

The background features a stylized landscape with a white sun partially obscured by a blue and orange circular frame. Below the sun are several layers of blue and orange curved bands representing hills or mountains. The overall design is modern and professional.

# Assessment of Newfoundland & Labrador Fabrication Facilities and Labour Capability to Develop the Husky Expansion Project

Addendum to Main Report

October, 2007

Prepared For: Husky Oil Operations  
White Rose Field Development Project Team

Prepared By: Production Services Network Canada Inc.

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Prepared for:

Husky Oil Operations Limited  
White Rose Field Development Project Team

Prepared by:

Production Services Network Canada Inc.

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D1	October 16, 2007	Issued to Client
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## Confidentiality Statement

This Addendum report is considered private and confidential by Husky Oil Operations Limited and its partners in the *White Rose* expansion project. The industry information and labour data contained in the report are derived from various sources and estimates from the Proponents. The Proponents believe that the data and information are generally indicative of market conditions at the time of issuing this report. Information contained in this report is subject to change.

This report presents a broad discussion of fabrication capabilities and the associated labour capacity in Newfoundland and Labrador. The report is based on conceptual information provided by Husky Oil Operations Ltd. that is preliminary in nature and subject to change pending further engineering, design and project definition. Husky Oil Operations does not endorse or recommend any commercial services identified in this report. The views and opinions expressed by the authors of this report do not necessarily reflect those of Husky Oil Operations Ltd.

## Executive Summary

Following submission of the report "Assessment of Newfoundland and Labrador Fabrication Facilities and Labour Capability to Develop the Husky Expansion Project," the feedback from Husky Oil Operations Limited was that although the report contained comprehensive data, it did not make reference to the National Occupational Classification codes, (NOC codes) which is a requirement of the CNLOPB.

To address this issue we have engaged the services of an independent consultancy company who have developed a labour resource availability model, using the latest available census information, NOC codes, demographic trend adjustments, new journeypersons and graduates coming into the industry plus various other factors. This model is currently being used for a number of major projects in the province which are currently under evaluation to determine resource availability.

The output from this evaluation when reviewed in conjunction with the original report highlights that while there are adequate skilled resources within the province to execute the Husky Expansion scope of work, there is a greater need to monitor other major projects occurring within the same timeframe that are also competing for the same labour force.

As with all labour availability studies there is a large element of subjectivity and at best the data provides an indication only as to the potential resources that will be available.

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## Appendices

Appendix A Labour Supply Capacity

## 1.0 Introduction

PSN Canada is pleased to present the Addendum to the report "Assessment of Newfoundland & Labrador Fabrication Facilities and Labour Capability to Develop the Husky Expansion Project" which was submitted on 25<sup>th</sup> July 2007.

As part of the above report we presented our assessment of labour capability based on information from the sources listed below:

- Union list totals from the Newfoundland and Labrador Building and Construction Trades Council (NLBCTC).
- Union list totals for the Canadian Auto Workers (CAW) at the Kiewit Offshore Services facility.
- Survey responses from fabricators and facilities. Note that where fabricators and facilities are unionized, the labour numbers have not been included in the totals, since in most cases they are already included in the NLBCTC numbers.

To account for a shift in workforce from NL to the Alberta labour market, the numbers received from the NLBCTC and the CAW have been factored by 0.8 to account for the expected 80% return of skilled labour to the province for one or more major projects. This factor has been derived based on the Study Team's knowledge of the local labour force and has been borne out by the response to labour demands for recent works at the Kiewit Offshore Services facilities in Marystown. On reflection this percentage may be deemed to be optimistic, as companies in Alberta are looking towards a 3 week on 3 week off rotation to attract construction personnel from provinces such as Newfoundland and Labrador.

Following submission of the report it was highlighted that as part of the application to the CNLOPB, the labour capability analysis must make reference to the National Occupational Classification codes for individual disciplines.

To address this issue we have engaged the services of an independent consultancy company who specialize in this area. The company has developed a labour resource availability model for the province of Newfoundland and Labrador. It is based on the latest available census data, NOC codes, demographic trend adjustments, new journeypersons and graduates coming into the industry and various factors such as mobility, and experience. This model is currently being used for other major projects within the province for a number of clients.

### 1.1 Study Objective

The objective of this addendum is to allocate NOC codes to the disciplines identified as being required to execute the project scope, input the project labour demand data into the model to assess the labour supply versus project labour demands and take cognisance of other simultaneous projects within the province.

## 2.0 Labour Capacity Analysis

### 2.1 Labour Demand

Notional data for the study was provided by Husky Oil Operations Ltd. and reviewed by the study team. Labour demand data includes estimates of person hours required for Module Fabrication, Module Integration, FPSO Modifications, Operations & Maintenance Turnaround activities, Commissioning, and Subsea Production System fabrication. In the case of topsides module fabrication, a maximum of 2000 tonnes of module fabrication was used to develop labour requirements by trade. Labour totals by project component are shown in Table 2-1.

Table 2-1 Estimated Trades Demand by Project Component (Direct Person Hours)

Project Component	Hours
Module Fabrication	599,000
Integration	156,000
Topsides Modifications	90,000
Operations and Maintenance Turnaround Scope	100,000
Commissioning	72,000
Subsea Fabrication	153,000
Subsea Commissioning	25,000
Total (Person hours)	1,195,000



## National Occupational Classification Code Matching

The labour demand for trades was broken down into specific trades and/or disciplines which were matched up with the appropriate National Occupational Classification (NOC) code as shown in Table 2-2 below:

Table 2-2 Disciplines and Associated National Occupational Classification Codes

Disciplines	NOC Codes	Description
Structural	7263	H323 Structural metal and platework fabricators and fitters
	7264	H342 Ironworkers
	7265	H326 Welders and related machine operators
Piping	7252	H112 Steamfitters, pipefitters and sprinkler system installers
	7253	H113 Gas fitters
	7265	H326 Welders and related machine operators
Electrical	7241	H211 Electricians (except industrial and power systems)
	7242	H212 Industrial electricians
	7243	H213 Power system electricians
	7333	H433 Electrical mechanics
Instrumentation	2241	C141 Electrical and electronics engineering technologists and technicians
	2243	C143 Industrial instrument technicians and mechanics
Mechanical	7262	H322 Boilermakers
	7311	H411 Construction millwrights and industrial mechanics (except textile)
	7316	H416 Machine fitters
HVAC	7261	H321 Sheet metal workers
Architectural	7271	H121 Carpenters
	7293	H143 Insulators
	7263	H323 Structural metal and platework fabricators and fitters
	7264	H342 Ironworkers
Coatings	9496	HJ226 painters and coaters, industrial
Insulation	7293	H143 Insulators

Labour demand histograms are shown in Figures 2-1 to 2-11 below.

Figure 2-1 Labour Demand by Project Component

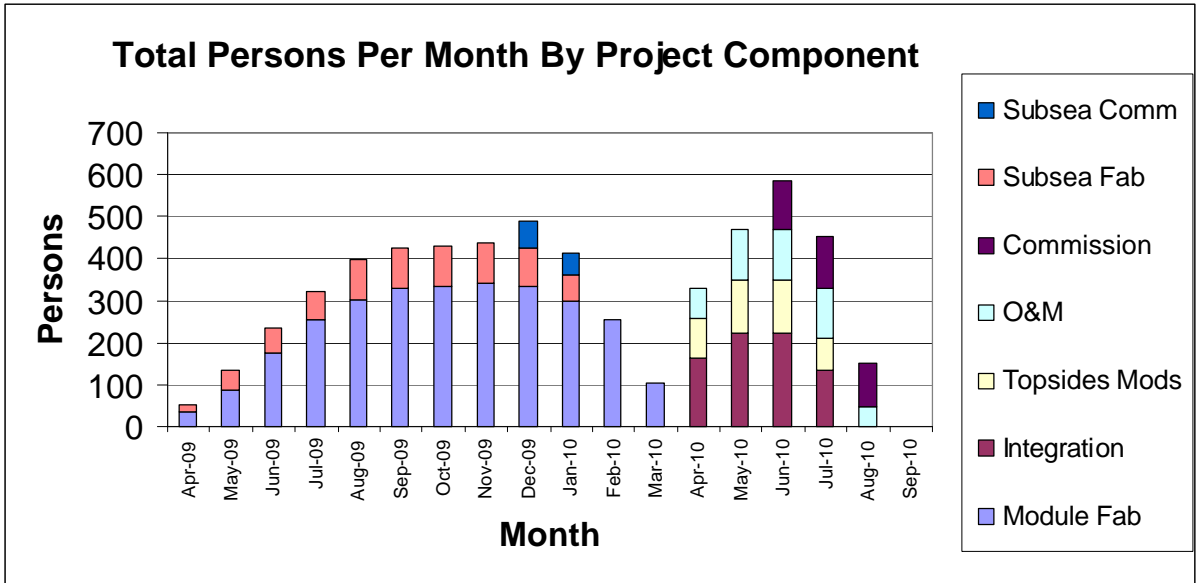


Figure 2-2 Labour Demand by Trade

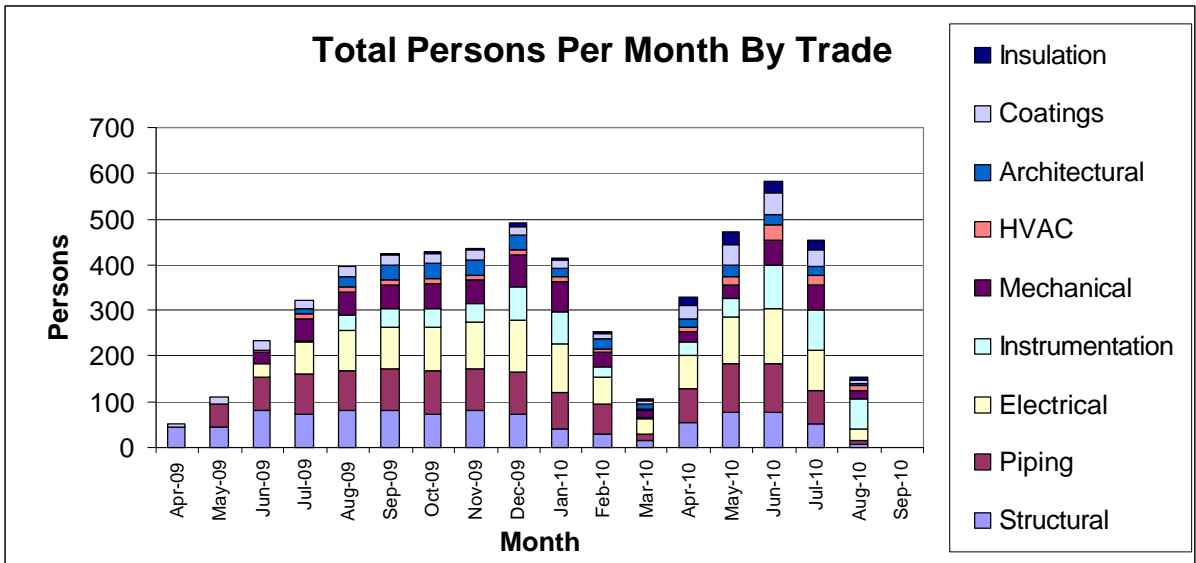


Figure 2-3 Labour Demand – Structural Trade

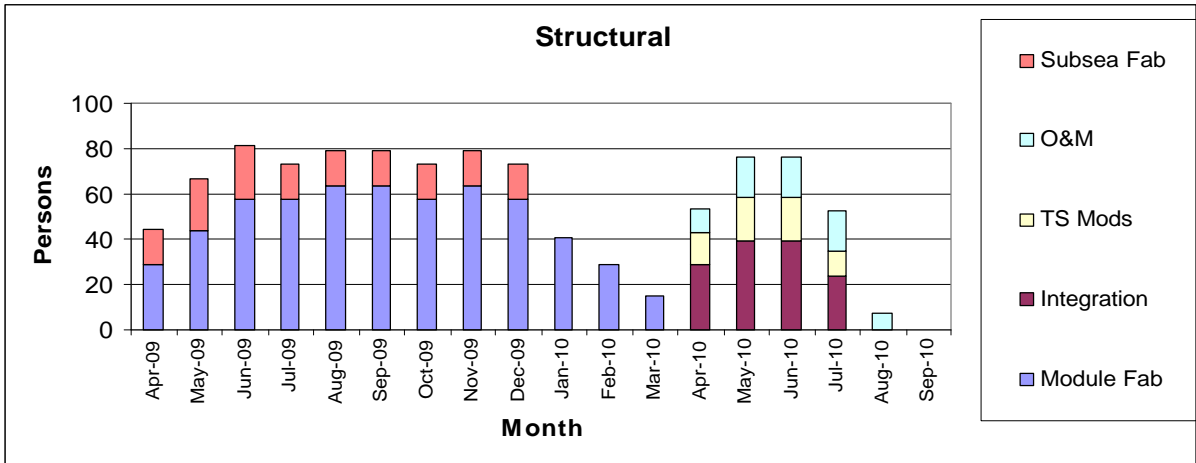


Figure 2-4 Labour Demand – Piping Trade

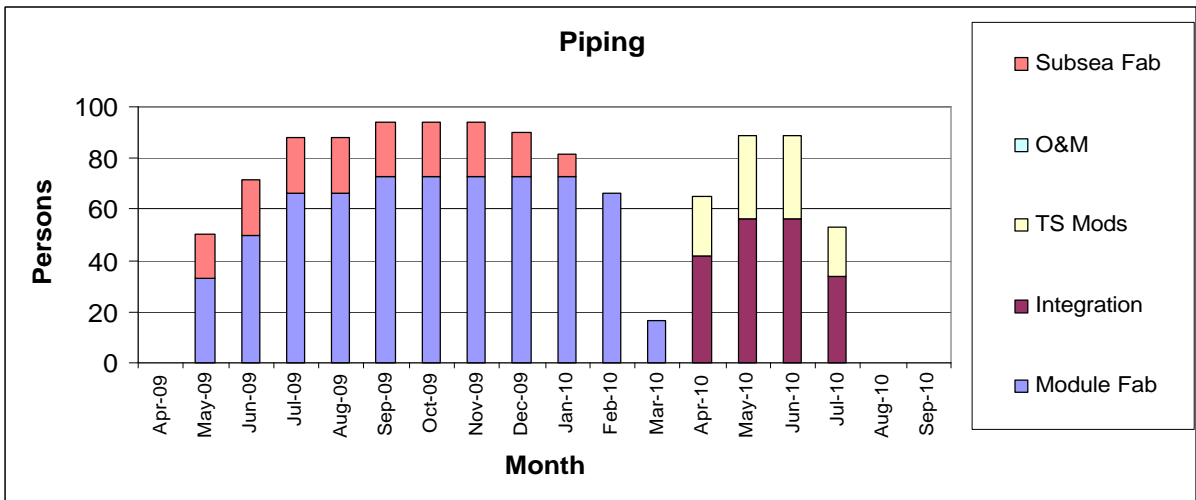


Figure 2-5 Labour Demand – Electrical Trade

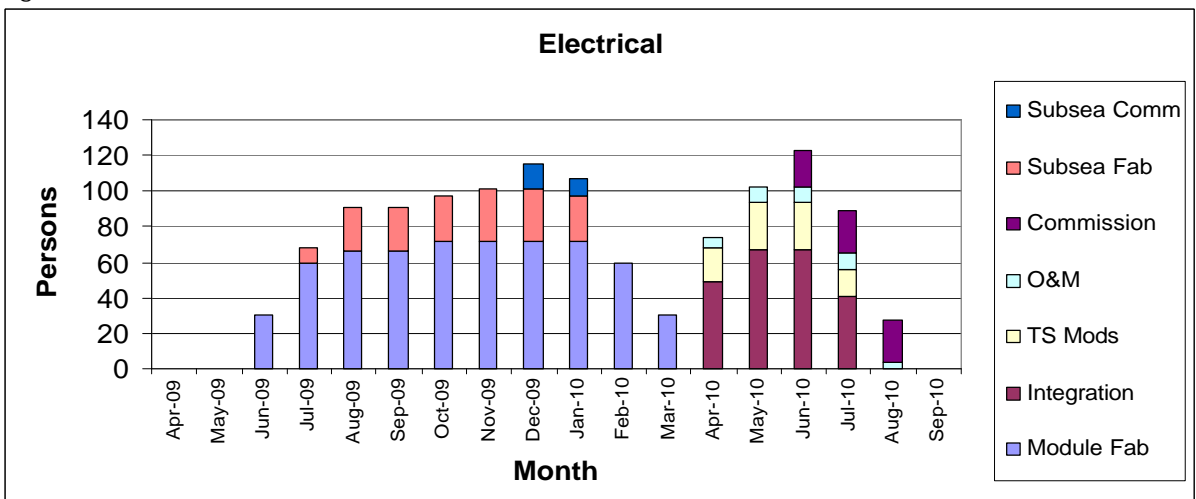


Figure 2-6 Labour Demand – Instrumentation Trade

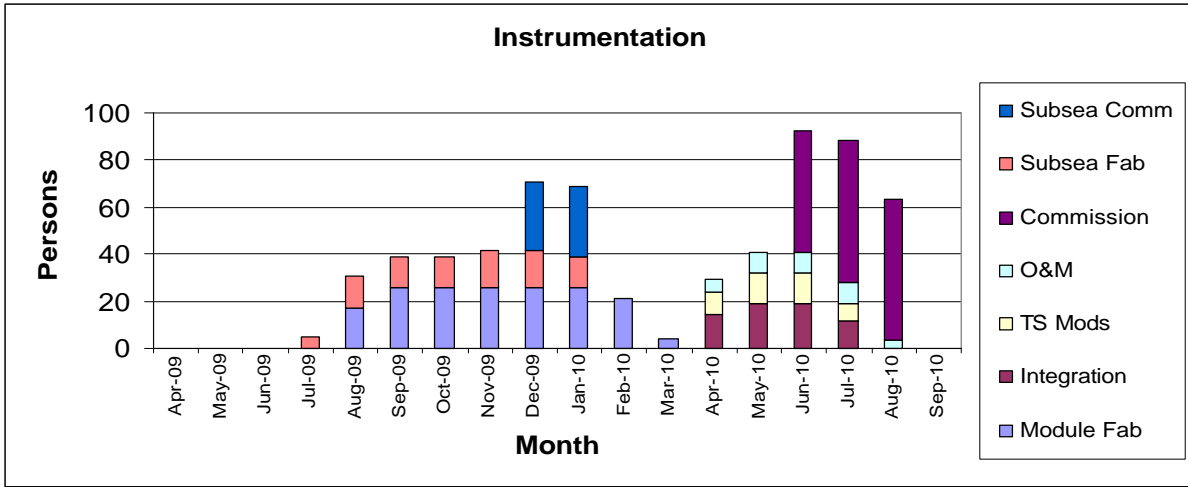


Figure 2-7 Labour Demand – Mechanical Trade

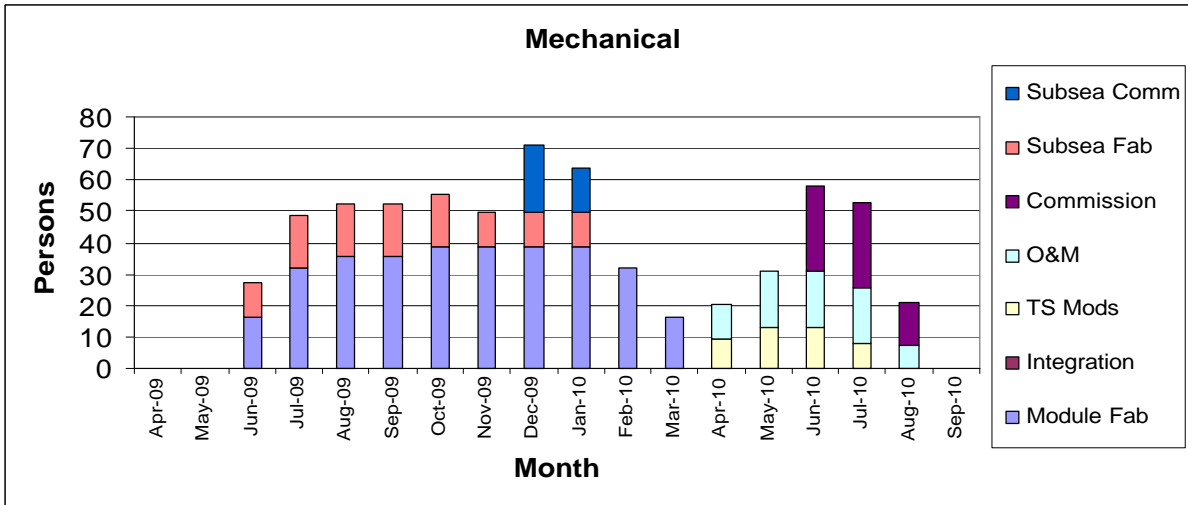


Figure 2-8 Labour Demand – HVAC Trade

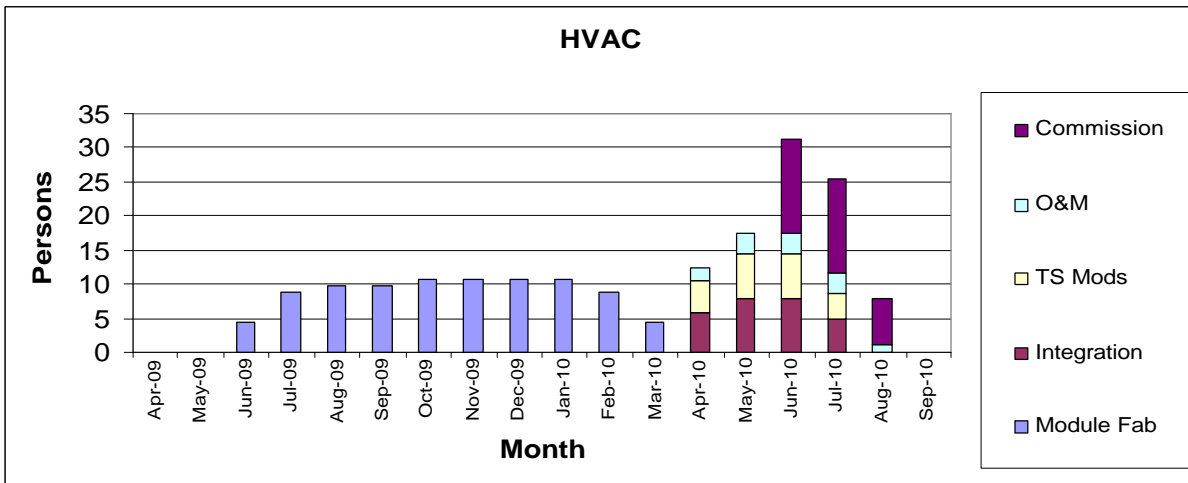


Figure 2-9 Labour Demand – Architectural Trade

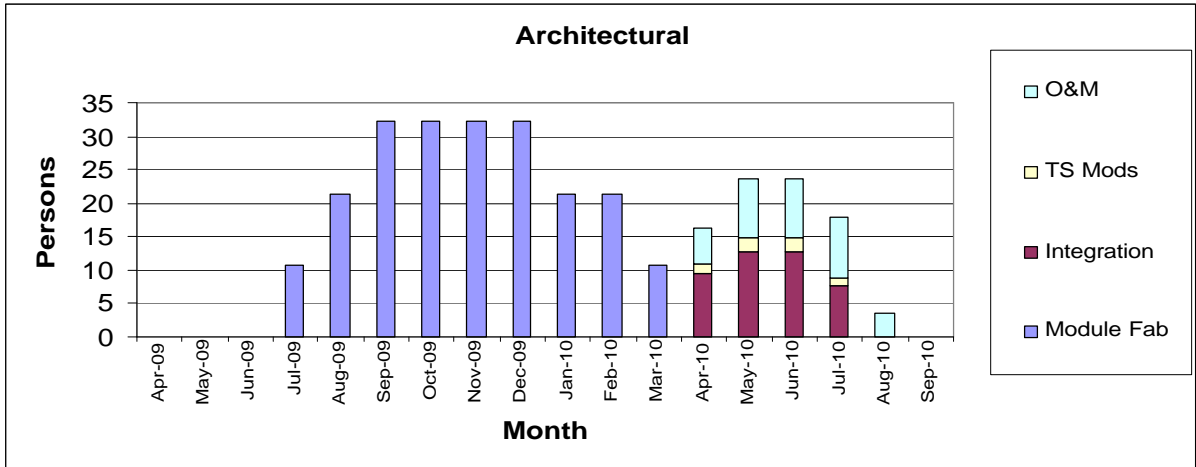


Figure 2-10 Labour Demand – Coatings Trade

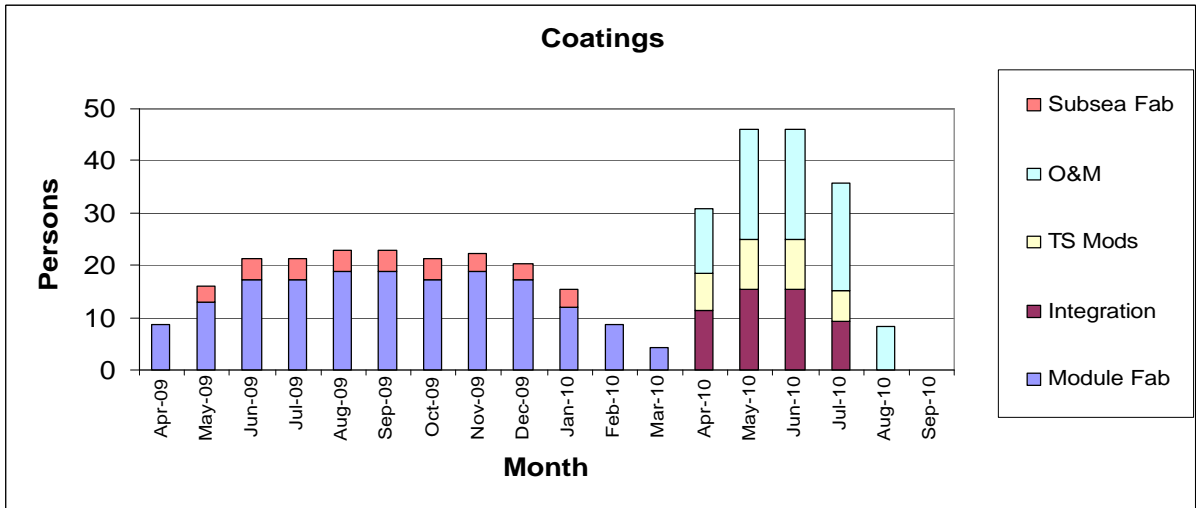
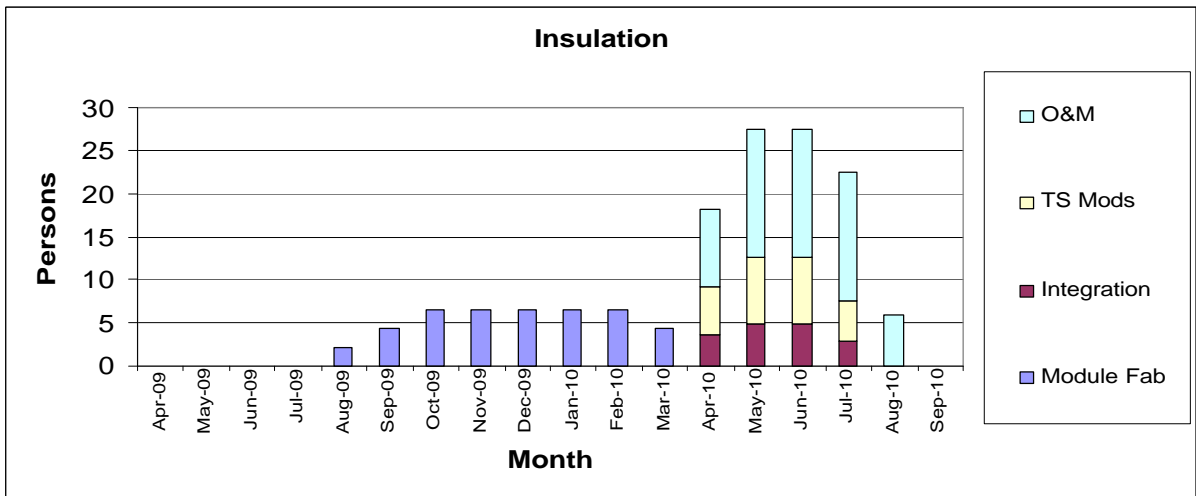


Figure 2-11 Labour Demand – Insulation Trade



## 2.2 Labour Supply

### Data Sources - Labour Supply

The sources of information used in this study to profile the Newfoundland and Labrador labour force and the broader labour market conditions in the construction industry included the following:

- Statistics Canada, Census of Canada 2001, 1996 and 1991
- Statistics Canada, Labour Force Survey
- Statistics Canada, Survey of Earnings, Payrolls and Hours (SEPH)
- "Career Search 2000" and "Career Search 2004" Government of Newfoundland and Labrador, Department of Education Post-Secondary Graduate Follow-up Surveys
- "The Apprenticeship Experience: 2003 Survey Of Registered Apprentices Of Newfoundland And Labrador", Government of Newfoundland and Labrador
- "Alberta Construction Workforce Supply/Demand Forecast", Construction Owners Association of Alberta (COAA)
- "Future Labour Supplies for Canada's Construction Industry", Construction Sector Council (CSC)
- "Construction Looking Forward – Labour Requirements from 2006 to 2014 for Atlantic Canada", CSC
- "Alberta's Labour Shortage: Just the Tip of the Iceberg", Conference Board of Canada

### Supply-Side Methodology

Using the labour supply information obtained from the sources identified above, the Newfoundland and Labrador labour force was profiled with particular reference to the types of skills required by the Project under consideration. This labour force data was then adjusted by a number of factors to determine an effective available labour capacity. The adjustments include:

- Demographic trend adjustment, to estimate how the base 2001 data may look during the time period of the project under consideration based on the age profile of the 2001 population;
- New graduate adjustment, to account for the addition of new graduates to the labour force;
- Newly certified journeypersons adjustment, to account for the addition of new journeypersons to the labour force;
- Retirement adjustment, to account for the reduction in the labour force from retirements;
- Out-migration adjustment, to account for interprovincial migration;
- Mobility factor, to adjust for the extent to which the labour force is mobile; and
- Experience adjustment, to account for those positions where specialized skills may be required and to adjust for NOC codes which may contain some cross-skilled workers.

Table 2-3 below describes the applied factors and illustrates the methodology used for the effective capacity analysis.

Table 2-3 Effective Labour Supply Methodology

Factor	Description	Source
Base	Number of persons identified in the 2001 Census as being in the occupation identified (either employed or unemployed)	Statistics Canada 2001 Census
Demographic trend adjustment	Adjustment made to 2001 Census data by age and occupation	2001 data by age group is used to estimate the age profile for 2009
New graduates	Adjustment to labour force by adding in new graduates from 2001-05	Career Search Survey, and statistics provided by Dept of Education
New journeypersons	Adjustment to labour force by adding in newly certified journeypersons from 2001-05	Career Search Survey, Apprentice Experience Survey, CSC report, and statistics provided by Dept of Education
Retirements	Adjustment made for early retirements Retirements from the 55-64 age group calculated in demographic trend adjustment	1991, 1996 and 2001 Census
Net interprovincial migration	Adjustment to account for net interprovincial migration Assumes net out-migration occurs in same proportion among all occupations	Statistics Canada population estimates (2001-05)
Adjusted Base	Adjusted base number to replace 2001 total with an estimate for 2006.	Calculated
Mobility Factor	Estimated number of persons that are mobile and potentially able to work on the Project. Uses employment by industry to estimate how many persons in each NOC code are mobile.	2001 Census – Employment by industry and occupation
Mobile Workforce	Adjusted base times Mobility Factor	Calculated based on employment by industry for each NOC code.
Lack of Experience Factor	Estimated % of sub-total workforce that do not have the requisite skills for the Project.	Estimated based on Study Team's experience and knowledge of project requirements
Effective Capacity	Total workforce having taken into account the above factors	Calculated

### 2.3 Labour Capacity Analysis Summary

For each trade discipline required for project execution the Effective Capacity was calculated using the factors detailed in Table 2-3 and is presented as Appendix A. A summary of labour supply capacity for all trades is presented as Tables 2-4 below:

Note:

In the situation where a particular NOC code relates to a trade discipline which covers more than one discipline an assessment was made based on trade skills, knowledge and experience and the overall number allocated accordingly. An example of this being NOC code 7265 which was allocated as follows:

NOC code 7265 H326 Welders and related machine operators

Structural            Actual Census total 1296    Effective Capacity 406

Piping                Actual Census total 229      Effective Capacity 65

Table 2-4 Effective Labour Supply Capacity

Discipline/Trade	Structural				Total
NOC Codes	7263	7264	7265		
2001 Census Totals	55	210	1,296		1,561
Effective Capacity	36	85	406		527
Discipline/Trade	Piping				Total
NOC Codes	7252	7253	7265		
2001 Census Totals	600	15	229		844
Effective Capacity	324	14	65		404
Discipline/Trade	Electrical				Total
NOC Codes	7241	7242	7243	7333	
2001 Census Totals	950	575	30	50	1,605
Effective Capacity	420	195	12	20	647
Discipline/Trade	Instrumentation				Total
NOC Codes	2241	2243			
2001 Census Totals	270	140			410
Effective Capacity	130	74			204
Discipline/Trade	Mechanical				Total
NOC Codes	7262	7311	7316		
2001 Census Totals	180	920	35		1,135
Effective Capacity	77	226	7		310
Discipline/Trade	HVAC				Total
NOC Codes	7261				
2001 Census Totals	265				265
Effective Capacity	93				93
Discipline/Trade	Architecture				Total
NOC Codes	7271	7293	7263	7264	
2001 Census Totals	3975	93	55	210	4333
Effective Capacity	1635	48	55	32	1769



Discipline/Trade	Coatings				
NOC Codes	9496				Total
2001 Census Totals	155				155
Effective Capacity	54				54
Discipline/Trade	Insulation				
NOC Codes	7293				Total
2001 Census Totals	185				185
Effective Capacity	62				62

As with the main report, the Effective Capacity Supply number for each trade discipline has been plotted against the project demand to determine whether there are sufficient resources to execute the project scope. Each trade discipline is summarized in terms of what the demand/supply analysis indicates, especially with respect to any major gaps in the NL labour force.

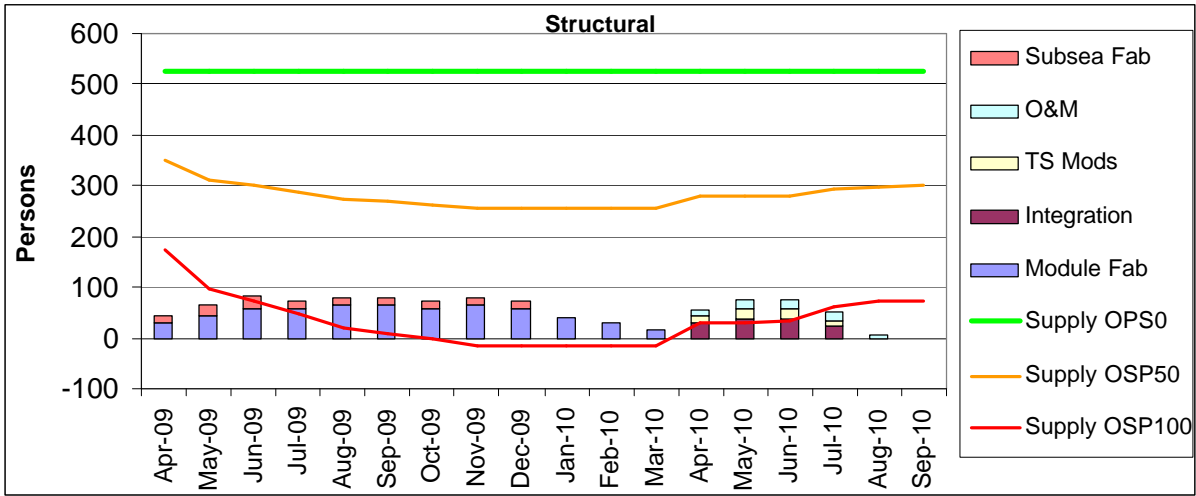
In addition to the Husky Expansion Project scope, the other simultaneous projects were also incorporated to provide an overall indication of resource availability.

For each trade, three labour supply levels have been developed:

- Supply OSP0  
Supply level with no other simultaneous projects occurring at the same time as the White Rose Expansion Project. This level is plotted as a green line on the histograms below and is labelled "Supply OSP0".
- Supply OSP100  
Supply level with all other simultaneous projects occurring at the same time as the White Rose Expansion Project. This level is equal to the Supply OSP0 level minus the demand from the other simultaneous projects. This level is plotted as a red line on the histograms below and is labelled "Supply OSP100".
- Supply OSP50  
Supply level with a labour demand, for other simultaneous projects, of 50% of the Supply OSP100 level. This level is plotted as an orange line on the histograms below and is labelled "Supply OSP50".

The labour supply and demand for each trade discipline is presented in Figures 2-12 to 2-20 overleaf:

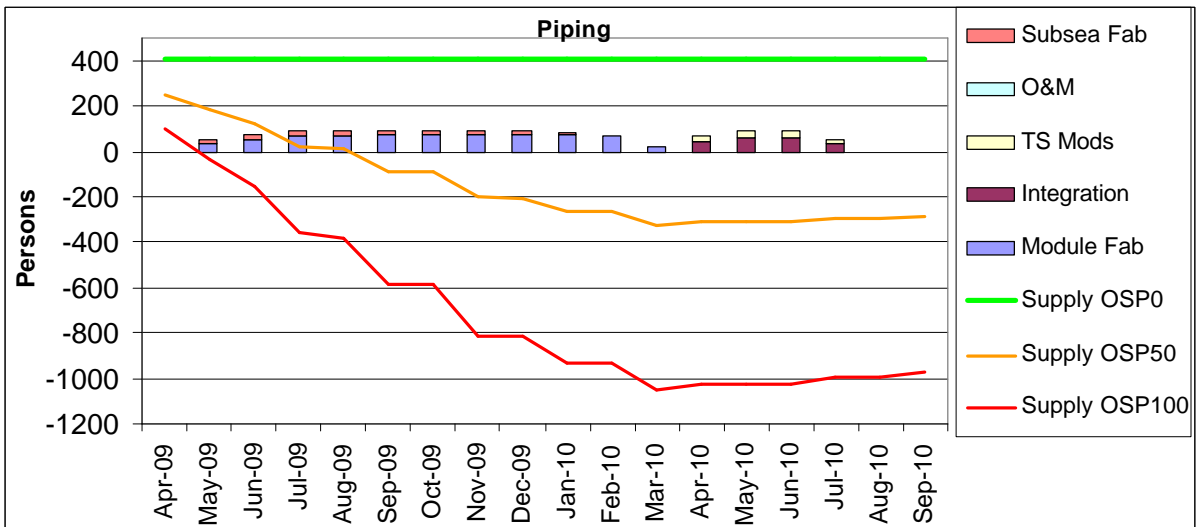
Figure 2-12 Labour Supply/Demand – Structural Trade



Peak project demand for Structural is 81 tradespersons.

There are not expected to be any shortfalls under the OSP0 or OSP50 cases, however the OSP100 case shows a resource shortfall.

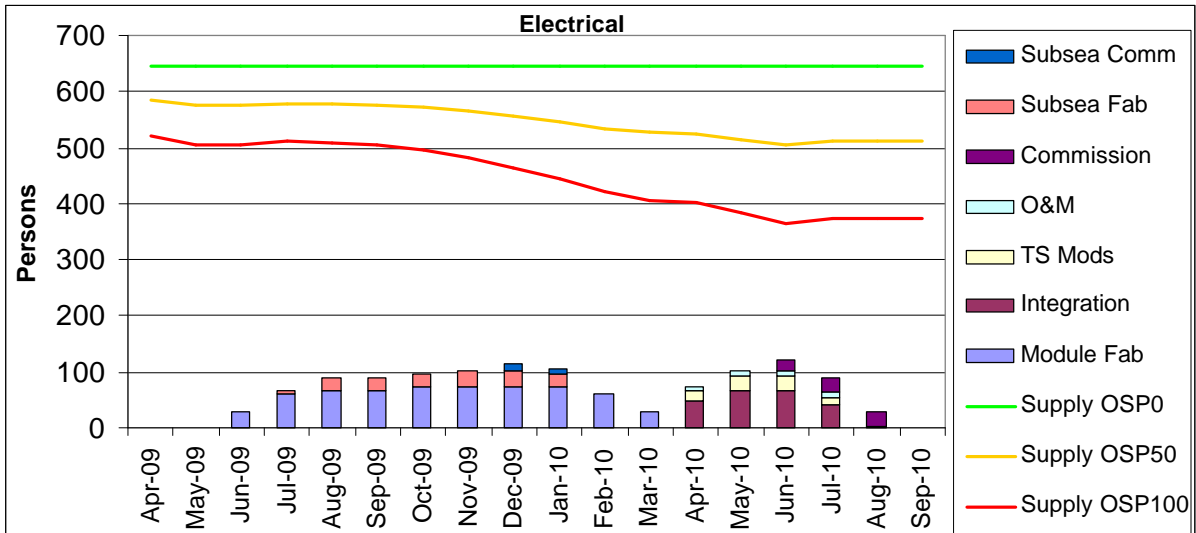
Figure 2-13 Labour Supply/Demand – Piping Trade



Peak project demand for Piping is 107 tradespersons.

There is not expected to be a shortfall under the OSP0 case, however both the OSP50 and OSP100 cases show a significant shortfall in piping trades. Project schedules, the labour market and other projects will need to be monitored very closely to ensure sufficient resources for the project scope.

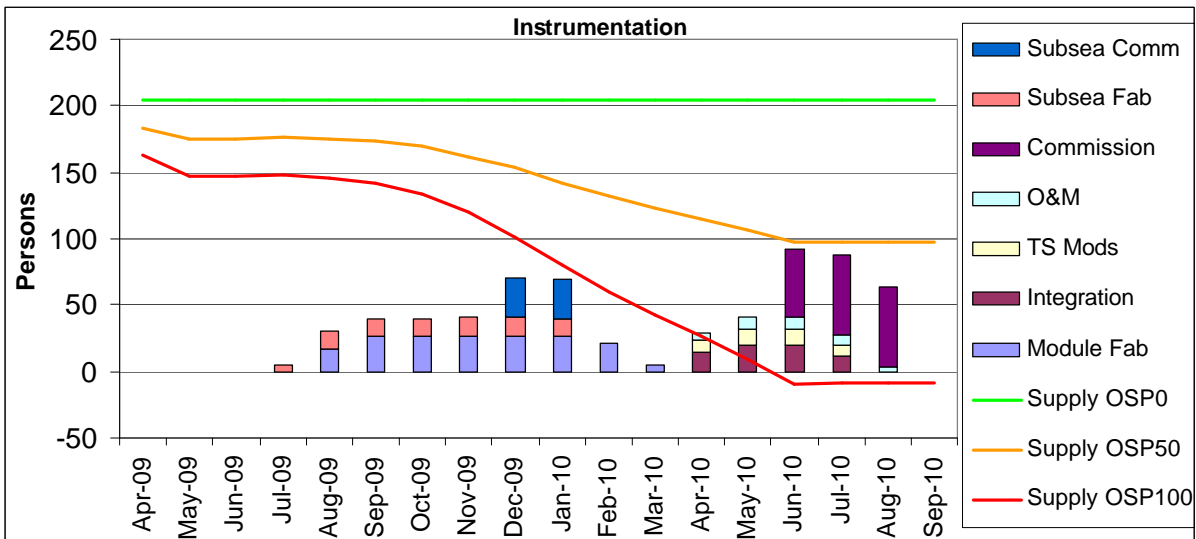
Figure 2-14 Labour Supply/Demand – Electrical Trade



Peak project demand for Electrical is 123 tradespersons.

There are not expected to be any shortfalls under the OSP0, OSP50, or OSP100 cases.

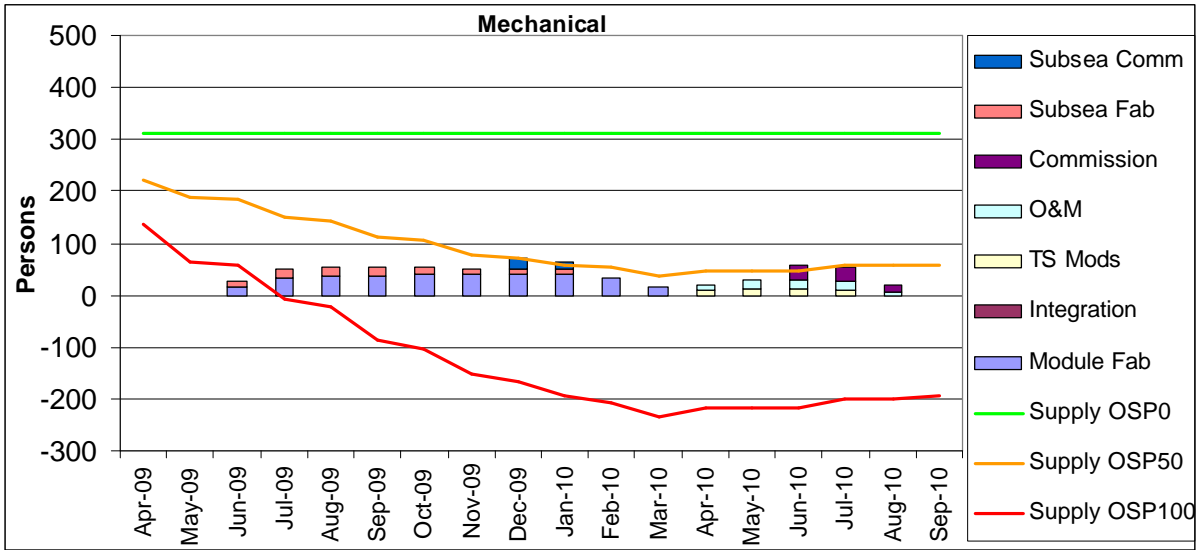
Figure 2-15 Labour Supply/Demand – Instrumentation Trade



Peak project demand for Instrumentation is 93 tradespersons.

There is not expected to be a shortfall under the OSP0 or OSP50 cases, although it comes close during the summer of 2010 when the project will be in the commissioning phase. The OSP100 case shows there will be a significant shortfall in the instrumentation trades during the Integration and Commissioning phases.

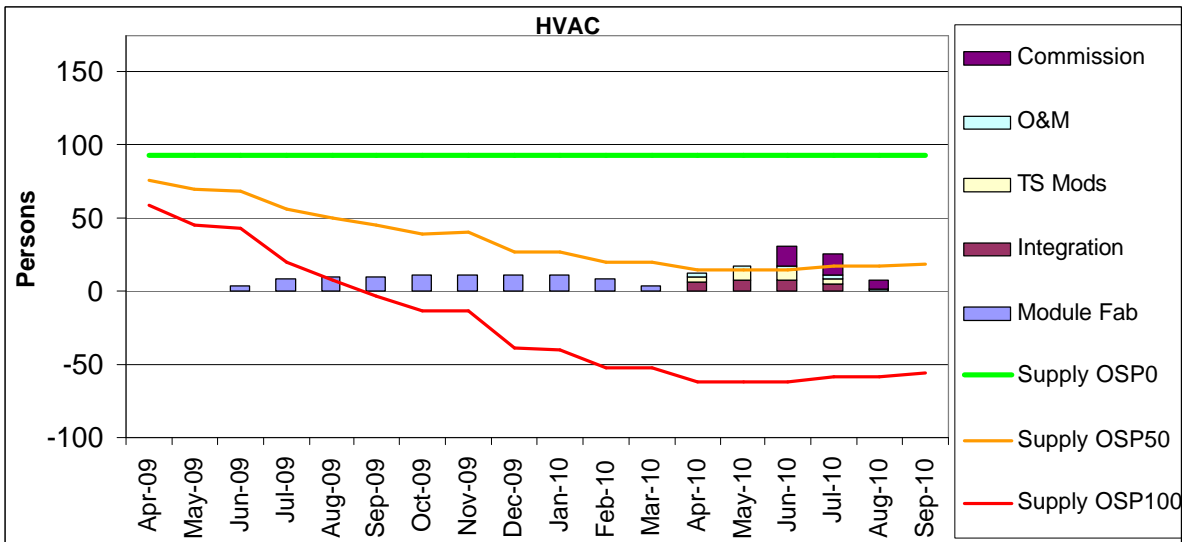
Figure 2-16 Labour Supply/Demand – Mechanical Trade



Peak project demand for Mechanical is 71 tradespersons.

There are not expected to be any shortfalls under the OSP0 case. However the OSP50 case shows shortfalls at various times during the project. The OSP100 case shows there will be a significant shortfall in the mechanical trades.

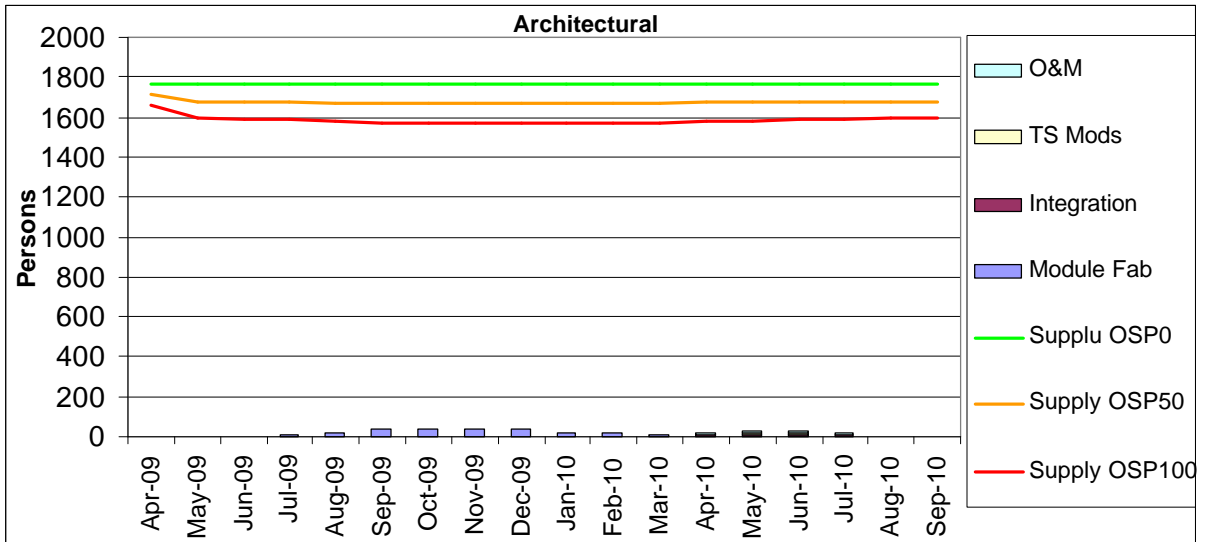
Figure 2-17 Labour Supply/Demand – HVAC Trade



Peak project demand for HVAC is 31 tradespersons.

There are not expected to be any shortfalls under the OSP0 case. The OSP50 case shows a shortfall during the Integration and Commissioning phases and the OSP100 case shows there will be a shortfall of HVAC workers in throughout the majority of the project.

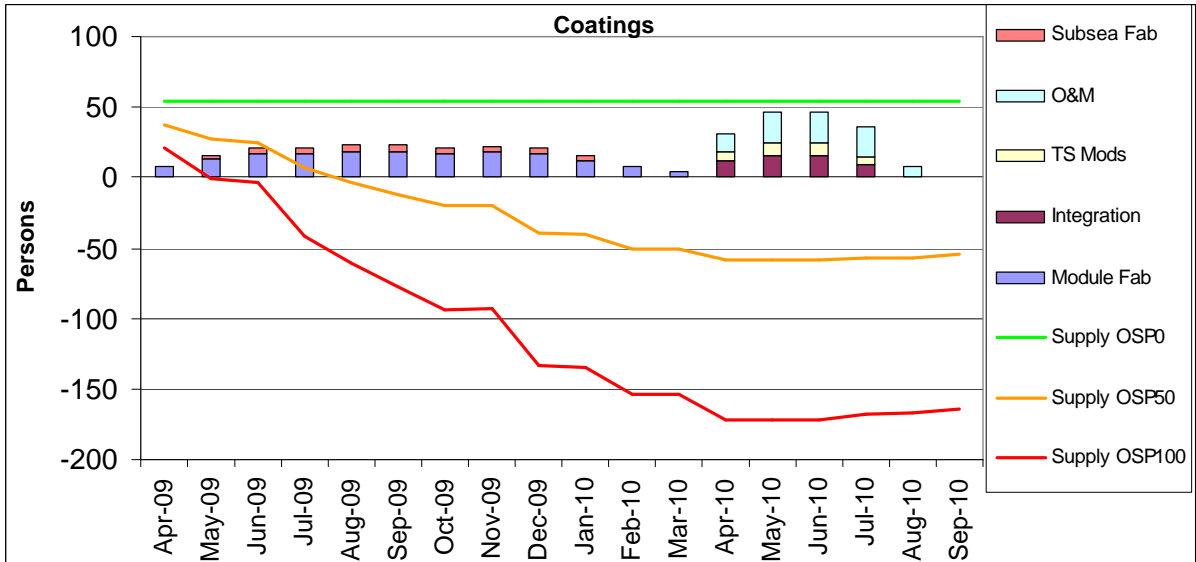
Figure 2-18 Labour Supply/Demand – Architectural Trade



Peak project demand for Architectural is 32 tradespersons.

There are not expected to be any shortfall under the OSP0, OSP50 or OSP100 cases.

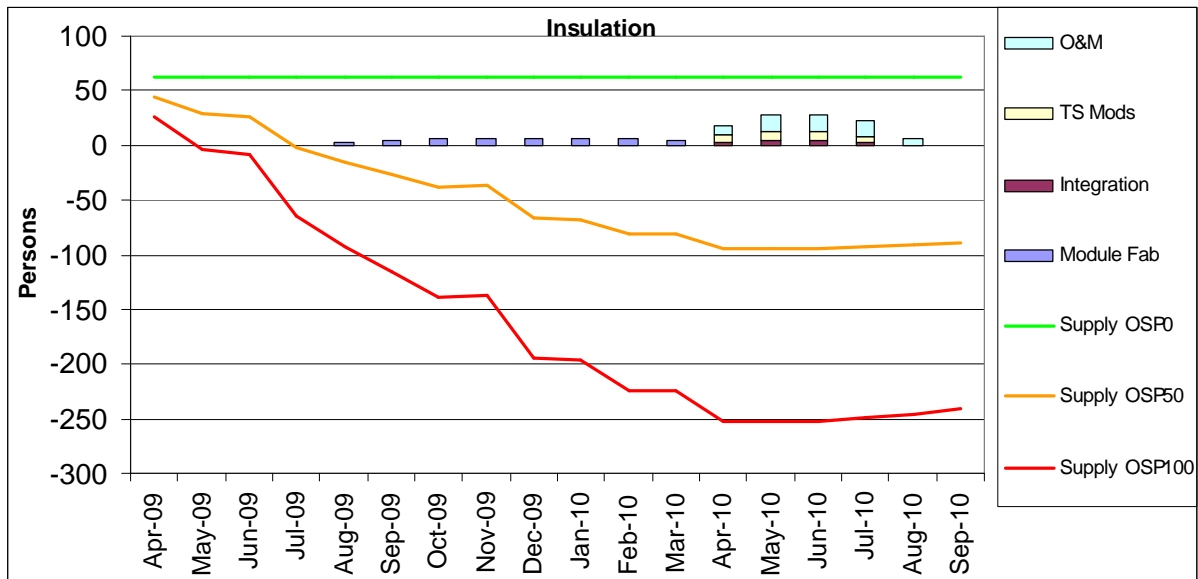
Figure 2-19 Labour Supply/Demand – Coatings Trade



Peak project demand for Coatings is 46 tradespersons.

There are not expected to be any shortfalls under the OSP0 case. However both the OSP50 and OSP100 cases show there will be a shortfall of coatings trades throughout the project.

Figure 2-20 Labour Supply/Demand – Insulation Trade



Peak project demand for Insulation is 27 tradespersons.

There is not expected to be a shortfall under the OSP0 case. However both the OSP50 and OSP100 cases indicate there will be a significant shortfall in the insulation trades throughout the project.

The data above indicates that there will be sufficient resources to execute the project scope in isolation, however close monitoring of other simultaneous projects is essential as there will be competition for labour within the province.

## 3.0 Conclusions

### 3.1 Conclusions – Labour Capability

Are there adequate skilled resources within the province to execute the scope of work within a specified period of time?

There exists a high probability that there will be elevated competition for skilled trade labour in 2009 through to 2011. Depending on which projects proceed on schedule there will be a competition for labour. Within Section 2.3 we have provided histograms per discipline to show estimated resource supply and demand based on no other simultaneous projects, a 50% level of demand for simultaneous projects, and all known simultaneous projects running as per schedule. From these we can conclude the following:

- With no other simultaneous projects, there should be adequate skilled resources within the province to execute the scope of work within the specified period of time.
- With other projects within the province scheduled to be executed in a similar timeframe the competition for skilled labour will be high.
- The project team needs to monitor the other project schedules and resource demands closely to be aware of the labour demands and take action as appropriate to attract and retain the workforce required for project execution.