

# **Asia Pacific Gateway Labour Market Information (LMI) 2012-13**

Lower Mainland Container Terminals Project  
(Labour Market Projections for Selected Trades)

By:



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The opinions and interpretations in this publication are those of the author and do not necessarily reflect those of the Government of Canada.

## 1. Overview: Container Terminal Trades Labour Market Information Project

As a part of the 2012/13 Gateway Labour Market Information Project, the APGST undertook to examine in greater depth three key occupations to provide a clearer picture of the issues and challenges that face employers in the Asia Pacific Gateway. This project is an in-depth look at the labour supply process and localized supply and demand for labour in three critical trades in the Container Terminal environment of the BC lower mainland. The project involves the three main employers serving Port Metro Vancouver (TSI - Vanterm and Centerm, DP World, Fraser Surrey Docks)

The need for this analysis was prompted by the October 19, 2011 award to Seaspan Marine Corporation (formally the Washington Marine Group) of an \$8 billion Federal contract for the construction of 9 to 11 Coast Guard vessels and supply ships over the next 20 years. It is expected that this contract could generate up to 1,000 jobs in the lower mainland, largely in North Vancouver. The concern is that this demand would impact the labour force in BC as soon as the current year (2013) and will draw skilled labourers out of shift and other less stable work environments, such as that offered by the Terminals, into the longer term shipyard opportunities. This is exacerbated by the terminals experience with unfilled shifts in these occupations and the negative impact these have on the terminals ability to meet business needs.

Also impacting BC's labour force in 2013 is an expected boom in resource development activity in the North. From oil and gas to mineral extraction, the economic activity and associated labour demand in northern BC is growing at a faster pace than the local workforce can meet and will eventually begin to draw from the lower mainland.

The Terminals, under the leadership of TSI, have requested a demand and supply analysis for the lower mainland labour supply for three 4 digit NOC categories:

7242 Industrial Electricians  
7265 Welders  
7312 Heavy Duty Equipment Mechanics

The *Lower Mainland Container Terminals LMI Project* will examine:

- The context for the demand shock
- An overview of the three selected occupations in the BC and lower mainland setting
- Demand and supply data from the local market
- Data tables and analyses demonstrating the impact of the demand changes from 2013-2017 on the three occupations
- An overview of the additional pressure northern resource expansion may have on the demand for workers in the three occupations

## 2. Study Design

The study focused on conducting a detailed labour market needs assessment of three selected occupations (Heavy Duty Equipment Mechanics, Industrial Electricians, and Welders) and designed to include two primary activities:

- 1) Comparative analysis of the provincial and regional labour market information; and,

- 2) Data analysis on the demand forecast prepared by each terminal.

Also included was an estimation of the demand growth based on historical trends and trade growth estimates between 2013 and 2017. The forecast takes a conservative view and includes major development and infrastructure projects. These economic drivers were combined with demographic information to create a picture of the supply and demand for workers in each occupation.

### 3. The Importance of Labour Market Information (LMI)

A properly functioning labour market is vital to a modern economy. A robust LMI system facilitates the matching of people and jobs both in times of labour shortages and in periods of high unemployment. Reliable LMI is necessary to make sure that good policy decisions are made to improve the economy's performance and reduce joblessness. Alternatively, in an 'under-supplied,' or 'tight,' labour market, accurate LMI will identify occupations with shortages and help to channel new entrants to the labour market into high-demand occupations. Accurate information in the form of accessible LMI can lead to better labour planning and that, in turn, can create the competitive edge necessary to capture a growing portion of the trade coming to and going from North America.

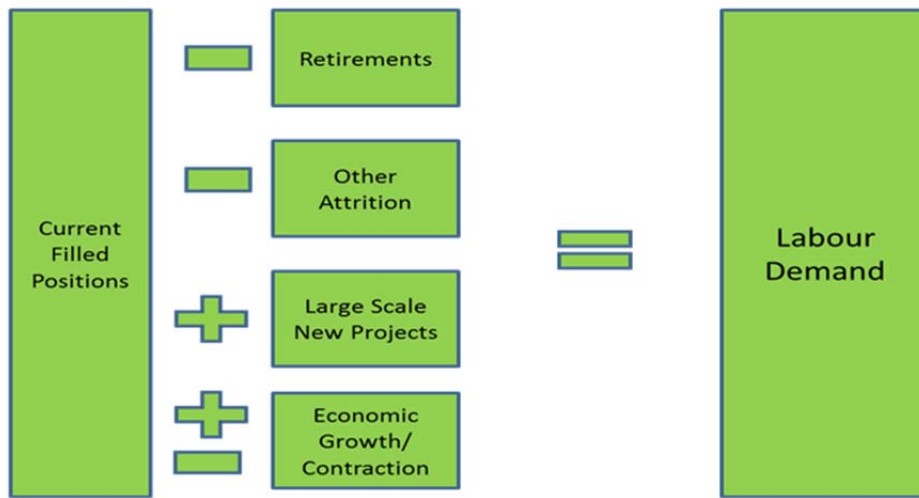
Labour market information may include but is not limited to: vacancies, expectations of the impact of economic growth or contraction, wages, skills required for an occupation, number of individuals who possess the required skills, types of training available and certifications granted, retirements expected, demographic changes, current jobs filled, mobility of workers in and out of the region, and large projects beginning or ending.

Traditional users of detailed labour market forecasts include:

- **Employers** for the development of in-house training programs for occupations expected to be in short supply, as well as for compensation and business planning decisions
- **Government policy makers** for decisions related to the allocation of resources for education and training, and decisions related to immigration
- **Post-secondary educators** for the decisions related to program allocation
- **Individual Canadians** for decisions related to career paths and relocation

**Labour Demand** is a combination of economic expansion and the introduction of large scale projects combined with changes in the labour supply due to retirement and other attrition (such as movement out of the labour force and death).

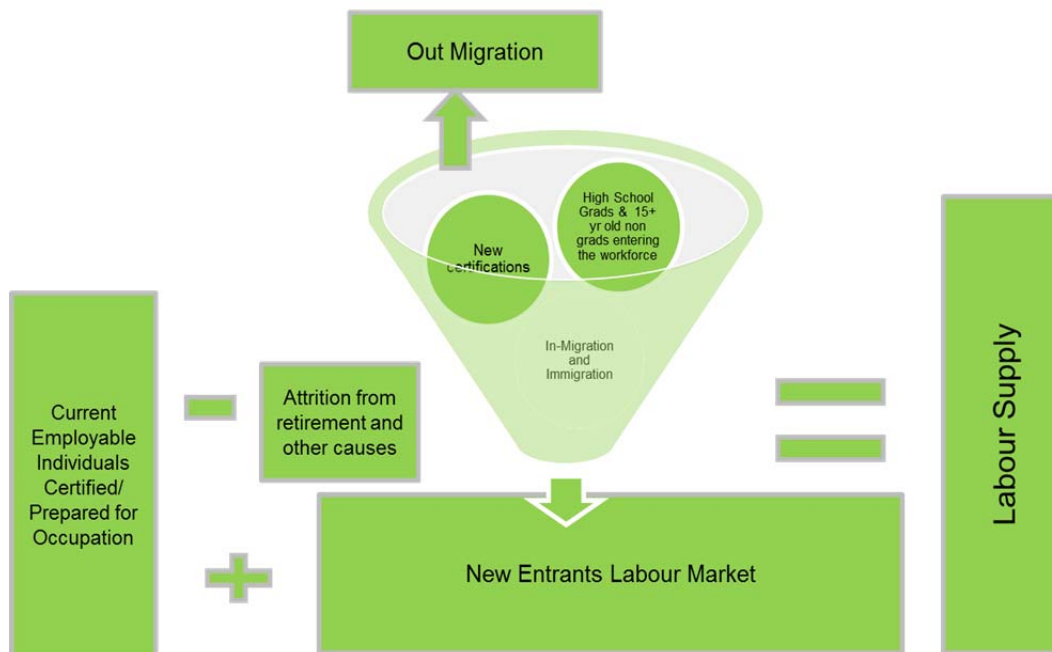
## Basic Determinants of Labour Demand



Labour demand is defined as the number of positions (full time equivalent) available in each occupation per year.

**Labour Supply** is the number of workers who are trained and or certified to work in an occupation, whether or not they currently are working in that occupation. Supply is generated by demographic drivers such as birth and death rates, school completion, interprovincial migration and immigration.

## Basic Determinants of Labour Supply



Labour supply is defined here as the number of workers with the skills and or required certifications to be considered qualified to work in each occupation in each year.

**Attrition** is defined here as the number of workers who leave each occupation, and the labour market as a whole, due to retirement or death each year

**Calculated unemployment** is defined here as the percentage of supply above demand – individuals who are certified but not currently working in the occupation for which they are certified.

## 4. The LMI Profile

The data presented in this forecast was generated by the Center for Spatial Economics<sup>1</sup> in July 2012. This forecast considers macro-economic forces such as GDP in Canada, China and other major trading partners, commodity prices which will drive both demand for goods as well as investment decisions in major projects, planned major projects such as the Shell LNG Plant or large scale government highways improvements and combines this with demographics related to factors such as age, training completions or retirement to build a picture of the expected demand for and supply of workers in an occupation. The three occupations, as defined by Statistics Canada's National Occupation Classification, selected for this study are:

7242	Industrial electricians
7265	Welders
7312	Heavy Duty Equipment Mechanics

### Ranking of the Occupations

The following ranking structure was developed for the Asia Pacific Gateway Skills Table (APGST) LMI Project. These rankings have been developed to provide a quick and clear graphical picture of the status of the labour market for each occupation in each year of the 2013–2022 forecast period. The rankings are based on an assumed level of frictional unemployment of 10 per cent. While higher than that used for non-construction occupations (5 per cent in BC as a whole and 7.5% in northern BC) the 10 per cent rate more accurately reflects both the labour mobility in the construction trades and the seasonality of the work.

For these Trades, the rankings are defined as follows:

- A "1" ranking means that there are at least 15 per cent more workers in the occupation than there are jobs: this would be a loose or oversupplied labour market
- A "2" ranking means that there are between 12.5 and 15 per cent more workers in the occupation than there are jobs: this would be a balanced labour market
- A "3" ranking means that there are between 10 and 12.5 per cent more workers in the occupation than there are jobs: this is becoming a tight or undersupplied labour market
- A "4" ranking means that there are less than 10 per cent more workers in the occupation than there are jobs: this would be a tight labour market

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<sup>1</sup> <http://www.c4se.com/>

### Three Trades Rankings by Region<sup>2</sup>

<b>Industrial</b>		<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>7242</b>	<b>Electricians</b>													
	Lower Mainland	1	1	2	3	3	4	4	4	4	3	3	3	3
	Northern	1	1	2	3	3	3	3	3	3	3	2	3	3
	All BC	2	2	3	3	3	3	4	4	4	4	3	3	3
<b>Heavy Duty Equipment</b>														
<b>7312</b>	<b>Mechanic</b>													
	Lower Mainland	4	4	4	4	4	4	4	4	4	4	4	4	4
	Northern	4	3	4	4	4	4	4	4	4	4	4	4	4
	All BC	4	4	4	4	4	4	4	4	4	4	4	4	4
<b>Welders and Related</b>														
<b>7265</b>	<b>Machine Operators</b>													
	Lower Mainland	2	2	3	3	3	4	4	4	4	3	3	3	3
	Northern	1	1	2	3	3	3	3	3	3	3	2	3	3
	All BC	2	2	3	3	3	3	4	4	4	4	3	3	3

<sup>2</sup> These tables and the following analyses are taken from the three (All BC, Northern BC and Lower Mainland) 2013 LMI Reports prepared by the APGST and supported by HRSDC

## 5. Key LMI Findings

### *Welders*

- For BC as a whole the number of Welder positions will grow by almost 10 per cent between 2013 and 2017.
- There will be over 2000 job openings throughout BC and almost 60% of them will be generated by attrition.
- Almost 1200 Welders will enter the profession in all of BC (via new certifications, in migration from other provinces and occupations and immigration from other countries)
- Over the same period almost 1300 welders throughout BC will leave the occupation (via retirement or death).
- In Northern BC the number of Welder positions will increase slightly more, by 11 per cent while in the lower mainland the growth mirrors that of the province as a whole
- Attrition for Welders happens at slightly higher rates in Northern BC (2.9 per cent) than in the Lower Mainland (2.3 per cent) and BC as a whole (2.2 percent).
- The average age of Welders in BC as a whole is 40.8; this is similar in Northern BC and the Lower Mainland.

### *Industrial Electricians*

- For BC as a whole the number of Industrial Electrician positions will grow by just over 9 per cent between 2013 and 2017.
- There will be over 1200 job openings throughout BC and more than 70% of them will be generated by attrition.
- Just under 600 Industrial Electricians will enter the profession in all of BC (via new certifications, in migration from other provinces and occupations and immigration from other countries)
- Over the same period almost 900 Industrial Electricians throughout BC will leave the occupation (via retirement or death).
- In Northern BC the number of Industrial Electrician positions will increase faster (10.5 per cent) than that of the province as a whole(9.2 per cent), while the lower mainland that number will grow slightly more slowly (8.8 per cent)
- Attrition for Industrial Electricians happens at a higher rate in Northern BC (4.4 per cent) than in the Lower Mainland (3.8 per cent) and BC as a whole (3.6 percent).
- The average age of Industrial Electricians in BC as a whole is 42.1, this is lower than in Northern BC (41.6) and the Lower Mainland (41.7)

### *Heavy Duty Equipment Mechanics*

- For BC as a whole the number of Heavy Duty Equipment Mechanic positions will grow by almost 12 per cent between 2013 and 2017.



- There will be almost 2000 job openings throughout BC and more than 60% of them will be generated by attrition.
- Over 1100 Heavy Duty Equipment Mechanics will enter the profession in all of BC (via new certifications, in migration from other provinces and occupations and immigration from other countries)
- Over the same period almost 1200 Heavy Duty Equipment Mechanics throughout BC will leave the occupation (via retirement or death).
- In Northern BC and the Lower Mainland the number of Heavy Duty Equipment Mechanic positions will increase slightly slower (9 per cent) than that of the province as a whole(12 per cent)
- Attrition for Heavy Duty Equipment Mechanics happens at a slightly higher rate in Northern BC (3.0 per cent) than in the Lower Mainland (2.6 per cent) and BC as a whole (2.9 percent).
- The average age of Heavy Duty Equipment Mechanics in BC as a whole is 41.2, this is similar in Northern BC and slightly lower than in the Lower Mainland (42)

## 6. Trades in the Container Terminals

### *Welders*

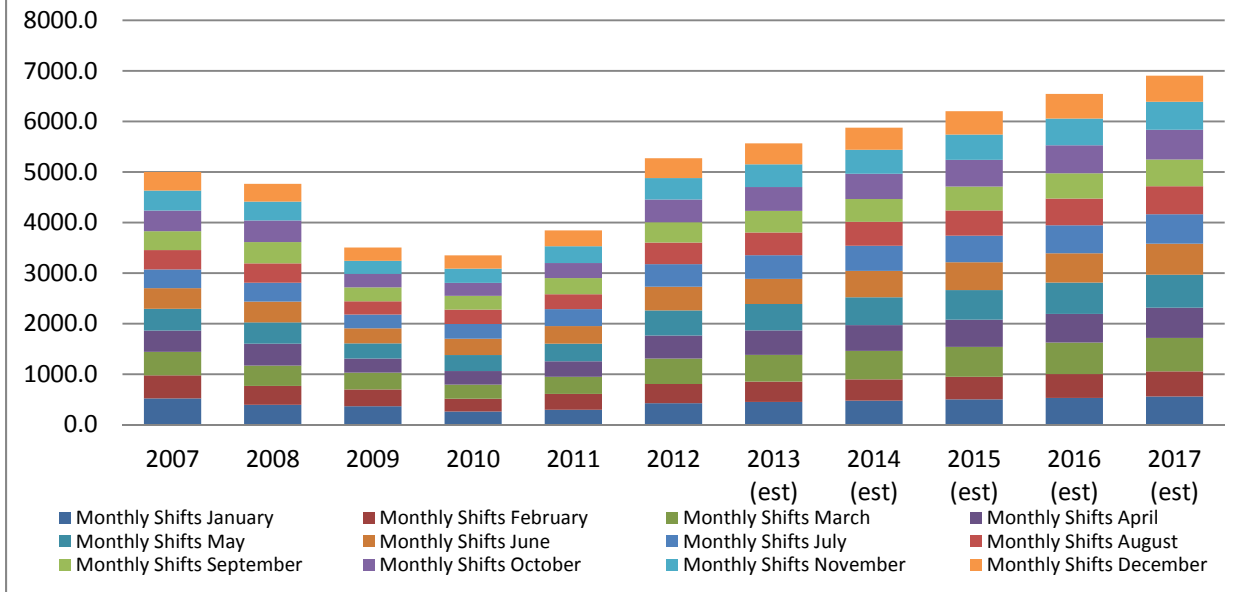
The data for Welders is generated from information submitted by DP World and TSI (Vanterm and Deltaport). Fraser Surrey Docks did not have access to data for Welders. As a result this will slightly understate the number of Welders working in the Container Terminals in the Lower Mainland.

In 2012 there were 18.1 FTE/Regular welders working in the three container terminals, 67 'registered' with the BCMEA, 20 of whom did not work in any of the container terminals in 2012.

As with the other two occupations, the team working on this project agreed that the 2012 data, while higher and, in terms of the overall trend, quite different from the 2011 data, presented an accurate picture going forward. Therefore 2012 the base upon which the 2013-17 projections are made.

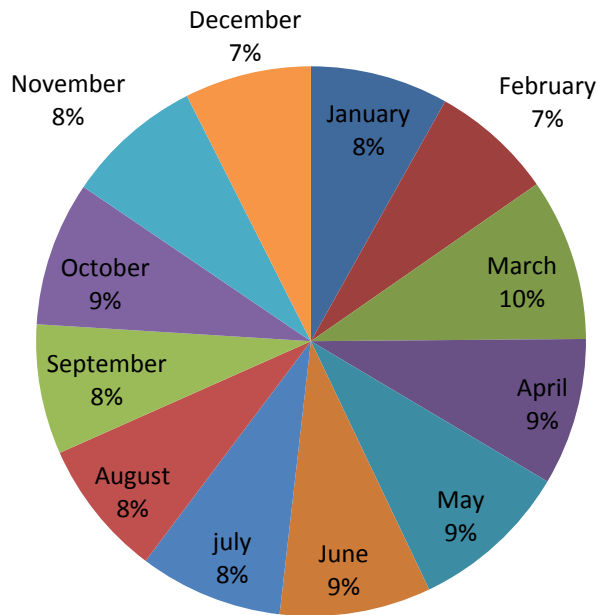
The projection shows a gradual increase in the number of shifts for welders across the three terminals over the 2013-17 period, equivalent to an FTE increase of approximately 5.

## Welders - Shifts by Month



When looking at the distribution of Welders Shifts, they appear to be spread relatively evenly month to month.

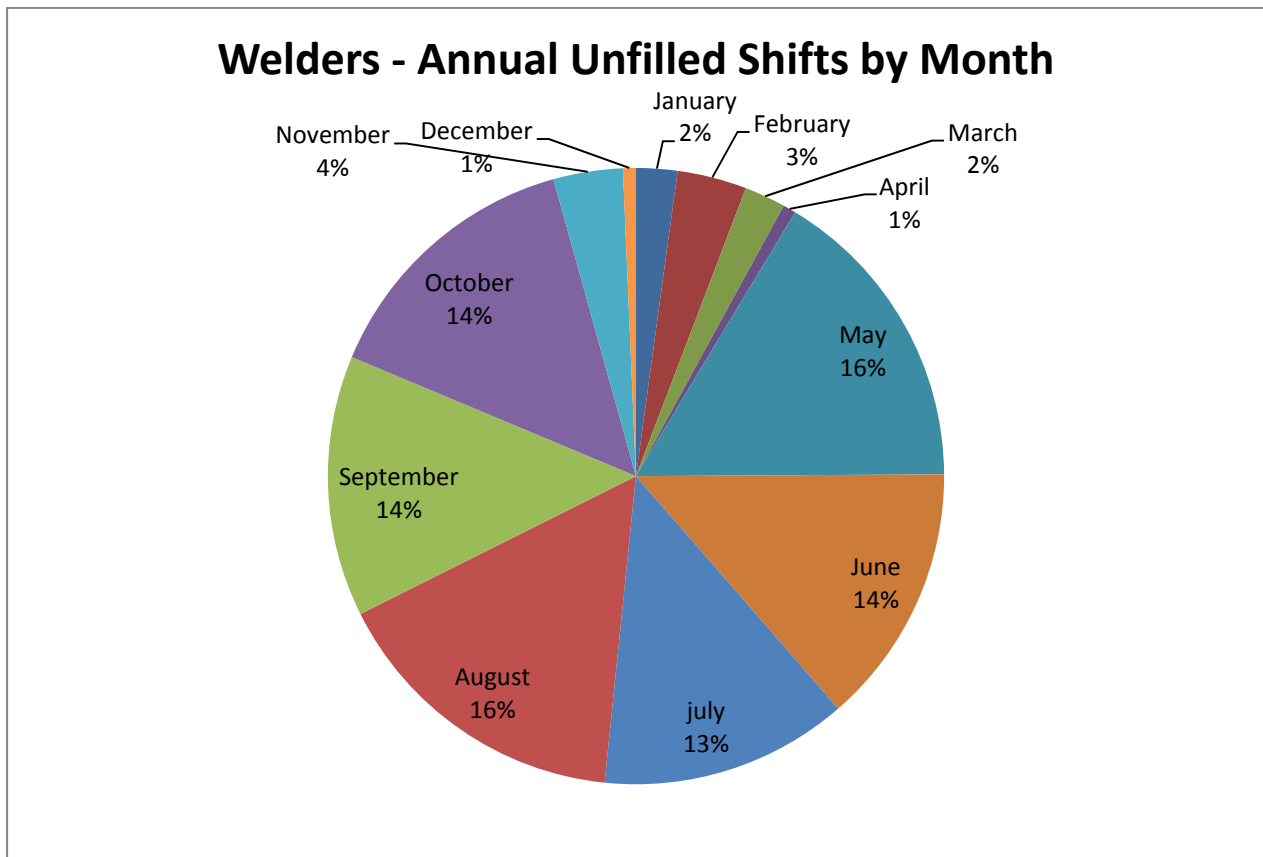
## Welders - Shifts by Month, 2013



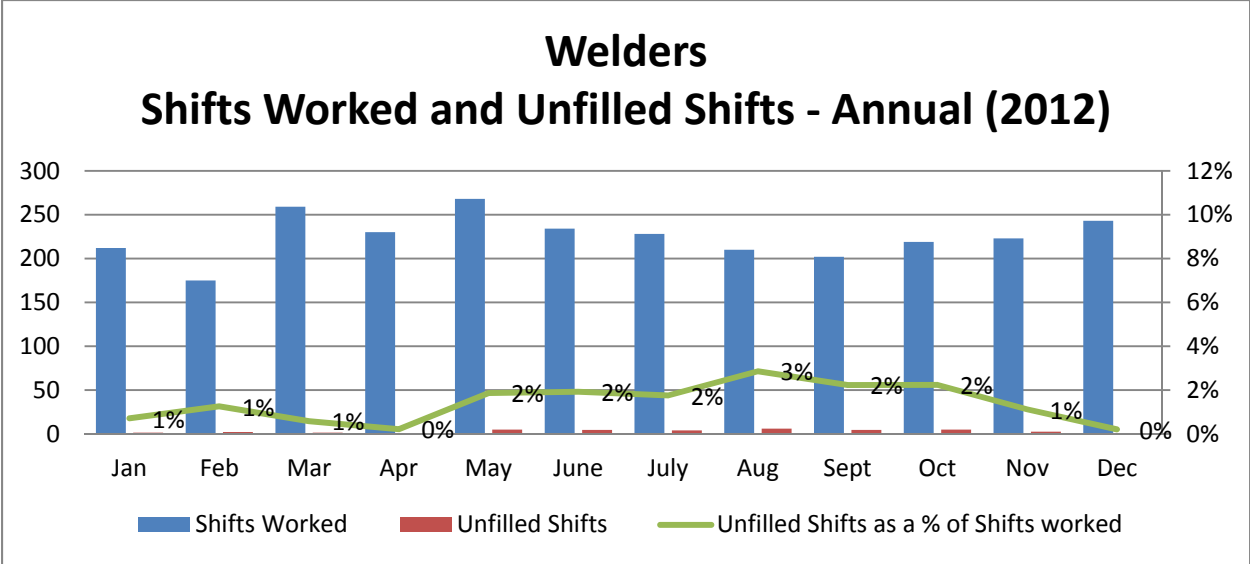
The project also estimated the number of unfilled shifts based on historical trends. While the number here is very small (an estimated 10<sup>th</sup> of an FTE in total) there was a definite pattern in the distribution of unfilled shifts across the year.

All Terminals	2013	2014	2015	2016	2017
FTE needed to supply demand growth	1.1	1.2	1.2	1.3	1.4
FTE needed to supply Annual Shortfall	0.1	0.0	0.0	0.0	0.0
<b>Total FTE needed</b>	<b>1.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.3</b>	<b>1.4</b>

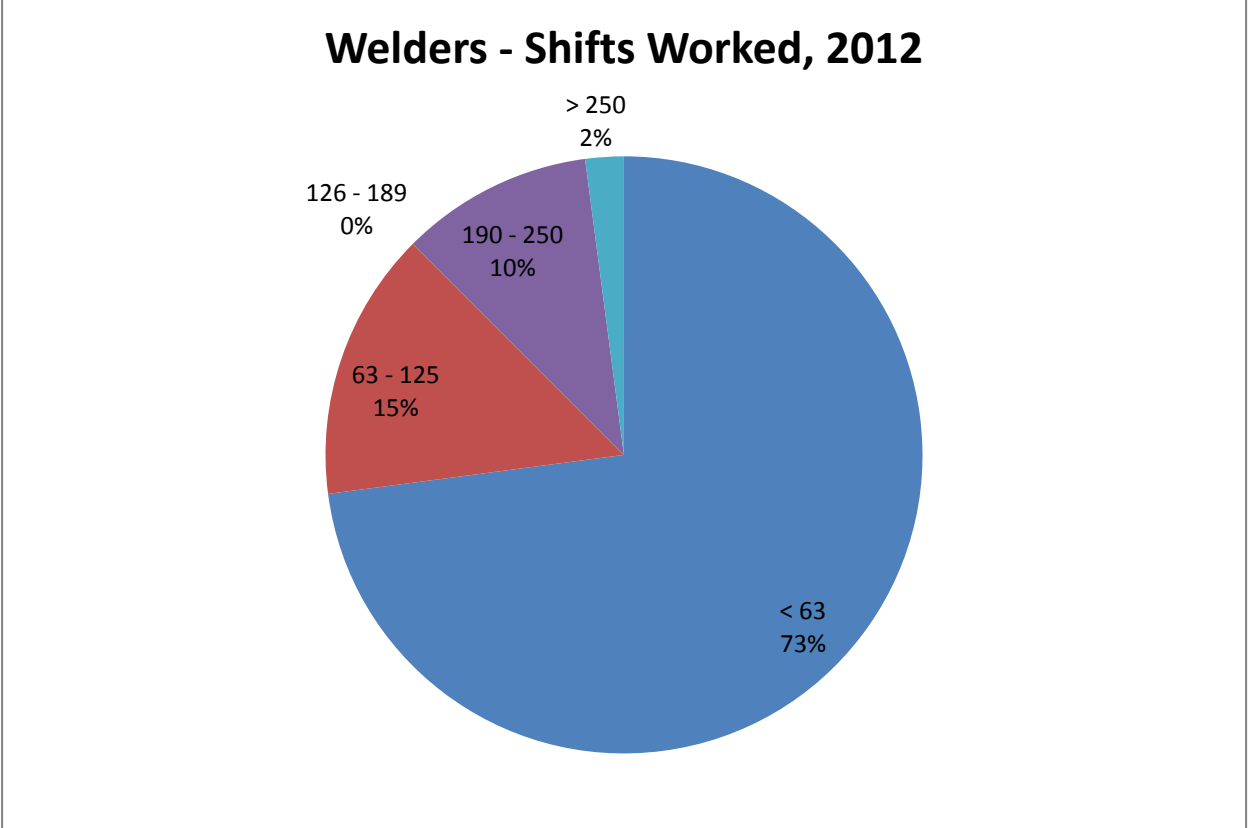
When the unfilled shifts (which are very small in total, averaging a total of about 23 shifts per year) are looked at by month it is clear that the six months from May to October have a different profile than the six months from November to April. In examining this data the Terminal representatives that supported this project all agreed that the unfilled shift challenges were limited or non-existent for Welders.



The trend by month is demonstrated below, and while the proportion and number of unfilled shifts is very low throughout the year, clearly the 6 warmer (May –October) months of the year show a different and higher trend of unfilled shifts than the 6 colder (November to April) months.

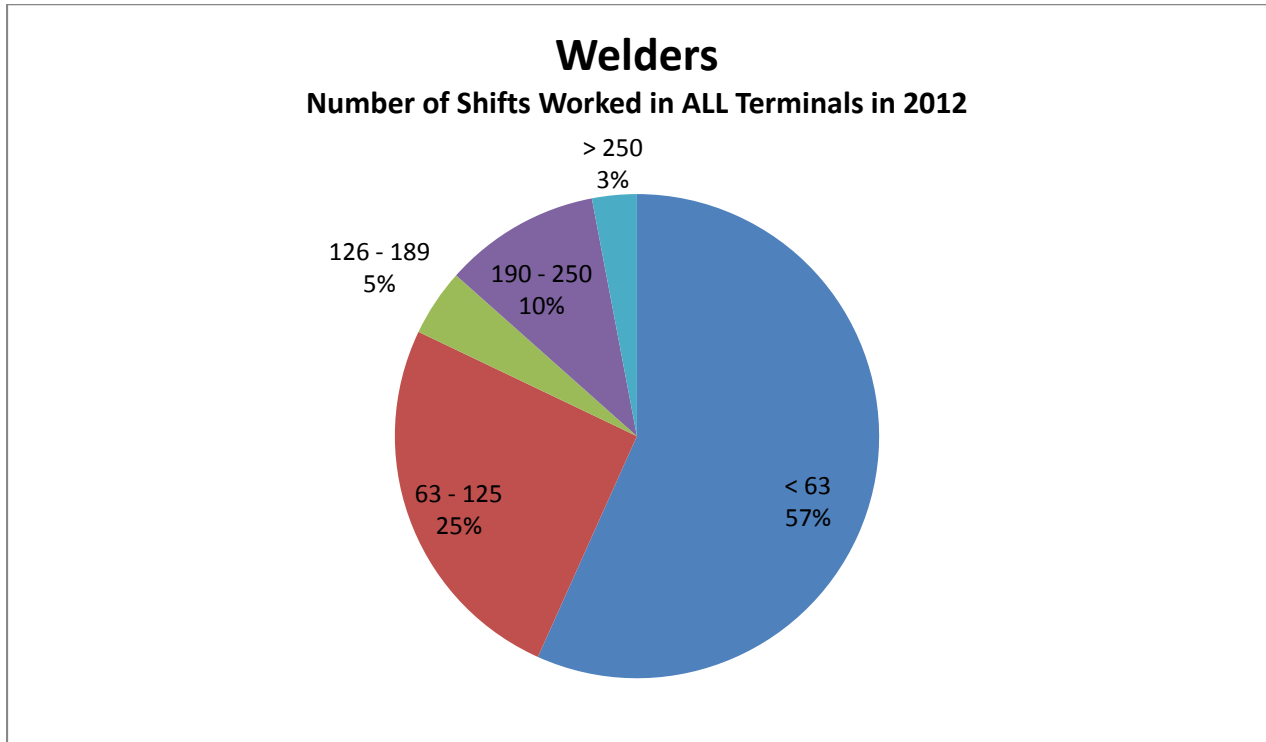


The other aspect of this is the workers, i.e., the number of welders with the requisite skill, available to work. Based on data from the BCMEA, there were 48 welders (or the equivalent) registered and paid to work in one of the four container terminals (a further 20 did not work in any of the four container terminals in 2012). However, an extraordinarily high portion of them (73%) worked ¼ time or less i.e. less than 65 shifts in the year.



Only 10% of these welders worked close to full time (190- 250 shifts per year) and only 2% worked more than full time (>250).

In looking at the number of shifts worked by welders across all terminals (container, bulk and break-bulk) the picture is still dramatic, 63% of the welders work 1/4 time or less while only 3% work more than full time.



This would suggest that the supply is available (there are approximately 40 welders with  $\frac{3}{4}$  or more of their time potentially available) although it is generally understood that many of these individuals are working elsewhere (outside the waterfront and terminals) in that available time.

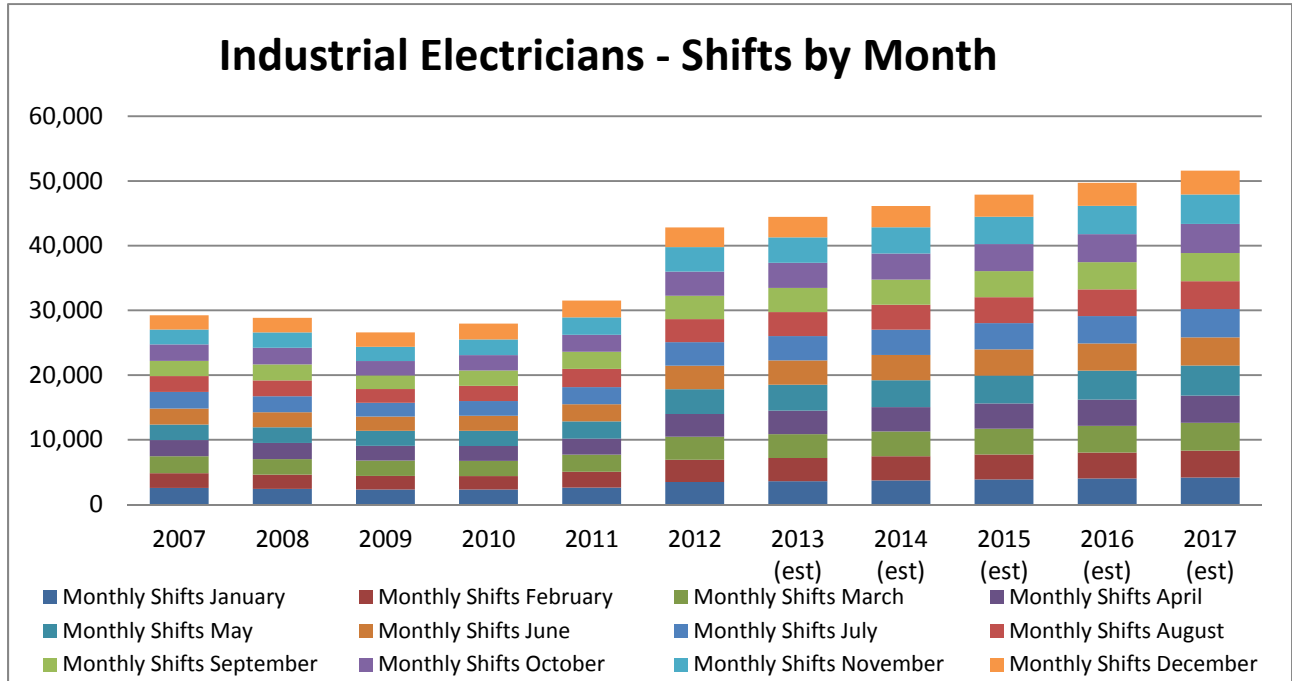
### ***Industrial Electricians***

The data for Industrial Electrician's is generated from information submitted by DP World, TSI (Vanterm and Deltaport) and Fraser Surrey Docks. As a result, this data should reflect the number of industrial electricians working in the Container Terminals in the Lower Mainland.

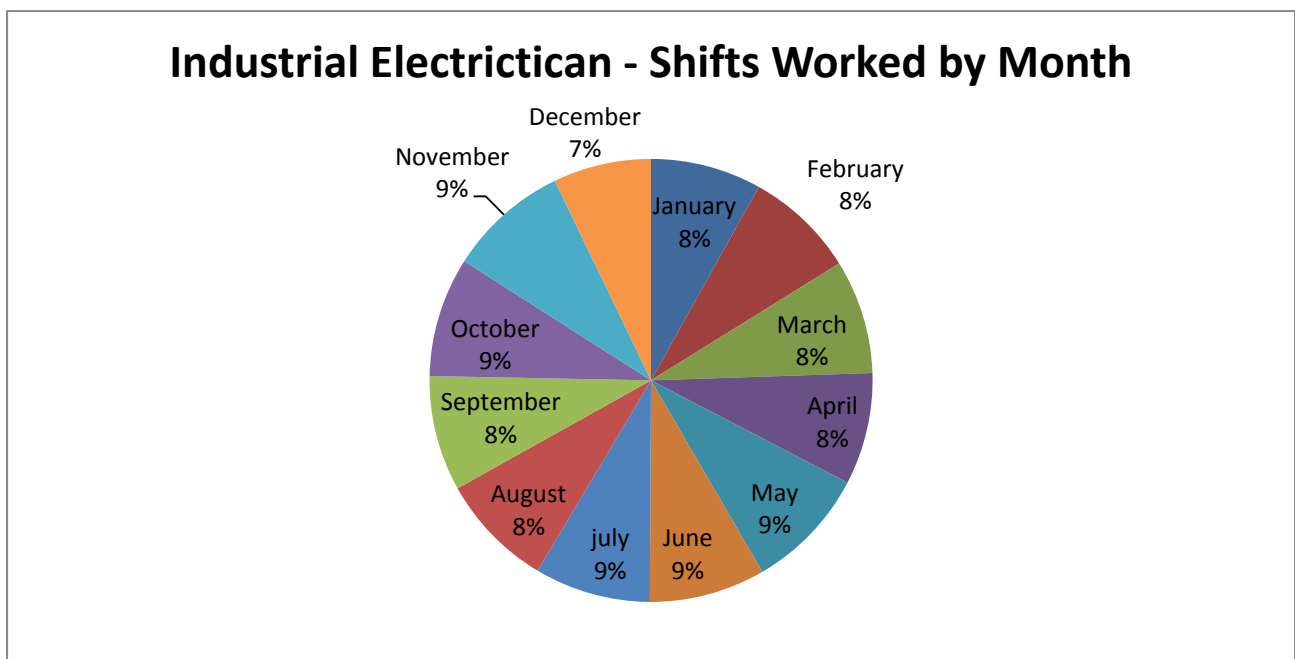
In 2012 there were 63.5 FTE/Regular industrial electricians working in the four container terminals and 230 'registered' with the BCMEA, 50 of which did not work in any of the four container terminals in 2012.

As with the other two occupations, the team working on this project agreed that the 2012 data, while higher and, in terms of the overall trend, quite different from the 2011 data, presented an accurate picture going forward. Therefore 2012 was the base upon which the 2013-17 projections are made.

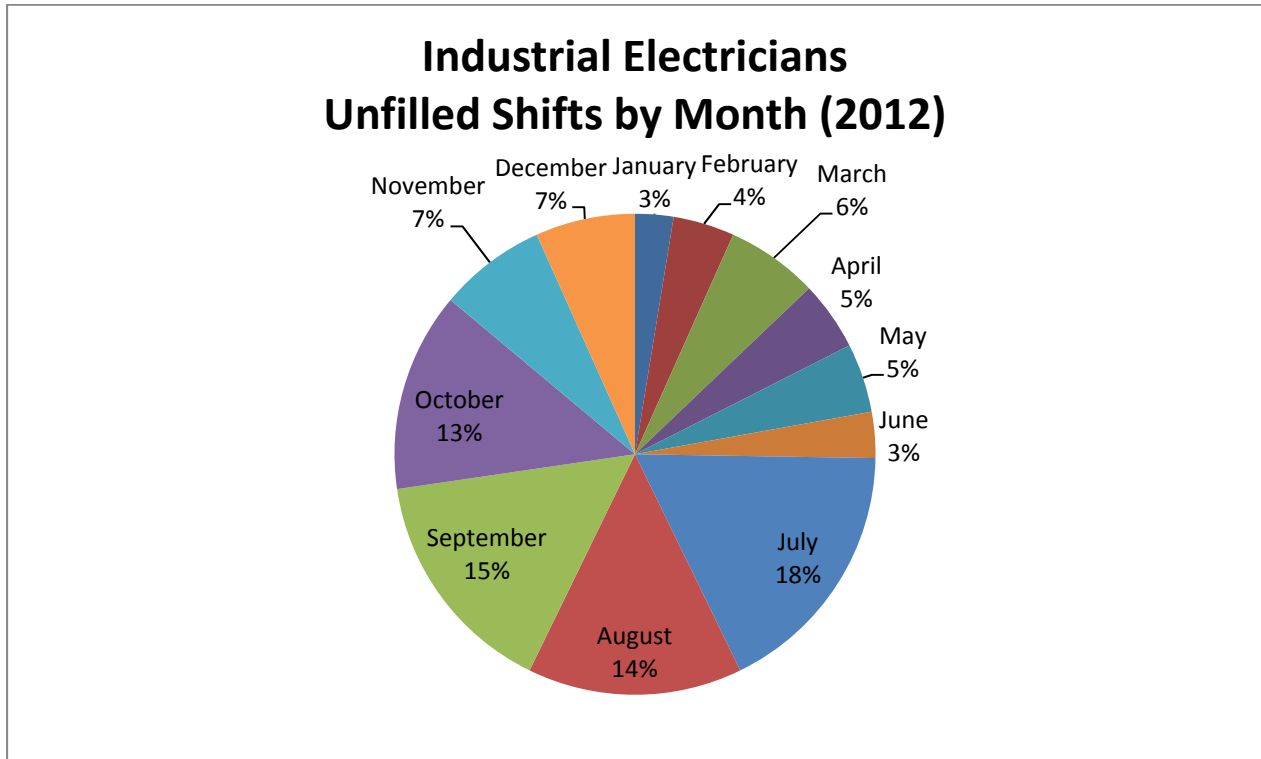
The projection shows a continuous increase in the number of shifts for industrial electricians across the four terminals over the 2013-17 period, equivalent to an FTE increase of approximately 29.



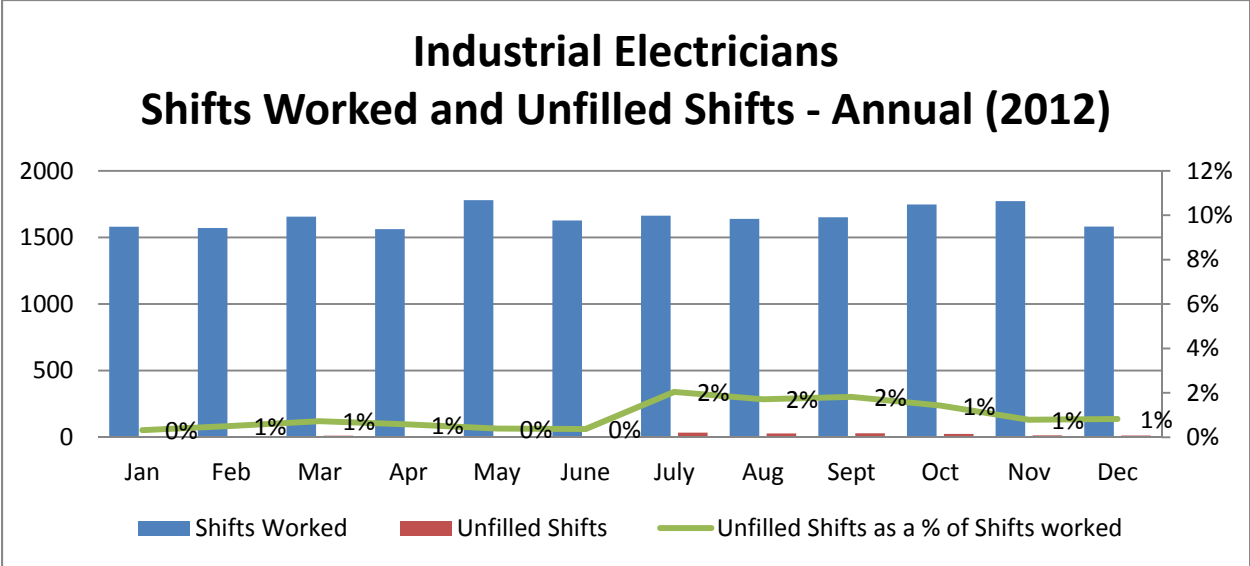
When looking at the distribution of Industrial Electrician Shifts, they appear to be spread relatively evenly month to month.



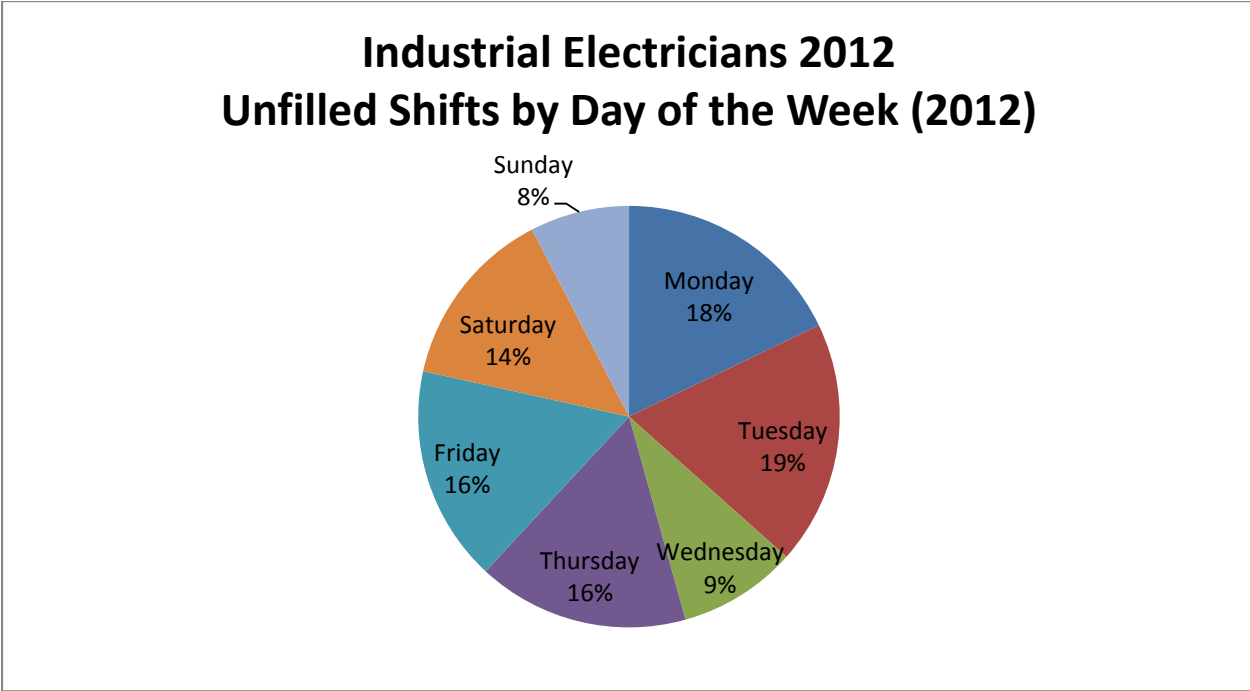
However, the profile is quite different when unfilled shifts are examined. There is a significant difference in the four months from July to October which represents 60% of the unfilled shifts over the course of the year.



The trend by month is demonstrated below, and while the proportion and number of unfilled shifts is very low throughout the year, clearly the 3 summer months (July - September) show a different and higher trend of unfilled shifts than the rest of the year. October, which is highlighted in the pie chart above, is also higher than other months, but not as significantly.



In looking at the days of the week again there is a clear trend. Sunday and Wednesday show a much lower portion of unfilled shifts, whereas Monday and Tuesday are the highest.



The study also estimated the number of unfilled shifts based on historical trends. While the number here is very small (just under 1 FTE in total) there was a definite pattern in the distribution of unfilled shifts across the year. When looking at the days of the week the shortfall is over 7 FTE. When the data is examined by shift, the number is just under 2 FTE. While these numbers are small, it is clear that they demonstrate a consistent shortfall that is more prevalent when both the month and the day of the week are taken into consideration.

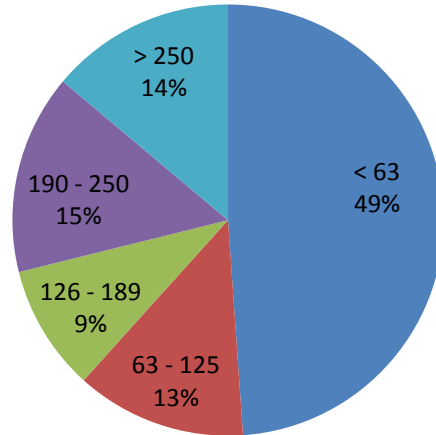


<b>All Terminals</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
FTE needed to supply demand growth	6.5	6.8	7.0	7.3	7.6
FTE needed to supply Annual Shortfall	0.81	0.03	0.03	0.03	0.03
<b>Total FTE needed</b>	<b>7.3</b>	<b>6.9</b>	<b>7.0</b>	<b>7.4</b>	<b>7.6</b>
Monday	1.16	0.04	0.04	0.04	0.04
Tuesday	1.25	0.04	0.05	0.05	0.05
Wednesday	0.59	0.02	0.02	0.02	0.02
Thursday	1.33	0.04	0.04	0.04	0.05
Friday	1.30	0.04	0.04	0.04	0.04
Saturday	1.0	0.0	0.0	0.0	0.0
Sunday	0.5	0.0	0.0	0.0	0.0
<b>Total Shortfall by Day of the Week</b>	<b>7.2</b>	<b>0.2</b>	<b>0.3</b>	<b>0.3</b>	<b>0.3</b>
Day	0.9	0.03	0.03	0.03	0.03
Afternoon	0.94	0.03	0.03	0.04	0.04
Evening	0.12	0.00	0.00	0.00	0.00
<b>Total Shortfall by Shift Type</b>	<b>1.9</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>

If only the annual data is taken into consideration, the four container terminals will need to hire at least 7 industrial electricians in 2013 to offset growth estimates and address the chronic challenges with unfilled shifts. Further they will likely need to hire/have access to 7 to 8 more each year thereafter to meet demand growth.

On the other side of the equation are the workers. Based on data from the BCMEA, there were 180 industrial electricians (or the equivalent) registered and paid to work in one of the four container terminals. However a very high portion of them (49%) worked ¼ time or less (less than 65 shifts in the year). There are a further 50 industrial electricians registered with the BCMEA who did not work in any of the four container terminals during 2012.

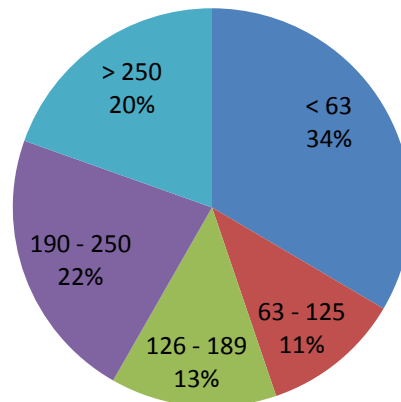
## Industrial Electricians Number of Shifts Worked in the Container Terminals in 2012



Only 15% of these industrial electricians worked close to full time (defined as 250 shifts per year), in the four container terminals although 14% worked more than 250 shifts in the year.

In looking at the number of shifts worked by industrial electricians across all terminals the picture is similar. 34% of the industrial electricians work 1/4 time or less while 20% work more than full time

## Industrial Electricians Number of Shifts Worked in ALL Terminals in 2012



This would suggest that supply is available (there are approximately 80 industrial electricians with ¾ or more of their time potentially available and a further 26 with at least half their time potentially available) although it is generally understood that many of these individuals are working elsewhere (outside the waterfront and terminals) during the available time.

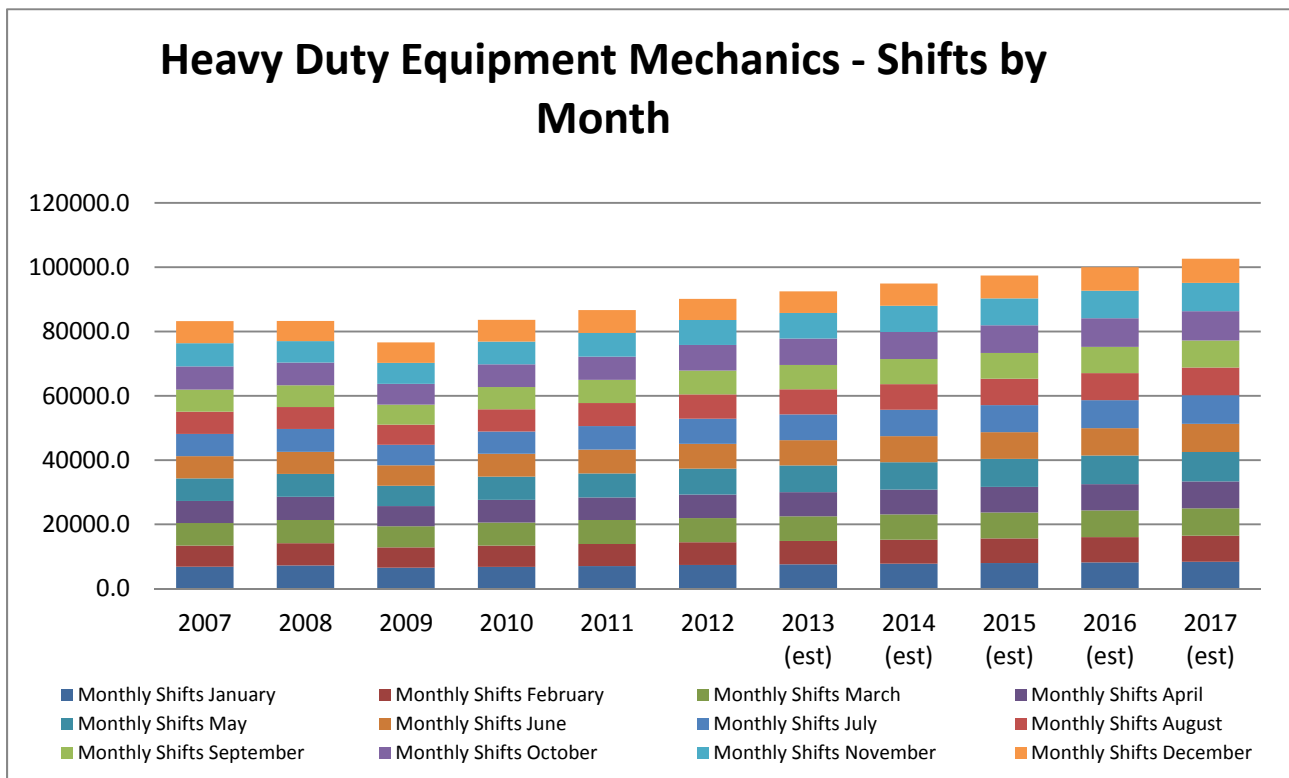
**Heavy Duty Equipment Mechanics**

The data for Heavy Duty Equipment Mechanics is generated from information submitted by DP World, TSI (Vanterm and Deltaport) and Fraser Surrey Docks. As a result, this should reflect the number of heavy duty equipment mechanics working in the Container Terminals in the Lower Mainland.

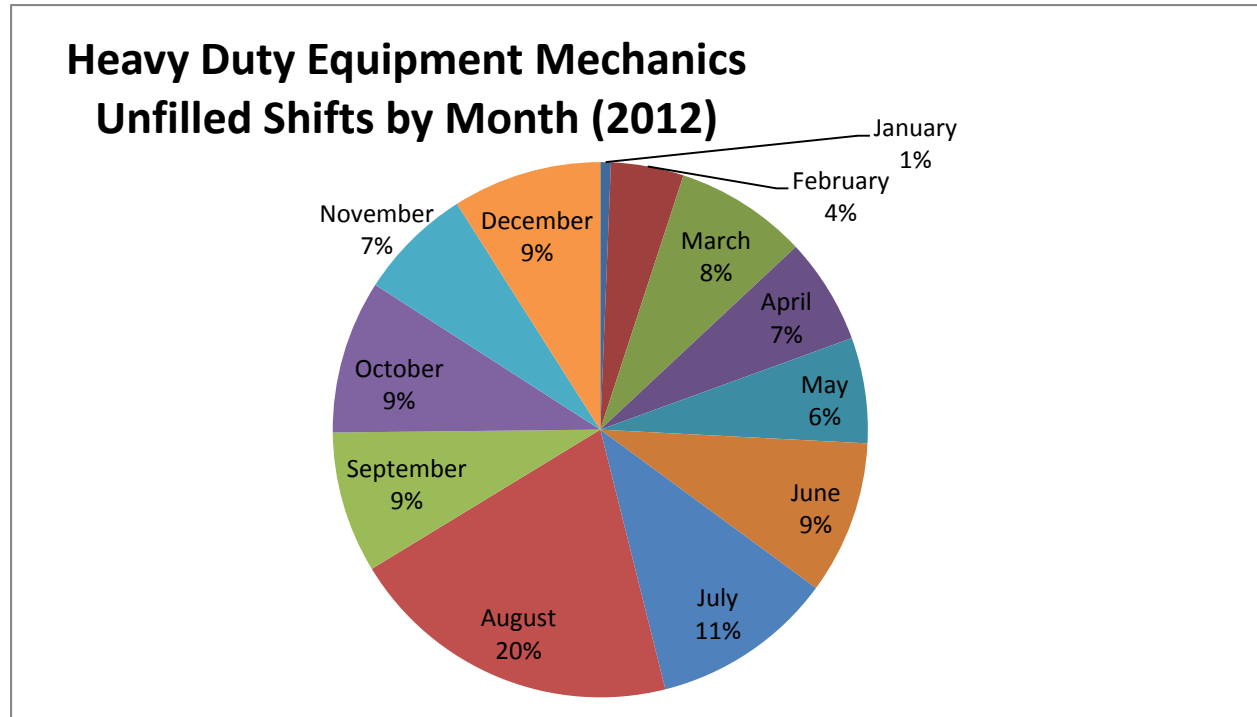
In 2012 there were 131.3 FTE/Regular Heavy Duty Equipment Mechanics working in the four container terminals and 524 ‘registered’ with the BCMEA, 175 of whom did not work in any of the four container terminals in 2012.

As with the other two occupations, the team working on this project agreed that the 2012 data, while higher and, in terms of the overall trend, quite different from the 2011 data, presented an accurate picture going forward. Therefore 2012 was selected as the base upon which the 2013-17 projections were made.

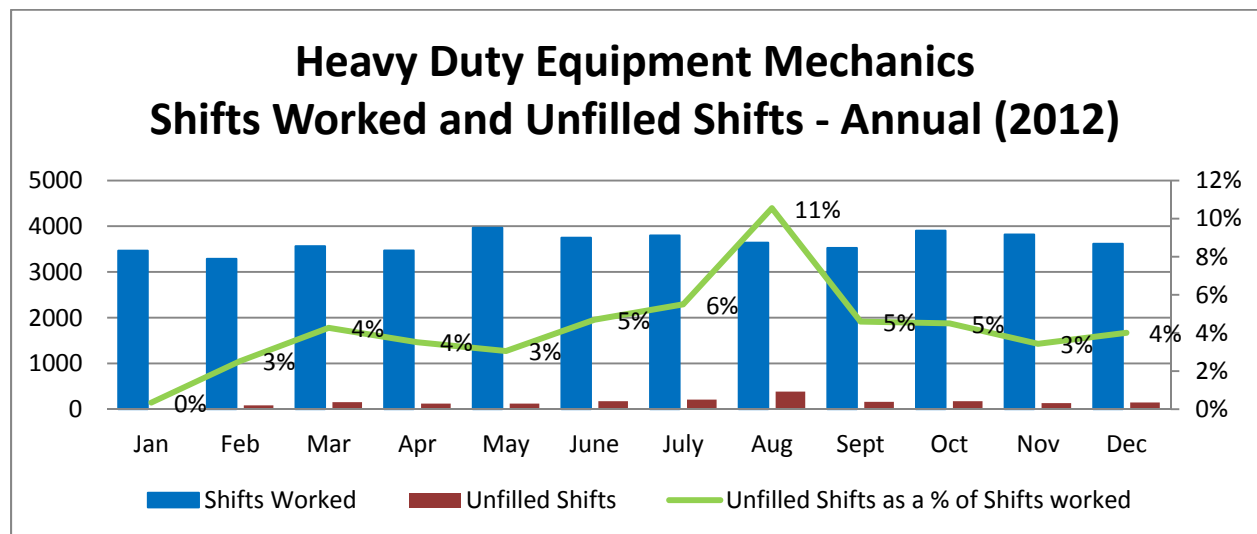
The projection shows a significant increase in the number of shifts for Heavy Duty Equipment Mechanics across the four terminals over the 2013-17 period, equivalent to an FTE increase of approximately 40.



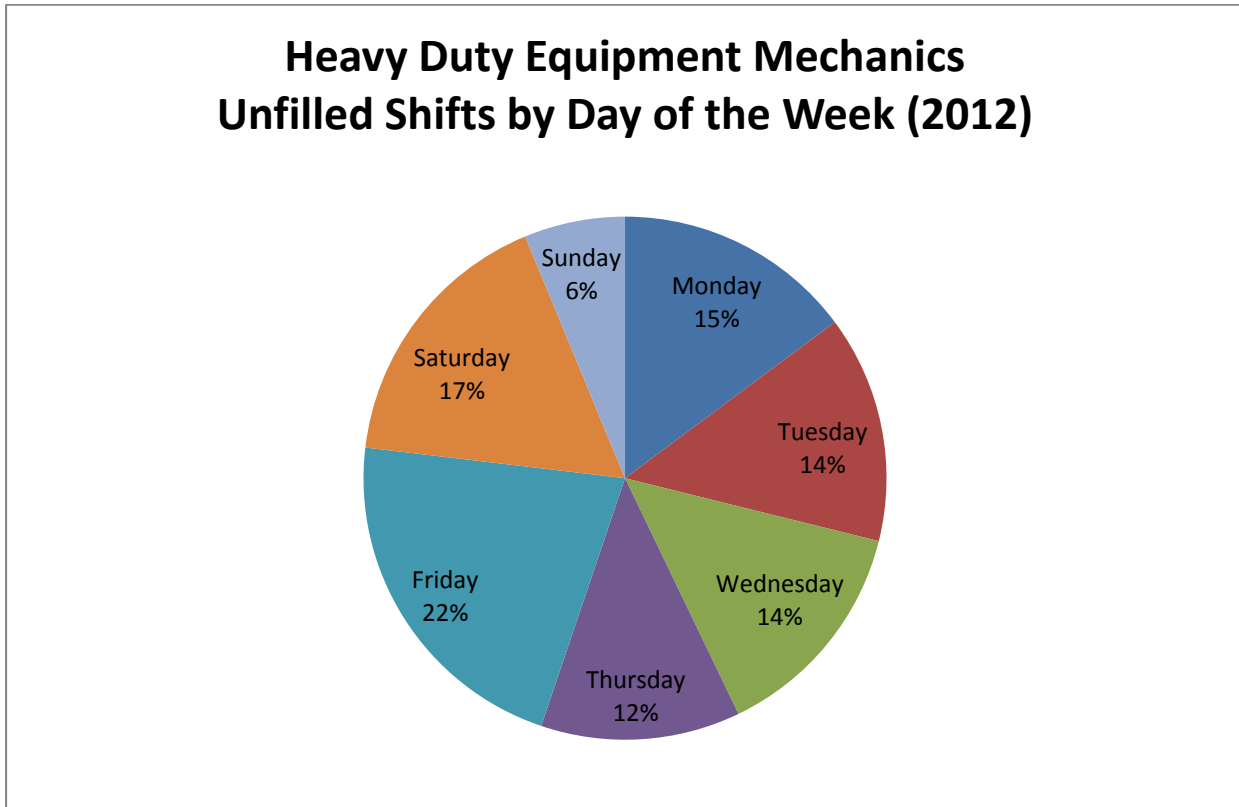
Additionally, there are signs of greater challenges when unfilled shifts are examined. The data show a significant difference between the January and February shifts, where very few shifts are unfilled, and July and August, which represent 30% of the unfilled shifts over the course of the year.



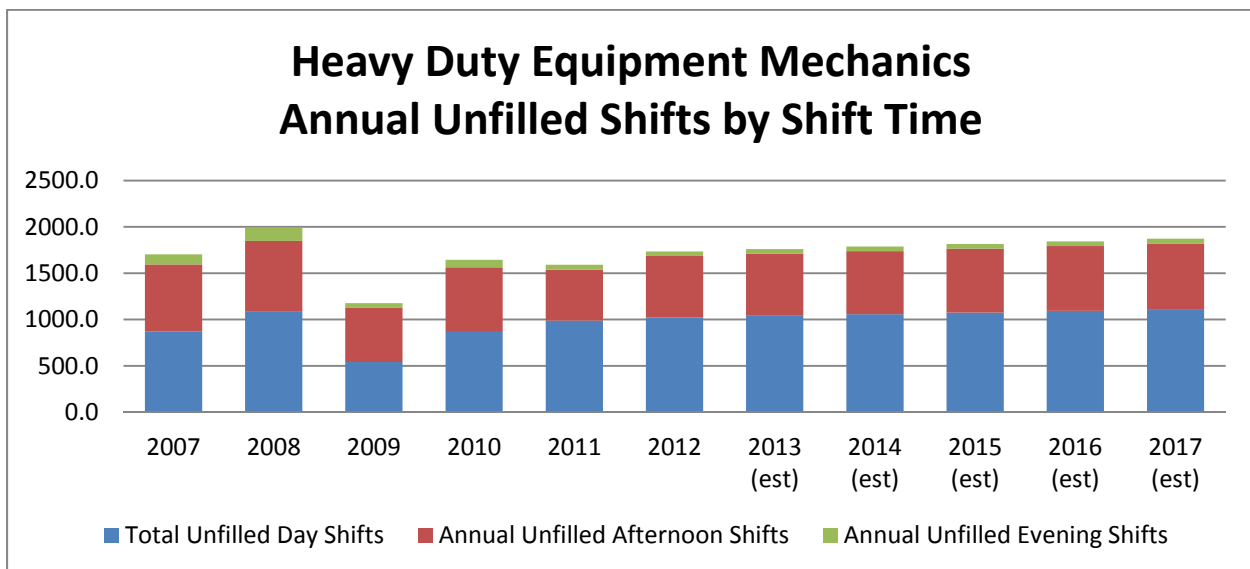
The trend by month is demonstrated below, for Heavy Duty Equipment Mechanics, the proportion and number of unfilled shifts is more significant throughout the year than the other two occupations. As well, the 4 summer months (June – September) show a different and higher trend of unfilled shifts than the rest of the year.



In looking at the days of the week again, there is a clear trend. Fridays and, to a lesser degree, Saturdays are over-represented while Sundays are underrepresented.



When examining the unfilled shifts by shift time (day, afternoon and evening) it is clear that the evening shift has little issue related to unfilled shifts. The largest area of challenge is in the day shift.



The project also estimated the number of unfilled shifts based on historical trends. When the annual unfilled shifts are converted to an FTE need, the number is just over 8 FTE over the five year forecast. However this becomes much more concerning when the days of the week are examined. Fridays alone show an FTE shortage of nearly 12 and, with the exception of Sunday (which is short by 3 FTE) the other days of the week show a 7 FTE deficit. The total FTE shortage by days of the week is a substantial 52.

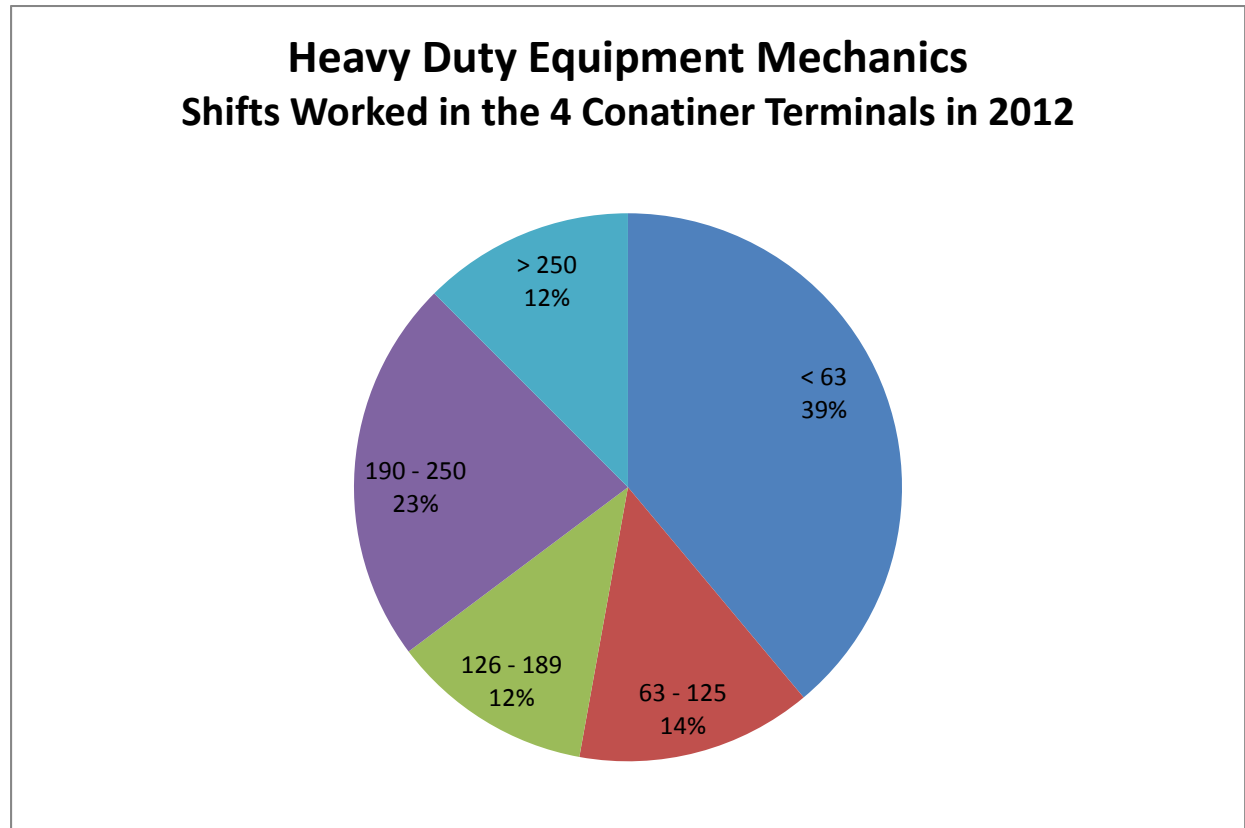
<b>All Terminals</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
FTE needed to supply Demand Growth	9.4	9.7	10.0	10.3	10.6
FTE needed to supply Annual Unfilled Shifts	7.50	0.21	0.12	0.12	0.12
<b>Total FTE needed</b>	<b>16.9</b>	<b>9.9</b>	<b>10.1</b>	<b>10.4</b>	<b>10.7</b>
Monday	7.84	0.13	0.13	0.13	0.14
Tuesday	7.49	0.17	0.12	0.13	0.13
Wednesday	7.42	0.12	0.12	0.13	0.13
Thursday	6.58	0.11	0.11	0.12	0.12
Friday	11.74	0.09	0.09	0.09	0.09
Saturday	7.88	0.09	0.09	0.09	0.09
Sunday	3.00	0.03	0.03	0.03	0.03
<b>Total unfilled shifts by Day of the Week</b>	<b>52.0</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>
Day	4.09	0.07	0.07	0.07	0.07
Afternoon	2.66	0.03	0.03	0.04	0.04
Evening	0.19	0.00	0.00	0.00	0.00
<b>Total unfilled shifts by Shift Type</b>	<b>6.94</b>	<b>0.11</b>	<b>0.11</b>	<b>0.11</b>	<b>0.11</b>

When the data is examined by shift, the number is just under 7 FTE. These numbers demonstrate a consistent shortfall that is more prevalent when both the month and the day of the week are taken into consideration.

If only the annual data is taken into consideration, the four container terminals will need to hire/have access to at least 17 new heavy duty equipment mechanics in 2013 to offset growth estimates and address the chronic challenges with unfilled shifts, further they will likely need to hire 10 to 11 more each year thereafter to meet demand growth.

From the supply side (the number of workers with the requisite skills available) based on data from the BCMEA, there were 350 heavy duty equipment mechanics (or the equivalent) registered and paid for

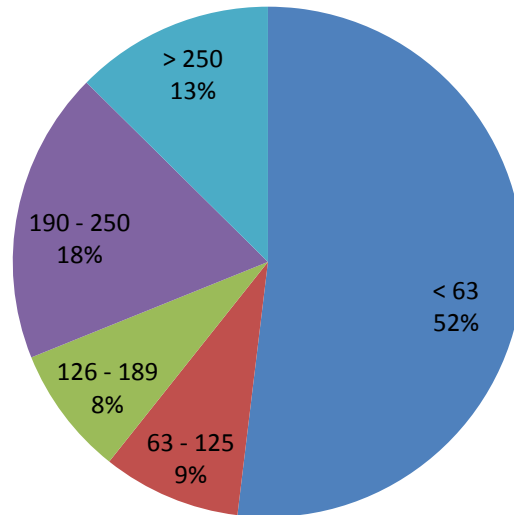
working in one of the four container terminals. There are a further 175 heavy duty equipment mechanics registered with the BCMEA who did not work in any of the four container terminals during 2012. A high portion of those working in the container terminals in 2012 (39%) of those worked ¼ time or less (less than 65 shifts in the year).



Nearly ¼ of these heavy duty equipment mechanics worked close to full time (defined as 250 shifts per year), although 12% worked more than 250 shifts in the year.

In looking at the number of shifts worked by heavy duty equipment mechanics across all terminals the picture is more dramatic, 52% of the heavy duty equipment mechanics work 1/4 time or less while 13% work more than full time.

## Heavy Duty Equipment Mechanics Number of Shifts Worked in ALL Terminals in 2012



This would suggest that the supply is available (there are approximately 270 heavy duty equipment mechanics (140 who have worked in the container terminals in 2012) with  $\frac{3}{4}$  or more of their time potentially available) although it is generally understood that many of these individuals are working elsewhere (outside the waterfront and terminals) in that available time.

### 7. Summary

At the outset of this project the participants believed that there was a current and potentially growing supply problem in the three trades, particularly for heavy duty equipment mechanics. This was related to the pattern of unfilled shifts that was observed by terminal managers and the associated impact it was having on their ability to deliver services to their customer base. There was also concern that the growth expected in Seaspan's workforce as a result of the 2011 federal shipbuilding contract, would increase what was seen as an already serious labour market supply problem.

As the information was gathered and analyzed, it became clear that while there will be ongoing growth in demand for workers in at least two of the three occupations – most significantly in heavy duty equipment mechanics but also in industrial electricians – the challenge related to unfilled shifts was in specific days of the week and/or months of the year. It also became clear that there are a substantial number of qualified workers (from 40-75%) in each occupation that are working less than  $\frac{1}{4}$  of an FTE (63 or fewer shifts in 2012) on the waterfront. There appears to be a ready source of workers to draw from, which begs the question as to why there are the unfilled shifts.



During the project one of the four terminals changed its scheduling process such that available shifts were known earlier in the week. This, they proposed would allow some of these under-utilized workers access to available shifts before they fill their time in other ways. While the information was anecdotal, that terminal believed that this was having a positive impact on the unfilled shift issue.

What is clear is that the challenges experienced in the number and frequency of unfilled shifts by the 4 container terminals is less an issue of supply and more related to scheduling (both by the workers and the employers). This implies that the solution may lie inside the worker-employer-union relationship along with some increase in the number of available workers.

## **8. Acknowledgements**

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