



**JUNE 2006**

## **PRINTING MACHINIST: OCCUPATIONAL SKILL SHORTAGE ASSESSMENT**

**Current Situation:** Genuine skill shortage

**Short-term Outlook:** Genuine skill shortage

### **1 Executive Summary**

1.1 Results from the 2005 Survey of Employers who have Recently Advertised suggest employers have had difficulty in filling printing machinist positions in New Zealand. Only 61% of positions were filled within ten weeks of advertising and there was an average of 14 suitable applicants for every 10 printing machinist vacancies. This report considers these survey results in the context of trends in the demand for and supply of printing machinists.

*Table 1: Employer Survey Indicators, 2005*

	Fill Rate	Average Number of Suitable Applicants
Printing Machinist	61%	1.4
All Trades Surveyed	37%	1.0

Source: Survey of Employers who have Recently Advertised.

1.2 The printing and publishing industry has been growing slowly since the early 1990s, while the employment of printing machinists and other printing trades workers has declined slightly over this period. The adoption of labour saving technology accounts for this slow decline in the demand for printing trades workers.

1.3 Training levels for printing machinists have been low since 2001. The average annual training rate between 2001 and 2005 was 1.6%, which was barely enough to compensate for retirements which occur at 1.2% per annum. There has been further loss in supply through net outward migration and some occupational detachment. The net effect of these supply forces is that the supply of printing machinists has declined over the past decade and a half. This decline has exceeded the decline in demand resulting in a **genuine skill shortage**. This shortage is relatively mild, as reflected in a fill rate of 61%.

1.4 The demand for printing machinists is expected to continue declining due to a slowing economy and the further adoption of labour saving technology in the printing industry. Training levels may increase slightly due to a slow increase in

the number of enrolments for the national certificate qualification over the past few years. Consequently, the Department foresees a slight easing in the shortage of printing machinists in the short term.

## 2 Introduction

- 2.1 The purpose of this report is to investigate skill shortages for printing machinists in New Zealand.
- 2.2 The following section presents key findings from the Department of Labour's (the Department's) *Survey of Employers who have Recently Advertised* (SERA). This survey provides an indication of employer's success in filling advertised vacancies for printing machinists as well as other information on their recruiting experiences. The next two sections investigate trends in the demand for, and supply of, printing machinists. The penultimate section presents some of the issues that arise from the matching of demand and supply in the labour market, such as wage rates. Finally, the 'Assessment' section considers all the information presented in the report and provides a view on whether the occupation is in shortage, and if so, the type of shortage being experienced. A short-term outlook for the shortage situation is also offered.



- 2.3 Further background to this occupational report, including a discussion of the methodology; a glossary of terms; and an overview of the Department of Labour's (the Department's) *Survey of Employers who have Recently Advertised* (SERA), including the survey questionnaire, can be found in the 'Background and technical note' at <http://www.dol.govt.nz/publications/jvm/trades/2005/background.asp>.

### 2.4 **Printing machinists in New Zealand**

- 2.4.1 Printing machinists (code 73317 in the New Zealand Standard Classification of Occupations) use printing presses to produce books, magazines, newspapers, brochures, packaging materials, stationery posters and leaflets. The tasks that printing machinists undertake vary depending on which press they operate, for example: offset lithography, gravure, flexography, letterpress, sheet-fed, reel-fed and digital.

- 2.4.2 The Department estimates that approximately 6,300 printing machinists were employed in New Zealand in 2005. Information from the 2001 Census indicated that the printing machinist workforce was predominantly male (89%) and worked full-time (93%).

### 3 Survey of Employers who have Recently Advertised

- 3.1 This section presents the key SERA findings of employers' experiences in recruiting printing machinists.
- 3.2 The SERA provides a measure of employers' success in filling advertised vacancies for printing machinists through the calculation of a fill rate. This rate is the proportion of vacancies included in the SERA sample which were filled with an adequately qualified and experienced person within ten weeks of advertising. Occupations with fill rates lower than 80% are typically regarded as being in shortage, while fill rates lower than 40% usually indicate that the occupation is in acute shortage.

*Table 2: SERA Results for Printing Machinists and All Trades Surveyed, August 2005*

	Number of Employers	Number of Vacancies	Fill Rate <sup>1</sup>	Average Number of Suitable Applicants per Vacancy <sup>1</sup>
<b>Printing Machinists</b>	21	31	61%	1.4
<b>All Trades Surveyed</b>	885	1480	37%	1.0

Source: Survey of Employers who have Recently Advertised, Department of Labour.

1 The 'All Trades Surveyed' fill rate and average number of suitable applicants per vacancy figures were both weighted to compensate for any under or over sampling of individual trade worker occupations in the 2005 survey.

- 3.3 Results from the 2005 SERA show that 61% of printing machinist vacancies included in the survey were filled within ten weeks of being advertised. Recruiting conditions for employers were marginally more difficult than in 2003 when the fill rate was 66%. The current fill rate for printing machinists was considerably higher than that for all trade occupations surveyed by the Department (37%). There was an average of 1.4 suitable applicants for each printing machinist vacancy compared with an average of 1.0 for all trade occupations surveyed.

### 4 Demand for Printing Machinists

- 4.1 This section investigates trends in the demand for printing machinists and the factors underlying them. Demand is measured by the number of printing machinists required by employers at current wage rates.
- 4.2 **Historical Demand**
- 4.2.1 The printing industry primarily serves enterprises in the publishing, business services and creative services industries. Changes in the level of economic activity of these three sectors can impact on activity in the printing industry.

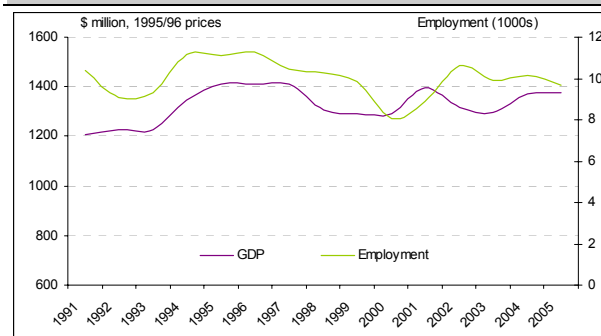
Additionally, research from the Electronic Document Systems Foundation suggests that demand for printed products can also be influenced by changes in levels of advertising, disposable personal income, business formations and transactions, and school, library and institutional book and publication acquisitions<sup>1</sup>.

4.2.2 Growth in advertising revenues has been robust. According to Advertising Standards Authority industry statistics, advertising revenues in New Zealand have increased across a number of print media between 1995 and 2004 (for example, newspapers (4.8%), magazines (8%), outdoor (21.3%) and direct unaddressed mail (5.4%) per annum). These findings show that advertising in traditional print media has continued to grow despite significant competition from electronic media.

4.2.3 Despite the strong growth in demand for printed publications, output from the printing, publishing and recorded media manufacturing sector grew very slowly (0.5% per annum) between 1991 and 2005. This apparent contradiction is explained by technological developments in printing. The computerisation of the workplace has enabled organisations to manage an increasing proportion of their printing needs in-house.

4.2.4 The employment of *printing trades workers*<sup>2</sup> has fluctuated over the past decade and a half, mostly in line with changes in output of the printing, publishing and recorded media manufacturing industry (see Figure 1). However, there has been a slight downward trend in employment of printing trades workers, declining on average by 0.4% per annum between 1991 and 2005. The decline in employment in the context of growing output is again explained by technology. There has been a shift from labour-intensive mechanical printing processes to high speed digital printing which requires fewer printing trades workers.

Figure 1: Printing, Publishing & Recorded Media Manufacturing Industry GDP & Employment of Printing Trades Workers, 1991-2005



Source: Economic Survey of Manufacturing, Household Labour Force Survey, Statistics New Zealand.

### 4.3 **Future Demand**

4.3.1 Output growth in the printing industry is likely to be subdued during 2006 as the economy slows and with it the demand for printed material. The growth of digital advertising may also impact negatively on the printing industry. Technological advancements will continue to reduce the need for printing machinists and other traditional printing trades workers. The Electronics Document Systems

<sup>1</sup> Electronic Document Systems Foundation. (2001). *Printing in the age of the Web & beyond: How Society will Communicate in the 21st Century*.

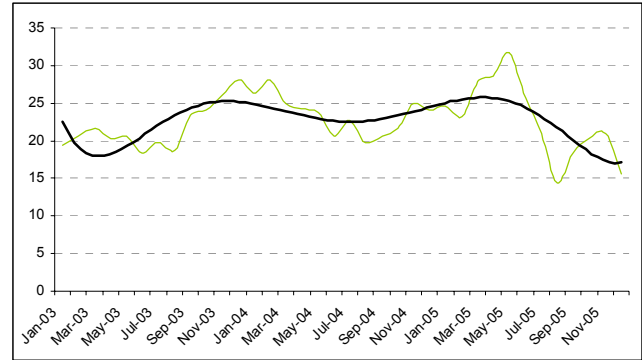
<sup>2</sup> Household Labour Force Survey data captures employment trends for *Printing Trades Workers*. This is the broad occupational category in which printing machinists comprise the majority of workers (58% in 2001).

Foundation predict that the less labour intensive digital printing will increase its share of all printing outputs from 24% in 2000 to 43% in 2010. The Department conclude that demand for printing machinists will decline in the short term and this trend will continue in the long term.

#### 4.4 **Changes in Market Conditions**<sup>3</sup>

- 4.4.1 The Department's Job Vacancy Monitor suggests that recruitment conditions for employers are improving. In the three months to December 2005, there were 35% fewer advertised vacancies for printing machinists compared to the same period in 2004. This decrease in the number of advertisements reflects the overall downward vacancy trend.

Figure 2: Number of Advertised Vacancies for Printing Machinist



Source: Job Vacancy Monitor, Department of Labour.

## 5 **Supply of Printing Machinists**

- 5.1 This section investigates the various sources contributing to the supply of printing machinists. Supply is measured by the number of people willing and able to work as printing machinists at current wage rates.

### 5.2 **Training - National Certificate (Level 4) Qualifications and Equivalent**

- 5.2.1 This section investigates the growth in supply of *fully qualified* printing machinists through training. Candidates who are interested in pursuing a National Certificate in Printing can specialise in one of the following branches: sheet-fed, reel-fed, formed shape (letterpress/dry offset), digital printing or direct mail production. There are other national certificate level 4 branches that candidates can study which lead to qualifications in pre-press operations and bookbinding.
- 5.2.2 To achieve any one of these relevant branches at level 4 for the printing machinist occupation, candidates must complete an apprenticeship or training programme facilitated through the Printing and Allied Industries Training Council (PAITC). The curriculum covers the relevant standards using the National Qualifications Framework for National Certificates at Level 4. An apprenticeship takes approximately 42 months to complete and involves job training, correspondence study and industry sponsored workshops. There are no other institutions that offer national certificate level 4 or equivalent qualifications for this occupation.
- 5.2.3 Total enrolments for this qualification have increased strongly from 297 in 2000 to 385 in 2005 (see Table 3). New enrolments have grown from 110 to 157 over

<sup>3</sup> Analysis of the Job Vacancy Monitor suggests that it is an indicator of change in labour market tightness, or change in the degree of difficulty of recruiting staff. An increase in vacancies typically indicates increasing difficulty in recruiting staff and vice versa. While changes in demand usually dictate changes in labour market tightness, it can also be affected by changes in supply conditions, such as a rise in net migration.

the same period. In 2005, the branches of specialisation which most newly enrolled trainees pursued included reel-fed (49%) and sheet-fed (40%).

*Table 3: Number of Trainees Enrolled for the National Certificate in Printing Level 4*

	<b>National Certificate in Printing Level 4 (PAITC)</b>	
	Total Enrolled	New Enrolments
<b>2000</b>	297	110
<b>2001</b>	316	143
<b>2002</b>	317	103
<b>2003</b>	351	135
<b>2004</b>	364	145
<b>2005</b>	385	157

Source: Printing and Allied Industries Training Council (PAITC).

*Table 4: Number of Trainees Achieving the National Certificate in Printing Level 4 and Other Qualifications<sup>4</sup>*

	<b>National Certificate in Printing Level 4 (PAITC)</b>	<b>National Certificate in Printing Level 3 (PAITC)</b>	<b>National Certificate in Printing Level 2 (PAITC)</b>	<b>Total</b>
<b>2000</b>	98	106	9	213
<b>2001</b>	106	88	10	204
<b>2002</b>	79	79	31	189
<b>2003</b>	73	102	29	204
<b>2004</b>	89	91	25	205
<b>2005</b>	110	79	17	206

Source: Printing and Allied Industries Training Council (PAITC).

5.2.4 In 2005, there were 110 new trainees who became qualified level 4 printing machinists (see Table 4). The number of achievements has varied each year since 2001. While the National Certificate Level 4 may be regarded as the qualification required to be a *fully qualified* printing machinist, there are other lower level printing qualifications available. Many trainees choose to pursue a national certificate level 2 or 3 qualification as part of their career development.

5.2.5 The training rates for printing machinists and all trades analysed by the Department are presented in Table 5. This indicator provides an approximate measure of the rate at which the supply of fully qualified printing machinist can potentially grow through training. The training rate is calculated by expressing the number of trainees achieving the relevant qualification as a percentage of total employment in the occupation. The training rate for printing machinists was estimated to be 1.7% in 2005 and averaged 1.6% between 2001 and 2005. The

<sup>4</sup> The National Certificate of Printing Level 2 and 3 figures include all printing and bookbinding specialisations. Direct comparisons with Level 4 figures should be made with caution as these figures only contain training specialisations directly related to the printing machinist occupation.

training rate in 2005 was considerably lower than the average training rate of 3.3% for all trades analysed by the Department.

*Table 5: Training Rate for Printing Machinists, 2001-2005*

	Printing Machinists	All Trades <sup>5</sup>
<b>2001</b>	2.0%	2.0%
<b>2002</b>	1.3%	2.2%
<b>2003</b>	1.3%	2.2%
<b>2004</b>	1.5%	2.7%
<b>2005</b>	1.7%	3.3%

Source: Department of Labour.

## 5.4 Migration

- 5.4.1 New Zealand has experienced a net migratory inflow of 61 *printing trades workers* in the four years to December 2005. These inflows, however, do not outweigh the migratory losses in the previous four-year period from 1998 to 2001, when 175 printing machinists left New Zealand (see Table 6). The net increase in the past four years has been mainly driven by decreases in the number of departures, rather than an increase in incoming migrants.

*Table 6: Permanent and Long-term Arrivals, Departures and Net Migration of Printing Trades Workers, 1998-2005 December Year End*

	1998	1999	2000	2001	2002	2003	2004	2005
<b>Arrivals</b>	117	115	86	127	135	132	95	106
<b>Departures</b>	168	156	167	129	113	103	98	93
<b>Net Migration</b>	-51	-41	-81	-2	22	29	-3	13

Source: External Migration, Statistics New Zealand. This data is only available at the broad (3-digit) occupational level of 'printing trades workers'. Printing machinists comprise a significant proportion (58% in the 2001 Census) of this broader parent group.

## 5.5 Retirements<sup>6</sup>

- 5.5.1 Based on 2001 Census data, it is estimated that approximately 1.2% of the printing machinist workforce retires each year (assuming a retirement age of 65). This is the equivalent of about 75 printing machinists annually. The average age of printing machinists in 2001 was 39. On average though, trainees enter this occupation at an older age than other trades. A Printing Industries New Zealand study found that in 2005 the average age of trainees was 30.

<sup>5</sup> The training rates for 'all trades' were calculated for the 14 trade occupations that were examined in-depth using data from the SERA Intensive 2005. As the composition of occupations being examined changes from year-to-year, so will the training rates.

<sup>6</sup> The printing machinist occupation was not classified in 1991 and 1996.

## 5.6 **Occupational Detachment**<sup>7</sup>

5.6.1 Employers in the printing trades were asked for their impressions of whether printing trade employees left the occupation to work in other trades more or less than in other occupations. Among the 20 employers responding, 12 thought they left at the same rate as in other occupations, two thought they left at a higher rate, and six thought they left at a lower rate. This finding suggests that there may be a small loss of printing machinists through occupational detachment.

## 6 **Matching of Supply and Demand**

6.1 This section considers some of the issues that arise from the labour market matching of the supply of printing machinists with the demand for printing machinists.

### 6.2 **Salaries**

6.2.1 Printing machinist wages are in line with wage rates of all trades workers. The Labour Cost Index (LCI) measured an average hourly wage of \$19.46 for printing machinists in June 2005 compared with an average wage for all trade workers of \$19.81 (see Table 7). According to the LCI, wages of printing machinists have increased by 4.0% in the twelve months to June 2005, compared with 4.8% in all trades.

*Table 7: Average Hourly Wage Rates for Printing Machinists*<sup>8</sup>

	2004	2005
<b>Printing Machinist</b>	\$18.71	\$19.46
<b>All Trades</b>	\$18.90	\$19.81

Source: Labour Cost Index, Statistics New Zealand.

6.2.2 The Printing Industries New Zealand study calculated that among its members, the average salary for a print operator was \$909 per week over the year. Regional and position-based considerations significantly determine the wage rates for print operators across New Zealand. Average wage rates were highest in Auckland (\$1,002) in comparison to Christchurch (\$857). While reel-fed labels press operators, for example, earn \$1,031 per week, wide format print operators on average only earn \$788.

## 7 **Assessment**

7.1 This section considers all the information presented in this report on employers' recruiting experiences, supply and demand trends, and matching issues, and

<sup>7</sup> 'Occupational detachment' refers to individuals who choose not to continue practising in their occupation but retain a connection to the occupation (e.g. move into a management or supervisory role, or retain professional registration), or who leave the occupation entirely (e.g. by changing occupation or withdrawing from the labour market).

<sup>8</sup> The data shown from the LCI are unadjusted mean hourly rates. Caution should be taken with interpreting this information due to the relatively small sample sizes, particularly at the occupational level. Furthermore, the LCI is designed to measure changes in, rather than the actual level of, wage and salary rates.

offers a view on whether there is a shortage of printing machinists and the type of shortage. A short-term outlook for the shortage situation is also offered.

7.2 The printing and publishing industry has been growing slowly since the early 1990s, while the employment of printing machinists and other printing trades workers has declined slightly over this period. The adoption of labour saving technology accounts for this slow decline in the demand for printing trades workers.

7.3 Training levels for printing machinists have been low since 2001. The average annual training rate between 2001 and 2005 was 1.6%, which was barely enough to compensate for retirements which occur at 1.2% per annum. There has been further loss in supply through net outward migration and some occupational detachment. The net effect of these supply forces is that the supply of printing machinists has declined over the past decade and a half. This decline has exceeded the decline in demand resulting in a **genuine skill shortage**. This shortage is relatively mild, as reflected in a fill rate of 61%.

#### **Box 1: Skill Shortage Definitions**

##### **Genuine Skill Shortage**

Occurs when employers have difficulties filling their job vacancies because there are not enough individuals with the required skills in the potential labour market to fill the positions on offer.

##### **Recruitment and Retention Difficulty**

Occurs when there is a considerable supply of individuals with the required skills in the potential labour market but they are unwilling to take up employment at current levels of remuneration and conditions of employment. Retention problems are often a major contributor to this condition.

7.4 The demand for printing machinists is expected to continue declining due to a slowing economy and the adoption of labour saving technology in the printing industry. Training levels may increase slightly due to a slow increase in the number of enrolments for the national certificate qualification over the past few years. Consequently, the Department foresees a slight easing in the shortage of printing machinists in the short term.

For queries regarding this report please contact [info@dol.govt.nz](mailto:info@dol.govt.nz).

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