

2005 Manpower Survey Report

Electrical And Mechanical Services Industry

機電工程業

二〇〇五年人力調查報告

Electrical And Mechanical Services Training Board

Vocational Training Council

職業訓練局

機電工程業訓練委員會

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Executive Summary of the  
Report on the 2005 Manpower Survey  
of the Electrical and Mechanical Services Industry

Objective

This survey was conducted in March 2005 to collect the latest manpower information of the electrical and mechanical services industry.

Coverage

2. The fieldwork of the manpower survey covered 1 172 establishments which were selected by a stratified random sampling method from a total of 9 124 establishments. These samples employed about 62% of the total workforce in the following sectors of the industry:

I. Electrical and Mechanical Engineering Sector

Contracting (E & M) Branch

Contractors dealing with electrical and mechanical systems and equipment include:

- (i) electrical wiring and fitting,
- (ii) lift/escalator installation and maintenance,
- (iii) air-conditioning/ventilation systems installation and maintenance,
- (iv) fire-alarm and fire-fighting equipment installation and maintenance,
- (v) electrical/mechanical equipment installation and maintenance, and
- (vi) electrical/ mechanical fitting works.

Servicing (E & M) Branch

Establishments providing electrical and mechanical services include:

- (i) aircraft engineering services,
- (ii) electric light and power,

- (iii) electrical fitting with water plumbing,
- (iv) railways and tramways,
- (v) electrical appliances repair,
- (vi) consulting of building services engineering companies,
- (vii) major trading companies of electrical products, equipment and systems having associated service workshops,
- (viii) major real estate management companies which have building services maintenance workers, and
- (ix) relevant divisions of government departments and educational institutions.

## II. Shipbuilding and Ship Repair Sector

Establishments providing shipbuilding, ship repair and related services include:

- (i) shipyards and boatyards, and
- (ii) shipping firms and fleet operators employing local shore-based technical staff, consulting firms, classification societies of ships, government agencies and educational institutions.

## III. Gas Sector

Establishments providing town gas and LP gas services include:

- (i) gas manufacturing and distribution companies,
- (ii) gas installation and maintenance companies,
- (iii) major trading companies of gas equipment having associated servicing workshops, and
- (iv) relevant divisions of government departments and educational institutions.

## Survey Findings

3. The Survey revealed that in March 2005, there were 54 861 workers employed in the principal jobs of electrical/mechanical engineering and related disciplines of the electrical and mechanical services industry in Hong Kong. Of these 54 861 workers, 50 268 workers (91.6%) were employed in the electrical and mechanical engineering sector, 2 794 workers (5.1%) in the shipbuilding and ship repair sector, and 1 799 workers (3.3%) in the gas sector. The survey also revealed that there were 26 973 workers of other disciplines working in the electrical and mechanical services industry in March 2005. Among the 26 973 workers, 21 832 workers were employed in the electrical and mechanical engineering sector, 3 804 workers in the shipbuilding and ship repair sector and 1 337 workers in the gas sector. As a whole, the electrical and mechanical services industry employed a total of 81 834 workers in March 2005.

### Electrical and Mechanical Engineering Sector

4. The distribution of workers by skill level and by branch of the electrical and mechanical engineering sector was as follows:

<u>Branch</u>	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
Contracting	2 817	4 364	17 374	1 959	26 514
Servicing	3 767	6 142	12 520	1 325	23 754
Sub-total	6 584	10 506	29 894	3 284	50 268
Percentage of total number of workers	13.1%	20.9%	59.5%	6.5%	100%

5. Employers in the electrical and mechanical engineering sector reported a total of 1 722 trainees and 1 254 vacancies, amounting to 3.4% and 2.5% respectively of the total manpower. Besides, employers forecasted that the sector would require a total of 52 288 technical workers by March 2006.

### Shipbuilding and Ship Repair Sector

6. The distribution of workers by skill level of the shipbuilding and ship repair sector was as follows:

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	307	490	1 871	126	2 794
Percentage of total number of workers	11%	17.5%	67%	4.5%	100%



7. At the time of the survey, the reported numbers of trainees and job vacancies in this sector were 102 and 11 respectively which represented 3.7% and 0.4% of the total number of workers. Employers anticipated that by March 2006, the number of technical workers would be 2 810.

### Gas Sector

8. The distribution of workers by skill level of the gas sector was as follows:

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	320	493	845	141	1 799
Percentage of total number of workers	17.8%	27.4%	47%	7.8%	100%

9. In March 2005, there were 69 trainees and only 4 vacancies in the gas sector, representing 3.8% and 0.2% of the total manpower. Employers forecasted that the total workforce by March 2006 would be 1 844.

### Projected Manpower Training Requirements

#### Electrical and Mechanical Engineering Sector

10. The survey findings showed a moderate average increase of 2.9% per annum in the overall technical manpower of electrical/mechanical engineering and related disciplines from year 2003 to 2005. By skill level, the average change per annum was 2.2% decrease in professional/technologist, 6.7% decrease in technician, 10% increase in tradesman/craftsman and 7.7% decrease in semi-skilled/general worker.

11. For the expansion of E&M facilities in the utility sector and the growth in construction projects for Hong Kong and Macao, the Training Board anticipates that there will be a slight increase on the demand for E & M workers in the electrical and mechanical engineering sector. Based on past and present survey data, the Training Board has computed the average annual training requirements of E & M manpower at the professional/ technologist, technician and tradesman/craftsman levels for year 2006 to 2008 as follow:

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2006-2008</u>
Professional/Technologist	6 584	234 – 290
Technician	10 506	374 – 463
Tradesman/Craftsman	29 894	1 064 – 1 316

## Shipbuilding and Ship Repair Sector

12. The survey revealed that from year 2003 to 2005, the overall technical manpower of this sector had a moderate increase of 3.7% per annum. The average change per annum by skill level was 5.5% decrease in professional/technologist, 12.5% increase in technician, 2.2% increase in tradesman/craftsman and 29.6% increase in semi-skilled/general worker.

13. The Training Board expects that the manpower requirements will have a slight increase in coming years. Based on past and present survey data, the Training Board has projected the likely average annual training requirements of E & M manpower for this sector from 2006 to 2008 as follow:

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2006-2008</u>
Professional/Technologist	307	19 – 24
Technician	490	30 – 38
Tradesman/Craftsman	1 871	115 – 143

## Gas Sector

14. The survey data indicated that the total manpower of the gas sector increased moderately at 2.6% per annum from year 2003 to 2005. By skill level, the average change per annum was 2.6% increase in professional/technologist, 41.9% increase in technician, 10.4% decrease in tradesman/craftsman and 13.7% increase in semi-skilled/general worker.

15. The Training Board anticipates that the demand for technical workers in the gas sector will have a slight increase in coming years. With 4 sets of manpower survey data available for using in manpower projection, the Training Board adopts adaptive filtering method (AFM) for deriving the average annual training requirements for year 2006 to 2008 as follows:

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2006-2008</u>
Professional/Technologist	320	12 – 15
Technician	493	19 – 24
Tradesman/Craftsman	845	32 – 41

## Major Conclusions and Recommendations

16. The Training Board's major conclusions and recommendations are summarised below:

(a) Training of Professionals/Technologists:

- (i) the projected provision of professionals/technologists will be slightly less than the projected training requirements of the major disciplines of the E&M engineering and gas sectors. However, the inadequacy will be supplemented by a source from workers at technician level who upgrade themselves to professional/technologist by part-time degree programmes.
- (ii) The small demand appeared in the shipbuilding and ship repair sector can be satisfied by graduates of mechanical engineering degree programmes.

(b) Training of Technicians:

- (i) the projected output of technician graduates in major disciplines of the E & M engineering sector and the gas sector matches with the market demand in the next few years.
- (ii) the projected figures of the output of graduates from training courses and the training requirements at technician level for the shipbuilding and ship repair sector matches with each other.

(c) Training of Tradesmen/Craftsmen:

- (i) the projected output of tradesmen/craftsmen graduates in key trades of the E & M engineering sector and the shipbuilding & ship repair sector will be less than the projected training requirements in coming years. However, there is an alternative route to attain the tradesman/craftsman qualification by receiving on-the-job training/skills upgrading training and pass of relevant trade tests.
- (ii) the supply of tradesmen/craftsmen meets the projected training requirement for the gas sector.

- (d) The projected training requirements for the three sectors of the electrical and mechanical services industry indicate the future training demand in terms of quantity only. Training providers should also take into account of enrolment and employment/placement results of their trainees/students when planning their training capacity.
- (e) Trade Tests and Intermediate Trade Tests - employers should follow the Government's lead by encouraging their workers to take the trade tests/intermediate trade tests.

## I. INTRODUCTION

### The Training Board

1.1 The Electrical and Mechanical Services Training Board of the Vocational Training Council is required by its terms of reference to determine the manpower demand of the electrical and mechanical services industry and to make recommendations to the Council for the development of training facilities to meet the demand. The Training Board comprises members nominated by major trade associations, trade unions, professional bodies, educational/training institutions and government departments. The Training Board's membership and terms of reference are listed in Appendices 1 and 2 respectively.

### The Survey

1.2 In pursuance of its terms of reference, the Training Board conducted a survey of the electrical and mechanical services industry in March 2005 to collect up-to-date manpower information with a view to assessing the industry's manpower requirements and training needs. The survey was carried out with the assistance of the Census and Statistics Department.

1.3 The following information was collected from the survey:

- (i) the number of employees at the time of the survey;
- (ii) employers' forecast of the number of employees by March 2006;
- (iii) the number of vacancies at the time of the survey;
- (iv) the number of employees under training; and
- (v) the average income of employees.

## Scope of the Survey

1.4 The survey covered the following sectors and branches of the industry:

I. Sector A : Electrical and Mechanical Engineering

Branch 1 : Contracting (E & M) Branch

Contractors dealing with electrical and mechanical systems and equipment include:

- (i) electrical wiring and fitting (HSIC : 5511);
- (ii) lift/escalator installation and maintenance (HSIC : 5513);
- (iii) air-conditioning/ventilation system installation and maintenance (HSIC : 5514);
- (iv) fire-alarm and fire-fighting equipment installation and maintenance (HSIC : 5515);
- (v) electrical/mechanical equipment installation and maintenance (HSIC : 5517); and
- (vi) electrical and mechanical fitting works (HSIC : 5518).

Branch 2 : Servicing (E & M) Branch

Establishments providing electrical and mechanical services include:

- (i) aircraft engineering services (HSIC : 3886);
- (ii) electric light and power (HSIC : 4111);
- (iii) electrical fitting with water plumbing (HSIC : 5512);
- (iv) railways and tramways (HSIC : 7112);
- (v) consulting of building services engineering (HSIC : 833404);
- (vi) electrical appliances repair (HSIC : 9512);
- (vii) major trading companies of electrical products, equipment and systems having associated servicing workshops;
- (viii) major real estate management companies which have building services maintenance workers; and
- (ix) relevant divisions of government departments and educational institutions.

## II. Sector B : Shipbuilding and Ship Repair

Establishments include:

- (i) shipyards and boatyards (HSIC : 3881 and 3882); and
- (ii) shipping firms and fleet operators employing local shore-based technical staff, consulting firms, classification societies of ships, government agencies and educational institutions.

## III. Sector C : Gas

Establishments include:

- (i) gas manufacturing and distribution companies (HSIC : 4112);
- (ii) gas installation and maintenance companies (HSIC : 5613);
- (iii) major trading companies of gas equipment having associated servicing workshops; and
- (iv) relevant divisions of government departments and educational institutions.

1.5 The survey covered a total of 9 124 establishments, including 8 611 establishments in the electrical and mechanical engineering sector, 336 in the shipbuilding and ship repair sector, and 177 in the gas sector. Of these 9 124 establishments, 9 015 were included in the Hong Kong Standard Classification (HSIC) listed in paragraph 1.4.

1.6 In view of the limited manpower available for the fieldwork, a stratified random sampling method was adopted to select 1 063 samples out of the 9 015 establishments in the HSICs. Together with 109 selected organisations, a total of 1 172 establishments were covered and about 62% of the total workforce of the industry were employed by them.

### Method of the Survey

1.7 Two weeks before the fieldwork, a questionnaire together with explanatory notes, and a description of the principal jobs and other survey documents (Appendices 15A, 15B and 15C) were sent to the chosen organisations.

1.8 During the fieldwork period, officers of the Census and Statistics Department visited the establishments by appointment to collect the completed questionnaires and to help employers complete them.

1.9 After the survey, the completed questionnaires were checked and, where necessary, verified with the respondents before being processed by the Census and Statistics Department. The survey data were scaled up by appropriate factors to reflect the overall manpower situation of various sectors in the electrical and mechanical services industry.

## Publicity

1.10 Prior notice of the survey was given through the local press. Relevant employers and trade associations were also requested to publicize the survey among their members.

## Survey Response

1.11 Of the 1 172 establishments, 901 supplied the information and 13 refused to do so. The remaining 258 had either closed, moved, or changed the nature of their business. The effective response rate was 98.6%

## The Manpower Survey Report

1.12 This full report presents the findings of the survey, the Training Board's forecast of the annual training requirements of various sectors in the electrical and mechanical services industry and recommendations on measures to meet the requirements. In this report, both the terms 'employees' and 'workers' refer to personnel engaged in the principal jobs, whereas the term 'trainees' includes both trainees under any form of training and apprentices.

1.13 After data collecting and processing, the Training Board mounted the 2005 manpower statistical report which presented a summary of the survey findings of the electrical and mechanical services industry on the web site of the Vocational Training Council in December 2005 for public access.



## II. SUMMARY OF SURVEY FINDINGS

### Number of Workers Employed

2.1 The survey revealed that in March 2005, a total of 54 861 workers were employed in the principal jobs of electrical/mechanical engineering and related disciplines in the electrical and mechanical services industry in Hong Kong. Of the 54 861 workers, 50 268 workers (91.6%) were employed in the electrical and mechanical engineering sector, 2 794 workers (5.1%) in the shipbuilding and ship repair sector, and 1 799 workers (3.3%) in the gas sector. The survey also revealed that there were 26 973 workers of other disciplines working in the electrical and mechanical services industry in March 2005. Among the 26 973 workers, 21 832 workers were employed in the electrical and mechanical engineering sector, 3 804 workers in the shipbuilding and ship repair sector and 1 337 workers in the gas sector.

### Electrical and Mechanical Engineering Sector

2.2 The distribution of workers according to job level in the two branches of the electrical and mechanical engineering sector was as follow:

<u>Branch</u>	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
Contracting	2 817	4 364	17 374	1 959	26 514
Servicing	3 767	6 142	12 520	1 325	23 754
Sub-total	6 584	10 506	29 894	3 284	50 268
Percentage of total number of workers	13.1%	20.9%	59.5%	6.5%	100%

2.3 The manpower statistics of the whole electrical and mechanical engineering sector are tabulated in Appendix 3 while that of its contracting and servicing branches are in Appendices 5 and 6.

2.4 At the time of the survey, there were 1 722 trainees under various forms of training in the electrical and mechanical engineering sector, representing 3.4% of the total workforce. Their distribution by job level was:

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Trainees</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	6 584	128	1.9%
Technician	10 506	356	3.4%
Tradesman/Craftsman	29 894	1 226	4.1%
Semi-skilled/General Worker	3 284	12	0.4%
Total	50 268	1 722	3.4%

2.5 Employers reported a total of 1 254 vacancies, representing about 2.5% of the total manpower of the electrical and mechanical engineering sector:

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Vacancies</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	6 584	91	1.4%
Technician	10 506	264	2.5%
Tradesman/Craftsman	29 894	888	3%
Semi-skilled/General Worker	3 284	11	0.3%
Total	50 268	1 254	2.5%

2.6 Employers forecasted a total of 52 288 E & M workers by March 2006 in the electrical and mechanical engineering sector, indicating a view of a moderate forecasted annual growth of 4%. Their distribution by job level would be:

<u>Job Level</u>	<u>Number of Workers at Time of Survey</u>	<u>Employers' Forecast on Number of Workers by March 2006</u>
Professional/Technologist	6 584	6 672
Technician	10 506	10 942
Tradesman/Craftsman	29 894	31 281
Semi-skilled/General Worker	3 284	3 393
Total	50 268	52 288

2.7 The distribution of trainees among the principal jobs, the number of vacancies at the time of survey and the forecasted number of workers by March 2006 at each principal job of the electrical and mechanical engineering sector are given in Appendix 3.

2.8 The monthly income range of the majority of E & M workers at each job level of the electrical and mechanical engineering sector was:

<u>Job Level</u>	<u>Monthly Income Range</u>
Professional/Technologist	\$25,001 - \$35,000
Technician	\$18,001 - \$25,000
Tradesman/Craftsman	\$9,001 - \$15,000
Semi-skilled/General Worker	\$6,001 - \$12,000

2.9 The distribution of E & M workers by their total monthly income range for each principal job of the electrical and mechanical engineering sector is tabulated in Appendix 4.

## Shipbuilding and Ship Repair Sector

2.10 The manpower statistics of the shipbuilding and ship repair sector are tabulated in Appendix 8. The distribution of E & M workers by job level of the shipbuilding and ship repair sector was as follow:

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	307	490	1 871	126	2 794
Percentage of total number of workers	11%	17.5%	67%	4.5%	100%

2.11 At the time of the survey, there were 102 trainees under various forms of training in the shipbuilding and ship repair sector, representing 3.7% of the total workforce. Their distribution by job level was:

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Trainees</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	307	2	0.7%
Technician	490	12	2.4%
Tradesman/Craftsman	1 871	88	4.7%
Semi-skilled/General Worker	126	-	-
Total	2 794	102	3.7%

2.12 Employers reported a total of 11 vacancies, representing about 0.4% of the total E & M workforce of the shipbuilding and ship repair sector:

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Vacancies</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	307	5	1.6%
Technician	490	1	0.2%
Tradesman/Craftsman	1 871	5	0.3%
Semi-skilled/General Worker	126	-	-
Total	2 794	11	0.4%

2.13 Employers forecasted a total of 2 810 E & M workers by March 2006 in the shipbuilding and ship repair sector, indicating a view of a marginal forecasted annual growth of 0.6%. Their distribution by job level was:

<u>Job Level</u>	<u>Number of Workers at Time of Survey</u>	<u>Employers' Forecast on Number of Workers by March 2006</u>
Professional/Technologist	307	312
Technician	490	492
Tradesman/Craftsman	1 871	1 880
Semi-skilled/General Worker	126	126
Total	2 794	2 810

2.14 The distribution of trainees among the principal jobs, the number of vacancies at the time of survey and the forecasted number of workers by March 2006 at each principal job of the shipbuilding and ship repair sector are given in Appendix 8.

2.15 The monthly income range of the majority of E & M workers at each job level of the shipbuilding and ship repair sector was:

<u>Job Level</u>	<u>Monthly Income Range</u>
Professional/Technologist	Over \$25,000
Technician	\$15,001 - \$25,000
Tradesman/Craftsman	\$9,001 - \$15,000
Semi-skilled/General Worker	\$9,001 - \$12,000

2.16 The distribution of E & M workers by their total monthly income range for each principal job of the shipbuilding and ship repair sector is tabulated in Appendix 9.

## Gas Sector

2.17 The manpower statistics of the gas sector are tabulated in Appendix 10. The distribution of E & M workers by job level of the sector was as follow:

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	320	493	845	141	1 799
Percentage of total number of workers	17.8%	27.4%	47%	7.8%	100%

2.18 At the time of the survey, there were 69 trainees under various forms of training in the gas sector, representing 3.8% of the total workforce. Their distribution by job level was:

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Trainees</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	320	-	-
Technician	493	-	-
Tradesman/Craftsman	845	69	8.2%
Semi-skilled/General Worker	141	-	-
Total	1 799	69	3.8%

2.19 Employers reported 4 vacancies at the time of the survey, representing about 0.2% of the total E & M manpower of the gas sector:

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Vacancies</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	320	-	-
Technician	493	1	0.2%
Tradesman/Craftsman	845	2	0.2%
Semi-skilled/General Worker	141	1	0.7%
Total	1 799	4	0.2%

2.20 Employers forecasted a total E & M workforce of 1 844 by March 2006 in the gas sector, indicating a view of a moderate forecasted annual growth of 2.5%. Their distribution by job level was:

<u>Job Level</u>	<u>Number of Workers at Time of Survey</u>	<u>Employers' Forecast on Number of Workers by March 2006</u>
Professional/Technologist	320	320
Technician	493	493
Tradesman/Craftsman	845	890
Semi-skilled/General Worker	141	141
Total	1 799	1 844

2.21 The distribution of trainees among the principal jobs, the number of vacancies at the time of the survey and the forecasted number of workers by March 2006 at each principal job of the gas sector are given in Appendix 10.

2.22 The monthly income range of the majority of E & M workers at each job level of the gas sector was:

<u>Job Level</u>	<u>Monthly Income Range</u>
Professional/Technologist	\$25,001 - \$35,000
Technician	\$12,001 - \$18,000
Tradesman/Craftsman	\$9,001 - \$15,000
Semi-skilled/General Worker	\$6,001 - \$12,000

2.23 The distribution of E & M workers by their total monthly income range for each principal job of the gas sector is tabulated in Appendix 11.

#### E & M Workers Working in Construction Sites

2.24 For assessing E & M workers participating in construction works, the Training Board conducted its fourth supplementary manpower survey in March 2005 to collect up-to-date manpower data of E & M workers working in construction sites. The collected data facilitated more comprehensive analysis of the manpower situation of the electrical and mechanical services industry. The supplementary survey covered all 795 building sites and 413 civil engineering and other sites recorded by the Census and Statistics Department at the time of the survey.

2.25 The supplementary survey revealed that there were 5 379 E & M workers of electrical/mechanical engineering and related disciplines working in the construction sites at the time of the survey. Of the 5 379 workers, 4 690 workers (87.2%) were employed in building sites and 689 workers (12.8%) in civil engineering and other sites. It is to note that the workforce covered by the supplementary survey has been included in the E & M engineering sector in the 2005 manpower survey of the electrical and mechanical services industry which was conducted on establishment basis in March 2005.



2.26 The distribution of workers by job level was as follow:

<u>Job Level</u>	<u>Number of Workers</u>	<u>Percentage of Total Number Employed</u>
Professional/Technologist	96 (202)	1.8%
Technician	415 (774)	7.7%
Tradesman/Craftsman	4 627 (6 312)	86%
Semi-skilled/General Worker	241 (412)	4.5%
<hr/>		
Total:	5 379 (7 700)	100%

(Figures in brackets are the corresponding data collected in the third supplementary manpower survey conducted in March 2003).

2.27 The manpower statistics of E & M workers working in construction sites are tabulated in Appendix 7.

## SECTION III

### OBSERVATIONS AND CONCLUSIONS

#### General

3.1 The Training Board has carefully examined the survey findings and considers that the data collected generally reflect the employment situation of the electrical and mechanical engineering sector, the shipbuilding and ship repair sector, and the gas sector of the electrical and mechanical services industry at the time of the survey.

#### Electrical and Mechanical Engineering Sector

3.2 In March 2005, the electrical and mechanical engineering sector employed a total of 50 268 E & M workers, representing a moderate average increase of 2.9% per annum when compared with 47 492 E & M workers found in the last survey conducted in March 2003. The distribution and comparison of the workforce by job level and by branch in 2003 and 2005 are shown in Table 3A below:

Table 3A: Distribution of E & M Workers in the  
Electrical and Mechanical Engineering  
Sector by Job Level and by Branch

<u>Job Level</u>	<u>Contracting Branch</u>	<u>Servicing Branch</u>	<u>Total</u>	<u>Average Annual Change in %</u>
Professional/Technologist	2 817 (3 586)	3 767 (3 297)	6 584 (6 883)	-2.2%
Technician	4 363 (5 153)	6 142 (6 919)	10 506 (12 072)	-6.7%
Tradesman/Craftsman	17 374 (13 152)	12 520 (11 533)	29 894 (24 685)	+10%
Semi-Skilled/General Worker	1 959 (2 397)	1 325 (1 455)	3 284 (3 852)	-7.7%
<b>Total</b>	26 514 (24 288)	23 754 (23 204)	50 268 (47 492)	
Average Annual Change in %	+4.5%	+1.2%	+2.9%	

Note:

Figures in brackets represent the corresponding numbers collected in the 2003 manpower survey.

## Manpower Changes of the E & M Engineering Sector

3.3 The figures indicate that there was a moderate average increase of 2.9% per annum in the overall employment of the electrical and mechanical engineering sector in the past two years. The professional/technologist and technician manpower had moderate decreases of 2.2% and 6.7% per annum respectively. On the other hand, the number of tradesmen indicated an apparent increase of 10% per annum. Regarding the semi-skilled worker/general worker level, the number of workers showed a decrease of 7.7% per annum.

3.4 The manpower changes of the E&M engineering sector from 1995 to 2005 are as follow:

<u>Year of Survey</u>	<u>Number of Workers Employed</u>		
	<u>Contracting Branch</u>	<u>Servicing Branch</u>	<u>Total</u>
1995 (adjusted)	21 479*	24 513*	45 992*
1997 (adjusted)	26 764*	25 935*	52 699*
1999	28 838	25 976	54 814
2001	23 889	23 910	47 799
2003	24 288	23 204	47 492
2005	26 514	23 754	50 268

\* Figures are adjusted in accordance with the scope of survey coverage adopted since the 1999 survey.

3.5 The manpower figures show that the manpower employed in the E&M engineering sector rose to a peak in year 1999 and then declined apparently until 2003. Following the upturn of the economy of Hong Kong and vicinity regions after 2003, the number of workers recorded a moderate rebound in the 2005 manpower survey. The figures also indicate that the fluctuation of the manpower of the contracting branch has been more apparently than that of the servicing branch.

3.6 The numbers of trainees in the E&M engineering sector surveyed in the manpower surveys since 1999 show a persistent decline. The percentages of the number of trainees of the number of workers employed dropped from 8.7% in 1999 to 3.4% in 2005. The changes on number of trainees in the sector are as follow:

<u>Year of Survey</u>	<u>Number of Workers Employed</u>	<u>Number of Trainees</u>	<u>Percentage of Workers</u>
1999	54 814	4 794	8.7%
2001	47 799	2 931	6.1%
2003	47 492	2 694	5.7%
2005	50 268	1 722	3.4%

### Business Outlook of the E & M Engineering Sector

#### Contracting Branch

3.7 As the HKSAR Government continues to implement the infrastructure projects, including the construction and extension of the new railway lines, the cross-border transport link and the new Central Government Offices building, there should be a steady demand of workers for the construction projects. In addition, the rapid development of infrastructure and building projects in Macao has also stimulated the demand of skilled workers of Hong Kong. However, the Training Board expects that by taking the stagnant situation of the property market of Hong Kong and the uncertainty of the volume of construction projects, there will be only a slight growth in the manpower requirements in the contracting branch of the E & M engineering sector in coming years.

#### Servicing Branch

3.8 The majority of workers in the servicing branch are engaged in maintenance and servicing of electrical and mechanical installations in buildings and utilities. Following the increase in the stock of buildings and the expansion of E & M facilities in the utility sector, the Training Board anticipates that there will be a steady additional demand for servicing and maintenance works in this branch. However, the increase in workload of the branch will be mostly absorbed by adoption of advanced equipment with less maintenance requirements and improvement of work productivity.

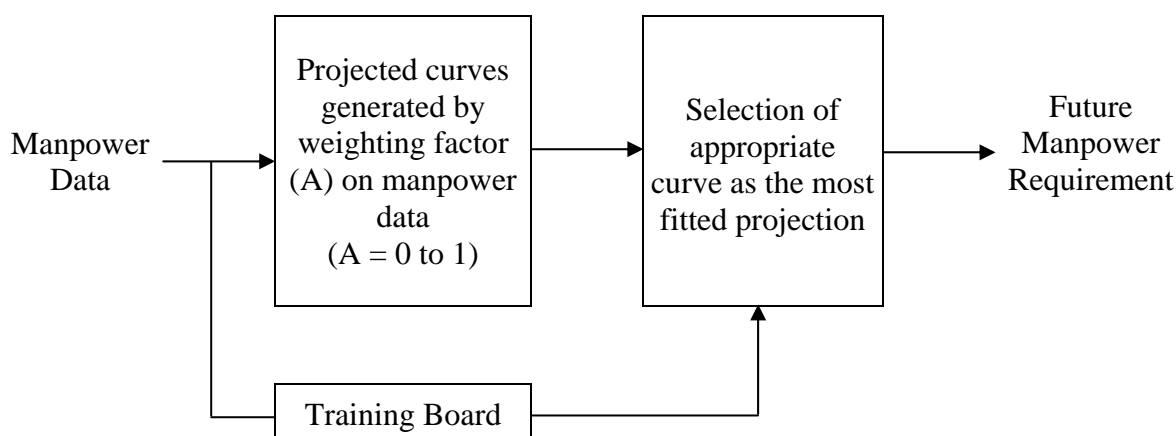
Reported Vacancies and Employers' One-year Forecast of the E & M Engineering Sector

3.9 Following the upturn of the local economy, the number of vacancies reported by employers at the time of the survey rose slightly. Employers were generally optimistic on the prospect of the sector as reflected by employers' one-year forecast:

<u>Skill Level</u>	<u>No. Employed in March 2005</u>	<u>Reported Vacancies</u>		<u>Employers' One-Year Forecast</u>
		<u>Number</u>	<u>Percentage</u>	<u>Number of Workers by March 2006</u>
Professional/Technologist	6 584	91	1.4%	6 672
Technician	10 506	264	2.5%	10 942
Tradesman/Craftsman	29 894	888	3%	31 281
Semi-skilled/General Worker	3 284	11	0.3%	3 393
<b>Total</b>	<b>50 268</b>	<b>1 254</b>	<b>2.5%</b>	<b>52 288</b>

Projected Manpower Training Requirements for the E&M Engineering Sector

3.10 In the previous manpower surveys of the E&M engineering sector, 'adaptive filtering method' was always adopted for projecting the future manpower requirements. The 'adaptive filtering method' (AFM) is a trend analysis technique. It is a 'curve fitting' method using weighting exponential smoothing. The method is illustrated in the following diagram:



Past manpower data are weighted. Heavier weightings are given to the data from more recent surveys. Thus the forecast is more dependent on the more recent manpower information. The degree of emphasis on the more recent survey data can however be varied by adjusting the weighting factor (A). Based on factors such as market trends, technological developments, and other social-economical factors, the Training Board decides on the most appropriate manpower projections.

3.11 In the 1997 and 2001 manpower survey, the Training Board adopted the ‘linear regression method’ (LRM) which was based on the correlation of the manpower with the construction costs of all types of buildings to project the manpower requirements of the contracting branch of the E&M engineering sector. The total future manpower requirements of the E&M engineering sector was established by aggregating the manpower projection of the contracting branch and the manpower projection of the servicing branch which was derived by AFM.

3.12 In the 2003 manpower survey, the Training Board adopted statistical modelling for projecting the manpower requirements for year 2004 to 2006. As a reference, the Training Board also used AFM to project the manpower requirements for comparison.

3.13 Statistical modelling (SM) in general comprises two main steps. The first step is ‘Diagnostic’: two sets of available economic indicators are tested to select determinants, which have direct impacts on establishing the model for forecasting manpower engaged in the sector under study. Set I comprises the nine core statistics of the National Accounts (e.g. Gross Domestic Products (GDP) and its components) of Hong Kong. These statistics provide information about general economic activities. Set II comprises 42 economic indicators with more detailed information about the economy. Such information includes building related activities, property, trade, and labour markets, etc. From these two sets of economic indicators, related determinants can be found. These determinants are then statistically tested for correlation (mutual dependence among determinants), multi-collinearity (interdependence among determinants), and orthogonality (independence among determinants) before they are grouped into principal components. The second step of statistical modelling is ‘Prognostic’: these groups of principal components are used to build and maintain the statistical models for manpower projection.

3.14 In the 2003 manpower survey, by applying the statistical modelling approach, a statistical model which was based on the correlation of the overall technical manpower employed in the E&M engineering sector with the principal component ‘Gross value of construction works on building at construction sites (GVCW.b)’ was developed. The principal component GVCW.b comprised a subset of determinants which included the ‘Gross domestic fixed capital formation’, ‘Total expenditure on building and construction’, ‘Total stocks of residential flats’, ‘Total stocks of non-residential flats’, ‘Total electricity consumption’ and ‘Total local consumption of gas’. The model could explain 84% variation of the manpower requirements at 5% level of significance (i.e. the coefficient of determination of the regression  $r^2 = 0.84$ , and the coefficient of correlation  $r = 0.92$ ).

3.15 For the 2005 manpower survey, the statistical modelling approach was tested to check the suitability of adoption for projecting the future manpower requirements of the E&M engineering sector of the E&M services industry. Unfortunately, as a result of changes of economic factors, the coefficient of determination of the regression  $r^2$  for the correlation of the overall technical manpower employed in the E&M engineering sector with the principal component GVCW.b for the 2005 manpower survey fell to 0.72 which was below the recommended criterion for application of 0.8.

3.16 With consideration of the uncertainty on the volume of construction projects and external factors, as well as the availability of manpower projection methods, the Training Board decides to adopt the 'adaptive filtering method' for projecting the future manpower requirements for the 2005 manpower survey.

3.17 In the E&M engineering sector, the percentages of technical workers of age over 50 collected in the surveys from 1997 to 2003 were steady in the range of 10.2% to 13.2%. Taking this percentage range and the working nature of the sector into consideration, the Training Board estimates the wastage rate to be 3%.

3.18 Based on the above considerations, the annual training requirements of manpower to cover the growth and the replacement for wastage at the professional/technologist, technician and tradesman/craftsman skill levels for year 2006 to 2008 for the E&M engineering sector are as follow:

<u>Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2006 - 2008</u>
Professional/Technologist	6 584	234 – 290
Technician	10 506	374 – 463
Tradesman/Craftsman	29 894	1 064 – 1 316

### Shipbuilding and Ship Repair Sector

#### Manpower Changes

3.19 The manpower changes at professional/technologist, technician and tradesman/craftsman levels of the shipbuilding and ship repair sector from 1992 to 2005 are as follow:

<u>Year of Survey</u>	<u>Professional/Technologist</u>	<u>Technician</u>	<u>Tradesman/Craftsman</u>	<u>Total Manpower</u>
1992	668	790	4 392	6 034
1994	659	825	3 966	5 641
1996	624	647	2 690	4 038
1999	407	513	1 844	2 849
2001	354	539	1 872	2 834
2003	344	387	1 791	2 597
2005	307	490	1 871	2 794

3.20 The figures indicate that the overall workforce of the sector had a moderate increase of 3.7% per annum in the past two years. The variation of the overall manpower has been moderate since 1999.

Business Outlook of the Shipbuilding and Ship Repair Sector

3.21 Following the drastic growth of the shipbuilding industry of Mainland China, the demand of technical and supporting services from the shipbuilding and ship repair sector of Hong Kong will increase. Besides, the growth of shipbuilding industry of Mainland China also brings regional advantages on ship repair and maintenance services to Hong Kong. However, technology advancement and productivity improvement will lessen the increase of manpower demand in this sector. The Training Board anticipates that the manpower requirements in the shipbuilding and ship repair sector of the E&M services industry will only have a slight rise in coming years.

Projected Manpower Training Requirements for the Shipbuilding and Ship Repair Sector

3.22 Considering the steady manpower trend, the Training Board continues to adopt the ‘adaptive filtering method’ (AFM) to project the manpower requirements in the shipbuilding and ship repair sector for 2006-2008.

3.23 With a consideration that the percentages of technical workers of age over 50 collected in the surveys from 1999 to 2003 were stable in the range of 34.1% to 37.3%. the Training Board continues to adopt a wastage rate of 6% for estimating its replacement demand.

3.24 Based on the above considerations, the Training Board has computed the average annual training requirements of E & M manpower for the shipbuilding and ship repair sector for 2006 to 2008 as follow:

<u>Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2006 - 2008</u>
Professional/Technologist	307	19 – 24
Technician	490	30 – 38
Tradesman/Craftsman	1 871	115 – 143



## Gas Sector

### Manpower Changes

3.25 The manpower changes at the three skill levels of the gas sector from the first survey in 1999 to this survey are as follow:

<u>Year of Survey</u>	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Total Manpower</u>
1999	298	304	1 088	1 820
2001	350	268	830	1 604
2003	304	245	1 052	1 710
2005	320	493	845	1 799

3.26 The figures show that the overall manpower of the gas sector had a moderate increase of 2.6% per annum in the past two years. The variation of the overall manpower has been moderate.

### Business Outlook of the Gas Sector

3.27 For this sector, the advancement of the piping renewal programme for towngas supply will bring some additional demand on technical manpower. Besides, the introduction of natural gas as the fuel for towngas production may also create a little increase on technical manpower demand for the maintenance of towngas generation plants. However, the increase will be relieved by the decrease in the demand for technical manpower as a result of technology advancement and productivity improvement in the sector. The Training Board expects that the demand for technical workers in the gas sector will have a slight increase in coming years.

### Projected Manpower Training Requirements for the Gas Sector

3.28 In view of insufficient data for applying manpower projection method reliably, the employers' 1-year forecasts on the number of workers were adopted in the previous three surveys for projecting the future manpower requirements of the sector. With the contribution of the 2005 manpower survey, there were 4 sets of manpower survey data available for using in manpower projection. By merits of moderate variation in overall manpower, the Training Board decides to adopt the 'adaptive filtering method' (AFM) to project the manpower requirements for 2006-2008.

3.29 By considering the finding in the previous surveys that the technical workers in the gas sector of age over 50 was in the range of 5.8% to 13.2%, it is recommended to take a wastage rate of 3% for projecting the future training requirements.

3.30 Based on the above considerations, the Training Board has projected the average annual training demand for manpower in the gas sector from year 2006 to 2008 as follow:

<u>Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2006 - 2008</u>
Professional/Technologist	320	12 – 15
Technician	493	19 – 24
Tradesman/Craftsman	845	32 – 41

3.31 The Training Board will conduct another manpower survey in 2007 to review and update the manpower requirements of the electrical and mechanical services industry.

## SECTION IV

### RECOMMENDATIONS

4.1 Following the upturn of the local economy, the E&M services industry recorded a moderate rebound in the past two years. On one hand, the Hong Kong economy has an optimistic outlook for the furthering CEPA, drastic growth of economy of Mainland China, rapid development of infrastructure and buildings in Macao and global economic growth. On the other hand, Hong Kong faces problems on structural change of local economy and stagnant local property market. With consideration on the economic situation and the business nature, the Training Board forecasts the demand for properly trained technical manpower for the three sectors of the electrical and mechanical services industry from 2006 to 2008 as follow:

- (i) E & M engineering sector: For the expansion of E&M facilities in the utility sector and the growth in construction projects for Hong Kong and Macao, there will be a slight increase in the demand for technical workers in the sector.
- (ii) Shipbuilding and ship repair sector: The drastic growth of the shipbuilding industry of Mainland China will bring a mild increase in the demand of technical manpower requirements in Hong Kong.
- (iii) Gas sector: The increase in demand for technical manpower for the advancement of piping renewal programme for town gas supply and the introduction of natural gas as the fuel for town gas production will be lessened by the decrease in demand for technical workers brought by technology advancement and productivity improvement. The overall demand for technical workers in this sector will only have a slight increase.

4.2 Manpower training is a long-term investment. To become a professional/technologist, a university graduate requires to receive 2 years recognised on-the-job training and a minimum of 2 years experience in a responsible position. For a technician or a tradesman/craftsman, the training normally takes 3 to 4 years. Properly trained manpower is particularly crucial when the industry is to satisfy the stringent requirements on quality and safety at work. If the industry is to secure an adequate supply of skilled manpower, the industry should embark on organised manpower training programmes at the scale recommended in paragraph 3.18, 3.24 and 3.30 respectively. The breakdowns into the principal jobs for the three sectors are given in Appendices 12, 13 and 14 respectively.

4.3 For manpower planning at the company level, employers should note that the total number of trainees (Appendices 12 to 14), when expressed in terms of existing manpower, represent average annual intake of trainees of about 4% of the number of professionals/technologists, technicians and tradesmen/craftsmen employed presently. Details of the annual intake percentage at various job levels are as follow:

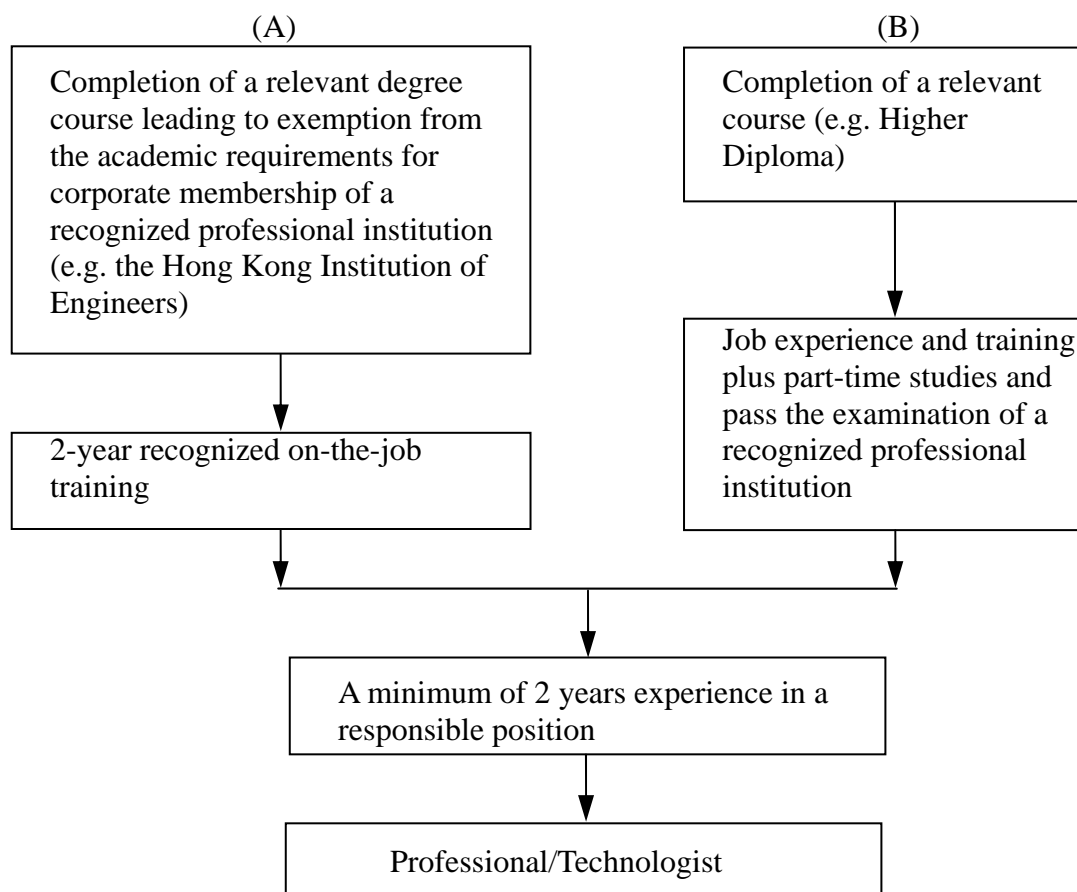
	<u>Professional/Technologist</u>	<u>Technician</u>	<u>Tradesman/Craftsman</u>
E & M Engineering Sector	4%	4%	4%
Shipbuilding and Ship Repair Sector	7%	7%	7%
Gas Sector	4%	4%	4%

#### Training of Professionals/Technologists

4.4 A professional/technologist is a person who has the qualification and experience required for corporate membership of a professional institution. He should be competent in analyzing and solving a wide range of technical problems. Furthermore, he should be able to assume personal responsibility for the development and application of engineering principles, to exercise original thought and judgement, to keep abreast of technology, to apply the latest techniques and to supervise/develop his sub-ordinates.

4.5 Professionals/technologists play an important role in bringing about improvements in management and technological innovations. The Training Board recommends that professional/technologists should be trained in the following manner:

Figure 4A: Training of Professionals/Technologists



4.6 The following tables show the projected average annual requirement from 2006 to 2008 as well as the projected number of graduates in local institutions for the major disciplines of the three sectors of the electrical and mechanical services industry. These tables intend to provide information on the possible supply of new entrants from local educational institutions to the industry. The number of graduates by disciplines who will join the industry are estimated separately by the Council and presented in its Demand and Supply Report on Technical Manpower of Major Hong Kong Industries.

E&M Engineering  
and Gas Sectors

Table 4A: Projected Average Annual Requirement of Professionals/Technologists in Major Disciplines of the E&M Engineering and Gas Sectors from 2006 to 2008

<u>Job Title</u>	<u>No. Employed at Date of Survey</u>	<u>Projected Average Annual Training Requirement</u>
Building Services Engineer	915	32 – 40
Electrical Engineer (E&M Engineering Sector) (Gas Sector)	2 098 22	75 – 92 1 – 1
Engineering Manager	430	15 – 19
Fire Services Engineer	325	12 – 14
Lift/Escalator Engineer	387	14 – 17
Mechanical Engineer (E&M Engineering Sector) (Gas Sector)	965 91	34 – 43 3 – 4
Refrigeration/Air-conditioning/ Ventilation Engineer	716	25 – 32
Gas Engineer (Gas Sector)	207	8 – 10
Building Services Engineer (Construction Industry)	1 087	41 – 45
	7 243	260 – 317

Table 4B: Projected No. of Local Universities Graduates from 2006 to 2008 (Degree Courses) for Major Disciplines of E&M Engineering and Gas Sectors  
(Sources: University Grants Committee and Graduation)

<u>Institution</u>	<u>Programme</u>	<u>Projected No. of Local Graduates</u>		
		<u>2006</u>	<u>2007</u>	<u>2008</u>
<u>Full-time Courses</u>				
City University of Hong Kong	B Eng (Building Services Eng)	51	41	52
HK Polytechnic University	B Eng (Electrical Eng)	23	20	21
	B Eng (Building Services Eng)	39	38	33
	B Eng * (Mechanical Eng)	19	20	15
HK University of Science & Technology	B Eng (Mechanical Eng (Building Services))	27	25	25
	B Eng * (Mechanical Eng)	30	25	27
The University of Hong Kong	B Eng (Building Services Eng)	19	19	19
	B Eng (Electrical Eng)	14	14	14
	B Eng * (Mechanical Eng)	29	29	29
	Total	251	231	235

Note

\* : It is assumed that 50% of B Eng graduates in mechanical engineering would join the electrical and mechanical services industry.

4.7 The figures in Tables 4A and 4B show that the output of local graduates from degree courses is slightly less than the projected training requirement of the major disciplines of the E&M engineering and gas sectors. However, the inadequacy will be supplemented by a source from workers at technician level who upgrade themselves to professionals/technologists by part-time degree courses.

#### Shipbuilding and Ship Repair Sector

4.8 Since the professional/technologist jobs in this sector declined for a long period in the last decade, there is no specific degree programme in marine engineering available in local universities. However, graduates from mechanical engineering degree programme can satisfy the small demand appeared in this sector.

#### Engineering Graduate Training Scheme (EGTS)

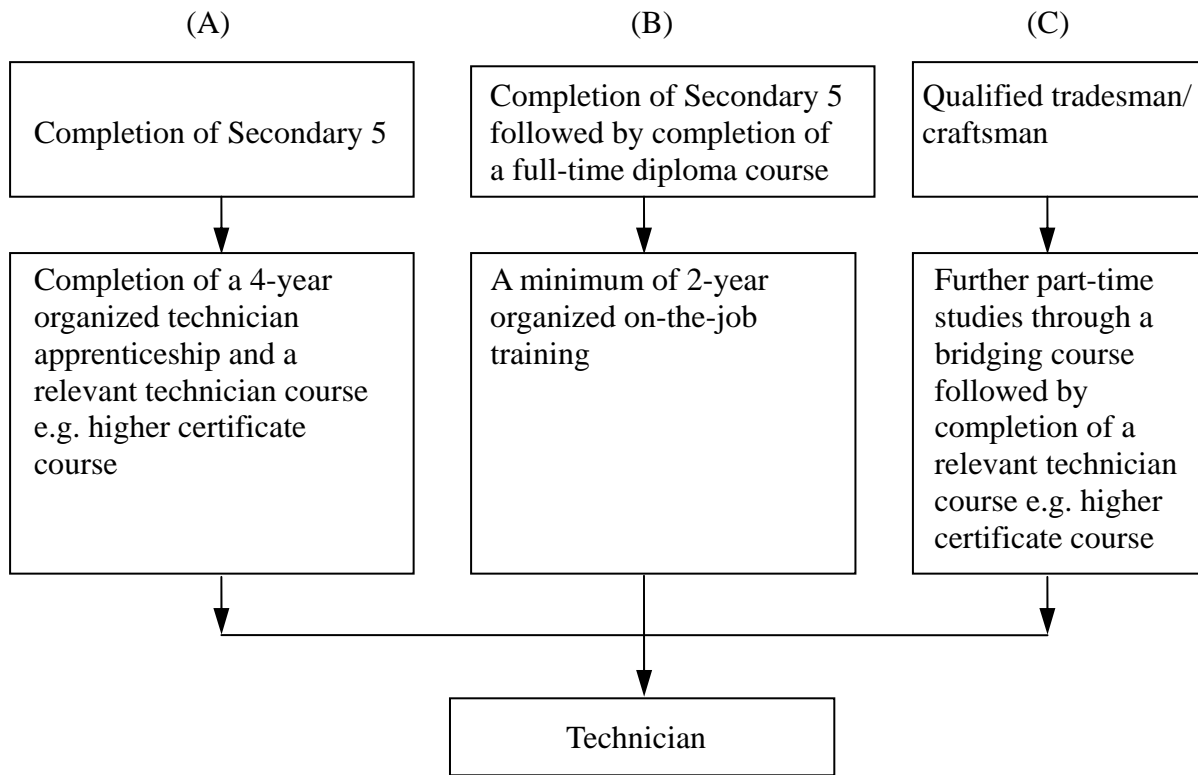
4.9 To bring about more well-structured practical training opportunities for engineering graduates, the Committee on Technologist Training of the Vocational Training Council is operating a subsidy scheme in providing engineering graduates with 18 months of practical training of a standard acceptable to the Hong Kong Institution of Engineers for corporate membership. Each graduate receiving training under the scheme is granted a subsidy through his employer as part of his salary. The Technologist Training Unit of the Council offers a free placement service to help employers recruit graduates and to provide assistance on all other matters concerning the training of engineering graduates. The Training Board strongly recommends employers to make use of the scheme in training their engineers.

#### Training of Technicians

4.10 A technician is one who occupies a position between the professional/technologist and the tradesman/craftsman. His education, training and practical experience enable him to apply proven techniques and procedures to carry out technical tasks, normally under the guidance of a professional/technologist.

4.11 The three normal routes for training technicians are listed below:

Figure 4B: Training of Technicians



4.12 The Hong Kong Institute of Vocational Education (IVE) of the Vocational Training Council offers full-time higher diploma/diploma courses and part-time day-release/part-time evening technician certificate courses in electrical engineering, air-conditioning engineering, building services engineering and marine engineering.

4.13 The Electrical Industry Training Centre of the Vocational Training Council also offers 1-year basic technician courses in electrical engineering, air-conditioning engineering, lift engineering and building services. Graduates of the courses are exempted from the first year of the technician apprenticeship in the relevant trades. Employers are urged to employ these graduates as technician/supervisor apprentices/trainees because they have received proper basic training before joining the industry.



## E & M Engineering and Gas Sectors

4.14 The projected average annual requirement and supply of technician from 2006 to 2008 for the E&M engineering and gas sectors are shown in the following tables:

Table 4C: Projected Average Annual Training Requirement of Technicians in Major Disciplines of the E&M Engineering and Gas Sectors from 2006 to 2008

<u>Job Title</u>	<u>No. Employed at Date of Survey</u>	<u>Projected Average Annual Training Requirement</u>
Building Services Technician	1 491	53 – 66
Draughtsman	509	18 – 22
Electrical Engineering Technician	1 828	65 – 80
Electrical Instrument & Meter Technician	70	2 – 3
Fire Services Technician	245	9 – 11
Lift/Escalator Technician	743	26 – 33
Mechanical Engineering Technician (E&M Engineering Sector)	1 135	40 – 50
(Gas Sector)	74	3 – 4
Refrigeration/Air-conditioning/ Ventilation Technician	761	27 – 34
Supervisor (E&M Engineering Sector)	1 792	64 – 79
(Gas Sector)	73	3 – 3
Office Equipment Service Technician	71	3 – 3
Gas Engineering Technician	346	13 – 17
	<hr/>	<hr/>
	9 138	326 – 405

Table 4D: Projected Local Supply of Technician Graduates for the E & M Engineering and Gas Sectors from 2006 to 2008  
(Sources: University Grants Committee and Graduation, and IVE Course Plan)

<u>Institution</u>	<u>Programme</u>	<u>Projected No. of Graduates</u>		
		<u>2006</u>	<u>2007</u>	<u>2008</u>
HK Polytechnic University	Higher Diploma (Building Services Eng.)+	26	26	26
	Higher Diploma (Electrical Eng.)+	17	15	15
City University of Hong Kong	Associate Degree (Building Services Eng.)+	45	41	39
IVE (VTC)	3-year Full-time Higher Diploma Courses:			
	- Building Services	133	70	150
	- Electrical Engineering	133	112	77
	- Mechanical Engineering*	57	62	43
	- Facilities Management	60	58	51
	- Aircraft Maintenance	47	47	94
	- E&M Services	-	-	51
	2-year Full-time Diploma Courses <sup>△</sup> :			
	- Building Services	59	-	-
	- Electrical Engineering	110	110	110
	Full-time Sub-total		687	641
2-year PTDR Certificate Courses:				
	- Building Services	40	32	21
	- Electrical Engineering	60	54	54
	PTDR Sub-total		100	86
Total		787	727	731

## Note

- △ Graduates from diploma courses may continue their study in higher diploma courses.
- + : It is assumed that 50% of higher diploma/associate degree programmes graduates from the universities would join the industry. The other 50% would continue their study in degree courses.
- \* : It is assumed that 50% of technician graduates in general mechanical engineering would join the E & M engineering and gas sectors.

4.15 From Tables 4C and 4D, it is noted that the output of graduates from technician courses in major disciplines of the electrical and mechanical engineering and gas sectors will be greater than the projected training requirement in coming years. However, a considerable proportion of graduates from the higher diploma/associate degree/diploma courses continued their study path for professional/technologist qualifications. By taking this factor into account, the supply of graduates from technician courses would match with the market demand. On the other hand, by virtue of their higher academic qualifications, graduates of technician courses from the IVE have good opportunities to enter the industry.

4.16 In view of small market size, there is no specific technician course in gas engineering offered by local institutions. The majority of existing engineering technicians in the gas sector were graduates from building services or mechanical engineering courses. The figures in Tables 4C and 4D indicate that the supply of gas technicians should be sufficient.

## Shipbuilding and Ship Repair Sector

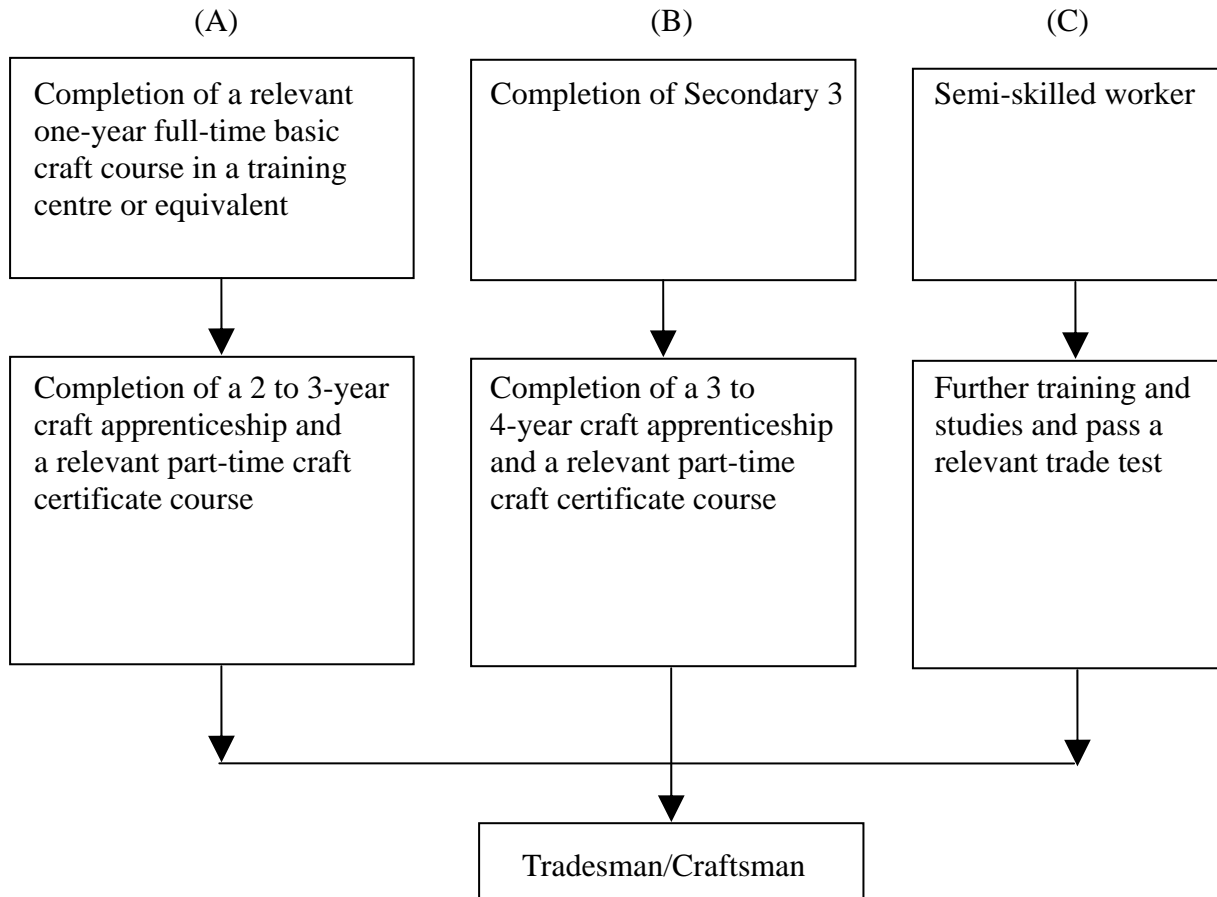
4.17 The projected average annual training demand of technicians for the sector from 2006 to 2008 is 34. On the supply side, the projected output from the Diploma in Maritime Studies course is 25. With the consideration that some technician jobs may be taken up by the graduates from technician courses of E&M disciplines, the supply will match with the market demand.

## Training of Tradesmen/Craftsmen

4.18 A tradesman/craftsman is a skilled worker in a particular occupation, trade or craft. He is expected to apply a wide range of skills to his work with minimum direction and supervision. He requires not only practical skills, but also related theoretical knowledge to enable him to adapt himself to new technologies. The Training Board recommends that young persons should join the apprenticeship scheme which ensures that they would receive the necessary practical training and technical education to become qualified tradesmen/craftsmen.

4.19 The common routes for training tradesmen/craftsmen are as follows:

Figure 4C: Training of Tradesmen/Craftsmen



4.20 The Training Board recommends route (A) because training period is shorter and the apprentices who have already undergone basic training will be productive right from the start of their apprenticeship.

4.21 Craft courses in various trades of the electrical and mechanical services industry are mainly offered by the Hong Kong Institute of Vocational Education and the Training Centres of the Vocational Training Council. Employers are urged to sponsor their apprentices/trainees and in-service workers to attend relevant courses.

4.22 The following tables show the projected average annual requirement and supply of tradesman/craftsmen in key electrical and mechanical trades from 2006 to 2008:

Table 4E: Projected Average Annual Training Requirement of Tradesmen/Craftsmen in Key E & M Trades from 2006 to 2008

<u>Job Title</u>	<u>No. Employed at Date of Survey</u>	<u>Projected Average Annual Training Requirement</u>
+Foreman/Chargehand	3 005	107 – 132
Electrician/Electrical Fitter (E&M Engineering Sector)	8 855	315 – 390
(Shipbuilding & Ship Repair Sector)	167	10 – 13
(Gas Sector)	25	1 – 1
+Fire Services Mechanical Fitter	882	31 – 39
+Fire Services Electrical Fitter	446	16 – 20
Refrigeration/Air-conditioning/ Ventilation Mechanic (E&M Engineering Sector)	5 386	192 – 237
(Shipbuilding & Ship Repair Sector)	75	5 – 6
+Lift/Escalator Mechanic	2 921	104 – 129
+Building Services Mechanic	1 141	41 – 50
Mechanical Fitter/Machinist (E&M Engineering Sector)	3 099	110 – 136
(Shipbuilding & Ship Repair Sector)	834	51 – 63
(Gas Sector)	28	1 – 1
+Cable Jointer (Power)	423	15 – 19
+Sheet Metal Worker/ Thermal Insulation Craftsman	161	6 – 7
+Overhead Linesman	252	9 – 11

<u>Job Title</u>	<u>No. Employed at Date of Survey</u>	<u>Projected Average Annual Training Requirement</u>
Plumber and Pipe Fitter (E&M Engineering Sector)	502	18 – 22
(Shipbuilding & Ship Repair Sector)	65	4 – 5
<sup>+</sup> Electrical Appliances Service Mechanic	525	19 – 23
	<hr/>	<hr/>
	28 792	1 055 – 1 304

Note

<sup>+</sup> : E&M Engineering Sector

Table 4F: Projected Local Supply of Craft Graduates in  
E&M Engineering Disciplines from 2006 to 2008  
(Sources : IVE Course Plans and  
Training Centres Course Plans)

<u>Institution</u>	<u>Programme</u>	<u>Projected No. of Graduates</u>		
		<u>2006</u>	<u>2007</u>	<u>2008</u>
Electrical Industry Training Centre (VTC)	1-year Full-time Basic Craft Certificate Courses in Electrical Engineering, Air-Cond. & Refrig., Lift Engineering, Bldg. Services and Fire Services	563*	468*	488*
IVE (VTC)	3-year PTDR Craft Certificate Courses in Electrical Engineering, Lift Maintenance & Repair, Air-Cond. & Refrig. and Building Services	325	334	334
<hr/>				
Total		888	802	822

Note

\* : Graduates from basic craft certificate courses may join apprenticeship and attend part-time craft certificate courses.

## E & M Engineering Sector

4.23 From Tables 4E and 4F, it is noted that the projected local supply of graduates from craft courses in key trades of the electrical and mechanical engineering sector will be less than the projected training requirement in coming years. However, there are many qualified tradesmen/craftsmen attained their qualifications through on-the-job training, skills upgrading training and pass of relevant trade tests.

## Shipbuilding and Ship Repair Sector

4.24 The skill requirements of tradesman/craftsman jobs in this sector are similar to those in the electrical and mechanical engineering sector. From Tables 4E and 4F, it is noted that the supply of tradesmen/craftsmen should be sufficient for the shipbuilding and ship repair sector from 2006 to 2008.

## Gas Sector

4.25 The projected average annual requirements of tradesmen/craftsmen of gas discipline from 2006 to 2008 and the projected supply are shown in Tables 4G and 4H.

Table 4G: Projected Average Annual Training Requirement of Tradesmen/Craftsmen of Gas Discipline from 2006 to 2008

<u>Job Title</u>	<u>No. Employed at Date of Survey</u>	<u>Projected Average Annual Training Requirement</u>
Gas Distribution Fitter (LPG)	39	1 – 2
Gas Distribution Fitter (Town Gas)	225	9 – 11
Gas Utilization Fitter (Domestic)	351	13 – 17
Gas Utilization Fitter (Non-domestic)	177	7 – 9
	792	30 – 39

Table 4H: Projected Local Supply of Craft Graduates  
in Gas Discipline from 2006 to 2008

<u>Institution</u>	<u>Programme</u>	<u>Projected No. of Graduates</u>		
		<u>2006</u>	<u>2007</u>	<u>2008</u>
Gas Industry Training Centre (VTC)	*1-year Full-time Basic Craft Certificate Courses in Gas Utilization	32*	32*	32*
	3-year PTDR Craft Certificate in Gas Services Engineering	32	32	32
Total		64	64	64

Note

\* Graduates from basic craft certificate course may join apprenticeship and attend the PTDR craft certificate course.

4.26 Tables 4G and 4H indicate that the projected output of tradesmen/craftsmen in gas discipline should meet the average annual projected training requirement in the next few years.

Training of Semi-skilled/General Workers

4.27 Semi-skilled/general workers are normally assigned to repetitive work requiring only a narrow range of skills and short period of training. In an increasingly competitive environment, it is imperative for employers to provide continuous on-the-job upgrading/updating training, and job enrichment to retain and raise the productivity of their semi-skilled/general workers. The Training Board recommends that the HKSAR Government should consider providing more resources for upgrading training of semi-skilled workers and unqualified craftsmen to improve their work quality and hence the safety and quality standard of work carried out by the electrical and mechanical services industry. The Skills Upgrading Scheme established in 2001 may help semi-skilled/general workers in the industry to upgrade their skills and technical knowledge with a view to improving their competitiveness and job security.



## Industry Training Centres of the Vocational Training Council

4.28 The Electrical Industry Training Centre, the Gas Industry Training Centre and the Welding Training Centre of the Vocational Training Council provide the following types of training and skill assessment for the electrical and mechanical services industry:

- (a) One year full-time basic training courses at technician and craft levels for new entrants of the industry.
- (b) One to three year multi-entry/multi-exit training courses on vocational studies in E&M disciplines.
- (c) Upgrading courses for upgrading and updating the knowledge and skills of in-service personnel in the industry.
- (d) Basic practical training for engineering students of the tertiary institutions and engineering graduate trainees.
- (e) Trade testing and intermediate trade testing for skill assessment of in-service workers.

## Trade Testing for Electricians

4.29 The Vocational Training Council has been operating a voluntary trade testing and certification system since 1989. The objectives of the trade testing are:

- (a) to help industry in the selection of workers,
- (b) to facilitate workers having had no formal training acquiring recognized qualifications,
- (c) to set standards for skilled workers and to enhance their status,
- (d) to facilitate the recognition of skill standards for licensing/registration purpose with the agreement of relevant authorities, and
- (e) to facilitate the establishment of skill hierarchy for the career advancement of skilled workers.

4.30 The Electrical and Mechanical Services Training Board is responsible for designing and conducting trade tests for electricians. The trade test certificate of electrician has been recognized by the government for the purpose of registration of Grade A and Grade R (Air-conditioning) electrical workers respectively.

4.31 Employers are urged to encourage their electricians to take the trade test so that their tradesman/craftsman status can be formally recognized.

#### E&M Trade Tests for Construction Workers

4.32 Under an Agreement with the Construction Industry Training Authority (CITA), the Vocational Training Council was appointed by the CITA as its agent to conduct the trade tests (TT) and intermediate trade tests (ITT) on 12 electrical and mechanical (E&M) construction trades for E&M construction workers at skilled and semi-skilled levels. The certificates for the TT and ITT are recognised as the qualifications for registration as qualified workers under the Construction Workers Registration Ordinance (CWRO).

4.33 E&M contractors for construction works are urged to encourage their E&M workers to take the tests and registration in order to meet the CWRO requirements.

#### New Technology Training Scheme (NTTS)

4.34 The New Technology Training Scheme provides financial assistance to local companies up to a maximum of 50% of the training cost for their employees to be trained in new technologies. The Scheme covers various types of training mode including overseas training courses or working attachments; and tailor-made local training courses/working attachments for individual companies. The Training Board recommends employers to make use of the Scheme for training their staff in new technologies.

#### Summary of Major Conclusions and Recommendations

4.35 The Training Board's major conclusions and recommendations are summarised below:

- (a) Training of Professionals/Technologists:
  - (i) the supply of professionals/technologists will be slightly less than the projected training requirements of the major disciplines of the E&M engineering and gas sectors (paragraph 4.7). However, the inadequacy will be supplemented by the a source from workers at technician level who upgrade themselves to professionals/technologists by part-time degree programmes. The small demand appeared in the shipbuilding and ship repair sector can be satisfied by graduates of mechanical engineering degree programmes (paragraph 4.8).

- (b) Training of Technicians:
  - (i) the projected output of technician graduates in major disciplines of the E & M engineering sector and the gas sector matches with the market demand in the next few years (paragraphs 4.15 and 4.16);
  - (ii) the projected figures of the output of graduates from training courses and the training requirements at technician level for the shipbuilding and ship repair sector matches with each other (paragraph 4.17).
- (c) Training of Tradesmen/Craftsmen:
  - (i) the projected output of tradesmen/craftsmen graduates in key trades of the E & M engineering sector and the shipbuilding & ship repair sector will be less than the projected training requirements in coming years (paragraphs 4.23 and 4.24). However, there is an alternative route to attain the tradesman/craftsman qualification by receiving on-the-job training/skills upgrading training and pass of relevant trade tests.
  - (ii) the supply of tradesmen/craftsmen meets the projected training requirement for the gas sector (paragraph 4.26)
- (d) The projected training requirements for the three sectors of the electrical and mechanical services industry indicate the future training demand in terms of quantity only. Training providers should also take into account of enrolment and employment/placement results of their trainees/students when planning their training capacity.
- (e) Trade Tests and Intermediate Trade Tests - employers should follow the Government's lead by encouraging their workers to take the trade tests/intermediate trade tests (paragraphs 4.31 and 4.33).

# 機電工程業

## 二〇〇五年人力調查報告摘要

### 目的

調查於二〇〇五年三月間進行，目的是蒐集機電工程業最新人力資料。

### 調查範圍

2. 調查採用分層隨機抽樣法，從 9 124 間機構選出 1 172 間作為調查對象，僱員數目約佔從業員總數的 62%，分屬下列行業及門類：

#### I. 機電工程行業

##### 機電工程承造門類

負責下列機電設備系統的承造商：

- (i) 電氣佈線及安裝；
- (ii) 升降機／自動梯安裝及保養；
- (iii) 空氣調節／通風系統的裝置及保養；
- (iv) 火警警報及消防設備的裝置及保養；
- (v) 機電設備安裝及保養；及
- (vi) 機電打磨裝配工程。

## 機電工程服務門類

提供下列機電工程維修服務的機構：

- (i) 飛機工程服務；
- (ii) 電燈及電力；
- (iii) 水電工程；
- (iv) 電車及鐵路運輸；
- (v) 電器修理；
- (vi) 屋宇設備工程服務；
- (vii) 經營電氣產品、設備與系統，並設有維修服務工場的主要貿易機構；
- (viii) 僱有屋宇設備保養人員的主要物業管理公司；及
- (ix) 有關政府部門及教育機構。

## II. 船舶修建行業

提供船舶修建及有關服務的機構：

- (i) 船廠及船排廠；及
- (ii) 聘用本地駐岸技術人員的船務公司及操作船隊機構；船舶顧問公司、船級協會、政府機構及教育院校。

## III. 氣體燃料行業

提供煤氣及石油氣服務的機構：

- (i) 煤氣製造及輸送公司；
- (ii) 氣體燃料設備裝設及保養公司；
- (iii) 經營氣體燃料設備，並設有維修服務工場的主要貿易機構；及
- (iv) 有關政府部門及教育機構。

## 調查結果

3. 調查顯示，於二〇〇五年三月時，在整個機電工程業中，從事機電工程工種及相關主要職務的僱員共有 54 861 人，其中 50 268 人（91.6%）屬機電工程行業，2 794 人（5.1%）屬船舶修建行業，1 799 人（3.3%）屬氣體燃料行業。調查又顯示，業內從事其他職務的僱員共有 26 973 人，其中 21 832 人在機電工程行業，3 804 人在船舶修建行業及 1 337 人在氣體燃料行業。整體而言，於二〇〇五年三月時，機電工程業僱員總數為 81 834 人。

## 機電工程行業

4. 機電工程行業兩個門類各技能等級僱員分佈情況如下：

<u>門類</u>	<u>專業人士／ 技師</u>	<u>技術員</u>	<u>技工</u>	<u>半技術工人／ 普通工人</u>	<u>總數</u>
承造	2 817	4 364	17 374	1 959	26 514
服務	3 767	6 142	12 520	1 325	23 754
小計	6 584	10 506	29 894	3 284	50 268
佔僱員總數 百分率	13.1%	20.9%	59.5%	6.5%	100%

5. 僱主填報，機電工程行業有受訓者 1 722 名及空缺 1 254 個，分別佔行業僱員總數的 3.4% 及 2.5%。此外，僱主預測至二〇〇六年三月時，機電工程行業將需各技能等級僱員 52 288 人。

## 船舶修建行業

6. 船舶修建行業各技能等級僱員分佈情況如下：

	<u>專業人士／ 技師</u>	<u>技術員</u>	<u>技工</u>	<u>半技術工人／ 普通工人</u>	<u>總數</u>
	307	490	1 871	126	2 794
佔僱員總數 百分率	11%	17.5%	67%	4.5%	100%

7. 於調查期間，業內有受訓者 102 名及空缺 11 個，分別佔行業僱員總數的 3.7% 及 0.4%。僱主預測至二〇〇六年三月時，船舶修建行業將有技術僱員 2 810 人。

## 氣體燃料行業

8. 氣體燃料行業各技能等級僱員分佈情況如下：

	<u>專業人士／ 技師</u>	<u>技術員</u>	<u>技工</u>	<u>半技術工人／ 普通工人</u>	<u>總數</u>
	320	493	845	141	1 799
佔僱員總數 百分率	17.8%	27.4%	47%	7.8%	100%

9. 於二〇〇五年三月時，業內有受訓者 69 名而空缺只有 4 個，約佔氣體燃料行業僱員總數的 3.8% 及 0.2%。僱主預測至二〇〇六年三月時，氣體燃料行業將有技術僱員 1 844 人。

## 推測未來人力訓練需求

### 機電工程行業

10. 調查顯示，二〇〇三至二〇〇五年間，整體機電工程及有關行業的技術人力平均每年溫和增長 2.9%。按技能等級劃分，平均每年專業人士／技師級人力下降 2.2%，技術員級下降 6.7%，技工級則增加 10%，而半技術工人／普通工人級下降 7.7%。

11. 基於香港和澳門公用事業的機電設施擴充，以及建築項目的增長，訓練委員會預計本行業對機電人手需求將會有輕微增長。根據以往及是次調查資料，本會計算二〇〇六至〇八年行業對各級技術人力平均每年訓練需求如下：

<u>技能等級</u>	<u>調查當日的 從業員數目</u>	<u>二〇〇六至〇八年 平均每年需訓練人手</u>
專業人士／技師	6 584	234 – 290
技術員	10 506	374– 463
技工	29 894	1 064 – 1 316

### 船舶修建行業

12. 調查顯示，於二〇〇三至二〇〇五年間，本行業整體技術人力溫和增長 3.7%。至於平均每年各技能等級人力變化，專業人士／技師下降 5.5%，技術員增加 12.5%，技工增加 2.2% 及半技術工人／普通工人增加 29.6%。

13. 本會預料這個行業的人力需求在未來數年會有輕微增長。根據以往及是次調查資料，本會計算二〇〇六至〇八年這個行業對機電人力平均每年訓練需求如下：



<u>技能等級</u>	<u>調查當日的從業員數目</u>	<u>二〇〇六至〇八年 平均每年需訓練人手</u>
專業人士／技師	307	19 – 24
技術員	490	30 – 38
技工	1 871	115 – 143

### 氣體燃料行業

14. 調查顯示，於二〇〇三至二〇〇五年間，本行業整體人力每年微升 2.6%。按技能等級，平均每年專業人士／技師數目增加 2.6%，技術員數目增加 41.9%，技工數目則下降 10.4%，而半技術工人／普通工人增加 13.7%。

15. 本會預計，這個行業在未來數年對技術人力需求將會有輕微增長。本會運用四套人力調查數據，採用「調節過濾法」推算二〇〇六至〇八年行業的人力訓練需求如下：

<u>技能等級</u>	<u>調查當日的從業員數目</u>	<u>二〇〇六至〇八年 平均每年需訓練人手</u>
專業人士／技師	320	12 – 15
技術員	493	19 – 24
技工	845	32 – 41

### 主要結論及建議摘要

16. 本會的主要結論及建議如下：

(a) 專業人士／技師訓練：

(i) 預計機電工程及氣體燃料學科專業人士／技師級畢業生的供應，將會輕微低於預計的培訓需求。然而，技術員通過進修兼讀學士課程，提升自己

成爲專業人士／技師，將可補足人手需求。

(ii) 機械工程學位課程的畢業生，當可應付船舶修建行業的小量需求。

(b) 技術員訓練：

(i) 未來數年機電工程及氣體燃料學科技術員課程畢業生，會與市場需求相符。

(ii) 船舶修建行業技術員培訓課程的畢業生預期人數，將與技術員的訓練需求相符。

(c) 技工訓練：

(i) 未來數年，機電工程及船舶修建學科技技工畢業生會求過於供。然而，另一個技工訓練途徑是接受在職培訓／技能提升培訓，並通過有關工藝測試而獲取技工專業資格。

(ii) 氣體燃料行業的技工人力供應，剛可應付預計訓練需求。

(d) 機電工程三個行業的預計訓練需求只以人數計算。訓練機構在制訂訓練名額時，應同時考慮報讀人數及學員／學生就業情況。

(e) 技能測驗及中級工藝測試 — 僱主應支持政府的政策，鼓勵僱員參加有關技能測試。

## 第一章

### 緒 論

#### 機電工程業訓練委員會

1.1 本訓練委員會隸屬職業訓練局，根據職權範圍，須定期調查機電工程業的人力需求，向職業訓練局提出發展訓練設施的建議，以應付業內所需。本會委員由各大行業公會、職工會、專業團體、教育／訓練機構及政府部門提名。本會委員名單及職權範圍分別載於附錄 1 及附錄 2。

#### 人力調查

1.2 本會按職權規定，於二〇〇五年三月進行機電工程業人力調查，蒐集最新人力資料，以評估業內的人力結構及訓練需求。是次調查由政府統計處協助進行。

1.3 是次調查收集以下資料：

- (i) 調查期間機電工程業僱員人數；
- (ii) 僱主預測至二〇〇六年三月時的僱員人數；
- (iii) 進行調查時的空缺數目；
- (iv) 調查期間正在受訓的僱員人數；及
- (v) 各工種的僱員平均薪金。

## 調查範圍

1.4 是次調查包括下列行業及門類：

### I. 行業 A：機電工程

#### 門類 1：機電工程承造門類

負責下列機電設備系統的承造商：

- (i) 電氣佈線及安裝(HSIC:5511)；
- (ii) 升降機／自動梯安裝及保養(HSIC:5513)；
- (iii) 空氣調節／通風系統的裝設及保養(HSIC:5514)；
- (iv) 火警警報及消防設備的裝設及保養(HSIC:5515)；
- (v) 機電設備安裝及保養(HSIC:5517)；及
- (vi) 機電打磨裝配工程(HSIC:5518)。

#### 門類 2：機電工程服務門類

提供下列機電工程維修服務的機構：

- (i) 飛機工程服務(HSIC:3886)；
- (ii) 電燈及電力(HSIC:4111)；
- (iii) 水電工程公司(HSIC:5512)
- (iv) 電車及鐵路運輸服務(HSIC:7112)；
- (v) 屋宇設備工程服務(HSIC:833404)；
- (vi) 電器修理(HSIC:9512)；
- (vii) 經營電氣產品、設備與系統，並設有維修服務工場的主要貿易機構；
- (viii) 僱有屋宇設備保養人員的主要物業管理公司；及
- (ix) 有關政府部門及教育機構。

## II. 行業 B：船舶修建

包括下列機構：

- (i) 船廠及船排廠(HSIC:3881、3882)；及
- (ii) 聘用本地駐岸技術人員的船務公司及操作船隊機構、船舶顧問公司、船級協會、政府機構及教育院校。

## III. 行業 C：氣體燃料

包括下列機構：

- (i) 燃氣製造及輸送公司(HSIC:4112)；
- (ii) 氣體燃料設備裝設及保養公司(HSIC:5613)；
- (iii) 經營氣體燃料設備，並設有維修服務工場的主要貿易機構；及
- (iv) 有關政府部門及教育機構。

1.5 是次調查覆蓋業內 9 124 間機構，包括機電工程行業 8 611 間機構、船舶修建行業 336 間機構，以及氣體燃料行業 177 間機構。9 124 間機構中，9 015 間列於第 1.4 段所述的香港標準行業分類(HSIC)內。

1.6 由於調查人手有限，本會遂採用分層隨機抽樣法，從香港標準行業分類所覆蓋的 9 015 間機構中，選出 1 063 間作為調查對象；加上 109 間特選機構，接受調查機構共有 1 172 間，僱員數目約佔業內僱員總數的 62%。

### 調查方法

1.7 進行調查前兩周，本會將調查表連同附註、各主要職務的工作說明，以及其他調查文件（見附錄 15A、15B 及 15C），寄予接受調查機構。

1.8 調查期間，政府統計處職員約晤接受調查機構，收集填妥的調查表，並協助僱主填寫表格。

1.9 調查完畢後，填妥的調查表由有關人員審核，並於需要時，與填表者覆核。調查資料隨後由政府統計處處理，所得數字用適當因數倍大，以反映機電工程業內各行業的人力概況。

### 宣傳

1.10 本會於調查進行前曾在本地報章宣傳，並致函籲請有關僱主協會及行業公會向其會員宣傳是次調查。

### 調查反應

1.11 1 172 間接受調查機構之中，901 間提供所需資料，13 間未有作覆。餘下的 258 間機構，或已結業、遷址，或轉營其他行業。調查的有效回應率為 98.6%。

### 人力調查報告

1.12 人力調查報告刊載調查結果、本會對機電工程業各門類的每年訓練需求預測，以及應付這些需求的建議。文中「僱員」及「從業員」均指從事機電工程業主要職務人士，而「受訓者」則指正在接受各種訓練的見習員或學徒。

1.13 資料經收集及處理後，輯成二〇〇五年人力統計報告，內載是次調查所得摘要。本會已於二〇〇五年十二月將人力統計報告上載職業訓練局網頁，供公眾閱悉。

## 第二章

### 調查結果摘要

#### 僱員人數

2.1 是次調查顯示，於二〇〇五年三月時，在整個機電工程業中，從事機電工程工種及相關主要職務的僱員共有 54 861 人，其中 50 268 人（91.6%）屬機電工程行業，2 794 人（5.1%）屬船舶修建行業，1 799 人（3.3%）屬氣體燃料行業。調查又顯示，業內從事其他職務的僱員共有 26 973 人，其中 21 832 人在機電工程行業，3 804 人在船舶修建行業及 1 337 人在氣體燃料行業。

#### 機電工程行業

2.2 機電工程行業兩個門類各技能等級僱員分佈情況如下：

門 類	專業人士／ 技師	技術員	技 工	半技術工人／ 普通工人	總 數
承造	2 817	4 364	17 374	1 959	26 514
服務	3 767	6 142	12 520	1 325	23 754
小計	6 584	10 506	29 894	3 284	50 268
佔僱員總數 百分率	13.1%	20.9%	59.5%	6.5%	100%

2.3 整個機電工程行業的人力統計數字，見附錄 3；承造及服務門類的人力統計數字，見附錄 5 及附錄 6。

2.4 調查期間，機電工程行業有 1 722 人接受各類訓練，佔總人力的 3.4%。按技能等級的分佈情況如下：

<u>技能等級</u>	<u>僱員人數</u>	<u>受訓人數</u>	<u>佔同級僱員 人數百分率</u>
專業人士／ 技師	6 584	128	1.9%
技術員	10 506	356	3.4%
技工	29 894	1 226	4.1%
半技術工人／ 普通工人	3 284	12	0.4%
總數	50 268	1 722	3.4%

2.5 僱主填報的空缺有 1 254 個，約佔機電工程行業僱員總數的 2.5%。各技能等級的空缺數目如下：

<u>技能等級</u>	<u>僱員人數</u>	<u>空缺數目</u>	<u>佔同級僱員 人數百分率</u>
專業人士／ 技師	6 584	91	1.4%
技術員	10 506	264	2.5%
技工	29 894	888	3%
半技術工人／ 普通工人	3 284	11	0.3%
總數	50 268	1 254	2.5%



2.6 僱主預測至二〇〇六年三月時，機電工程行業將有機電僱員 52 288 人，顯示 4% 的溫和年增長，按技能等級的分佈情況如下：

<u>技能等級</u>	<u>調查期間 僱員人數</u>	<u>僱主預測至 二〇〇六年 三月時僱員人數</u>
專業人士／ 技師	6 584	6 672
技術員	10 506	10 942
技工	29 894	31 281
半技術工人／ 普通工人	3 284	3 393
總數	50 268	52 288

2.7 在調查期間，機電工程行業各主要職務的受訓人數及空缺數目，以及預測至二〇〇六年三月時各工種的僱員人數，見附錄 3。

2.8 機電工程行業各技能等級的大部分機電僱員每月收入幅度如下：

<u>技能等級</u>	<u>每月收入幅度</u>
專業人士／ 技師	\$25,001 - \$35,000
技術員	\$18,001 - \$25,000
技工	\$9,001 - \$15,000
半技術工人／ 普通工人	\$6,001 - \$12,000

2.9 根據每月總收入幅度劃分的各主要職務僱員分佈情況，見附錄 4。

## 船舶修建行業

2.10 船舶修建行業的人力統計數字，見附錄 8。船舶修建行業各技能等級機電僱員分佈情況如下：

	專業人士／ 技師	技術員	技工	半技術工人／ 普通工人	總數
	307	490	1 871	126	2 794
佔僱員總數 百分率	11%	17.5%	67%	4.5%	100%

2.11 調查期間，業內有 102 人接受各類訓練，佔行業總人力的 3.7%。按技能等級的分佈情況如下：

技能等級	僱員人數	受訓人數	佔同級僱員 人數百分率
專業人士／ 技師	307	2	0.7%
技術員	490	12	2.4%
技工	1 871	88	4.7%
半技術工人／ 普通工人	126	-	-
總數	2 794	102	3.7%

2.12 僱主填報的空缺有 11 個，約佔船舶修建行業機電僱員總數的 0.4%。各技能等級的空缺數目如下：

技能等級	僱員人數	空缺數目	佔同級僱員人數百分率
專業人士／ 技師	307	5	1.6%
技術員	490	1	0.2%
技工	1 871	5	0.3%
半技術工人／ 普通工人	126	-	-
總數	2 794	11	0.4%

2.13 僱主預測至二〇〇六年三月時，船舶修建行業會有機電僱員 2 810 人，顯示 0.6% 的輕微年增長，按技能等級的分佈情況如下：

<u>技能等級</u>	<u>調查期間僱員人數</u>	<u>僱主預測至二〇〇六年三月時僱員人數</u>
專業人士／技師	307	312
技術員	490	492
技工	1 871	1 880
半技術工人／普通工人	126	126
總 數	2 794	2 810

2.14 在調查期間，船舶修建行業各主要職務的受訓人數及空缺數目，以及預測至二〇〇六年三月時各工種的僱員人數，見附錄 8。

2.15 船舶修建行業各技能等級的大部分機電僱員每月收入幅度如下：

<u>技能等級</u>	<u>每月收入幅度</u>
專業人士／技師	\$25,000 以上
技術員	\$15,001 - \$25,000
技工	\$9,001 - \$15,000
半技術工人／普通工人	\$9,001 - \$12,000

2.16 根據每月總收入幅度劃分的各主要職務僱員分佈情況，見附錄 9。

## 氣體燃料行業

2.17 氣體燃料行業的人力統計數字，見附錄 10。行業內各技能等級機電僱員分佈情況如下：

	專業人士／ 技師	技術員	技工	半技術工人／ 普通工人	總數
	320	493	845	141	1 799
佔僱員總數 百分率	17.8%	27.4%	47%	7.8%	100%

2.18 調查期間，業內有 69 人接受各類訓練，佔僱員總數的 3.8%。按技能等級的分佈情況如下：

技能等級	僱員人數	受訓人數	佔同級僱員 人數百分率
專業人士／ 技師	320	-	-
技術員	493	-	-
技工	845	69	8.2%
半技術工人／ 普通工人	141	-	-
總數	1 799	69	3.8%

2.19 僱主填報的空缺有 4 個，約佔氣體燃料行業機電僱員總數的 0.2%。各技能等級的空缺數目如下：

技能等級	僱員人數	空缺數目	佔同級僱員 人數百分率
專業人士／ 技師	320	-	-
技術員	493	1	0.2%
技工	845	2	0.2%
半技術工人／ 普通工人	141	1	0.7%
總數	1 799	4	0.2%

2.20 僱主預測至二〇〇六年三月時，氣體燃料行業將有機電僱員 1 844 人，顯示 2.5% 的溫和年增長。按技能等級的分佈情況如下：

<u>技能等級</u>	<u>調查期間 僱員人數</u>	<u>僱主預測至 二〇〇六年 三月時僱員人數</u>
專業人士／ 技師	320	320
技術員	493	493
技工	845	890
半技術工人／ 普通工人	141	141
總數	1 799	1 844

2.21 在調查期間，氣體燃料行業各主要職務的受訓人數及空缺數目，以及預測至二〇〇六年三月時各工種的僱員人數，見附錄 10。

2.22 氣體燃料行業各技能等級的大部分機電僱員每月收入幅度如下：

<u>技能等級</u>	<u>每月收入幅度</u>
專業人士／技師	\$25,001 - \$35,000
技術員	\$12,001 - \$18,000
技工	\$9,001 - \$15,000
半技術工人／ 普通工人	\$6,001 - \$12,000

2.23 根據每月總收入幅度劃分的各主要職務僱員分佈情況，見附錄 11。

## 地盤機電人力

2.24 為評估地盤機電人力狀況，在二〇〇五年三月，機電工程業訓練委員會進行第四次補充調查，蒐集地盤工作的機電僱員最新人力資料。收集得來的資料有助更全面地分析機電工程行業的人力狀況。補充調查包括調查期間政府統計處紀錄的所有 795 個屋宇地盤，以及 413 個土木工程及其他地盤。

2.25 補充調查顯示，二〇〇五年三月時，共有 5 379 名機電僱員在地盤從事機電工程工種及相關主要職務，其中 4 690 人（87.2%）在屋宇地盤工作，689 人（12.8%）在土木工程及其他地盤工作。補充調查的人力數據，已包括在本調查中的機電工程行業範圍內。

2.26 各技能等級僱員分佈情況如下：

<u>技能等級</u>	<u>僱員人數</u>	<u>佔僱員總數百分率</u>
專業人士／技師	96 (202)	1.8%
技術員	415 (774)	7.7%
技工	4 627 (6 312)	86%
半技術工人／普通工人	241 (412)	4.5%
總數	5 379 (7 700)	100%

（括弧內數字為二〇〇三年三月第三次補充調查所得的同類數據。）

2.27 地盤機電人力統計數字見附錄 7。

## 第三章

### 結論及總結

#### 概況

3.1 本會審閱是次調查結果後，認為所得資料大致能夠反映調查期間機電工程業內機電工程、船舶修建及氣體燃料行業主要職務的就業情況。

#### 機電工程行業

3.2 二〇〇五年三月時，機電工程行業僱員共有 50 268 人，與二〇〇三年三月調查所得的 47 492 人比較，平均每年溫和增長 2.9%。二〇〇三至二〇〇五年間，業內各門類及技能等級的技術人力分佈情況及比較如下：

表 3A：機電工程行業各門類及技能等級的機電人力分佈情況

<u>技能等級</u>	<u>承造門類</u>	<u>服務門類</u>	<u>總數</u>	<u>平均每年 變化百分率</u>
專業人士／ 技師	2 817 (3 586)	3 767 (3 297)	6 584 (6 883)	-2.2%
技術員	4 363 (5 153)	6 142 (6 919)	10 506 (12 072)	-6.7%
技工	17 374 (13 152)	12 520 (11 533)	29 894 (24 685)	+10%
半技術工人／ 普通工人	1 959 (2 397)	1 325 (1 455)	3 284 (3 852)	-7.7%
總 數	26 514 (24 288)	23 754 (23 204)	50 268 (47 492)	
平均每年變化百分率	+4.5%	+1.2%	+2.9%	

#### 附註：

括弧內為二〇〇三年人力調查數字。

## 機電工程行業的人力變化

3.3 數字顯示，機電工程行業在過去兩年的整體就業人數平均每年溫和增長 2.9%。不過，專業人士／技師及技術員人力分別平均每年下降 2.2% 及 6.7%。另一方面，技工人數每年顯著增長 10%，而半技術工人／普通工人則每年下降 7.7%。

3.4 在一九九五年至二〇〇五年期間，機電工程行業人力變化如下：

### 從業員人數

<u>調查年份</u>	<u>承造門類</u>	<u>服務門類</u>	<u>總數</u>
1995(經調整)	21 479*	24 513*	45 992*
1997(經調整)	26 764*	25 935*	52 699*
1999	28 838	25 976	54 814
2001	23 889	23 910	47 799
2003	24 288	23 204	47 492
2005	26 514	23 754	50 268

\* 有關數字根據自一九九九年採納的調查範圍作出調整。

3.5 人力數字顯示，機電工程行業僱用的人力於一九九九年攀升至高峰，其後顯著下跌，直至二〇〇三年為止。隨著二〇〇三年後香港及鄰近地區經濟上揚，於二〇〇五年的調查中，僱員數目輕微回升。數字亦顯示承造門類的人力較服務門類顯著波動。

3.6 自一九九九年，人力調查中機電工程行業的見習員人數持續下跌，所佔僱員人數的百分比由一九九九年的 8.7% 下降至二〇〇五年的 3.4%。行業內見習員人數的變化如下：



<u>調查年份</u>	<u>僱員人數</u>	<u>見習員人數</u>	<u>佔僱員人數的百分比</u>
1999	54 814	4 794	8.7%
2001	47 799	2 931	6.1%
2003	47 492	2 694	5.7%
2005	50 268	1 722	3.4%

## 機電工程行業的業務展望

### 承造門類

3.7 由於香港特區政府持續進行基建項目，包括興建和擴建新鐵路路線、跨境運輸連繫及新的政府總部大樓，預期對建築人手的需求穩定。此外，澳門的基建和樓宇項目急速發展，亦刺激對香港技術人手的需求。然而，鑑於香港物業市場呆滯，建築項目的數量不明朗，本會預期在未來幾年，承造門類的人力需求只有輕微增長。

### 服務門類

3.8 服務門類的大部分僱員從事維修及保養樓宇及公用設施的機電裝置及設備。隨著樓宇數量的增加及公用事業機電設施的擴充，本會預期維修及保養工程將會有穩定的新增需求。然而，該門類工作量的增長，大部分將會因採用先進設備，既減低維修需求又改善生產力，而有所抵銷。

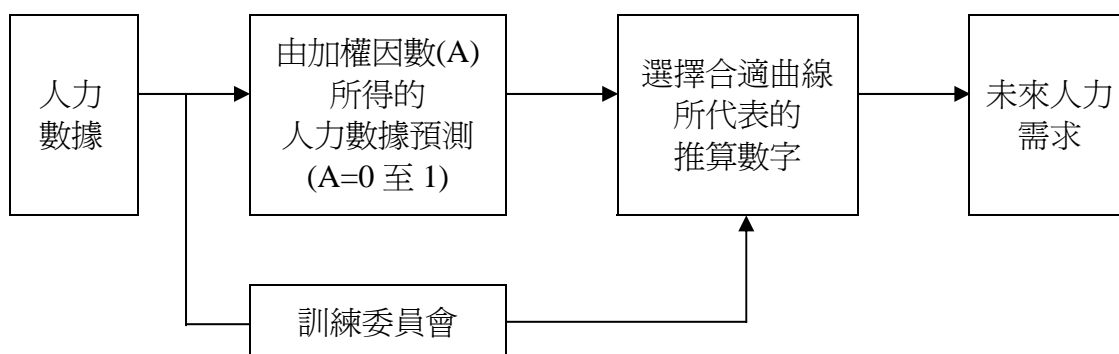
## 僱主填報的空缺數目及對未來一年的預測

3.9 隨著本地經濟上揚，調查期間僱主填報的空缺數目輕微上升。從未來一年僱員人數的預測可見，僱主一般對行業前景樂觀。

技能等級	二〇〇五年三月 的僱員人數	填報空缺數目		未來一年 僱員人數預測  至二〇〇六年 三月的僱員人數
		人數	百分率	
專業人士／ 技師	6 584	91	1.4%	6 672
技術員	10 506	264	2.5%	10 942
技工	29 894	888	3%	31 281
半技術工人／ 普通工人	3 284	11	0.3%	3 393
總 數	50 268	1 254	2.5%	52 288

### 機電工程行業的未來人力需求

3.10 機電工程行業人力調查以往均採用「調節過濾法」來推算未來人力需求。「調節過濾法」(adaptive filtering method)是趨勢分析的技巧，以加權指數平整法進行曲線擬合，如下圖所示：



這個方法是將過往調查所得人力數據加以權衡，愈新近的數據比重愈大，對預測結果影響亦較大；不過，所佔比重亦可由加權因數（A）控制。本會根據市場趨勢、技術發展及其他社會經濟因素，選定最合適的人力推算數字。

3.11 在一九九七年及二〇〇一年的人力調查中，本會採用「線性回歸法」(linear regression method)，找出人力需求與各類樓宇建築成本之間的關係，以推算出承造門類的人力需求；機電工程行業未來每年整體人力需求，由承造門類及服務門類的每年人力推算數字相加而成。

3.12 於二〇〇三年的人力調查中，本會採用統計模型分析法預測二〇〇四年至二〇〇六年的人力需求。本會亦採用調節過濾法預測人力需求，以作比較。

3.13 統計模型分析法一般包括兩個步驟。第一個步驟是「測試」：先測試兩組可用經濟指標以選定決定因子，這對設定有關行業人力預測模式有直接影響。第一組指標由本港國民帳戶 9 項核心統計數字（如：本地生產總值及其成分）組成。這些統計數字提供一般經濟活動的資料。第二組指標由 42 項提供更詳細經濟資料的經濟指標組成，包括與建築有關的活動、地產、貿易、人力市場等。從這兩組可用經濟指標找出決定因子，再以統計學方式測試這些因子的相關性（兩項因子之間是否互相依賴）、多共線性（多個因子之間是否互相依賴），以及因子之間是否各自獨立，互不相關。因子其後歸類為主要成分。統計模型分析法第二個步驟是「預報」：這些類別的主要成分用作建立和維持人力推算統計模型。

3.14 於二〇〇三年人力調查中，透過應用統計模型分析法，開發出統計模型，找出機電工程行業整體技術人力與主要成分「地盤樓宇建築工程總值(GVCW.b)」之間的關係。主要成分 GVCW.b 由分類更細的決定因子組成，包括「本地固定資本形成總額」、「建築總開支」、「住宅單位總存貨量」、「非住宅單位總存貨量」、「總耗電量」及「本地氣體總耗用量」。統計模型能解釋 84% 的人力需求變化，顯著水平為 5%（即：迴歸釐定系數  $r^2=0.84$ ，相關系數  $r=0.92$ ）。

3.15 就二〇〇五年人力調查而言，本會測試是否適合採用統計模型分析法推算機電工程業未來的人力需求。可惜，由於經濟因素的轉變，機電工程行業整體技術人力與主要成分「地盤樓宇建築工程總值」之間關係的迴歸釐定系數  $r^2$  下跌至 0.72，低於建議採用準則的 0.8。

3.16 鑑於建築項目的數量及外圍情況等的不明朗因素，以及可供使用的人力預測方法，本會決定，二〇〇五年人力調查採納「調節過濾法」，以預測未來的人力需求。

3.17 在機電工程行業內，由一九九七年至二〇〇三年的調查所蒐集的數據顯示，50 歲以上技術人員所佔的百分率穩定，介乎 10.2% 至 13.2%。考慮到上述百分比，以及行業的工作性質，本會估計流失率為 3%。

3.18 考慮到以上因素，機電工程行業在二〇〇六年至二〇〇八年，為應付增長和填補各級人力的流失，平均每年所需訓練人手如下：

技能等級	調查當日的 從業員人數	二〇〇六年至二〇〇八年 平均每年訓練需求
專業人士／技師	6 584	234 – 290
技術員	10 506	374 – 463
技工	29 894	1 064 – 1 316

## 船舶修建行業

### 人力變化

3.19 一九九二年至二〇〇五年間，這個行業各級的人力變化如下：

<u>調查年份</u>	<u>專業人士／技師</u>	<u>技術員</u>	<u>技工</u>	<u>總人力</u>
1992	668	790	4 392	6 034
1994	659	825	3 966	5 641
1996	624	647	2 690	4 038
1999	407	513	1 844	2 849
2001	354	539	1 872	2 834
2003	344	387	1 791	2 597
2005	307	490	1 871	2 794

3.20 調查顯示，過去兩年，本行業整體人力每年輕微上升3.7%。由一九九九年起，整體機電人力變化不大。

### 船舶修建業務展望

3.21 隨著中國內地造船業的急速增長，對香港船舶修建業的技術及支援服務需求將會上升。此外，內地造船業的增長亦為香港帶來船舶維修及保養服務的地區優勢。然而，先進的技術和生產力的改善，將會抵銷對這個行業人力需求的增長。預期船舶修建業的人力需求在未來幾年會有輕微增長。

### 船舶修建業的未來人力需求

3.22 考慮到人力將維持穩定，本會採用「調節過濾法」推算二〇〇六年至二〇〇八年的人力需求。

3.23 鑑於由一九九九年至二〇〇三年的調查中所蒐集的數據顯示，50歲以上的技術人員所佔的百分比維持穩定，介乎34.1%至37.3%，因此在本會預測補充人力需求時，仍將流失率定於6%。

3.24 考慮到以上因素，本會預測本行業機電人力在二〇〇六年至二〇〇八年，平均每年需要訓練人手如下：

<u>技能等級</u>	<u>調查當日的 從業員人數</u>	<u>二〇〇六年至二〇〇八年 平均每年訓練需求</u>
專業人士／ 技師	307	19 – 24
技術員	490	30 – 38
技工	1 871	115 – 143

### 氣體燃料行業

#### 人力變化

3.25 一九九九年氣體燃料行業首次進行人力調查至今，行業內三個技能等級人力變化如下：

<u>調查年份</u>	<u>專業人士／技師</u>	<u>技術員</u>	<u>技工</u>	<u>總人力</u>
1999	298	304	1 088	1 820
2001	350	268	830	1 604
2003	304	245	1 052	1 710
2005	320	493	845	1 799

3.26 調查顯示，過去兩年，本行業整體人力每年微升2.6%。由1999年至2005年，整體人力變化不大。

## 氣體燃料業務展望

3.27 就本業而言，煤氣公司加快進行喉管更新工程，將對技術人員產生額外的需求。此外，引入天然氣作為生產燃料，亦可帶來少量的維修廠房技術人力需求增長。不過，先進科技普及，工作效率提高，又令技術人力需求下降。預期氣體燃料行業未來幾年的技術人力需求將會輕微上升。

## 氣體燃料行業未來人力需求

3.28 由於數據不足，未能可靠運用人力預測方法，因此，過往三次調查均採用僱主對員工數目的一年預測，以預測本行業的未來人力需求。加上二〇〇五年人力調查，至今共有 4 套人力調查數據可用於人力預測。基於整體人力的溫和變化，本會決定採納「調節過濾法」，以推算二〇〇六年至二〇〇八年的人力需求。

3.29 以往調查結果顯示行業內有 5.8% 至 13.2% 的技術僱員超過 50 歲，本會在預測未來的訓練需求時，將流失率定於 3%。

3.30 考慮到以上因素，本會推算本行業人力在二〇〇六年至二〇〇八年，平均每年需要訓練人手如下：

<u>技能等級</u>	<u>調查當日的 從業員人數</u>	<u>二〇〇六年至二〇〇八年 平均每年訓練需求</u>
專業人士／技師	320	12 – 15
技術員	493	19 – 24
技工	845	32 – 41

3.31 本會將在二〇〇七年進行另一次機電工程業人力調查，以蒐集最新的人力資料。

## 第四章

### 建 議

4.1 過去兩年，隨著本地經濟上揚，機電工程業錄得輕微回升。內地與香港更緊密經貿關係安排、內地經濟急速增長、澳門基建和樓宇迅速發展，以及全球經濟增長，為香港的經濟前景帶來樂觀的一面。然而，香港須面對本地經濟的結構轉型，以及本港地產市道呆滯的問題。考慮到經濟狀況及機電工程業的業務性質，本會預測，二〇〇六年至二〇〇八年，機電工程業內的三個行業對幹練的技術人力需求如下：

- (i) 機電工程行業：擴建香港及澳門的公用事業機電設施和建築項目的增長，將令技術僱員需求輕微增加。
- (ii) 船舶修建行業：內地造船業急速發展，將為香港技術人力的需求帶來溫和的增長。
- (iii) 氣體燃料行業：雖然煤氣喉管更新工程計劃的提前及引入天然氣作為煤氣的生產燃料之計劃，將會增加技術人力的需求，但由於採用先進科技，工作效率得以提高，令技術人力需求下降，抵銷了相關人力需求的增長；整體技術人力的需求只會有輕微增長。

4.2 人力訓練是長遠的投資；一名大學畢業生要成為專業人士／技師，一般需要接受兩年認可在職訓練，以及最少兩年擔任要職經驗。訓練技術員或技工則需三至四年。本業尤其需要受過良好訓練的人力，才能達至工作質素及安全方面的嚴格要求。為確保有足夠的技術人員，本會建議業界根據第 3.18、3.24 及 3.30 段所列數字推行有系統的人力訓練方案。按三個行業各主要職務分類的有關數字，分別見附錄 12、13 及 14。



4.3 僱主進行人力策劃時，須注意附錄 12 至 14 所列的每年訓練人數，約分別佔目前專業人士／技師、技術員及技工人數的 4%。每年訓練人數佔各技能等級人數的百分率如下：

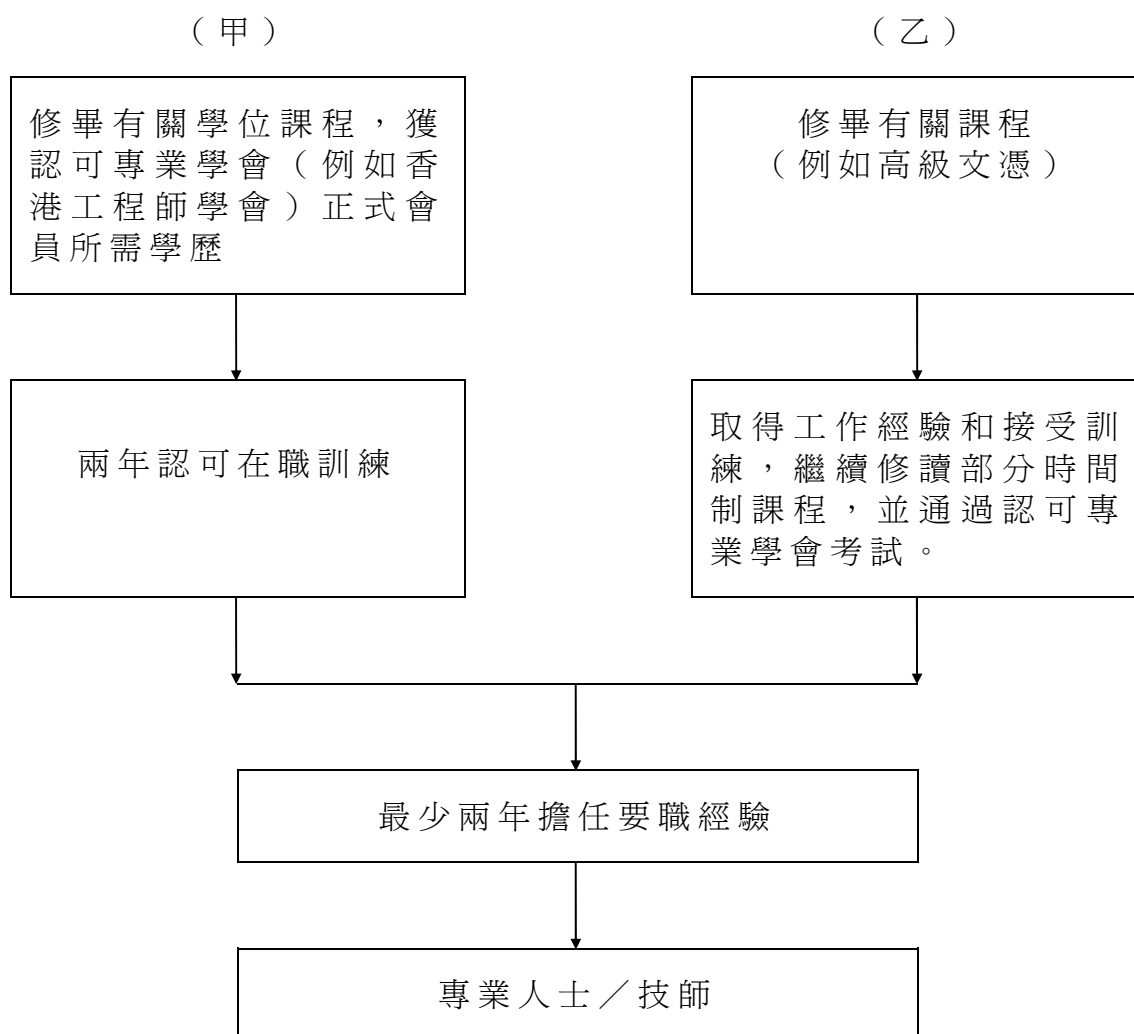
	<u>專業人士／技師</u>	<u>技術員</u>	<u>技工</u>
機電工程行業	4%	4%	4%
船舶修建行業	7%	7%	7%
氣體燃料行業	4%	4%	4%

#### 專業人士／技師訓練

4.4 要成為專業人士／技師，須具備有關專業學會正式會員所需的資歷及經驗，並能分析及解決各類技術上的問題。此外，亦須負責發展及應用工程原理，具創見和判斷力；與科技發展並進，應用最新技術，以及督導和培訓下屬。

4.5 在改進管理及發展新技術方面，專業人士／技師擔當十分重要的角色。本會建議下列訓練途徑：

圖 4A : 專業人士／技師訓練



4.6 下表分別列出機電工程業內三個行業二〇〇六至二〇〇八年間平均每年的預計訓練需求，以及本地院校有關學科的預計畢業人數。下表只提供來自本港院校的新入行人數。職業訓練局會按學科分類，估計入行的畢業生人數，並將這些資料刊載於《香港工業技術人力供求報告書》。

## 機電工程及氣體燃料行業

表 4A：機電工程及氣體燃料行業二〇〇六年至二〇〇八年間  
專業人士／技師主要職務平均每年預計訓練需求

職 稱	調查時的 僱員人數	平均每年 需訓練人數
屋宇設備工程師	915	32 - 40
電機工程師 (機電工程行業)	2 098	75 - 92
(氣體燃料行業)	22	1 - 1
工程經理	430	15 - 19
消防設備工程師	325	12 - 14
升降機／自動梯工程師	387	14 - 17
機械工程師 (機電工程行業)	965	34 - 43
(氣體燃料行業)	91	3 - 4
冷凝／空氣調節／ 通風設備工程師	716	25 - 32
氣體燃料工程師	207	8 - 10
屋宇設備工程師 (建造業)	1 087	41 - 45
	<hr/> 7 243	<hr/> 260 - 317

表 4B：預計二〇〇六年至二〇〇八年間  
本地機電工程及氣體燃料行業大學畢業生供應情況  
(資料來源：大學教育資助委員會畢業生統計數字)

<u>院 校</u>	<u>課 程</u>	<u>預計畢業生人數</u>		
		<u>2006</u>	<u>2007</u>	<u>2008</u>
<u>全日制課程</u>				
香港城市大學	工學士 (屋宇裝備工程學)	51	41	52
香港理工大學	工學士 (電機工程學)	23	20	21
	工學士 (屋宇裝備工程學)	39	38	33
	工學士* (機械工程學)	19	20	15
香港科技大學	工程學學士 (機械工程學(屋宇裝備))	27	25	25
	工程學學士* (機械工程學)	30	25	27
香港大學	工學士 (屋宇裝備工程學)	19	19	19
	工學士 (電機工程學)	14	14	14
	工學士* (機械工程學)	29	29	29
總數		251	231	235

註：

\* 假設 50% 的工程學士畢業生會投身機電工程業。

4.7 表 4A 及 4B 的數據顯示，本地大學相關學科畢業生人數，將會輕微低於預計的機電工程及氣體燃料培訓需求。然而，不足之數將由技術員通過修讀部分時間制學士課程，提升自己成為專業人士／技師而得以補足。

#### 船舶修建行業

4.8 由於業內專業人士／技師過去十年陸續減少，需求不大，本地大學沒有特別開辦輪機工程學位課程，機械工程學位課程畢業生的數目，應能應付有關需求。

#### 工科畢業生訓練計劃

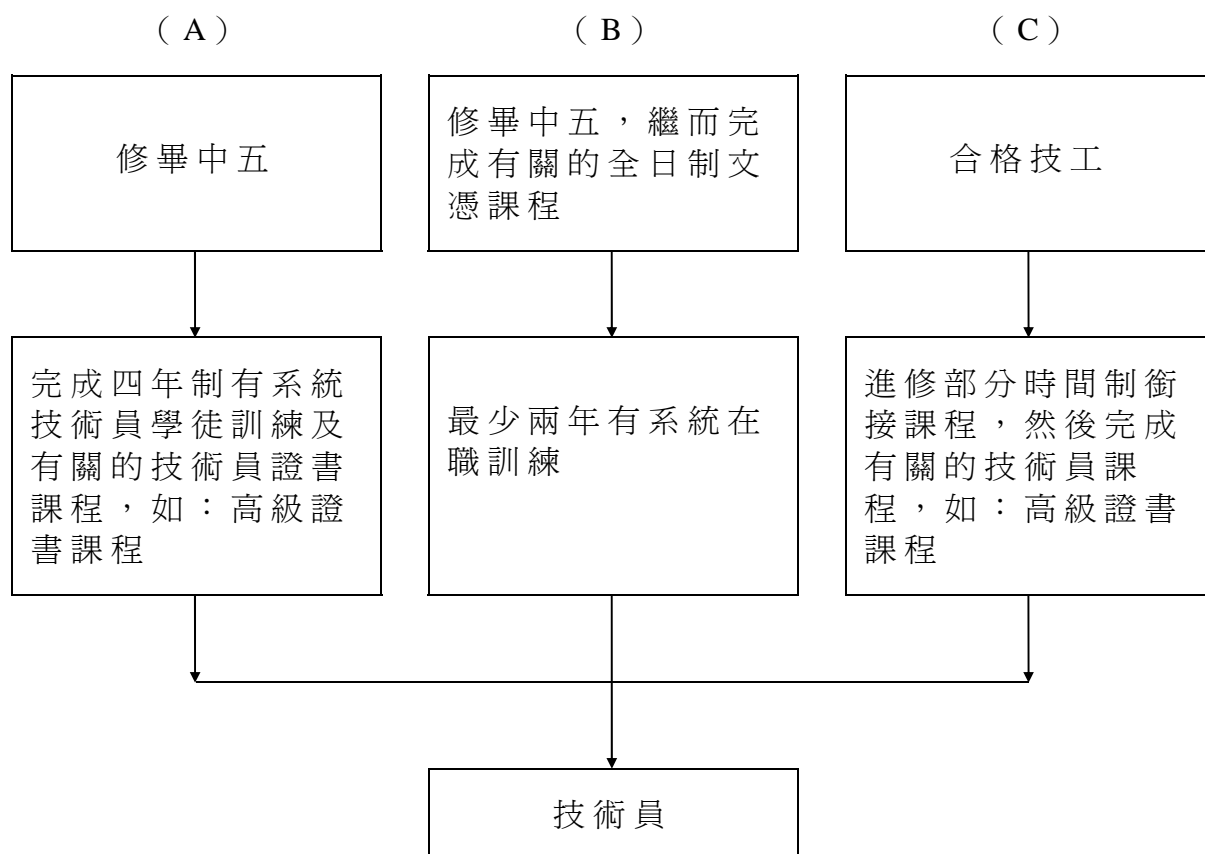
4.9 為使工科畢業生有更多機會接受有系統的實務訓練，職業訓練局屬下技師訓練委員會推行一項資助計劃，協助工科畢業生獲得為期十八個月的實務訓練，以符合香港工程師學會正式會員資格。受訓的畢業生可以獲得津貼，每月透過僱主發給，作為薪金的一部分。技師訓練組亦提供免費服務，協助僱主招聘畢業生，並就一切與工科畢業生訓練有關的事宜，提供協助。本會建議僱主利用這項計劃訓練其工程師。

#### 技術員訓練

4.10 技術員的職級介乎專業人士／技師與技工之間，具備相當學歷、工作經驗及曾接受訓練，一般可在專業人士／技師的督導下，運用已確立的技術和方法，完成工作。

4.11 訓練技術員的三種途徑如下：

圖 4B：技術員訓練



4.12 職業訓練局屬下香港專業教育學院(IVE)辦有電機、空氣調節、屋宇設備工程、輪機工程等全日制高級文憑／文憑課程、日間部分時間給假調訓制和夜學制技術員證書課程。

4.13 職業訓練局電機業訓練中心亦辦有一年制電機工程、空氣調節工程、電梯工程、屋宇裝備等基本技術員課程；畢業學員可獲豁免相關工種首年的技術員學徒訓練。本會籲請僱主聘請這些畢業生為技術員／管工 學徒／見習員，因為他們投身本業前，已接受適當的基本訓練。

## 機電工程及氣體燃料行業

4.14 二〇〇六年至二〇〇八年間，機電工程及氣體燃料兩個行業技術員平均每年的預計訓練需求，以及供應情況見下表：

表 4C：機電工程及氣體燃料行業二〇〇六年至二〇〇八年間  
技術員主要職務平均每年的預計訓練需求

職 稱	調查時的 僱員人數	平均每年 需訓練人數
屋宇設備技術員	1 491	53 - 66
繪圖員	509	18 - 22
電機工程技術員	1 828	65 - 80
電工儀器技術員	70	2 - 3
消防設備技術員	245	9 - 11
升降機／自動梯技術員	743	26 - 33
機械工程技術員 (機電工程行業)	1 135	40 - 50
(氣體燃料行業)	74	3 - 4
冷凝／空氣調節／ 通風設備技術員	761	27 - 34
監督 (機電工程行業)	1 792	64 - 79
(氣體燃料行業)	73	3 - 3
辦公室設備維修技術員	71	3 - 3
氣體燃料工程技術員	346	13 - 17
	<hr/> 9 138	<hr/> 326 - 405

表 4D：預計二〇〇六年至二〇〇八年間  
本地機電工程及氣體燃料行業  
技術員畢業生供應情況

(資料來源：大學教育資助委員會畢業生統計數字及  
香港專業教育學院課程計劃)

院校	課程	預計畢業生人數		
		2006	2007	2008
香港理工大學	高級文憑 (屋宇裝備工程學)†	26	26	26
	高級文憑 (電機工程學)†	17	15	15
香港城市大學	副學士 (屋宇裝備工程學)†	45	41	39
香港專業教育學院 (職業訓練局)	三年全日制高級文憑課程：			
	- 屋宇設備	133	70	150
	- 電機工程	133	112	77
	- 機械工程*	57	62	43
	- 設施管理	60	58	51
	- 飛機保養	47	47	94
	- 機電服務	-	-	51
	兩年全日制文憑課程△：			
	- 屋宇設備	59	-	-
	- 電機工程	110	110	110
全日小計		687	641	656
兩年部分時間 給假調訓制證書課程：				
- 屋宇設備	40	32	21	
- 電機工程	60	54	54	
部分時間給假調訓制小計		100	86	75
總數		787	727	731

註：

△ 文憑課程畢業生可升讀高級文憑課程。

† 假設 50% 的高級文憑／大學副學士課程畢業生會投身本業，其餘 50% 則會升讀學位課程。

\* 假設 50% 的機械工程技術員畢業生會投身機電工程及氣體燃料行業。



4.15 表 4C、4D 的數據顯示，未來幾年機電工程及氣體燃料學科技術員課程的畢業生人數，會供過於求。然而，高級文憑／副學士／文憑課程會有相當多畢業生繼續修讀專業／技師資格的課程。考慮到這個因素，畢業生的供應將能配合市場的需求。另一方面，香港專業教育學院技術員課程畢業生憑著較佳的學歷，仍有很好的入行機會。

4.16 由於市場規模小，本地院校並無開辦氣體燃料工程技術員課程。現職氣體燃料工程技術員，大部分為屋宇裝備或機械工程學科畢業生。表 4C、4D 的數據顯示，氣體燃料技術員的供應，足夠應付需求。

#### 船舶修建行業

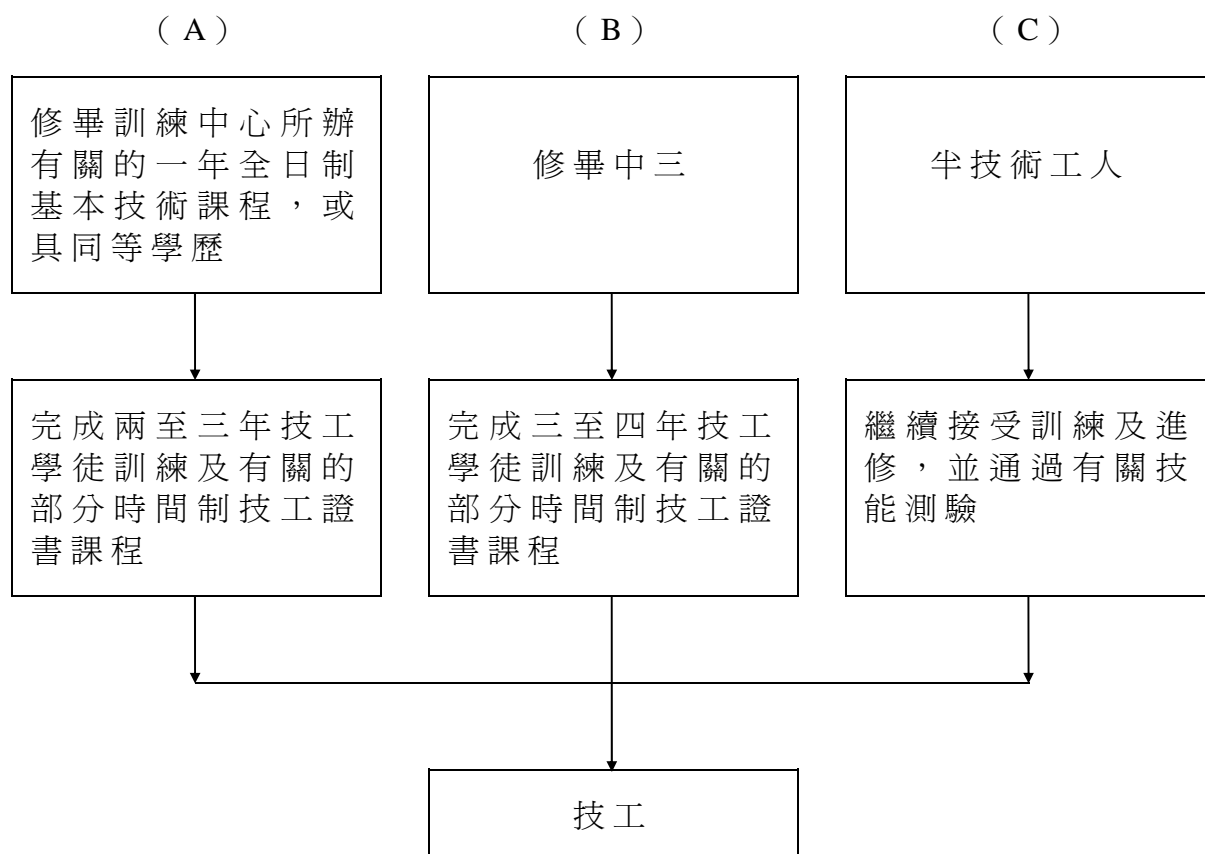
4.17 預測二〇〇六年至二〇〇八年業內每年對技術員的平均培訓需求為 34 人。供應方面，預期海事科技文憑課程的畢業生人數為 25 人。考慮到機電工程技術員課程的畢業生亦可能擔任這行業的技術員工作，供應將配合市場需求。

#### 技工訓練

4.18 技工是指熟練工人，能在有限度的指示及督導下，應用各種技能執行個別行業的職務。技工除須具備實際技能外，亦須有相關的理論知識，以便能適應日新月異的科技發展。本會建議青年人參加學徒訓練計劃，接受所需的實務訓練及專業教育，以成為合格技工。

4.19 訓練技工的一般途徑如下：

圖 4C：技工訓練



4.20 本會建議採用訓練途徑（A），因為訓練期較短，而且受聘者已接受過若干基本訓練，故在學徒訓練開始時，即能從事生產工作。

4.21 機電工程行業技工課程，主要由職業訓練局屬下香港專業教育學院及訓練中心提供。本會籲請僱主資助其學徒、見習員及員工修讀有關課程。

4.22 下列兩表為二〇〇六年至二〇〇八年間，機電行業技工主要職務平均每年需求及本地院校的人力供應預測：

表 4E : 二〇〇六年至二〇〇八年間機電行業  
技工主要職務平均每年預計訓練需求

職 稱	調查時的 僱員人數	平均每年 需訓練人數
+管工／領工	3 005	107 - 132
電工／電氣打磨裝配技工		
（機電工程行業）	8 855	315 - 390
（船舶修建行業）	167	10 - 13
（氣體燃料行業）	25	1 - 1
+消防機械裝配工	882	31 - 39
+消防電氣裝配工	446	16 - 20
空調／製冷設備技工		
（機電工程行業）	5 386	192 - 237
（船舶修建行業）	75	5 - 6
+升降機／自動梯技工	2 921	104 - 129
+屋宇設備技工	1 141	41 - 50
機械打磨裝配工／機床工		
（機電工程行業）	3 099	110 - 136
（船舶修建行業）	834	51 - 63
（氣體燃料行業）	28	1 - 1
+強電流電纜接駁技工	423	15 - 19
+薄片金屬構造工／保溫技工	161	6 - 7
+架空電線技工	252	9 - 11
喉管工		
（機電工程行業）	502	18 - 22
（船舶修建行業）	65	4 - 5
+電器用具維修技工	525	19 - 23
	28 792	1 055 - 1 304

註：

+ 機電工程行業

表 4F：預計二〇〇六年至二〇〇八年間  
本地機電工程學科技工畢業生供應情況  
(資料來源：香港專業教育學院及  
訓練中心課程計劃)

<u>院 校</u>	<u>課 程</u>	<u>預計畢業生人數</u>		
		<u>2006</u>	<u>2007</u>	<u>2008</u>
電機業訓練中心 (職業訓練局)	一年全日制基本技術證書 課程(電機工程、空氣調 節及冷凝、電梯工程、屋 宇設備及消防設備)	563*	468*	488*
香港專業教育學院 (職業訓練局)	三年部分時間給假調訓制 技工證書課程(電機工 程、電梯保養及修理、 空氣調節及冷凝、屋宇設 備)	325	334	334
總數		888	802	822

註：

\* 基本技術證書課程畢業生或會參加學徒訓練，並修讀部分時間制技工證書課程。

### 機電工程行業

4.23 表 4E、4F 的數據顯示，未來幾年，本地機電工程學科技工畢業生的數目，會供不應求。不過，許多合資格技工是透過在職訓練、技能提升訓練及通過相關技能測驗而取得行業所需的專業資格。

### 船舶修建行業

4.24 本行業技工職位的技能要求與機電工程行業相似。表 4E、4F 顯示，二〇〇六年至〇八年，行業內技工供應足以應付預計需求。

## 氣體燃料行業

4.25 二〇〇六年至二〇〇八年技工主要職務平均每年的推算訓練需求見表 4G、4H。

表 4G：二〇〇六年至二〇〇八年氣體燃料行業  
技工主要職務平均每年預計訓練需求

職稱	調查時的僱員人數	平均每年需訓練人數
氣體燃料輸送技工 (石油氣)	39	1-2
氣體燃料輸送技工 (煤氣)	225	9-11
氣體燃料用戶裝置技工 (住宅式)	351	13-17
氣體燃料用戶裝置技工 (非住宅式)	177	7-9
	792	30-39

表 4H：二〇〇六年至二〇〇八年間氣體燃料行業  
本地技工畢業生預計供應情況

院校	課程	預計畢業生人數		
		2006	2007	2008
氣體燃料業訓練中心 (職業訓練局)	*一年全日制氣體燃料設備基本技術證書課程	32*	32*	32*
	三年部分時間給假調訓制氣體燃料裝備工程技工證書課程	32	32	32
	總數	64	64	64

註：

\* 基本技術證書課程畢業生或會參加學徒訓練計劃，並修讀部分時間給假調訓制技工證書課程。

4.26 表 4G、4H 的數據顯示，未來幾年，氣體燃料行業技工主要職務的人力供應，與平均每年預計訓練需求相若。

#### 半技術工人／普通工人訓練

4.27 半技術工人／普通工人通常獲指派擔任性質重複的工作，要求的技能較少，訓練時間亦較短。現時市場競爭日趨激烈，僱主必須經常為這類員工提供在職增修訓練，豐富他們的工作內容，方可挽留員工，提高他們的質素。另一方面，本會建議，特區政府應考慮撥出更多資源，為半技術工人及未合資格的技工提供技能提升訓練，以改善他們的工作質素，從而提升機電工程業的質素及安全標準。技能提升計劃於二〇〇一年成立，有助業內半技術工人／普通工人提升技能和知識，增加競爭力和就業保障。

#### 職業訓練局工業訓練中心

4.28 職業訓練局屬下電機業訓練中心、氣體燃料業訓練中心及焊接業訓練中心，為有關的機電工程行業提供以下幾方面的訓練及技能鑒定：

- (a) 為有志入行者而設的一年全日制技術員或技工級基本訓練課程；
- (b) 提供一至三年多入讀點、多結業點的機電學科專業訓練課程；
- (c) 有助提升知識和技能的在職技能提升課程；
- (d) 專上院校工科生及工科畢業生基本實務訓練；
- (e) 鑒定從業員技能水平的技能測驗及中級工藝測試。

## 電工技能測驗

4.29 職業訓練局由一九八九年，推行自願參加性質的技能測驗及證書頒發制度，目的為：

- (a) 協助工業界選聘合適人才；
- (b) 使未受過正規訓練人士亦能取得認可資格；
- (c) 制定技術標準，並提高技術人員地位；
- (d) 取得有關當局同意，使技術人員所達至的技術標準獲得認可，以便發給牌照或准予註冊；
- (e) 設立技能等級，使技術人員有晉升機會。

4.30 機電工程業訓練委員會負責設計與推行電工技能測驗。電工技能測驗證書已獲政府認可，分別作為 A 級及 R 級（空氣調節）兩類電工註冊之用。

4.31 僱主應鼓勵屬下電工參加技能測驗，以便取得正式認可的技術資格。

## 建造業工人的機電技能測驗

4.32 與建造業訓練局達成的協議，職業訓練局獲委任為該局代理，為技術及半技術級的建造工程機電工人就 12 個機電建造類別進行技能測驗及中級工藝測試。技能測驗及中級工藝測試的證書，獲認可等同《建造業工人註冊條例》合資格工人註冊資格。

4.33 本會籲請建造工程的機電承辦商鼓勵工人參加測試及註冊，從而符合《建造業工人註冊條例》的規定。

## 新科技培訓計劃

4.34 新科技培訓計劃向本地僱主提供最高達訓練開支 50% 的資助，使他們可以讓僱員學習新科技。合資格申請的訓練方式包括：海外訓練或在職實習，以及為個別公司特設的本地課程／在職實習。本會建議僱主利用這項計劃，讓僱員學習新科技。

## 主要結論及建議

4.35 本會主要結論及建議如下：

(a) 專業人士／技師訓練：

- (i) 預計機電工程及氣體燃料學科專業人士／技師級畢業生的供應，輕微供不應求（第 4.7 段）。不過，不足之數將由技術員通過修讀部分時間制學士課程，提升自己成為專業人士／技師而得以補足。船舶修建行業的訓練需求很小，機械工程學位課程畢業生的供應，足可應付（第 4.8 段）。

(b) 技術員訓練：

- (i) 預測未來幾年機電工程及氣體燃料學科技術員課程的畢業生人數，將會與需求互相配合（第 4.15、4.16 段）。
- (ii) 預測船舶修建行業技術員的畢業生人數，將會與訓練需求互相配合（第 4.17 段）。



(c) 技工訓練：

(i) 未來幾年，機電工程及船舶修建學科技工畢業生，將會供不應求（第 4.23、4.24 段）。不過，另一個技工來源是在職員工透過在職訓練或技能提升訓練，並通過相關技能測驗，取得技工專業資格。

(ii) 氣體燃料行業的技工人力供應，可應付預計訓練需求（第 4.26 段）。

(d) 機電工程業內三個行業的預計訓練需求只以人數計算。訓練機構在制訂訓練名額時，應同時考慮報讀人數及學員／學生就業情況。

(e) 技能測驗及中級工藝測試 — 僱主應支持政府的政策，鼓勵僱員參加技能測驗及中級工藝測試（第 4.31 段及 4.33 段）。

Electrical and Mechanical Services Training Board

Membership

Chairman

Mr CHAN Lee-shing, William (nominated by the Hong Kong Electrical Contractors' Association Limited)

Vice-Chairman

Mr WONG Yiu-sun, Peter (nominated by the Hong Kong and Kowloon Electric Trade Association)

Members

Ir CHAN Kam-tim, Stephen (nominated by the Hong Kong and China Gas Company Limited)

Mr CHENG Cho-ying, Francis (nominated by an electricity supply company)

Dr CHEUNG Chow, Norbert (nominated by a local university)

Mr CHONG Kin-lit, Paul (nominated by the Hong Kong Electrical and Mechanical Contractors' Association Limited)

Mr CHU Yuk-ching (nominated by the Hong Kong and Kowloon Electrical Engineering and Appliances Trade Workers Union)

Ir HO Simon, Vincent (nominated by the Hong Kong Institution of Engineers)

Mr MAK Tsz-cheung (nominated by an ocean-going vessel repairing company)

Ir SYNN Cheung, Raymond (nominated by the Hong Kong Air Conditioning and Refrigeration Association Limited)

Mr SZETO Feat (nominated by a local craft repairing company)

Mr TANG Man-fai, Francis (nominated by the Association of Registered Fire Service Installation Contractors of Hong Kong Ltd.)

Mr WONG Wai-ho	(nominated by an electrical and mechanical consulting company)
Mr WONG Woon-chung	(nominated by an aircraft engineering company)
Mr YEUNG Sau-on, Tony	(nominated by an electric railway company)
Mr YIU Chow-leung	(nominated by a LP gas supply company)
Mr YU Bing-hon	(nominated by the Lift and Escalator Contractors Association)
Dr LEUNG Kin-man	(representative of the Director of Electrical and Mechanical Services)
Mr YEUNG Kar-lung	(representative of the Commissioner for Labour)
Mr CHU Kwai-luen, Albert	(representative of the Executive Director of the Vocational Training Council)

Secretary

Mr TSANG Hing-lok, Edward	(Vocational Training Council)
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機電工程業訓練委員會  
委員名單

主席：

陳理誠先生 (香港電器工程商會有限公司提名)

副主席：

黃耀新先生 (港九電業總會提名)

委員：

陳錦添工程師 (香港中華煤氣有限公司提名)  
鄭祖瀛先生 (一間電力公司提名)  
張宙博士 (一間本地大學提名)  
莊堅烈先生 (香港機電工程商聯會提名)  
朱育青先生 (港九電器工程電業器材職工會提名)  
何世傑工程師 (香港工程師學會提名)  
麥子祥先生 (一間遠洋輪船維修公司提名)  
冼泳霖工程師 (香港空調及冷凍商會有限公司提名)  
司徒法先生 (一間本地船隻維修公司提名)  
鄧文輝先生 (香港註冊消防工程公司商會有公司提名)  
黃懷豪先生 (一間電機及機械工程顧問公司提名)  
黃煥松先生 (一間飛機工程公司提名)  
楊壽安先生 (一間電氣化鐵路公司提名)  
姚秋樑先生 (一間石油氣供應商提名)  
余秉康先生 (電梯業協會提名)  
梁建民博士 (機電工程署署長代表)  
楊家龍先生 (勞工處處長代表)  
朱桂鑾先生 (職業訓練局執行幹事代表)

秘書：

曾慶樂先生 (職業訓練局)

Electrical and Mechanical Services Training Board

Terms of Reference

1. To determine the manpower demand of the industry, including the collection and analysis of relevant manpower and student/trainee statistics and information on socio-economic, technological and labour market developments.
2. To assess and review whether the manpower supply for the industry matches with the manpower demand.
3. To recommend to the Vocational Training Council the development of vocational education and training facilities to meet the assessed manpower demand.
4. To advise the Hong Kong Institute of Vocational Education (IVE) and training & development centres on the direction and strategic development of their programmes in the relevant disciplines.
5. To advise on the course planning, curriculum development and quality assurance systems of the IVE and training & development centres.
6. To prescribe job specifications for the principal jobs in the industry defining the skills, knowledge and training required.
7. To advise on training programmes for the principal jobs in the industry specifying the time a trainee needs to spend on each skill elements.
8. To tender advice in respect of skill assessments, trade tests and certification for in-service workers, apprentices and trainees, for the purpose of ascertaining that the specified skill standards have been attained.
9. To advise on the conduct of skill competitions in key trades in the industry for the promotion of vocational education and training as well as participation in international competitions.
10. To liaise with relevant bodies on matters pertaining to the development and promotion of vocational education and training in the industry, including employers, employers' associations, trade unions, professional institutions, training and educational institutions and government departments.
11. To organize seminars/conferences/symposia on vocational education and training for the industry.
12. To advise on the publicity relating to the activities of the Training Board and relevant vocational education and training programmes of the VTC.
13. To submit to the Council an annual report on the Training Board's work and its recommendations on the strategies for programmes in the relevant disciplines.
14. To undertake any other functions delegated by the Council in accordance with Section 7 of the Vocational Training Council Ordinance.

## 機電工程業訓練委員會

### 職權範圍

1. 確定業內的人力需求，包括收集、分析相關的人力和學生／學員統計數字，以及關於社會經濟、科技及人力市場發展的資料。
2. 評估及研究本業的人力供求是否平衡。
3. 就發展業內專業教育及訓練設施應付人力需求，向職業訓練局提供意見。
4. 就相關學科的課程發展方向及策略，向香港專業教育學院（IVE）、訓練及發展中心提出建議。
5. 就 IVE、訓練及發展中心的課程策劃、課程發展和質素保證制度提供意見。
6. 擬訂本業主要職務的工作範圍，界定所需的技能、知識及訓練。
7. 建議本業主要職務訓練方案，並訂每種技能所需的訓練期。
8. 對技術鑒定、技能測驗及證書頒發制度提供意見，以確定從業員、學徒及見習員的技能水平。
9. 就本業主要行業舉辦技能比賽提供意見，以推廣專業教育與訓練和派員參加國際賽事。
10. 就本業專業教育及訓練的發展與推廣事宜，與僱主、僱主聯會、工會、專業團體、訓練及教育機構、政府部門等聯絡。
11. 為本業舉辦有關專業教育及訓練的研討會與會議。
12. 就業內訓練委員會工作、有關職訓局專業教育及訓練課程的宣傳事宜提供意見。
13. 每年向局方呈交訓練委員會工作報告，以及相關學科課程發展策略建議。
14. 根據《職業訓練局條例》第 7 條，負責局方所委派的其他工作。

THE WHOLE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR

整個機電工程行業

MANPOWER STATISTICS

人力狀況

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL</b>		<b>專業人士／技師級</b>		
Building Services Engineer 屋宇設備工程師	915	50	10	935
Electrical Engineer 電機工程師	2 098	37	46	2 145
Electronics Engineer/Control and Instrumentation Engineer 電子工程師／控制及儀器 工程師	748	3	17	766
Lift/Escalator Engineer 升降機／自動梯工程師	387	3	2	390
Mechanical Engineer 機械工程師	965	33	6	956
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備 工程師	716	2	6	721
Fire Services Engineer 消防設備工程師	325	-	1	327
Engineering Manager 工程經理	430	-	3	432
Sub-total 小計	6 584	128	91	6 672

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TECHNICIAN LEVEL 技術員級</b>				
Building Services Technician 屋宇設備技術員	1 491	48	52	1 560
Draughtsman 繪圖員	509	4	1	515
Electrical Engineering Technician 電機工程技術員	1 828	107	28	1 924
Electrical Instrument and Meter Technician 電工儀器技術員	70	-	-	70
Electronics Technician 電子技術員	1 059	30	40	1 115
Lift/Escalator Technician 升降機／自動梯技術員	743	1	-	748
Telecommunication Technician 電訊技術員	802	6	65	873
Mechanical Engineering Technician 機械工程技術員	1 135	87	40	1 218
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	761	67	19	804
Fire Services Technician 消防設備技術員	245	3	1	246
Office Equipment Service Technician 辦公室設備維修技術員	71	3	-	71
Supervisor 監督	1 792	-	18	1 798
Sub-total 小計	10 506	356	264	10 942



Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TRADESMAN LEVEL 技工級</b>				
Building Security System Mechanic 屋宇防盜系統技工	39	6	-	39
Building Services Mechanic 屋宇設備技工	1 141	3	35	1 194
Cable Jointer (Power) 強電流電纜接駁技工	423	18	-	423
Carpenter/Painter 木工/髹漆工	191	-	5	192
Communication System Mechanic 電訊系統裝配工	1 589	13	54	1 649
Electrician/Electrical Fitter 電工/電氣打磨裝配工	8 855	337	142	9 658
Fire Services Mechanical Fitter 消防機械裝配工	882	2	-	884
Fire Services Electrical Fitter 消防電氣裝配工	446	6	4	456
Lift/Escalator Mechanic 升降機/自動梯技工	2 921	277	8	3 029
Mechanical Fitter/Machinist 機械打磨裝配工/機床工	3 099	135	131	3 240
Overhead Linesman 架空電線技工	252	-	12	260
Plumber and Pipe Fitter 喉管工	502	4	1	507
Refrigeration/Air-conditioning/ Ventilation Mechanic 冷凝/空氣調節/通風設備 技工	5 386	356	418	5 449
Sheet Metal Worker/Thermal Insulation Craftsman 薄片金屬構造工/保溫技工	161	-	8	169
Sign Installer 招牌安裝工	2	-	-	2

Job Title 職 稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TRADESMAN LEVEL (Continued) 技工級 (續)</b>				
Welder 焊接技工	49	-	1	50
Electrical Appliances Service Mechanic 電器用具維修技工	525	63	3	569
AV and RF Mechanic 影音及射頻技工	426	6	8	440
Foreman/Chargehand 管工/領工	3 005	-	58	3 071
Sub-total 小計	29 894	1 226	888	31 281
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>				
Labourer 雜工	1 208	-	3	1 196
Semi-skilled Worker 半技術工人	2 076	12	8	2 197
Sub-total 小計	3 284	12	11	3 393
<b>GRAND TOTAL</b> 總 計	<b>50 268</b>	<b>1 722</b>	<b>1 254</b>	<b>52 288</b>

**THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR**  
機電工程行業

**DISTRIBUTION OF EMPLOYEES BY MONTHLY INCOME RANGE**  
根據每月收入幅度僱員人數分佈情況

Job Title 職稱	Under \$6,001 以下	\$6,001- \$9,000	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>									
Building Services Engineer 屋宇設備工程師	-	-	22	16	62	384	267	162	2
Electrical Engineer 電機工程師	-	-	1	35	207	483	892	373	107
Electronics Engineer/ Control and Instrumentation Engineer 電子工程師／控制及儀 器工程師	-	-	-	-	81	138	236	268	25
Lift/Escalator Engineer 升降機／自動梯工程師	-	-	-	67	9	218	72	21	-
Mechanical Engineer 機械工程師	-	-	20	2	156	75	296	412	4
Refrigeration/ Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／ 通風設備工程師	-	-	-	13	118	361	20	204	-
Fire Services Engineer 消防設備工程師	-	-	-	-	99	191	25	6	4
Engineering Manager 工程經理	-	-	-	-	8	27	83	302	10
Sub-total 小計	-	-	43	133	740	1 877	1 891	1 748	152
<b>TECHNICIAN LEVEL 技術員級</b>									
Building Services Technician 屋宇設備技術員	-	-	324	359	123	312	279	94	-
Draughtsman 繪圖員	2	111	155	59	24	75	73	-	10
Electrical Engineering Technician 電機工程技術員	-	1	258	216	303	953	56	-	41
Electrical Instrument and Meter Technician 電工儀器技術員	-	16	9	-	18	9	-	18	-
Electronics Technician 電子技術員	-	64	85	145	12	692	51	-	10
Lift/Escalator Technician 升降機／自動梯技術員	-	-	48	213	223	259	-	-	-

Job Title 職稱	Under \$6,001 以下	\$6,001- \$9,000	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>TECHNICIAN LEVEL (Continued) 技術員級 (續)</b>									
Telecommunication Technician 電訊技術員	-	13	186	192	248	155	7	-	1
Mechanical Engineering Technician 機械工程技術員	-	-	54	74	163	767	77	-	-
Refrigeration/ Air-conditioning/ Ventilation Technician 冷凝/空氣調節/ 通風設備技術員	-	26	283	257	50	141	1	-	3
Fire Services Technician 消防設備技術員	-	1	34	21	115	55	-	2	17
Office Equipment Service Technician 辦公室設備維修技術員	-	-	-	60	9	2	-	-	-
Supervisor 監督	-	-	61	356	517	621	203	5	29
Sub-total 小計	2	232	1 497	1 952	1 805	4 041	747	119	111
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>									
Building Security System Mechanic 屋宇防盜系統技工	-	-	39	-	-	-	-	-	-
Building Services Mechanic 屋宇設備技工	-	191	605	340	5	-	-	-	-
Cable Jointer (Power) 強電流電纜接駁技工	-	-	202	189	32	-	-	-	-
Carpenter/Painter 木工/髹漆工	-	4	90	44	51	-	-	-	2
Communication System Mechanic 電訊系統裝配工	-	452	862	275	-	-	-	-	-
Electrician/Electrical Fitter 電工/電氣打磨裝配工	4	1 709	2 753	4 045	267	3	-	-	74
Fire Services Mechanical Fitter 消防機械裝配工	-	90	248	307	205	-	-	-	32
Fire Services Electrical Fitter 消防電氣裝配工	-	164	162	82	14	-	-	-	24
Lift/Escalator Mechanic 升降機/自動梯技工	-	41	590	1 835	455	-	-	-	-
Mechanical Fitter/ Machinist 機械打磨裝配工/ 機床工	-	8	530	1 601	956	-	-	-	4
Overhead Linesman 架空電線技工	-	-	26	226	-	-	-	-	-

Job Title 職稱	Under \$6,001 以下	\$6,001- \$9,000	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>									
Plumber and Pipe Fitter 喉管工	-	71	211	171	49	-	-	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic 冷凝/空氣調節/ 通風設備技工	-	1 198	2 947	1 222	11	-	-	-	8
Sheet Metal Worker/ Thermal Insulation Craftsman 薄片金屬構造工/ 保溫技工	-	-	41	109	11	-	-	-	-
Sign Installer 招牌安裝工	-	-	2	-	-	-	-	-	-
Welder 焊接工	2	-	18	17	4	8	-	-	-
Electrical Appliances Service Mechanic 電器用具維修技工	-	160	305	60	-	-	-	-	-
AV and TV Mechanic 影音及射頻技工	21	123	226	56	-	-	-	-	-
Foreman/Chargehand 管工/領工	-	36	440	687	1 721	105	4	-	12
Sub-total 小計	27	4 247	10 297	11 266	3 781	116	4	-	156
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>									
Labourer 雜工	64	633	483	14	-	-	-	-	14
Semi-skilled Worker 半技術工人	345	1 018	661	44	4	4	-	-	-
Sub-total 小計	409	1 651	1 144	58	4	4	-	-	14
GRAND TOTAL 總計	438	6 130	12 981	13 409	6 330	6 038	2 642	1 867	433

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR  
機電工程行業

BRANCH I: CONTRACTING BRANCH  
門類 I: 承造

MANPOWER STATISTICS  
人力狀況

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士/技師級</b>				
Building Services Engineer 屋宇設備工程師	246	18	2	254
Electrical Engineer 電機工程師	647	7	4	654
Electronics Engineer/Control and Instrumentation Engineer 電子工程師/控制及儀器 工程師	240	-	1	242
Lift/Escalator Engineer 升降機/自動梯工程師	361	3	2	364
Mechanical Engineer 機械工程師	138	11	1	147
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝/空氣調節/通風設備 工程師	647	1	5	651
Fire Services Engineer 消防設備工程師	276	-	1	277
Engineering Manager 工程經理	262	-	-	262
Sub-total 小計	2 817	40	16	2 851

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TECHNICIAN LEVEL 技術員級</b>				
Building Services Technician 屋宇設備技術員	185	35	12	204
Draughtsman 繪圖員	302	3	1	303
Electrical Engineering Technician 電機工程技術員	621	20	2	633
Electrical Instrument and Meter Technician 電工儀器技術員	41	-	-	41
Electronics Technician 電子技術員	239	5	2	246
Lift/Escalator Technician 升降機／自動梯技術員	729	1	-	734
Telecommunication Technician 電訊技術員	347	-	41	388
Mechanical Engineering Technician 機械工程技術員	75	6	-	80
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	630	49	5	641
Fire Services Technician 消防設備技術員	235	3	1	236
Office Equipment Service Technician 辦公室設備維修技術員	10	-	-	10
Supervisor 監督	950	-	1	951
Sub-total 小計	4 364	122	65	4 467

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TRADESMAN LEVEL 技工級</b>				
Building Security System Mechanic 屋宇防盜系統技工	37	6	-	37
Building Services Mechanic 屋宇設備技工	53	-	-	53
Cable Jointer (Power) 強電流電纜接駁技工	238	18	-	238
Carpenter/Painter 木工/髹漆工	13	-	-	13
Communication System Mechanic 電訊系統裝配工	1 549	13	47	1 602
Electrician/Electrical Fitter 電工/電氣打磨裝配工	4 911	220	1	5 523
Fire Services Mechanical Fitter 消防機械裝配工	873	2	-	875
Fire Services Electrical Fitter 消防電氣裝配工	428	6	4	438
Lift/Escalator Mechanic 升降機/自動梯技工	2 921	277	8	3 029
Mechanical Fitter/Machinist 機械打磨裝配工/機床工	392	-	-	392
Overhead Linesman 架空電線技工	44	-	-	44
Plumber and Pipe Fitter 喉管工	94	-	-	94
Refrigeration/Air-conditioning/ Ventilation Mechanic 冷凝/空氣調節/通風設備 技工	4 269	313	307	4 219
Sheet Metal Worker/Thermal Insulation Craftsman 薄片金屬構造工/保溫技工	65	-	8	73
Sign Installer 招牌安裝工	-	-	-	-



Job Title 職 稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TRADESMAN LEVEL (Continued) 技工級 (續)</b>				
Welder 焊接技工	16	-	-	16
Electrical Appliances Service Mechanic 電器用具維修技工	4	-	-	4
AV and RF Mechanic 影音及射頻技工	56	-	-	56
Foreman/Chargehand 管工/領工	1 411	-	-	1 415
Sub-total 小計	17 374	855	375	18 121
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>				
Labourer 雜工	438	-	-	438
Semi-skilled Worker 半技術工人	1 521	-	-	1 635
Sub-total 小計	1 959	-	-	2 073
<b>GRAND TOTAL</b> 總 計	26 514	1 017	456	27 512

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR  
機電工程行業

BRANCH II : SERVICING BRANCH  
門類 II : 服務

MANPOWER STATISTICS  
人力狀況

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年三月時的僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士/技師級</b>				
Building Services Engineer 屋宇設備工程師	669	32	8	681
Electrical Engineer 電機工程師	1 451	30	42	1 491
Electronics Engineer/Control and Instrumentation Engineer 電子工程師/控制及儀器工程師	508	3	16	524
Lift/Escalator Engineer 升降機/自動梯工程師	26	-	-	26
Mechanical Engineer 機械工程師	827	22	5	809
Refrigeration/Air-conditioning/Ventilation Engineer 冷凝/空氣調節/通風設備工程師	69	1	1	70
Fire Services Engineer 消防設備工程師	49	-	-	50
Engineering Manager 工程經理	168	-	3	170
Sub-total 小計	3 767	88	75	3 821

Job Title 職 稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TECHNICIAN LEVEL 技術員級</b>				
Building Services Technician 屋宇設備技術員	1 306	13	40	1 356
Draughtsman 繪圖員	207	1	-	212
Electrical Engineering Technician 電機工程技術員	1 207	87	26	1 291
Electrical Instrument and Meter Technician 電工儀器技術員	29	-	-	29
Electronics Technician 電子技術員	820	25	38	869
Lift/Escalator Technician 升降機／自動梯技術員	14	-	-	14
Telecommunication Technician 電訊技術員	455	6	24	485
Mechanical Engineering Technician 機械工程技術員	1 060	81	40	1 138
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	131	18	14	163
Fire Services Technician 消防設備技術員	10	-	-	10
Office Equipment Service Technician 辦公室設備維修技術員	61	3	-	61
Supervisor 監督	842	-	17	847
Sub-total 小計	6 142	234	199	6 475

Job Title 職 稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TRADESMAN LEVEL 技工級</b>				
Building Security System Mechanic 屋宇防盜系統技工	2	-	-	2
Building Services Mechanic 屋宇設備技工	1 088	3	35	1 141
Cable Jointer (Power) 強電流電纜接駁技工	185	-	-	185
Carpenter/Painter 木工／髹漆工	178	-	5	179
Communication System Mechanic 電訊系統裝配工	40	-	7	47
Electrician/Electrical Fitter 電工／電氣打磨裝配工	3 944	117	141	4 135
Fire Services Mechanical Fitter 消防機械裝配工	9	-	-	9
Fire Services Electrical Fitter 消防電氣裝配工	18	-	-	18
Lift/Escalator Mechanic 升降機／自動梯技工	-	-	-	-
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	2 707	135	131	2 848
Overhead Linesman 架空電線技工	208	-	12	216
Plumber and Pipe Fitter 喉管工	408	4	1	413
Refrigeration/Air-conditioning/ Ventilation Mechanic 冷凝／空氣調節／通風設備 技工	1 117	43	111	1 230
Sheet Metal Worker/Thermal Insulation Craftsman 薄片金屬構造工／保溫技工	96	-	-	96
Sign Installer 招牌安裝工	2	-	-	2

Job Title 職 稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TRADESMAN LEVEL (Continued) 技工級 (續)</b>				
Welder 焊接技工	33	-	1	34
Electrical Appliances Service Mechanic 電器用具維修技工	521	63	3	565
AV and RF Mechanic 影音及射頻技工	370	6	8	384
Foreman/Chargehand 管工/領工	1 594	-	58	1 656
Sub-total 小計	12 520	371	513	131 60
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>				
Labourer 雜工	770	-	3	758
Semi-skilled Worker 半技術工人	555	12	8	562
Sub-total 小計	1 325	12	11	1 320
<b>GRAND TOTAL</b> 總 計	23 754	705	798	24 776

**ELECTRICAL & MECHANICAL WORKERS  
WORKING IN CONSTRUCTION SITES**  
在建築地盤工作的機電工程從業員

**MANPOWER STATISTICS**  
人力狀況

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>			
Building Services Engineer 屋宇設備工程師	18	-	-
Control and Instrumentation Engineer 控制及儀器工程師	6	-	-
Electrical Engineer 電機工程師	13	-	-
Electronics Engineer 電子工程師	4	-	-
Lift/Escalator Engineer 升降機／自動梯工程師	20	-	-
Mechanical Engineer 機械工程師	3	-	-
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備 工程師	21	-	-
Fire Services Engineer 消防設備工程師	11	-	-
Sub-total 小計	96	-	-
<b>TECHNICIAN LEVEL 技術員級</b>			
Building Services Technician 屋宇設備技術員	21	-	-
Draughtsman 繪圖員	12	-	-
Electrical Engineering Technician 電機工程技術員	56	-	-

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目
<b>TECHNICIAN LEVEL (Continued) 技術員級 (續)</b>			
Electrical Instrument and Meter Technician 電工儀器技術員	24	-	-
Electronics Technician 電子技術員	4	-	1
Lift/Escalator Technician 升降機／自動梯技術員	35	-	-
Telecommunication Technician 電訊技術員	10	-	-
Mechanical Engineering Technician 機械工程技術員	12	-	-
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	115	-	-
Fire Services Technician 消防設備技術員	103	-	-
Supervisor 監督	23	-	-
Sub-total 小計	415	-	1
<b>TRADESMAN LEVEL 技工級</b>			
Building Security System Mechanic 屋宇防盜系統技工	16	-	-
Building Services Mechanic 屋宇設備技工	93	-	-
Cable Jointer (Power) 強電流電纜接駁技工	72	-	-
Communication System Mechanic 電訊系統裝配工	49	-	-
Electrician/Electrical Fitter 電工／電氣打磨裝配工	1 988	2	-
Fire Services Mechanical Fitter 消防機械裝配工	344	-	-
Fire Services Electrical Fitter 消防電氣裝配工	123	-	-
Lift/Escalator Mechanic 升降機／自動梯技工	249	-	-

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目
<b>TRADESMAN LEVEL (Continued) 技工級 (續)</b>			
Mechanical Fitter 機械打磨裝配工	85	-	-
Overhead Linesman 架空電線技工	3	-	-
Plumber and Pipe Fitter 喉管工	355	-	-
Refrigeration/Air-conditioning/ Ventilation Mechanic 冷凝/空氣調節/通風設備技工	875	-	-
Sheet Metal Worker 薄片金屬構造工	50	-	-
Thermal Insulation Craftsman 保溫技工	56	-	-
Welder 焊接技工	27	-	-
Electrical Appliances Service Mechanic 電器用具維修技工	92	-	-
Gas Installer 氣體裝置技工	59	-	-
Foreman/Chargehand 管工/領工	91	-	-
Sub-total 小計	4 627	2	-
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>			
Labourer 雜工	90	-	-
Semi-skilled Worker 半技術工人	151	-	-
Sub-total 小計	241	-	-
<b>GRAND TOTAL 總計</b>	<b>5 379</b>	<b>2</b>	<b>1</b>



THE SHIPBUILDING AND SHIP REPAIR SECTOR

船舶修建工程行業

MANPOWER STATISTICS

人力狀況

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>				
Electrical Engineer 電機工程師	13	-	-	13
Marine Engineer 輪機工程師	81	-	1	82
Mechanical Engineer 機械工程師	44	2	1	46
Ship Designer/Naval Architect 船舶設計師／造船工程師	19	-	-	19
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	150	-	3	152
Sub-total 小計	307	2	5	312
<b>TECHNICIAN LEVEL 技術員級</b>				
Draughtsman 繪圖員	8	-	1	9
Electrical Engineering Technician 電機工程技術員	41	10	-	41
Electronics/ Telecommunication Technician 電子／通訊技術員	13	-	-	13
Estimator 估計員	32	1	-	33

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
TECHNICIAN LEVEL (Continued) 技術員級 (續)				
Mechanical Engineering Technician 機械工程技術員	120	-	-	120
Safety Officer 安全主任	19	-	-	19
Supervisor/Foreman 監督/管工	257	1	-	257
Sub-total 小計	490	12	1	492
TRADESMAN/CRAFTSMAN LEVEL 技工級				
Air-conditioning Mechanic/ Sheet Metal Worker 空氣調節技工/ 薄片金屬構造工	75	-	2	77
Carpenter 木工	159	-	-	159
Crane Driver 起重機操作工	56	-	-	56
Electrician 電工	167	9	-	167
Mechanical Fitter 機械打磨裝配工	763	57	1	768
GRP-Worker 玻璃纖維工	30	-	-	30
Machinist 機床工	71	6	1	72
Marine Pipeworker 船舶喉管工	65	9	-	65
Painter 髹漆工	104	-	-	104
Rigger 索具工 ( 工 )	91	2	-	91
Ship Classification Qualified Welder 船級協會認可焊接工	126	-	-	126

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>				
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工 (鍋爐工、造船鋼板 工、捻縫工/鐵工)	93	3	-	93
Welder 焊接技工	71	2	1	72
Sub-total 小計	1 871	88	5	1 880
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>				
Labourer 雜工	88	-	-	88
Semi-skilled Worker 半技術工人	38	-	-	38
Sub-total 小計	126	-	-	126
<b>GRAND TOTAL 總計</b>	<b>2 794</b>	<b>102</b>	<b>11</b>	<b>2 810</b>

THE SHIPBUILDING AND SHIP REPAIR SECTOR  
船舶修建工程行業

DISTRIBUTION OF EMPLOYEES BY MONTHLY INCOME RANGE  
根據每月收入幅度僱員人數分佈情況

Job Title 職稱	Under \$6,001 以下	\$6,001- \$9,000	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>									
Electrical Engineer 電機工程師	-	-	-	-	1	1	6	4	1
Marine Engineer 輪機工程師	-	-	-	-	5	10	26	35	5
Mechanical Engineer 機械工程師	-	-	-	2	23	5	13	1	-
Ship Designer/ Naval Architect 船舶設計師／ 造船工程師	-	-	-	-	1	-	2	16	-
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	-	-	-	-	-	26	55	62	7
Sub-total 小計	-	-	-	2	30	42	102	118	13
<b>TECHNICIAN LEVEL 技術員級</b>									
Draughtsman 繪圖員	1	-	1	-	1	4	1	-	-
Electrical Engineering Technician 電機工程技術員	-	-	9	4	-	16	-	12	-
Electronics/ Telecommunication Technician 電子／通訊技術員	-	-	-	-	13	-	-	-	-
Estimator 估計員	-	-	10	1	11	10	-	-	-
Mechanical Engineering Technician 機械工程技術員	-	-	2	31	34	23	8	22	-
Safety Officer 安全主任	-	-	1	-	2	6	5	5	-
Supervisor/Foreman 監督／管工	-	-	30	62	39	121	5	-	-
Sub-total 小計	1	-	53	98	100	180	19	39	-

Job Title 職稱	Under \$6,001 以下	\$6,001- \$9,000	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>									
Air-conditioning Mechanic/Sheet Metal Worker 空氣調節技工/ 薄片金屬構造工	-	-	2	58	15	-	-	-	-
Carpenter 木工	-	4	41	105	9	-	-	-	-
Crane Driver 起重機操作工	-	-	35	21	-	-	-	-	-
Electrician 電工	-	28	67	72	-	-	-	-	-
Mechanical Fitter 機械打磨裝配工	-	41	548	165	-	9	-	-	-
GRP-Worker 玻璃纖維工	-	-	8	2	20	-	-	-	-
Machinist 機床工	-	5	33	27	4	2	-	-	-
Marine Pipeworker 船舶喉管工	-	2	34	29	-	-	-	-	-
Painter 髹漆工	-	4	79	21	-	-	-	-	-
Rigger 索具工 ( 工)	-	5	47	38	1	-	-	-	-
Ship Classification Qualified Welder 船級協會認可焊接工	-	5	88	9	22	2	-	-	-
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工 ( 鍋爐工、造船 鋼板工、捻縫工/鐵工)	-	7	36	50	-	-	-	-	-
Welder 焊接工	-	13	20	29	-	9	-	-	-
Sub-total 小計	-	114	1 038	626	71	22	-	-	-
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>									
Labourer 雜工	24	17	47	-	-	-	-	-	-
Semi-skilled Worker 半技術工人	3	4	21	10	-	-	-	-	-
Sub-total 小計	27	21	68	10	-	-	-	-	-
<b>GRAND TOTAL 總計</b>	<b>28</b>	<b>135</b>	<b>1 159</b>	<b>736</b>	<b>201</b>	<b>244</b>	<b>121</b>	<b>157</b>	<b>13</b>

THE GAS SECTOR  
氣體燃料行業

MANPOWER STATISTICS  
人力狀況

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>				
Electrical Engineer 電機工程師	22	-	-	22
Gas Engineer (Fuel Gas) 氣體燃料工程師	207	-	-	207
Mechanical Engineer 機械工程師	91	-	-	91
Sub-total 小計	320	-	-	320
<b>TECHNICIAN LEVEL 技術員級</b>				
Gas Engineering Technician 氣體燃料工程技術員	346	-	-	346
Mechanical Engineering Technician 機械工程技術員	74	-	1	74
Supervisor/Chargehand 監督／管工	73	-	-	73
Sub-total 小計	493	-	1	493
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>				
Electrician/Electrical Fitter 電工／電氣打磨裝配工	25	1	-	26
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	39	-	-	39

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Employees by March 2006 估計二零零六年 三月時的 僱員人數
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>				
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工 (煤氣)	225	6	-	231
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工 (住宅式)	351	47	1	387
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工 (非住宅式)	177	14	1	178
Mechanical Fitter 機械打磨裝配工	28	1	-	29
Sub-total 小計	845	69	2	890
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>				
Driver (LPG Cylinder) 司機 (石油氣瓶車)	13	-	-	13
Labourer 雜工	60	-	-	60
Semi-skilled Worker 半技術工	39	-	1	39
Vehicle Attendant/ Deliveryman (LPG Cylinder) 跟車/送貨員 (石油氣瓶)	29	-	-	29
Sub-total 小計	141	-	1	141
<b>GRAND TOTAL 總計</b>	<b>1 799</b>	<b>69</b>	<b>4</b>	<b>1 844</b>

**THE GAS SECTOR**  
氣體燃料行業

**DISTRIBUTION OF EMPLOYEES BY MONTHLY INCOME RANGE**

根據每月收入幅度僱員人數分佈情況

Job Title 職稱	Under \$6,001 以下	\$6,001- \$9,000	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>									
Electrical Engineer 電機工程師	-	-	-	-	1	1	20	-	-
Gas Engineer (Fuel Gas) 氣體燃料工程師	-	-	-	-	1	4	185	17	-
Mechanical Engineer 機械工程師	-	-	-	-	-	3	81	7	-
Sub-total 小計	-	-	-	-	2	8	286	24	-
<b>TECHNICIAN LEVEL 技術員級</b>									
Gas Engineering Technician 氣體燃料工程技術員	-	1	5	300	11	26	3	-	-
Mechanical Engineering Technician 機械工程技術員	-	-	5	34	35	-	-	-	-
Supervisor/Chargehand 監督／管工	-	-	14	14	15	28	2	-	-
Sub-total 小計	-	1	24	348	61	54	5	-	-
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>									
Electrician/Electrical Fitter 電工／電氣打磨裝配工	1	4	6	12	2	-	-	-	-
Gas Distribution Fitter (LPG) 氣體燃料輸送技工 (石油氣)	-	-	4	3	32	-	-	-	-
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工 (煤氣)	-	6	42	177	-	-	-	-	-
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工 (住宅式)	-	73	211	56	11	-	-	-	-
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工 (非住宅式)	-	12	79	77	9	-	-	-	-



Job Title 職稱	Under \$6,001 以下	\$6,001- \$9,000	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)									
Mechanical Fitter 機械打磨裝配工	-	5	23	-	-	-	-	-	-
Sub-total 小計	1	100	365	325	54	-	-	-	-
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人									
Driver (LPG Cylinder) 司機 (石油氣瓶車)	-	5	8	-	-	-	-	-	-
Labourer 雜工	-	7	53	-	-	-	-	-	-
Semi-skilled Worker 半技術工人	4	11	24	-	-	-	-	-	-
Vehicle Attendant/ Deliveryman (LPG Cylinder) 跟車/送貨員 (石油氣瓶)	-	29	-	-	-	-	-	-	-
Sub-total 小計	4	52	85	-	-	-	-	-	-
GRAND TOTAL 總計	5	153	474	673	117	62	291	24	-

**THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR**  
機電工程行業

**RECOMMENDED NUMBER OF TRAINEES  
TO BE TAKEN ON ANNUALLY BETWEEN 2006 AND 2008**

二零零六年至二零零八年間  
建議每年招收的受訓者人數

Job Title 職稱	Number of employees in March 2005 二零零五年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2006 由二零零六年起建議 每年招收的受訓者人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士/技師級</b>		
Building Services Engineer 屋宇設備工程師	915	32 – 40
Electrical Engineer 電機工程師	2 098	75 – 92
Electronics Engineer/Control and Instrumentation Engineer 電子工程師/控制及儀器工程師	748	27 – 33
Lift/Escalator Engineer 升降機/自動梯工程師	387	14 – 17
Mechanical Engineer 機械工程師	965	34 – 43
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝/空氣調節/通風設備工程師	716	25 – 32
Fire Services Engineer 消防設備工程師	325	12 – 14
Engineering Manager 工程經理	430	15 – 19
Sub-total 小計	6 584	234 – 290
<b>TECHNICIAN LEVEL 技術員級</b>		
Building Services Technician 屋宇設備技術員	1 491	53 – 66
Draughtsman 繪圖員	509	18 – 22
Electrical Engineering Technician 電機工程技術員	1 828	65 – 80
Electrical Instrument and Meter Technician 電工儀器技術員	70	2 – 3
Electronics Technician 電子技術員	1 059	38 – 47
Lift/Escalator Technician 升降機/自動梯技術員	743	26 – 33

Job Title 職稱	Number of employees in March 2005 二零零五年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2006 由二零零六年起建議 每年招收的受訓者人數
<b>TECHNICIAN LEVEL (Continued) 技術員級 (續)</b>		
Telecommunication Technician 電訊技術員	802	29 – 35
Mechanical Engineering Technician 機械工程技術員	1 135	40 – 50
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	761	27 – 34
Fire Services Technician 消防設備技術員	245	9 – 11
Office Equipment Service Technician 辦公室設備維修技術員	71	3
Supervisor 監督	1 792	64 – 79
Sub-total 小計	10 506	374 – 463
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>		
Building Security System Mechanic 屋宇防盜系統技工	39	1 – 2
Building Services Mechanic 屋宇設備技工	1 141	41 – 50
Cable Jointer (Power) 強電流電纜接駁技工	423	15 – 19
Carpenter/Painter 木工／髹漆工	191	7 – 8
Communication System Mechanic 電訊系統裝配工	1 589	56 – 70
Electrician/Electrical Fitter 電工／電氣打磨裝配工	8 855	315 – 390
Fire Services Mechanical Fitter 消防機械裝配工	882	31 – 39
Fire Services Mechanical Fitter 消防電氣裝配工	446	16 – 20
Lift/Escalator Mechanic 升降機／自動梯技工	2 921	104 – 129
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	3 099	110 – 136
Overhead Linesman 架空電線技工	252	9 – 11
Plumber and Pipe Fitter 喉管工	502	18 – 22
Refrigeration/Air-conditioning/ Ventilation Mechanic 冷凝／空氣調節／通風設備技工	5 386	192 – 237
Sheet Metal Worker/Thermal Insulation Craftsman 薄片金屬構造工／保溫技工	161	6 – 7
Sign Installer 招牌安裝工	2	–

Job Title 職稱	Number of employees in March 2005 二零零五年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2006 由二零零六年起建議 每年招收的受訓者人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)		
Welder 焊接技工	49	2
Electrical Appliances Service Mechanic 電器用具維修技工	525	19 – 23
AV and RF Mechanic 影音及射頻技工	426	15 – 19
Foreman/Chargehand 管工/領工	3 005	107 – 132
Sub-total 小計	29 894	1 064 – 1 316

**THE SHIPBUILDING AND SHIP REPAIR SECTOR**

船舶修建工程行業

**RECOMMENDED NUMBER OF TRAINEES  
TO BE TAKEN ON ANNUALLY BETWEEN 2006 AND 2008**

二零零六年至二零零八年間  
建議每年招收的受訓者人數

Job Title 職稱	Number of employees in March 2005 二零零五年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2006 由二零零六年起建議 每年招收的受訓者人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士/技師級</b>		
Electrical Engineer 電機工程師	13	1
Marine Engineer 輪機工程師	81	5 – 6
Mechanical Engineer 機械工程師	44	3 – 4
Ship Designer/Naval Architect 船舶設計師/造船工程師	19	1
Ship Repairs Manager/Superintendent 船舶修理主管/船舶修理監督	150	9 – 12
Sub-total 小計	307	19 – 24
<b>TECHNICIAN LEVEL 技術員級</b>		
Draughtsman 繪圖員	8	1
Electrical Engineering Technician 電機工程技術員	41	2 – 3
Electronics/Telecommunication Technician 電子/通訊技術員	13	1
Estimator 估計員	32	2 – 3
Mechanical Engineering Technician 機械工程技術員	120	7 – 9
Safety Officer 安全主任	19	1
Supervisor/Foreman 監督/管工	257	16 – 20
Sub-total 小計	490	30 – 38
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>		
Air-conditioning Mechanic/ Sheet Metal Worker 空氣調節技工/薄片金屬構造工	75	5 – 6
Carpenter 木工	159	10 – 12

Job Title 職稱	Number of employees in March 2005 二零零五年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2006 由二零零六年起建議 每年招收的受訓者人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)		
Crane Driver 起重機操作工	56	3 – 4
Electrician 電工	167	10 – 13
Mechanical Fitter 機械打磨裝配工	763	47 – 58
GRP-Worker 玻璃纖維工	30	2 – 3
Machinist 機床工	71	4 – 5
Marine Pipeworker 船舶喉管工	65	4 – 5
Painter 髹漆工	104	6 – 8
Rigger 索具工	91	6 – 7
Ship Classification Qualified Welder 船級協會認可焊接工	126	8 – 10
Steel Worker (Boiler Maker/ Steel Plater/Blacksmith) 鋼鐵工 (鍋爐工、造船鋼板工、 捻縫工/鐵工)	93	6 – 7
Welder 焊接技工	71	4 – 5
Sub-total 小計	1 871	115 – 143

THE GAS SECTOR  
氣體燃料行業

RECOMMENDED NUMBER OF TRAINEES  
TO BE TAKEN ON ANNUALLY BETWEEN 2006 AND 2008

二零零六年至二零零八年間  
建議每年招收的受訓者人數

Job Title 職稱	Number of employees in March 2005 二零零五年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2006 由二零零六年起建議 每年招收的受訓者人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士/技師級</b>		
Electrical Engineer 電機工程師	22	1
Gas Engineer (Fuel Gas) 氣體燃料工程師	207	8 – 10
Mechanical Engineer 機械工程師	91	3 – 4
Sub-total 小計	320	12 – 15
<b>TECHNICIAN LEVEL 技術員級</b>		
Gas Engineering Technician 氣體燃料工程技術員	346	13 – 17
Mechanical Engineering Technician 機械工程技術員	74	3 – 4
Supervisor/Chargehand 監督/管工	73	3
Sub-total 小計	493	19 – 24
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>		
Electrician/Electrical Fitter 電工/電氣打磨裝配工	25	1
Gas Distribution Fitter (LPG) 氣體燃料輸送技工(石油氣)	39	1 – 2
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工(煤氣)	225	9 – 11
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工(住宅式)	351	13 – 17
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工(非住宅式)	177	7 – 9
Mechanical Fitter 機械打磨裝配工	28	1
Sub-total 小計	845	32 – 41

<b>CONFIDENTIAL</b> WHEN ENTERED WITH DATA	填入數據後即成 <b>機密文件</b>
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**VOCATIONAL TRAINING COUNCIL**  
職業訓練局

**THE 2005 MANPOWER SURVEY OF THE ELECTRICAL AND MECHANICAL SERVICES INDUSTRY**  
機電工程業二〇〇五年人力調查  
**QUESTIONNAIRE**  
調查表

*PLEASE READ THE EXPLANATORY NOTES BEFORE COMPLETING THIS QUESTIONNAIRE*  
填表前，請參閱附註

For Official Use Only: 此欄毋須填寫	Rec. Type	Survey Code	Industry Code	Establishment No.	Enumerator's No.	Editor's No.	Check Digit	No. of Employees Covered by the Questionnaire
	<input type="text" value="1"/>	<input type="text" value="0"/> <input type="text" value="4"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
	1	2 3	4 5 6 7 8 9	10 11 12 13 14 15	16 17	18 19	20 21 22	23 24 25 26 27

NAME OF ESTABLISHMENT: \_\_\_\_\_  
機構名稱

ADDRESS: \_\_\_\_\_  
地址

TYPE OF SERVICE: \_\_\_\_\_  
服務性質

TOTAL NO. OF PERSONS ENGAGED: \_\_\_\_\_  
僱員總數

NAME OF PERSON TO CONTACT: \_\_\_\_\_  
聯絡人姓名

28 47

POSITION: \_\_\_\_\_  
職位

TEL. NO.: \_\_\_\_\_ - \_\_\_\_\_  
電話

48 55 56 63

FAX NO.: \_\_\_\_\_  
圖文傳真

E-MAIL: \_\_\_\_\_  
電郵

64 83



(A) Job 工作			(B) Monthly Income 每月收入	(C) No. Employed (excl. trainees) 僱員人數 (受訓者除外)	(D) Forecast of No. Employed 12 Months from Now (excl. trainees) 預計 十二個月後 僱員人數 (受訓者除外)	(E) No. of Vacancies at Date of Survey (excl. trainees) 現有 空缺額 (受訓者 除外)	(F) No. of Trainees at Date of Survey 現有 受訓者 人數	* Enter in column (B) the employee's monthly income range according to the following code: 請將僱員每月總收入幅度按照下列類別 編號填入 (B) 欄內：	
Title 職稱	Rec. Type	Job No. 編號	Code* 編號					Monthly Income Range 每月總收入幅度	Code 編號
For Official Use Only 供資料處理用		→	8-10	11	12-15	16-19	20-22	23-25	
								Under \$6,000 以下	1
								\$6,001 - \$9,000	2
								\$9,001 - \$12,000	3
								\$12,001 - \$15,000	4
								\$15,001 - \$18,000	5
								\$18,001 - \$25,000	6
								\$25,001 - \$35,000	7
								Over \$35,000 以上	8
1	Building Services Engineer (屋宇設備工程師)	2	1   0   1						
2	Electrical Engineer (電機工程師)	2	1   0   2						
3	Refrigeration/Air-conditioning/Ventilation Engineer (冷凝/空氣調節/通風設備工程師)	2	1   0   3						
4	Mechanical Engineer (機械工程師)	2	1   0   4						
5	Lift/Escalator Engineer (升降機/自動梯工程師)	2	1   0   5						
6	Fire Services Engineer (消防設備工程師)	2	1   0   6						
7	Electronics Engineer/Control and Instrumentation Engineer (電子工程師/控制及儀器工程師)	2	1   0   7						
8	Engineering Manager (工程經理)	2	1   0   8						
9	Supervisor (監督)	2	2   0   1						
10	Building Services Technician (屋宇設備技術員)	2	2   0   2						
11	Draughtsman (繪圖員)	2	2   0   3						
12	Electrical Engineering Technician (電機工程技術員)	2	2   0   4						
13	Refrigeration/Air-conditioning/Ventilation Technician (冷凝/空氣調節/通風設備技術員)	2	2   0   5						
14	Mechanical Engineering Technician (機械工程技術員)	2	2   0   6						
15	Lift/Escalator Technician (升降機/自動梯技術員)	2	2   0   7						
16	Fire Services Technician (消防設備技術員)	2	2   0   8						

Note 1 If additional lines are necessary, please tick here  and enter on supplementary sheet(s).  
附註一 如此頁經已填滿，請先將 (✓) 號填入此  內，然後在附頁繼續填寫。

Note 2 The term 'trainees' includes all trainees receiving any form of training and apprentices under a contract of apprenticeship.  
附註二 「受訓者」包括正在接受各種訓練的人士，以及簽有學徒合約的登記學徒。



The 2005 Manpower Survey of the  
Electrical and Mechanical Services Industry  
機電工程業二〇〇五年人力調查

Explanatory Notes  
附註

1. When filling the questionnaire, please ignore the numbers in the row immediately beneath the headings. They are purely column numbers for data processing.  
每行標題下的分欄編號，只供資料處理之用，填表時毋須理會。
2. Please complete the columns ('A' to 'F') of the questionnaire and insert a zero (0) for any column not applicable to your establishment.  
請填寫表內各欄（‘A’至‘F’），並在貴機構不適用的各欄內填入（0）符號。
3. For detailed job descriptions, please refer Appendix C for Electrical and Mechanical Engineering Sector, Appendix D for Shipbuilding and Ship Repair Sector or Appendix E for Gas Sector.  
如需詳細職稱和工作說明，機電工程行業請參閱附錄 C、船舶修建行業請參閱附錄 D 或氣體燃料行業請參閱附錄 E。
4. Job Titles - Column 'A'  
職稱——‘A’欄
  - (a) Please go through column 'A' and mark those job titles applicable to your establishment. For detailed job descriptions, please refer Appendix C, D or E.  
請溜覽‘A’欄，選取適用於貴機構的職稱，如需詳細工作說明，請參閱附錄 C、D 或 E。
  - (b) Please add in column 'A' titles of any technical jobs not mentioned in job descriptions, briefly describe them and indicate their skill levels.  
如貴機構另有技術性職稱未載於工作說明，請一併填入‘A’欄內，並扼要說明其工作性質及技能等級。

- (c) Please classify an employee according to his/her main duty irrespective of any additional secondary duties he/she may be required to perform (e.g. a technician, who works mainly as an electrical engineering technician but is also required to perform the work of a draughtsman occasionally, should be classified as an electrical engineering technician and not as a draughtsman).

請根據僱員的主要職務分類，而不以其兼任的其他職務分類（例如，某技術員的主要職務為電機工程技術員，但間中亦須擔任繪圖員的工作，則應歸類為電機工程技術員而非繪圖員）。

- (d) If an electrical and mechanical (E & M) engineering professional/technologist normally plays only managerial role for E & M engineering projects or services, and sometimes offers professional engineering advices and decisions on the projects or services, please classify such professional/technologist as engineering manager. (Please refer job description of job 108)

如有機電工程專業人員日常在機電工程計劃或服務中祇擔任管理角色，但會間常提供工程專業意見和決定，請將此等人員歸類為工程經理。（請參閱工作編號 108 的工作說明）

5. Total Monthly Income Range of Employees - Column 'B'

僱員每月總收入幅度 —— 'B' 欄

Please enter into this column the total monthly income range for each type of employees. This should include basic wages, regular overtime pay, cost of living allowance, meal allowance etc., if any. If you have more than one employee doing the same job, please enter the average range.

請在 'B' 欄填入每類僱員每月總收入幅度的編號，這包括底薪、定期超時工作工資、生活津貼、膳食津貼等。若從事同類工作的僱員多於一名，則請取其平均收入。

6. Number Employed (Excluding Trainees) - Column 'C'

現有僱員人數（受訓者除外） —— 'C' 欄

For any one job, please fill in the total number of direct employees (permanent, casual and self-employed). The number should exclude trainees.

請填寫貴機構現時直接僱用的每類員工總數（包括長工、散工及自僱人士）。此總數不包括受訓者人數。

7. Forecast of Number Employed 12 Months from now (Excluding Trainees) - Column 'D'

預計十二個月後僱員總人數

（受訓者除外） —— 'D' 欄

The forecast of number employed means the number of employees (excluding trainees) you will be employing 12 months from now.

預計的僱員人數指貴機構於十二個月後所僱用的員工總數（受訓者除外）。

8. Number of Vacancies at Date of Survey (Excluding Trainees) - Column 'E'

現有空缺額（受訓者除外）—— 'E' 欄

Please fill in the number of existing vacancies (excluding those for trainees).  
請填入貴機構現有的空缺數目（受訓空缺額除外）。

'Existing Vacancies' refer to those unfilled, immediately available job openings for which the establishment is actively trying to recruit personnel at date of survey.

「現有空缺額」是指該職位仍懸空，須立刻填補，而現正積極招聘人員填補。

9. Number of Trainees at Date of Survey - Column 'F'

現有受訓者人數 —— 'F' 欄

Please fill in the total number of employees undergoing training.  
請填寫正在接受訓練的僱員人數。

The term 'trainees' includes all trainees receiving any form of training and apprentices under a contract of apprenticeship.

「受訓者」包括正在接受各種訓練的人士以及簽有學徒合約的登記學徒。

10. Example

例子

To facilitate proper completion, an example is given overleaf for your reference.  
為協助閣下填表，現將例子附錄於後，以供參考。

Example 例子

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(A) Job 工作				(B) Monthly Income 每月收入	(C) No. Employed (excl. trainees) 僱員人數 (受訓者除外)	(D) Forecast of No. Employed 12 Months from Now (excl. trainees) 預計 十二個月後 僱員人數 (受訓者除外)	(E) No. of Vacancies at Date of Survey (excl. trainees) 現有 空缺額 (受訓者 除外)	(F) No. of Trainees at Date of Survey 現有 受訓者 人數	* Enter in column (B) the employee's monthly income range according to the following code: 請將僱員每月總收入幅度按照下列類別 編號填入 (B) 欄內：		
Title 職稱	Rec. Type	Job No. 編號		Code* 編號					Monthly Income Range 每月總收入幅度	Code 編號	
For Official Use Only 供資料處理用				→	8-10	11	12-15	16-19	20-22	23-25	
									Under \$6,000 以下	1	
									\$6,001 - \$9,000	2	
									\$9,001 - \$12,000	3	
									\$12,001 - \$15,000	4	
									\$15,001 - \$18,000	5	
									\$18,001 - \$25,000	6	
									\$25,001 - \$35,000	7	
									Over \$35,000 以上	8	
1 Building Services Engineer (屋宇設備工程師)	2	1	0   1	8	2	2	0	1			
2 Electrical Engineer (電機工程師)	2	1	0   2	7	3	5	1	1			
9 Supervisor (監督)	2	2	0   1	6	6	7	0	0			
10 Building Services Technician (屋宇設備技術員)	2	2	0   2	5	4	4	0	1			
11 Draughtsman (繪圖員)	2	2	0   3	4	2	2	0	1			
12 Electrical Engineering Technician (電機工程技術員)	2	2	0   4	5	6	8	1	2			
22 Building Services Mechanic (屋宇設備技工)	2	3	0   2	4	1   0	1   1	1	1			
23 Electrician/Electrical Fitter (電工/電氣打磨裝配工)	2	3	0   3	4	1   5	1   8	1	4			
40 Labourer (雜工)	2	4	0   1	2	2	1	0	0			
41 Semi-skilled Worker (半技術工)	2	4	0   2	2	6	6	0	0			

Note 1 If additional lines are necessary, please tick here  and enter on supplementary sheet(s).

附註一 如此頁經已填滿，請先將 (✓) 號填入此  內，然後在附頁繼續填寫。

Note 2 The term 'trainees' includes all trainees receiving any form of training and apprentices under a contract of apprenticeship.

附註二 「受訓者」包括正在接受各種訓練的人士，以及簽有學徒合約的登記學徒。

**JOB DESCRIPTIONS FOR PRINCIPAL JOBS  
IN THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR**

機電工程行業主要職務的工作說明

Code 編號	Job Title 職稱	Job Description 工作說明
<b>PROFESSIONAL/TECHNOLOGIST      專業人士／技師</b>		
101	Building Services Engineer  屋宇設備工程師	<p>Designs and advises on building services facilities in buildings. Plans, supervises and coordinates their installation, testing, maintenance and repair.</p> <p>設計屋宇內的屋宇設備、策劃、監督及協調其裝設、測試、保養和修理。</p>
102	Electrical Engineer  電機工程師	<p>Researches into electrical engineering problems, designs and advises on electrical systems and equipment, and plans and supervises their development, construction, manufacture, installation, operation, maintenance and repair.</p> <p>研究電機工程問題；設計電機系統及設備，並就該方面提供意見；策劃及管理其發展、建造、製造、安裝、操作、保養及修理。</p>
103	Refrigeration/ Air-conditioning/ Ventilation Engineer  冷凝／空氣調節／ 通風設備工程師	<p>Researches into electrical and mechanical engineering problems related to refrigeration/air-conditioning/ventilation systems, designs and advises on refrigerating, air-handling and electrical equipment for air-conditioning plant, cold stores and other refrigerating systems, plans and supervises their development, manufacture, construction, installation, operation, maintenance and repair.</p> <p>研究有關冷藏／空調系統的電機及機械工程問題；設計空調廠房、冷藏庫及其他冷藏系統的各项冷凝、空氣處理及電機設備，並就該方面提供意見；策劃及管理其發展、製造、建造、安裝、操作、保養及修理。</p>

Code 編號	Job Title 職稱	Job Description 工作說明
PROFESSIONAL/TECHNOLOGIST (Continued)      專業人士／技師（續）		
104	Mechanical Engineer  機械工程師	Researches into mechanical engineering problems, designs and advises on mechanical plant and equipment, plans and supervises their development, manufacture, construction, installation, operation, maintenance and repair. 研究機械工程問題；設計機械裝置及設備，並就該方面提供意見；策劃及管理其發展、製造、建造、安裝、操作、保養及修理。
105	Lift/Escalator Engineer  升降機／自動梯工程師	Researches into electrical and mechanical engineering problems related to lift and escalator systems, designs and advises on mechanical and electrical equipment for lift and escalator systems, plans and supervises their development, manufacture, construction, installation, operation, maintenance and repair. 研究有關升降機和自動梯系統的電機及機械工程問題；設計升降機和自動梯系統的機械及電機設備，並就該方面提供意見；策劃及管理其發展、製造、建造、安裝、操作、保養及修理。
106	Fire Services Engineer  消防設備工程師	Researches into fire service problems, designs and advises on fire services systems and equipment, and plans and supervises their development, construction, manufacture, installation, operation, maintenance and repair. 研究消防設備問題；設計消防系統及設備，並就該方面提供意見；策劃及管理其發展、建造、製造、安裝、操作、保養及修理。



Code 編號	Job Title 職稱	Job Description 工作說明
PROFESSIONAL/TECHNOLOGIST (Continued)      專業人士／技師（續）		
107	Electronics Engineer  電子工程師  Control and Instrumentation Engineer  控制及儀器工程師	<p>Researches into the application of electronic techniques in electrical engineering problems, designs and advises on electronic systems and equipment, plans and supervises their development, construction, manufacture, installation, operation, maintenance and repair.</p> <p>研究電子技術在電機工程問題上的應用；設計電子系統及設備，並就該方面提供意見；策劃及管理其發展、建造、製造、安裝、操作、保養及修理。</p> <p>Designs and advises on electrical and mechanical measuring, control and test instruments, and plans and supervises their development, construction, installation, operation and maintenance.</p> <p>設計電機及機械測量、控制及試驗儀器，並就該方面提供意見；策劃及管理其發展、建造、安裝、操作及保養。</p>
108	Engineering Manager  工程經理	<p>Directs and assumes accountabilities for all aspects of electrical and mechanical (E &amp; M) engineering projects or services. The job holder is not normally directly involved in day-to-day work of the engineering projects or services but sometimes offers professional engineering advices and decisions. He/she should have professional qualification and experience in E &amp; M engineering.</p> <p>管理及負責機電工程或服務。其職務通常不會直接參與工程或服務的日常工作，但會間常提出專業工程建議及決定。此職位需由具備專業資歷的人士擔任。</p>
TECHNICIAN      技術員		
201	Supervisor  監督	<p>Performs supervisory duties contributory to the planning and allocation of tasks to workers and trainees, and to the manufacture, inspection, quality control, installation, operation, maintenance and repair of equipment and system.</p> <p>擔任管理職務，如策劃及分配工作予工人及受訓者；管理有關設備及系統的製造、查驗、品質控制、安裝、操作、保養及修理。</p>

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued)		技術員 (續)
202	Building Services Technician  屋宇設備技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, installation, operation, maintenance and repair of building services systems and equipment. Assists to plan, coordinate and supervise their projects. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、安裝、操作、保養及修理屋宇裝置及設備。並協助工程師策劃、協調及管理有關計劃。
203	Draughtsman  繪圖員	Prepares detail and assembly drawings and circuit diagrams according to design specifications. 按照設計規格，繪製明細圖、裝配圖及線路圖。
204	Electrical Engineering Technician  電機工程技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, manufacture, installation, operation, maintenance and repair of electrical systems and equipment. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、製造、安裝、操作、保養及修理電機裝置及設備。
205	Refrigeration/ Air-conditioning/ Ventilation Technician  冷凝／空氣調節／ 通風設備技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, manufacture, construction, installation, efficient operation, maintenance and repair of air-conditioning plant and equipment. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、製造、建造、安裝、有效操作、保養及修理冷凝空氣調節廠房及設備。
206	Mechanical Engineering Technician  機械工程技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, manufacture, construction, installation, efficient operation, maintenance and repair of mechanical plant and equipment. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、製造、建造、安裝、有效操作、保養及修理機械裝置及設備。

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued)		技術員 (續)
207	Lift/Escalator Technician  升降機／自動梯 技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, manufacture, installation, operation, maintenance and repair of both mechanical and electrical equipment for various types of lifts and escalators. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、製造、安裝、操作、保養及修理各類升降機及自動梯的機械及電氣設備。
208	Fire Services Technician  消防設備技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, manufacture, installation, operation, maintenance and repair of fire services systems, equipment and fire extinguishers. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、製造、安裝、操作、保養及修理消防系統，設備及滅火筒。
209	Electrical Instrument and Meter Technician 電工儀器技術員	Fits, assembles, repairs, tests and calibrates electrical meters and instruments either independently or under the direction of a qualified engineer. 單獨或在有資歷工程師的指導下，裝配、組合、修理、測試及校準電表及電工儀器。
210	Electronics Technician  電子技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, construction, installation, operation, maintenance and repair of electronic devices and equipment other than telecommunication systems. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、建造、安裝、操作、保養及修理電子裝置及設備（電訊系統除外）。
211	Telecommunication Technician  電訊技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, installation, operation, maintenance and repair of telecommunication systems and equipment. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、安裝、操作、保養及修理電訊系統及設備。

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued)		技術員 (續)
212	Office Equipment Service Technician  辦公室設備維修技 術員	Checks, tests, installs, maintains and services, repairs and overhauls general office equipment including electronic business equipment and copying machines, in both workshops and customers' premises. 在工場或顧客事務所查驗、測試、安裝、保養及檢修、修理及大修各項常用辦公室裝置，包括電子商業設備及各類複印機器。
TRADESMAN/CRAFTSMAN		技工
301	Foreman/Chargehand  管工／領工	Organises and directs groups or teams of craftsmen or other workers. 組織及督導若干組或若干隊技工或其他工人。
302	Building Services Mechanic 屋宇設備技工	Installs, operates, maintains and repairs various types of building services systems and equipment. 安裝、操作、保養和維修各類屋宇裝置及設備。
303	Electrician/ Electrical Fitter  電工／ 電氣打磨裝配工	Installs, tests, maintains and repairs electrical installations including electrical wiring in accordance with regulations and specifications; fits, assembles, erects, installs, maintains and repairs electrical plant and equipment. 依據規例及規格安裝、測試、保養和維修電力裝置，包括敷電線；裝配、組合、設置、安裝、保養及修理各類電氣裝置及設備。
304	Refrigeration, Air-conditioning and Ventilation Mechanic  空調製冷設備技工	Fits, assembles, erects, installs, commissions, services, operates, maintains and repairs refrigerating, air-handling and electrical equipment for ventilation system, air-conditioning plant, cold stores, ice-making, and other refrigerating apparatus and appliances for domestic, commercial and industrial uses including ventilation and air-conditioning equipment form part of a fire services system. 裝配、組合、設置、安裝、試動、檢修、操作、保養及修理家庭用、商用及工業用通風系統、空氣調節、冷藏、製冰及其他冷凝裝置的各項冷凝、空氣處理及電機設備，與消防的通風及空氣調節設備也包括在內。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN		技工
305	Plumber and Pipe Fitter 喉管工	Assembles, installs and maintains pipes, fittings and fixtures for conveying gases and liquids other than fire services piping. 組合、安裝及保養用以供應氣體和液體的喉管及裝置（消防設備喉管除外）。
306	Sheet Metal Worker 薄片金屬構造工  Thermal Insulation Craftsman 保溫技工	Fabricates, installs and repairs sheet metal assemblies and products including ventilation ducting, dampers, fire resistant board and fittings in accordance with specifications. 依據規格建造、裝置及修理薄片金屬組合及製品。包括通風槽、風閘、防火板及配件。  Prepares, fits, fixes and repairs thermal insulations of air-conditioning and refrigeration plants. 預備、裝配、固定及維修空氣調節及冷凝裝置的保溫設備。
307	Mechanical Fitter/ Machinist  機械打磨裝配工/ 機床工	Fits, assembles, erects, installs, repairs and services mechanical plant and equipment; sets up and operates machine tools to make products to specified tolerances and surface finishes. 打磨、裝配、裝置、安裝、修理及檢修機械設備；裝設及操作機械工具，製作產品以符合規定的公差及表面公度。
308	Lift/Escalator Mechanic 升降機／自動梯技工	Installs, adjusts, services, maintains and repairs various types of lifts and/or escalators. 安裝、校正、檢修、保養及修理各類升降機及／或自動梯設備。
309	Fire Services Electrical Fitter 消防電氣裝配工	Installs, tests, maintains, repairs and inspects automatic fire alarm (AFA) and manual fire alarm systems, and electrical/electronic parts of fire services systems. 安裝、測試、保養、修理及查驗自動及手動火警警報系統及消防系統電氣和電子設備。
310	Fire Services Mechanical Fitter 消防機械裝配工	Installs, tests, maintains, repairs and inspects fire services piping systems and mechanical parts of fire services systems. 安裝、測試、保養、修理及查驗消防設備喉管及消防系統機械設備。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued) 技工 (續)		
311	Cable Jointer (Power) 強電流電纜接駁工	Joints low voltage cables (i.e. not exceeding 1 000 Volts) either with the circuits dead or one or both cables energised and joints dead cables of all voltages. 接駁無通電、或其中一條或兩條已通電的低壓電纜（即不超過 1 000 伏特者），並負責接駁無通電的各級電壓電纜。
312	Overhead Linesman 架空電線技工	Constructs, maintains and repairs overhead line systems of all voltages on tubular steel, concrete, lattice girder or wood supports. 建造、保養及修理裝於管狀鋼鐵、混凝土、格子桁或木支座上的各級電壓架空電線系統。
313	Electrical Appliances Service Mechanic 電器用具服務技工	Fits and assembles, tests and installs, maintains, services and repairs all commonly used commercial and domestic electrical appliances excluding office, refrigeration and air-conditioning equipment. 裝配及組合、測試及安裝、保養、檢修及修理各類常用的商用及家庭電器用具（不包括文儀、冷凝及空氣調節設備）。
314	Welder 銲接工	Joins, cuts and deposits metals by means of an electric arc or a gas flame or by other welding or brazing processes. 使用電弧、氣體火焰、黃銅銲接或其他銲接法，以接合、割切及附合金屬。
315	Carpenter 木工  Painter 髹漆工	Cuts out, assembles, erects and repairs structural and other woodwork. 鋸切、裝配、架設及修理木架及其他木材結構。  Prepares surfaces, selects, mixes and applies paint. 擔任物品表面的打灰與磨滑、選油、混色及塗漆等工作。
316	Sign Installer 招牌安裝工	Installs neon and other illuminated signs. 安裝霓虹燈及其他照明招牌。
317	AV and RF Mechanic 影音及射頻技工	Installs, maintains and repairs television receivers, consumer video equipment and community antenna systems. 安裝、保養及修理電視機、影音設備及公用天線系統。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued)      技工 (續)		
318	Building Security System Mechanic  屋宇防盜系統技工	Installs, maintains and repairs building security systems including building doorphone systems, CCTV systems, public address systems and security alarm systems and access control system. 安裝、保養及修理各類屋宇防盜系統包括訪客對講機系統、閉路電視系統、擴音系統及防盜警報系統及進出控制系統。
319	Communication System Mechanic  電訊系統裝配工	To fit, assemble, install, maintain and repair communication equipment and systems including block wiring systems, private automatic branch exchange system, intercom systems, in-building coaxial cable distribution systems, and other wired or wireless signal transmission and reception systems. 裝配、組合、安裝、保養及修理各類電訊裝置及系統包括電線及光纖的分支及終端接駁系統、專用電話自動接駁系統、內線電話系統、大廈內同軸電纜系統及其他有線或無線的訊號收發系統。
SEMI-SKILLED WORKER/GENERAL WORKER      半技術工人／普通工人		
401	Labourer 雜工	Undertakes general labouring work. 擔任一般雜務工作。
402	Semi-skilled Worker 半技術工	Assists skilled craftsmen in the industry. 協助業內的技工工作。

**JOB DESCRIPTIONS FOR THE PRINCIPAL JOBS OF THE  
SHIPBUILDING AND SHIP REPAIR SECTOR**

船舶修建工程行業主要職務工作說明

Code 編號	Job Title 職稱	Job Description 工作說明
<b>PROFESSIONAL/TECHNOLOGIST 專業人士／技師</b>		
151	Electrical Engineer  電機工程師	Carries out research on electrical engineering problems, designs electrical systems and plans and supervises their construction, installation, operation, maintenance and repair, and advises employers, associates or clients on electrical engineering matters. 研究電機工程問題，設計電氣系統，策劃與監督系統的建造、裝設、操作、保養及修理；向僱主、同僚或顧客提供關於電機工程的意見。
152	Marine Engineer  輪機工程師	Studies, designs and advises on propulsion systems, power plants, heating and ventilating systems, steering gear, pumps and other mechanical and electrical equipment, construction, installation, maintenance and repair. 研究、設計及就船舶推進系統、動力裝置、暖氣與通風系統、操舵裝置、泵、其他機械與電機設備的建造、裝設、保養及修理提供專業意見。
153	Mechanical Engineer  機械工程師	Carries out research on mechanical engineering problems; designs and advises on mechanically functioning, plant and equipment, and plans and supervises their development, manufacture, construction, installation, operation, maintenance and repair. 研究機械工程問題；設計機械設備，並提供專業意見。計劃及監督機械設備的發展、生產、建造、裝設、操作、保養及修理。



Code 編號	Job Title 職稱	Job Description 工作說明
PROFESSIONAL/TECHNOLOGIST (Continued) 專業人士／技師（續）		
154	Ship Designer/Naval Architect  船舶設計師／ 造船工程師	Studies and prepares specifications for shipbuilding, conversion or repair. Studies, designs, and advises on the hulls and superstructures. Plans and supervises and be responsible for the overall design, their development, construction, maintenance and repair. 研究及編製建造新船、改裝船舶或修船的規格。研究、設計及就輪船的船身及上層結構提供專業意見。策劃、監督及負責輪船的全面設計、發展、構造、保養及修理。
155	Ship Repairs Manager/ Superintendent  船舶修理主管或 船舶修理監督	(A) Shipping Company: Organises and directs the repair and maintenance of ships; acts as company consultant on design, technical, cost and related matters.  (B) Dockyard/Shipyard: Organises and directs the building, repair and maintenance; discusses and negotiates with owner's representatives on design, technical, cost and related matters.  (甲) 船務工程公司方面的工作： 策劃與指導船舶的維修及保養；在設計、技術、成本及有關事宜方面擔任公司顧問。  (乙) 船廠方面的工作： 策劃與指導建造、維修及保養工作；就設計、技術、成本及有關事宜與船東代表研討及洽商。
TECHNICIAN 技術員		
251	Draughtsman  繪圖員	Prepares structural, layout, detail and assembly drawings or circuit diagrams for the maintenance and repair of plants, equipment and ship structures. 繪製結構圖、配置圖、明細圖、裝配圖或線路圖，用以保養及維修船隻結構，船上裝置及設備。

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued) 技術員 (續)		
252	Electrical Engineering Technician 電機工程技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, installation, operation, maintenance and repair of electrical systems and equipment. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、安裝、操作、保養及修理電機裝置及設備。
253	Electronics/ Telecommunication Technician 電子／通訊技術員	Carries out installation and repairing of marine electronic/telecommunication equipment. 安裝及修理船用電子／通訊設備。
254	Estimator 估計員	Obtains basic data and sets up detailed cost sheets for materials, overhead and labour in the preparation of tenders for shipbuilding and ship repair work; takes off quantities for work. 獲取基本資料，並詳細開列工料成本及雜項開支，以備競投船舶建造與修理工程之用。計算工程進度。
255	Mechanical Engineering Technician 機械工程技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, construction, installation, efficient operation, maintenance and repair of mechanical plant and equipment 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、建造、安裝、有效操作、保養及修理機械裝置及設備。
256	Safety Officer 安全主任	Responsible for implementing of safe practice and industrial safety training. 負責推行安全守則及工業安全訓練。
257	Supervisor/Foreman 監督／管工	Controls groups or teams of craftsmen or other workers. 管理若干組或若干隊技工或其他工人。

Code 編號	Job Title 職稱	Job Description 工作說明
<b>TRADESMAN 技工</b>		
351	Air-conditioning Mechanic/Sheet Metal Worker 空氣調節技工/ 薄片金屬構造工	Fits, assembles, erects, installs, commissions, services, operates, maintains and repairs air-conditioning plant and ducting fitted on-board ships. 安裝、組合、裝配、設置、測試、檢修、操作、保養及維修船上的空氣調節系統及風槽。
352	Carpenter 木工	Constructs and repairs wooden vessels, and carries out structural wood work. 建造及修理木船，並從事與船舶建造有關的木工。
353	Crane Driver 起重機操作工	Operates various types of cranes. 操作各類起重機。
354	Electrician 電工	Tests, overhauls and installs electrical plant and equipment, and wiring for power and lighting. 測試、檢查及安裝電氣設備和供電及照明的佈線。
355	Mechanical Fitter 機械打磨裝配工	Fits, assembles, erects, installs, services, repairs and tests plant and machinery on board or in workshop; and making tools for performing the above duties. 負責打磨、裝配、保養、修理及測試船上或工場內的機械，並製造工具以完成上述任務。
356	GRP - Worker 玻璃纖維工	Constructs, repairs and assembles vessels and articles from glass reinforced plastic material (GRP). 使用玻璃纖維建造、修理及組合船隻與用具。
357	Machinist 機床工	Sets up and operates machine tools, to machine parts to drawings and specifications. 調校與操作機床，並依據圖則與規格機製零件。
358	Marine Pipeworker 船舶喉管工	Fabricates, assembles, installs, maintains and repairs piping systems on board ships. 負責船舶上各種喉管系統的構製、組合、安裝、保養和修理。
359	Painter 髹漆工	Undertakes surface preparations and painting works on ships. 負責船舶的表面處理及髹漆工作。
360	Rigger 索具工（噶咗工）	Responsible for the rigging of ship's derricks, masts, lifeboat davits, staging and other rope work. 負責船上吊杆、船桅、救生艇吊架、架板及其他的索具裝配工作。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN (Continued) 技工 (續)		
361	Ship Classification Qualified Welder  船級協會認可焊接工	Being certified by the ship classification societies as qualified welder to perform welding jobs to the standard set by the respective classification societies. 船級協會認可的焊接工，能進行符合協會標準的焊接工作。
362	Steel Worker (Boiler Maker/Steel Plater/Blacksmith) 鋼鐵工 (鍋爐工、造 船鋼板工、捻縫工或 鐵工)	Carries out the fabrication and erection of steel structures on marine crafts.  建造、裝設與修理船舶鋼鐵結構。
363	Welder  焊接工	Performs cutting of ferrous metals, joining and depositing of ferrous and non-ferrous metal by means of welding with an electric arc, an oxy-acetylene or oxy-butane flame. 以電弧、氧乙炔焰或氧丁烷焰焊接法切割鐵金屬、連接及附焊鐵金屬與非鐵金屬。
SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人		
451	Labourer  雜工	Undertakes general cleaning work, removal of industrial waste and handling of materials. 擔任各種清潔工作，清理工業廢料及搬運物料。
452	Semi-skilled Worker 半技術工	Assists skilled craftsmen in the industry 協助業內技工工作

**JOB DESCRIPTIONS FOR THE PRINCIPAL JOBS  
IN THE GAS SECTOR**

氣體燃料行業主要職務的工作說明

Code 編號	Job Title 職稱	Job Description 工作說明
<b>PROFESSIONAL/TECHNOLOGIST 專業人士／技師</b>		
171	Electrical Engineer  電機工程師	<p>Designs and advises on electrical systems and equipment of fuel gas production plant, and plans and supervises their development, construction, installation, operation, maintenance and repair.</p> <p>設計氣體燃料製造廠房的電機系統及設備，並就該方面提供意見；策劃及管理其發展、建造、安裝、操作、保養及修理。</p>
172	Gas Engineer (Fuel Gas)  氣體工程師 (氣體燃料)	<p>Designs and advises on supply or utilization of gas. Plans, supervises and coordinates their development, construction, installation, operation, maintenance and repair.</p> <p>設計氣體燃料的供應或應用，並就該方面提供意見。策劃、監督及協調其發展、建造、安裝、操作、保養及修理。</p>
173	Mechanical Engineer  機械工程師	<p>Designs and advises on mechanical equipment of fuel gas production plant, and plans and supervises their development, construction, installation, operation, maintenance and repair.</p> <p>設計氣體燃料製造廠房的機械裝置及設備，並就該方面提供意見；策劃及管理其發展、建造、安裝、操作、保養及修理。</p>
<b>TECHNICIAN 技術員</b>		
271	Gas Engineering Technician  氣體燃料工程技術員	<p>Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, installation, operation, maintenance and repair of equipment concerned with the supply or utilization of gas. Assists to plan, coordinate and supervise their projects.</p> <p>單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、安裝、操作、保養及修理氣體燃料的供應或應用的設備。並協助工程師策劃、協調及管理有關計劃。</p>

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued) 技術員 (續)		
272	Mechanical Engineering Technician  機械工程技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, construction, installation, efficient operation, maintenance and repair of mechanical plant and equipment.  單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、建造、安裝、有效操作、保養及修理機械裝置及設備。
273	Supervisor/ Chargehand  監督／管工	Performs supervisory duties contributory to the planning and allocation of tasks to workers and trainees, and to the inspection, quality control, installation, operation, maintenance and repair of equipment and system.  擔任管理職務，如策劃及分配工作予工人及受訓者；管理有關設備及系統的查驗、品質控制、安裝、操作、保養及修理。
TRADESMAN/CRAFTSMAN 技工		
371	Electrician/Electrical Fitter 電工／電氣打磨 裝配工	Installs, tests, maintenances and repairs electrical installations in fuel gas production plants. 安裝、測試、保養和維修在氣體燃料製造廠房的電力裝置及設備。
372	Gas Distribution Fitter (LPG)  氣體燃料輸送技工 (石油氣)	Installs, commissions, tests and services LPG distribution systems including storage and piping before meter point. 安裝、試用、測試及維修石油氣輸送系統，包括在石油氣錶前之石油氣貯藏及喉管鋪設。
373	Gas Distribution Fitter (Town Gas)  氣體燃料輸送技工 (煤氣)	Installs, commissions, tests and services town gas distribution systems starting at outside the gas production works and terminating generally at one metre above ground level outside the consumer's building. 在煤氣生產處至用戶大廈通常離地一米處之間進行安裝、試用、測試及維修煤氣輸送系統。

Code 編號	Job Title 職稱	Job Description 工作說明
<b>TRADESMAN/CRAFTSMAN (Continued) 技工 (續)</b>		
374	Gas Utilization Fitter (Domestic)  氣體燃料應用技工 (住宅式)	Installs, commissions, tests and services all types of gas appliances together with their associated equipment, piping and gas supplies in domestic premises, including diagnostic fault finding and repairing. 安裝、試用、測試及維修住宅樓宇內一切氣體燃料用具、其附屬設備、喉管及氣體燃料供應系統。包括判斷與尋找故障及修理工作。
375	Gas Utilisation Fitter (Non-domestic)  氣體燃料應用技工 (非住宅式)	Installs, commissions, tests and services all types of gas appliances together with their associated equipment, piping and gas supplies in commercial and industrial premises, including diagnostic fault finding and repairing. 安裝、試用、測試及維修工商業樓宇內一切氣體燃料用具、其附屬設備、喉管及氣體燃料供應系統。包括判斷與尋找故障及修理工作。
376	Mechanical Fitter  機械打磨裝配工	Fits, assembles, erects, installs, repairs and services mechanical equipment of fuel gas production plant. 打磨、裝配、裝置、安裝、修理及檢修氣體燃料製造廠房的機械設備。
<b>SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人</b>		
471	Driver (LPG Cylinder Wagon)  司機 (石油氣瓶車)	Operates wagons to deliver LPG cylinders. 駕駛石油氣瓶車運送石油氣瓶。
472	Labourer  雜工	Undertakes general labouring work. 擔任一般雜務工作。
473	Semi-skilled Worker  半技術工	Assists skilled tradesmen in the industry. 協助業內的技工工作。
474	Vehicle Attendant/ Deliveryman (LPG Cylinder) 跟車／送貨員 (石油氣瓶)	Assists the driver in the delivery of LPG cylinder.  協助司機運送石油氣瓶。