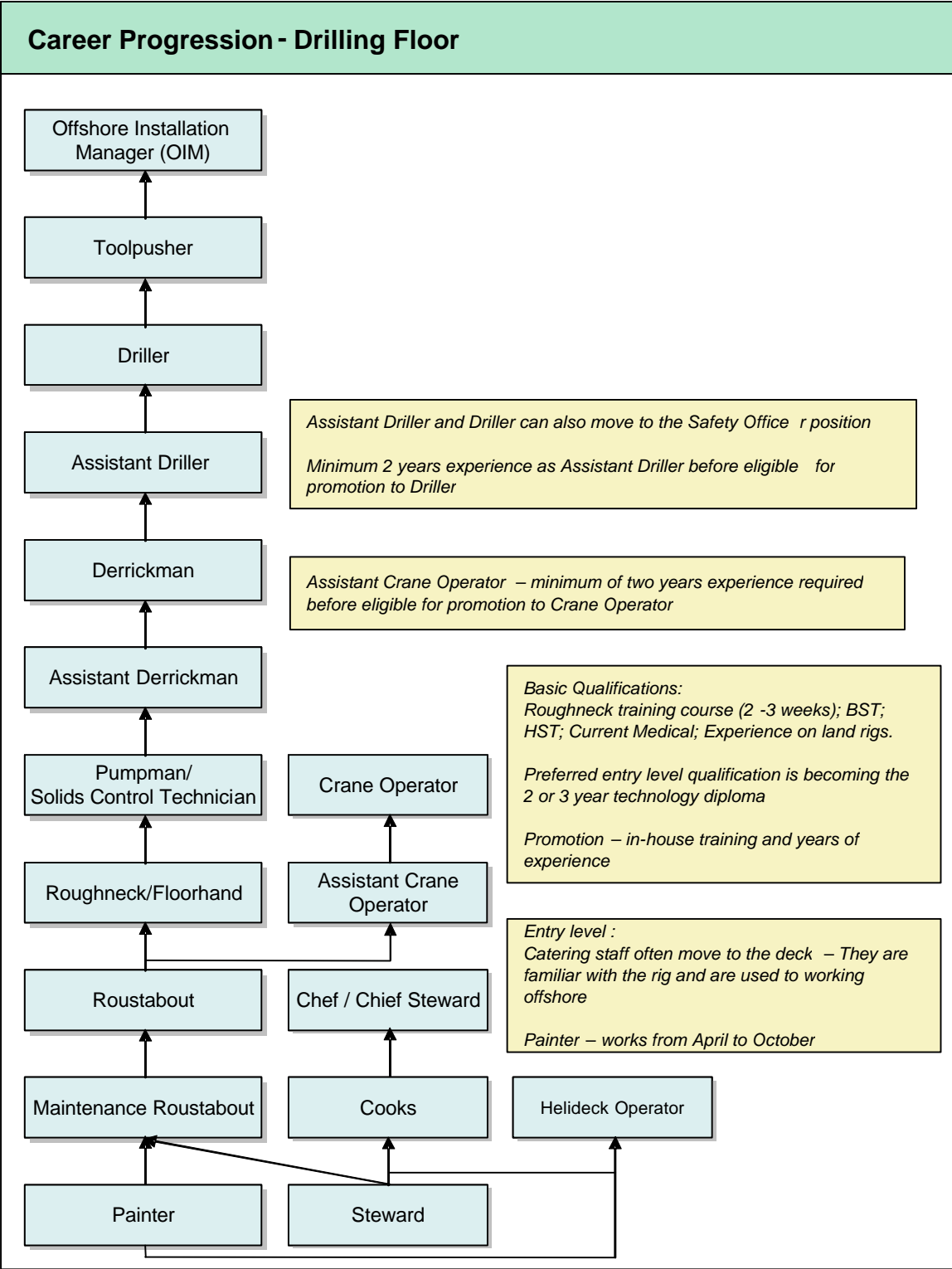
CORE POSITION PROFILE FORM

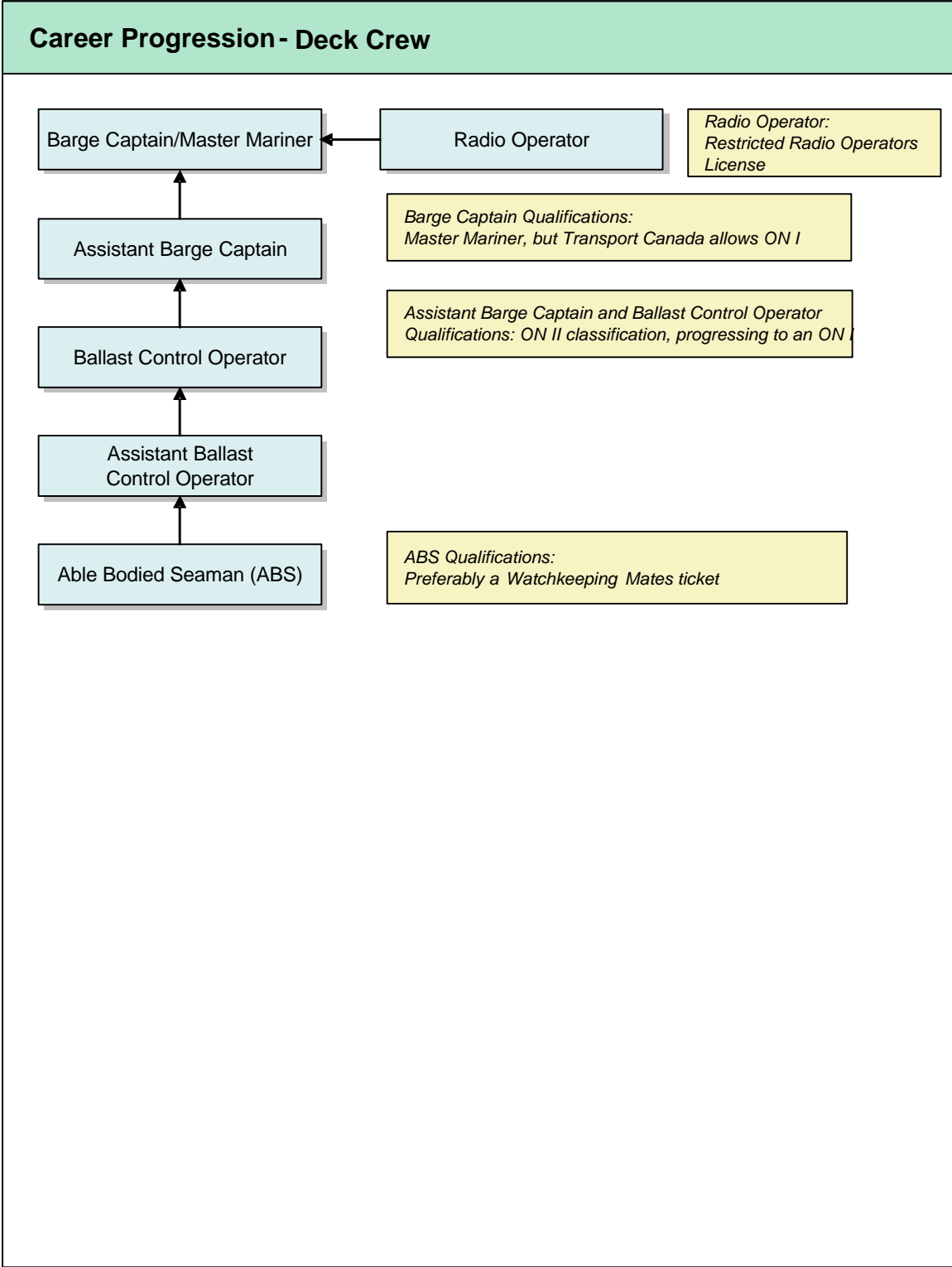
Position Title:			
<ul style="list-style-type: none"> ▪ Number of Employees in Position: 			
<ul style="list-style-type: none"> ▪ Do you typically hire people for this position from inside or from outside your organization? 	<input type="checkbox"/> Primarily from inside <input type="checkbox"/> Primarily from the outside <input type="checkbox"/> A combination of the two		
<ul style="list-style-type: none"> ▪ If you hire from the outside, do you primarily recruit locally, regionally, nationally, or internationally for this position? 	<input type="checkbox"/> Locally <input type="checkbox"/> Regionally <input type="checkbox"/> Nationally <input type="checkbox"/> Internationally		
<ul style="list-style-type: none"> ▪ What is the minimum level of post-secondary education you normally require for this position? 	<input type="checkbox"/> High school <input type="checkbox"/> College level diploma or certificate <input type="checkbox"/> University degree		
<ul style="list-style-type: none"> ▪ What is the typical or normal employment status of individuals who are employed in this position? 	<input type="checkbox"/> Permanent full-time <input type="checkbox"/> Temporary full-time <input type="checkbox"/> Regular part-time <input type="checkbox"/> Casual/ad hoc		
<ul style="list-style-type: none"> ▪ What level of difficulty does your organization experience in <u>recruiting</u> suitable employees for this position? 	<input type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
<ul style="list-style-type: none"> ▪ If you indicated HIGH, what do you feel is the main reason for this? 			
<ul style="list-style-type: none"> ▪ What level of difficulty does your organization experience in <u>retaining</u> good employees in this position? 	<input type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input type="checkbox"/> High
<ul style="list-style-type: none"> ▪ If you indicated HIGH, what do you feel is the main reason for this? 			
<ul style="list-style-type: none"> ▪ Do you expect your number of employees in this position to increase, decrease, or stay the same over the next 10 year period? 	<input type="checkbox"/> Number of employees will <u>increase</u> <input type="checkbox"/> Number of employees will <u>decrease</u> <input type="checkbox"/> Number of employees will <u>stay the same</u>		
<ul style="list-style-type: none"> ▪ Do you expect your ability to recruit or retain suitable employees in this position over the next several years to improve, diminish, or stay the same? 	<input type="checkbox"/> Supply of suitable employees will <u>improve</u> <input type="checkbox"/> Supply of suitable employees will <u>diminish</u> <input type="checkbox"/> Supply will <u>stay the same</u>		
<ul style="list-style-type: none"> ▪ Have you enclosed a copy of 	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> NA

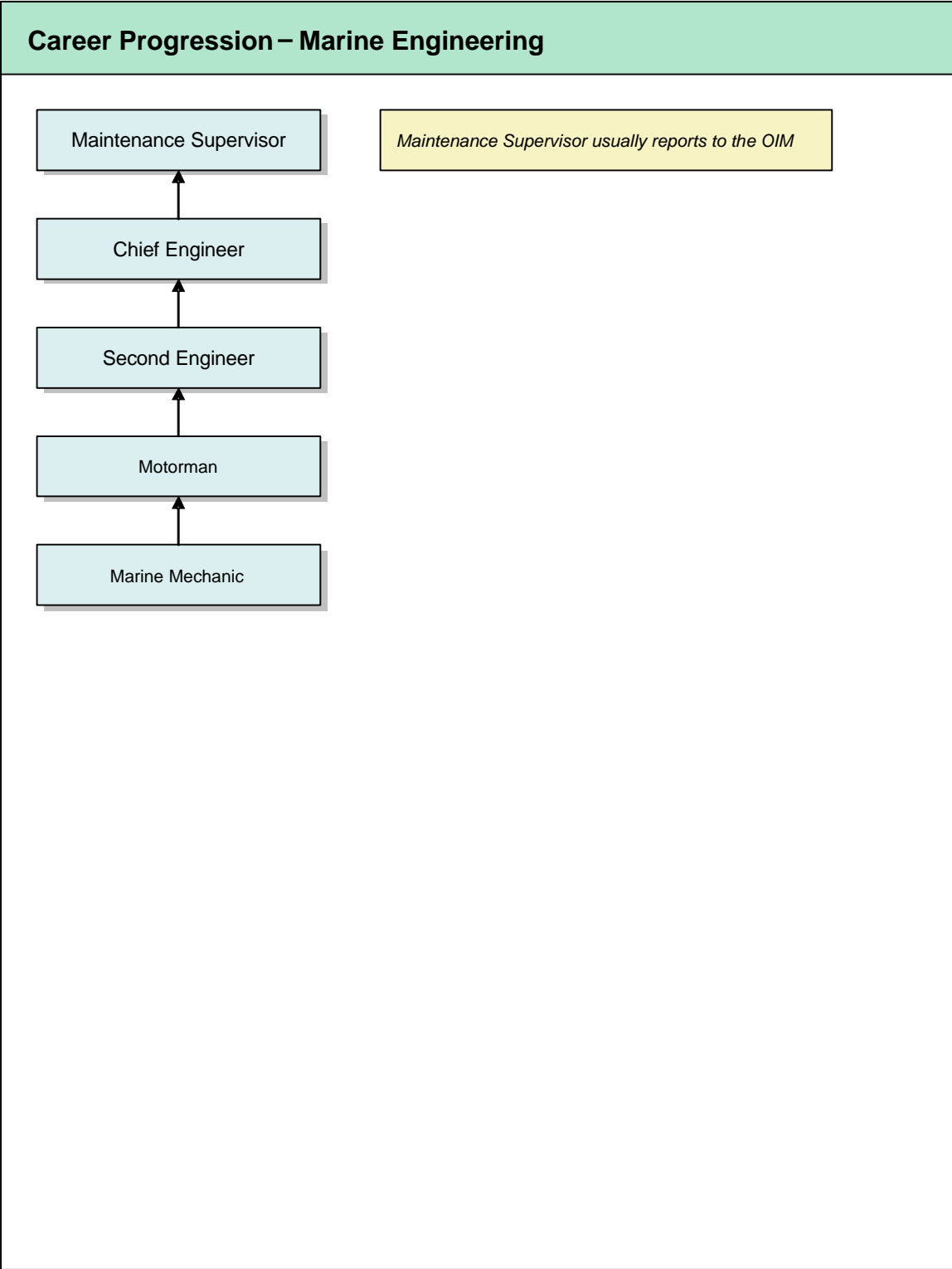
Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

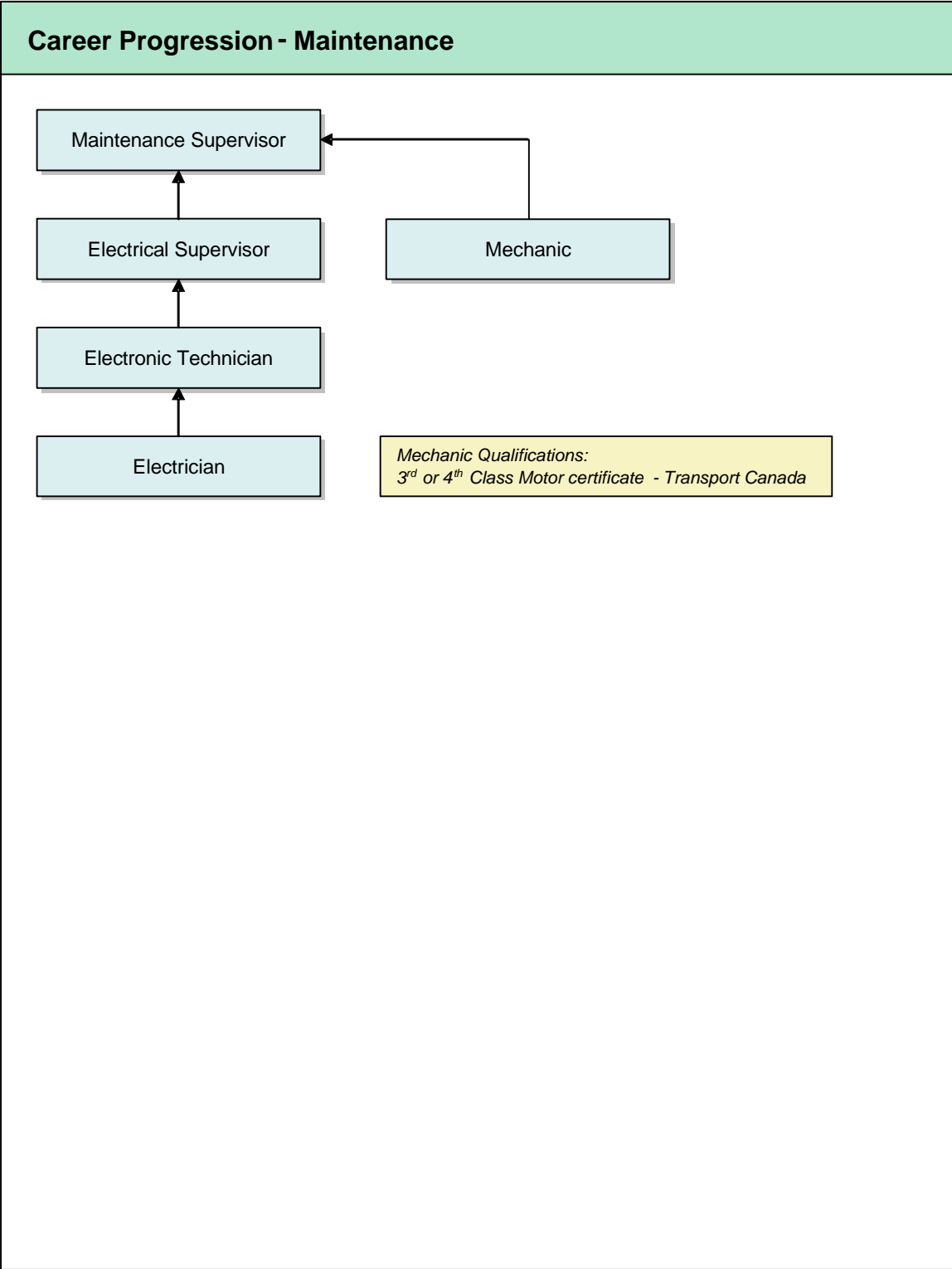
**your company's internal job description
for this position?**

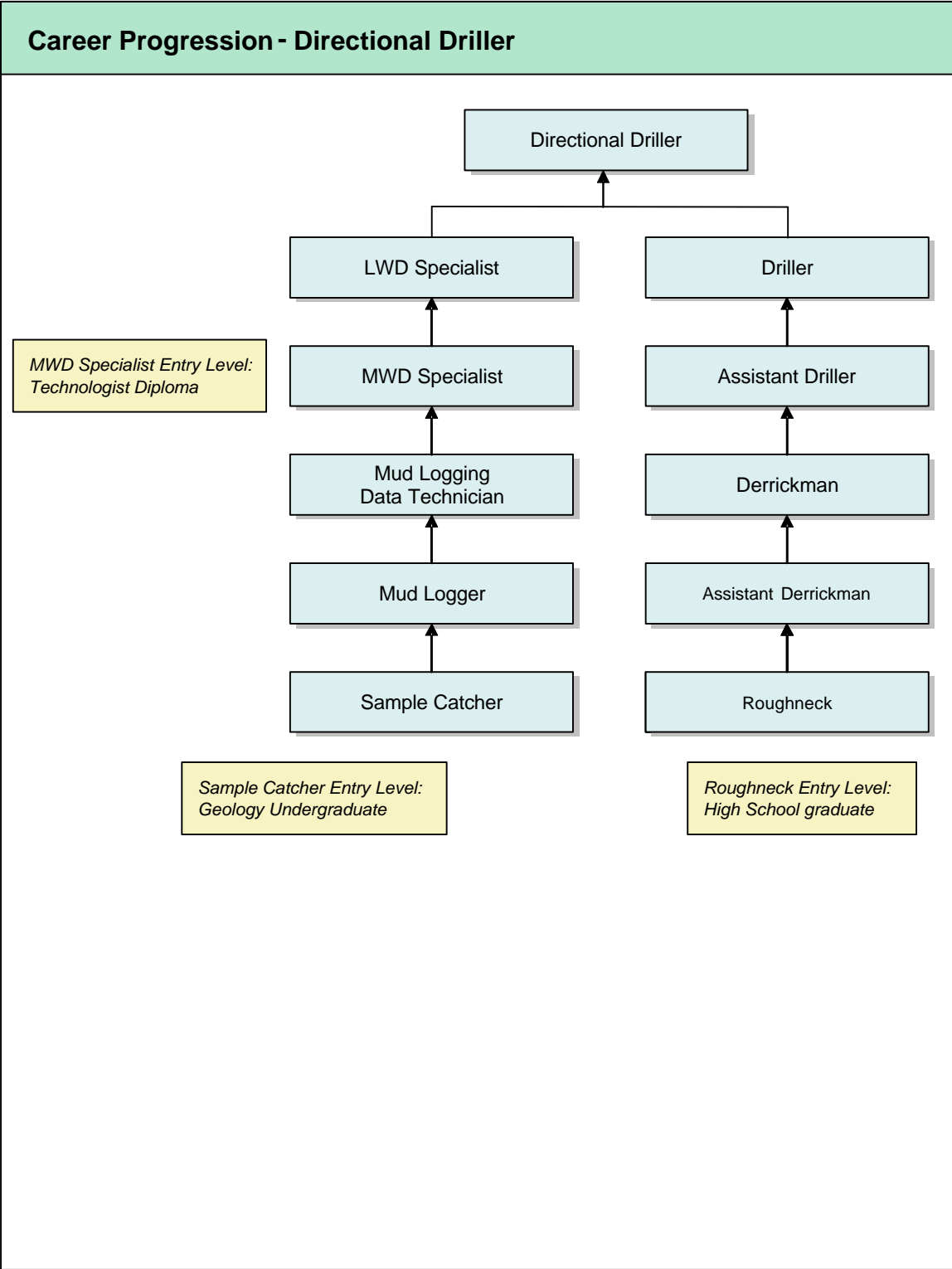
Appendix D – Career Progression

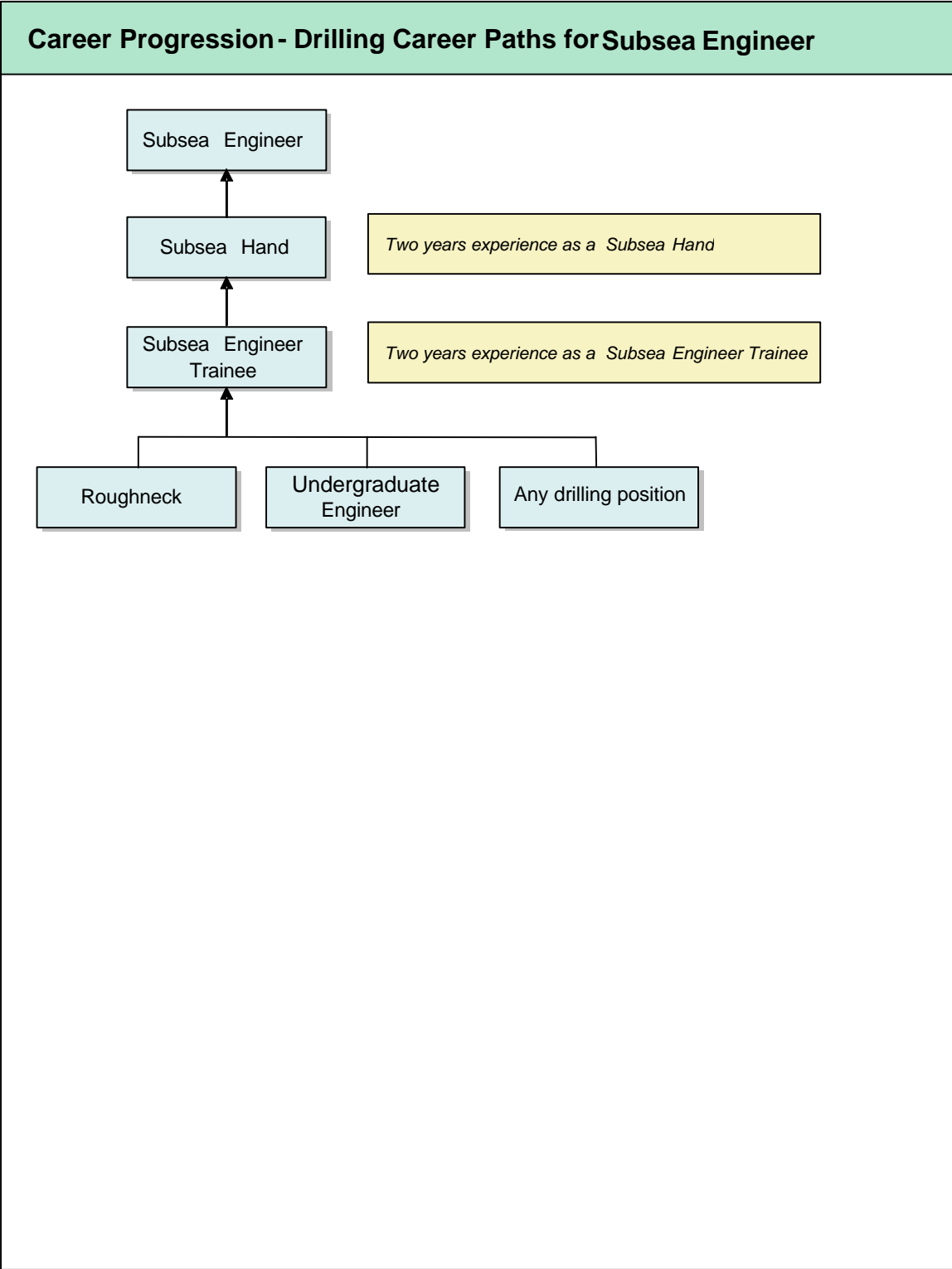


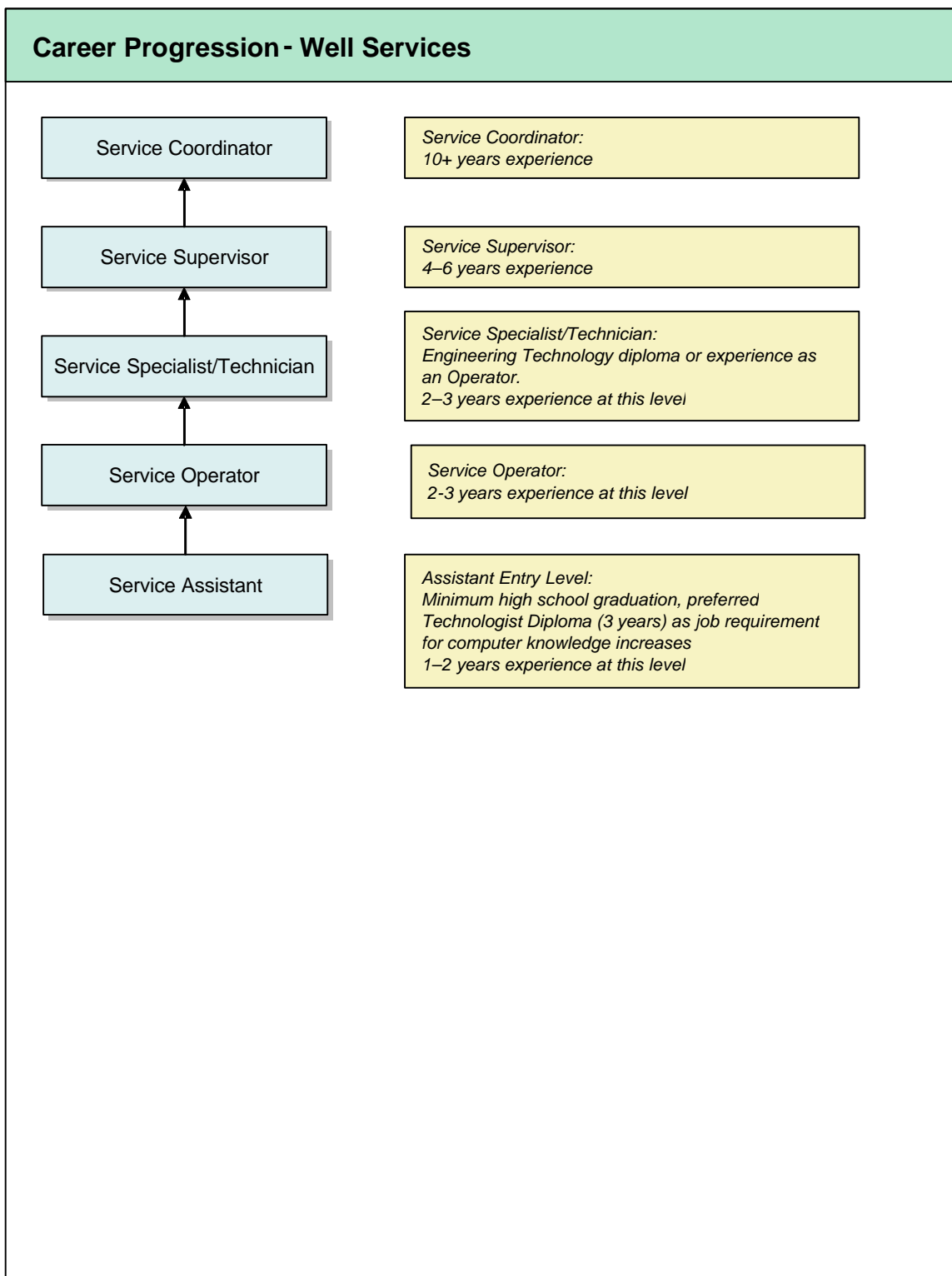


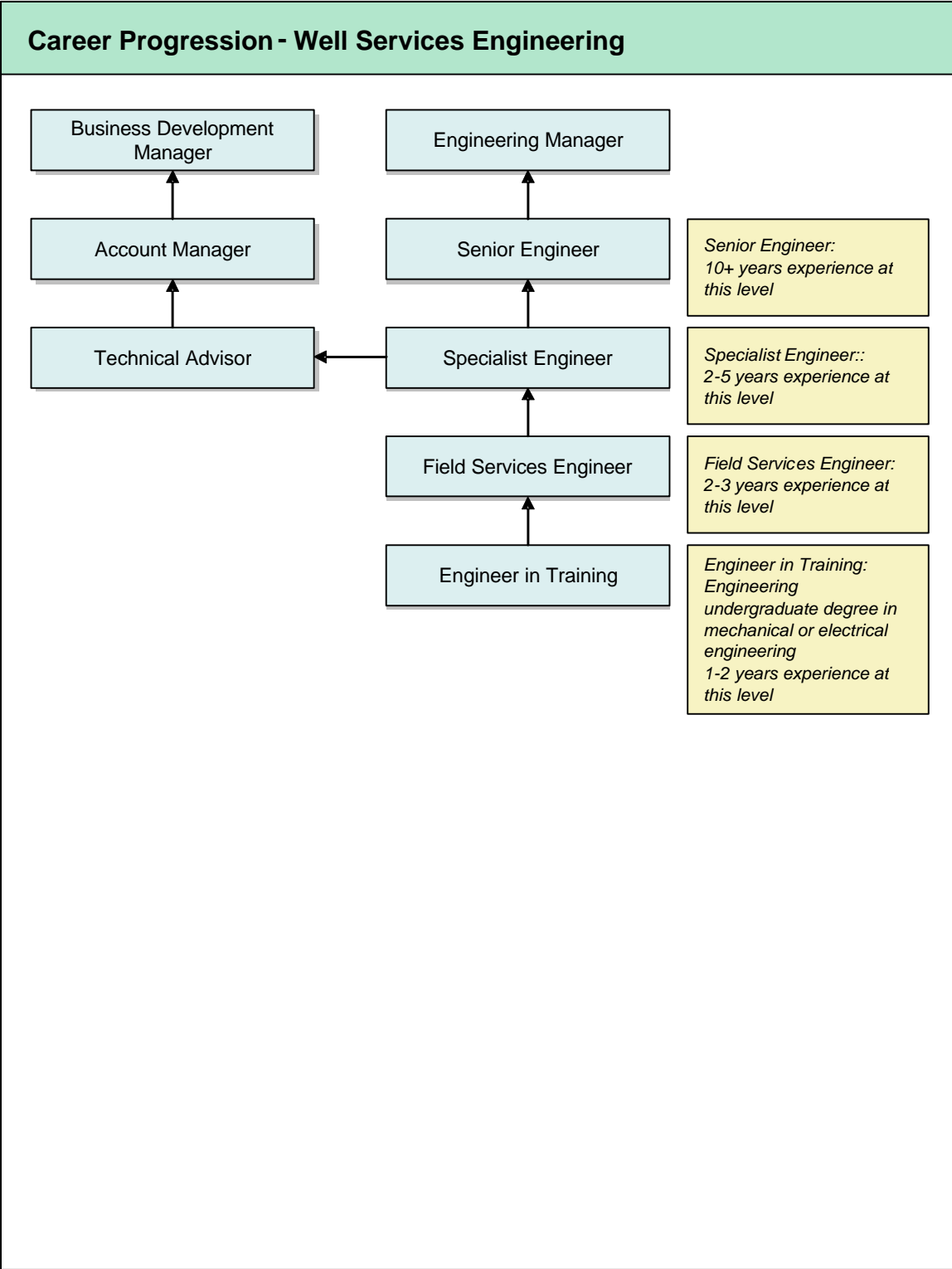


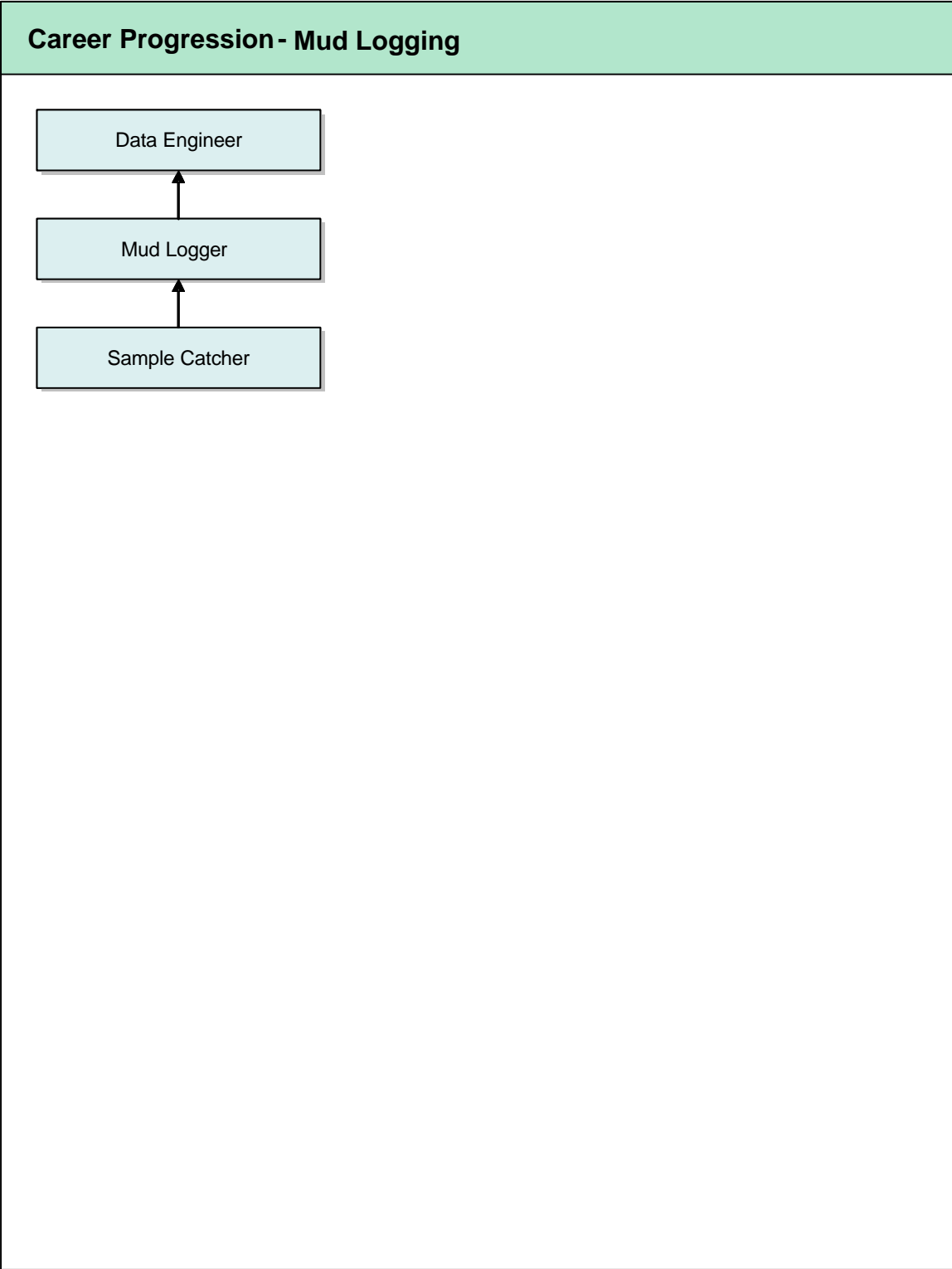


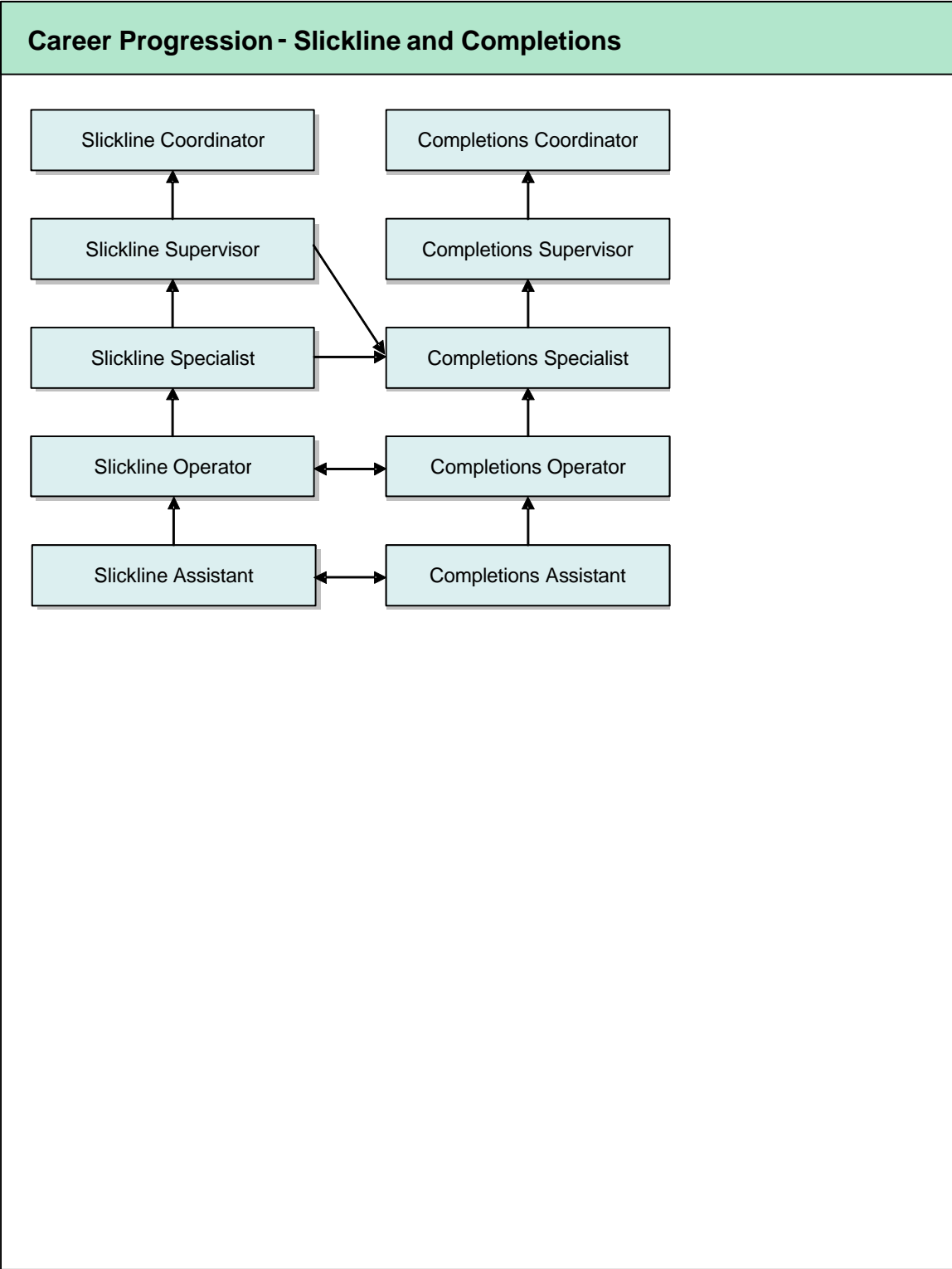


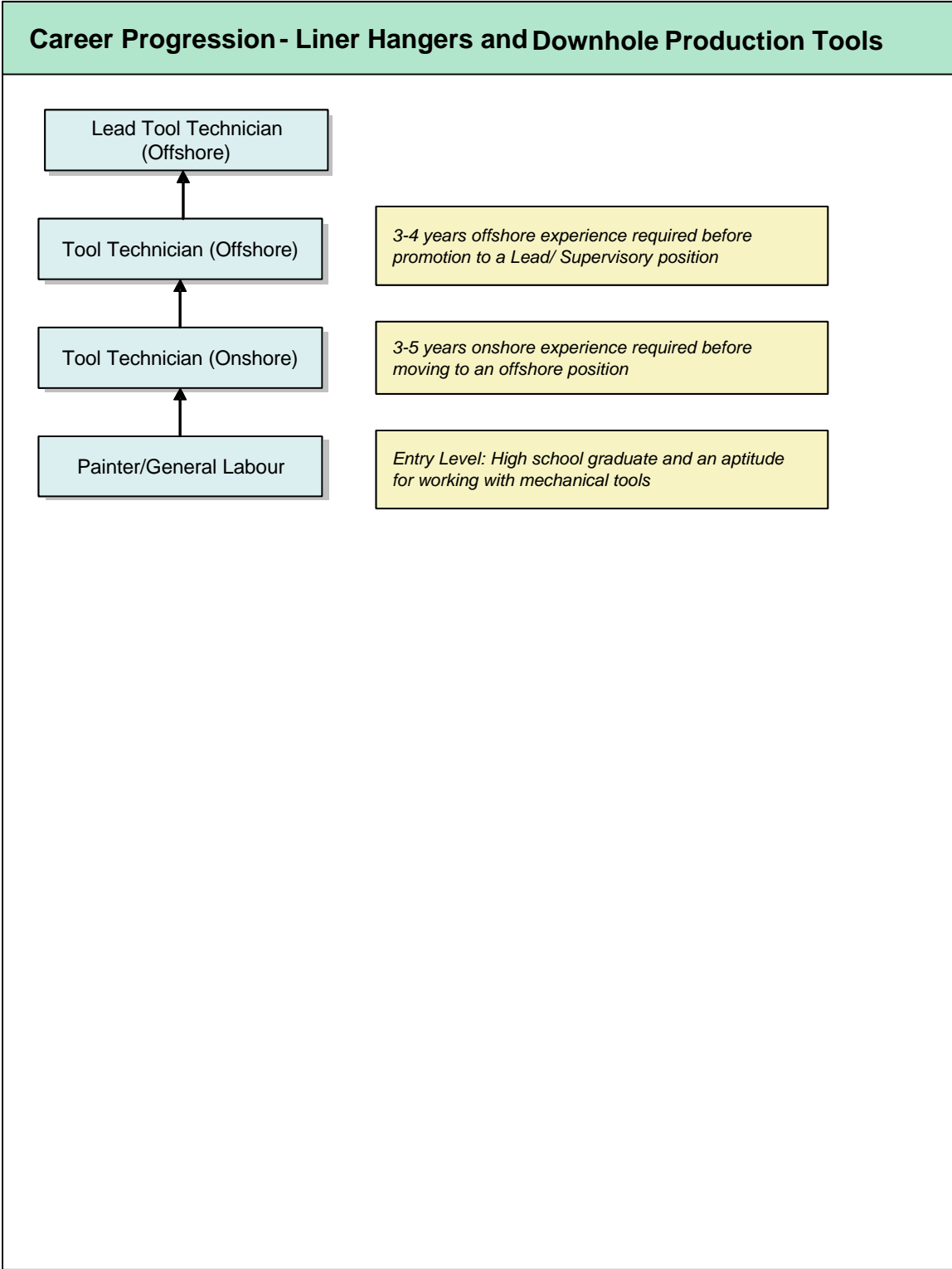


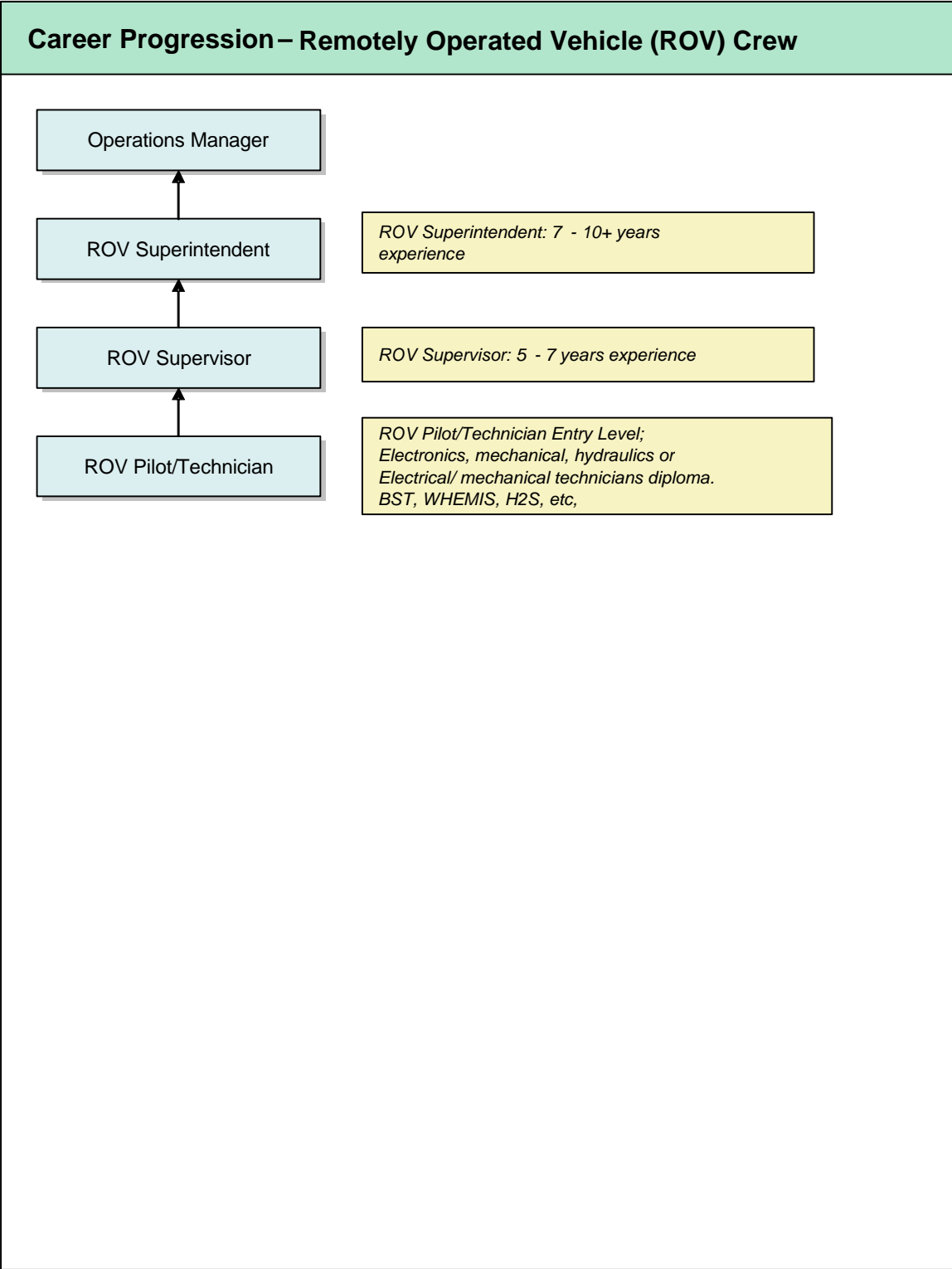


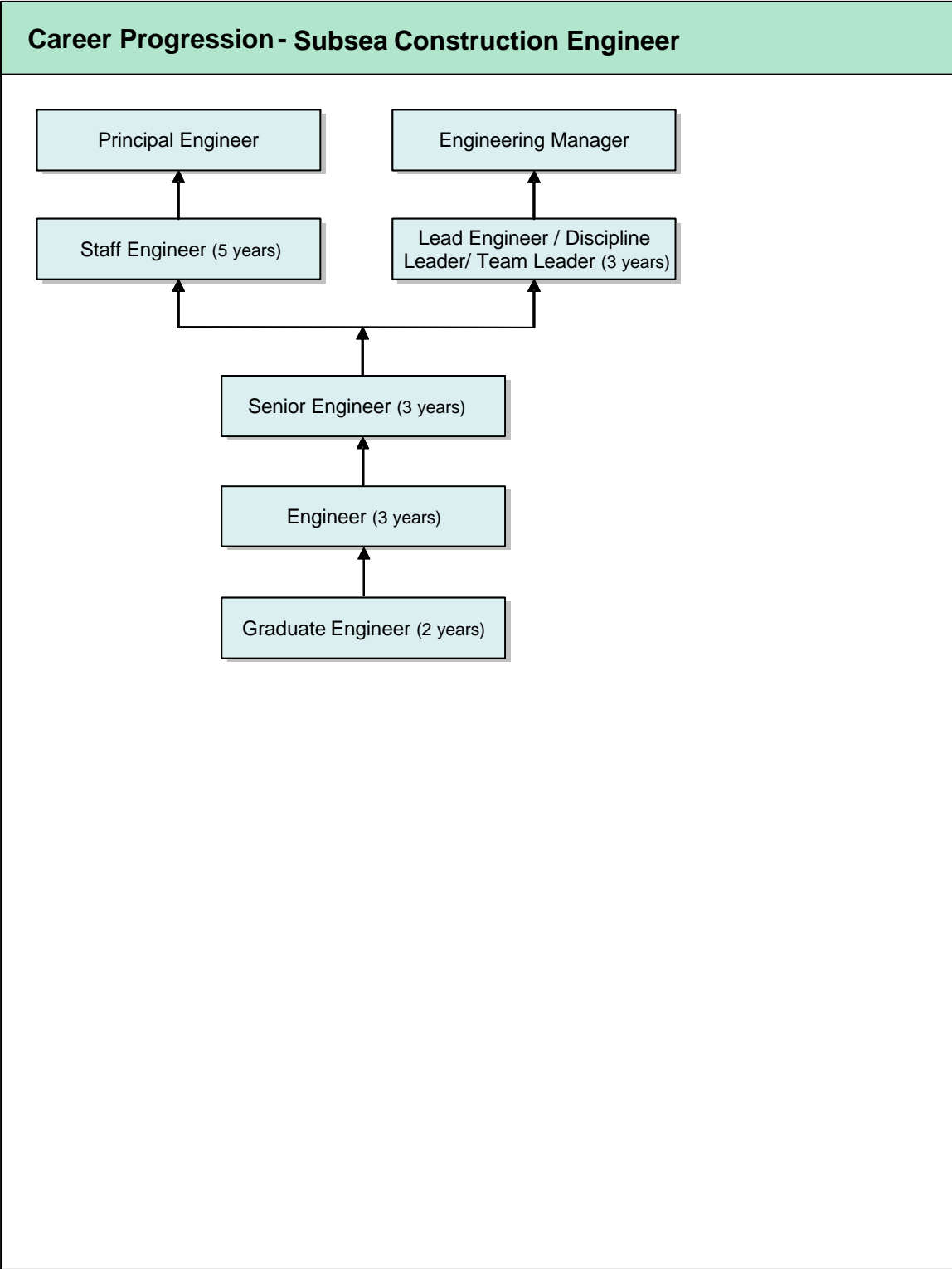












Appendix E – Position Descriptions

Owner/Operator	E-3
Reservoir Manager.....	E-4
Reservoir Engineer.....	E-5
Petrophysicist.....	E-6
Geophysicist.....	E-7
Geologist (Petroleum)	E-8
Drilling Manager	E-9
Rig Superintendent.....	E-10
Offshore Installation Manager.....	E-11
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Owner/Operator

Reservoir Manager

Key Responsibilities and Skill Requirements

- Develops and executes the operator's reservoir management strategy in order to maximize recoverable reserves, predict and improve reservoir performance, and increase reserve additions.
- Develops reservoir descriptions and determines well placement and related functional requirements; well inventories and forecasts; well intervention schedules; depletion processes; production and injection strategies and allocations; production and injection profiles; data acquisition requirements; contingency plans; and well operating plans.
- Conducts reserve tracking and economic modeling.
- Develops investment decisions and predicts potential reservoir/production problems such as gas and water breakthrough, low reservoir pressure, gas flaring, and well performance.

Education, Experience and Certification Requirements

Requires 15 or more years of increasingly responsible leadership and senior technical experience in the geoscience and/or reservoir engineering disciplines with application to complex, multi-fault, offshore reservoir development. Formal education will typically include a minimum an undergraduate and/or masters degree in a geosciences or related engineering discipline.

Typical Entry Level or Career Path

This senior leadership role requires great knowledge of reservoirs and probability-based calculations concerning oil and gas in place and probable recovery. The role encompasses many years of progressively responsible international experience in these areas, typically in a variety of fields.

Relevant NOC Reference: 2145, Reservoir Engineer, Petroleum

Reservoir Engineer

Key Responsibilities and Skill Requirements

- Conduct feasibility assessment studies for developing new oil and gas fields
- Direct and monitor oil and gas drilling operations.
- Provide technical input for maximization of reserves recovery and optimization of production.
- Direct and monitor the completion and evaluation of wells, well testing and well surveys.
- Reservoir Characterization, Production, Modeling and Simulation experience is required.
- Integration of geophysical, geological, petrophysical, reservoir engineering and production data for reservoir modeling and as a consequence, production rate prediction.
- Analyze reservoir rock and fluid data to design optimum recovery methods and to predict reservoir performance and reserves.
- Monitor and forecast oil and gas reservoir performance and recommend oil recovery techniques which extend the economic life of field.
- Design and select artificial lift machinery and well and surface production equipment and systems and specify programs for corrosion control and oil and gas treatment.

Education, Experience and Certification Requirements

A Bachelor degree in petroleum engineering or related engineering discipline is required. A Master's degree in a related engineering discipline may be required. Licensing by a provincial association of professional engineers is required to approve engineering drawings and reports and to practice as a Professional engineer (P. Eng.)

Engineers often work in a multidisciplinary environment and acquire knowledge and skills through work experience that may allow them to practice in associated areas of science engineering, sales or management

Relevant NOC Reference: 2145, Reservoir Engineer, Petroleum

Petrophysicist

Key Responsibilities and Skill Requirements

- Provides analysis, interpretation and recommendations regarding hydrocarbon pore volumes and the quality of past and present oil and gas well bores in relation to reservoir development and reserve determinations.
- Analyzes and catalogues all data obtained from open hole operations through wireline, tubing-conveyed, and other tools for the purpose of analyzing reservoir structure, conducting deposit analyses, and formulating net pay estimates.
- Compiles and maintains all pertinent petrophysical data and interpretations in a form that can be integrated with geological, geophysical, reservoir and production engineering disciplines. Interfaces with offshore personnel, including contractor representatives, regarding the use of cost-effective logging and data acquisition operations.
- Contributes to the design of formation evaluation plans.

Education, Experience and Certification Requirements

Undergraduate degree in Engineering or Geology, combined with 7-10 years of related experience in the field of geophysics, reservoir engineering, or reservoir geology.

Relevant NOC Reference: 2113, Petrophysicist

Geophysicist

Key Responsibilities and Skill Requirements

- Processes and interprets three-dimensional seismic data to determine the structural framework of and oil and gas fields.
- Identifies and incorporates seismic attributes to help refine reservoir models used in mapping primary and secondary reservoirs. Builds and maintains 2D and 3D earth models for use in the reservoir management process and in the determination of drilling locations.
- Builds and maintains velocity models required for accurate depth conversion and prediction.
- Extracts information from seismic data which, when combined with well-bore data, will optimize the reservoir models used for reservoir management and predicting reserve additions.

Education, Experiences and Certification Requirements

A university degree in geophysics or a related discipline is required, combined with several years of experience in geophysical interpretation and 3D interpretation on workstations. Requires knowledge of the latest seismic data processing techniques, and a familiarity with statistical methods, seismic attribute analysis, computer mapping, and data management methods/tools.

Relevant NOC Reference: 2113, Geophysicist

Geologist (Petroleum)

Key Responsibilities and Skill Requirements

- Catalogues, maintains and analyzes data from open and cased hole operations with existing data sets from delineation or development wells to assist in the generation of structural and stratigraphic interpretations of multiple hydrocarbon-bearing reservoirs.
- Generates quantitative maps and simulations of 3D reservoir distribution.
- Assesses the performance of drilling and production/injection activities with respect to regulator-approved pooling, data acquisition, and field development plans.
- Contributes to the generation and documentation of drilling proposals and the monitoring of drilling activities.

Education, Experience and Certification Requirements

A university degree in Geology with a minimum of 10 years of petroleum experience in exploration or production environments.

Relevant NOC Reference: 2113, Petroleum Geologist

Drilling Manager

Key Responsibilities and Skill Requirements

- Generally responsible for leading the Operator's drilling, completions and well servicing operations; overseeing the operations of the drilling and well services contractors; and delivering capable wells to the owner/operator.
- Develops well construction design and execution plans in liaison with the Reservoir function.
- Develops and delivers well operating plans for all wells.
- Develops and delivers all well servicing programs.
- Negotiates on behalf of the owner/operator all commercial agreements with drilling, oil field service, and other contractors.

Education, Experience and Certification Requirements

Completion of an undergraduate degree, typically in Engineering or a related discipline, plus 15 or more years of increasingly responsible experience in offshore drilling and completions leadership, with a broad base of experience in drilling engineering and well operations engineering.

Typical Entry Level or Career Path

This senior leadership role encompasses asset-level accountability for all aspects of offshore drilling and completions, and several many years of progressively responsible international experience in these areas, typically in a variety of fields and project locations around the world.

Relevant NOC Reference: 0811, Primary Production Managers

Rig Superintendent

Key Responsibilities and Skill Requirements

- Generally responsible for coordinating and leading rig-site staff in providing safe, technically sound and cost-effective oil and gas well constructions.
- In consultation with the Drilling Superintendent (onshore), ensures that all materials, services and equipment are available on site when needed, and that rig operations are conducted in accordance with operational objectives, environmental regulations, and industry best practices.
- Coordinates the execution of well construction activities, ensures the availability of all facilities and hardware systems needed for construction, completion and re-completion purposes, and ensures the maintenance of well equipment integrity and well control processes.
- Forecasts, reports and manages well construction costs, and ensures that well construction time, cost and quality targets are met by the drilling contractor.

Education, Experience and Certification Requirements

Completion of an undergraduate degree, typically in Engineering or a related discipline, plus 10 to 15 years of increasingly responsible experience in well drilling and completions, preferably in an offshore environment. Completion of an IWCF Well Control Certificate.

Typical Entry Level or Career Path

There is no typical path for this role, although many incumbents are individuals who have worked their way up through the entire ladder of rig operations positions. Typically, incumbents are promoted from the position of Driller or Toolpusher.

Relevant NOC Reference: 8222, Supervisors, Oil and Gas Drilling and Service

Offshore Installation Manager

Key Responsibilities and Skill Requirements

- Generally responsible for overseeing and directing all aspects of the operation of an offshore oil and gas production facility.
- Ensures that all oil storage, processing and off-loading activities are carried out in a safe and environmentally compliant manner.
- Ensures the achievement of business objectives through the ongoing establishment and review of installation priorities, the efficient and cost-effective execution of production operations, and ensuring maximum production and injection system availability.
- Maintains effective communications among different groups across the installation and with onshore support organizations.
- Provides platform crisis management and emergency response leadership when required.
- Ensures the effective ongoing operation of SH&E management systems.
- Ensures the effective implementation and ongoing administration of the Operator's training and competency assurance program.

Education, Experience and Certification Requirements

Completion of an undergraduate degree; 15 or more years of increasingly responsible leadership experience in offshore operations; and completion of an appropriate program of certification related to emergency response and crisis management.

Typical Entry Level or Career Path

This position is normally an Operator's most senior offshore role and entails accountability for all aspects of oil and gas production operations on a given offshore facility. Incumbents typically accumulate many years of progressively responsible international experience in these areas, usually in a variety of fields and project locations around the world.

Relevant NOC Reference: 0811, Primary Production Managers

Process/Field Operator

Key Responsibilities and Skill Requirements

- Operates a wide variety of equipment used in the production and processing of oil and gas on an offshore production installation.
- Starts, operates and shuts down processing and utility equipment in accordance with established operating and control of work procedures.
- Monitors and operates production equipment and processes as a control panel operator in a centralized, highly automated DCS environment.
- Performs routine maintenance of equipment and assists Maintenance Technicians.

Education, Experience and Certification Requirements

At least five years of operating experience in the oil and gas industry or in a closely related industrial processing environment, with a working knowledge of DCS, ECS, and FGS operating environments. Either a journeyman trade certification (e.g., electrical, mechanical, instrumentation) or a Technologist qualification is preferred.

Typical Entry Level or Career Path

Junior Operator or Operator Trainee.

Relevant NOC Reference: 9232, Process Technician, Refinery

Master - Marine

Key Responsibilities and Skill Requirements

- Acts as the owner's representative in relation to all aspects of the operations of the vessel with ultimate responsibility and authority to make decisions on their behalf.
- Commands and operates a supply vessel, oil tanker, or other ship engaged in offshore oil and gas operations.
- Plans and executes safe navigational passage using navigational aids such as instruments, maps and charts in accordance with national and international regulations, codes and guidelines, company/owner instructions, and practices of safe seamanship.
- Ensures the seaworthiness and safety of the crew, ship and cargo.
- Supervises and coordinates the activities of deck crews, and directs and oversees the loading and unloading of cargo.
- Ensures the Chief Officer and Chief Engineer are well trained and informed of the Master's duties and work.
- Keeps all certificates and class surveys, records, files and drawings up to date.
- Maintains the ship's log of vessel progress, crew activities, and weather and sea conditions.

Education, Experience and Certification Requirements

Completion of a Deck Officer Cadet program from an approved nautical institute and certification as a Master Foreign Going by Transport Canada. Certification at this level typically requires a minimum of 36 months of experience as a Chief Officer.

Typical Entry Level or Career Path

The progression to Master (Foreign Going) would normally be as follows:

- Completion of Nautical Science Program (three years + 12 months marine experience)
- Second Mate (3 years ocean-going experience + TC certification)
- First Mate (Chief Officer) (5 years ocean-going experience + TC certification)
- Master (3 years experience as a Chief Officer + TC certification)

Relevant NOC Reference: 2273, Deck Officers, Water Transport

Chief Engineer - Marine

Key Responsibilities and Skill Requirements

- Operates main engines, machinery and all auxiliary equipment aboard ships, including boilers, steering and deck machinery, motors, pumps, generators, and condensers.
- Supervises and coordinates the activities of engine room crew, the monitoring of engine and machinery performance, and the inspection, maintenance and emergency repair of engines, machinery and auxiliary equipment.
- Inspects and records fuel, bunkers and stores used for operations and maintenance.
- Oversees the vessel's preventive maintenance and spare part control systems.
- The Chief Engineer reports to the Master.

Education, Experience and Certification Requirements

Completion of a Marine Engineering program from an approved nautical institute and certification as a Marine Engineer, 1st Class by Transport Canada. Certification at this level requires a minimum of [number] years of experience in a marine engineering environment.

The requirement for formal post-secondary training may not apply if the employee has the requisite years of directly related marine engineering experience and has been appropriately certified by Transport Canada.

Typical Entry Level or Career Path

The progression to Chief Engineer would normally be as follows:

- Completion of a Marine Engineering Program (three years)
- 4th Class Marine Engineer (36 months of related experience + TC certification)
- 3rd Class Marine Engineer (48 months experience + TC certification)
- 2nd Class Marine Engineer (minimum 4th class + 12 months experience + TC certification)
- Chief Engineer (minimum 3rd class + 24 months experience + TC certification)

Relevant NOC Reference: 2274, Engineer Officers, Water Transport

Drilling

Instrumentation-Electronics Technician

Key Responsibilities and Skill Requirements

- Installs, calibrates and modifies electronic systems and components in an offshore production or marine environment, including those used in oil and gas production and processing; drilling and subsea operations; communication; data acquisition; computer system operations; dynamic positioning; and navigation.
- Inspects electronic instruments and systems to diagnose faults, calibration errors, and defective parts, and repair/adjust as required.
- Performs scheduled preventive maintenance and repair of electronic systems.

Education, Experience and Certification Requirements

Completion of a College level program in Instrumentation/Electronics Technology, plus a minimum of 12-18 months of practical workplace experience in an industrial setting.

Certification of familiarity with offshore/marine systems and processes in accordance with the operator's competence assurance process.

Typical Entry Level or Career Path

If the employee does not possess relevant industrial experience, a period of apprenticeship of up to two years is required in order to obtain journey person certification, prior to operating independently as a Technician.

Relevant NOC Reference: 2243, Industrial Instrument Technicians and Mechanics

Electrical Technician (Marine)

Key Responsibilities and Skill Requirements

- Generally responsible for the operational integrity, maintenance, installation/removal, and repair of electrical equipment in an offshore marine or oil and gas production environment.
- Maintains, troubleshoots, repairs, tests and installs electrical motors, generators, industrial storage batteries and hydraulic and pneumatic electrical control systems for marine vessels and other marine-related applications.
- Performs diagnostic tests and troubleshoots system faults and failures to ensure that electrical power is provided where and when needed.

Education, Experience and Certification Requirements

Completion of a four year industrial electrician apprenticeship program; a valid journeyman certification; plus a minimum of 6-12 months experience in a marine electrical maintenance/repair environment.

Typical Entry Level or Career Path

Industrial Electrician.

Relevant NOC Reference: 7272, Industrial Electricians

Mechanical Technician

Key Responsibilities and Skill Requirements

- Responsible for the operational integrity, maintenance, installation/removal, and repair of mechanical system components and drilling systems such as drawworks; pipehandling units; rotary tables/bushings and other rotary components on the drilling system; and blow-out preventer (BOP) control system and stack components.
- Responsible for the operational integrity, maintenance, installation/removal, and repair of auxiliary and support equipment such as air compressors; pump and water systems; pipes, fittings and vales; and waste disposal units.
- Performs repairs and preventive maintenance on mechanical system components and drilling systems such as drawworks; pipehandling units; rotary tables/bushings and other rotary components on the drilling system; and blow-out preventer (BOP) control system and stack components.
- Assists in the inspection of mechanical installations and construction projects.

Education, Experience and Certification Requirements

Completion of a two or three-year college program in mechanical engineering technology. A period of supervised work experience, usually two years, is required for certification through provincial association of engineering/applies science technicians, and may be require for some positions.

Typical Entry Level or Career Path

Motorman or Mechanic Trainee, or direct hire with current experience as a Mechanic on a semi-submersible or jack-up drilling rig.

Relevant NOC Reference: 7311, Industrial Mechanic

Subsea Technician

Key Responsibilities and Skill Requirements

- Generally responsible for installing, maintaining, monitoring and operating subsea wellhead and production equipment.
- Maintains the operational integrity of various subsea equipment including all subsea running tools; choke and kill valves; BOP stack; annular preventers; flow diverter and control systems; motion compensator; and BOP handling and moving equipment.
- Ensures the proper maintenance of subsea equipment in accordance with established preventive maintenance standards and carries out timely repairs as needed.
- Operates artificial lift machinery and well and surface production equipment and systems.

Education, Experience and Certification Requirements

Completion of high school diploma, plus 3-5 years experience in the offshore industry. Training with the necessary instruments, tools and methods to be used in the position.

Typical Entry Level or Career Path

Employees typically enter as Subsea Technician/Engineer Trainees.

Relevant NOC Reference: 2145, Subsea Engineer

Materials Coordinator (Rig Operations)

Key Responsibilities and Skill Requirements

- Coordinates the rig's materials requisitions, organizes and controls the warehouse, and maintains the warehouse inventory levels within established guidelines.
- Maintains adequate stock levels of equipment spares and consumable to facilitate the continuous operations of the offshore units(s). Receives materials into the warehouse stock and issues parts and other items to departments as required.
- Maintains accurate records of received and outstanding requisitions and cargo manifests, and tracks the progress of purchase orders.
- Performs cyclical inventories of stock and maintains the physical security of the inventory at all times.
- Supervises stores activities ensure they are conducted safely at all times.

Education, Experience and Certification Requirements

Minimum requirement is a high school diploma with demonstrated oral and written communication abilities, supplemented with rig-based work experience. Preferable education is a 2 or 3 year business diploma and information technology experience.

Typical Entry Level or Career Path

Employees may enter this position with previous experience as a Warehouse Shipper or Receiver/Receiver in either an onshore or offshore-based environment. Also recruiting from the marine and drill crews as they are familiar with the rig, the equipment and the material system.

Relevant NOC Reference: 1215, Supervisors Recording, Distributing and Scheduling

Offshore Installation Manager (Drilling)

Key Responsibilities and Skill Requirements

- Generally responsible for overseeing and directing all aspects of the operation of an offshore oil and gas drilling unit.
- Ensures the achievement of business objectives through the ongoing establishment and review of installation priorities, the efficient and cost-effective execution of drilling operations, and ensuring maximum drilling system availability.
- Manages all activities either directly or indirectly through department managers in the areas of safety; environment; rig management; operations; personnel and training; information; regulatory compliance; and budget management.
- Provides unit crisis management and emergency response leadership when required.
- Ensures the effective ongoing operation of SH&E management systems.

Education, Experience and Certification Requirements

This position is the drilling operator's most senior offshore role and promotion to the OIM role typically occurs for employees with significant experience as Stability Technicians or as senior or chief mates on a drillship.

Relevant NOC Reference: 0811, Primary Production Managers

Toolpusher

Key Responsibilities and Skill Requirements

- Supervises the work activities of all rig drilling department personnel in carrying out the objectives established by the O.I.M or onshore rig management for the completion of successful oil and gas wells within compliance of necessary regulations.
- Ensures through effective planning, scheduling, problem solving, inspections, operational meetings, and interactions with night personnel that the necessary equipment, materials and resources are available to ensure efficient and safe operations.
- Liaises with representatives from oil companies who visit and inspect the site.

Education, Experience and Certification Requirements

Incumbents are normally promoted from the position of Night Toolpusher and will typically have accumulated 12-15 years of progressively responsible experience in drilling department operations.

Typical Entry Level or Career Path

Several years of experience onboard a rig is usually needed for entry to this job. Toolpushers often begin at basic laboring level (Roughneck), and progress through to Derrickman/woman and Driller.

Relevant NOC Reference: 8222, Toolpusher, Offshore Drilling Rig

Driller

Key Responsibilities and Skill Requirements

- Operates and monitors all drilling systems and equipment and supervises all drill work activities and routine drilling operations from a control console.
- Pre-plans the equipment, materials and proper sequence of constricting a well from start to finish, and obtains necessary approvals from the Toolpusher and the client.
- During drilling operations, directs the installation of the BOP on the wellhead and coordinates pressure testing of the BOP stack; operates the rig's hoisting equipment and rotary table, and supervises the drill crew in running the required drill stem components; monitors drilling instruments to ascertain drill stem and well bore performance; and reviews drilling options with the toolpusher to ascertain the most economic and efficient method of drilling the well to the client's specifications.

Education, Experience and Certification Requirements

Incumbents are normally promoted from the position of Assistant Driller or Derrickman, and would typically have 10 or more years of progressively responsible experience in offshore drilling operations.

Typical Entry Level or Career Path

Formal qualifications are not always required for entry, although it can be useful to have at least some Standard Grades or the equivalent. Several years of experience (10 +) onboard a rig is usually needed for entry to this job. Drillers often begin at basic laboring level (Roughneck), and progress through to Derrickman/woman and Assistant Driller.

Relevant NOC Reference: 8232, Driller, Oil and Gas

Assistant Driller

Key Responsibilities and Skill Requirements

- Assists the Driller with operating and monitoring all drilling systems and equipment and with the supervision of all drill work activities and routine drilling operations from a control console.
- Assists the Driller with pre-planning the equipment, materials and proper sequence of constricting a well.
- During drilling operations, assists the Driller with directing the installation of the BOP on the wellhead and coordinating pressure testing of the BOP stack; operates the rig's hoisting equipment and rotary table, and supervises the drill crew in running the required drill stem components; monitors drilling instruments to ascertain drill stem and well bore performance; and reviews drilling options with the toolpusher to ascertain the most economic and efficient method of drilling the well to the client's specifications.

Education, Experience and Certification Requirements

Incumbents are normally promoted from the position of Derrickman or Pipe Handling Technician, and would typically have 5-7 years of progressively responsible experience in offshore drilling operations.

Typical Entry Level or Career Path

Formal qualifications are not always required for entry, although it can be useful to have at least some Standard Grades or the equivalent. Several years of experience onboard a rig is usually needed for entry to this job. Derrickmen often begin at basic laboring level (Roughneck), and progress through the ranks.

Relevant NOC Reference: 8232, Assistant Driller, Oil and Gas Drilling

Ballast Control Operator

Key Responsibilities and Skill Requirements

- Generally responsible for the safe, efficient and effective operation of all functions of the ballast control room.
- Maintains the proper trim of the of the drilling unit utilizing approved ballast control methods for draft and trim corrections, operates all ballast system pumps and vales, both locally and remotely.
- Participates in all marine operations including rig moves, and supply boat and helicopter operations.

Education, Experience and Certification Requirements

- Diploma in Marine Studies
- Ballast Control experience
- Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation o dangerous goods and pressure control

Typical Entry Level or Career Path

Entrants to this position are typically experienced Mates or Ballast Control Trainees.

Relevant NOC Reference: 8412, Ballast Control Operator, Offshore Drilling

Dynamic Positioning/Stability Technician

Key Responsibilities and Skill Requirements

- Maintains drilling unit/vessel stability and positioning while on station.
- Monitors and records mooring tensions and the rig's position relative to the wellhead, and ensures that mooring winches are in a state of readiness to adjust anchor tensions as required.
- Ensures that any available propulsion is ready to assist in position keeping, and operates dynamic positioning equipment for this purpose when required.
- Monitors variable load on a daily basis to calculate and maintain unit stability.

Education, Experience and Certification Requirements

A high school diploma, supplemented by a 2nd Mates Ticket, plus three to five years of related experience in offshore drilling operations, is typically required for this position.

Typical Entry Level or Career Path

This job is typically filled by promoting Mates or Ballast Control Operator Trainees.

Relevant NOC Reference: 8412, Dynamic Positioning Operator, Offshore Drilling

Chief Engineer – Marine (Drill Rig)

Key Responsibilities and Skill Requirements

- Generally responsible for the management, maintenance, repair and operation of all mechanical and electrical equipment on board the drilling unit.
- Supervises and coordinates all repair and preventative maintenance activities, and advises the O.I.M. on all engineering, maintenance and repair matters.
- Supervises the activities of Junior Engineers in engine room operations.

Education, Experience and Certification Requirements

Completion of a Marine Engineering program from an approved nautical institute and certification as a Marine Engineer, 1st Class by Transport Canada.

The requirement for formal post-secondary training may not apply if the employee has the requisite years of directly related marine engineering experience and has been appropriately certified by Transport Canada.

Typical Entry Level or Career Path

The progression to Chief Engineer would normally be as follows:

- Completion of a Marine Engineering Program (three years)
- 4th Class Marine Engineer (36 months of related experience + TC certification)
- 3rd Class Marine Engineer (48 months experience + TC certification)
- 2nd Class Marine Engineer (minimum 4th class + 12 months experience + TC certification)
- Chief Engineer (minimum 3rd class + 24 months experience + TC certification)

Relevant NOC Reference: 2274, Engineer Officers, Water Transport

Offshore Crane Operator

Key Responsibilities and Skill Requirements

- Operates deck cranes utilized in the lifting and movement of all operations equipment, systems, supplies, containers, tubulars and other materials used in the daily functioning of the drilling unit.
- Inspects the condition of cranes and associated equipment to ensure operational integrity to handle heavy workloads.
- Inspects and makes available safe and proper rigging for the movement of materials. Ensures materials, equipment, and supplies are unloaded and back-loaded to supply vessels in an efficient manner.
- Performs routine maintenance work such as cleaning and lubricating cranes.

Education, Experience and Certification Requirements

Some secondary school education or licensing in the area of heavy equipment operations or equivalent is preferred.

Typical Entry Level or Career Path

Crane Operator Trainees from the Roustabout level are typically promoted into this position.

Relevant NOC Reference: 7371, Crane Operator, Offshore Drilling

Well Services

Fishing Tools Supervisor

Key Responsibilities and Skill Requirements

- Supervises, co-ordinates and schedules the activities of fishing tool technicians.
- Requisition materials and supplies.
- Trains workers in job duties.
- Sets up machines and equipment.
- Analyzes conditions of unserviceable oil or gas wells and directs use of special well- fishing tools and techniques to recover lost equipment and other obstacles from boreholes of wells.
- Supervises technicians and confers with them to gather information regarding size of pipes and tools and borehole conditions in wells.
- Ensures techniques used do not compromise well control.
- Ability to draw upon experience to design tools on-site to deal with unexpected situations in the well.

Education, Experience and Certification Requirements

Completion of secondary school is preferred. Completion of college or Petroleum Industry Training Service (PITS) courses is desired. 5 - 10 years of experience as a fishing tool specialist. Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

Typical Entry Level or Career Path

This supervising role requires knowledge of well services primarily dealing with fishing tool techniques. It is possible for a fishing tool technician to be promoted to fishing tool supervisor. Fishing tool technicians typically gain well services experience by working up through the drilling positions (roughneck, derrickman, assistant driller, and driller). They then specialize in fishing operations.

Relevant NOC Reference: 8232, Fishing Tool Operator, Oil Field Services

Completions Tool Technician

Key Responsibilities and Skill Requirements

- Prepares and services downhole completion equipment and service equipment used in well completions.
- Operates company specific equipment, tools and software necessary for well servicing.
- Works as part of the completion team running oil and gas well completions.
- Maintains equipment data books.

Education, Experience and Certification Requirements

Completion Tool Technicians usually require completion of a 1 to 2 year college program in a related field. Good mechanical aptitude and the ability to visualize what is happening downhole is required. Computer literacy is a must. A period of supervised work experience, usually two years, is required before certification. Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

Typical Entry Level or Career Path

This position requires training and understanding of the well services sector and of company specific completion equipment. A completions tool technician typically learns about the completion equipment by preparing it in the shop. After gaining that experience, s/he becomes part of the completion team that installs the equipment downhole. The completion technician could be promoted to the position of completions supervisor with the proper training, competence and initiative.

Relevant NOC Reference: 2212, Geological and Mineral Technologists and Technicians (Petroleum Technician)

Liner Hanger Technician

Key Responsibilities and Skill Requirements

- Prepares and services downhole liner hanger equipment and related service equipment.
- Supervises running of liner string and setting of liner hanger.
- Operate company specific equipment, tools and software necessary for well serving.
- Types of skill capabilities include rig services, connector make-up services, computerized make-up analysis, a variety of standard and customized pipe handling techniques, and liner equipment.
- Maintains records related to service industry.
- Perform limited data interpretation.
- Applies understanding of cementing equipment and techniques.
- Performs hydrostatic calculations.

Education, Experience and Certification Requirements

- Completion of secondary school is usually required.
- Well services such as this require company specific training (equipment, processes and procedures), three to six month of formal on the job training, college or Petroleum Industry Training Service (PITS).
- Offshore work requires several years of experience in an equivalent position.
- Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

Typical Entry Level or Career Path

This position requires training and understanding of the well services sector and of company specific equipment. A liner hanger tool technician typically learns about the liner hanger equipment by preparing it in the shop. After gaining that experience, s/he becomes part of the team that installs the equipment downhole. A liner hanger technician could be promoted to the position of supervisor with the proper training, competence and initiative.

Relevant NOC Reference: 2212, Petroleum Technician

Thread Inspector

Key Responsibilities and Skill Requirements

- Inspects threads on joints of steel casings, tubing, drill pipes and other tubular oil well equipment to detect defects.
- Determines conformance to specified tolerances in taper, lead and threads per inch, using precision gauges and instruments.
- Measure machined threads and outside diameter of pipes to determine thread size, taper, threads per inch and size of pipe.
- Applies knowledge of standard and obsolete thread forms.
- Applies understanding of specific thread design and relevant parameters affecting thread performance.
- Applies understanding of metallurgy, torque machines and thread preservation techniques.

Education, Experience and Certification Requirements

Completion of secondary school is usually required. Well services such as this require three to six month of formal on the job training, college or Petroleum Industry Training Service (PITS) Also requires specific training from each threading company on their thread designs. Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, workplace hazardous materials information system (WHMIS), transportation of dangerous goods.

Typical Entry Level or Career Path

This position requires training and understanding of the well services sector A thread inspector could be promoted to the position of supervisor with the proper training, competence and initiative.

Relevant NOC Reference: 2261, Non Destructive Testers and Inspectors

Casing Running Technician

Key Responsibilities and Skill Requirements

- Operates company specific equipment, tools and software necessary for making up tubular connections.
- Types of skill capabilities include conductor and caisson driving services, connector make-up services, computerized make-up analysis, a variety of standard and customized pipe handling techniques, and casing centralizers and cementation equipment.
- Maintains records related to service industry.
- Performs limited data interpretation.

Education, Experience and Certification Requirements

Completion of secondary school is usually required. Well services such as this require three to six month of formal on the job training, college or Petroleum Industry Training Service (PITS) Offshore work requires several years of experience in an equivalent position. Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

Typical Entry Level or Career Path

This position requires training and understanding of the well services sector and company specific equipment. A casing running technician typically learns about the tubular make-up equipment by preparing it in the shop. After gaining that experience, s/he becomes part of the team that installs runs the tubulars downhole. A casing running technician could be promoted to the position of supervisor with the proper training, competence and initiative.

Relevant NOC Reference: 2212, Petroleum Technician

Cementing Engineer – Well Services

Key Responsibilities and Skill Requirements

- Designs casing cementing programs.
- Coordinates and manages QA/QC of cement designs through laboratory analysis.
- Must be able to perform hydraulic calculations, tubing stress analysis.
- Specifies equipment requirements.
- Performs analysis with company specific software and interpret results.
- Chemical engineering capabilities.

Education, Experience and Certification Requirements

Completion of an undergraduate degree in Engineering plus a minimum of two years of related well services experience (Engineer-in-Training Phase). Requires a full understanding of company specific pumping equipment and downhole tools. A chemical aptitude and understanding of how chemicals react is required. Offshore work requires several years of experience in an equivalent position. Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

Typical Entry Level or Career Path

The progression for Cementing Engineers typically occurs in the following sequence.

- Engineer-in-Training (entry level)
- Jr. Cementing Engineer
- Sr. Cementing Engineer
- Cementing Supervisor/Manager

Relevant NOC Reference: 8412, Oil and Gas Well Drilling Workers and Service Operators

Coil Tubing Supervisor

Key Responsibilities and Skill Requirements

- Supervises, co-ordinates, and schedules the activities of the coil tubing team on location.
- Mentors coil tubing technicians and trains them in job duties, safety procedure and company policies.
- Establishes methods to meet work schedule and co-ordinate work activities with other departments.
- Requisitions materials and supplies.
- Prepares production and other reports.
- Sets up machines and equipment for coil tubing.
- Interprets real time data gathering information to predict and mitigate problems prior to occurrence.
- Runs coil tubing software associated with fluid displacement and associated parameters.
- Troubleshoots job problems.

Education, Experience and Certification Requirements

Completion of secondary school is required. Completion of college or Petroleum Industry Training Service (PITS) courses is required. 8 years of experience as a service supervisor. Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

Typical Entry Level or Career Path

This supervising role requires knowledge of well services primarily dealing with coil tubing. Career progression typically begins as a Service Assistant and progressing up through various positions requiring additional experience and responsibility until the supervisor position is attained. It is possible for a coil tubing supervisor to be promoted to coil tubing coordinator with the proper training, competence and initiative.

Relevant NOC Reference: 8412, Oil and Gas Well Drilling Workers and Service Operators

Completions Engineer – Well Services

Key Responsibilities and Skill Requirements

- Designs well completions.
- Specifies completion equipment based upon equipment function, wellbore conditions.
- Develops well completion and well intervention programs.
- Coordinates and manages the running of the completion and/or well intervention.
- Basic reservoir and production understanding is required.
- Competence with tubing stress analysis programs and a good understanding of metallurgical properties.

Education, Experience and Certification Requirements

Completion of an undergraduate degree in Engineering plus a minimum of two years of related well services experience (Engineer-in-Training Phase). Requires a full understanding of company specific completion equipment and service equipment. Good mechanical aptitude and the ability to visualize what is happening downhole is required. Offshore work requires several years of experience in an equivalent position. Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

Typical Entry Level or Career Path

The progression for Completions Engineers typically occurs in the following sequence.

- Engineer-in-Training (entry level)
- Jr. Completions Engineer
- Sr. Completions Engineer
- Completions Supervisor / Manager

Relevant NOC Reference: 8412, Oil and Gas Well Drilling Workers and Service Operators

Directional Drilling Engineer

Key Responsibilities and Skill Requirements

- Monitors and directs drilling operations.
- Develops drilling programs including selection of sites, and specification of drilling fluids.
- Designs well paths.
- Directs and monitors the completion and evaluation of wells, wells testing and well surveys.
- Provides guidance to Well Technicians.

Education, Experience and Certification Requirements

Completion of an undergraduate degree in a related discipline such as Engineering, Science or Geology, or an equivalent substitute of progressively responsible experience in drilling and rig operations.

Typical Entry Level or Career Path

Completion of an undergraduate degree in Engineering plus a minimum of two years of related well services experience (Engineer-in-Training Phase). Requires a full understanding of company specific completion equipment and service equipment. Good mechanical aptitude and the ability to visualize what is happening downhole is required. Offshore work requires several years of experience in an equivalent position. Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

The progression for Directional Drillers typically occurs in the following sequence:

- Well Planner
- Directional Drilling Engineer
- Directional Drilling Supervisor

Relevant NOC Reference: 8232, Oil and Gas Well Drillers, Servicers, Testers, and Related Workers

Permanent Downhole Gauges Coordinator

Key Responsibilities and Skill Requirements

- Supervises, co-ordinates, schedules the activities of the downhole gauge team.
- Mentors downhole gauge technicians and trains them in job duties, safety procedure and company policies.
- Establishes methods to meet work schedule and co-ordinate work activities with other departments.
- Requisition materials and supplies.
- Prepares production and other reports.
- Operates company specific equipment, tools and software necessary for well serving and installation of gauges.
- Types of skill capabilities include testing and continuous improvement, calibration, repair, data processing and testing.
- Performs limited data interpretation.
- Must be computer literate.

Education, Experience and Certification Requirements

- Diploma in Engineering (Mechanical, Electrical or Petroleum).
- Well services such as this require company specific training (equipment, processes and procedures), three to six month of formal on the job training, college or Petroleum Industry Training Service (PITS).
- Offshore work requires several years of experience in an equivalent position.
- Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

Typical Entry Level or Career Path

This supervising role requires knowledge of well services primarily dealing with downhole gauges. Career progression typically begins as a Service Assistant and progressing up through various positions requiring additional experience and responsibility until the supervisor position is attained. It is possible for a downhole gauge supervisor to be promoted to downhole gauge coordinator with the proper training, competence and initiative.

Relevant NOC Reference: 8232, Downhole Tool Operator

Slickline Supervisor

Key Responsibilities and Skill Requirements

- Supervises, co-ordinates and schedules the activities of the slickline team on location.
- Mentors slickline technicians and trains them in job duties, safety procedure and company policies.
- Establishes methods to meet work schedule and co-ordinate work activities with other departments.
- Requisitions materials and supplies.
- Prepares production and other reports.
- Sets up equipment for Slickline operations.
- Troubleshoots slickline tool problems as required.

Education, Experience and Certification Requirements

Completion of secondary school is required. Completion of college or Petroleum Industry Training Service (PITS) courses is desired. 5+ years of experience as a service specialist. Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

Typical Entry Level or Career Path

This supervising role requires knowledge of well services primarily dealing with Slickline services and completions. Career progression typically begins as a Service Assistant and progressing up through various positions requiring additional experience and responsibility until the supervisor position is attained. Experience is typically gained on land operations prior to shifting to the offshore environment. It is possible for a slickline supervisor to be promoted to slickline coordinator with the proper training, competence and initiative.

Relevant NOC Reference: 8232, Downhole Tool Operator

Well Planning/Drilling Engineer

Key Responsibilities and Skill Requirements

- Projects the well drilling path to the target depth coordinates established for an offshore oil and gas well.
- Provides in town support to drilling personnel who are responsible for operating drilling facilities engaged in the creation of an offshore well bore, as monitors the progress of the well path in reference to the pre-established well plan and well target coordinates.
- Selects fit for purpose bottom-hole assemblies including motors, stabilizers and drill bits.

Education, Experience and Certification Requirements

Completion of a Bachelors of Engineering (Mechanical or Petroleum), plus 3-5 years general and offshore experience. Professional Engineering Designation is preferred. Company specific training regarding equipment, processes, and procedures.

Typical Entry Level or Career Path

Completion of an undergraduate degree in Engineering plus a minimum of two years of related well services experience (Engineer-in-Training Phase). Requires a full understanding of company specific drilling equipment. Good mechanical aptitude and the ability to visualize what is happening downhole is required. Offshore work requires several years of experience in an equivalent position. Safety training is required in aspects such as: first aid, hydrogen sulphide awareness, blowout prevention, well control, workplace hazardous materials information system (WHMIS), transportation of dangerous goods and pressure control.

The progression for Well Planners typically occurs in the following sequence:

- Well Planner
- Directional Drilling Engineer
- Directional Drilling Supervisor

Relevant NOC Reference: 2145, Offshore Drilling Engineer

Marine Logistics and Transportation

Master - Marine

Key Responsibilities and Skill Requirements

- Acts as the owner's representative in relation to all aspects of the operations of the vessel with ultimate responsibility and authority to make decisions on their behalf.
- Commands and operates a supply vessel, oil tanker, or other ship engaged in offshore oil and gas operations.
- Plans and executes safe navigational passage using navigational aids such as instruments, maps and charts in accordance with national and international regulations, codes and guidelines, company/owner instructions, and practices of safe seamanship.
- Ensures the seaworthiness and safety of the crew, ship and cargo.
- Supervises and coordinates the activities of deck crews, and directs and oversees the loading and unloading of cargo.
- Ensures the Chief Officer and Chief Engineer are well trained and informed of the Master's duties and work.
- Keeps all certificates and class surveys, records, files and drawings up to date.
- Maintains the ship's log of vessel progress, crew activities, and weather and sea conditions.

Education, Experience and Certification Requirements

Completion of a Deck Officer Cadet program from an approved nautical institute and certification as a Master Foreign Going by Transport Canada. Certification at this level requires a minimum of three years of experience as a Chief Officer.

Typical Entry Level or Career Path

The progression to Master (Foreign Going) would normally be as follows:

- Third Mate (completion of Nautical Science Program + 12 months marine experience)
- Second Mate (3 years ocean-going experience + TC certification)
- First Mate (Chief Officer) (5 years ocean-going experience + TC certification)
- Master (3 years experience as a Chief Officer + TC certification)

Relevant NOC Reference: 2273, Deck Officers, Water Transport

Second Mate

Key Responsibilities and Skill Requirements

- Under the direction of the first mate.
- The second mate carries out daily operations of the vessel.
- Assumes the duties of the first mate in his/her absence.
- Responsible for volunteer training in the first mate's absence.
- Must act as designated engineer in the engineer's absence.
- Maintains all navigation equipment, publications and charts.
- Prepares information for the bridge.
- Performs bridge watch shifts.
- Plots voyage track.
- Verifies that all charts, bridge electronics, navigational and alarm systems are in order.

Education, Experience and Certification Requirements

Completion of a Deck Officer Cadet program from an approved nautical institute or an equivalent amount of related marine experience and certification as a Second Mate by Transport Canada.

Typical Entry Level or Career Path

The progression within the deck officer ranks would normally be as follows:

- Third Mate (completion of Nautical Science Program + 12 months marine experience)
- Second Mate (3 years ocean-going experience + TC certification)
- First Mate (Chief Officer) (5 years ocean-going experience + TC certification)
- Master (3 years experience as a Chief Officer + TC certification)

Relevant NOC Reference: 2273, Deck Officers, Water Transport

Third Mate

Key Responsibilities and Skill Requirements

- Functions as the ship's safety officer.
- Maintains lifesaving, fire fighting and other emergency equipment.
- Assists in training the crew in emergency drill procedures.
- Responsible for condition and repair of lifeboats, life rafts, life rings, life jackets.
- Performs bridge watch shift.
- Carries out scientific operations as directed.

Education, Experience and Certification Requirements

Completion of a Deck Officer Cadet program from an approved nautical institute or an equivalent amount of related marine experience and certification as a Third Mate by Transport Canada.

Typical Entry Level or Career Path

The progression within the deck officer ranks would normally be as follows:

- Third Mate (completion of Nautical Science Program + 12 months marine experience)
- Second Mate (3 years ocean-going experience + TC certification)
- First Mate (Chief Officer) (5 years ocean-going experience + TC certification)
- Master (3 years experience as a Chief Officer + TC certification)

Relevant NOC Reference: 2273, Deck Officers, Water Transport

Second, Third and Fourth Engineer

Key Responsibilities and Skill Requirements

- Operates main engines, machinery and all auxiliary equipment aboard ships, such as boilers, steering and deck machinery, motors, pumps, generators and condensers.
- Stands engine room watch, monitoring and noting performance of engines, machinery and all auxiliary equipment.
- Inspects and conducts maintenance and emergency repair to engines, machinery and all auxiliary equipment.
- Supervises and co-ordinates activities of engine room crew.
- Maintains records and prepares reports on engine performance and failures.

Education, Experience and Certification Requirements

Completion of three-year cadet program in marine engineering from an approved marine training institute and/or credit in some cases for prior related marine experience on an equivalency basis, and certification by Transport Canada at the appropriate level competency.

Typical Entry Level or Career Path

The progression of Marine Engineers would normally be as follows:

- Completion of a Marine Engineering Program (three years)
- 4th Class Marine Engineer (36 months of related experience + TC certification)
- 3rd Class Marine Engineer (48 months experience + TC certification)
- 2nd Class Marine Engineer (minimum 4th class + 12 months experience + TC certification)
- Chief Engineer (minimum 3rd class + 24 months experience + TC certification)

Relevant NOC Reference: 2274, Engineer Officers, Water Transport

Helicopter Pilot

Key Responsibilities and Skill Requirements

- Flies twin-engine helicopters to transport people and small freight.
- Provides services such as search and rescue and aerial surveying.
- Maintains safe flight operations.
- Manages base crews (Base Manager, Assistant Base Manager).
- Tests new aircraft to evaluate aircraft performance.
- Plans and coordinates flight logistics.

Education, Experience and Certification Requirements

Must contain a Department of Transportation License (ATPL(H)) as well as experience rating for aircraft in question. A person must also attain an Instrument Flight Rating (IFR) and a Visual Flight Rating (VFR). 1000 hours of flying experience as a pilot and 500 flying hours as a co-pilot are also required. Previous experience with large, multi-engine helicopters is preferred, along with experience operating in an offshore environment.

Typical Entry Level or Career Path

First Officer

Relevant NOC Reference: 2271, Helicopter Pilot

Engineering Design and Fabrication

Process Engineer

Key Responsibilities and Skill Requirements

- Oversees technical design work related to the construction, modification, operation and/or maintenance of processing units and other facilities related to the development and production of offshore oil and gas.
- Evaluates client requests and contract tenders, and prepares contracts.
- Provides direction and supervision as necessary to process engineering and drafting personnel to ensure that technical solutions are delivered in accordance with technical, cost and quality standards.
- Approves Process data sheets, drawings, reports and other Process deliverables.
- Provides process engineering advice and support to offshore oil and gas clients.

Education, Experience and Certification Requirements

An undergraduate degree in a related engineering discipline (e.g., process, petroleum), plus 3-5 years experience in a petroleum/offshore processing environment, or in a related industrial processing setting.

Typical Entry Level or Career Path

Junior Process Engineer to Intermediate Process Engineer to Senior Process Engineer.

Relevant NOC Reference: 2134, Process Engineer

Loss Control Engineer

Key Responsibilities and Skill Requirements

- Conducts economic and technical feasibility studies in areas related to chemical and petroleum processing.
- Conduct research into the development or improvement of petroleum and chemical engineering processes, reactions and materials.
- Designs, tests and evaluates process technologies and equipment and determines production specifications.
- Oversees the construction, modification, operation and maintenance of pilot plants, processing units or processing plants.
- Establish and conduct quality control programs, operating procedures and control strategies to ensure consistency and adherence to standards for raw materials, products and waste products or emissions.
- Prepares contract documents and evaluate tenders for the process aspects of industrial construction.
- Supervises technicians, technologists and other engineers.

Education, Experience and Certification Requirements

Completion of an undergraduate degree in Chemical or Petroleum Engineering, plus 5-10 years of project management experience, including 3-5 years of experience in a petroleum processing or offshore production environment.

Relevant NOC Reference: 2134, Chemical Engineers

Structural Engineer

Key Responsibilities and Skill Requirements

- Plan and design major civil projects such as buildings, roads, bridges, dams, water and waste management systems and structural steel fabrication.
- Confers with clients and other members of the engineering team and conduct research to determine project requirements, develops construction specifications and procedures.
- Interprets, reviews and approves survey and civil design work. Prepares contract documents and review and evaluate tenders for construction projects.
- Ensures construction plans meet guidelines and both client and regulatory specifications. Establishes and monitors construction work schedules.
- Conduct feasibility studies, economic analyses, environmental impact studies or other investigations.
- Acts as project or site supervisor, supervises technicians, technologists and other engineers and reviews and approves designs, calculations and cost estimates.

Education, Experience and Certification Requirements

Completion of and undergraduate degree in civil, mechanical, or other related engineering discipline (a Master's degree may be required); registration as a Professional Engineer by a provincial or territorial association of Professional Engineers; and 3-5 years of related general and offshore/petroleum sector experience.

Relevant NOC Reference: 2131, Civil Engineers

Instrumentation Engineer

Key Responsibilities and Skill Requirements

- Conducts research into the feasibility, design, operation and performance of electrical generation and distribution networks, electrical machinery and components and electronic communications, instrumentation and control systems, equipment, and components.
- Prepares material cost and timing estimates, reports and design specifications for electrical and electronic systems and equipment.
- Designs electrical and electronic circuits, components, systems and equipment.
- Supervises and inspects the installation, modification, testing and operation of electrical and electronic systems and equipment.
- Develops maintenance and operating standards for electrical and electronic systems and equipment.
- Investigate electrical or electronic failures.
- Prepares contract documents and evaluates tenders for construction or maintenance.
- Supervises technicians, technologists, programmers, analysts and other engineers.

Education, Experience and Certification Requirements

Completion of and undergraduate degree in electronics, electrical or other related engineering discipline (a Master's degree may be required); registration as a Professional Engineer by a provincial or territorial association of Professional Engineers; and 3-5 years of related general and offshore/petroleum sector experience.

Relevant NOC Reference: 2133, Electrical Engineers

Instrumentation/Electronics Technician

Key Responsibilities and Skill Requirements

- Installs, calibrates and modifies electronic systems and components in an offshore production or marine environment, including those used in oil and gas production and processing; drilling and subsea operations; communication; data acquisition; computer system operations; dynamic positioning; and navigation.
- Inspects electronic instruments and systems to diagnose faults, calibration errors, and defective parts, and repair/adjust as required;
- Performs scheduled preventive maintenance and repair of electronic systems.

Education, Experience and Certification Requirements

Completion of a College level program in Instrumentation/Electronics Technology, plus a minimum of 12-18 months of practical workplace experience in an industrial setting.

Certification of familiarity with offshore/marine systems and processes in accordance with the operator's competence assurance process.

Typical Entry Level or Career Path

If the employee does not possess relevant industrial experience, a period of apprenticeship of up to two years is required in order to obtain journey person certification, prior to operating independently as a Technician.

Relevant NOC Reference: 2243, Industrial Instrument Technicians and Mechanics

Welder (Exotic Metals)

Key Responsibilities and Skill Requirements

- Reads and interprets blueprints or welding process specifications.
- Operates manual or semi-automatic welding equipment to fuse metal segments using processes such as gas tungsten arc (GTAW), gas metal arc (GMAW), flux-cored arc (FCAW), plasma arc (PAW), shielded metal arc (SMAW), oxy-acetylene (OAW), resistance welding and submerged arc welding (SAW).
- Operates manual or semi-automatic flame-cutting equipment.
- Operates brazing and soldering equipment.
- Operates metal shaping machines such as brakes, shears and other metal straightening and bending machines.
- Repair worn parts of metal products by welding on extra layers.

Education, Experience and Certification Requirements

Completion of a three-year apprenticeship program or a combination of over three years of work experience in the trade and some college or industry courses in welding is usually required to be eligible for trade certification. Inter-provincial trade certification (Red Seal) is also available to qualified welders. Canadian Welding Bureau (CWB) certifications may be required in relation to specialized techniques.

Typical Entry Level or Career Path

It is possible to enter directly into this position with a college diploma or trade certificate. The position can also be attained after completing an apprenticeship or by having adequate work experience in the trade. Progression to supervisory positions is possible with experience.

Relevant NOC Reference: 7265, Welders and Related Machine Operators

Pipefitter (Exotic Materials)

Key Responsibilities and Skill Requirements

- Install supports, valves, piping and control systems.
- Reads and interprets drawings, blueprints and specifications to determine layout requirements.
- Measures, cuts, threads and bends pipe to required shape using hand and power tools. Welds, brazes, cements, solders and threads joints to join pipes and fabricates sections of piping systems.
- Tests systems for leaks using testing equipment.
- Cleans and maintains pipe units and fittings; flushes systems; removes and replace worn components; and reactivates systems.

Education, Experience and Certification Requirements

Completion of a four to five year apprenticeship program or a trade certification program (mandatory in certain provinces). Inter-provincial trade certification (Red Seal) is also available to qualified steamfitters/pipefitters, and Canadian Welding Bureau (CWB) certifications may be required in relation to specialized techniques.

Typical Entry Level or Career Path

It is possible to enter directly into this position with a college diploma or trade certificate. The position can also be attained after completing an apprenticeship or by having adequate work experience in the trade. Progression to supervisory positions is possible with experience.

Relevant NOC Reference: 7252, Steamfitters, Pipefitters

Industrial Painter

Key Responsibilities and Skill Requirements

- Operates equipment to clean, wash, strip, sand, remove corrosion; fills dents or otherwise prepares items for application of paint, lacquer or other protective or decorative coatings in an industrial setting.
- Operates automated spray paint, dip or flow coating equipment or other mechanized painting or product coating application equipment.
- May clean and prepare metal parts for coating.
- May prepare and mix metallizing solutions; operate electroplating equipment to coat metal and other objects; and operate hot-dip metal plating equipment to galvanize metal and other objects.
- May operate spray equipment to build up worn or damaged parts or to bond protective or decorative coatings on metal objects.

Education, Experience and Certification Requirements

Three to five years of related experience in industrial painting and coating applications is desired, and specialized courses or post-secondary training may be required in certain specialized areas.

Relevant NOC Reference: 9496, Painters and Coaters – Industrial
 9497, Plating, Metal Spraying & Related Operators

QA/QC Manager

Key Responsibilities and Skill Requirements

- Develops, documents and implements quality assurance standards and processes in such areas as engineering design, modifications and construction, production/processing, procurement, safety and environmental compliance, or other functional business areas.
- Designs and implements surveillance processes for the ongoing monitoring and measuring quality outcomes against established standards.
- Plans and conducts audits and inspections to determine compliance with quality specifications, standards and procedures.
- Writes Non Conformance Reports as required and works with accountable personnel to ensure remediation plans are documented to rectify issues or to implement improvement opportunities.

Education, Experience and Certification Requirements

An undergraduate degree in Engineering, Business or a discipline related to the area of technical knowledge and expertise involved, combined with a minimum of 5-7 years of professional experience, including three years experience in a QA/QC function. A working knowledge of ISO 9000 quality standards or some other comparable quality management system is usually required.

Relevant NOC Reference: 2141, Quality Control Engineer
 0211, Engineering Service Quality Control Manager

QA/QC Inspector

Key Responsibilities and Skill Requirements

- Conducts audits and inspections to determine compliance with quality specifications, standards and procedures in such areas as engineering design, modifications and construction, production/processing, procurement, safety and environmental compliance, or other functional business areas.
- Often uses visual inspection or precision measuring instruments and calibration tools to perform first article and final inspections, as well as tests of raw materials used in construction or production applications.
- Maintains quality records.

Education, Experience and Certification Requirements

Must have excellent interpersonal and communication skills. Ability to multi-task and work in a highly organized fashion with attention to detail and accuracy. Good understanding of QC tools and procedures. Two years minimum QC experience.

Relevant NOC Reference: 2233, Quality Assurance Technologist

QA Inspector

Key Responsibilities and Skill Requirements

- Performs dimensional inspections on all machined parts as per drawings.
- Writes Non Conformance Reports as required and workswith engineering and purchasing to rectify any issues.
- Works within documentation system and identifies improvements opportunities.

Education, Experience and Certification Requirements

- Must have excellent interpersonal and communication skills. Ability to multi-task and work in a highly organized fashion with attention to detail and accuracy. Good understanding of downhole and QA tools. Two years minimum QA experience.

Relevant NOC Reference: 2233, Quality Control Technologist

Health, Safety and Environment Manager

Key Responsibilities and Skill Requirements

- Develops, implements and maintains policies, processes and systems to ensure compliance with regulatory and organizational standards related to health, safety and the environment.
- Ensures the effective development and implementation of Emergency Response/Emergency Preparedness systems in both onshore and offshore oil and gas industrial settings.
- Establishes and tracks measures of safety and environmental performance, ensures the timely implementation of internal and external audits.
- Documents non-conformance situations and liaises with company or client representatives in the development and implementation of remedial actions.
- Work closely with operator and major contractor representatives in the development and execution of clear SH&E plans and Key Performance Indicators (KPI's) in relation to activities on offshore oil and gas project.
- Supervises SH&E Advisors or other junior personnel involved in the administration and execution of SH&E systems and plans.

Education, Experience and Certification Requirements

The ideal candidate for this position will possess an undergraduate or Master's degree in science or a related engineering discipline and post-graduate qualifications in safety management. Related certification from agencies such as NEBOSH / British Safety Council, and/or certification in auditing (e.g., ISO 14001) may be required depending on the organization's requirements. A minimum of 5-7 years of relevant working experience, including two years working experience in an offshore or petroleum-related setting would be required.

Relevant NOC Reference: 0112, Occupational Health & Safety Manager

Electrical and Instrumentation

Electrical Engineer

Key Responsibilities and Skill Requirements

- Conduct research into the feasibility, design, operation, and performance of electrical generation and distribution networks, electrical machinery and components and electronic communications, instrumentation and control systems, equipment, and components.
- Prepare material cost and timing estimates, reports and design specifications for electrical and electronic systems and equipment used in an oil and gas environment.
- Design electrical and electronic circuits, components, systems and equipment that are used in an oil and gas environment.
- Supervise and inspect the installation, modification, testing and operation of electrical and electronic systems and equipment that is used in an oil and gas environment.
- Develop maintenance and operating standards for electrical and electronic systems and equipment that is used in an oil and gas environment.
- Investigate electrical or electronic failures.
- Prepare contract documents and evaluate tenders for construction or maintenance for an oil and gas environment.
- Supervise technicians, technologists, programmers, analysts, other engineers.

Education, Experience and Certification Requirements

A bachelor's degree in electrical or electronics engineering or in an appropriate related engineering discipline is required. A masters or doctoral degree in a related engineering discipline may be required. Licensing by a provincial or territorial association of professional engineers is required to approve engineering drawings and reports and to practice as a Professional Engineer (P.Eng.).

Typical Entry Level or Career Path

Engineers are eligible for registration following graduation from an accredited educational program, three to four years of supervised work experience in engineering and passing a professional practice examination. Supervisory and senior positions in this unit group require experience.

Relevant NOC Reference: 2133, Electrical Engineer

Piping Engineer

Key Responsibilities and Skill Requirements

- Prepare material, cost and timing estimates, reports and design specifications for machinery and systems.
- Supervise and inspect the installation, modification and commissioning of mechanical systems at construction sites or in industrial facilities.
- Investigate mechanical failures or unexpected maintenance problems.

Education, Experience and Certification Requirements

A bachelor's degree in mechanical engineering or in an appropriate related engineering discipline is required. Registration as a Professional Engineer (P.Eng.) by a provincial or territorial association of professional engineers is often required for employment and to practice as a mechanical engineer.

Typical Entry Level or Career Path

Engineers are eligible for registration following graduation from an accredited educational program and after at least two years of supervised work experience in engineering and, in some provinces, after passing a professional practice examination. Supervisory and senior positions in this area require experience.

Relevant NOC Reference: 2132, Piping Engineer

Vibration Specialist

Key Responsibilities and Skill requirements

- Conducts tests and analysis to determine extent and causes of vibration in rotating equipment used in industrial marine and offshore drilling and oil and gas production settings.
- Performs dynamic balancing and other corrective measures as required.

Education, Experience and Certification Requirements

Level 1

One year experience as a vibration data collector/analyst. Three years experience as a mechanical, electrical or instrumental technician in a process plant (chemicals, refinery, paper mill, etc.). Certification as a Level 1 specialist by the Vibration Institute and the completion of a basic vibration analysis course.

Level 2

Three years experience as a vibration specialist with five years work experience in a process plant (chemicals, refinery, paper mill, etc.). Certified as a Level 2 specialist by the Vibration Institute. Must have completed an advanced course in vibration analysis.

Typical Entry Level of Career Path:

Certified Engineering Technologist.

Relevant NOC Reference: 2261, Nondestructive Testers and Inspectors

Environmental Consulting

Weather Forecaster

Key Responsibilities and Skill Requirements

- Analyzes and interprets data obtained from meteorological stations, radar and satellite imagery and computer model output.
- Produces weather forecasts and acts as a consultant to those engaged in weather sensitive activities.
- Analyzes the impact of industrial projects on the climate and quality of the air.

Education, Experience and Certification Requirements

A Bachelor or Master of Science degree in meteorology, physics, mathematics or in a related field. Formal training of nine months is provided by the Atmospheric Environment Service for weather forecasters.

Typical Entry Level or Career Path

A doctorate is usually required for employment as a research scientist in meteorology. Membership in the Canadian Meteorological and Oceanographic Society is available for qualified meteorologists.

Relevant NOC Reference: 2114, Weather Forecaster

Physical Oceanographer

Key Responsibilities and Skill Requirements

- Studies the physical environment of the ocean (currents, temperature, salt and gas content).
- Studies how the ocean and atmosphere affect each other.
- Studies physical oceanographic processes and their influence on the structure and dynamics of the marine ecosystem.

Education, Experience and Certification Requirements

Ph.D. or equivalent in a physical science, preferably in oceanography, plus extensive practical knowledge of standard oceanographic data collection, analysis and interpretation techniques

Relevant NOC Reference: 2113, Physical Oceanographer

Marine Biologist

Key Responsibilities and Skill Requirements

- Studies salt water plants and animals and how they relate to their environment.
- Relates how findings determine how marine ecosystems will cope with changes such as global warming, pollution, pressure from fisheries and damage caused by tourism in sensitive areas.

Education, Experience and Certification Requirements

Job seekers need the broadest possible undergraduate background in the sciences. Recommended courses include biology, chemistry, computer science, physics and calculus. A Ph.D. is usually required for independent research, but a master's degree is sufficient for some jobs in applied research or product development; a bachelor's degree is adequate for some non-research jobs. To understand marine organisms and their behaviors completely, marine biologists must have a basic understanding of other oceanography disciplines.

Relevant NOC Reference: 2121, Marine Biologist

Acoustic Engineer

Key Responsibilities and Skill Requirements

- Prepares conceptual designs for proposal and bids including feasibility analysis of various noise abatement scenarios.
- Works with other disciplines to provide detailed design.
- Performs field data acquisition including data analysis and interpretation, acoustic modeling and preparation of reports.
- Reviews software applications.

Education, Experience and Certification Requirements

A Bachelor of Science in Mechanical Engineering, to specialize in Acoustics is required. Must be familiar with MS Office products, and acoustic analysis software. Experience with mechanical systems within industrial environments; i.e. generators, turbines, fans, ventilation systems, etc. is also necessary.

Relevant NOC Reference: 2132, Acoustics Engineer

Inspection Services

Mechanical Engineer

Key Responsibilities and Skill Requirements

- Designs, develops, maintains and tests machines, components, tools and equipment.
- Prepares cost and material estimates, project schedules and reports.
- Supervises, monitors, and inspects mechanical installations and construction.
- Prepares contract and tender documents.
- Prepares engineering designs, drawings and specifications.
- Prepares standards and schedules and supervises mechanical maintenance programs or operations of mechanical plants.

Education, Experience and Certification Requirements

Requires Bachelors Degree in Engineering, prefer P.Eng. or eligibility to register, 5+ years experience in mechanical and structural design. Familiarity with upstream oil and gas production equipment would be an asset.

Relevant NOC Reference: 2132, Mechanical Engineer

Certified Industrial Hygienist

Key Responsibilities and Skill Requirements

- Manages indoor air quality studies.
- Monitors mid-level staff.
- Prepares project proposals and sample plans.
- Evaluates indoor air quality data.
- Provides peer review of project reports.
- Performs building evaluations.

Education, Experience and Certification Requirements

A BS in a Scientific or Public Health Discipline is required. A master's in Industrial Hygiene or C.A.C. is preferred along with C.I.H. Certification. 5 years experience in industrial hygiene or indoor air quality and experience in bioaerosol evaluations (including models) are essential.

Relevant NOC Reference: 4161, Industrial Hygienist

NDT Technician

Key Responsibilities and Skill Requirements

- Carries out non-destructive testing on plant, equipment or structures using processes such as radiographic, infra-red, ultrasonic, x-ray, liquid penetrant, and magnetic particle inspections.
- Produces detailed reports of inspections and identifies any defects or anomalies found. Maintains records of inspection results, logs and inspection reports.
- Determines the size and location of flaws and establishes the acceptability status of parts through evaluation to applicable quality standards. Takes actions to prevent the occurrence of non-conformities.
- Maintains inspection equipment, and ensures that equipment calibration or testing is kept up to date.

Education, Experience and Certification Requirements

Five years of related experience in the oil and gas industry or a technical equivalent, or an equivalent combination of education, professional certification, and experience. Secondary training and certification in a variety of non-destructive testing methods, including radiography, ultrasonic, magnetic particle, and dye penetration inspection is required. Additional certification in visual welding inspection may also be required.

Relevant NOC Reference: 2261, Non Destructive Testers and Inspectors

Tubular - Drill Pipe Inspector

Key Responsibilities and Skill Requirements

- Conducts various destructive and non-destructive inspections of drill pipe and casing used in offshore oil and gas well development and construction.
- Applies knowledge of the various weights and grades of tubulars, metallurgical differences, service limitations and the impact of corrosive environmental effects in determining conformance with established standards and specifications.
- Use software applications to determine tubular stresses and to understand the effects of tri-axial stresses on tubular string.

Education, Experience and Certification Requirements

Completion of Grade 12, plus the successful completion of a recognized training program in the understanding and application of DS-1 and applicable API (American Petroleum Institute) codes and standards, including the completion of prescribed practical examinations and documented field competence. Must also possess a current certification in various non-destructive testing techniques, such as liquid penetrant, magnetic particle, and ultrasonic inspection.

Relevant NOC Reference: 2261, Non Destructive Testers and Inspectors

Inspection Engineer

Key Responsibilities and Skill Requirements

- Carries out on-stream condition monitoring of plants and QA/QC of all maintenance activities to ensure safe and reliable operations.
- Conducts internal, external planned and unplanned inspections on all static equipment/facilities.
- Coordinates with NDT group after determining the appropriate NDT method applicable to assess the equipment condition.
- Maintains inspection files, keep records up-to-date.
- Identifies the type of corrosion/deterioration to equipment or piping and initiates appropriate monitoring methods in consultation with Process and Corrosion Groups.

Education, Experience and Certification Requirements

The minimum requirement for this job is a B.Sc. in Mechanical Engineering, Metallurgical Engineering or Corrosion Engineering as well as over 11 years experience. Sound knowledge of international codes/standards as applicable to inspection (ASTM, API, ASME, TEMA, NACE, ANSI, etc). Thorough knowledge and experience in various forms of corrosion and their identification along with monitoring and mitigation methods. Full understanding of different NDT methods and their application of equipment and piping monitoring and inspection. Good verbal and written communication skill including technical report writing. And finally, the ability to adapt to new work situations is all important requirements and necessary.

Relevant NOC Reference: 2131, Civil Inspection Engineer

Specialty Services

ROV Technician

Key Responsibilities and Skill Requirements

- Operates remotely operated vehicle for inspection, construction activity.
- Understands Workplace Safety, Hydraulics, Electronics and Electrical systems.
- Underwater Navigation.
- Launch and Recovery.

Education, Experience and Certification Requirements

There are no specific training requirements for ROV pilots other than the general requirement that all offshore personnel are competent to perform their tasks. Company specific training is available. To enter the ROV labour market one must have 3 years general experience in a related field.

Typical Entry Level or Career Path

This position can be obtained after enough experience is obtained in the industry. Training can be done in the US or UK. Instead of this training one could apprentice with a ROV company.

Medic/Offshore Nurse

Key Responsibilities and Skill Requirements

- Assesses extent of injuries or illness of trauma victims/patients.
- Administers pre-hospital care, i.e. cardiopulmonary resuscitation (CPR), oxygen, bandaging and splinting.
- Establishes and maintains intravenous treatment (IV).
- Transports patients by air, land or water to medical facility for further treatment.
- Documents nature of injuries and treatment provided.
- Maintains emergency medical equipment and supplies.

Education, Experience and Certification Requirements

Complete of a college, hospital based or other recognized program in emergency medical technology. Supervised practical experience. Emergency Medical Attendant (EMA), Emergency Medical Technician (EMT), Paramedic etc.

Relevant NOC Reference: 3152, Industrial Nurse

Marine Geologist

Key Responsibilities and Skill Requirements

- Studies and maps the ocean floor.
- Collects information using remote sensing devices aboard surface ships or underwater research crafts.
- Ability to work in laboratory.
- Efficiency recording data.
- Ability to do field work.
- Ability to analyze, compare and interpret facts and figures.

Education, Experience and Certification Requirements

A bachelor's degree in geology or geophysics is adequate for entry into some lower level geology jobs. A master's degree in geology or geophysics is preferred along with some background experience in oceanography.

Relevant NOC Reference: 2113, Marine Geologist

Geophysicist

Key Responsibilities and Skill Requirements

- Generally responsible for processing and interpreting seismic data to determine the structure of oil and gas fields.
- Maps oil and gas reservoirs based on an interpretation of three dimensional seismic data, incorporates seismic attributes to refine reservoir models, and builds and maintains the two dimensional and three dimensional earth models for these reservoirs as required for reservoir management and the determination of drilling locations.
- Builds and maintains velocity models required for depth conversion and prediction.
- Identifies and implements geophysically related technologies and the latest seismic data processing techniques to improve seismic interpretation and overall reservoir management.

Education, Experience and Certification Requirements

An undergraduate degree in Geophysics, Geology, Engineering or a related discipline, plus a minimum of 2-3 years of industry-related experienced related to the development and use of seismic interpretation and reservoir modeling.

Typical Entry Level or Career Path

University graduate.

Relevant NOC Reference: 2113, Geophysicist

Radio Operator

Key Responsibilities and Skill Requirements

- Processes and transmits information and instructions to coordinate the activities of vehicle operators, crews and equipment.
- Operates a two-way radio and a variety of computer-aided communications and dispatching equipment.
- Receives and transmits dispatches.
- Contacts the appropriate personnel to be dispatched, giving all pertinent information.

Education, Experience and Certification Requirements

Must be eligible for the necessary licenses prescribed by the Federal Communications Commission. Must be able to type minimum of twenty (20) words per minute.

Typical Entry Level or Career Path

Entry-level position followed by company specific training. Advancement to supervisory role possible with experience.

Relevant NOC Reference: 1475, Marine Radio Operator

IT/Telecommunications Technician

Key Responsibilities and Skill Requirements

- Installs, operates, maintains and repairs telecommunications and broadcasting networks and equipment.
- Puts network equipment and new telecommunications services into place.
- Ensures that equipment and circuit installations are of good quality.
- Installs cables, jumpers, wires and strappings.
- Provides cost estimates to customers for installation of equipment.

Education, Experience and Certification Requirements

High School Diploma is required. A Degree or the equivalent technical certificates is also required. 3 years experience installing cable for telephones and data networks. Must have experience working with customers

Relevant NOC Reference: 7246, Telecommunications Technician

Appendix F – List of Occupations

Occupation	Current Number Employed in Occupation
Able Bodied Seaman	3.00
Accounting Advisor	1.00
Accounting Support	32.00
Administration Support	68.00
Aircraft Technician	12.00
Applications Support	7.00
Asset Manager	1.00
Assistant Ballast Control Operator	2.00
Assistant Derrickman	8.00
Assistant Driller	12.00
Assistant Passenger Movement Coordinator	1.00
Assistant Rig Manager/Asst Toolpusher	5.00
Assistant Subsea Supervisor	2.00
Avionics Manager	1.00
Avionics Technician	2.00
Ballast Control Operator	4.00
Base Engineer/Production Manager	1.00
Biologist (Fish Health)	4.00
Business Analyst	11.00
Business Development (Proposals)	1.50
Business Manager	4.50
Business Services Manager	1.00
Buyer/Expeditior	25.00
CAD/CIS Technician	8.40
Captain/Master	32.00
Case Manager/Occupational Health Nurse	1.00
Casing Running Specialist/Tubular Handling	17.00
Catering/Accommodations Coordinator	6.00
Cementing Bulk Plant Operator	2.00
Cementing Engineer	2.00
Cementing Manager	2.00
Cementing Operator	2.00
Cementing Service Supervisor	4.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Occupation	Current Number Employed in Occupation
Certification Engineer	1.00
Chef	14.00
Chief Engineer	30.00
Coatings Inspector	1.00
Coil Tubing Engineer	5.00
Coil Tubing Manager	2.00
Coil Tubing Service Supervisor	5.00
Coil Tubing Specialist	3.20
Commercial Coordinator	9.00
Completions Coordinator	2.00
Completions Engineer	6.00
Completions Field Services Quality Coordinator	1.00
Completions Manager	2.00
Completions Operator	2.00
Completions Specialist	2.00
Completions Supervisor	4.00
Completions Tool Technician (onshore) (wellbore)	3.00
Construction Supervisor	2.00
Construction/Projects Lead	1.00
Container Technician	1.00
Contracts Technician	1.00
Controls Engineer	1.00
Cook	30.00
Corrosion Engineer	2.00
Cost Control Engineer	2.00
Crane Operator	2.00
Data Analyst	2.00
Deck Hand	132.00
Deck/Material Movement Operative	4.00
Derrickman	12.00
Directional Driller	10.00
Directional Drilling Supervisor	4.00
Directional Drilling Technician	2.00
Directional Drilling Manager	2.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Occupation	Current Number Employed in Occupation
Dispatcher	1.00
Document Control Clerks	5.00
Document Control Coordinator	13.00
Drill Bit Engineer	2.00
Driller	12.00
Drilling Engineer	8.00
Drilling Engineer Supervisor	2.00
Drilling Fluids Bulk Plant Operator	2.00
Drilling Fluids Coordinator	2.00
Drilling Fluids Engineer	2.00
Drilling Fluids Laboratory Technician	2.00
Drilling Fluids Supervisor	4.00
Drilling Maintenance Coordinator	2.00
Drilling Manager	2.00
Drilling Superintendent	2.00
Drilling Supervisor	12.00
Drilling Technologist	2.00
Drivers	10.00
Electric Wireline Engineer	10.00
Electric Wireline Manager	2.00
Electric Wireline Operator	15.00
Electric Wireline Technician	7.00
Electrical Engineer	7.00
Electrical Technician	21.00
Electrical/Instrumentation Lead	4.00
Electrician	4.00
Electrician (Offshore)	10.00
Electronic Technologist	12.00
Emergency Response Coordinator	3.00
Emergency Response Technician	4.00
Engine Room Assistant (ERA)	28.00
Engine Room Cadet	12.00
Engineer - Acoustics	1.00
Engineering Manager	1.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Occupation	Current Number Employed in Occupation
Engineering Technologist/Technician	29.40
Environmental Project Manager	3.00
Environmental Technician	11.00
Estimator	2.00
Examining Physician	1.50
Fabric Maintenance Engineer	1.00
Facilities Engineering Supervisor	1.00
Facilities Lead	1.00
Facilities/Reliability Engineer	1.00
Field Technologist	1.40
Finance/Accounting Manager	26.20
Financial Analyst	6.00
First Mate	32.00
Fishing Tools and Services Supervisor	3.00
Fishing Tools Shophand	2.00
Fishing Tools Specialist	2.00
Flight Followers	2.00
Fourth Engineer	6.00
Freight Forwarding Coordinator	2.00
Geophysicist	8.00
Heavy Equipment Operator	3.00
Helicopter Pilot	14.00
Hosefitter	2.00
HSE Manager	1.00
Human Resources Manager	17.00
Human Resources Support	12.00
Ice Management Specialist/Tech	2.00
Implementation Coordinator	1.00
Implementation Technician	12.00
Information Technology Analyst	23.00
Information Technology Manager	9.00
Instrumentation Engineer	2.00
Instrumentation Technician	14.00
Instrumentation/Controls Engineer	13.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Occupation	Current Number Employed in Occupation
Instrumentation/Electronics Technician	27.00
Insulator	2.00
Insurance Advisor	1.00
Internal Auditor	2.00
IT/Telecommunications Technician	11.00
Laboratory Manager	1.00
Laboratory Technician	5.00
Labourer	10.00
Lifting & Transportation Co-ordinator	1.00
Lifting Equipment Technicians	4.00
Liner Hanger Coordinator	2.00
Liner Hanger Tool Technician	5.00
Logistics Lead/Coordinator	8.00
Loss Control Engineer	4.00
Machinery Engineer	1.00
Machinist	7.00
Maintenance (Instrument/Electrical/Mechanical Technician)	3.00
Maintenance and Construction Manager	1.00
Maintenance and Operations Advisor	1.00
Maintenance Electrician	6.00
Maintenance Engineer	5.00
Maintenance Foreman	10.00
Maintenance Mechanic	9.00
Maintenance Mechanic (Onshore)	1.40
Maintenance Planner	1.00
Maintenance Planning Advisor	2.00
Maintenance Roustabout	2.00
Maintenance Supervisor	1.00
Maintenance Technician	1.00
Marine Biologist	3.00
Marine Electrician	6.00
Marine Electrician Trainee	6.00
Marine Geologist	4.00
Material Controller	4.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Occupation	Current Number Employed in Occupation
Material Coordinator	6.00
Material Inspector	1.00
Material Movement Coordinator	13.00
Material Technician	1.00
Materials Handler	6.00
Materials/Welding Engineer	3.00
Mechanic	2.00
Mechanical Engineer	16.00
Mechanical Maintenance Engineer	2.00
Mechanical System Supervisor	2.00
Mechanical Technician	36.00
Mechanical/Facility Engineer	1.00
Medic/Offshore Nurse	6.00
Motor Specialist	3.00
Mud Logging Sample Catcher	8.00
Mudlogger	6.00
Mudlogging Coordinator	2.00
Mudlogging Data Engineer	4.00
Mudlogging Inhouse Geology Support	1.00
Mudlogging Technician	2.00
MWD/LWD Manager	2.00
MWD/LWD Specialist	8.00
MWD/LWD Technician	2.00
Navigation Cadet	36.00
NDT Technician (part-time)	4.00
NDT Technician	10.00
Network Operations	2.00
Nitrogen Operator/Technician	5.00
Occupational Medical Specialist	1.00
Offshore Crane Operator	14.00
Offshore Installation Manager (OIM)	6.00
Offshore Maintenance Lead	2.00
Offshore Production Lead	2.00
OIMS Advisor (Offshore)	2.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Occupation	Current Number Employed in Occupation
OIMS Coordinator	1.00
On-call Medevac MD	1.00
On-call Medevac RN	2.00
Onshore Maintenance Lead	1.00
Onshore OIM	1.00
Onshore Production Lead	1.00
Onshore Vessel Lead	1.00
Operations Assistant	1.00
Operations Clerk	2.00
Operations Coordinator/Supervisor	4.00
Operations Engineer	1.00
Operations Manager	17.00
Painter	13.00
Panel Operator	10.00
Passenger Check In Agent	4.00
Passenger Movement Coordinator	1.00
Permanent Downhole Gauges Coordinator	2.00
Permanent Downhole Gauges Technician	2.00
Petroleum Geologist	5.00
Petrophysicist	4.00
Physical Oceanographer	1.00
Pipefitter	14.00
Pipeyard Manager	1.00
Pipeyard Technician	4.00
Piping Designer	4.00
Piping Engineer	4.00
Planner	4.00
Planning/Cost Analysis	1.00
Platform Service Supervisor	1.00
Power Turbines Specialist	1.00
President/General Manager	11.00
Process Engineer	6.00
Process/Field Operator	28.00
Procurement & Contracts Manager	13.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Occupation	Current Number Employed in Occupation
Production Accountant	1.00
Production Co-ordinator/Foreman	6.00
Production Engineer	4.00
Production Managers Assistant	1.00
Production Operations Superintendent	1.00
Production Supervisor	1.00
Production Systems Lead	1.00
Production Technician	12.00
Programmatics Lead	1.00
Project Engineer	10.00
Project Manager	15.00
Public Relations Advisor	3.50
QA Inspector	1.00
QA Manager	1.00
QC Inspector	1.00
QHSE Advisor	8.00
QHSE Coordinator / Advisor	20.00
QHSE Coordinator	5.00
QMS Coordinator	4.00
Quality Control Emersion Suits/Security	1.00
Quality Technician	1.00
Radio Operator	14.00
Radio Operator (Onshore)	5.00
Radio Operator Supervisor	1.00
Receiver/Shipper	4.00
Reservoir Engineer	12.00
Reservoir Manager	2.00
Reservoir Technologist	1.00
Rig Engineer	1.00
Rig Manager/Toolpusher	5.00
Rig Superintendent	1.00
Roughneck/Floorhand	30.00
Roustabout	32.00
ROV Electrical Technician	12.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Occupation	Current Number Employed in Occupation
ROV Mechanical Technician	12.00
ROV Supervisor	11.00
Safety Health and Environment Lead (onshore)	1.00
Safety Training Coordinator	4.00
Sales	4.00
SAP PM Administrator	1.00
Scaffolder/Rigger	10.00
Scheduler (ships)	4.00
Second Engineer	28.00
Second Mate	29.00
Security Officer	4.00
Security/Cargo	2.00
Seismic Survey Engineer	5.00
Senior Technical Manager	13.00
Service Tools Specialist	1.00
Ships Clerk	6.00
Shop Foreman	4.00
Slickline Operator	2.00
Slickline Specialist	2.00
Slickline Supervisor	3.00
Software Developer	4.00
Solids Control Technician	12.00
Steelworker	5.00
Stevedore	10.00
Steward	48.00
Storeskeeper	6.00
Storeskeeper (Onshore)	2.00
Structural and Mooring Engineer	1.00
Structural Designer	1.00
Structural Engineer	1.00
Structural/Facilities Engineer	5.00
Subsea Construction Engineer	1.00
Subsea Engineer	7.00
Subsea Lead	1.00

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Occupation	Current Number Employed in Occupation
Superintendent Vessels	2.00
Supervisor/Foreman Fabrication	3.00
Surveillance Engineer	2.00
Surveyor Technologist	13.50
Tax Advisor	1.00
TCP (Tubing Conveyed Perforating)	1.00
Technical Clerk	3.00
Technical Manager (P. Eng.)	1.00
Technical Services Manager	1.00
Telecommunications Engineer	1.00
Telecommunications Engineer Manager	1.00
Telecommunications Manager	1.00
Telecommunications Specialist	8.00
Terminal Manager	1.00
Third Engineer	8.00
Third Mate	6.00
Thread Inspector	27.00
Toolpusher	4.00
Traffic Office Agent	2.00
Training Administrator	2.00
Transportation Clerk	1.00
Valve Technician	6.00
Vibration Specialist	1.00
Warehouse Coordinator	6.00
Warehouse Technician	21.00
Weather Forecaster	6.00
Weather/Ice Observer	16.00
Welder	22.00
Well Design Lead	1.00
Well Head Systems	8.00
Well Planning/Drilling Engineer	2.00
Well Services Supervisor	3.00
Well Testing Coordinator	1.00
Well Testing Engineer	1.00

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Occupation	Current Number Employed in Occupation
Well Testing Specialist	6.00
Wellbore Cleanout Tool Technician	5.00
Wellsite Data Management	1.00
Total	2,285.50

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Appendix G – Labour Demand Scenarios by Industry Sector

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
Project Operator/Owner	Applications Support	7.00	7.00	7.00						
	Asset Manager	1.00	1.00	1.00						
	Business Services Manager	1.00	1.00	1.00						
	Certification Engineer	1.00	1.00	1.00						
	Commercial Coordinator	4.00	4.00	4.00	5.00	5.00	5.00			
	Completions Engineer				2.00	3.00	4.00	2.00	2.00	3.00
	Construction Supervisor				2.00	4.00	6.00			
	Construction/Projects Lead				1.00	1.00	1.00			
	Controls Engineer				1.00	1.00	1.00			
	Corrosion Engineer	1.00	1.00	1.00	1.00	1.00	1.00			
	Document Control Clerks				5.00	5.00	5.00			
	Drilling Engineer				5.00	7.00	9.00	3.00	3.00	4.00
	Drilling Engineer Supervisor				1.00	1.00	1.00	1.00	1.00	1.00
	Drilling Manager				1.00	1.00	1.00	1.00	1.00	1.00
	Drilling Superintendent				1.00	1.00	1.00	1.00	1.00	1.00
	Drilling Technologist				2.00	4.00	6.00			
	Electrical Engineer	1.00	1.00	1.00	1.00	1.00	1.00			
	Facilities Engineering Supervisor				1.00	1.00	1.00			
	Facilities Lead	1.00	1.00	1.00						
	Facilities/Reliability Engineer	1.00	1.00	1.00						
	Financial Analyst	6.00	6.00	6.00						
	Geophysicist	3.00	4.00	5.00	3.00	4.00	5.00			
	Instrumentation Engineer	1.00	1.00	1.00	1.00	1.00	1.00			
	Instrumentation Technician				12.00	24.00	36.00			
	Insurance Advisor				1.00	1.00	1.00			
	Lifting & Transportation Co-ordinator	1.00	1.00	1.00						
	Loss Control Engineer	2.00	2.00	3.00						
	Machinery Engineer				1.00	1.00	1.00			
	Maintenance and Construction Manager				1.00	1.00	1.00			
	Maintenance Engineer	3.00	4.00	5.00	2.00	3.00	4.00			

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
	Maintenance Planning Advisor				2.00	4.00	6.00			
	Maintenance Supervisor				2.00	2.00	2.00			
	Maintenance Technician				1.00	2.00	3.00			
	Material Controller	2.00	3.00	4.00						
	Material Coordinator				5.00	8.00	11.00	1.00	2.00	3.00
	Mechanical Engineer	1.00	1.00	1.00						
	Mechanical Maintenance Engineer	2.00	3.00	4.00						
	Mechanical/Facility Engineer	1.00	1.00	1.00						
	Offshore Maintenance Lead	2.00	4.00	6.00						
	Offshore Production Lead	2.00	4.00	6.00						
	OIMS Advisor (Offshore)				2.00	4.00	6.00			
	OIMS Coordinator				1.00	1.00	1.00			
	Onshore Maintenance Lead	1.00	2.00	3.00						
	Onshore OIM	1.00	2.00	3.00						
	Onshore Production Lead	1.00	2.00	3.00						
	Onshore Vessel Lead	1.00	2.00	3.00						
	Operations Engineer	1.00	2.00	3.00						
	Petroleum Geologist	1.00	1.00	1.00	3.00	4.00	5.00	2.00	4.00	6.00
	Petrophysicist	3.00	3.00	3.00	1.00	1.00	2.00			
	Planning/Cost Analysis	1.00	1.00	1.00						
	Process Engineer	3.50	6.00	8.50	2.50	5.00	7.50			
	Production Accountant				1.00	2.00	2.00			
	Production Co-ordinator/Foreman	2.00	4.00	6.00	4.00	8.00	12.00			
	Production Engineer	3.00	3.00	3.00	1.00	1.00	1.00			
	Production Operations Superintendent				1.00	1.00	1.00			
	Production Supervisor				2.00	2.00	2.00			
	Production Systems Lead	1.00	1.00	1.00						
	Production Technician	12.00	24.00	36.00						
	Programmatics Lead				1.00	1.00	1.00			
	Reservoir Engineer	1.00	1.00	1.00	8.00	10.00	12.00	3.00	4.00	5.00
	Reservoir Manager	1.00	1.00	1.00	1.00	1.00	1.00			
	Reservoir Technologist				2.00	3.00	4.00			

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
	Safety Health and Environment Lead (onshore)				1.00	1.00	1.00			
	SAP PM Administrator	1.00	1.00	1.00						
	Structural and Mooring Engineer	1.00	1.00	1.00						
	Structural Engineer				1.00	1.00	1.00			
	Subsea Engineer	4.00	5.00	6.00						
	Subsea Lead	1.00	1.00	1.00						
	Surveillance Engineer				2.00	3.00	4.00			
	Technical Services Manager	1.00	1.00	1.00						
	Training Administrator	1.00	1.00	1.00	1.00	1.00	1.00			
	Well Design Lead							1.00	1.00	1.00
	Well Services Supervisor				2.00	4.00	6.00	1.00	1.00	1.00
	Wellsite Data Management	1.00	1.00	1.00						
Well Services	Casing Running Specialist/Tubular Handling				8.00	12.00	16.00	8.00	12.00	16.00
	Cementing Bulk Plant Operator				1.00	1.00	1.00	1.00	1.00	1.00
	Cementing Engineer				1.00	1.00	2.00	1.00	1.00	2.00
	Cementing Manager				1.00	1.00	1.00	1.00	1.00	1.00
	Cementing Operator				1.00	2.00	3.00	1.00	1.00	2.00
	Cementing Service Supervisor				2.00	4.00	6.00	2.00	4.00	6.00
	Coil Tubing Engineer				4.00	8.00	12.00	1.00	1.00	1.00
	Coil Tubing Manager				1.00	1.00	1.00	1.00	1.00	1.00
	Coil Tubing Service Supervisor				5.00	10.00	15.00	0.60	1.00	2.00
	Coil Tubing Specialist				2.00	4.00	6.00	1.20	2.00	4.00
	Completions Coordinator				1.00	1.00	1.00	1.00	1.00	1.00
	Completions Engineer				1.00	1.00	1.00	1.00	1.00	1.00
	Completions Field Services Quality Coordinator							1.00	1.00	1.00
	Completions Manager				1.00	1.00	1.00	1.00	1.00	1.00
	Completions Operator				1.00	2.00	3.00	1.00	2.00	3.00
	Completions Specialist				1.00	2.00	3.00	1.00	2.00	3.00
	Completions Supervisor				2.00	3.00	4.00	1.00	2.00	3.00
Completions Tool Technician (onshore) (wellbore)				1.50	1.50	1.50	1.50	1.50	1.50	
Contracts Technician				1.00	1.00	1.00				
Directional Driller				4.00	8.00	12.00	4.00	8.00	12.00	

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
	Directional Drilling Supervisor				2.00	4.00	6.00	2.00	4.00	6.00
	Directional Drilling Technician				1.00	2.00	3.00	1.00	2.00	3.00
	Directional Drilling Manager				1.00	1.00	1.00	1.00	1.00	1.00
	Drill Bit Engineer				1.00	1.00	1.00	1.00	1.00	1.00
	Drilling Fluids Bulk Plant Operator				1.00	1.00	1.00	1.00	1.00	1.00
	Drilling Fluids Coordinator				1.00	1.00	1.00	1.00	1.00	1.00
	Drilling Fluids Engineer				1.00	1.00	1.00	1.00	1.00	1.00
	Drilling Fluids Laboratory Technician				1.00	1.00	1.00	1.00	1.00	1.00
	Drilling Fluids Supervisor				2.00	4.00	6.00	2.00	4.00	6.00
	Electric Wireline Engineer				8.00	16.00	24.00	2.00	4.00	6.00
	Electric Wireline Manager				1.00	1.00	1.00	1.00	1.00	1.00
	Electric Wireline Operator				8.00	16.00	24.00	4.00	8.00	12.00
	Electric Wireline Technician				4.00	8.00	12.00	4.00	8.00	12.00
	Fishing Tools and Services Supervisor				1.00	1.00	1.00	1.00	1.00	1.00
	Fishing Tools Shophand				1.00	1.00	1.00	1.00	1.00	1.00
	Fishing Tools Specialist				1.00	1.00	2.00	1.00	1.00	2.00
	Laboratory Technician				1.00	1.00	1.00	1.00	1.00	1.00
	Liner Hanger Coordinator				1.00	1.00	1.00	1.00	1.00	1.00
	Liner Hanger Tool Technician				1.00	1.00	2.00	1.00	1.00	2.00
	Mud Logging Sample Catcher				4.00	8.00	12.00	4.00	8.00	12.00
	Mudlogger				2.00	4.00	6.00	2.00	4.00	6.00
	Mudlogging Coordinator				1.00	1.00	1.00	1.00	1.00	1.00
	Mudlogging Data Engineer				2.00	4.00	6.00	2.00	4.00	6.00
	Mudlogging Inhouse Geology Support							1.00	1.00	1.00
	Mudlogging Technician				1.00	1.00	1.00	1.00	1.00	1.00
	MWD/LWD Manager				1.00	1.00	1.00	1.00	1.00	1.00
	MWD/LWD Specialist				4.00	8.00	12.00	4.00	8.00	12.00
	MWD/LWD Technician				2.00	4.00	6.00	1.00	1.00	2.00
	Nitrogen Operator/Technician				1.00	1.00	1.00	1.00	1.00	2.00
	Permanent Downhole Gauges Coordinator				1.00	1.00	1.00	1.00	1.00	1.00
	Permanent Downhole Gauges Technician				1.00	1.00	2.00	1.00	1.00	2.00
	Service Tools Specialist							1.00	2.00	2.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
	Slickline Operator				2.00	2.00	3.00	2.00	2.00	3.00
	Slickline Specialist				2.00	2.00	3.00	2.00	2.00	3.00
	Slickline Supervisor				2.00	2.00	3.00	2.00	2.00	3.00
	TCP (Tubing Conveyed Perforating)				1.00	1.00	2.00	1.00	1.00	2.00
	Warehouse Technician				1.00	1.00	1.00			
	Well Head Systems				4.00	6.00	8.00	4.00	6.00	8.00
	Well Planning/Drilling Engineer				1.00	1.00	2.00	1.00	1.00	2.00
	Well Testing Coordinator							1.00	1.00	1.00
	Well Testing Engineer							1.00	1.00	2.00
	Well Testing Specialist							6.00	12.00	18.00
	Wellbore Cleanout Tool Technician				2.00	2.00	2.00	2.00	2.00	2.00
Sub-Sea	Subsea Construction Engineer	1.00	1.00	1.00						
	Subsea Engineer							2.00	4.00	6.00
Marine Logistics and Transportation	Aircraft Technician	6.00	9.00	12.00	6.00	9.00	12.00			
	Assistant Passenger Movement Coordinator	0.50	0.50	0.50	0.50	0.50	0.50			
	Avionics Manager	0.50	0.50	0.50	0.50	0.50	0.50			
	Avionics Technician	1.00	1.00	1.00	1.00	1.00	1.00			
	Ballast Control Operator							4.00	8.00	12.00
	Base Engineer/Production Manager	0.50	1.50	1.50	0.50	0.50	0.50			
	Captain/Master	12.00	22.00	34.00	12.00	20.00	30.00	2.00	4.00	6.00
	Chief Engineer	12.00	22.00	34.00	12.00	20.00	30.00			
	Container Technician	0.50	0.50	0.50	0.50	0.50	0.50			
	Deck Hand	50.00	96.00	152.00	48.00	84.00	130.00			
	Dispatcher	0.50	0.50	0.50	0.50	0.50	0.50			
	Drivers	5.00	5.00	5.00	5.00	5.00	5.00			
	Emergency Response Technician	2.00	2.00	2.00	2.00	2.00	2.00			
	Engine Room Assistant (ERA)	10.00	26.00	42.00	18.00	34.00	50.00			
	Engine Room Cadet	4.00	12.00	20.00	8.00	16.00	24.00			
	First Mate	12.00	22.00	34.00	12.00	20.00	30.00	2.00	4.00	6.00
	Fourth Engineer	2.00	6.00	10.00	4.00	8.00	12.00			
	Helicopter Pilot	7.00	14.00	21.00	7.00	14.00	21.00			

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
	Logistics Lead/Coordinator	5.50	9.50	13.50	2.50	2.50	2.50			
	Marine Electrician	2.00	6.00	10.00	4.00	8.00	12.00			
	Marine Electrician Trainee	2.00	6.00	10.00	4.00	8.00	12.00			
	Navigation Cadet	4.00	12.00	20.00	8.00	16.00	24.00			
	Operations Assistant	0.50	1.50	1.50	0.50	0.50	0.50			
	Operations Clerk	1.00	1.00	1.00	1.00	1.00	1.00			
	Operations Coordinator/Supervisor	3.00	5.00	7.00	1.00	1.00	1.00			
	Passenger Check In Agent	2.00	4.00	5.00	2.00	3.00	5.00			
	Passenger Movement Coordinator	0.50	1.50	1.50	0.50	0.50	0.50			
	Production Managers Assistant	0.50	1.50	1.50	0.50	0.50	0.50			
	Quality Control Emersion Suits/Security	0.50	0.50	1.50	0.50	1.50	1.50			
	Second Engineer	10.00	20.00	32.00	10.00	18.00	28.00	2.00	4.00	6.00
	Second Mate	13.00	26.00	41.00	10.00	18.00	28.00			
	Security Officer	2.00	2.00	2.00	2.00	2.00	2.00			
	Security/Cargo	1.00	1.00	1.00	1.00	1.00	1.00			
	Ships Clerk	2.00	6.00	10.00	4.00	8.00	12.00			
	Stevedore	5.00	10.00	15.00	5.00	10.00	15.00			
	Storeskeeper (Onshore)	1.00	2.00	2.00	1.00	2.00	2.00			
	Superintendent Vessels	1.00	2.00	3.00	1.00	2.00	3.00			
	Third Engineer	2.00	6.00	10.00	4.00	8.00	12.00			
	Third Mate	2.00	6.00	10.00	4.00	8.00	12.00			
	Traffic Office Agent	1.00	2.00	3.00	1.00	2.00	3.00			
	Transportation Clerk	0.25	0.25	0.25	0.75	0.75	0.75			
Warehousing and Logistics	Crane Operator	1.00	1.00	1.00	1.00	1.00	1.00			
	Freight Forwarding Coordinator	1.00	1.00	1.00	1.00	1.00	1.00			
	Material Controller	2.00	2.00	2.00						
	Material Inspector	0.50	0.50	0.50	0.50	0.50	0.50			
	Material Technician	0.50	0.50	0.50	0.50	0.50	0.50			
	Pipeyard Technician	1.50	1.50	1.50	2.00	2.00	2.00	0.50	0.50	0.50
	Receiver/Shipper	2.00	2.00	2.00	2.00	2.00	2.00			
	Warehouse Coordinator	1.50	1.50	1.50	3.50	3.50	3.50	1.00	1.00	1.00
	Warehouse Technician	5.50	5.50	5.50	10.50	10.50	10.50	4.00	4.00	4.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
Catering/Accommodations	Catering/Accommodations Coordinator	2.00	4.00	6.00	2.00	4.00	6.00	2.00	4.00	6.00
	Chef	4.00	10.00	16.00	6.00	12.00	18.00	4.00	8.00	12.00
	Cook	8.00	14.00	22.00	12.00	22.00	34.00	4.00	8.00	12.00
	Steward	12.00	26.00	40.00	24.00	48.00	72.00	12.00	24.00	36.00
Offshore Operations, Maintenance and CAPEX	Deck/Material Movement Operative				4.00	8.00	12.00			
	Drilling Supervisor				8.00	16.00	24.00	4.00	8.00	12.00
	Electrical Technician	6.00	12.00	18.00	14.50	28.50	42.50	0.50	0.50	0.50
	Electrician (Offshore)				6.00	12.00	18.00	4.00	8.00	12.00
	Fabric Maintenance Engineer	0.50	0.50	0.50	0.50	0.50	0.50			
	Instrumentation/Electronics Technician	10.00	20.00	30.00	16.00	27.00	38.00	1.00	2.00	3.00
	Insulator				2.00	4.00	6.00			
	IT/Telecommunications Technician	2.50	5.00	7.50	4.00	8.00	12.00			
	Maintenance Foreman	0.50	0.50	0.50	7.50	13.50	19.50	2.00	4.00	6.00
	Maintenance Roustabout							2.00	4.00	6.00
	Material Movement Coordinator	2.00	2.00	2.00	5.00	10.00	15.00	6.00	12.00	18.00
	Mechanical Technician	7.00	14.00	21.00	28.00	51.00	74.00	1.00	2.00	3.00
	Medic/Offshore Nurse	2.00	4.00	6.00	2.00	4.00	6.00	2.00	4.00	6.00
	Offshore Crane Operator	2.00	4.00	6.00	8.00	16.00	24.00	4.00	8.00	12.00
	Offshore Installation Manager (OIM)	3.00	5.00	7.00	2.00	4.00	6.00	2.00	4.00	6.00
	Painter	2.00	4.00	6.00	3.00	6.00	9.00	8.00	16.00	24.00
	Panel Operator				10.00	20.00	30.00			
	Pipefitter	3.00	6.00	9.00	7.00	14.00	21.00	4.00	8.00	12.00
	Process/Field Operator	10.00	14.00	18.00	18.00	30.00	42.00			
	QHSE Coordinator / Advisor	9.90	11.30	13.70	9.10	10.70	13.30	1.00	1.00	1.00
	Radio Operator	2.00	4.00	6.00	4.00	8.00	12.00	4.00	8.00	12.00
	Radio Operator Supervisor	0.50	0.50	0.50	0.50	0.50	0.50			
	Scaffolder/Rigger				10.00	20.00	30.00			
Storeskeeper				6.00	12.00	18.00				
Telecommunications Manager	0.50	0.50	0.50	0.50	0.50	0.50				
Welder				5.00	5.00	5.00	7.00	9.00	11.00	
Electrical/Instrumentation	Electrical Engineer	1.00	1.00	1.00						

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
Personnel and Services	Maintenance Mechanic (Onshore)	0.70	0.70	0.70	0.70	0.70	0.70			
	Mechanical Engineer	4.00	4.00	4.00						
	Motor Specialist	1.50	1.50	1.50	1.50	1.50	1.50			
	Power Turbines Specialist	1.00	2.00	3.00						
	Shop Foreman	3.50	3.50	3.50	0.50	0.50	0.50			
	Vibration Specialist	0.60	1.20	1.80	0.40	0.80	1.20			
	Offshore/Marine Fabrication	HSE Manager	0.50	0.50	0.50	0.50	0.50	0.50		
Labourer		7.00	14.00	21.00	3.00	6.00	9.00			
Machinist		5.00	10.00	15.00	2.00	4.00	6.00			
Mechanical Engineer		1.00	2.00	3.00	1.00	2.00	3.00			
QA Inspector		0.50	0.50	0.50	0.50	0.50	0.50			
QA Manager		0.50	0.50	0.50	0.50	0.50	0.50			
QC Inspector		0.50	0.50	0.50	0.50	0.50	0.50			
Supervisor/Foreman Fabrication		1.50	1.50	1.50	1.50	1.50	1.50			
Engineering, Design and Fabrication		CAD/CIS Technician	4.75	8.50	12.25	3.65	7.30	10.95		
	Cost Control Engineer	1.00	2.00	3.00	1.00	2.00	3.00			
	Electrical Engineer	1.50	2.50	3.50	2.50	4.50	6.50			
	Electrician	2.50	4.50	6.50	1.50	2.50	3.50			
	Engineering Manager	0.50	0.50	0.50	0.50	0.50	0.50			
	Engineering Technologist/Technician	13.65	26.30	38.95	14.25	28.00	41.75	1.50	2.50	3.50
	Estimator	1.00	2.00	3.00	1.00	2.00	3.00			
	Implementation Coordinator				1.00	2.00	3.00			
	Implementation Technician	6.00	12.00	18.00	6.00	12.00	18.00			
	Instrumentation/Controls Engineer	8.00	9.50	10.50	5.00	6.50	7.50			
	Loss Control Engineer	1.00	2.00	3.00	1.00	2.00	3.00			
	Materials/Welding Engineer	1.50	3.00	3.50	2.50	3.00	4.50			
	Mechanical Engineer	7.00	14.00	20.00	3.00	4.00	6.00			
	Piping Designer	3.00	6.00	9.00	1.00	2.00	3.00			
	Piping Engineer	3.00	6.00	9.00	1.00	2.00	3.00			
Planner	2.50	5.00	7.50	1.50	3.00	4.50				

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
	Project Engineer	3.00	6.00	9.00	7.00	12.00	17.00			
	Project Manager	4.00	6.50	10.00	9.00	12.50	17.00	1.50	1.50	1.50
	Steelworker	3.00	6.00	9.00	2.00	4.00	6.00			
	Structural Designer	1.00	2.00	3.00						
	Structural/Facilities Engineer	2.50	5.00	7.50	2.50	5.00	7.50			
	Technical Clerk	1.50	2.50	3.50	1.50	2.50	3.50			
	Welder	7.00	14.00	21.00	3.00	6.00	9.00			
Environmental Consulting	Biologist (Fish Health)	2.00	3.00	4.00	2.00	3.00	4.00			
	Data Analyst	1.00	2.00	3.00	1.00	2.00	3.00			
	Electronic Technologist	7.90	14.90	21.90	4.10	8.10	12.10			
	Engineer - Acoustics	1.00	1.00	1.00						
	Environmental Project Manager	1.50	1.50	1.50	1.50	1.50	1.50			
	Environmental Technician	3.10	3.20	3.30	3.10	4.20	5.30	0.10	0.20	0.30
	Field Technologist	1.40	1.40	1.40						
	Ice Management Specialist/Tech	2.00	5.00	8.00		1.00	2.00			
	Laboratory Manager	0.50	0.50	0.50	0.50	0.50	0.50			
	Laboratory Technician	0.50	1.00	1.50	0.50	1.00	1.50	0.20	0.40	0.60
	Marine Biologist	0.75	1.50	2.25	0.75	1.50	2.25	0.20	0.40	0.60
	Physical Oceanographer	0.80	0.80	0.80	0.20	0.20	0.20			
	Senior Technical Manager	2.00	2.00	2.00						
	Weather Forecaster	3.00	6.00	8.00	3.00	5.00	7.00			
Specialty Services	Case Manager/Occupational Health Nurse	0.50	0.50	0.50	0.50	0.50	0.50			
	Coatings Inspector				1.00	2.00	3.00			
	Examining Physician	0.75	1.50	2.25	0.75	1.50	2.25			
	Geophysicist	1.50	3.00	4.50	0.50	1.00	1.50			
	Heavy Equipment Operator	1.50	2.50	4.00	1.50	2.50	4.00			
	Marine Geologist	2.50	5.00	7.50	1.50	3.00	4.50			
	Materials Handler	3.00	6.00	9.00	3.00	6.00	9.00			
	NDT Technician (part-time)							4.00	4.00	4.00
	NDT Technician	4.00	8.00	12.00	6.00	9.00	12.00			
	Occupational Medical Specialist	0.50	1.00	1.50	0.50	1.00	1.50			
	On-call Medevac MD	1.00	2.00	3.00	1.00	2.00	3.00	1.00	2.00	3.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
	On-call Medevac RN	2.00	4.00	6.00	2.00	4.00	6.00	2.00	4.00	6.00
	Pipeyard Manager	0.50	0.50	0.50	0.50	0.50	0.50			
	Quality Technician				0.50	0.50	0.50	0.50	0.50	0.50
	ROV Electrical Technician				0.12	0.24	0.36	2.00	4.00	6.00
	ROV Mechanical Technician				0.12	0.24	0.36	2.00	4.00	6.00
	ROV Supervisor				0.12	0.24	0.36	2.00	4.00	6.00
	Seismic Survey Engineer	3.00	6.00	9.00	2.00	4.00	6.00			
	Software Developer	3.50	4.00	4.50	0.50	1.00	1.50			
	Subsea Engineer	1.00	1.00	2.00	1.00	1.00	2.00			
	Surveyor Technologist	9.00	18.00	27.00	4.50	9.00	13.50			
	Technical Manager (P. Eng.)				0.50	0.50	0.50	0.50	0.50	0.50
	Thread Inspector	9.00	9.00	12.00	13.00	13.00	16.00	2.00	4.00	6.00
	Valve Technician	5.00	5.00	5.00	1.00	2.00	3.00	1.00	2.00	3.00
	Weather/Ice Observer	3.00	5.00	7.00	5.00	9.00	13.00	2.00	4.00	6.00
Industrial Product Suppliers	Hosefitter	1.00	1.00	1.00	1.00	1.00	1.00			
	Lifting Equipment Technicians	2.00	2.00	3.00	2.00	2.00	3.00			
	Sales	2.50	2.50	2.50	1.50	1.50	1.50			
Drilling/Well Development	Able Bodied Seaman	1.00	2.00	3.00				2.00	4.00	6.00
	Assistant Ballast Control Operator							2.00	4.00	6.00
	Assistant Derrickman				8.00	16.00	24.00			
	Assistant Driller				8.00	16.00	24.00	4.00	8.00	12.00
	Assistant Rig Manager/Asst Toolpusher				4.00	8.00	12.00	1.00	1.00	1.00
	Assistant Subsea Supervisor							2.00	4.00	6.00
	Derrickman				8.00	16.00	24.00	4.00	8.00	12.00
	Driller				8.00	16.00	24.00	4.00	8.00	12.00
	Drilling Maintenance Coordinator				2.00	4.00	6.00			
	Electrical/Instrumentation Lead				2.00	4.00	6.00	2.00	4.00	6.00
	Instrumentation Technician							2.00	4.00	6.00
	Maintenance and Operations Advisor				1.00	1.00	1.00			
	Maintenance Electrician							6.00	12.00	18.00
	Maintenance Mechanic				1.00	1.00	1.00	8.00	16.00	24.00

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
	Maintenance Planner				1.00	1.00	1.00			
	Mechanic							2.00	4.00	6.00
	Mechanical System Supervisor				2.00	4.00	6.00			
	Platform Service Supervisor				1.00	2.00	3.00			
	QHSE Coordinator	2.00	4.00	6.00	2.00	4.00	6.00	1.00	2.00	3.00
	Rig Engineer							1.00	2.00	3.00
	Rig Manager/Toolpusher				4.00	8.00	12.00	1.00	2.00	3.00
	Rig Superintendent				1.00	1.00	1.00			
	Roughneck/Floorhand				16.00	32.00	48.00	14.00	28.00	42.00
	Roustabout				16.00	32.00	48.00	16.00	32.00	48.00
	Safety Training Coordinator				2.00	4.00	6.00	2.00	4.00	6.00
	Solids Control Technician				8.00	16.00	24.00	4.00	8.00	12.00
	Toolpusher							4.00	8.00	12.00
Onshore Support	Accounting Advisor	0.50	0.50	0.50	0.50	0.50	0.50			
	Accounting Support	13.50	13.50	13.50	17.50	17.50	17.50	1.00	2.00	3.00
	Administration Support	27.50	27.50	27.50	39.50	39.50	39.50	1.00	1.00	1.00
	Business Analyst	2.00	3.00	4.00	9.00	12.00	15.00			
	Business Development (Proposals)	0.75	0.75	0.75	0.75	0.75	0.75			
	Business Manager	2.25	2.25	2.25	2.25	2.25	2.25			
	Buyer/Expeditor	14.50	18.50	21.50	10.50	13.50	16.50			
	Document Control Coordinator	8.50	9.50	10.50	4.50	5.50	6.50			
	Emergency Response Coordinator	1.50	1.50	1.50	1.50	1.50	1.50			
	Finance/Accounting Manager	12.60	12.60	12.60	12.60	12.60	12.60	1.00	1.00	1.00
	Flight Followers	1.00	1.00	1.00	1.00	1.00	1.00			
	Human Resources Manager	7.50	7.50	7.50	8.50	8.50	8.50	1.00	1.00	1.00
	Human Resources Support	6.00	6.00	6.00	5.00	5.00	5.00	1.00	2.00	3.00
	Information Technology Analyst	9.30	9.30	9.30	13.70	13.70	13.70			
	Information Technology Manager	5.00	5.00	5.00	4.00	4.00	4.00			
	Internal Auditor	0.50	0.50	0.50	1.50	1.50	1.50			
	Maintenance (Instrument/Electrical/Mechanical Technician)	1.50	1.50	1.50	1.50	1.50	1.50			
	Network Operations	1.00	1.00	1.00	1.00	1.00	1.00			

Labour Market Assessment of the Oil and Gas Industry Supply and Service Sector in Newfoundland and Labrador

Sector Description	Job Description	1 FPSO	2 FPSO	3 FPSO	1 FPP	2 FPP	3 FPP	1 SS	2 SS	3 SS
	Operations Manager	5.50	5.50	5.50	8.50	8.50	8.50	2.50	2.50	2.50
	President/General Manager	4.00	4.00	4.00	6.00	6.00	6.00	1.00	1.00	1.00
	Procurement & Contracts Manager	6.50	7.50	8.50	6.50	7.50	8.50			
	Public Relations Advisor	1.50	1.50	1.50	2.00	2.00	2.00			
	QHSE Advisor	8.00	8.00	8.00						
	QMS Coordinator	1.50	1.50	1.50	1.50	1.50	1.50	0.50	0.50	0.50
	Radio Operator (Onshore)	2.50	2.50	2.50	2.50	2.50	2.50			
	Scheduler (ships)	3.00	5.00	7.00	1.00	1.00	1.00			
	Senior Technical Manager	6.00	6.00	6.00	5.00	5.00	5.00			
	Tax Advisor				1.00	1.00	1.00			
	Telecommunications Engineer	0.50	0.50	0.50	0.50	0.50	0.50			
	Telecommunications Engineer Manager	0.50	0.50	0.50	0.50	0.50	0.50			
	Telecommunications Specialist	5.50	5.50	5.50	2.50	2.50	2.50			
	Terminal Manager	0.25	0.25	0.25	0.75	0.75	0.75			
	Total	736.20	1,164.20	1,613.20	1,081.66	1,731.02	2,419.38	322.80	555.50	804.00