

2007 Manpower Survey Report

Electrical And Mechanical Services Industry

機電工程業

二〇〇七年人力調查報告

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 2007 Manpower Survey
of the Electrical and Mechanical Services Industry

Objective

This survey was conducted in March/April 2007 to collect the latest manpower information of the electrical and mechanical services industry.

Coverage

2. The fieldwork of the manpower survey covered 1 054 establishments which were selected by a stratified random sampling method from a total of 8 983 establishments. These samples employed about 71% 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) consulting of building services engineering,
- (vi) electrical appliances repair,
- (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 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

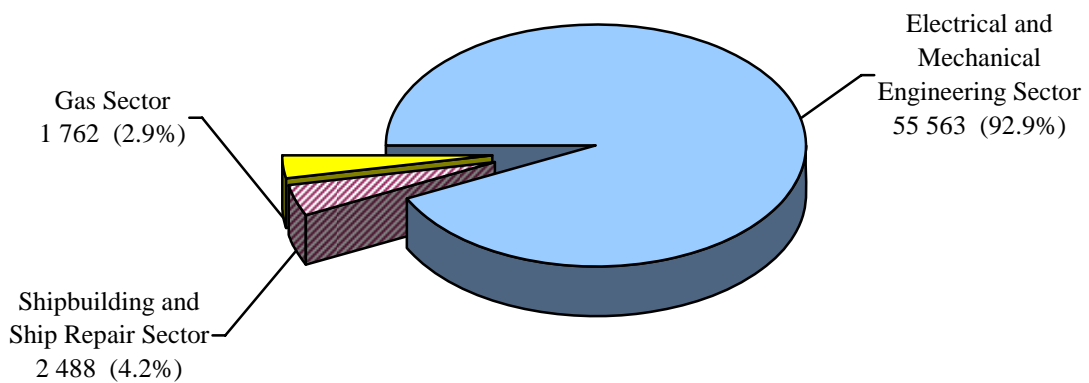
Establishments include:

- (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/April 2007, there were 59 813 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 59 813 workers, 55 563 workers (92.9%) were employed in the electrical and mechanical engineering sector, 2 488 workers (4.2%) in the shipbuilding and ship repair sector, and 1 762 workers (2.9%) in the gas sector. The distribution of electrical and mechanical engineering workers by sector is shown in Figure 1.

Figure 1 Distribution of Electrical and Mechanical Engineering Workers by Sector



4. The survey also revealed that there were 27 848 workers of other disciplines working in the electrical and mechanical services industry in March/April 2007. Among the 27 848 workers, 23 842 workers were employed in the electrical and mechanical engineering sector, 2 073 workers in the shipbuilding and ship repair sector and 1 933 workers in the gas sector. As a whole, the electrical and mechanical services industry employed a total of 87 661 workers in March/April 2007.

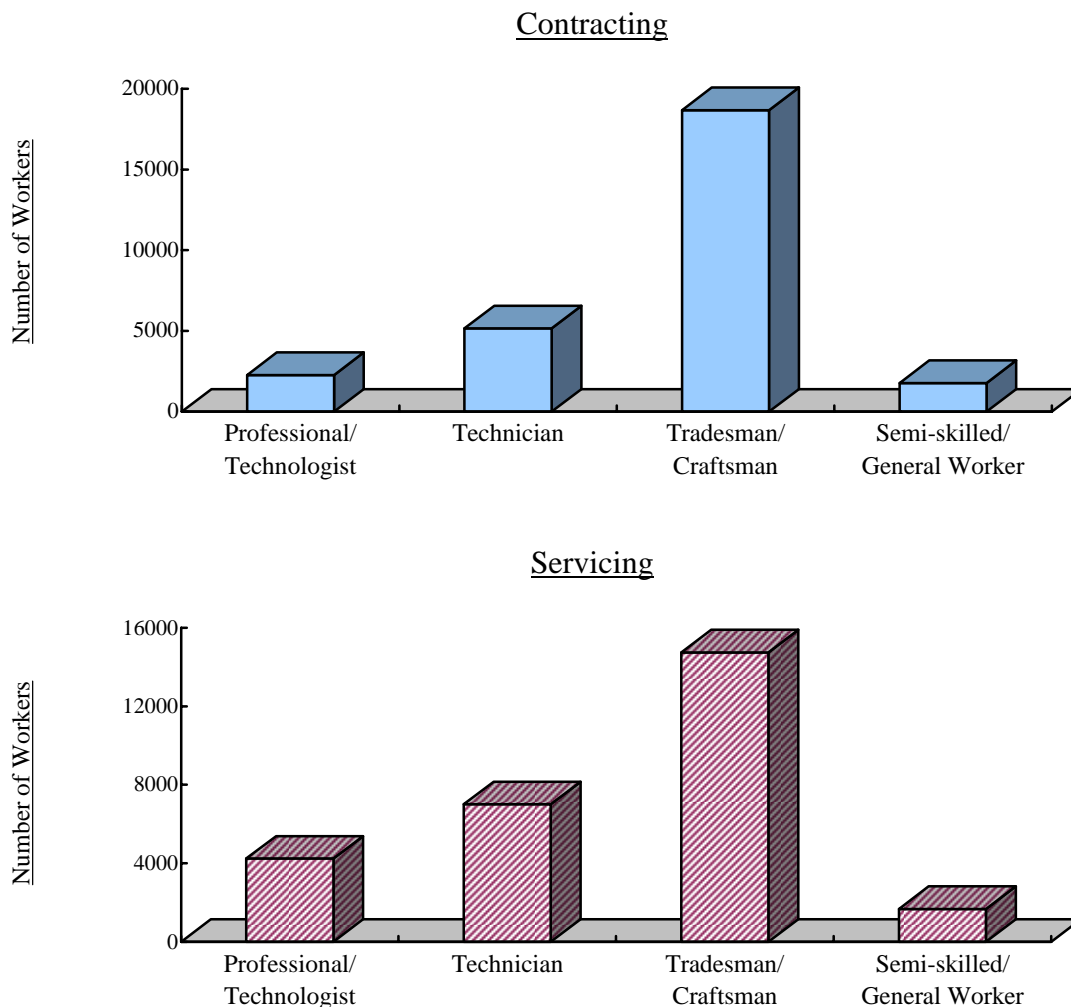
Electrical and Mechanical Engineering Sector

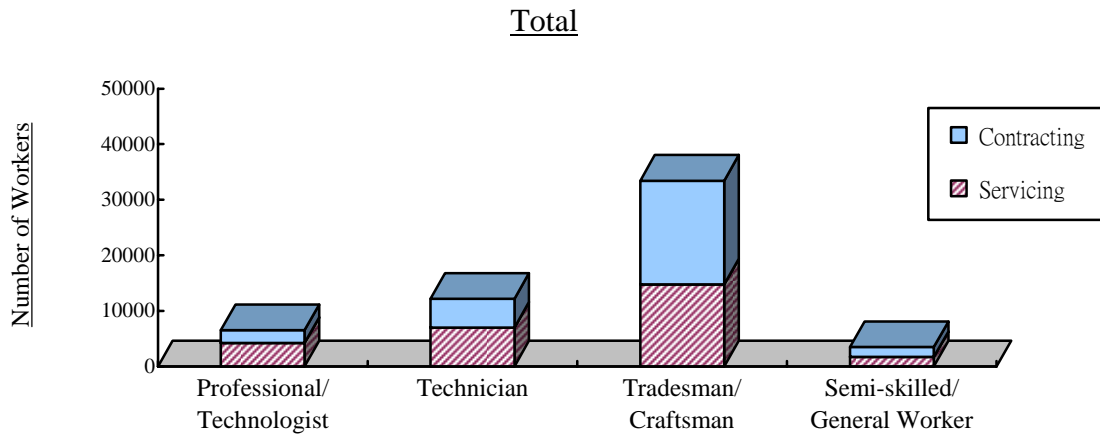
5. The distribution of workers by skill level and by branch of the electrical and mechanical engineering sector is shown in Table 1 and Figure 2.

Table 1 Distribution of Workers by Job Level of the Electrical and Mechanical Engineering Sector

<u>Branch</u>	<u>Professional/Technologist</u>	<u>Technician</u>	<u>Tradesman/Craftsman</u>	<u>Semi-skilled/General Worker</u>	<u>Total</u>
Contracting	2 272	5 154	18 682	1 772	27 880
Servicing	4 243	7 009	14 747	1 684	27 683
Sub-total	6 515	12 163	33 429	3 456	55 563
Percentage of total number of workers	11.7%	21.9%	60.2%	6.2%	100%

Figure 2 Distribution of Workers by Job Level of the Electrical and Mechanical Engineering Sector





6. Employers in the electrical and mechanical engineering sector reported a total of 2 028 trainees and 1 149 vacancies, amounting to 3.6% and 2.1% respectively of the total manpower. Besides, employers forecasted that the sector would require a total of 57 715 technical workers by March 2008.

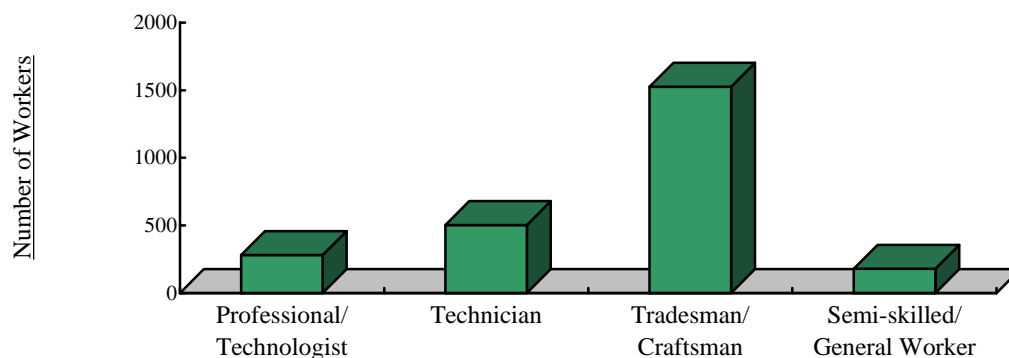
Shipbuilding and Ship Repair Sector

7. The distribution of workers by skill level of the shipbuilding and ship repair sector is shown in Table 2 and Figure 3.

Table 2 Distribution of E & M Workers by Job Level of the Shipbuilding and Ship Repair Sector

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	281	502	1 526	179	2 488
Percentage of total number of workers	11.3%	20.2%	61.3%	7.2%	100%

Figure 3 Distribution of E & M Workers by Job Level of the Shipbuilding and Ship Repair Sector



8. At the time of the survey, the reported numbers of trainees and job vacancies in this sector were 79 and 18 respectively which represented 3.2% and 0.7% of the total number of workers. Employers anticipated that by March 2008, the number of technical workers would be 2 508.

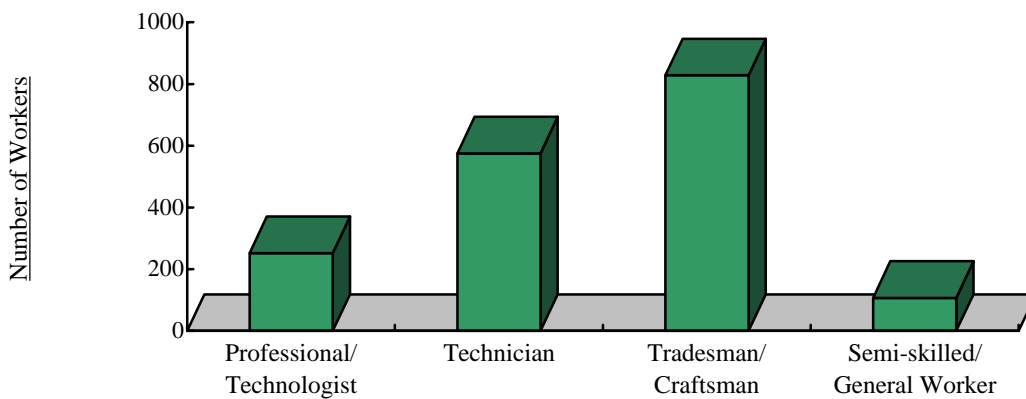
Gas Sector

9. The distribution of workers by skill level of the gas sector is shown in Table 3 and Figure 4.

Table 3 Distribution of E & M workers by Job Level of the Gas Sector

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	252	575	828	107	1 762
Percentage of total number of workers	14.3%	32.6%	47%	6.1%	100%

Figure 4 Distribution of E & M Workers by Job Level of the Gas Sector



10. In March/April 2007, there were 60 trainees and only 2 vacancies in the gas sector, representing 3.4% and 0.1% of the total manpower. Employers forecasted that the total workforce by March 2008 would be 1 770.

Projected Manpower Training Requirements

Electrical and Mechanical Engineering Sector

11. The survey findings showed a moderate average increase of 5.1% per annum in the overall technical manpower of electrical/mechanical engineering and related disciplines from year 2005 to 2007. By skill level, the average change per annum was 0.5% decrease in professional/technologist, 7.6% increase in technician, 5.7% increase in tradesman/craftsman and 2.6% increase in semi-skilled/general worker.

12. The local economy has a prominent and continuous growth from 2004. To sustain the economic growth, the HKSAR Government has pledged to inject about HK\$250 billions over the next decade into 10 major infrastructure projects. The Training Board anticipates that the policy will stimulate the demand of manpower in building and construction related E&M services trades. In addition, the rapid development of infrastructure and buildings in Macau and the persistent drastic growth of economy of Mainland China as well as the revival of local property market will increase the demand of E&M workers in the 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 2008 to 2010 as shown in Table 4.

Table 4 Projected Annual E & M Manpower Training Requirement of the Electrical and Mechanical Engineering Sector

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements 2008 – 2010</u>
Professional/Technologist	6 515	280 – 342
Technician	12 163	523 – 639
Tradesman/Craftsman	33 429	1 437 – 1 757

Shipbuilding and Ship Repair Sector

13. The survey revealed that from year 2005 to 2007, the overall technical manpower of this sector had a moderate decrease of 5.6% per annum. The average change per annum by skill level was 4.3% decrease in professional/technologist, 1.2% increase in technician, 9.7% decrease in tradesman/craftsman and 19.2% increase in semi-skilled/general worker.

14. The Training Board expects that the manpower requirements will remain stable in the 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 2008 to 2010 as shown in Table 5.

Table 5 Project Annual E & M Manpower Training Requirement of the Shipbuilding and Ship Repair Sector

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements 2008 – 2010</u>
Professional/Technologist	281	12 – 15
Technician	502	22 – 26
Tradesman/Craftsman	1 526	66 – 80

Gas Sector

15. The survey data indicated that the total manpower of the gas sector decreased moderately at 1% per annum from year 2005 to 2007. By skill level, the average change per annum was 11.3% decrease in professional/technologist, 8% increase in technician, 1% decrease in tradesman/craftsman and 12.9% decrease in semi-skilled/general worker.

16. The Training Board anticipates that the demand for technical workers in the gas sector will remain stable in the coming years. The Training Board has projected the average annual training requirements for year 2008 to 2010 as shown in Table 6.

Table 6 Project Annual E & M Manpower Training Requirement of the Gas Sector

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements 2008 – 2010</u>
Professional/Technologist	252	7 – 8
Technician	575	16 – 20
Tradesman/Craftsman	828	23 – 28

Major Conclusions and Recommendations

17. 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. However, the inadequacy will be satisfied by the source from workers at technician level who upgrade themselves to professionals/technologists by part-time degree programmes;
 - (ii) the small demand appeared in the shipbuilding and ship repair sector can be matched 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 can meet 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 will match with each other.
- (c) Training of Tradesmen/Craftsmen:
 - (i) the supply of tradesmen/craftsmen graduates in key trades of the E & M engineering sector and the shipbuilding & ship repair sector may not be sufficient to meet the projected training requirements in coming years. The Training Board recommends the vocational training organizations to increase their training capacities of pre-employment training courses at tradesmen/craftsmen level and offer more training courses for upgrading in-service semi-skilled workers to qualified tradesmen/craftsmen.
 - (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.
- (f) Registration of Construction Workers – E&M contractors of construction worker should encourage their E&M workers to register under the Construction Workers Registration Ordinance.

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/April 2007 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 2008;
- (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 8 983 establishments, including 8 491 establishments in the electrical and mechanical engineering sector, 318 in the shipbuilding and ship repair sector, and 174 in the gas sector. Of these 8 983 establishments, 8 880 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 951 samples out of the 8 880 establishments in the HSICs. Together with 103 selected organisations, a total of 1 054 establishments were covered and about 71% 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 1 054 establishments, 858 supplied the information and 18 refused to do so. The remaining 178 had either closed, moved, or changed the nature of their business. The effective response rate was 98%.

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 2007 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 early October 2007 for public access.

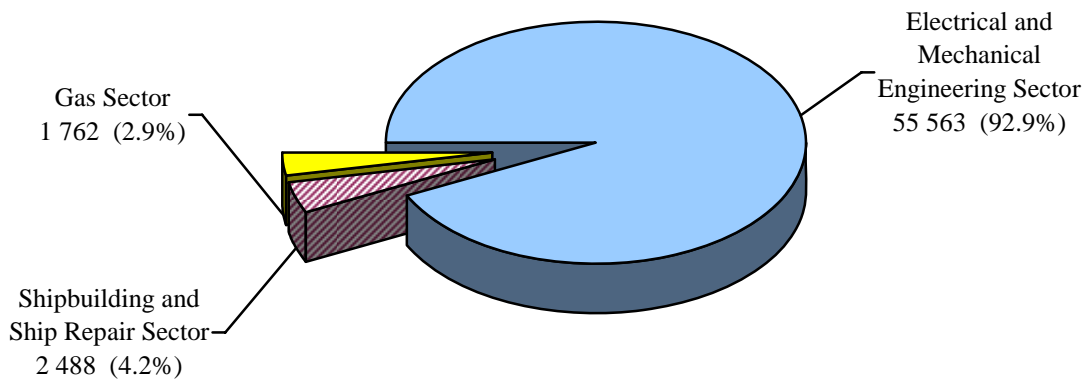
SECTION II

SUMMARY OF SURVEY FINDINGS

Number of Workers Employed

2.1 The survey revealed that in March/April 2007, a total of 59 813 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 59 813 workers, 55 563 workers (92.9%) were employed in the electrical and mechanical engineering sector, 2 488 workers (4.2%) in the shipbuilding and ship repair sector, and 1 762 workers (2.9%) in the gas sector. The distribution of electrical and mechanical engineering workers by sector is shown in Figure 2.1.

Figure 2.1 Distribution of Electrical and Mechanical Engineering Workers by Sector



2.2 The survey also revealed that there were 27 848 workers of other disciplines working in the electrical and mechanical services industry in March/April 2007. Among the 27 848 workers, 23 842 workers were employed in the electrical and mechanical engineering sector, 2 073 workers in the shipbuilding and ship repair sector and 1 933 workers in the gas sector.

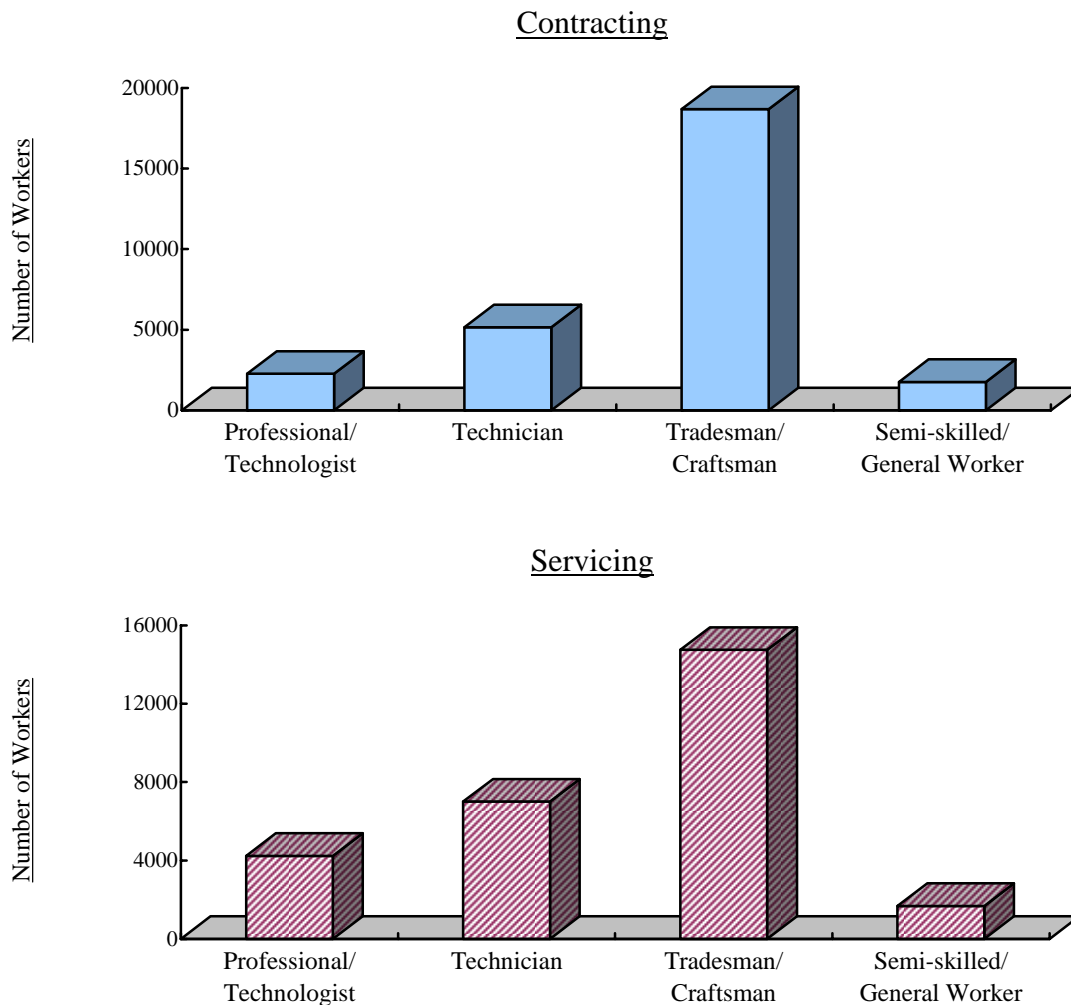
Electrical and Mechanical Engineering Sector

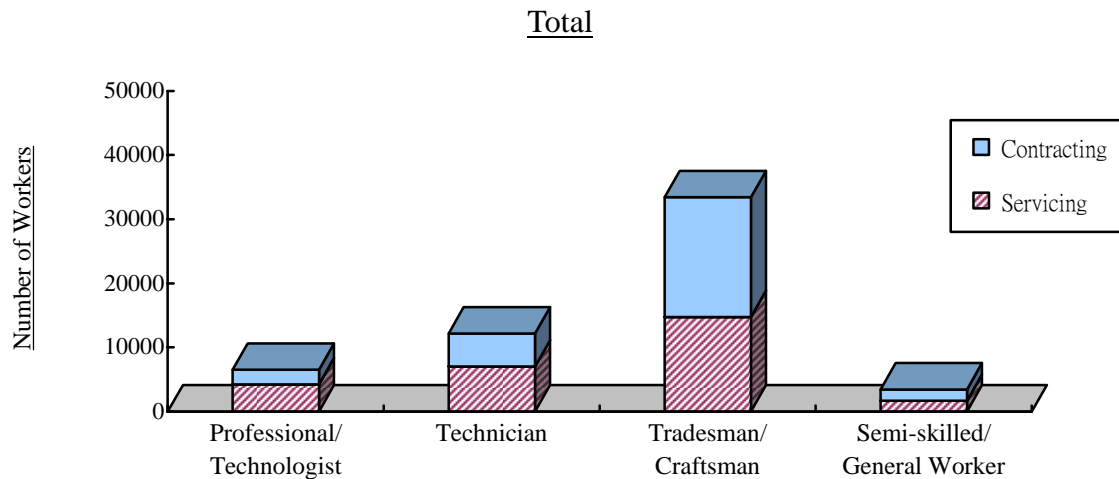
2.3 The distribution of workers according to job level in the two branches of the electrical and mechanical engineering sector is shown in Table 2.1 and Figure 2.2.

Table 2.1 Distribution of Workers by Job Level of the Electrical and Mechanical Engineering Sector

<u>Branch</u>	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
Contracting	2 272	5 154	18 682	1 772	27 880
Servicing	4 243	7 009	14 747	1 684	27 683
Sub-total	6 515	12 163	33 429	3 456	55 563
Percentage of total number of workers	11.7%	21.9%	60.2%	6.2%	100%

Figure 2.2 Distribution of Workers by Job Level of the Electrical and Mechanical Engineering Sector





2.4 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.

2.5 At the time of the survey, there were 2 028 trainees under various forms of training in the electrical and mechanical engineering sector, representing 3.6% of the total workforce. Their distribution by job level is shown in Table 2.2.

Table 2.2 Distribution of Trainees by Job Level of the Electrical and Mechanical Engineering Sector

<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	6 515	213	3.3%
Technician	12 163	226	1.9%
Tradesman/Craftsman	33 429	1 589	4.8%
Semi-skilled/General Worker	3 456	-	-
Total	55 563	2 028	3.6%

2.6 Employers reported a total of 1 149 vacancies, representing about 2.1% of the total manpower of the electrical and mechanical engineering sector. The distribution of the vacancies by job level is shown in Table 2.3.

Table 2.3 Distribution of Vacancies by Job Level 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	6 515	256	3.9%
Technician	12 163	188	1.5%
Tradesman/Craftsman	33 429	680	2.0%
Semi-skilled/General Worker	3 456	25	0.7%
Total	55 563	1 149	2.1%

2.7 Employers forecasted a total of 57 715 E & M workers by March 2008 in the electrical and mechanical engineering sector, indicating a view of a moderate forecasted annual growth of 1.8%. Their distribution by job level is shown in Table 2.4.

Table 2.4 Distribution of Forecasted Number of Workers by Job Level of the Electrical and Mechanical Engineering Sector

<u>Job Level</u>	<u>Number of Workers Plus Vacancies at Time of Survey</u>	<u>Employers' Forecast on Number of Workers by March 2008</u>
Professional/Technologist	6 771	6 764
Technician	12 351	12 454
Tradesman/Craftsman	34 109	34 974
Semi-skilled/General Worker	3 481	3 523
Total	56 712	57 715

2.8 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 2008 at each principal job of the electrical and mechanical engineering sector are given in Appendix 3.

2.9 The monthly income range of the majority of E & M workers at each job level of the electrical and mechanical engineering sector is shown in Table 2.5:

Table 2.5 Monthly Income Range of Workers of the Electrical and Mechanical Engineering Sector

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

2.10 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.

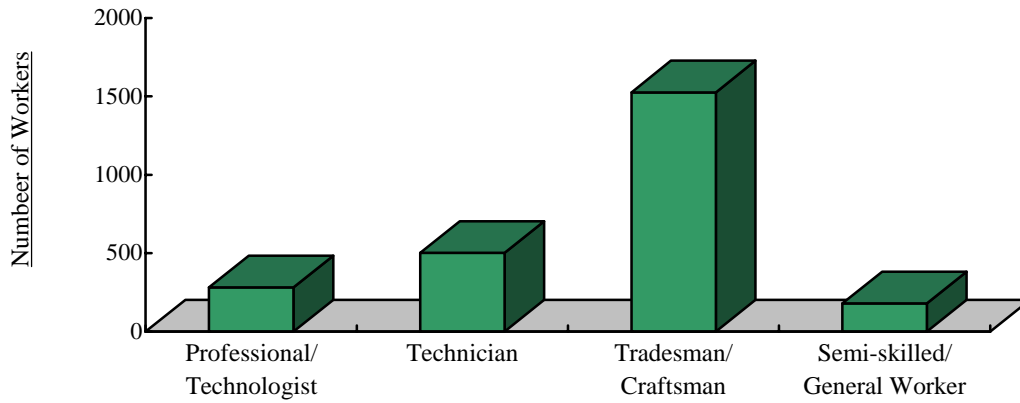
Shipbuilding and Ship Repair Sector

2.11 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 is shown in Table 2.6 and Figure 2.3.

Table 2.6 Distribution of E & M Workers by Job Level of the Shipbuilding and Ship Repair Sector

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	281	502	1 526	179	2 488
Percentage of total number of workers	11.3%	20.2%	61.3%	7.2%	100%

Figure 2.3 Distribution of E & M Workers by Job Level of the Shipbuilding and Ship Repair Sector



2.12 At the time of the survey, there were 79 trainees under various forms of training in the shipbuilding and ship repair sector, representing 3.2% of the total workforce. Their distribution by job level is shown in Table 2.7.

Table 2.7 Distribution of E & M Trainees by Job Level of the Shipbuilding and Ship Repair Sector

<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	281	6	2.1%
Technician	502	11	2.2%
Tradesman/Craftsman	1 526	62	4.1%
Semi-skilled/General Worker	179	-	-
Total	2 488	79	3.2%

2.13 Employers reported a total of 18 vacancies, representing about 0.7% of the total E & M workforce of the shipbuilding and ship repair sector. Their distribution by job level is shown in Table 2.8.

Table 2.8 Distribution of E & M Vacancies by Job Level 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	281	4	1.4%
Technician	502	4	0.8%
Tradesman/Craftsman	1 526	6	0.4%
Semi-skilled/General Worker	179	4	2.2%
Total	2 488	18	0.7%

2.14 Employers forecasted a total of 2 508 E & M workers by March 2008 in the shipbuilding and ship repair sector, indicating a view of a marginal forecasted annual growth of 0.1%. Their distribution by job level is shown in Table 2.9.

Table 2.9 Distribution of Forecasted Number of E & M Workers by Job Level of the Shipbuilding and Ship Repair Sector

<u>Job Level</u>	<u>Number of Workers Plus Vacancies at Time of Survey</u>	<u>Employers' Forecast on Number of Workers by March 2008</u>
Professional/Technologist	285	286
Technician	506	506
Tradesman/Craftsman	1 532	1 533
Semi-skilled/General Worker	183	183
Total	2 506	2 508

2.15 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 2008 at each principal job of the shipbuilding and ship repair sector are given in Appendix 8.

2.16 The monthly income range of the majority of E & M workers at each job level of the shipbuilding and ship repair sector is shown in Table 2.10.

Table 2.10 Monthly Income Range of E & M Workers of the Shipbuilding and Ship Repair Sector

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

2.17 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.

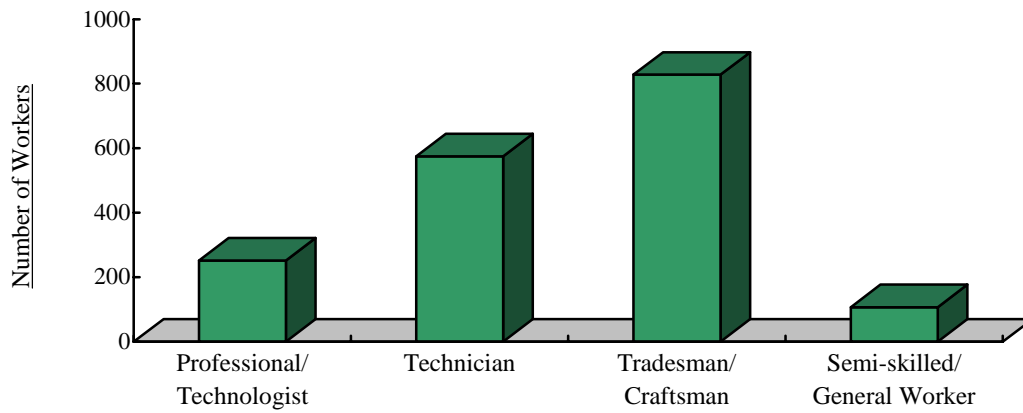
Gas Sector

2.18 The manpower statistics of the gas sector are tabulated in Appendix 10. The distribution of E & M workers by job level of the sector is shown in Table 2.11 and Figure 2.4.

Table 2.11 Distribution of E & M workers by Job Level of the Gas Sector

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	252	575	828	107	1 762
Percentage of total number of workers	14.3%	32.6%	47%	6.1%	100%

Figure 2.4 Distribution of E & M Workers by Job Level of the Gas Sector



2.19 At the time of the survey, there were 60 trainees under various forms of training in the gas sector, representing 3.4% of the total workforce. Their distribution by job level is shown in Table 2.12.

Table 2.12 Distribution of E & M Trainees by Job Level of the Gas Sector

<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	252	-	-
Technician	575	-	-
Tradesman/Craftsman	828	60	7.2%
Semi-skilled/General Worker	107	-	-
Total	1 762	60	3.4%

2.20 Employers reported 2 vacancies at the time of the survey, representing about 0.1% of the total E & M manpower of the gas sector. The distribution by job level is shown in Table 2.13.

Table 2.13 Distribution of E & M Vacancies by Job Level 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	252	-	-
Technician	575	-	-
Tradesman/Craftsman	828	2	0.2%
Semi-skilled/General Worker	107	-	-
Total	1 762	2	0.1%

2.21 Employers forecasted a total E & M workforce of 1 770 by March 2008 in the gas sector, indicating a view of a moderate forecasted annual growth of 3%. Their distribution by job level is shown in Table 2.14.

Table 2.14 Distribution of Forecasted Number of E & M Workers by Job Level of the Gas Sector

<u>Job Level</u>	<u>Number of Workers Plus Vacancies at Time of Survey</u>	<u>Employers' Forecast on Number of Workers by March 2008</u>
Professional/Technologist	252	253
Technician	575	577
Tradesman/Craftsman	830	833
Semi-skilled/General Worker	107	107
Total	1 762	1 770

2.22 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 2008 at each principal job of the gas sector are given in Appendix 10.

2.23 The monthly income range of the majority of E & M workers at each job level of the gas sector is shown in Table 2.15.

Table 2.15 Monthly Income Range of E & M Workers of the Gas Sector

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

2.24 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

2.25 For assessing E & M workers participating in construction works, the Training Board conducted its fifth supplementary manpower survey in March 2007 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 829 building sites and 407 civil engineering and other sites recorded by the Census and Statistics Department at the time of the survey.

2.26 The supplementary survey revealed that there were 4 486 E & M workers of electrical/mechanical engineering and related disciplines working in the construction sites at the time of the survey. Of the 4 486 workers, 4 076 workers (90.9%) were employed in building sites and 410 workers (9.1%) 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 2007 manpower survey of the electrical and mechanical services industry which was conducted on establishment basis in March/April 2007.

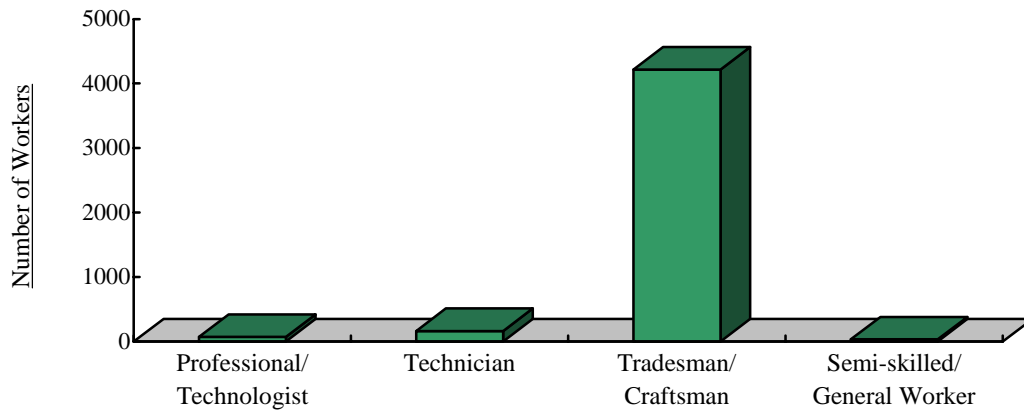
2.27 The distribution of workers by job level is shown in Table 2.16 and Figure 2.5.

Table 2.16 Distribution of E & M Workers Working in Construction Sites

<u>Job Level</u>	<u>Number of Workers</u>		<u>Percentage of Total Number Employed</u>
Professional/Technologist	72	(96)	1.6%
Technician	164	(415)	3.7%
Tradesman/Craftsman	4 216	(4 627)	94%
Semi-skilled/General Worker	34	(241)	0.7%
Total:	4 486	(5 379)	100%

(Figures in brackets are the corresponding data collected in the fourth supplementary manpower survey conducted in March 2005).

Figure 2.5 Distribution of E & M Workers Working in Construction Sites



2.28 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/April 2007, the electrical and mechanical engineering sector employed a total of 55 563 E & M workers, representing a moderate average increase of 5.1% per annum when compared with 50 268 E & M workers found in the last survey conducted in March 2005. The distribution and comparison of the workforce by job level and by branch in 2005 and 2007 are shown in Table 3.1.

Table 3.1: 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	2 272 (2 817)	4 243 (3 767)	6 515 (6 584)	-0.5%
Technician	5 154 (4 364)	7 009 (6 142)	12 163 (10 506)	+7.6%
Tradesman/Craftsman	18 682 (17 374)	14 747 (12 520)	33 429 (29 894)	+5.7%
Semi-Skilled/General Worker	1 772 (1 959)	1 684 (1 325)	3 456 (3 284)	+2.6%
Total	27 880 (26 514)	27 683 (23 754)	55 563 (50 268)	
Average Annual Change in %	+2.5%	+8.0%	+5.1%	

Note:

Figures in brackets represent the corresponding numbers collected in the 2005 manpower survey.

Manpower Changes of the E & M Engineering Sector

3.3 The survey revealed that there was an average increase of 5.1% per annum in the overall employment of the electrical and mechanical engineering sector in the past two years. The professional/technologist workforce has a slight decrease of 0.5% per annum while the technician and tradesman manpower faced apparent increase of 7.6% and 5.7% per annum respectively. Regarding the semi-skilled worker/general worker level, the number of workers showed a moderate increase of 2.6% per annum.

3.4 The decrease of professionals/technologists was mainly recorded in contracting branch. When considering the manpower by trades, it is found that sharp increases were recorded in mechanical engineering and refrigeration/air-conditioning/ventilation engineering trades. In contrary, lift engineering trades faced a moderate decrease in manpower in the past two years.

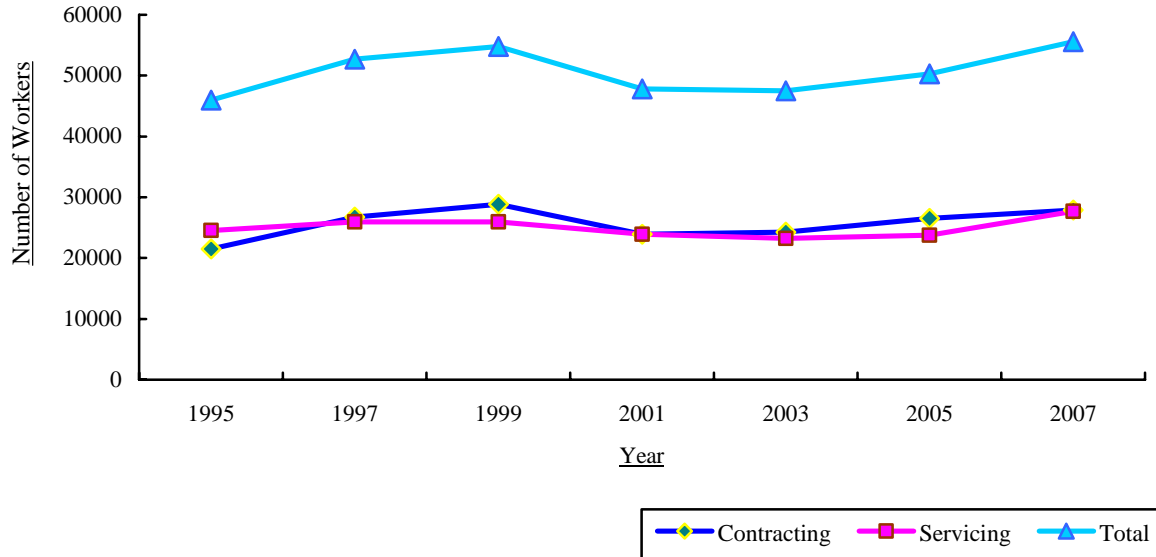
3.5 The manpower changes of the E&M engineering sector from 1995 to 2007 are shown in Table 3.2 and Figure 3.1.

Table 3.2 Manpower Changes of the Electrical and Mechanical Engineering Sector between 1995 and 2007

<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
2007	27 880	27 683	55 563

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

Figure 3.1 Manpower Changes of the Electrical and Mechanical Engineering Sector between 1995 and 2007



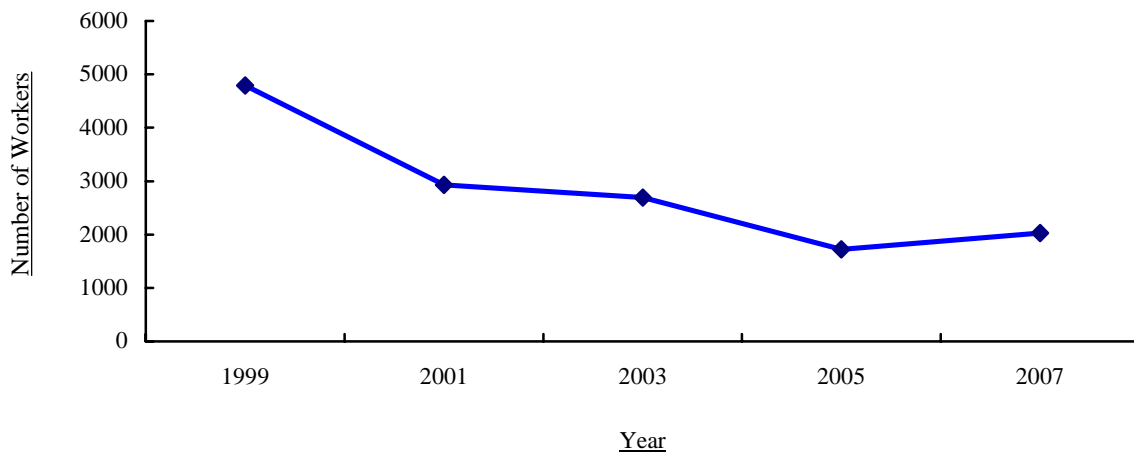
3.6 The manpower figures show that the manpower employed in the E&M engineering sector rose to a peak in year 1999 and then declined apparently until 2003. Following the upturn of the economy of Hong Kong and vicinity regions after 2003, the number of workers recorded a moderate rebound in the 2005 manpower survey. In the past two years, the manpower had a sustained growth to cope with the tight programmes of Macau construction projects and the prominent increase of renovation and decoration works following the rebound of Hong Kong economy after 2003. The number of workers surveyed in 2007 manpower survey had an increase of 17% when compared with that in 2005 manpower survey. The surveyed figure of 55 563 technical workers in the 2007 manpower survey had overtaken the peak figure of 54 814 workers recorded in 1999 manpower survey.

3.7 To cope with the demand arising from the launch of large scale hangar, the numbers of workers and trainees in mechanical engineering and aircraft engineering services trades recorded apparent increases in the past two years. As a result, the number of trainees in the E&M engineering sector surveyed in the 2007 manpower survey turned the persistent decline to a remarkable rise. The changes on number of trainees in the sector are shown in Table 3.3 and Figure 3.2.

Table 3.3 Changes on Number of Trainees of the E & M Engineering Sector

<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%
2007	55 563	2 028	3.6%

Figure 3.2 Changes of Number of Trainees of the Electrical and Mechanical Engineering Sector



Business Outlook of the E & M Engineering Sector

Contracting Branch

3.8 The Chief Executive of the HKSAR Government pledged in his 2007 policy address to push ahead with 10 large-scale infrastructure (Appendix 15), projects for sustaining economic growth of Hong Kong. The large-scale projects with intensive E&M engineering works will include South Island Railway Line, Sha Tin-Central Railway Link, Guangzhou-Shenzhen- Hong Kong Express Rail Link, West Kowloon Cultural District and Kai Tak Development Plan. Therefore, there should be a steady demand of workers for the construction projects. In addition, the continuous development of infrastructure and building projects in Macau will also maintain the demand of skilled workers of Hong Kong. Moreover, the revival of property market will also stimulate the demand of manpower in building related E&M trades.

Servicing Branch

3.9 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 partly 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

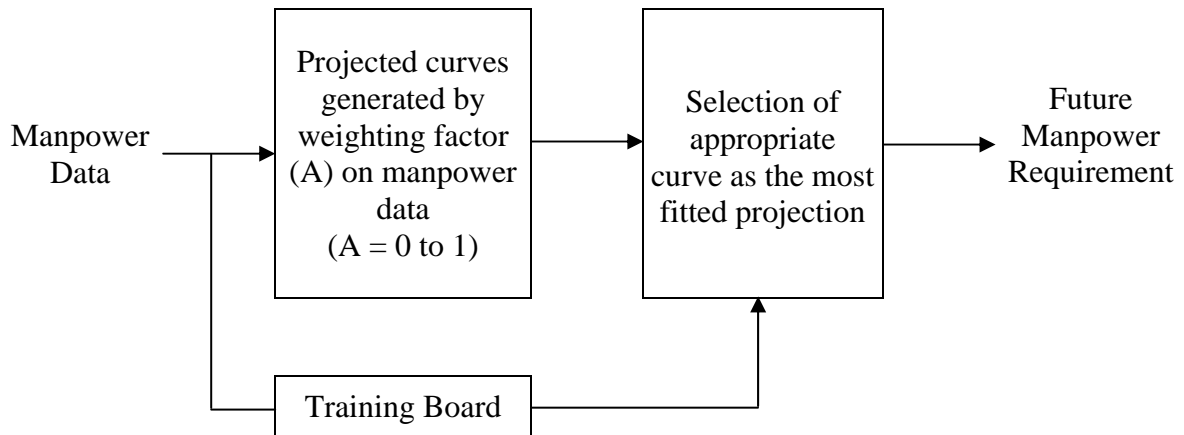
3.10 Comparing with the figures of 2005 manpower survey, the number of vacancies reported by employers at the time of the survey decreased slightly. However, the number of vacancies of professionals/technologists trebled. Employers were generally optimistic on the prospect of the sector as reflected by employers' one-year forecast shown in Table 3.4.

Table 3.4 Distribution of Vacancies and Forecasted Number of E & M Workers of the Electrical and Mechanical Engineering Sector

<u>Skill Level</u>	<u>No. Employed at Time of Survey</u>	<u>Reported Vacancies</u>		<u>Employers' One-Year Forecast</u>
		<u>Number</u>	<u>Percentage</u>	<u>Number of Workers by March 2008</u>
Professional/Technologist	6 515	256	3.9%	6 764
Technician	12 163	188	1.5%	12 454
Tradesman/Craftsman	33 429	680	2.0%	34 974
Semi-skilled/General Worker	3 456	25	0.7%	3 523
Total	55 563	1 149	2.1%	57 715

Projected Manpower Training Requirements for the E&M Engineering Sector

3.11 In the previous manpower surveys of the E&M engineering sector, the 'adaptive filtering method' (AFM) have been commonly adopted for projecting the future manpower requirements. The 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.

3.12 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.

3.13 In the 2003 manpower survey, the Training Board adopted statistical modelling for projecting the manpower requirements. Statistical modeling 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)’.

3.14 In the 2005 manpower survey, as a result of the shift of technical manpower distribution from new construction sub-sector to renovation and decoration sub-sector, the confidence level of the correlation of the overall technical manpower employed in the E&M engineering sector with the principal component GVCW fell below the recommended criteria for application. 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 decided to adopt the AFM for projecting the manpower requirements.

3.15 For the 2007 manpower survey, with the same situation on technical manpower distribution as in year 2005, the Training Board decides to apply the AFM again for projecting the manpower requirements for year 2008 to 2010.

3.16 In the E&M engineering sector, the percentages of technical workers of age over 50 collected in the previous surveys 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%.

3.17 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 2008 to 2010 for the E&M engineering sector are shown in Table 3.5.

Table 3.5 Projected Annual E & M Manpower Training Requirement of the Electrical and Mechanical Engineering Sector

<u>Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2008 - 2010</u>
Professional/Technologist	6 515	280 – 342
Technician	12 163	523 – 639
Tradesman/Craftsman	33 429	1 437 – 1 757

Shipbuilding and Ship Repair Sector

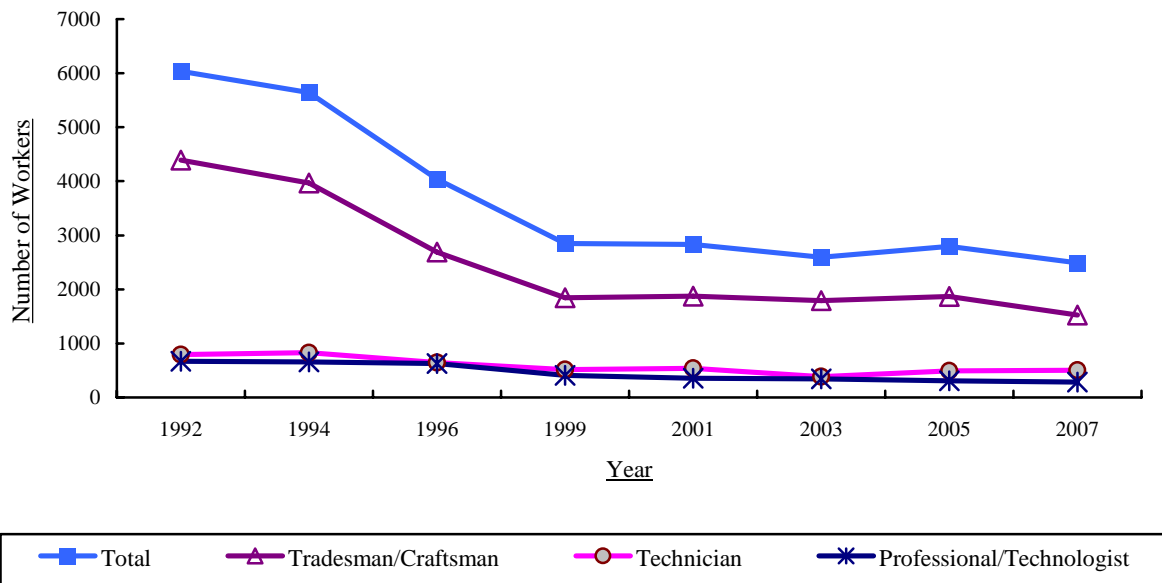
Manpower Changes

3.18 The manpower changes at professional/technologist, technician and tradesman/craftsman levels of the shipbuilding and ship repair sector from 1992 to 2007 are shown in Table 3.6 and Figure 3.3.

Table 3.6 E & M Manpower Changes of the Shipbuilding and Ship Repair Sector

<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
2007	281	502	1 526	2 488

Figure 3.3 E & M Manpower Changes of the Shipbuilding and Ship Repair Sector



3.19 The figures indicate that the overall workforce of the sector had a moderate decrease of 5.6% 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

3.20 The growth of shipbuilding industry of Mainland China brings regional advantages on ship repair and maintenance services to Hong Kong. However, technology advancement and productivity improvement will balance off 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 remain stable in the coming three years.

Projected Manpower Training Requirements for the Shipbuilding and Ship Repair Sector

3.21 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 2008-2010.

3.22 With a consideration that the percentages of technical workers of age over 50 collected in the previous surveys were stable in the range of 34.1% to 37.3%, the Training Board continues to adopt a wastage rate of 6% for estimating the annual training requirements.

3.23 Based on the above considerations, the Training Board has determined the average annual training requirements of E & M manpower for the shipbuilding and ship repair sector for 2008 to 2010 is shown in Table 3.7.

Table 3.7 Projected Annual E & M Manpower Training Requirement of the Shipbuilding and Ship Repair Sector

<u>Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2008 - 2010</u>
Professional/Technologist	281	12 – 15
Technician	502	22 – 26
Tradesman/Craftsman	1 526	66 – 80

Gas Sector

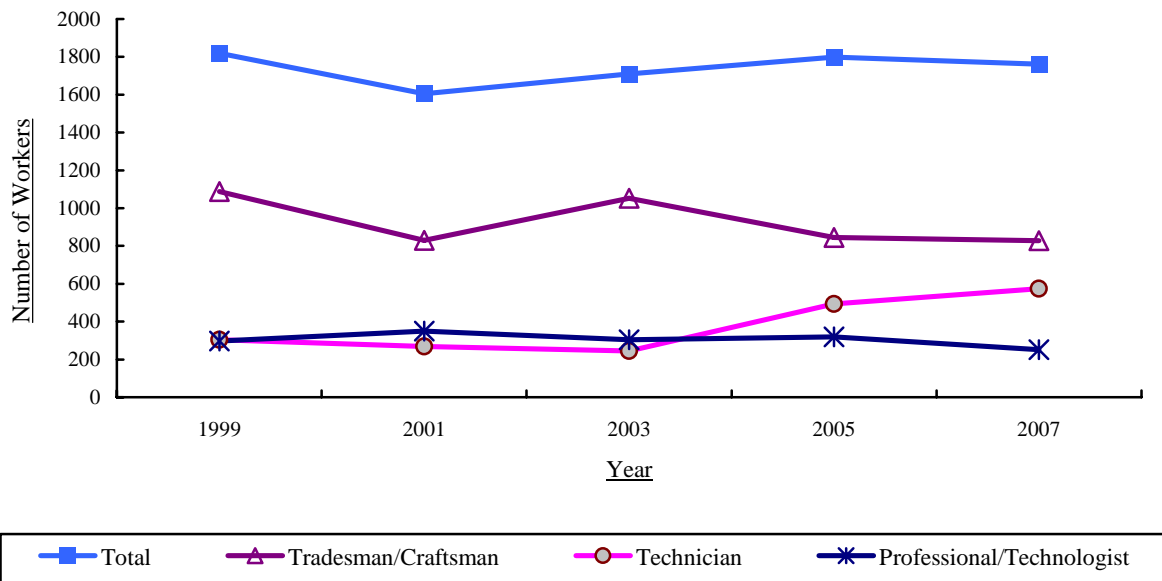
Manpower Changes

3.24 The manpower changes at the three skill levels of the gas sector from the first survey in 1999 to this survey are shown in Table 3.8 and Figure 3.4.

Table 3.8 E & M Manpower Changes of the Gas Sector

<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
2007	252	575	828	1 762

Figure 3.8 E & M Manpower Changes of the Gas Sector



3.25 The figures show that the overall manpower of the gas sector had a slight decrease of 1% per annum in the past two years. The variation of the overall manpower has been moderate.

Business Outlook of the Gas Sector

3.26 For upgrading the standards of safety and quality assurance on gas equipment and systems as well as the development projects in Mainland China, there should be a mild increase in the number of technical workers for the sector. 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 no significant change in coming years.

Projected Manpower Training Requirements for the Gas Sector

3.27 With the contribution of the 2007 manpower survey, there were 5 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 2008-2010.

3.28 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%, the Training Board decides to take a wastage rate of 3% for projecting the future training requirements.

3.29 Based on the above considerations, the Training Board has projected the average annual training demand for manpower in the gas sector from year 2008 to 2010 is shown in Table 3.9.

Table 3.9 Projected Annual E & M Manpower Training Requirement of the Gas Sector

<u>Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2008 - 2010</u>
Professional/Technologist	252	7 – 8
Technician	575	16 – 20
Tradesman/Craftsman	828	23 – 28

3.30 The Training Board will conduct another manpower survey in 2009 to review and update the manpower requirements of the electrical and mechanical services industry.

SECTION IV

RECOMMENDATIONS

4.1 With consideration on the local and global economic situation as well as the business nature of the E&M services industry, the Training Board anticipates the demand for properly trained technical manpower for the three sectors of the industry from 2008 to 2010 will be as follows:

- (i) E & M engineering sector: the local economy has a prominent and continuous growth from 2004. To sustain the economic growth, the HKSAR Government has pledged to inject about HK\$250 billions over the next decade into 10 major infrastructure projects (Appendix 15). The policy will stimulate the demand of manpower in building and construction related E&M services trades. In addition, the rapid development of infrastructure and buildings in Macau and the persistent drastic growth of economy of Mainland China as well as the revival of local property market will increase the demand of E&M workers in the sector.
- (ii) Shipbuilding and ship repair sector: since the increase of manpower demand brought by the growth of shipbuilding industry of Mainland China will be balanced off by the technology advancement and productivity improvement, the manpower requirements in the sector will remain stable.
- (iii) Gas sector: as the increase of manpower demand arising from development projects in Mainland China and upgrading standards on safety and quality assurance will be relieved by the technology advancement and productivity improvement, the overall demand for technical workers in this sector will remain stable.

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 3.17, 3.23 and 3.29 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 4.7% of the number of professionals/technologists, technicians and tradesmen/craftsmen employed presently. Details of the annual intake percentage at various job levels are shown in Table 4.1.

Table 4.1 Annual Intake Percentage of Trainees by Job Level and by Sector

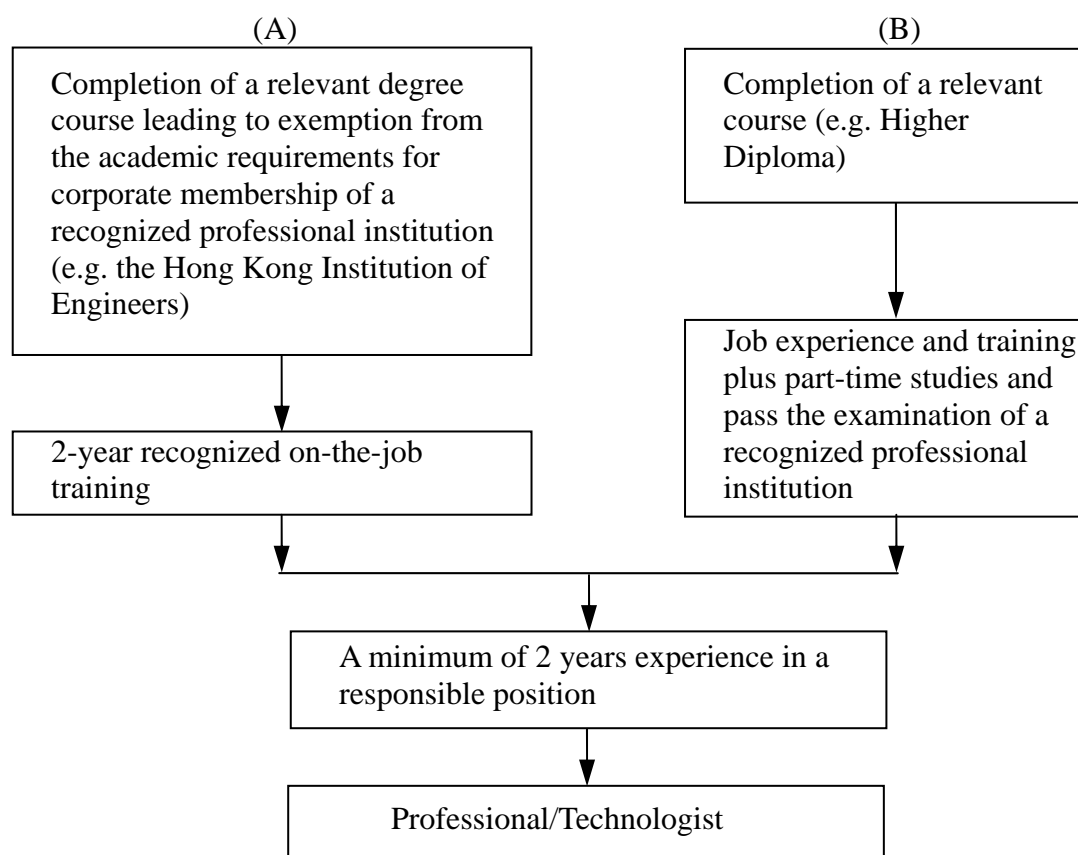
	<u>Professional/Technologist</u>	<u>Technician</u>	<u>Tradesman/Craftsman</u>
E & M Engineering Sector	4.8%	4.8%	4.8%
Shipbuilding and Ship Repair Sector	4.8%	4.8%	4.8%
Gas Sector	3.1%	3.1%	3.1%

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 as shown in Figure 4.1.

Figure 4.1: Training of Professionals/Technologists



4.6 The following tables show the projected average annual requirements from 2008 to 2010 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 4.2: Projected Average Annual Requirement of Professionals/Technologists in Major Disciplines of the E&M Engineering and Gas Sectors from 2008 to 2010

<u>Job Title</u>	<u>No. Employed at Date of Survey</u>	<u>Projected Average Annual Training Requirement</u>
Building Services Engineer	876	38 - 46
Electrical Engineer (E&M Engineering Sector) (Gas Sector)	1 875 31	80 - 98 1 - 1
Engineering Manager	636	27 - 33
Fire Services Engineer	329	14 - 17
Lift/Escalator Engineer	225	10 - 12
Mechanical Engineer (E&M Engineering Sector) (Gas Sector)	1 120 59	48 - 59 2 - 2
Refrigeration/Air-conditioning/ Ventilation Engineer	735	32 - 39
Gas Engineer (Gas Sector)	162	4 - 5
Building Services Engineer/ Electrical Engineer/ Mechanical Engineer (Construction Industry)	1 485	56 - 61
	7 533	312 - 373

Table 4.3: Projected No. of Local Universities Graduates from 2007 to 2009 (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>2007</u>	<u>2008</u>	<u>2009</u>
<u>Full-time Courses</u>				
City University of Hong Kong	B Eng (Building Services Eng)	42	37	32
HK Polytechnic University	B Eng (Electrical Eng)	31	33	31
	B Eng (Building Services Eng)	44	40	38
	B Eng * (Mechanical Eng)	21	17	15
HK University of Science & Technology	B Eng (Mechanical Eng (Building Services))	25	27	25
	B Eng * (Mechanical Eng)	26	29	40
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	245	243

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 4.2 and 4.3 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)

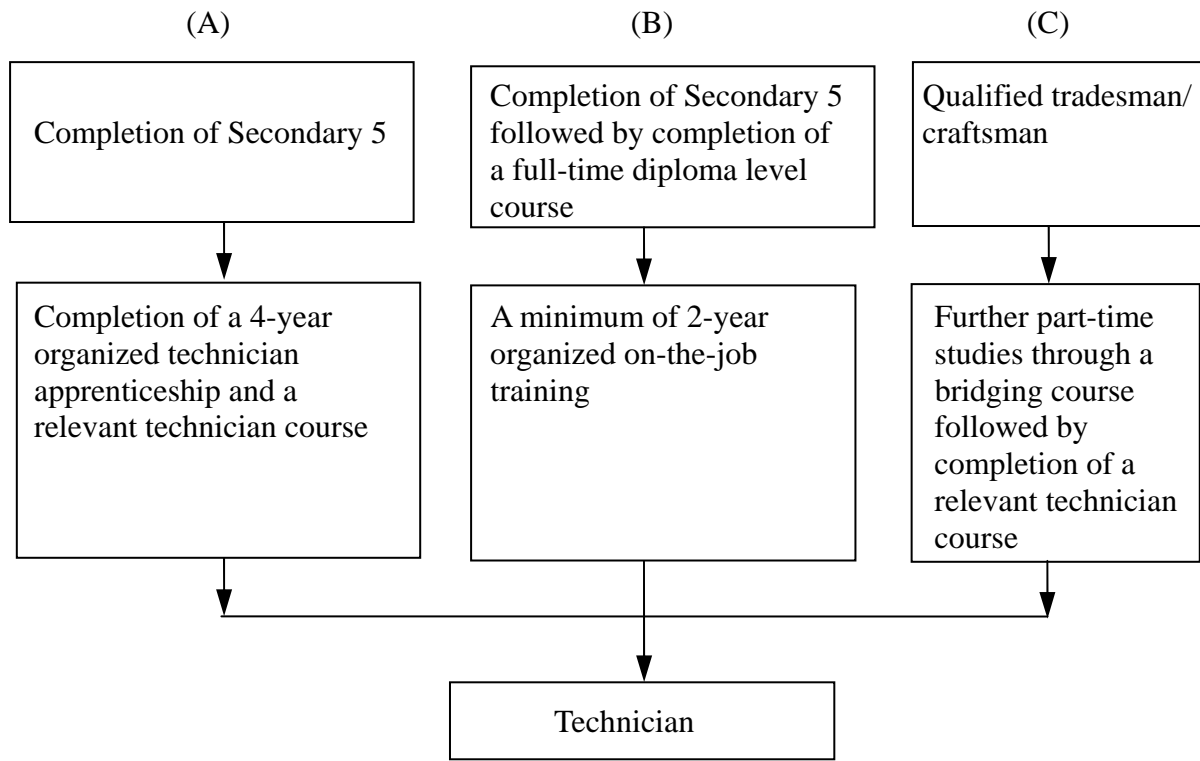
4.9 To bring about more well-structured practical training opportunities for engineering graduates, the Committee on Technologist Training of the Vocational Training Council is operating a subsidy scheme in providing engineering graduates with 18 months of practical training of a standard acceptable 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 in Figure 4.2.

Figure 4.2: 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 level courses in electrical engineering, air-conditioning engineering, building services engineering and facilities management.

4.13 The Electrical Industry Training Centre (ELTC) and the Youth College (YC) of the Vocational Training Council also offer basic technician level 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 2008 to 2010 for the E&M engineering and gas sectors are shown in Tables 4.4 and 4.5.

Table 4.4: Projected Average Annual Training Requirement of Technicians in Major Disciplines of the E&M Engineering and Gas Sectors from 2008 to 2010

<u>Job Title</u>	<u>No. Employed at Date of Survey</u>	<u>Projected Average Annual Training Requirement</u>
Building Services Technician	1 680	72 - 88
Draughtsman	509	22 - 27
Electrical Engineering Technician	1 931	83 - 101
Electrical Instrument & Meter Technician	79	3 - 4
Fire Services Technician	363	16 - 19
Lift/Escalator Technician	622	27 - 33
Mechanical Engineering Technician (E&M Engineering Sector)	1 404	60 - 74
(Gas Sector)	66	2 - 2
Refrigeration/Air-conditioning/ Ventilation Technician	1 022	44 - 54
Supervisor (E&M Engineering Sector)	2 721	117 - 143
(Gas Sector)	168	5 - 6
Office Equipment Service Technician	65	3 - 3
Gas Engineering Technician	333	9 - 12
	10 963	463 - 566

Table 4.5: Projected Local Supply of Technician Graduates for the E & M Engineering and Gas Sectors from 2007 to 2009
(Sources: University Grants Committee and Graduation, and IVE Course Plan)

<u>Institution</u>	<u>Programme</u>	<u>Projected No. of Graduates</u>		
		<u>2007</u>	<u>2008</u>	<u>2009</u>
HK Polytechnic University	Higher Diploma (Building Services Eng.)+	28	25	25
	Higher Diploma (Electrical Eng.)+	22	15	15
City University of Hong Kong	Associate Degree (Building Services Eng.)+	43	43	38
IVE (VTC)	3-year Full-time Higher Diploma Courses:			
	- Building Services	72	52	66
	- Electrical Engineering	194	173	220
	- Mechanical Engineering*	65	57	76
	- Facilities Management	57	31	20
	- Aircraft Maintenance	48	70	72
	- E&M Services	-	53	63
	- Energy Management	17	25	40
	Full-time Diploma Courses [△] :			
	- Building Services	12	-	-
- Electrical Engineering	102	5	-	
Full-time Sub-total		660	549	635
PTDR	Higher Diploma/Certificate Courses:			
	- Building Services	40	32	21
	- Electrical Engineering	39	36	36
	PTDR Sub-total	79	68	57
Total		739	617	692

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 and energy management would join the E & M engineering and gas sectors.

4.15 From Tables 4.4 and 4.5, 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 slightly 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 4.4 and 4.5 indicate that the supply of gas technicians should be sufficient.

Shipbuilding and Ship Repair Sector

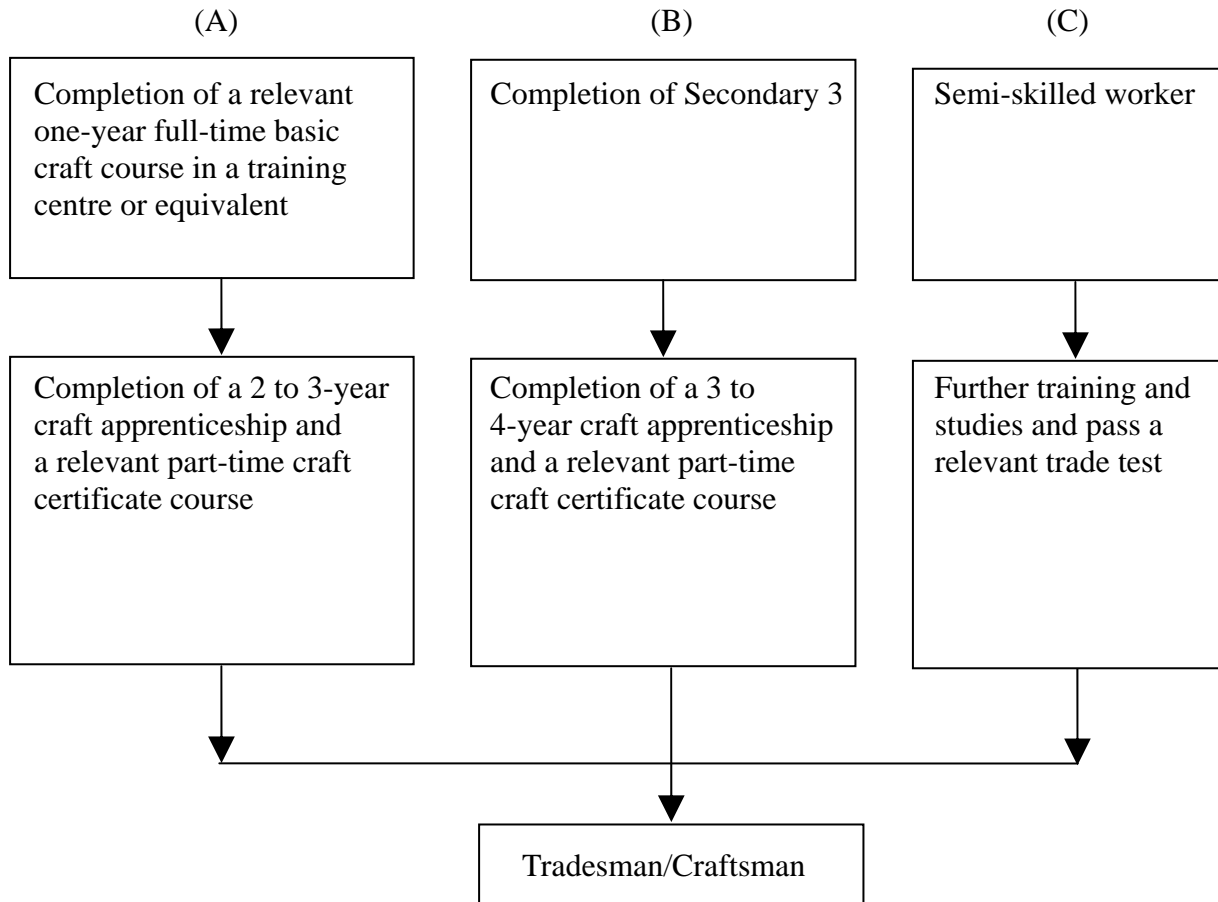
4.17 The projected average annual training demand of technicians for the sector from 2008 to 2010 is 24. On the supply side, the projected output from the Diploma in Maritime Studies course is 27. The Training Board considers that the supply matches with the demand.

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 shown in Figure 4.3.

Figure 4.3: 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, the Youth College 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 Tables 4.6 and 4.7 show the projected average annual requirement and supply of tradesman/craftsmen in key electrical and mechanical trades from 2008 to 2010:

Table 4.6: Projected Average Annual Training Requirement of Tradesmen/Craftsmen in Key E & M Trades from 2008 to 2010

<u>Job Title</u>	<u>No. Employed at Date of Survey</u>	<u>Projected Average Annual Training Requirement</u>
+Foreman/Chargehand	3 463	149 - 182
Electrician/Electrical Fitter (E&M Engineering Sector)	9 367	403 - 492
(Shipbuilding & Ship Repair Sector)	170	7 - 9
(Gas Sector)	37	1 - 1
+Fire Services Mechanical Fitter	967	42 - 51
+Fire Services Electrical Fitter	491	21 - 26
Refrigeration/Air-conditioning/ Ventilation Mechanic (E&M Engineering Sector)	6 788	292 - 357
(Shipbuilding & Ship Repair Sector)	34	1 - 2
+Lift/Escalator Mechanic	2 768	119 - 145
+Building Services Mechanic	1 062	46 - 56
Mechanical Fitter/Machinist (E&M Engineering Sector)	3 359	144 - 177
(Shipbuilding & Ship Repair Sector)	539	23 - 28
(Gas Sector)	16	0 - 1
+Cable Jointer (Power)	224	10 - 12
+Sheet Metal Worker/ Thermal Insulation Craftsman	430	18 - 23
+Overhead Linesman	492	21 - 26

<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)	700	30 - 37
(Shipbuilding & Ship Repair Sector)	63	3 - 3
⁺ Electrical Appliances Service Mechanic	790	34 - 42
	<hr/>	<hr/>
	31 760	1 364 - 1 670

Note

⁺ : E&M Engineering Sector

Table 4.7: Projected Local Supply of Craft Graduates in
E&M Engineering Disciplines from 2007 to 2009
(Sources : IVE Course Plans, Youth College Course,
Plans Training Centres Course Plans)

<u>Institution</u>	<u>Programme</u>	<u>Projected No. of Graduates</u>		
		<u>2007</u>	<u>2008</u>	<u>2009</u>
Electrical Industry Training Centre and Youth College (VTC)	Full-time Basic Craft Courses/ Diploma in Vocational Studies in Electrical Engineering, Air-Cond. & Refrig., Lift Engineering, Bldg. Services and Fire Services	500*	505*	500*
IVE (VTC)	3-year PTDR Craft Certificate Courses in Electrical Engineering, Lift Maintenance & Repair, Air-Cond. & Refrig., Building Services and Pipefitting	371	428	400
<hr/>				
Total		871	933	900

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 4.6 and 4.7, 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 far below the projected training requirement in coming years. Although there are many qualified tradesmen/craftsmen attained their qualifications through on-the-job training/skills upgrading training and pass of relevant trade tests, the supply is considered to be inadequate.

4.24 For providing more qualified tradesmen/craftsmen to the E&M engineering sector for sustainable development, the Training Board recommends the vocational training organizations to offer more training courses for upgrading in-service semi-skilled workers to qualified tradesmen/craftsmen.

Shipbuilding and Ship Repair Sector

4.25 The skill requirements of tradesman/craftsman jobs in this sector are similar to those in the electrical and mechanical engineering sector. From Tables 4.6 and 4.7, it is noted that the supply of tradesmen/craftsmen may not be sufficient for the shipbuilding and ship repair sector from 2008 to 2010.

Gas Sector

4.26 The projected average annual requirements of tradesmen/craftsmen of gas discipline from 2008 to 2010 and the projected supply are shown in Tables 4.8 and 4.9.

Table 4.8: Projected Average Annual Training Requirement of Tradesmen/Craftsmen of Gas Discipline from 2008 to 2010

<u>Job Title</u>	<u>No. Employed at Date of Survey</u>	<u>Projected Average Annual Training Requirement</u>
Gas Distribution Fitter (LPG)	1	–
Gas Distribution Fitter (Town Gas)	221	6 – 7
Gas Utilization Fitter (Domestic)	374	11 – 13
Gas Utilization Fitter (Non-domestic)	172	5 – 6
	768	22 – 26

Table 4.9: Projected Local Supply of Craft Graduates in Gas Discipline from 2007 to 2009

<u>Institution</u>	<u>Programme</u>	<u>Projected No. of Graduates</u>		
		<u>2007</u>	<u>2008</u>	<u>2009</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.

4.27 Tables 4.8 and 4.9 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

4.28 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

4.29 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

4.30 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.

4.31 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.

4.32 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 and Specified Training Courses for Construction Workers

4.33 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).

4.34 The Vocational Training Council has also been entrusted by the CITA to offer Specified Training Courses on the 12 E&M construction trades to the registered skilled workers (provisional) under the CWRO for equipping them for registration before expiry of the 3-year provisional period.

4.35 E&M contractors for construction works are urged to encourage their E&M workers to take the tests and registration, as well as their registered skilled workers (provisional) to attend the specified training courses, in order to meet the CWRO requirements.

New Technology Training Scheme (NTTS)

4.36 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

4.37 The Training Boards' 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 satisfied by the 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 matched 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 can meet 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 will match with each other (paragraph 4.17).
- (c) Training of Tradesmen/Craftsmen:
 - (i) the supply of tradesmen/craftsmen graduates in key trades of the E & M engineering sector and the shipbuilding & ship repair sector may not be sufficient to meet the projected training requirements in coming years (paragraphs 4.23 and 4.24). The Training Board recommends the vocational training organizations to increase their training capacities of pre-employment training courses at tradesmen/craftsmen level and offer more training courses for upgrading in-service semi-skilled workers to qualified tradesmen/craftsmen.
 - (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 4.32 and 4.35).
- (f) Registration of Construction Workers – E&M contractors of construction worker should encourage their E&M workers to register under the Construction Workers Registration Ordinance.

機電工程業

2007年人力調查報告摘要

目的

調查於2007年3／4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8 983間機構選出1 054間作為調查對象，僱員數目約佔從業員總數的71%，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／通風系統的裝設及保養；
- (iv) 火警警報及消防設備的裝設及保養；
- (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) 屋宇設備工程；
- (vi) 電器修理；
- (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

包括下列機構：

- (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

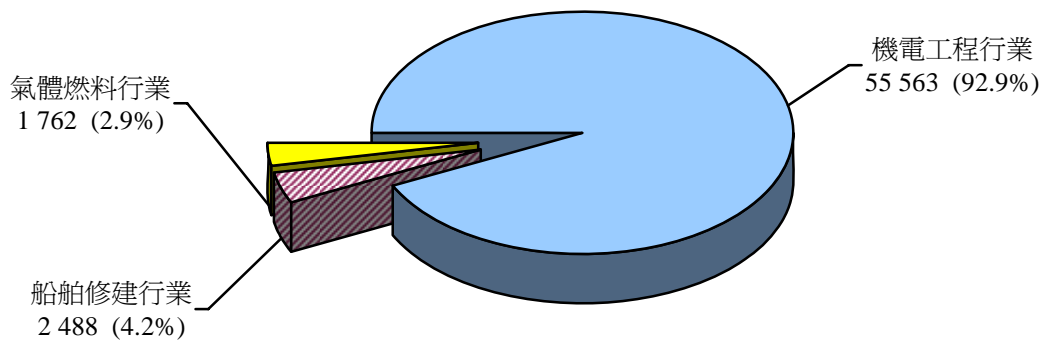
包括下列機構：

- (i) 氣體燃料製造及輸送公司；
- (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2007年3／4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59 813 人，其中55 563人（92.9%）屬機電工程行業，2 488人（4.2%）屬船舶修建行業，1 762人（2.9%）屬氣體燃料行業。機電工程僱員按行業劃分的分布如下：

圖1 機電工程僱員按行業劃分的分布情況



4. 調查又顯示，於2007年3／4月時，業內從事其他職務的僱員共有27 848人，其中23 842人在機電工程行業，2 073人在船舶修建行業及1 933人在氣體燃料行業。整體而言，於2007年3／4月時，機電工程業僱員總數為87 661人。

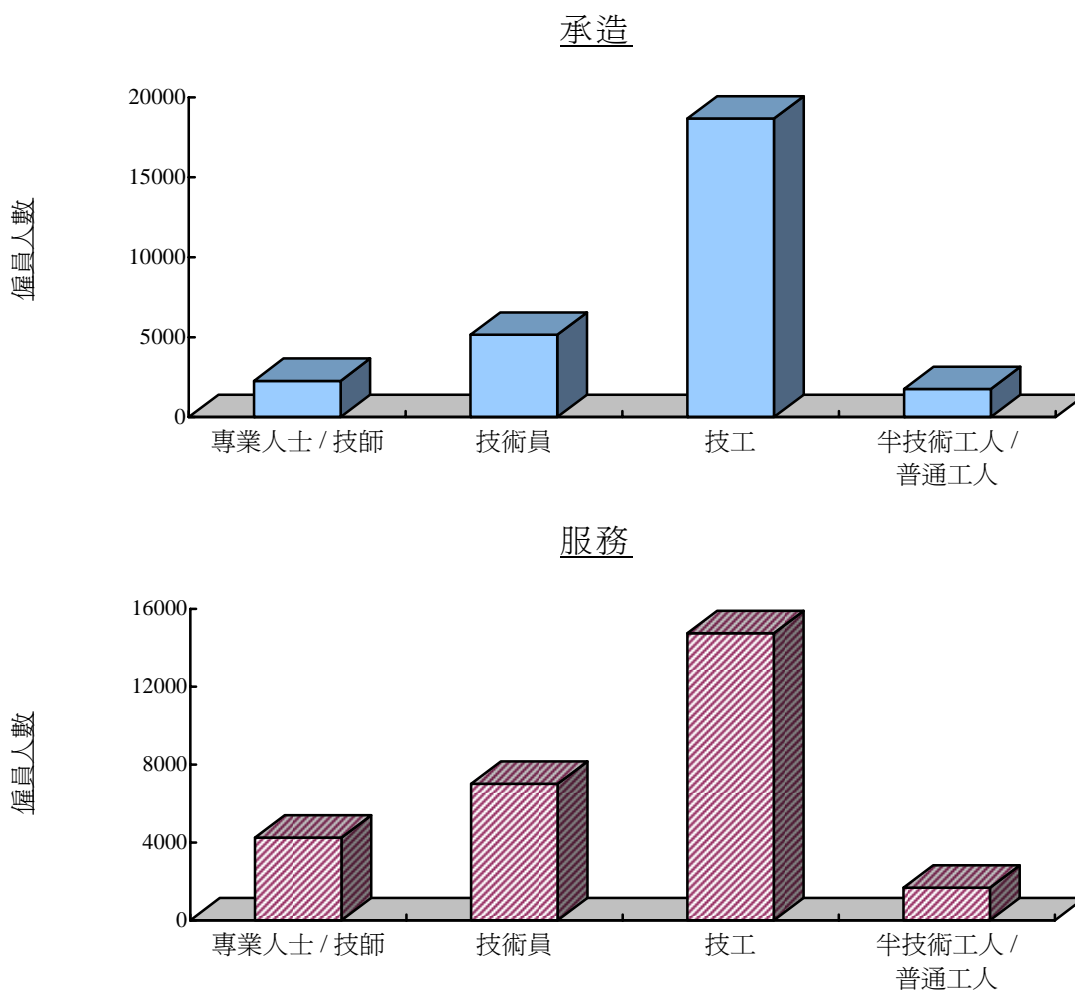
機電工程行業

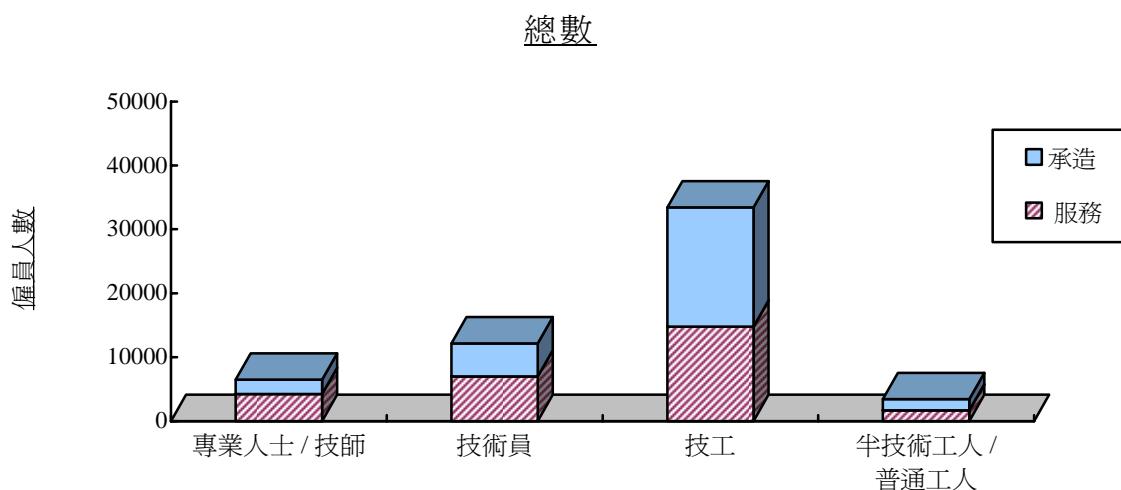
5. 機電工程行業兩個門類的各級技能等級僱員分布情況見表1及圖2：

表 1 機電工程行業各技能等級僱員分布情況

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	2 272	5 154	18 682	1 772	27 880
服務	4 243	7 009	14 747	1 684	27 683
小計	6 515	12 163	33 429	3 456	55 563
佔僱員總數 百分率	11.7%	21.9%	60.2%	6.2%	100%

圖 2 機電工程行業各技能等級僱員分布情況





6. 僱主填報，機電工程行業有受訓者2 028名及空缺1 149個，分別佔行業僱員總數的3.6% 及2.1%。此外，僱主預測至2008年3月時，機電工程行業將需要各技能等級僱員共57 715人。

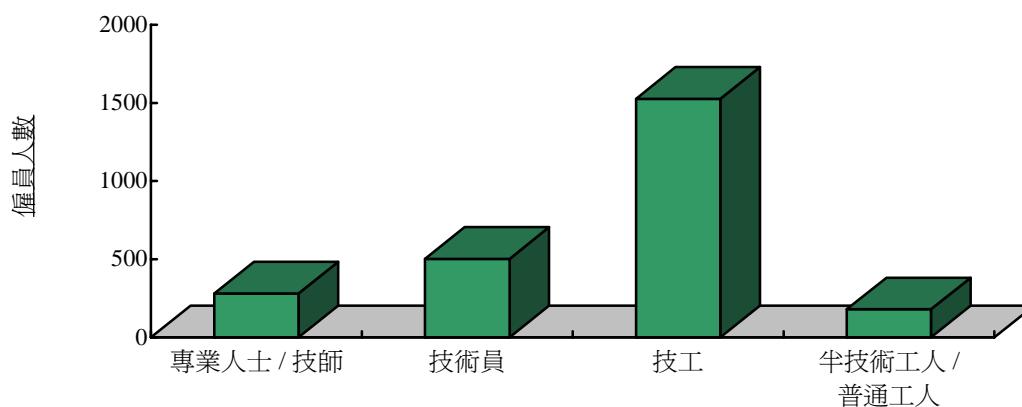
船舶修建行業

7. 船舶修建行業各技能等級僱員分布情況見表2及圖3：

表 2 船舶修建行業各技能等級機電僱員的分布情況

	專業人士 / 技師	技術員	技工	半技術工人 / 普通工人	總數
	281	502	1 526	179	2 488
佔僱員 總數百分率	11.3%	20.2%	61.3%	7.2%	100%

圖 3 船舶修建行業各技能等級機電僱員的分布情況



8. 於調查期間，業內有受訓者79名及空缺18個，分別佔行業僱員總數的3.2%及0.7%。僱主預測至2008年3月時，船舶修建行業將有技術僱員2 508人。

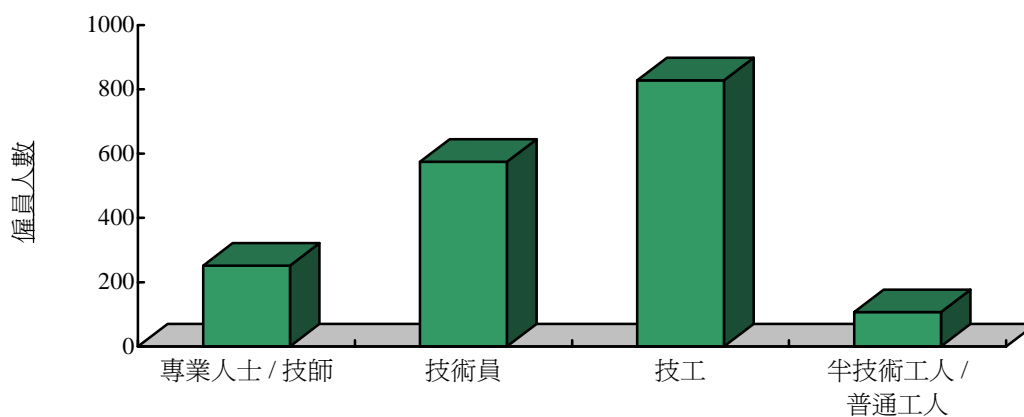
氣體燃料行業

9. 氣體燃料行業各技能等級僱員分布情況如下：

表 3 氣體燃料行業各技能等級機電僱員的分布情況

	專業人士／ 技師	技術員	技工	半技術工人／ 普通工人	總數
	252	575	828	107	1 762
佔僱員 總數百分率	14.3%	32.6%	47%	6.1%	100%

圖 4 氣體燃料行業各技能等級機電僱員的分布情況



10. 於2007年3/4月時，業內有受訓者60名而空缺只有2個，約佔氣體燃料行業僱員總數的3.4%及0.1%。僱主預測至2008年3月時，氣體燃料行業將有技術僱員1 770人。

預測未來人力訓練需求

機電工程行業

11. 調查顯示，2005至2007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5.1%。按技能等級劃分，專業人士／技師級人力平均每年下降0.5%，技術員級、技工級及半技術工人／普通工人級則分別增加7.6%、5.7% 及2.6%。

12. 本地經濟自2004年起明顯持續增長。為保持經濟增長，香港特區政府已宣布於未來10年注資港幣2,500億元於10大基建項目。訓練委員會預期這項政策將刺激與樓宇及建築業相關的機電工程服務人力需求。此外，澳門基建及樓宇建造急速發展，內地經濟持續快速增長，以及本地地產市道復甦，將增加業內機電僱員的需求。本會根據以往及是次調查所得資料，計算2008-2010年機電工程行業平均每年需要訓練的各技能等級人力如下：

表 4 預計機電工程行業每年的機電人力訓練需求

<u>技能等級</u>	<u>調查當日的 僱員人數</u>	<u>2008至2010年 平均每年訓練需求</u>
專業人士／技師	6 515	280 – 342
技術員	12 163	523 – 639
技工	33 429	1 437 – 1 757

船舶修建行業

13. 調查顯示，於2005至2007年間，本行業整體技術人力溫和下降5.6%。至於平均每年各技能等級人力變化，專業人士／技師下降4.3%，技術員增加1.2%，技工下降9.7% 及半技術工人／普通工人增加19.2%。

14. 本會預料這個行業的人力需求在未來數年會維持穩定。根據以往及是次調查所得資料，本會預計2008至2010年這個行業平均每年需要訓練的機電人力如下：

表 5 預計船舶修建行業每年機電人力訓練需求

技能等級	調查當日的 僱員人數	2008至2010年 平均每年訓練需求
專業人士／技師	281	12 – 15
技術員	502	22 – 26
技工	1 526	66 – 80

氣體燃料行業

15. 調查顯示，於2005至2007年間，本行業整體人力每年微跌1%。按技能等級，平均每年專業人士／技師數目下降11.3%，技術員數目增加8%，技工數目則下降1%，而半技術工人／普通工人下降12.9%。

16. 本會預計，這個行業在未來數年對技術人力需求將會維持穩定。本會預計2008至2010年這個行業的訓練需求如下：

表 6 預計氣體燃料行業每年機電人力訓練需求

技能等級	調查當日的 僱員人數	2008至2010年 平均每年訓練需求
專業人士／技師	252	7 – 8
技術員	575	16 – 20
技工	828	23 – 28

主要結論及建議摘要

17. 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訓練需求。然而，技術員通過修讀兼讀學士課程而晉身專業人士／技師，將可補足人手需求；
- (ii) 機械工程學位課程的畢業生，應足以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) 預測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工畢業生可能會求過於供。本會建議職業訓練機構增加技工級職前訓練課程的學額，及開辦更多課程，提升在職半技術工人成為合格技工；
- (ii) 氣體燃料行業的技工人力供應，足以應付預計訓練需求。

(d) 機電工程三個行業的預計訓練需求只以人數計算。訓練機構在計劃訓練名額時，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。

(f) 建造業工人註冊 — 機電工程承辦商應鼓勵工人根據《建造業工人註冊條例》的規定註冊。

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 2007 年 3/4 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 是次調查蒐集以下資料：

- (i) 調查期間機電工程業僱員人數；
- (ii) 僱主預測至 2008 年 3 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) 各工種僱員的平均薪金。

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(HSIC:5512)
- (iv) 電車及鐵路運輸(HSIC:7112)；
- (v) 屋宇設備工程(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) 氣體燃料製造及輸送公司(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 8 983 間機構，包括機電工程行業 8 491 間機構、船舶修建行業 318 間機構，以及氣體燃料行業 174 間機構。8 983 間機構中，8 880 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 8 880 間機構中，選出 951 間作為調查對象；加上 103 間特選機構，接受調查機構共有 1 054 間，僱員數目約佔業內僱員總數的 71%。

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 1 054 間接受調查機構之中，858 間提供所需資料，18 間未有作覆。餘下的 178 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%。

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 2007 年人力統計報告，內載是次調查所得摘要。本會已於 2007 年 10 月初將人力統計報告上載職業訓練局網頁，供公眾參閱。

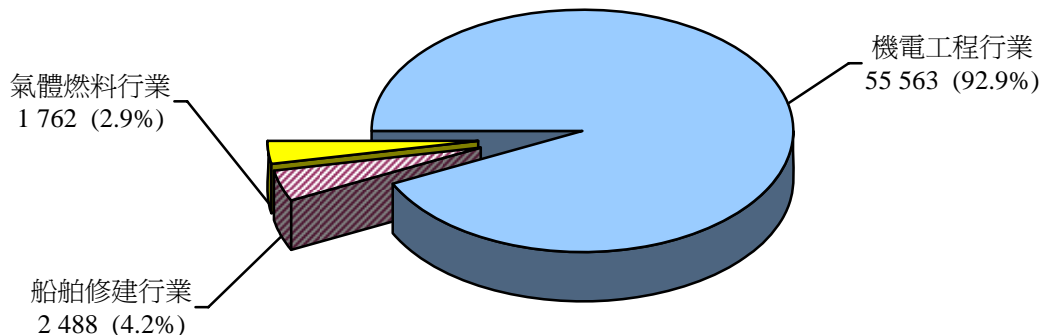
第二章

調查結果摘要

僱員人數

2.1 是次調查顯示，於 2007 年 3/4 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 59 813 人，其中 55 563 人（92.9%）屬機電工程行業，2 488 人（4.2%）屬船舶修建行業，1 762 人（2.9%）屬氣體燃料行業。機電工程僱員按行業劃分的分布如下：

圖 2.1 機電工程僱員按行業劃分的分布情況



2.2 調查又顯示，2007 年 3/4 月時，業內從事其他職務的僱員共有 27 848 人，其中 23 842 人在機電工程行業，2 073 人在船舶修建行業，1 933 人在氣體燃料行業。

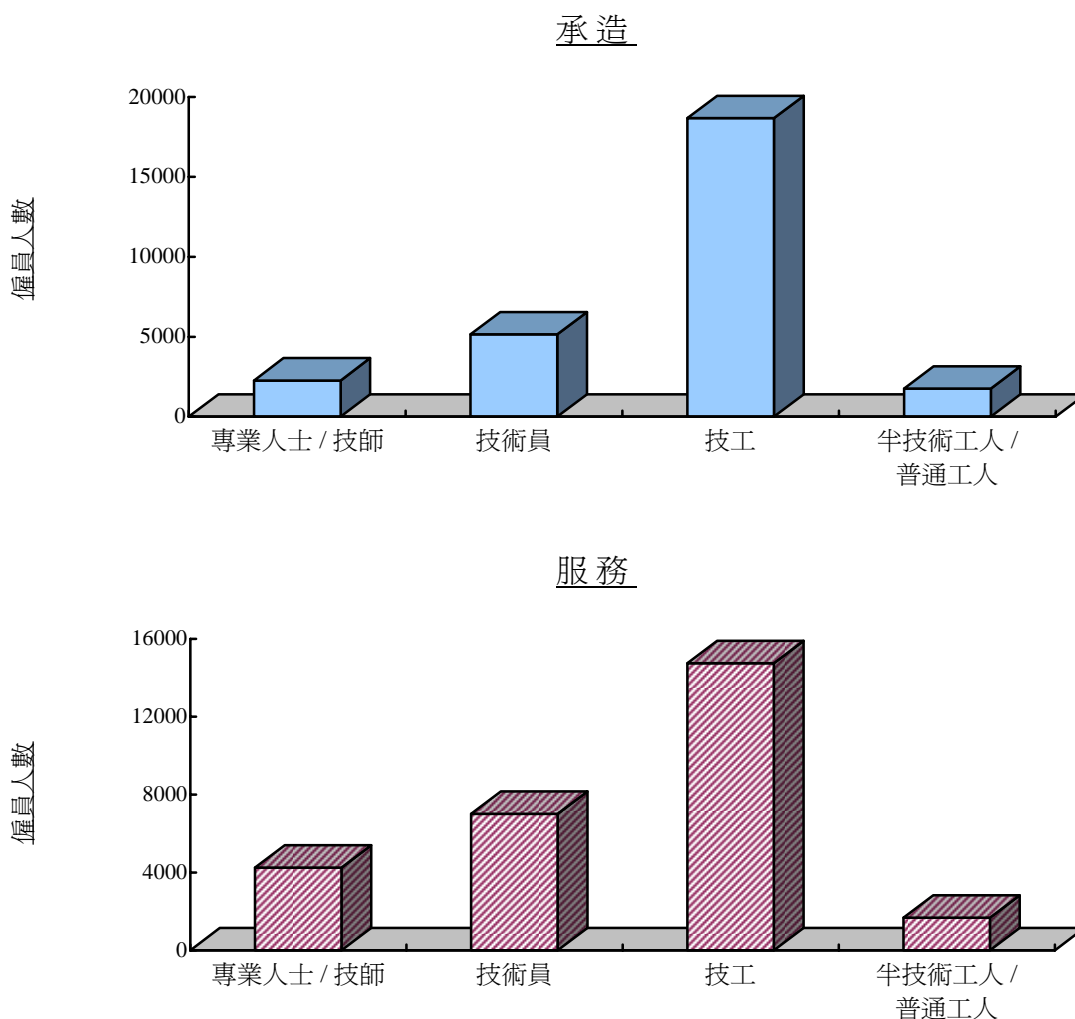
機電工程行業

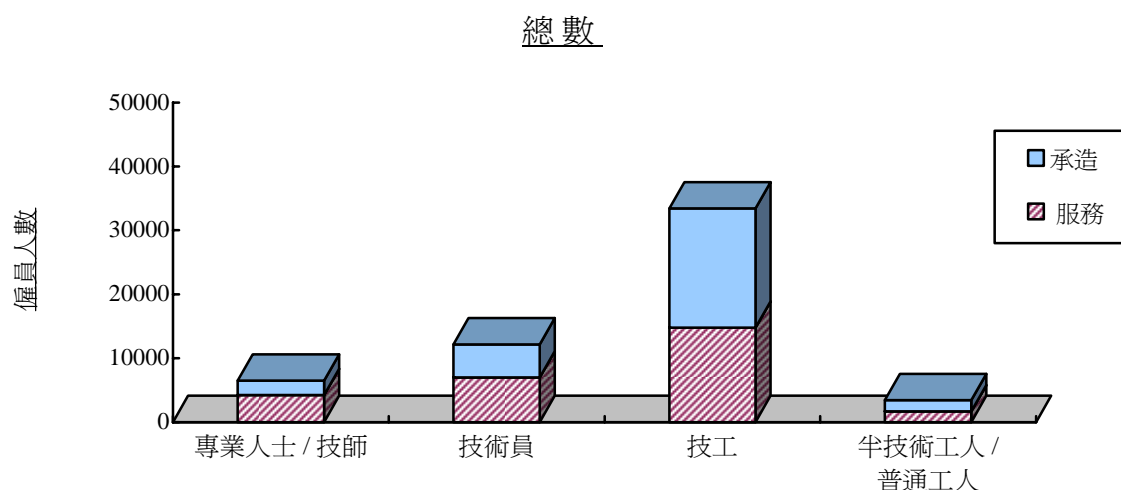
2.3 機電工程行業兩個門類各技能等級僱員分布情況如下：

表 2.1 機電工程行業各技能等級僱員分布情況

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	2 272	5 154	18 682	1 772	27 880
服務	4 243	7 009	14 747	1 684	27 683
小計	6 515	12 163	33 429	3 456	55 563
佔僱員總數 百分率	11.7%	21.9%	60.2%	6.2%	100%

圖 2.2 機電工程行業各技能等級僱員分布情況





2.4 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。

2.5 調查期間，機電工程行業有 2 028 人接受各類訓練，佔總人力的 3.6%。各技能等級的分布情況如下：

表 2.2 機電工程行業
各技能等級受訓者的分布情況

<u>技能等級</u>	<u>僱員人數</u>	<u>受訓者 人數</u>	<u>佔同級僱員 人數百分率</u>
專業人士／技師	6 515	213	3.3%
技術員	12 163	226	1.9%
技工	33 429	1 589	4.8%
半技術工人／普通工人	3 456	-	-
總數	55 563	2 028	3.6%

2.6 僱主填報的空缺有 1 149 個，約佔機電工程行業僱員總數的 2.1%。各技能等級空缺數目的分布情況如下：

表 2.3 機電工程行業
各技能等級空缺數目的分布情況

<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	6 515	256	3.9%
技術員	12 163	188	1.5%
技工	33 429	680	2.0%
半技術工人／普通工人	3 456	25	0.7%
總數	55 563	1 149	2.1%

2.7 僱主預測至 2008 年 3 月時，機電工程行業將有機電僱員 57 715 人，顯示 1.8% 的溫和年增長，各技能等級的分布情況如下：

表 2.4 機電工程行業各技能等級
預測僱員人數的分布情況

<u>技能等級</u>	<u>調查期間 僱員人數加空缺數目</u>	<u>僱主預測至 2008 年 3 月時 僱員人數</u>
專業人士／技師	6 771	6 764
技術員	12 351	12 454
技工	34 109	34 974
半技術工人／普通工人	3 481	3 523
總數	56 712	57 715

2.8 在調查期間，機電工程行業各主要職務的受訓者人數及空缺數目，以及預測至 2008 年 3 月時各工種的僱員人數，見附錄 3。

2.9 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：

表 2.5 機電工程僱員每月收入幅度

<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	\$12,001 - \$15,000
半技術工人／普通工人	\$9,001 - \$12,000

2.10 根據每月總收入幅度劃分的各主要職務僱員分布情況，見附錄 4。

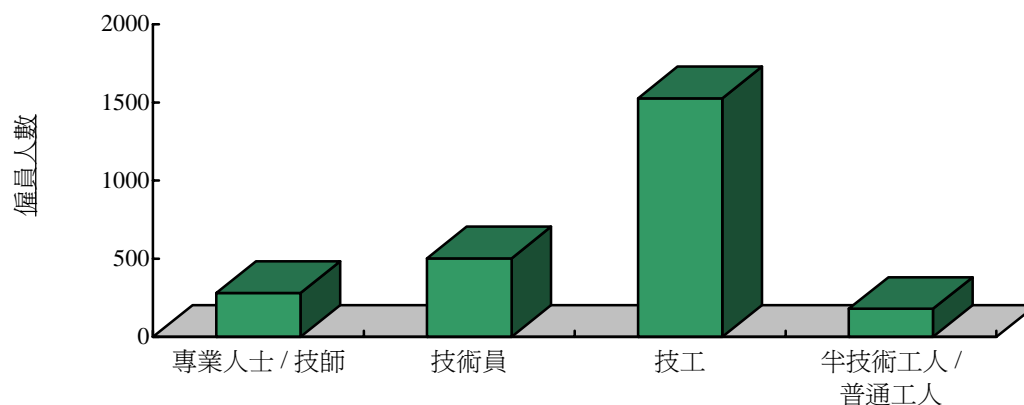
船舶修建行業

2.11 船舶修建行業的人力統計數字見附錄 8。各技能等級機電僱員的分布情況如下：

表 2.6 船舶修建行業各技能等級
機電僱員的分布情況

	<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>
	281	502	1 526	179	2 488
佔僱員 總數百分率	11.3%	20.2%	61.3%	7.2%	100%

圖 2.3 船舶修建行業各技能等級
機電僱員的分布情況



2.12 調查期間，業內有 79 人接受各類訓練，佔行業總人力的 3.2%。各技能等級的分布情況如下：

表 2.7 船舶修建行業各技能等級
機電工程受訓者的分布情況

<u>技能等級</u>	<u>僱員人數</u>	<u>受訓者人數</u>	<u>佔同級僱員 人數百分率</u>
專業人士 / 技師	281	6	2.1%
技術員	502	11	2.2%
技工	1 526	62	4.1%
半技術工人 / 普通工人	179	-	-
總數	2 488	79	3.2%

2.13 僱主填報的空缺數目有 18 個，約佔本業機電僱員總數的 0.7%。各技能等級空缺數目的分布如下：

表 2.8 船舶修建行業各技能等級
機電僱員空缺數目的分布情況

<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	281	4	1.4%
技術員	502	4	0.8%
技工	1 526	6	0.4%
半技術工人／普通工人	179	4	2.2%
總 數	2 488	18	0.7%

2.14 僱主預測至 2008 年 3 月時，船舶修建行業會有機電僱員 2 508 人，顯示 0.1% 的輕微年增長，各技能等級的分布情況如下：

表 2.9 船舶修建行業各技能等級
機電僱員的預測人數分布情況

<u>技能等級</u>	<u>調查期間 僱員人數加空缺數目</u>	<u>僱主預測至 2008 年 3 月時 僱員人數</u>
專業人士／技師	285	286
技術員	506	506
技工	1 532	1 533
半技術工人／普通工人	183	183
總 數	2 506	2 508

2.15 在調查期間，船舶修建行業各主要職務的受訓者人數及空缺數目，以及預測至 2008 年 3 月時各工種的僱員人數，見附錄 8。

2.16 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：

表 2.10 船舶修建行業
機電僱員的每月收入幅度

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

2.17 根據每月總收入幅度劃分的各主要職務僱員分布情況，見附錄 9。

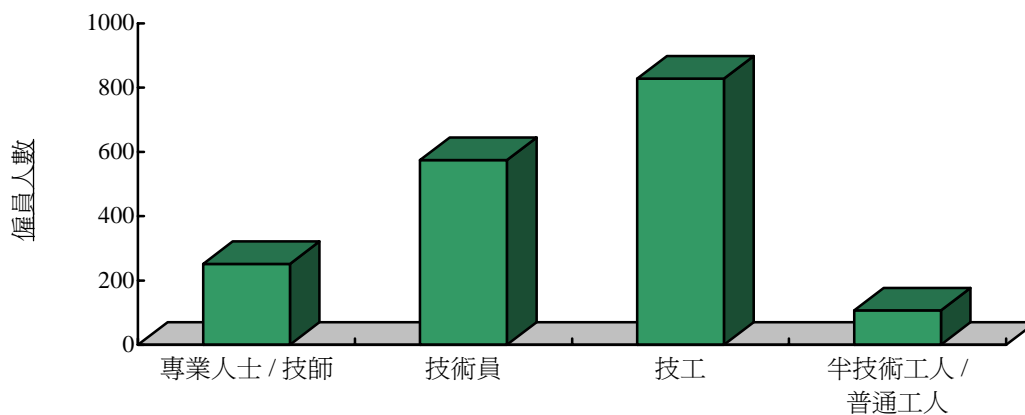
氣體燃料行業

2.18 氣體燃料行業的人力統計數字見附錄 10。本業各技能等級機電僱員的分布情況如下：

表 2.11 氣體燃料行業各技能等級
機電僱員的分布情況

	<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>
	252	575	828	107	1 762
佔僱員 總數百分率	14.3%	32.6%	47%	6.1%	100%

圖 2.4 氣體燃料行業各技能等級
機電僱員的分布情況



2.19 調查期間，業內有 60 人接受各類訓練，佔僱員總數的 3.4%。各技能等級的分布情況如下：

表 2.12 氣體燃料行業各技能等級
機電工程受訓者的分布情況

技能等級	僱員人數	受訓者人數	佔同級僱員 人數百分率
專業人士／技師	252	-	-
技術員	575	-	-
技工	828	60	7.2%
半技術工人／普通工人	107	-	-
總數	1 762	60	3.4%

2.20 僱主填報的空缺有 2 個，約佔氣體燃料行業機電僱員總數的 0.1%。各技能等級空缺數目的分布情況如下：

表 2.13 氣體燃料行業各技能等級
機電僱員空缺數目的分布情況

<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	252	-	-
技術員	575	-	-
技工	828	2	0.2%
半技術工人／普通工人	107	-	-
總數	1 762	2	0.1%

2.21 僱主預測至 2008 年 3 月時，氣體燃料行業將有機電僱員 1 770 人，顯示 3% 的溫和年增長。各技能等級的分布情況如下：

表 2.14 氣體燃料行業各技能等級
機電僱員的預測人數分布情況

<u>技能等級</u>	<u>調查期間 僱員人數加空缺數目</u>	<u>僱主預測至 2008 年 3 月時 僱員人數</u>
專業人士／技師	252	253
技術員	575	577
技工	830	833
半技術工人／普通工人	107	107
總數	1 762	1 770

2.22 在調查期間，氣體燃料行業各主要職務的受訓者人數及空缺數目，以及預測至 2008 年 3 月時各工種的僱員人數，見附錄 10。

2.23 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：

表 2.15 氣體燃料行業機電僱員每月收入幅度

<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 - \$15,000
技工	\$12,001 - \$15,000
半技術工人／普通工人	\$9,001 - \$12,000

2.24 根據每月總收入幅度劃分的各主要職務僱員分布情況，見附錄 11。

地盤機電人力

2.25 為評估地盤機電人力狀況，在 2007 年 3 月，機電工程業訓練委員會進行第五次補充調查，蒐集於地盤工作的機電僱員最新人力資料。蒐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 829 個屋宇地盤，以及 407 個土木工程及其他地盤。

2.26 補充調查顯示，於調查期間，共有 4 486 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 4 076 人（90.9%）在屋宇地盤工作，410 人（9.1%）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。

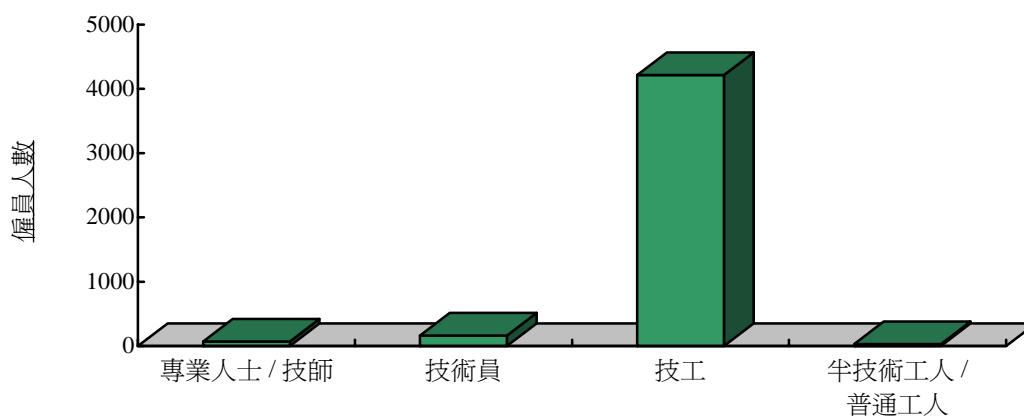
2.27 各技能等級僱員的分布情況如下：

表 2.16 地盤機電僱員的分布情況

<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	72 (96)	1.6%
技術員	164 (415)	3.7%
技工	4 216 (4 627)	94%
半技術工人／普通工人	34 (241)	0.7%
總數	4 486 (5 379)	100%

(括弧內數字為 2005 年 3 月第四次補充調查所得的同類數據。)

圖 2.5 地盤機電僱員的分布情況



2.28 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 2007年3/4月時，機電工程行業僱員共有55 563人，與2005年3月調查所得的50 268人比較，平均每年溫和增長5.1%。2005至2007年間，業內各門類及技能等級的技術人力分布情況及比較如下：

表 3.1 機電工程行業各門類
及技能等級的機電人力分布情況

技能等級	承造門類	服務門類	總數	平均每年 變化百分率
專業人士／技師	2 272 (2 817)	4 243 (3 767)	6 515 (6 584)	-0.5%
技術員	5 154 (4 364)	7 009 (6 142)	12 163 (10 506)	+7.6%
技工	18 682 (17 374)	14 747 (12 520)	33 429 (29 894)	+5.7%
半技術工人／普通工人	1 772 (1 959)	1 684 (1 325)	3 456 (3 284)	+2.6%
總數	27 880 (26 514)	27 683 (23 754)	55 563 (50 268)	
平均每年變化百分率	+2.5%	+8.0%	+5.1%	

附註：

括弧內為 2005 年人力調查數字。

機電工程行業的人力變化

3.3 調查顯示，機電工程行業在過去兩年的整體僱員人數平均每年增長 5.1%。不過，專業人士／技師平均每年輕微下降 0.5%，而技術員及技工分別明顯增長 7.6% 及 5.7%。另一方面，半技術工人／普通工人則每年溫和增長 2.6%。

3.4 專業人士／技師人數下降，主要於承造門類錄得。若按職務劃分，機械工程及冷凝／空氣調節／通風設備工程的人力增長最明顯。相反，升降機工程的人力於過去兩年輕微下降。

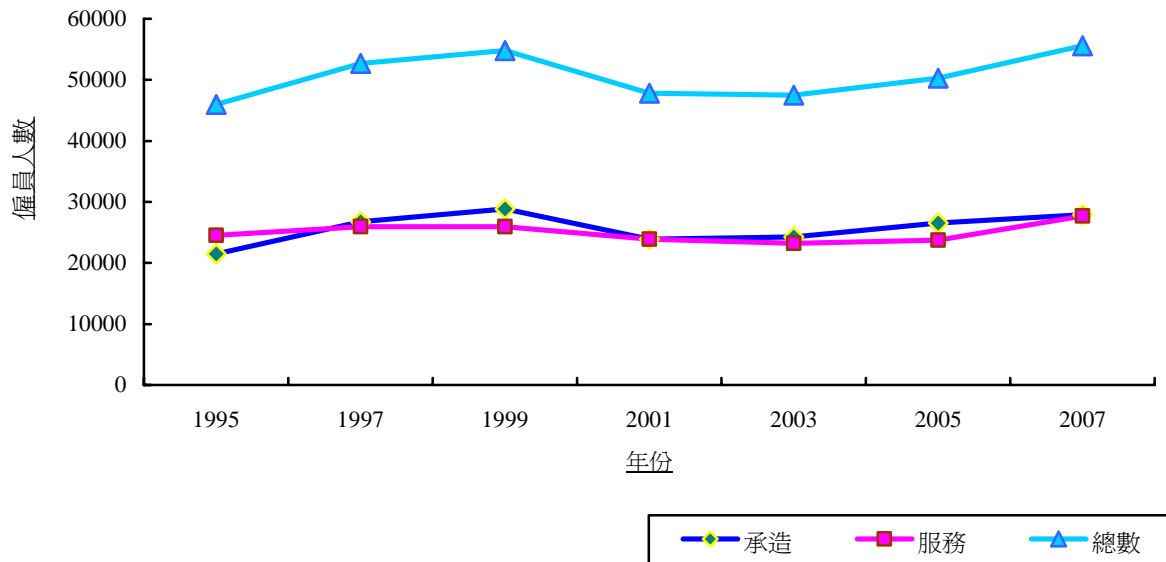
3.5 1995 至 2007 年間，機電工程行業的人力變化如下：

表 3.2 1995 至 2007 年機電工程行業人力變化

調查年份	從業員人數		
	承造門類	服務門類	總數
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
2007	27 880	27 683	55 563

* 有關數字根據自 1999 年起採用的調查範圍作出調整。

圖 3.1 1995 至 2007 年的機電工程行業人力變化



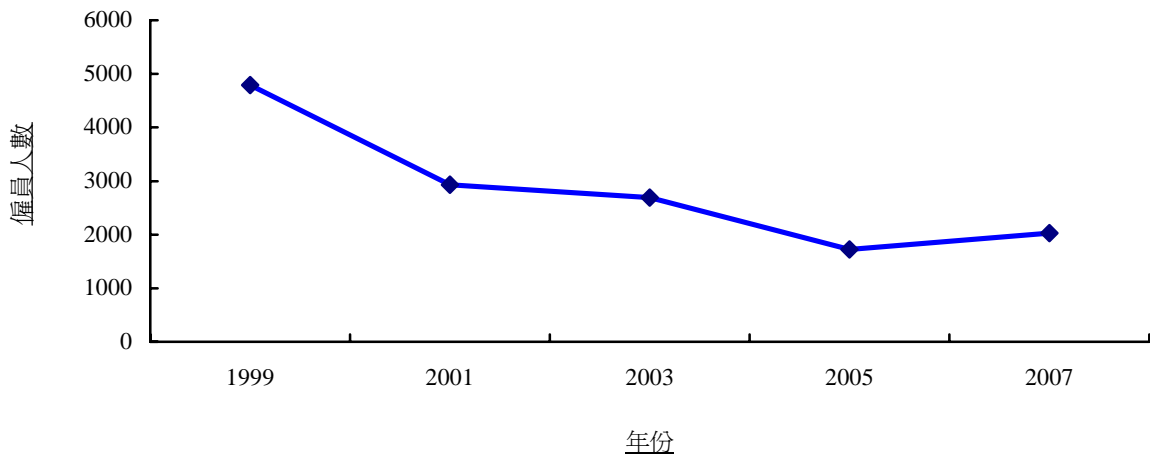
3.6 人力數字顯示，機電工程行業僱用的人力於 1999 年攀升至高峰，其後顯著下跌，直至 2003 年為止。隨著 2003 年後香港及鄰近地區經濟轉趨蓬勃，於 2005 年的調查中，僱員數目輕微回升。過去兩年，人力持續增長，應付澳門緊湊的建築工程，以及 2003 年後香港經濟復甦隨之而來的大量改建及裝修工程。2007 年人力調查錄得的從業員人數較 2005 年增長 17%。2007 年調查錄得的 55 563 名技術人員，已取代 1999 年高峰期的 54 814 人成為新高。

3.7 為了應付採用大型飛機庫帶來的上升需求，機械工程及飛機工程服務業僱員及受訓者人數於過去兩年均錄得明顯增長。因此，2007 年人力調查顯示，機電工程行業的受訓者人數由持續下跌轉為顯著上升。業內受訓者人數的變化如下：

表 3.3 機電工程行業受訓者人數的變化

<u>調查年份</u>	<u>僱員人數</u>	<u>受訓者人數</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%
2007	55 563	2 028	3.6%

圖 3.2 機電工程行業受訓者人數的變化



機電工程行業的業務展望

承造門類

3.8 香港特區政府行政長官於其 2007 年施政報告中承諾推行 10 個大型基建項目(見附錄 15)，以便香港經濟持續增長。這些涉及大量機電工程的大型項目將包括南港島線、沙中線、廣深港高速鐵路、西九龍文化區及啓德發展項目，這些建造項目對人手有穩定的需求。此外，澳門的基建和樓宇項目的持續發展，亦保持對香港技術人手的需要。再者，物業市場復甦亦將刺激與建築相關的機電人力需求。

服務門類

3.9 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。隨著樓宇數量增加及公用事業機電設施擴充，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，部分將會因採用先進設備而有所抵銷，因為先進設備既有助減低維修需求，又能改善生產力。

僱主填報的空缺數目及對未來一年的預測

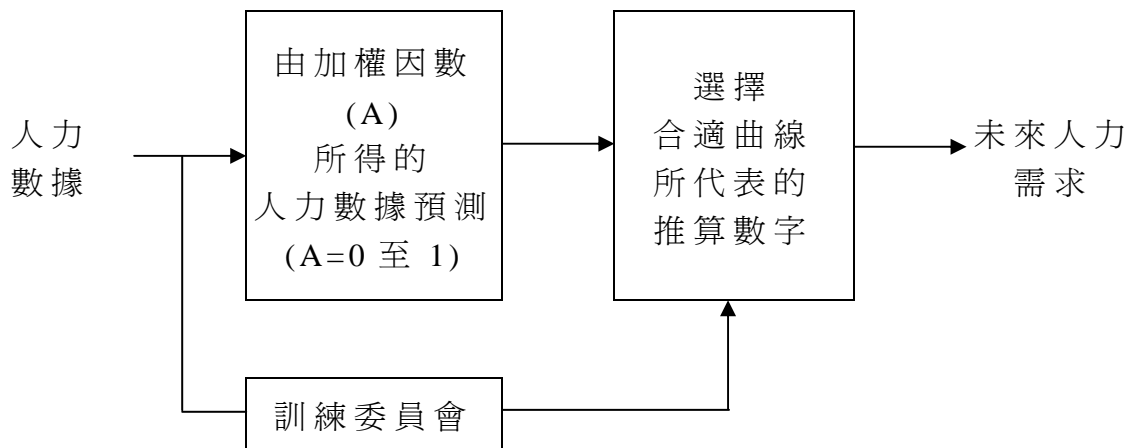
3.10 與 2005 年人力調查的數字比較，調查期間僱主填報的空缺數目輕微下跌。然而，專業人士／技師空缺數目上升三倍。從以下未來一年僱員人數的預測可見，僱主一般對行業前景樂觀。

表 3.4 機電工程行業僱員的空缺分布及預測人數

<u>技能等級</u>	<u>調查時的 僱員人數</u>	<u>填報 空缺數目</u>		<u>未來一年 預測僱員人數</u> 至 2008 年 3 月時 的僱員人數
		<u>人數</u>	<u>百分率</u>	
專業人士／技師	6 515	256	3.9%	6 764
技術員	12 163	188	1.5%	12 454
技工	33 429	680	2.0%	34 974
半技術工人／ 普通工人	3 456	25	0.7%	3 523
總 數	55 563	1 149	2.1%	57 715

機電工程行業的未來人力需求

3.11 機電工程行業人力調查以往均採用「調節過濾法」(adaptive filtering method)來推算未來人力需求。調節過濾法是普遍採用的趨勢分析技巧，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，所佔比重亦可透過加權因數（A）調節。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。

3.12 在 1997 及 2001 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。

3.13 於 2003 年的人力調查中，本會採用統計模型分析法預測人力需求。統計模型分析法是建基於機電工程行業整體技術人力與「地盤樓宇建築工程總值(GVCW)」這個主要因素之間的關係。

3.14 2005 年人力調查中，由於技術人力分布由新建築工程轉移至維修及裝修工程，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」之間關係的信心指數，下跌至低於建議採用的準則。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，本會決定採用「調節過濾法」預測人力需求。

3.15 就 2007 年人力調查而言，由於技術人力分布與 2005 年相若，本會決定再次採用「調節過濾法」，以預測 2008 至 2010 年的人力需求。

3.16 過往調查所蒐集得的數據顯示，在機電工程行業內，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%。

3.17 考慮到以上因素，機電工程行業在 2008 至 2010 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：

表 3.5 預測機電工程行業每年的機電人力訓練需求

<u>技能等級</u>	<u>調查當日的 僱員人數</u>	<u>2008 至 2010 年 平均每年訓練需求</u>
專業人士／技師	6 515	280 – 342
技術員	12 163	523 – 639
技工	33 429	1 437 – 1 757

船舶修建行業

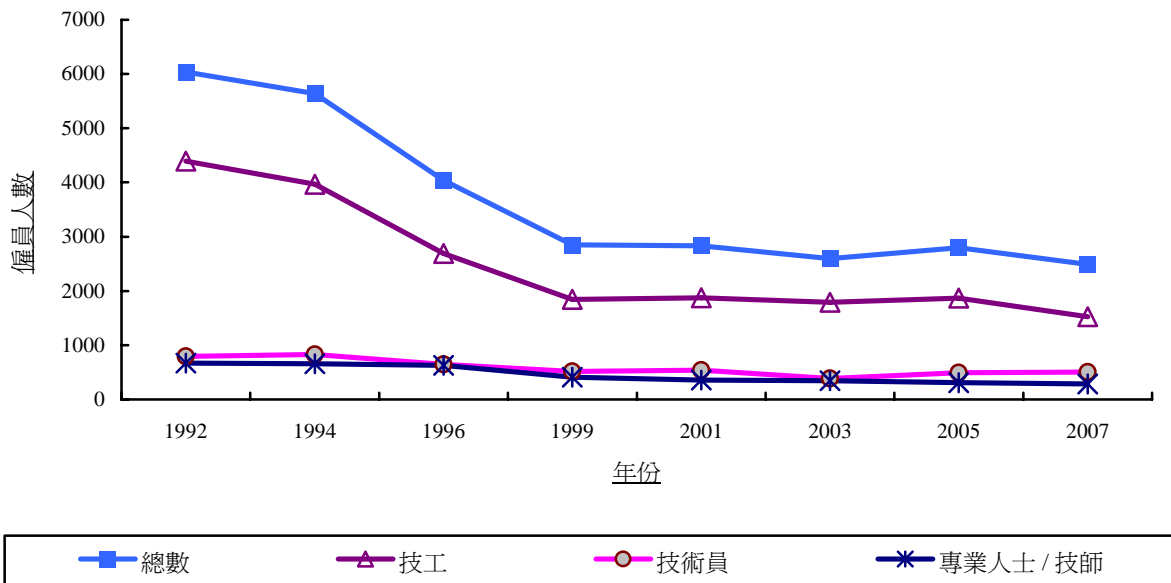
人力變化

3.19 1992 至 2007 年間，船舶修建行業專業人士／技師、技術員及技工級的人力變化如下：

表 3.6 船舶修建行業機電僱員的人力變化

<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
2007	281	502	1 526	2 488

圖 3.3 船舶修建行業機電僱員的人力變化



3.19 調查顯示，過去兩年，本行業整體人力每年輕微下降 5.6%。由 1999 年起，整體機電僱員的人力變化不大。

船舶修建業務展望

3.20 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。本會預期，船舶修建業的人力需求在未來三年將會維持穩定。

船舶修建業的未來人力需求

3.21 考慮到人力將維持穩定，本會採用「調節過濾法」推算 2008 至 2010 年的人力需求。

3.22 鑑於過往調查所蒐集的數據顯示，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%，因此在本會預測每年訓練需求時，仍將流失率定於 6%。

3.23 考慮到以上因素，本會預測本行業機電人力在 2008 至 2010 年平均每年需要訓練人手如下：

表 3.7 預測船舶修建行業
每年的機電人力訓練需求

<u>技能等級</u>	<u>調查當日的 僱員人數</u>	<u>2008 至 2010 年 平均每年訓練需求</u>
專業人士／技師	281	12 – 15
技術員	502	22 – 26
技工	1 526	66 – 80

氣體燃料行業

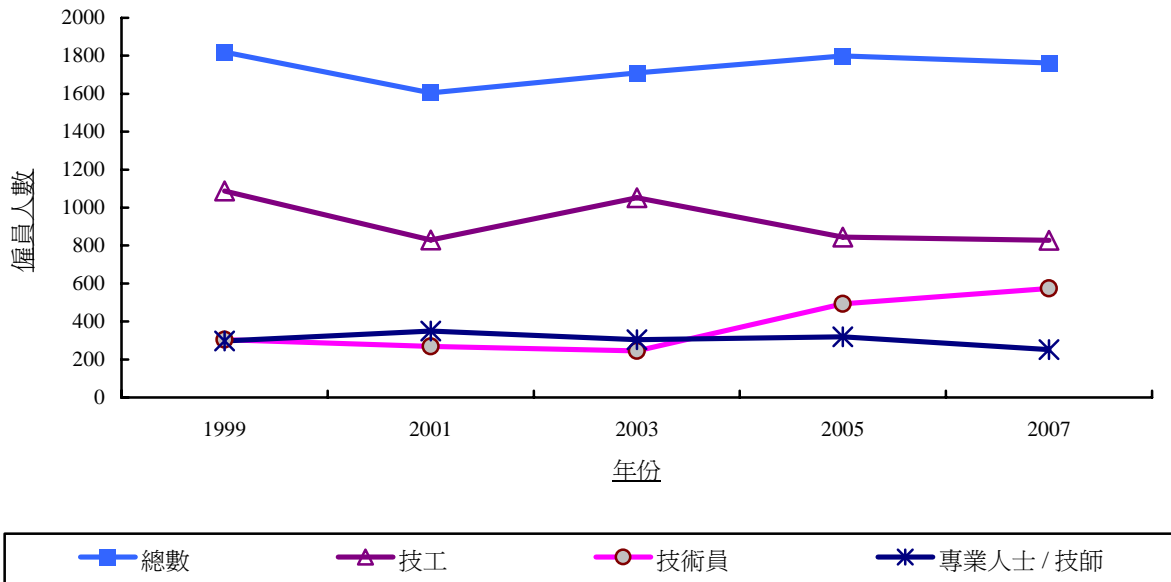
人力變化

3.24 1999 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的人力變化如下：

表 3.8 氣體燃料行業機電僱員的人力變化

<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
2007	252	575	828	1 762

圖 3.8 氣體燃料行業機電僱員的人力變化



3.25 調查顯示，過去兩年，本行業整體人力每年微跌 1%，整體人力變化不大。

氣體燃料業務展望

3.26 由於提升氣體燃料設備的安全準則及質素保證，加上內地的發展項目，技術人員的人數將會輕微上升。不過，先進科技普及，工作效率提高，將令技術人力需求下降。本會預期，氣體燃料行業未來幾年的技術人力需求不會有顯著的變化。

氣體燃料行業未來的人力需求

3.27 連同 2007 年人力調查，至今共有 5 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，本會決定採用「調節過濾法」，以推算 2008 至 2010 年的人力需求。

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

3.29 考慮到以上因素，本會預測本行業在2008至2010年，平均每年需要訓練人手如下：

表 3.9 預測氣體燃料行業
每年的機電人力訓練需求

<u>技能等級</u>	<u>調查當日的 僱員人數</u>	<u>2008至2010年 平均每年訓練需求</u>
專業人士／技師	252	7－8
技術員	575	16－20
技工	828	23－28

3.30 本會將在 2009 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 考慮到本地及全球經濟狀況，以及機電工程業的業務性質，本會預測，2008 至 2010 年業內三個行業對幹練技術人力的需求如下：

- (i) 機電工程行業：本地經濟自 2004 年起明顯持續增長。為保持增長動力，香港特區政府已宣布於未來 10 年注資港幣 2,500 億元於 10 大基建項目(見附錄 15)。此一政策將刺激與樓宇及建造業相關的機電服務人力需求。此外，澳門基建及樓宇建造急速發展，內地經濟持續快速增長，以及本地地產市道復甦，將增加業內機電僱員的需求。
- (ii) 船舶修建行業：內地造船業的增長使人力需求增加，然而人力需求亦因採用先進科技及提高工作效率而減少，因此預期業內人力需求將維持穩定。
- (iii) 氣體燃料行業：內地的發展項目及提升安全與質素保證工作使人力需求增加，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將維持穩定。

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的經驗。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 3.17、3.23 及 3.29 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 僱主進行人力規劃時，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 4.7%。每年受訓者人數佔各技能等級人數的百分率如下：

表 4.1 每年受訓者人數佔各行業技能等級人數的百分率

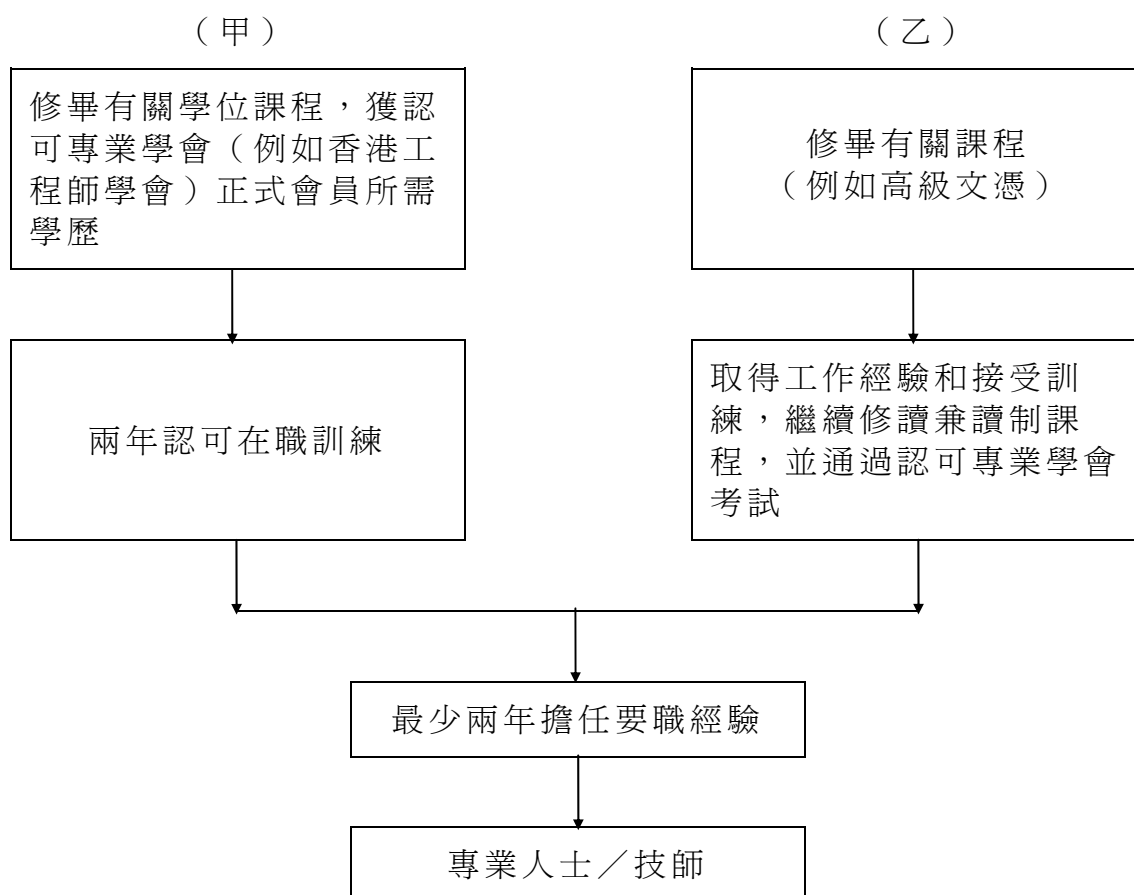
	<u>專業人士／技師</u>	<u>技術員</u>	<u>技工</u>
機電工程行業	4.8%	4.8%	4.8%
船舶修建行業	4.8%	4.8%	4.8%
氣體燃料行業	3.1%	3.1%	3.1%

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 4.1 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 2008 至 2010 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 4.2 預計 2008 至 2010 年間
機電工程及氣體燃料行業專業人士／
技師級主要職務平均每年訓練需求

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	876	38 – 46
電機工程師 (機電工程行業)	1 875	80 – 98
(氣體燃料行業)	31	1 – 1
工程經理	636	27 – 33
消防設備工程師	329	14 – 17
升降機／自動梯工程師	225	10 – 12
機械工程師 (機電工程行業)	1 120	48 – 59
(氣體燃料行業)	59	2 – 2
冷凝／空氣調節／ 通風設備工程師	735	32 – 39
氣體燃料工程師	162	4 – 5
屋宇設備工程師／電機工 程師／機械工程師 (建造業)	1 485	56 – 61
	7 533	312 – 373

表 4.3 預計 2007 至 2009 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)

院校	課程	預計畢業生人數		
		2007	2008	2009
<u>全日制課程</u>				
香港城市大學	工學士 (屋宇裝備工程學)	42	37	32
香港理工大學	工學士 (電機工程學)	31	33	31
	工學士 (屋宇裝備工程學)	44	40	38
	工學士* (機械工程學)	21	17	15
香港科技大學	工程學學士 (機械工程學(屋宇裝備))	25	27	25
	工程學學士* (機械工程學)	26	29	40
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	245	243

註：

* 假設 50% 的工程學士畢業生會投身機電工程業。

4.7 表 4.2 及 4.3 的數據顯示，本地大學相關學科的畢業生人數，將會輕微低於預計的機電工程及氣體燃料行業的訓練需求。然而，不足之數將由技術員通過修讀兼讀制學士課程晉身專業人士／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

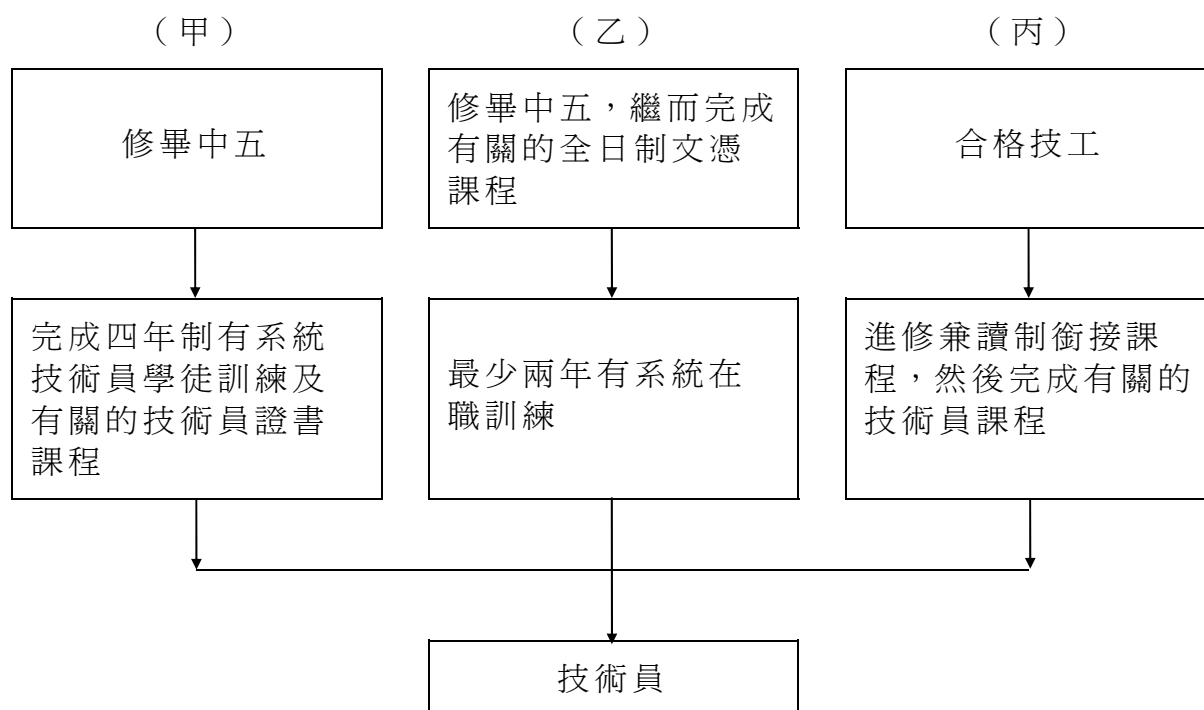
4.9 為使工科畢業生有更多機會接受有系統的實務訓練，職業訓練局屬下技師訓練委員會推行一項資助計劃，協助工科畢業生獲得為期 18 個月的實務訓練，以符合香港工程師學會正式會員資格。受訓的畢業生可以獲得津貼，每月透過僱主發放，作為薪金的一部分。技師訓練組亦提供免費服務，協助僱主招聘畢業生，並就一切與工科畢業生訓練有關的事宜，提供協助。本會建議僱主利用這項計劃訓練其工程師。

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 4.2 技術員訓練



4.12 職業訓練局屬下香港專業教育學院(IVE)開辦電機、空氣調節、屋宇設備工程、設施管理等全日制高級文憑／文憑課程、日間部分時間給假調訓制和兼讀制技術員課程。

4.13 職業訓練局電機業訓練中心及青年學院亦開辦電機工程、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／受訓者，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 2008 至 2010 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，以及供應情況如下：

表 4.4 預計 2008 至 2010 年間機電工程及氣體燃料行業技術員級主要職務平均每年的訓練需求

<u>職 稱</u>	<u>調查時的 僱員人數</u>	<u>平均每年 需訓練人數</u>
屋宇設備技術員	1 680	72 – 88
繪圖員	509	22 – 27
電機工程技術員	1 931	83 – 101
電工儀器技術員	79	3 – 4
消防設備技術員	363	16 – 19
升降機／自動梯技術員	622	27 – 33
機械工程技術員 (機電工程行業)	1 404	60 – 74
(氣體燃料行業)	66	2 – 2
冷凝／空氣調節／ 通風設備技術員	1 022	44 – 54
監督		
(機電工程行業)	2 721	117 – 143
(氣體燃料行業)	168	5 – 6
辦公室設備維修技術員	65	3 – 3
氣體燃料工程技術員	333	9 – 12
	<hr/>	<hr/>
	10 963	463 – 566

表 4.5 預計 2007 至 2009 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		
		2007	2008	2009
香港理工大學	高級文憑 (屋宇裝備工程學)†	28	25	25
	高級文憑 (電機工程學) †	22	15	15
香港城市大學	副學士 (屋宇裝備工程學) †	43	43	38
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	72	52	66
	- 電機工程	194	173	220
	- 機械工程*	65	57	76
	- 設施管理	57	31	20
	- 飛機保養	48	70	72
	- 機電服務	-	53	63
	- 能源管理	17	25	40
	全日制文憑課程△：			
	- 屋宇設備	12	-	-
- 電機工程	102	5	-	
全日制小計		660	549	635
日間部分時間給假調訓制 高級文憑／證書課程：				
- 屋宇設備	40	32	21	
- 電機工程	39	36	36	
日間部分時間給假調訓制 課程小計		79	68	57
總數		739	617	692

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能源管理行業。

4.15 表 4.4 及 4.5 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，會輕微供過於求。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課程，以取得專業／技師資格。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 4.4 及 4.5 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

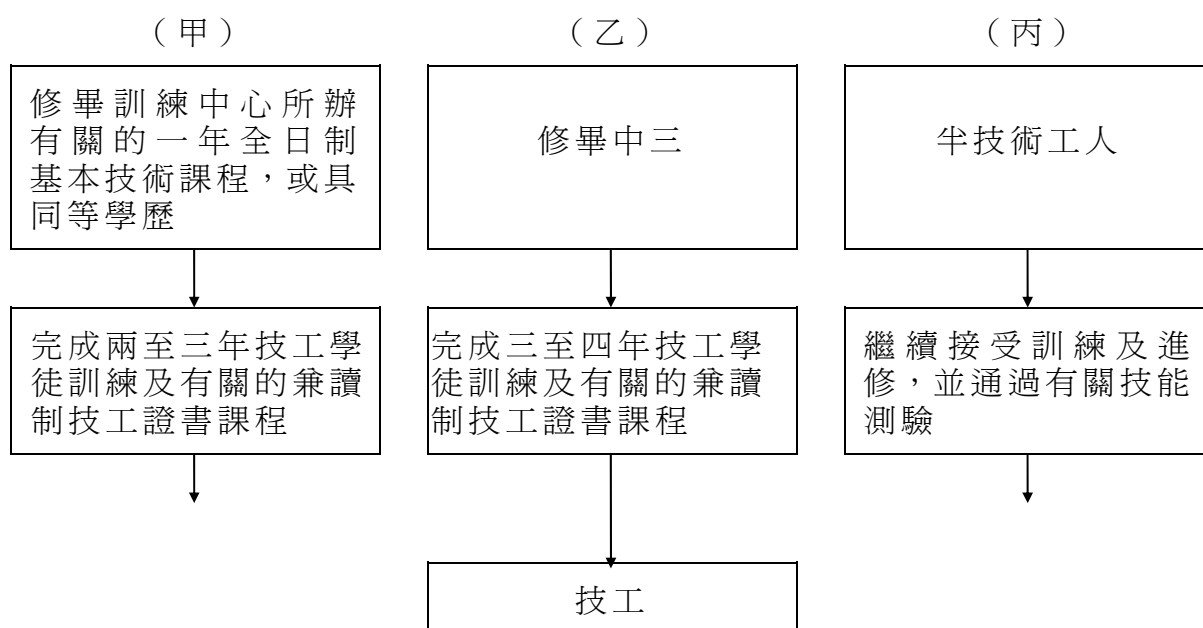
4.17 預測 2008 至 2010 年業內每年對技術員的平均訓練需求為 24 人。供應方面，預期海事科技文憑課程的畢業生人數為 27 人。本會認為，供應配合需求。

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 4.3：技工訓練



4.20 本會建議採用訓練途徑（甲），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，即能參與工作。

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、青年學院及訓練中心提供。本會籲請僱主資助其學徒、受訓者及在職員工修讀有關課程。

4.22 下列兩表為 2008 至 2010 年間，機電行業技工級主要職務平均每年需求及本地院校的人力供應預測：

表 4.6 預計 2008 至 2010 年間機電行業
技工級主要職務平均每年訓練需求

職 稱	調查時的 僱員人數	平均每年 需訓練人數
+管工／領工	3 463	149 – 182
電工／電氣打磨裝配技工		
（機電工程行業）	9 367	403 – 492
（船舶修建行業）	170	7 – 9
（氣體燃料行業）	37	1 – 1
+消防機械裝配工	967	42 – 51
+消防電氣裝配工	491	21 – 26
空調／製冷設備技工		
（機電工程行業）	6 788	292 – 357
（船舶修建行業）	34	1 – 2
+升降機／自動梯技工	2 768	119 – 145
+屋宇設備技工	1 062	46 – 56
機械打磨裝配工／機床工		
（機電工程行業）	3 359	144 – 177
（船舶修建行業）	539	23 – 28
（氣體燃料行業）	16	0 – 1
+強電流電纜接駁技工	224	10 – 12
+薄片金屬構造工／保溫技工	430	18 – 23
+架空電線技工	492	21 – 26
喉管工		
（機電工程行業）	700	30 – 37
（船舶修建行業）	63	3 – 3
+電器用具維修技工	790	34 – 42
	31 760	1 364 – 1 670

註：

+ 機電工程行業

表 4.7 預計 2007 至 2009 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、青年學院及
訓練中心課程計劃)

院 校	課 程	預計畢業生人數		
		2007	2008	2009
電機業訓練中心及 青年學院 (職業訓練局)	全日制基本技術證書／中 專文憑課程(電機工程、 空氣調節及冷凝、電梯工 程、屋宇設備及消防設備)	500*	505*	500*
香港專業教育學院 (職業訓練局)	三年日間部分時間給假調 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 備及喉管工程)	371	428	400
總數		871	933	900

註：

* 基本技術證書課程畢業生或會參加學徒訓練，並修讀兼讀制技工證書課程。

機電工程行業

4.23 表 4.6 及 4.7 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，會遠遠供不應求。雖然很多合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成爲技工，但相信供應仍然不足。

4.24 爲提供更多合格技工以支援機電工程業持續發展，本會建議，職業訓練機構應開辦更多訓練課程，提升在職半技術工人成爲合格技工。

船舶修建行業

4.25 本行業技工職位的技能要求與機電工程行業相似。表 4.6 及 4.7 顯示，2008 至 2010 年，行業內技工供應可能不足以應付預計需求。

氣體燃料行業

4.26 2008 至 2010 年技工級主要職務平均每年預計訓練需求見表 4.8 及 4.9。

表 4.8 預計 2008 至 2010 年氣體燃料行業
技工級主要職務平均每年訓練需求

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)	1	—
氣體燃料輸送技工 (煤氣)	221	6 – 7
氣體燃料用戶裝置技工 (住宅式)	374	11 – 13
氣體燃料用戶裝置技工 (非住宅式)	172	5 – 6
	768	22 – 26

表 4.9 預計 2007 至 2009 年間氣體燃料行業
本地技工畢業生供應情況

院校	課程	預計畢業生人數		
		2007	2008	2009
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，並修讀日間部分時間給假調訓制技工證書課程。

4.27 表 4.8 及 4.9 的數據顯示，未來幾年，氣體燃料行業技工級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

4.28 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 2001 年成立，有助業內半技術工人／普通工人提升技能和知識，增強競爭力和就業保障。

職業訓練局的訓練中心

4.29 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) 提供一至三年多入學點、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

4.30 職業訓練局由 1989 年起，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。

4.31 機電工程業訓練委員會負責設計及推行電工技能測驗。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。

4.32 僱主應鼓勵屬下電工參加技能測驗，以便取得獲正式認可的技術資格。

建造業工人的機電技能測驗及特定訓練課程

4.33 職業訓練局與建造業議會達成協議，獲委擔任該局代理，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》規定的合資格工人註冊資格。

4.34 職業訓練局亦獲建造業議會委託，為根據《建造業工人註冊條例》註冊的技術工人(臨時)開辦 12 個機電建造類別的特定訓練課程，協助他們於三年臨時期限屆滿前註冊。

4.35 本會籲請建造工程的機電工程承辦商鼓勵工人參加測試及註冊，並鼓勵註冊技術工人(臨時)參加特定訓練課程，從而符合《建造業工人註冊條例》的規定。

新科技培訓計劃

4.36 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

4.37 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將輕微低於預計的訓練需求（第 4.7 段）。然而，不足之數將由技術員通過修讀兼讀制學士課程而晉身專業人士／技師而得以補足。
 - (ii) 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，足可應付需求（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，將會與市場需求相符（第 4.15、4.16 段）。
 - (ii) 預測船舶修建行業技術員培訓課程的畢業生人數，將會與訓練需求相符（第 4.17 段）。
- (c) 技工訓練：
 - (i) 未來數年，機電工程及船舶修建學科技工畢業生，可能會供不應求（第 4.23、4.24 段）。本會建議職業訓練機構增加技工級職前訓練課程的學額，開辦更多課程，提升在職半技術工人成為合格技工。
 - (ii) 氣體燃料行業的技工人力供應，足以應付預計訓練需求（第 4.26 段）。
- (d) 機電工程業三個行業的預計訓練需求只以人數計算。訓練機構在計劃訓練名額時，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 4.32 及 4.35 段）。
- (f) 建造業工人註冊 — 機電工程承辦商應鼓勵工人根據《建造業工人註冊條例》的規定註冊。

Electrical and Mechanical Services Training Board

Membership
(As at 31st March 2007)

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 Dr 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 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)
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 2008 估計二零零八年 三月時的 僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級				
Building Services Engineer 屋宇設備工程師	876	62	45	929
Electrical Engineer 電機工程師	1 875	90	96	1 975
Electronics Engineer/Control and Instrumentation Engineer 電子工程師／控制及 儀器工程師	719	4	10	729
Lift/Escalator Engineer 升降機／自動梯工程師	225	-	5	224
Mechanical Engineer 機械工程師	1 120	31	35	1 127
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／ 通風設備工程師	735	17	43	786
Fire Services Engineer 消防設備工程師	329	9	16	352
Engineering Manager 工程經理	636	-	6	642
Sub-total 小計	6 515	213	256	6 764

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 2008 估計二零零八年 三月時的 僱員人數
TECHNICIAN LEVEL 技術員級				
Building Services Technician 屋宇設備技術員	1 680	34	16	1 723
Draughtsman 繪圖員	509	4	29	541
Electrical Engineering Technician 電機工程技術員	1 931	53	19	1 950
Electrical Instrument and Meter Technician 電工儀器技術員	79	-	-	79
Electronics Technician 電子技術員	1 068	35	25	1 095
Lift/Escalator Technician 升降機／自動梯技術員	622	2	3	622
Telecommunication Technician 電訊技術員	696	-	16	761
Mechanical Engineering Technician 機械工程技術員	1 404	40	15	1 443
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	1 022	43	43	1 071
Fire Services Technician 消防設備技術員	363	12	6	369
Office Equipment Service Technician 辦公室設備維修技術員	65	3	-	65
Safety Officer 安全主任	3	-	-	3
Supervisor 監督	2 721	-	16	2 732
Sub-total 小計	12 163	226	188	12 454

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 2008 估計二零零八年 三月時的 僱員人數
TRADESMAN LEVEL 技工級				
Building Security System Mechanic 屋宇防盜系統技工	24	-	-	24
Building Services Mechanic 屋宇設備技工	1 062	-	24	1 085
Cable Jointer (Power) 強電流電纜接駁技工	224	9	2	226
Carpenter/Painter 木工／髹漆工	252	2	41	282
Communication System Mechanic 電訊系統裝配工	1 679	4	49	1 728
Electrician/Electrical Fitter 電工／電氣打磨裝配工	9 367	282	71	9 536
Fire Services Mechanical Fitter 消防機械裝配工	967	18	54	1 030
Fire Services Electrical Fitter 消防電氣裝配工	491	4	61	552
Lift/Escalator Mechanic 升降機／自動梯技工	2 768	95	19	2 770
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	3 359	661	58	3 933
Overhead Linesman 架空電線技工	492	18	-	492
Plumber and Pipe Fitter 喉管工	700	2	2	685
Refrigeration/Air-conditioning/ Ventilation Mechanic 冷凝／空氣調節／ 通風設備技工	6 788	455	159	7 105
Sheet Metal Worker/Thermal Insulation Craftsman 薄片金屬構造工／保溫技工	430	33	-	455
Sign Installer 招牌安裝工	4	-	-	4

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 2008 估計二零零八年 三月時的 僱員人數
TRADESMAN LEVEL (Continued) 技工級 (續)				
Welder 焊接技工	122	2	-	127
Electrical Appliances Service Mechanic 電器用具維修技工	790	2	2	784
AV and RF Mechanic 影音及射頻技工	447	2	62	509
Foreman/Chargehand 管工／領工	3 463	-	76	3 647
Sub-total 小計	33 429	1 589	680	34 974
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人				
Labourer 雜工	1 000	-	8	1 013
Semi-skilled Worker 半技術工人	2 456	-	17	2 510
Sub-total 小計	3 456	-	25	3 523
GRAND TOTAL 總 計	55 563	2 028	1 149	57 715

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
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級									
Building Services Engineer 屋宇設備工程師	-	-	-	12	9	254	405	139	57
Electrical Engineer 電機工程師	-	-	-	-	66	303	959	185	362
Electronics Engineer/ Control and Instrumentation Engineer 電子工程師／控制及 儀器工程師	-	-	-	-	158	70	348	86	57
Lift/Escalator Engineer 升降機／自動梯工程師	-	-	-	-	62	56	100	5	2
Mechanical Engineer 機械工程師	-	-	-	-	32	110	464	336	178
Refrigeration/ Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／ 通風設備工程師	-	-	-	6	87	452	119	34	37
Fire Services Engineer 消防設備工程師	-	-	-	1	63	167	37	8	53
Engineering Manager 工程經理	-	-	-	-	26	76	118	316	100
Sub-total 小計	-	-	-	19	503	1 488	2 550	1 109	846
TECHNICIAN LEVEL 技術員級									
Building Services Technician 屋宇設備技術員	-	-	404	263	103	653	126	90	41
Draughtsman 繪圖員	-	23	136	126	61	47	75	-	41
Electrical Engineering Technician 電機工程技術員	-	-	26	288	422	893	106	-	196
Electrical Instrument and Meter Technician 電工儀器技術員	-	-	24	1	3	18	-	18	15
Electronics Technician 電子技術員	-	-	72	85	34	803	35	-	39
Lift/Escalator Technician 升降機／自動梯技術員	-	-	226	63	200	108	10	-	15

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
TECHNICIAN LEVEL (Continued) 技術員級 (續)									
Telecommunication Technician 電訊技術員	-	13	8	83	533	46	3	-	10
Mechanical Engineering Technician 機械工程技術員	-	-	32	128	336	757	106	-	45
Refrigeration/ Air-conditioning/ Ventilation Technician 冷凝/空氣調節/ 通風設備技術員	-	-	189	329	196	243	23	-	42
Fire Services Technician 消防設備技術員	-	-	45	135	105	56	-	-	22
Office Equipment Service Technician 辦公室設備維修技術員	-	-	-	64	-	1	-	-	-
Safety Officer 安全主任	-	-	-	-	-	-	3	-	-
Supervisor 監督	-	-	10	154	805	1 347	336	9	60
Sub-total 小計	-	36	1 172	1 719	2 798	4 972	823	117	526
TRADESMAN/CRAFTSMAN LEVEL 技工級									
Building Security System Mechanic 屋宇防盜系統技工	-	1	23	-	-	-	-	-	-
Building Services Mechanic 屋宇設備技工	-	1	573	397	55	-	-	-	36
Cable Joints (Power) 強電流電纜接駁技工	-	-	40	136	-	-	-	-	48
Carpenter/Painter 木工/髹漆工	-	37	27	178	-	-	-	-	10
Communication System Mechanic 電訊系統裝配工	-	188	514	789	164	-	-	-	24
Electrician/Electrical Fitter 電工/電氣打磨裝配工	-	542	2 444	4 758	1 352	-	-	5	266
Fire Services Mechanical Fitter 消防機械裝配工	-	26	318	292	325	-	-	-	6
Fire Services Electrical Fitter 消防電氣裝配工	-	32	121	115	192	-	-	-	31
Lift/Escalator Mechanic 升降機/自動梯技工	-	417	507	1 230	474	-	-	-	140
Mechanical Fitter/ Machinist 機械打磨裝配工/ 機床工	-	11	564	1 648	973	-	-	-	163

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)									
Overhead Linesman 架空電線技工	-	-	40	438	6	-	-	-	8
Plumber and Pipe Fitter 喉管工	-	12	143	472	32	-	-	-	41
Refrigeration/ Air-conditioning/ Ventilation Mechanic 冷凝／空氣調節／ 通風設備技工	-	862	2 399	3 083	240	-	-	-	204
Sheet Metal Worker/ Thermal Insulation Craftsman 薄片金屬構造工／ 保溫技工	-	-	157	249	10	-	-	-	14
Sign Installer 招牌安裝工	-	-	2	2	-	-	-	-	-
Welder 焊接工	-	2	32	79	4	-	-	-	5
Electrical Appliances Service Mechanic 電器用具維修技工	-	242	246	268	34	-	-	-	-
AV and TV Mechanic 影音及射頻技工	-	1	223	28	189	-	-	-	6
Foreman/Chargehand 管工／領工	-	101	224	792	2 169	92	-	-	85
Sub-total 小計	-	2 475	8 597	14 954	6 219	92	-	5	1 087
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人									
Labourer 雜工	11	343	630	-	-	-	-	-	16
Semi-skilled Worker 半技術工人	202	902	1 314	1	-	-	-	-	37
Sub-total 小計	213	1 245	1 944	1	-	-	-	-	53
GRAND TOTAL 總計	213	3 756	11 713	16 693	9 520	6 552	3 373	1 231	2 512

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 2008 估計二零零八年 三月時的 僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級				
Building Services Engineer 屋宇設備工程師	177	-	4	181
Electrical Engineer 電機工程師	329	12	10	349
Electronics Engineer/Control and Instrumentation Engineer 電子工程師／控制及儀器 工程師	259	-	-	259
Lift/Escalator Engineer 升降機／自動梯工程師	223	-	5	223
Mechanical Engineer 機械工程師	110	4	-	114
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備 工程師	626	7	38	666
Fire Services Engineer 消防設備工程師	228	2	3	233
Engineering Manager 工程經理	320	-	2	322
Sub-total 小計	2 272	25	62	2 347

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 2008 估計二零零八年 三月時的 僱員人數
TECHNICIAN LEVEL 技術員級				
Building Services Technician 屋宇設備技術員	145	31	-	150
Draughtsman 繪圖員	274	3	19	295
Electrical Engineering Technician 電機工程技術員	661	2	4	665
Electrical Instrument and Meter Technician 電工儀器技術員	42	-	-	42
Electronics Technician 電子技術員	230	2	14	246
Lift/Escalator Technician 升降機／自動梯技術員	610	2	2	609
Telecommunication Technician 電訊技術員	352	-	1	326
Mechanical Engineering Technician 機械工程技術員	153	6	-	160
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	865	24	42	913
Fire Services Technician 消防設備技術員	356	12	6	362
Office Equipment Service Technician 辦公室設備維修技術員	3	-	-	3
Safety Officer 安全主任	3	-	-	3
Supervisor 監督	1 460	-	1	1 453
Sub-total 小計	5 154	82	89	5 227

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 2008 估計二零零八年 三月時的 僱員人數
TRADESMAN LEVEL 技工級				
Building Security System Mechanic 屋宇防盜系統技工	23	-	-	23
Building Services Mechanic 屋宇設備技工	79	-	-	79
Cable Jointer (Power) 強電流電纜接駁技工	44	-	-	44
Carpenter/Painter 木工/髹漆工	11	-	-	11
Communication System Mechanic 電訊系統裝配工	1 480	4	49	1 529
Electrician/Electrical Fitter 電工/電氣打磨裝配工	4 565	74	10	4 617
Fire Services Mechanical Fitter 消防機械裝配工	957	18	54	1 020
Fire Services Electrical Fitter 消防電氣裝配工	475	4	61	536
Lift/Escalator Mechanic 升降機/自動梯技工	2 768	95	19	2 770
Mechanical Fitter/Machinist 機械打磨裝配工/機床工	350	-	9	363
Overhead Linesman 架空電線技工	246	-	-	246
Plumber and Pipe Fitter 喉管工	236	-	-	236
Refrigeration/Air-conditioning/ Ventilation Mechanic 冷凝/空氣調節/通風設備 技工	5 368	371	132	5 612
Sheet Metal Worker/Thermal Insulation Craftsman 薄片金屬構造工/保溫技工	257	2	-	257
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 2008 估計二零零八年 三月時的 僱員人數
TRADESMAN LEVEL (Continued) 技工級 (續)				
Welder 焊接技工	94	-	-	98
Electrical Appliances Service Mechanic 電器用具維修技工	-	-	-	-
AV and RF Mechanic 影音及射頻技工	177	-	54	231
Foreman/Chargehand 管工/領工	1 552	-	7	1 560
Sub-total 小計	18 682	568	395	19 232
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人				
Labourer 雜工	193	-	2	197
Semi-skilled Worker 半技術工人	1 579	-	3	1 585
Sub-total 小計	1 772	-	5	1 782
GRAND TOTAL 總 計	27 880	675	551	28 588

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 2008 估計二零零八年 三月時的 僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級				
Building Services Engineer 屋宇設備工程師	699	62	41	748
Electrical Engineer 電機工程師	1 546	78	86	1 626
Electronics Engineer/Control and Instrumentation Engineer 電子工程師／控制及儀器工程師	460	4	10	470
Lift/Escalator Engineer 升降機／自動梯工程師	2	-	-	1
Mechanical Engineer 機械工程師	1 010	27	35	1 013
Refrigeration/Air-conditioning/Ventilation Engineer 冷凝／空氣調節／通風設備工程師	109	10	5	120
Fire Services Engineer 消防設備工程師	101	7	13	119
Engineering Manager 工程經理	316	-	4	320
Sub-total 小計	4 243	188	194	4 417

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 2008 估計二零零八年 三月時的 僱員人數
TECHNICIAN LEVEL 技術員級				
Building Services Technician 屋宇設備技術員	1 535	3	16	1 573
Draughtsman 繪圖員	235	1	10	246
Electrical Engineering Technician 電機工程技術員	1 270	51	15	1 285
Electrical Instrument and Meter Technician 電工儀器技術員	37	-	-	37
Electronics Technician 電子技術員	838	33	11	849
Lift/Escalator Technician 升降機／自動梯技術員	12	-	1	13
Telecommunication Technician 電訊技術員	344	-	15	435
Mechanical Engineering Technician 機械工程技術員	1 251	34	15	1 283
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／ 通風設備技術員	157	19	1	158
Fire Services Technician 消防設備技術員	7	-	-	7
Office Equipment Service Technician 辦公室設備維修技術員	62	3	-	62
Supervisor 監督	1 261	-	15	1 279
Sub-total 小計	7 009	144	99	7 227

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 2008 估計二零零八年 三月時的 僱員人數
TRADESMAN LEVEL 技工級				
Building Security System Mechanic 屋宇防盜系統技工	1	-	-	1
Building Services Mechanic 屋宇設備技工	983	-	24	1 006
Cable Jointer (Power) 強電流電纜接駁技工	180	9	2	182
Carpenter/Painter 木工／髹漆工	241	2	41	271
Communication System Mechanic 電訊系統裝配工	199	-	-	199
Electrician/Electrical Fitter 電工／電氣打磨裝配工	4 802	208	61	4 919
Fire Services Mechanical Fitter 消防機械裝配工	10	-	-	10
Fire Services Electrical Fitter 消防電氣裝配工	16	-	-	16
Lift/Escalator Mechanic 升降機／自動梯技工	-	-	-	-
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	3 009	661	49	3 570
Overhead Linesman 架空電線技工	246	18	-	246
Plumber and Pipe Fitter 喉管工	464	2	2	449
Refrigeration/Air-conditioning/ Ventilation Mechanic 冷凝／空氣調節／ 通風設備技工	1 420	84	27	1 493
Sheet Metal Worker/Thermal Insulation Craftsman 薄片金屬構造工／保溫技工	173	31	-	198
Sign Installer 招牌安裝工	4	-	-	4

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 2008 估計二零零八年 三月時的 僱員人數
TRADESMAN LEVEL (Continued) 技工級 (續)				
Welder 焊接技工	28	2	-	29
Electrical Appliances Service Mechanic 電器用具維修技工	790	2	2	784
AV and RF Mechanic 影音及射頻技工	270	2	8	278
Foreman/Chargehand 管工／領工	1 911	-	69	2 087
Sub-total 小計	14 747	1 021	285	15 742
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人				
Labourer 雜工	807	-	6	816
Semi-skilled Worker 半技術工人	877	-	14	925
Sub-total 小計	1 684	-	20	1 741
GRAND TOTAL 總 計	27 683	1 353	598	29 127

**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
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級			
Building Services Engineer 屋宇設備工程師	18	3	-
Control and Instrumentation Engineer 控制及儀器工程師	-	-	-
Electrical Engineer 電機工程師	26	1	-
Electronics Engineer 電子工程師	-	-	-
Lift/Escalator Engineer 升降機／自動梯工程師	8	-	-
Mechanical Engineer 機械工程師	10	-	-
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備 工程師	6	-	-
Fire Services Engineer 消防設備工程師	4	-	-
Sub-total 小計	72	4	-
TECHNICIAN LEVEL 技術員級			
Building Services Technician 屋宇設備技術員	8	-	-
Draughtsman 繪圖員	4	-	-
Electrical Engineering Technician 電機工程技術員	40	-	-

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
TECHNICIAN LEVEL (Continued) 技術員級 (續)			
Electrical Instrument and Meter Technician 電工儀器技術員	3	-	-
Electronics Technician 電子技術員	4	-	-
Lift/Escalator Technician 升降機／自動梯技術員	6	-	-
Telecommunication Technician 電訊技術員	-	-	-
Mechanical Engineering Technician 機械工程技術員	15	-	-
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	35	-	-
Fire Services Technician 消防設備技術員	16	-	-
Supervisor 監督	33	1	-
Sub-total 小計	164	1	-
TRADESMAN LEVEL 技工級			
Building Security System Mechanic 屋宇防盜系統技工	70	-	-
Building Services Mechanic 屋宇設備技工	28	-	-
Cable Jointer (Power) 強電流電纜接駁技工	39	-	-
Communication System Mechanic 電訊系統裝配工	20	-	-
Electrician/Electrical Fitter 電工／電氣打磨裝配工	1 800	-	-
Fire Services Mechanical Fitter 消防機械裝配工	3615	-	-
Fire Services Electrical Fitter 消防電氣裝配工	108	-	-
Lift/Escalator Mechanic 升降機／自動梯技工	349	-	-

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
TRADESMAN LEVEL (Continued) 技工級 (續)			
Mechanical Fitter 機械打磨裝配工	92	-	-
Overhead Linesman 架空電線技工	-	-	-
Plumber and Pipe Fitter 喉管工	151	-	-
Refrigeration/Air-conditioning/ Ventilation Mechanic 冷凝/空氣調節/通風設備技工	840	-	-
Sheet Metal Worker 薄片金屬構造工	107	-	-
Thermal Insulation Craftsman 保溫技工	18	-	-
Welder 焊接技工	5	-	-
Electrical Appliances Service Mechanic 電器用具維修技工	170	-	-
Gas Installer 氣體裝置技工	35	-	-
Foreman/Chargehand 管工/領工	69	-	-
Sub-total 小計	4 216	-	-
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人			
Labourer 雜工	28	-	-
Semi-skilled Worker 半技術工人	6	-	-
Sub-total 小計	34	-	-
GRAND TOTAL 總計	4 486	5	-

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 2008 估計二零零八年 三月時的 僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級				
Electrical Engineer 電機工程師	26	2	-	26
Marine Engineer 輪機工程師	76	1	3	79
Mechanical Engineer 機械工程師	33	2	-	33
Ship Designer/Naval Architect 船舶設計師／造船工程師	32	-	-	32
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	114	1	1	116
Sub-total 小計	281	6	4	286
TECHNICIAN LEVEL 技術員級				
Draughtsman 繪圖員	9	-	-	9
Electrical Engineering Technician 電機工程技術員	57	3	-	57
Electronics/ Telecommunication Technician 電子／通訊技術員	42	3	-	44
Estimator 估計員	19	-	-	19

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 2008 估計二零零八年 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	125	4	1	125
Safety Officer 安全主任	28	1	3	31
Supervisor/Foreman 監督/管工	222	-	-	221
Sub-total 小計	502	11	4	506
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	34	-	-	34
Carpenter 木工	152	-	2	154
Crane Driver 起重機操作工	40	-	-	40
Electrician 電工	170	8	1	175
Mechanical Fitter 機械打磨裝配工	539	29	1	533
GRP-Worker 玻璃纖維工	25	-	-	25
Machinist 機床工	57	6	-	57
Marine Pipeworker 船舶喉管工	63	3	-	63
Painter 髹漆工	103	-	-	103
Rigger 索具工 (喊咗工)	102	-	-	98
Ship Classification Qualified Welder 船級協會認可焊接工	46	4	-	50

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 2008 估計二零零八年 三月時的 僱員人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)				
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工 (鍋爐工、造船鋼 板工、捻縫工/鐵工)	90	7	2	92
Welder 焊接技工	105	5	-	109
Sub-total 小計	1 526	62	6	1 533
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人				
Labourer 雜工	115	-	-	115
Semi-skilled Worker 半技術工人	64	-	4	68
Sub-total 小計	179	-	4	183
GRAND TOTAL 總計	2 488	79	18	2 508

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
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級									
Electrical Engineer 電機工程師	-	-	-	1	1	6	2	2	14
Marine Engineer 輪機工程師	-	-	-	-	5	8	23	30	10
Mechanical Engineer 機械工程師	-	-	-	-	-	10	6	2	15
Ship Designer/ Naval Architect 船舶設計師／ 造船工程師	-	-	-	-	2	-	5	21	4
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	-	-	-	-	-	15	17	82	-
Sub-total 小計	-	-	-	1	8	39	53	137	43
TECHNICIAN LEVEL 技術員級									
Draughtsman 繪圖員	-	-	-	-	-	9	-	-	-
Electrical Engineering Technician 電機工程技術員	-	-	3	13	5	7	-	9	20
Electronics/ Telecommunication Technician 電子／通訊技術員	-	-	5	-	9	8	-	-	20
Estimator 估計員	-	-	-	-	18	1	-	-	-
Mechanical Engineering Technician 機械工程技術員	-	-	8	23	15	23	1	30	25
Safety Officer 安全主任	-	-	-	1	3	5	12	6	1
Supervisor/Foreman 監督／管工	-	-	15	46	74	69	3	-	15
Sub-total 小計	-	-	31	83	124	122	16	45	81

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 技工級									
Air-conditioning Mechanic/Sheet Metal Worker 空氣調節技工/ 薄片金屬構造工	-	-	8	13	1	-	-	-	12
Carpenter 木工	-	4	37	91	20	-	-	-	-
Crane Driver 起重機操作工	-	-	16	23	1	-	-	-	-
Electrician 電工	-	-	40	100	-	-	-	-	30
Mechanical Fitter 機械打磨裝配工	-	20	167	262	86	4	-	-	-
GRP-Worker 玻璃纖維工	-	-	13	6	6	-	-	-	-
Machinist 機床工	-	-	34	16	5	2	-	-	-
Marine Pipeworker 船舶喉管工	-	-	24	39	-	-	-	-	-
Painter 髹漆工	-	4	39	54	6	-	-	-	-
Rigger 索具工（喊咗工）	-	-	82	19	1	-	-	-	-
Ship Classification Qualified Welder 船級協會認可焊接工	-	-	10	18	-	10	-	-	8
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工（鍋爐工、造船 鋼板工、捻縫工／鐵工）	-	-	43	32	15	-	-	-	-
Welder 焊接工	-	-	23	76	2	4	-	-	-
Sub-total 小計	-	28	536	749	143	20	-	-	50
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人									
Labourer 雜工	2	99	4	3	-	-	-	-	7
Semi-skilled Worker 半技術工人	-	52	12	-	-	-	-	-	-
Sub-total 小計	2	151	16	3	-	-	-	-	7
GRAND TOTAL 總計	2	179	583	836	275	181	69	182	181

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 2008 估計二零零八年 三月時的 僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級				
Electrical Engineer 電機工程師	31	-	-	31
Gas Engineer (Fuel Gas) 氣體燃料工程師	162	-	-	163
Mechanical Engineer 機械工程師	59	-	-	59
Sub-total 小計	252	-	-	253
TECHNICIAN LEVEL 技術員級				
Electrical Engineering Technician 電機工程技術員	8	-	-	8
Gas Engineering Technician 氣體燃料工程技術員	333	-	-	333
Mechanical Engineering Technician 機械工程技術員	66	-	-	68
Supervisor/Chargehand 監督／管工	168	-	-	168
Sub-total 小計	575	-	-	577
TRADESMAN/CRAFTSMAN LEVEL 技工級				
Electrician/Electrical Fitter 電工／電氣打磨裝配工	37	-	-	37
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	1	-	-	1

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 2008 估計二零零八年 三月時的 僱員人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)				
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工 (煤氣)	221	13	-	221
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工 (住宅式)	374	42	1	378
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工 (非住宅式)	172	5	1	173
Mechanical Fitter 機械打磨裝配工	16	-	-	16
Welder 焊接技工	7	-	-	7
Sub-total 小計	828	60	2	833
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)	22	-	-	22
Labourer 雜工	14	-	-	14
Semi-skilled Worker 半技術工	41	-	-	41
Vehicle Attendant/ Deliveryman (LPG Cyliner) 跟車/送貨員 (石油氣瓶)	30	-	-	30
Sub-total 小計	107	-	-	107
GRAND TOTAL 總計	1 762	60	2	1 770

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
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士/技師級									
Electrical Engineer 電機工程師	-	-	-	-	11	-	12	8	-
Gas Engineer (Fuel Gas) 氣體燃料工程師	-	-	-	-	33	3	107	18	1
Mechanical Engineer 機械工程師	-	-	-	-	-	-	59	-	-
Sub-total 小計	-	-	-	-	44	3	178	26	1
TECHNICIAN LEVEL 技術員級									
Electrical Engineering Technician 電機工程技術員	-	-	-	6	2	-	-	-	-
Gas Engineering Technician 氣體燃料工程技術員	-	-	14	298	9	6	4	-	2
Mechanical Engineering Technician 機械工程技術員	-	-	-	31	1	-	34	-	-
Supervisor/Chargehand 監督/管工	-	-	27	28	34	79	-	-	-
Sub-total 小計	-	-	41	363	46	85	38	-	2
TRADESMAN/CRAFTSMAN LEVEL 技工級									
Electrician/ Electrical Fitter 電工/電氣打磨裝配工	-	-	7	28	1	-	-	-	1
Gas Distribution Fitter (LPG) 氣體燃料輸送技工 (石油氣)	-	-	-	-	1	-	-	-	-
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工 (煤氣)	-	25	22	174	-	-	-	-	-
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工 (住宅式)	-	49	131	152	39	-	-	-	3

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)									
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工 (非住宅式)	-	22	33	106	11	-	-	-	-
Mechanical Fitter 機械打磨裝配工	-	3	13	-	-	-	-	-	-
Welder 焊接技工	-	-	-	-	7	-	-	-	-
Sub-total 小計	-	99	206	460	59	-	-	-	4
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)	-	-	16	2	-	-	-	-	4
Labourer 雜工	1	2	11	-	-	-	-	-	-
Semi-skilled Worker 半技術工人	-	13	22	3	-	-	-	-	3
Vehicle Attendant/ Deliveryman (LPG Cylinder) 跟車/送貨員 (石油氣瓶)	-	5	20	-	-	-	-	-	5
Sub-total 小計	1	20	69	5	-	-	-	-	12
GRAND TOTAL 總計	1	119	316	828	149	88	216	26	19

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR
機電工程行業

**RECOMMENDED NUMBER OF TRAINEES
TO BE TAKEN ON ANNUALLY BETWEEN 2008 AND 2010**

二零零八年至二零一零年間
建議每年招收的受訓者人數

Job Title 職稱	Number of employees in March 2007 二零零七年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2008 由二零零八年起建議 每年招收的受訓者人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士/技師級		
Building Services Engineer 屋宇設備工程師	876	38 – 46
Electrical Engineer 電機工程師	1 875	80 – 98
Electronics Engineer/Control and Instrumentation Engineer 電子工程師/控制及儀器工程師	719	31 – 38
Lift/Escalator Engineer 升降機/自動梯工程師	225	10 – 12
Mechanical Engineer 機械工程師	1 120	48 – 59
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝/空氣調節/通風設備工程師	735	32 – 39
Fire Services Engineer 消防設備工程師	329	14 – 17
Engineering Manager 工程經理	636	27 – 33
Sub-total 小計	6 515	280 – 342
TECHNICIAN LEVEL 技術員級		
Building Services Technician 屋宇設備技術員	1 680	72 – 88
Draughtsman 繪圖員	509	22 – 27
Electrical Engineering Technician 電機工程技術員	1 931	83 – 101
Electrical Instrument and Meter Technician 電工儀器技術員	79	3 – 4
Electronics Technician 電子技術員	1 068	46 – 56
Lift/Escalator Technician 升降機/自動梯技術員	622	27 – 33

Job Title 職稱	Number of employees in March 2007 二零零七年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2008 由二零零八年起建議 每年招收的受訓者人數
TECHNICIAN LEVEL (Continued) 技術員級 (續)		
Telecommunication Technician 電訊技術員	696	30 – 37
Mechanical Engineering Technician 機械工程技術員	1 404	60 – 74
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	1 022	44 – 54
Fire Services Technician 消防設備技術員	636	16 – 19
Office Equipment Service Technician 辦公室設備維修技術員	65	3 – 3
Safety Officer 安全主任	3	–
Supervisor 監督	2 721	117 – 143
Sub-total 小計	12 163	523 – 639
TRADESMAN/CRAFTSMAN LEVEL 技工級		
Building Security System Mechanic 屋宇防盜系統技工	24	1 – 1
Building Services Mechanic 屋宇設備技工	1 062	46 – 56
Cable Jointer (Power) 強電流電纜接駁技工	224	10 – 12
Carpenter/Painter 木工／髹漆工	252	11 – 13
Communication System Mechanic 電訊系統裝配工	1 679	72 – 88
Electrician/Electrical Fitter 電工／電氣打磨裝配工	9 367	403 – 492
Fire Services Mechanical Fitter 消防機械裝配工	967	42 – 51
Fire Services Mechanical Fitter 消防電氣裝配工	491	21 – 26
Lift/Escalator Mechanic 升降機／自動梯技工	2 768	119 – 145
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	3 359	144 – 177
Overhead Linesman 架空電線技工	492	21 – 26
Plumber and Pipe Fitter 喉管工	700	30 – 37
Refrigeration/Air-conditioning/ Ventilation Mechanic 冷凝／空氣調節／通風設備技工	6 788	292 – 357
Sheet Metal Worker/Thermal Insulation Craftsman 薄片金屬構造工／保溫技工	430	18 – 23

Job Title 職稱	Number of employees in March 2007 二零零七年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2008 由二零零八年建議 每年招收的受訓者人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)		
Sign Installer 招牌安裝工	4	-
Welder 焊接技工	122	5 - 6
Electrical Appliances Service Mechanic 電器用具維修技工	790	34 - 42
AV and RF Mechanic 影音及射頻技工	447	19 - 23
Foreman/Chargehand 管工/領工	3 463	149 - 182
Sub-total 小計	33 429	1 437 - 1 757

THE SHIPBUILDING AND SHIP REPAIR SECTOR

船舶修建工程行業

**RECOMMENDED NUMBER OF TRAINEES
TO BE TAKEN ON ANNUALLY BETWEEN 2008 AND 2010**

二零零八年至二零一零年間
建議每年招收的受訓者人數

Job Title 職稱	Number of employees in March 2007 二零零七年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2008 由二零零八年起建議 每年招收的受訓者人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士/技師級		
Electrical Engineer 電機工程師	26	1 – 1
Marine Engineer 輪機工程師	76	3 – 4
Mechanical Engineer 機械工程師	33	2 – 2
Ship Designer/Naval Architect 船舶設計師/造船工程師	32	1 – 2
Ship Repairs Manager/Superintendent 船舶修理主管/船舶修理監督	114	5 – 6
Sub-total 小計	281	12 – 15
TECHNICIAN LEVEL 技術員級		
Draughtsman 繪圖員	9	–
Electrical Engineering Technician 電機工程技術員	57	3 – 3
Electronics/Telecommunication Technician 電子/通訊技術員	42	2 – 2
Estimator 估計員	19	1 – 1
Mechanical Engineering Technician 機械工程技術員	125	5 – 7
Safety Officer 安全主任	28	1 – 1
Supervisor/Foreman 監督/管工	222	10 – 12
Sub-total 小計	502	22 – 26
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	34	1 – 2
Carpenter 木工	152	7 – 8

Job Title 職稱	Number of employees in March 2007 二零零七年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2008 由二零零八年起建議 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	40	2 – 2
Electrician 電工	170	7 – 9
Mechanical Fitter 機械打磨裝配工	539	23 – 28
GRP-Worker 玻璃纖維工	25	1 – 1
Machinist 機床工	57	2 – 3
Marine Pipeworker 船舶喉管工	63	3 – 3
Painter 髹漆工	103	5 – 6
Rigger 索具工	102	4 – 5
Ship Classification Qualified Welder 船級協會認可焊接工	46	2 – 2
Steel Worker (Boiler Maker/ Steel Plater/Blacksmith) 鋼鐵工 (鍋爐工、造船鋼板工、 捻縫工/鐵工)	90	4 – 5
Welder 焊接技工	105	5 – 6
Sub-total 小計	1 526	66 – 80

THE GAS SECTOR
氣體燃料行業

**RECOMMENDED NUMBER OF TRAINEES
TO BE TAKEN ON ANNUALLY BETWEEN 2008 AND 2010**

二零零八年至二零一零年間
建議每年招收的受訓者人數

Job Title 職稱	Number of employees in March 2007 二零零七年三月時 的僱員人數	Recommended number of trainees to be taken on annually from 2008 由二零零八年起建議 每年招收的受訓者人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級		
Electrical Engineer 電機工程師	31	1 – 1
Gas Engineer (Fuel Gas) 氣體燃料工程師	162	4 – 5
Mechanical Engineer 機械工程師	59	2 – 2
Sub-total 小計	252	7 – 8
TECHNICIAN LEVEL 技術員級		
Electrical Engineering Technician 電機工程技術員	8	–
Gas Engineering Technician 氣體燃料工程技術員	333	9 – 12
Mechanical Engineering Technician 機械工程技術員	66	2 – 2
Supervisor/Chargehand 監督／管工	168	5 – 6
Sub-total 小計	575	16 – 20
TRADESMAN/CRAFTSMAN LEVEL 技工級		
Electrician/Electrical Fitter 電工／電氣打磨裝配工	37	1 – 1
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	1	–
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	221	6 – 7
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工（住宅式）	374	11 – 13
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工（非住宅式）	172	5 – 6
Mechanical Fitter 機械打磨裝配工	16	0 – 1
Welder 焊接技工	7	–
Sub-total 小計	828	23 – 28

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(A) Principal Jobs 主要職務			(B) Monthly Income 每月收入	(C) No. Employed at Date of Suvey (excl. trainees) 現有僱員人數 (受訓者除外)	(D) Forecast of No. Employed 12 Months from Now (excl. trainees) 預計 12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 codes: 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 Code 工作編號	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	
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							

Monthly
Income Range
每月總收入幅度

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

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，請將
(✓) 號填入此 內，然後
另紙繼續填寫。

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 2007 Manpower Survey of the
Electrical and Mechanical Services Industry
機電工程業 2007 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欄內填寫零（0）。
3. For detailed job descriptions, please refer to Appendix C.
如需詳細工作說明，請參閱附錄 C。
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 to Appendix C.
請瀏覽 '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。
 - (b) Please add in column 'A' titles of any technical jobs not mentioned in Appendix C, briefly describe them and indicate their skill levels.
如貴機構另有技術性職稱未載於附錄 C，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 but 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 to job description of job code 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 code of the total monthly income range for each job 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' 欄填入每個職稱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 at Date of Survey (excluding trainees) - Column 'C'

現有僱員人數（受訓者除外） —— 'C' 欄

For each 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個職稱員工總數（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

(A) Principal Jobs 主要職務			(B) Monthly Income 每月收入	(C) No. Employed at Date of Survey (excl. trainees) 現有僱員人數 (受訓者除外)	(D) Forecast of No. Employed 12 Months from Now (excl. trainees) 預計 12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 codes: 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 Code 工作編號	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	
1 Building Services Engineer (屋宇設備工程師)	2	1 0 1	8	2	2	0	1	Under \$6,000 以下	1
2 Electrical Engineer (電機工程師)	2	1 0 2	7	3	5	1	1	\$6,001 - \$9,000	2
								\$9,001 - \$12,000	3
9 Supervisor (監督)	2	2 0 1	6	6	7	0	0	\$12,001 - \$15,000	4
10 Building Services Technician (屋宇設備技術員)	2	2 0 2	5	4	4	0	1	\$15,001 - \$18,000	5
11 Draughtsman (繪圖員)	2	2 0 3	4	2	2	0	1	\$18,001 - \$25,000	6
12 Electrical Engineering Technician (電機工程技術員)	2	2 0 4	5	6	8	1	2	\$25,001 - \$35,000	7
								Over \$35,000 以上	8
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，請將 (✓) 號填入此 內，然後另紙繼續填寫。

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
PROFESSIONAL/TECHNOLOGIST 專業人士／技師		
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>
104	Mechanical Engineer 機械工程師	<p>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.</p> <p>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。</p>

Code 編號	Job Title 職稱	Job Description 工作說明
PROFESSIONAL/TECHNOLOGIST (Continued) 專業人士／技師（續）		
105	Lift/Escalator Engineer 升降機／自動梯工程師	<p>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.</p> <p>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。</p>
106	Fire Services Engineer 消防設備工程師	<p>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.</p> <p>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。</p>
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>

Code 編號	Job Title 職稱	Job Description 工作說明
PROFESSIONAL/TECHNOLOGIST (Continued)		專業人士／技師（續）
108	Engineering Manager 工程經理	<p>Directs and assumes accountabilities for all aspects of electrical and mechanical (E & 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 & 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>
202	Building Services Technician 屋宇設備技術員	<p>Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, installation, operation, maintenance and repair of building services systems and equipment. 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、保養及修理屋宇裝置及設備。並協助工程師策劃、協調及管理有關計劃。</p>
203	Draughtsman 繪圖員	<p>Prepares detail and assembly drawings and circuit diagrams according to design specifications.</p> <p>按照設計規格，繪製明細圖、裝配圖及線路圖。</p>
204	Electrical Engineering Technician 電機工程技術員	<p>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.</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、發展、製造、安裝、操作、保養及修理電機裝置及設備。</p>

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued)		技術員 (續)
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。
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。

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued)		技術員 (續)
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。
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。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued) 技工 (續)		
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。
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。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued) 技工 (續)		
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。
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。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued) 技工 (續)		
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。
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
PROFESSIONAL/TECHNOLOGIST 專業人士／技師		
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。
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。

Code 編號	Job Title 職稱	Job Description 工作說明
PROFESSIONAL/TECHNOLOGIST (Continued) 專業人士／技師（續）		
155	Ship Repairs Manager/ Superintendent 船舶修理主管或 船舶修理監督	<p>(A) Shipping Company: Organises and directs the repair and maintenance of ships; acts as company consultant on design, technical, cost and related matters.</p> <p>(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.</p> <p>(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。</p> <p>(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。</p>
TECHNICIAN 技術員		
251	Draughtsman 繪圖員	<p>Prepares structural, layout, detail and assembly drawings or circuit diagrams for the maintenance and repair of plants, equipment and ship structures.</p> <p>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。</p>
252	Electrical Engineering Technician 電機工程技術員	<p>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.</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、發展、安裝、操作、保養及修理電機裝置及設備。</p>
253	Electronics/ Telecommunication Technician 電子／通訊技術員	<p>Carries out installation and repairing of marine electronic/telecommunication equipment.</p> <p>安裝及修理船用電子／通訊設備。</p>

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued) 技術員 (續)		
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。
TRADESMAN 技工		
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。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN (Continued) 技工 (續)		
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 (喊吔工)	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。
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。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN (Continued) 技工 (續)		
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
PROFESSIONAL/TECHNOLOGIST 專業人士／技師		
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>
TECHNICIAN 技術員		
271	Electrical Engineering Technician 電機工程技術員	<p>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.</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、發展、製造、安裝、操作、保養及修理電機裝置及設備。</p>

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued) 技術員 (續)		
272	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>
273	Mechanical Engineering Technician 機械工程技術員	<p>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.</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、發展、建造、安裝、有效操作、保養及修理機械裝置及設備。</p>
274	Supervisor/ Chargehand 監督／管工	<p>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.</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查驗、品質控制、安裝、操作、保養及修理。</p>
TRADESMAN/CRAFTSMAN 技工		
371	Electrician/Electrical Fitter 電工／電氣打磨 裝配工	<p>Installs, tests, maintenances and repairs electrical installations in fuel gas production plants.</p> <p>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。</p>
372	Gas Distribution Fitter (LPG) 氣體燃料輸送技工(石油氣)	<p>Installs, commissions, tests and services LPG distribution systems including storage and piping before meter point.</p> <p>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。</p>

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued) 技工 (續)		
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。
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。
377	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 for gas production plant and delivery system. 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，用於氣體燃料製造廠房及輸送系統。

Code 編號	Job Title 職稱	Job Description 工作說明
SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人		
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。

Extract from the Chief Executive's 2007 Policy Address
Undertaking 10 Major Infrastructure Projects for Economic Growth

18. Infrastructure development can bring about huge economic benefits. Both employment opportunities and wages will increase during the construction stage, and, upon completion, the infrastructure projects will boost economic activities and improve the living environment.

19. The recently established Development Bureau in the reorganised Government Secretariat will co-ordinate major infrastructure projects.

20. A rough estimate of the added value to our economy brought about by these projects, from commissioning to a mature stage, would be more than \$100 billion annually, amounting to some 7% of our GDP in 2006. In addition, some 250 000 additional jobs would be created. Details of the projects are:

Transport Infrastructure

- (1) **South Island Line:** Construction of the seven-kilometre mass transit railway line to Southern District will start in 2011 and cost more than \$7 billion. The South Island Line will be commissioned no later than 2015.
- (2) **The Sha Tin to Central Link:** The link will connect the Northeast New Territories and Hong Kong Island via East Kowloon. A detailed plan will be ready for public consultation early 2008. Construction work is expected to start in 2010.
- (3) **The Tuen Mun Western Bypass and Tuen Mun-Chek Lap Kok Link:** The plan is to develop the Tuen Mun Western Bypass and the Tuen Mun-Chek Lap Kok Link at a cost of over \$20 billion with completion in 2016.

Cross-boundary Infrastructure Projects

- (4) **The Guangzhou-Shenzhen-Hong Kong Express Rail Link:** The target is to complete the planning and design processes within next year, so that construction will commence in 2009.
- (5) **Hong Kong-Zhuhai-Macao Bridge:** Have completed the engineering feasibility studies for over 20 project items and commenced the site selection study in Hong Kong. Aiming to complete the financial arrangements in the near future and discuss specific investment and financing arrangements by the three governments at the next stage.

- (6) **Hong Kong-Shenzhen Airport Co-operation:** A rail link can forge even closer ties between the two airports. The two governments will form a joint task force. The Airport Authority will provide research support to the task force. We hope that specific work plans can be drawn up early next year.
- (7) **Hong Kong-Shenzhen Joint Development of the Lok Ma Chau Loop:** A high-level co-ordinating mechanism will be established to explore the feasibility of developing the Lok Ma Chau Loop and steer further research and planning work on other cross-boundary issues.

New Urban Development Areas

- (8) **West Kowloon Cultural District (WKCD):** A public engagement exercise has been launched. Initial assessment shows general and positive public support for the early development of WKCD. The Government will introduce the bill on establishing the WKCD Authority in early 2008. The aim is to have the legislation enacted in mid-2008 so that the Authority can be set up as soon as possible.
- (9) **Kai Tak Development Plan:** Statutory procedures to amend the Kai Tak Outline Zoning Plan are almost finished, after which the project will enter the implementation stage. The first berth is expected to be operational in 2012.
- (10) **New Development Areas (NDAs):** The scope of NDAs will be smaller, less than one fourth of that of the existing new towns such as Tuen Mun and Sha Tin. The NDAs will provide land for various uses such as housing, employment, high value-added and non-polluting industries. The planning and engineering studies on NDAs at Kwu Tung North, Fanling North, Ping Che and Ta Kwu Ling and Hung Shui Kiu will be revived.

2007年施政報告摘錄
十大建設 繁榮經濟

18. 基建會帶來巨大經濟效益，動工期間會增加就業機會及工資，完工後則會促進經濟活動，改善市民生活環境。

19. 最近成立的發展局將負責統籌各項重大基建工程。

20. 粗略估計，當這些項目完成、投入運作至成熟階段，可以每年為香港經濟創造1,000億元的增加值，大概相等於2006年本地生產總值的7%，同時可以為我們創造額外25萬個職位，以下是十項基建項目具體內容：

交通基建

- (1) **南港島線**：這條七里長的鐵路線造價超過70億元，將在2011年動工，不遲於2015年投入服務。
- (2) **沙田至中環線**：沙中線會經東九龍貫通新界東北部和港島，政府將於2008年初制定詳細計劃，諮詢市民，期望於2010年開始施工。
- (3) **屯門西繞道及屯門至赤鱗角連接路**：計劃興建屯門西繞道及屯門至赤鱗角連接路，造價超過200億元，預計於2016年竣工。

跨界基建

- (4) **廣深港高速鐵路**：目標是在明年完成規劃和設計程序，並於2009年動工。
- (5) **港珠澳大橋**：工程可行性研究已完成了20多個項目，並已展開本港境內的選址研究。我們的目標是在短期內完成財務安排，讓三地政府在下一步商討具體投資及融資安排。
- (6) **港深空港合作**：興建接駁鐵路可以進一步加強兩個機場之間的聯繫。兩地政府將成立聯合專責小組，香港機場管理局會為專責小組的研究提供支援。我們希望可以在明年年初擬訂具體工作計劃。
- (7) **港深共同開發河套**：建立高層協調機制，研究發展落馬洲河套區的可行性，以及督導其他跨界事宜的研究和規劃工作。

都市新發展區

- (8) **西九龍文化區**：政府公開讓市民參與發表意見，初步估計市民反應正面，普遍認為西九龍文化區應盡快興建。政府將於 2008 年初向立法會提交成立西九管理局的法案，希望法案於年中通過，讓西九管理局能盡快成立。
- (9) **啓德發展計劃**：修訂《啓德分區計劃大綱圖》的法定程序快將完成，其後將進入落實計劃階段，期望首個泊位能於 2012 年啓用。
- (10) **新發展區**：新發展區計劃規模會較小，不及屯門、沙田等傳統新市鎮的四分之一大小。新發展區會提供土地作住屋、就業、高增值及無污染工業等不同用途。我們會恢復進行古洞北、粉嶺北、坪輦和打鼓嶺，以及洪水橋新發展區的規劃及工程研究。