2009 Manpower Survey Report

Electrical And Mechanical Services Industry

機電工程業

2009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

CONTENTS

目錄

LIST OF APPENDICES

附錄表

Executive Summary of the Report on the 2009 Manpower Survey of the Electrical and Mechanical Services Industry

Objective

This survey was conducted in March/April 2009 to collect the latest manpower information of the electrical and mechanical services industry.

Coverage

2. The fieldwork of the manpower survey covered 1 012 establishments which were selected by a stratified random sampling method from a total of 8 909 establishments. These samples employed about 70% 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,

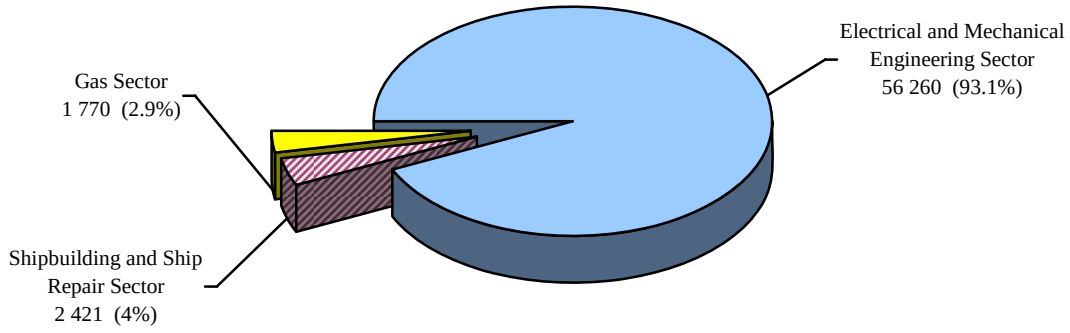
(iii) major trading companies of gas equipment having associated servicing workshops, and

(iv) relevant divisions of government departments and educational institutions.

Survey Findings

3. The Survey revealed that in March/April 2009, there were 60 451 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 60 451 workers, 56 260 workers (93.1%) were employed in the electrical and mechanical engineering sector, 2 421 workers (4.0%) in the shipbuilding and ship repair sector, and 1 770 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 27 141 workers of other disciplines working in the electrical and mechanical services industry in March/April 2009. Among the 27 141 workers, 22 554 workers were employed in the electrical and mechanical engineering sector, 2 644 workers in the shipbuilding and ship repair sector and 1 943 workers in the gas sector. As a whole, the electrical and mechanical services industry employed a total of 87 592 workers in March/April 2009.

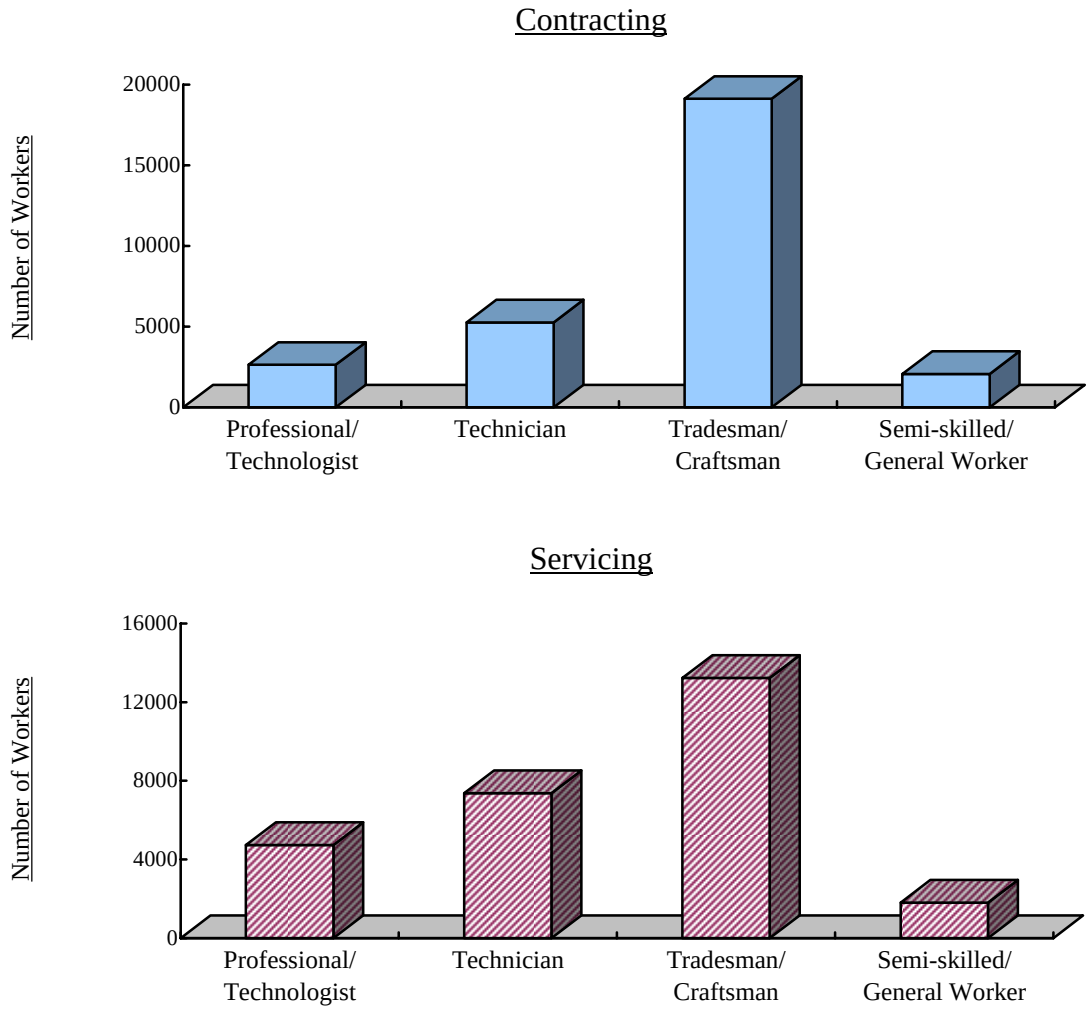
Electrical and Mechanical Engineering Sector

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.

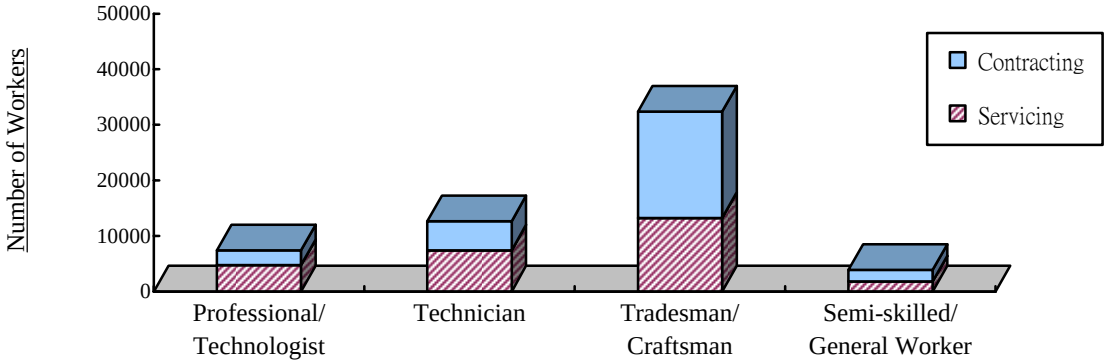
Table 1 Distribution of Workers by Job Level of the Electrical and Mechanical Engineering Sector

Branch	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
Contracting	2 634	5 270	19 130	2 067	29 101
Servicing	4 735	7 379	13 234	1 811	27 159
Sub-total	7 369	12 649	32 364	3 878	56 260
Percentage of total number of workers	13.1%	22.5%	57.5%	6.9%	100%

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



Total



6. Employers in the electrical and mechanical engineering sector reported a total of 1 679 trainees and 963 vacancies, amounting to 3.0% and 1.7% respectively of the total manpower. Besides, employers forecasted that the sector would require a total of 56 655 technical workers by March 2010.

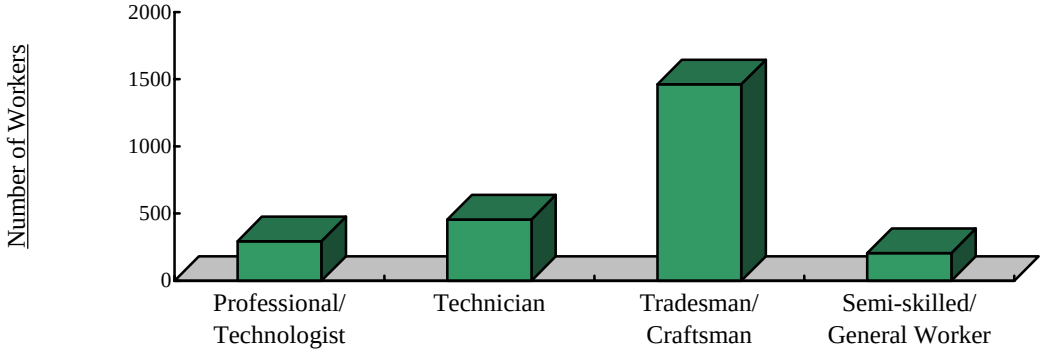
Shipbuilding and Ship Repair Sector

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

	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
	294	457	1 463	207	2 421
Percentage of total number of workers	12.1%	18.9%	60.4%	8.6%	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 72 and 36 respectively which represented 3.0% and 1.5% of the total number of workers. Employers anticipated that by March 2010, the number of technical workers would be 2 475.

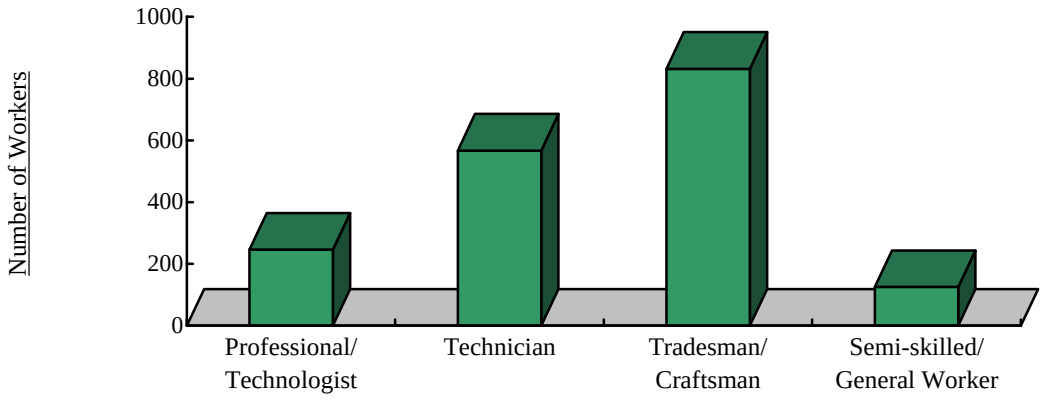
Gas Sector

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

	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
	246	567	832	125	1 770
Percentage of total number of workers	13.9%	32.0%	47.0%	7.1%	100%

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



10. In March/April 2009, there were 35 trainees and only 8 vacancies in the gas sector, representing 2.0% and 0.5% of the total manpower. Employers forecasted that the total workforce by March 2010 would be 1 764.

Projected Manpower Training Requirements

Electrical and Mechanical Engineering Sector

11. The survey findings showed a slight increase of 0.6% per annum in the overall technical manpower of electrical/mechanical engineering and related disciplines from year 2007 to 2009. By skill level, the average change per annum was 6.4% increase in professional/technologist, 2.0% increase in technician, 1.6% decrease in tradesman/craftsman and 5.9% increase in semi-skilled/general worker.

12. Although the Government is speeding up the major infrastructure and non-residential projects, the Training Board anticipates that the demand for E & M workers in contracting branch will remain steady as most job opportunities for E & M workers will come after the projects reach their construction peaks. In servicing branch, along with the gradual recovery of Hong Kong's economy, the Training Board anticipates that there will be steady additional demand for servicing and maintenance workers. 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 2010 to 2012 as shown in Table 4.

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

Skill Level	No. of Workers at the Date of Survey	Projected Average Annual Training Requirements 2010 – 2012
Professional/Technologist	7 369	254 – 311
Technician	12 649	437 – 537
Tradesman/Craftsman	32 364	1 116 – 1 364

Shipbuilding and Ship Repair Sector

13. The survey revealed that from year 2007 to 2009, the overall technical manpower of this sector had a slight decrease of 1.4% per annum. The average change per annum by skill level was 2.3% increase in professional/technologist, 4.6% decrease in technician, 2.1% decrease in tradesman/craftsman and 7.5% 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 2010 to 2012 as shown in Table 5.

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

Skill Level	No. of Workers at the Date of Survey	Projected Average Annual Training Requirements 2010 – 2012
Professional/Technologist	294	12 – 15
Technician	457	19 – 23
Tradesman/Craftsman	1 463	61 – 74

Gas Sector

15. There is no significant change in the overall manpower of the gas sector in the past two years. By skill level, the average change per annum was 1.2% decrease in professional/technologist, 0.7% decrease in technician, 0.2% increase in tradesman/craftsman and 8.1% increase 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 2010 to 2012 as shown in Table 6.

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

Skill Level	No. of Workers at the Date of Survey	Projected Average Annual Training Requirements 2010 – 2012
Professional/Technologist	246	7 – 8
Technician	567	16 – 19
Tradesman/Craftsman	832	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 projected manpower demand of professionals / technologists in the E & M engineering and gas sectors will be slightly higher than the supply from local graduates. However, overseas graduates and technicians upgraded through part-time degree programmes will compensate the inadequacy.

(ii) the demand of professionals/technologists in the shipbuilding and ship repair sector is small and can be matched by the graduates of mechanical engineering degree programmes.

(b) Training of Technicians:

(i) the projected figures of technician graduate output will meet the market demand of technician manpower in the E & M engineering sector and the gas sector in the coming few years;

(ii) Graduate output from the E & M engineering technician courses will match with the demand for technicians in the shipbuilding and ship repair sector.

(c) Training of Tradesmen/Craftsmen:

(i) the projected demand of tradesmen/craftsmen the E & M engineering sector and the shipbuilding & ship repair sector will be higher than that of projected supply of tradesmen / craftsmen from craft courses in the coming years. Training capacities of pre-employment training courses should be increased and more upgrading training opportunities should be offered to in-service semi-skilled workers to advance as tradesmen/craftsmen.

(ii) the projected training requirement of tradesmen/craftsmen in the gas sector meets the projected supply in the coming years

(d) The projected training requirements represent the training demand of the electrical and mechanical services industry in terms of quantity only. Training providers should consider enrolment and employment/placement results when planning training capacity.

(e) With the establishment of Qualifications Framework (QF) for the E & M industry, it is believed that it will definitely benefit the industry by providing well-defined standards of qualifications and clear indication of the articulation ladders for both employers and employees. The QF enables employees to set clear goals and map out their own progression pathway for lifelong learning.

(e) Trade Tests and Intermediate Trade Tests – employees should be encouraged to take the trade tests/intermediate trade tests in order to be recognized by the Government.

(f) Registration of Construction Workers – E & M workers working in construction site should be encouraged by employers to register as qualified workers under the Construction Workers Registration Ordinance.

機電工程業
2009年人力調查報告摘要

目的

調查於2009年3／4月間進行，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8 909間機構選出1 012間作爲調查對象，僱員數目約佔從業員總數的70%，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

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

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；

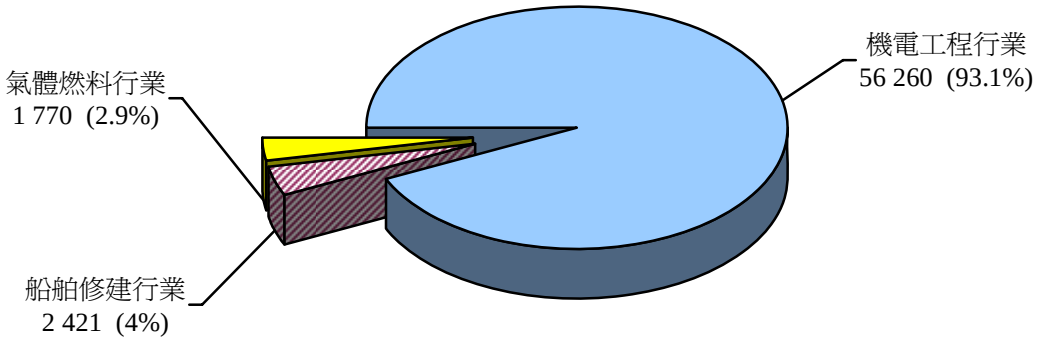
(iii) 經營氣體燃料設備，並設有維修服務工場的主要貿易機構；及

(iv) 有關政府部門及教育機構。

調查結果摘要

3. 是次調查顯示，於2009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60 451人，其中56 260人（93.1%）屬機電工程行業，2 421人（4.0%）屬船舶修建行業，1 770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，2009年3／4月時，業內從事其他職務的僱員共有27 141人，其中22 554人受僱於機電工程行業，2 644人受僱於船舶修建行業，1 943人受僱於氣體燃料行業。整體而言，於2009年3／4月時，機電工程業僱員總數爲87 592人。

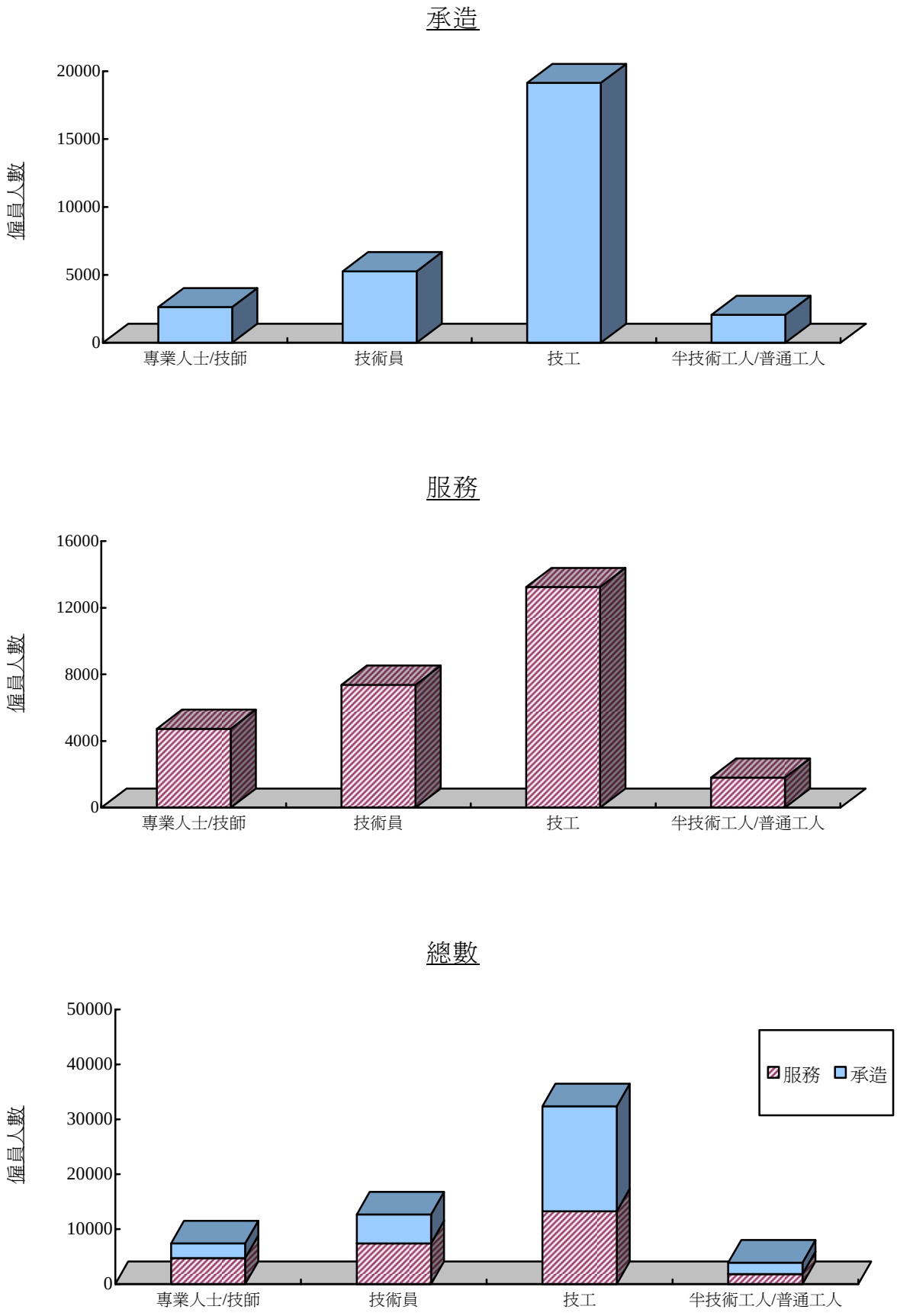
機電工程行業

5.　　機電工程行業兩個門類各技能等級僱員分布情況如下：

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	2 634	5 270	19 130	2 067	29 101
服務	4 735	7 379	13 234	1 811	27 159
小計	7 369	12 649	32 364	3 878	56 260
佔僱員總數百分率	13.1%	22.5%	57.5%	6.9%	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1 679名及空缺963個，分別佔行業僱員總數的3.0% 及1.7% 。此外，僱主預測至2010年3月時，機電工程行業將需各技能等級僱員56 655人。

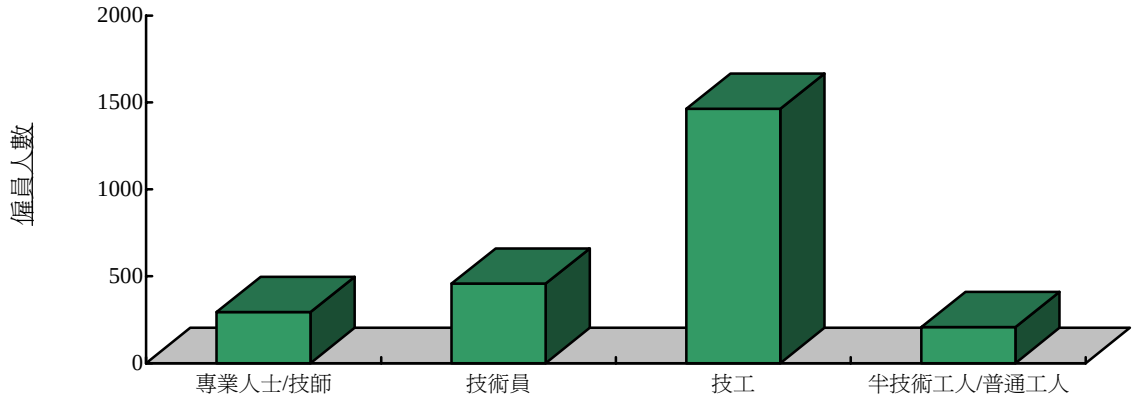
船舶修建行業

7. 船舶修建行業各技能等級機電僱員的分布情況如下：

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
	294	457	1 463	207	2 421
佔僱員總數百分率	12.1%	18.9%	60.4%	8.6%	100%

圖 3 船舶修建行業各技能等級機電僱員的分布情況



8. 僱主填報，船舶修建行業有受訓者72名及空缺36個，分別佔行業僱員總數的3.0% 及1.5% 。此外，僱主預測至2010年3月時，業內將需各技能等級僱員2 475人。

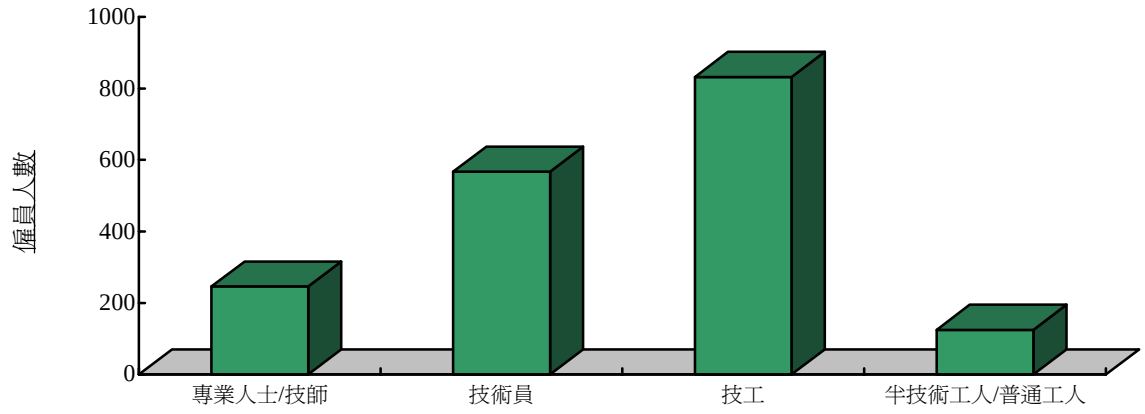
氣體燃料行業

9. 氣體燃料行業各技能等級機電僱員的分布情況如下：

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
	246	567	832	125	1 770
佔僱員總數百分率	13.9%	32.0%	47.0%	7.1%	100%

圖 4 氣體燃料行業各技能等級機電僱員的分布情況



10. 僱主填報，氣體燃料行業有受訓者35名及空缺8個，分別佔行業僱員總數的2.0% 及0.5% 。此外，僱主預測至2010年3月時，業內將需各技能等級僱員1 764人。

預測未來人力訓練需求

機電工程行業

11. 調查顯示，2007至2009年間，機電工程及有關行業的整體技術人力平均每年微增0.6%。按技能等級劃分，專業人士／技師級、技術員級及半技術工人／普通工人級分別平均每年增加人力6.4%， 2.0%及5.9%，技工級人力則減少1.6%。

12. 雖然政府加快落實多項基建工程及非住宅項目，但因有關項目進入建築高峰期後才需僱用機電工程人員，本會預期承造門類的機電工程人力需求將保持平穩。至於服務門類，隨著本地經濟漸漸復甦，本會預期機電服務及維修人員的需求將穩步增加。本會根據以往及是次調查所得資料，計算2010至2012年機電工程行業各技能等級機電人員的預測每年訓練需求如下：

表 4 預測機電工程行業每年的機電人力訓練需求

技能等級	調查時的僱員人數	2010至2012年平均每年訓練需求
專業人士／技師	7 369	254 – 311
技術員	12 649	437 – 537
技工	32 364	1 116 – 1 364

船舶修建行業

13. 調查顯示，於2007至2009年間，船舶修建行業整體技術人力微降1.4%。各技能等級平均每年的人力變化如下：專業人士／技師增加2.3%，技術員減少4.6%，技工減少2.1% ，半技術工人／普通工人增加7.5%。

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，本會預測2010至2012年船舶修建行業對機電人力的訓練需求如下：

表 5 預測船舶修建行業每年的機電人力訓練需求

技能等級	調查時的僱員人數	2010至2012年平均每年訓練需求
專業人士／技師	294	12 – 15
技術員	457	19 – 23
技工	1 463	61 – 74

氣體燃料行業

15. 調查顯示，於2007至2009年間，氣體燃料行業整體人力變化不大。各技能等級平均每年的人力變化如下：專業人士／技師減少1.2%，技術員減少0.7%，技工增加0.2%，半技術工人／普通工人增加8.1%。

16. 本會預計，這個行業在未來數年對技術人力的需求將維持穩定，2010至2012年的訓練需求如下：

表 6 預測氣體燃料行業每年的機電人力訓練需求

技能等級	調查時的僱員人數	2010至2012年平均每年訓練需求
專業人士／技師	246	7 – 8
技術員	567	16 – 19
技工	832	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，業界可聘用海外畢業生，加上技術員可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人數，將可應付市場需求；

(ii) 機電工程技術員課程的畢業生人數，足以應付船舶修建行業的需求。

(c) 技工訓練：

(i) 未來幾年，預計技工課程畢業生的供應將不能滿足機電工程及船舶修建行業的需求；本會建議增加技工級職前訓練課程的學額，開辦更多訓練課程，提升在職半技術工人取得認可資歷，成爲合格技工。

(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) 機電業設立資歷架構後，可爲業界訂立明確的資歷標準，清楚展示升學階梯，爲僱員及僱主提供參考，業界整體均會受惠。僱員可據此訂立明確目標及進修途徑，持續終身學習。

(f) 技能測驗及中級工藝測試 —僱主應鼓勵僱員參加技能測驗及中級工藝測試，以取得政府認可資格。

(g) 建造業工人註冊－僱主應鼓勵地盤機電工人根據《建造業工人註冊條例》的規定註冊。

SECTION 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 2009 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 2010;

(iii) the number of vacancies at the time of the survey;

(iv) the number of employees under training;

(v) employers' forecast of the number of employees under training by March 2010; and

(vi) 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 8 909 establishments, including 8 419 establishments in the electrical and mechanical engineering sector, 305 in the shipbuilding and ship repair sector, and 185 in the gas sector. Of these 8 909 establishments, 8 812 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 915 samples out of the 8 909 establishments in the HSICs. Together with 97 selected organisations, a total of 1 012 establishments were covered and about 69.6% 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, 15C and 15D) 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 Relevant employers and trade associations were requested to publicize the survey among their members.

Survey Response

1.11 Of the 1 012 establishments, 801 supplied the information and 17 refused to do so. The remaining 194 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 2009 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 October 2009 for public access.

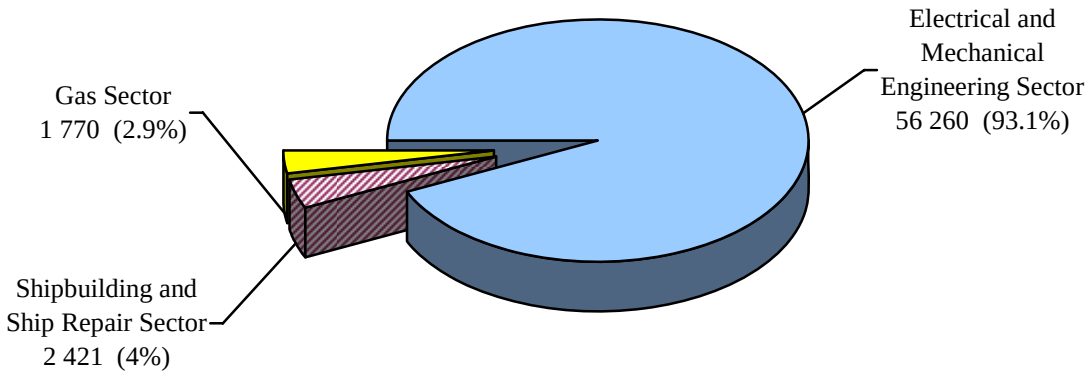
SECTION II

SUMMARY OF SURVEY FINDINGS

Number of Workers Employed

2.1 The survey revealed that in March/April 2009, a total of 60 451 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 60 451 workers, 56 260 workers (93.1%) were employed in the electrical and mechanical engineering sector, 2 421workers (4%) in the shipbuilding and ship repair sector, and 1 770 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 27 141 workers of other disciplines working in the electrical and mechanical services industry in March/April 2009. Among the 27 141 workers, 22 554 workers were employed in the electrical and mechanical engineering sector, 2 644 workers in the shipbuilding and ship repair sector and 1 943 workers in the gas sector.

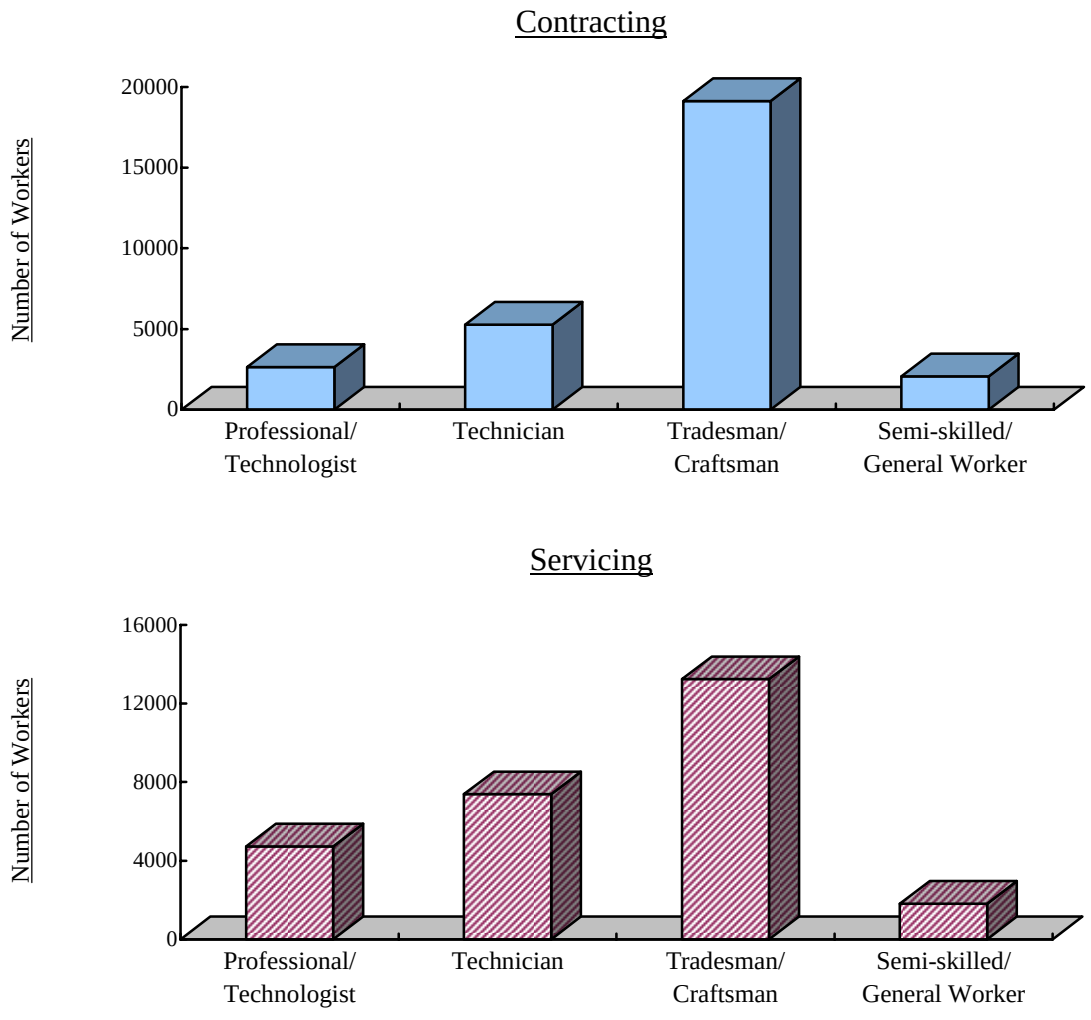
Electrical and Mechanical Engineering Sector

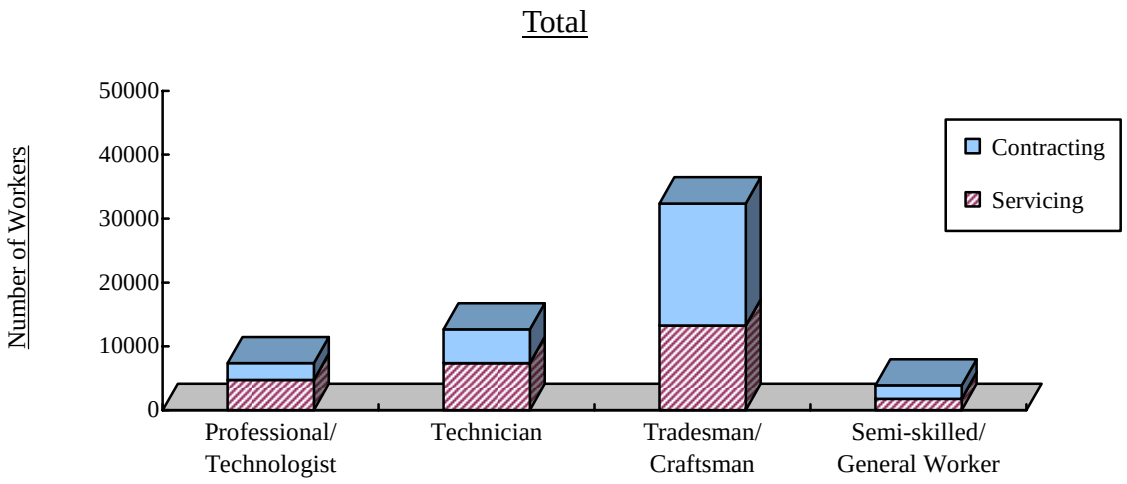
2.3 The distribution of workers according to job level in the two branches of the electrical and mechanical engineering sector is shown in Table 2.1 and Figure 2.2.

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

Branch	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
Contracting	2 634	5 270	19 130	2 067	29 101
Servicing	4 735	7 379	13 234	1 811	27 159
Sub-total	7 369	12 649	32 364	3 878	56 260
Percentage of total number of workers	13.1%	22.5%	57.5%	6.9%	100%

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





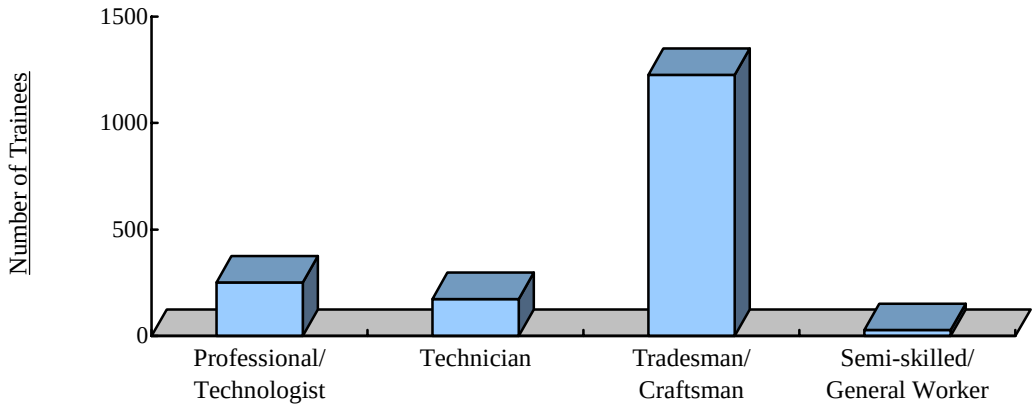
2.4 The manpower statistics of the whole electrical and mechanical engineering sector are tabulated in Appendix 3 while that of its contracting and servicing branches are in Appendices 5 and 6 respectively.

2.5 At the time of the survey, there were 1 679 trainees under various forms of training in the electrical and mechanical engineering sector, representing 3.0% of the total workforce. Their distribution by job level is shown in Table 2.2 and Figure 2.3.

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

Job Level	Number of Workers Employed	Number of Trainees	Percentage of Workers at the Same Level
Professional/Technologist	7 369	251	3.4%
Technician	12 649	174	1.4%
Tradesman/Craftsman	32 364	1 226	3.8%
Semi-skilled/General Worker	3 878	28	0.7%
Total	56 260	1 679	3.0%

Figure 2.3 Distribution of Trainees by Job Level of the Electrical and Mechanical Engineering Sector

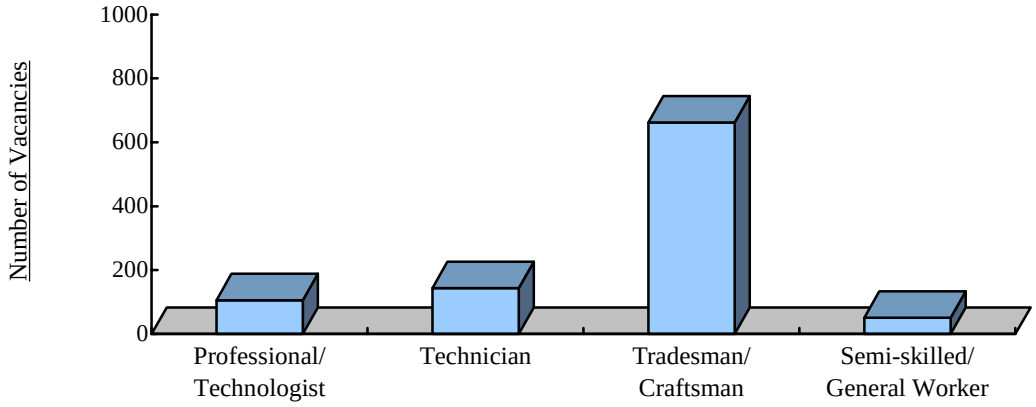


2.6 Employers reported a total of 963 vacancies, representing about 1.7% of the total manpower of the electrical and mechanical engineering sector. The distribution of the vacancies by job level is shown in Table 2.3.

Table 2.3 Distribution of Vacancies by Job Level of the Electrical and Mechanical Engineering Sector

Job Level	Number of Workers Employed	Number of Vacancies	Percentage of Workers at the Same Level
Professional/Technologist	7 369	106	1.4%
Technician	12 649	144	1.1%
Tradesman/Craftsman	32 364	662	2.0%
Semi-skilled/General Worker	3 878	51	1.3%
Total	56 260	963	1.7%

Figure 2.4 Distribution of Vacancies by Job Level of the Electrical and Mechanical Engineering Sector

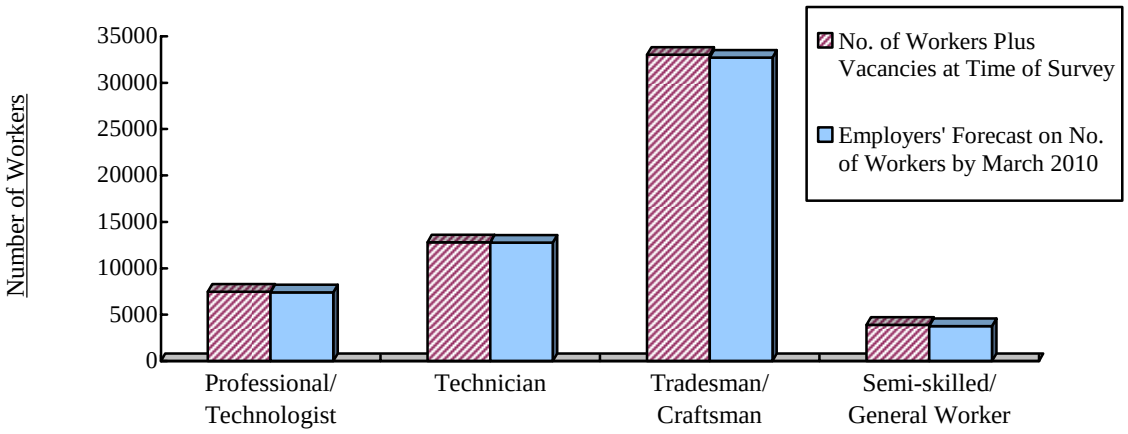


2.7 Employers forecasted a total of 56 655 E & M workers by March 2010 in the electrical and mechanical engineering sector, indicating a view of a marginal forecasted annual drop of 1%. Their distribution by job level is shown in Table 2.4.

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

Job Level	Number of Workers Plus Vacancies at Time of Survey	Employers' Forecast on Number of Workers by March 2010
Professional/Technologist	7 475	7 408
Technician	12 793	12 774
Tradesman/Craftsman	33 026	32 713
Semi-skilled/General Worker	3 929	3 760
Total	57 223	56 655

Figure 2.5 Distribution of Forecasted Number of Workers by Job Level of the Electrical and Mechanical Engineering Sector



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 2010 at each principal job of the electrical and mechanical engineering sector are given in Appendix 3.

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

Table 2.5 Average Income of Workers of the Electrical and Mechanical Engineering Sector

Monthly Average Income Range	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	All
Under $6 000	-	-	31	189	220
$6 001 - $9 000	-	36	2 917	1 471	4 424
$9 001 - $12 000	28	609	13 091	2 159	15 887
$12 001 - $15 000	82	2 452	11 179	31	13 744
$15 001 - $18 000	366	3 283	3 791	-	7 440
$18 001 - $25 000	1 214	4 275	686	-	6 175
$25 001 - $35 000	2 413	1 284	21	-	3 718
Over $35 000	1 765	218	-	-	1 983
Unspecified	1 501	492	648	28	2 669
Total	7 369	12 649	32 364	3 878	56 260

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.

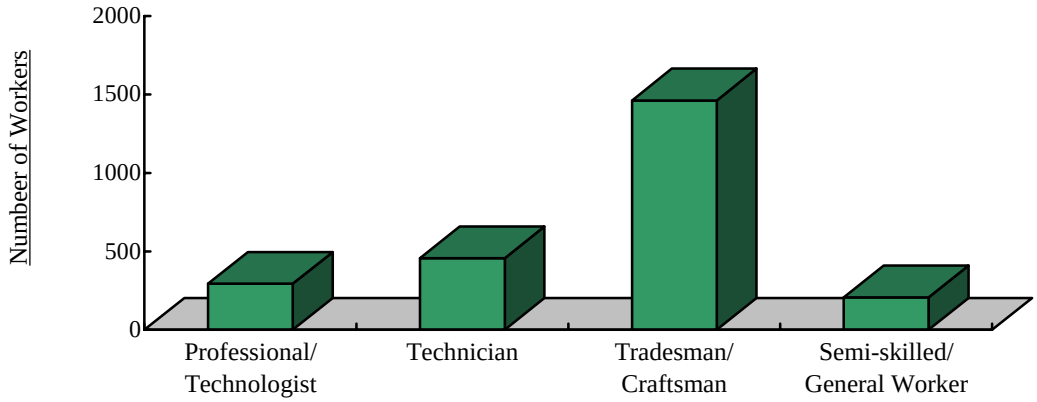
Shipbuilding and Ship Repair Sector

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 2.6.

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

	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
	294	457	1 463	207	2 421
Percentage of total number of workers	12.1%	18.9%	60.4%	8.6%	100%

Figure 2.6 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 72 trainees under various forms of training in the shipbuilding and ship repair sector, representing 3.0% 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

Job Level	Number of Workers Employed	Number of Trainees	Percentage of Workers at the Same Level
Professional/Technologist	294	3	1.0%
Technician	457	2	0.43%
Tradesman/Craftsman	1 463	67	4.6%
Semi-skilled/General Worker	207	-	-
Total	2 421	72	3.0%

2.13 Employers reported a total of 36 vacancies, representing about 1.5% 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

Job Level	Number of Workers Employed	Number of Vacancies	Percentage of Workers at the Same Level
Professional/Technologist	294	1	0.3%
Technician	457	9	2.0%
Tradesman/Craftsman	1 463	22	1.5%
Semi-skilled/General Worker	207	4	1.9%
Total	2 421	36	1.5%

2.14 Employers forecasted a total of 2 475 E & M workers by March 2010 in the shipbuilding and ship repair sector, indicating a view of a marginal forecasted annual growth of 0.7%. 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

Job Level	Number of Workers Plus Vacancies at Time of Survey	Employers' Forecast on Number of Workers by March 2010
Professional/Technologist	295	295
Technician	466	467
Tradesman/Craftsman	1 485	1 502
Semi-skilled/General Worker	211	211
Total	2 457	2 475

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 2010 at each principal job of the shipbuilding and ship repair sector are given in Appendix 8.

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

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

Monthly Average Income Range	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	All
Under $6 000	-	5	5	21	31
$6 001 - $9 000	-	-	67	59	126
$9 001 - $12 000	-	32	446	122	600
$12 001 - $15 000	-	139	828	-	967
$15 001 - $18 000	13	90	52	-	155
$18 001 - $25 000	36	189	35	-	260
$25 001 - $35 000	86	1	-	-	87
Over $35 000	155	-	-	-	155
Unspecified	4	1	30	5	40
Total	294	457	1 463	207	2 421

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.

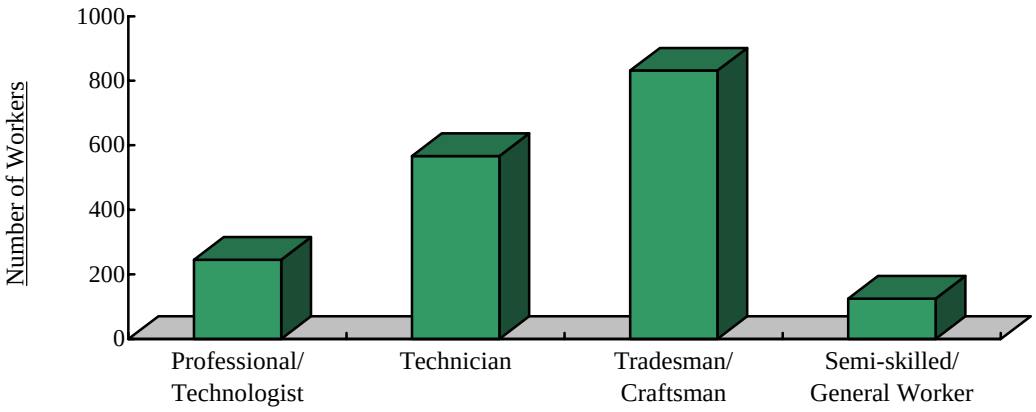
Gas Sector

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 2.7.

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

	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
	246	567	832	125	1 770
Percentage of total number of workers	13.9%	32.0%	47%	7.1%	100%

Figure 2.7 Distribution of E & M Workers by Job Level of the Gas Sector



2.19 At the time of the survey, there were 35 trainees under various forms of training in the gas sector, representing 2.0% 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

Job Level	Number of Workers Employed	Number of Trainees	Percentage of Workers at the Same Level
Professional/Technologist	246	-	-
Technician	567	-	-
Tradesman/Craftsman	832	35	4.2%
Semi-skilled/General Worker	125	-	-
Total	1 770	35	2.0%

2.20 Employers reported 8 vacancies at the time of the survey, representing about 0.5% 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

Job Level	Number of Workers Employed	Number of Vacancies	Percentage of Workers at the Same Level
Professional/Technologist	246	-	-
Technician	567	6	1.1%
Tradesman/Craftsman	832	-	-
Semi-skilled/General Worker	125	2	1.6%
Total	1 770	8	0.5%

2.21 Employers forecasted a total E & M workforce of 1 764 by March 2010 in the gas sector, indicating a view of a marginal forecasted annual drop of 0.8%. 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

Job Level	Number of Workers Plus Vacancies at Time of Survey	Employers' Forecast on Number of Workers by March 2008
Professional/Technologist	246	247
Technician	573	567
Tradesman/Craftsman	832	828
Semi-skilled/General Worker	127	122
Total	1 778	1 764

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 2010 at each principal job of the gas sector are given in Appendix 10.

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

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

Monthly Average Income Range	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	All
Under $6 000	-	-	-	1	1
$6 001 - $9 000	-	-	80	46	126
$9 001 - $12 000	-	20	354	78	452
$12 001 - $15 000	-	375	343	-	718
$15 001 - $18 000	43	63	40	-	146
$18 001 - $25 000	7	75	10	-	92
$25 001 - $35 000	172	34	-	-	206
Over $35 000	24	-	-	-	24
Unspecified	-	-	5	-	5
Total	246	567	832	125	1 770

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 sixth supplementary manpower survey in March 2009 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 867 building sites and 421 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 6 466 E & M workers of electrical/mechanical engineering and related disciplines working in the construction sites at the time of the survey. Of the 6 466 workers, 5 809 workers (89.8%) were employed in building sites and 657 workers (10.2%) 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 2009 manpower survey of the electrical and mechanical services industry which was conducted on establishment basis in March/April 2009.

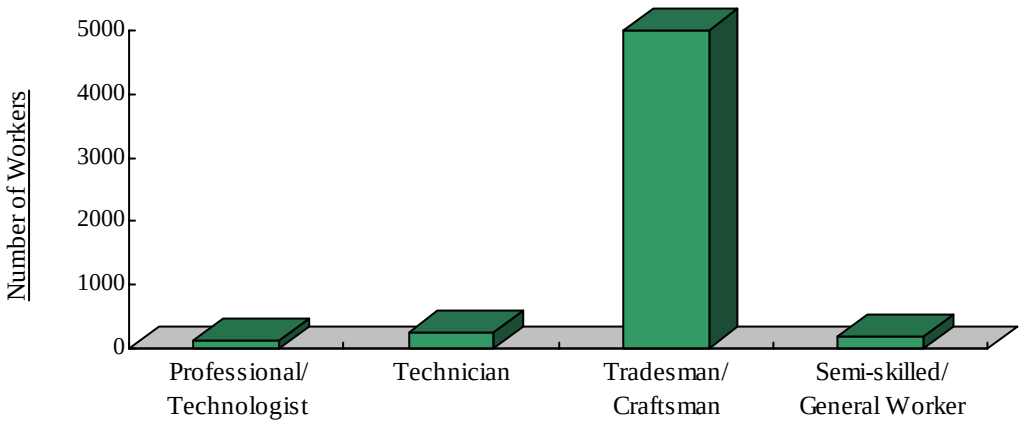
2.27 The distribution of workers by job level is shown in Table 2.16 and Figure 2.8.

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

Job Level	Number of Workers		Percentage of Total Number Employed
Professional/Technologist	114	(72)	1.8%
Technician	259	(164)	4.0%
Tradesman/Craftsman	5 913	(4 216)	91.4%
Semi-skilled/General Worker	180	(34)	2.8%
Total:	6 466	(4 486)	100%

(Figures in brackets are the corresponding data collected in the fifth supplementary manpower survey conducted in March 2007).

Figure 2.8 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 is of the view 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 2009, the electrical and mechanical engineering sector employed a total of 56 260 E & M workers, representing a slight increase of 0.6% per annum when compared with 55 563 E & M workers found in the last survey conducted in March 2007. The distribution and comparison of the workforce by job level and by branch in 2007 and 2009 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

Job Level	Contracting Branch	Servicing Branch	Total	Average Annual Change in %
Professional/Technologist	2 634 (2 272)	4 735 (4 243)	7 369 (6 515)	+6.4%
Technician	5 270 (5 154)	7 379 (7 009)	12 649 (12 163)	+2.0%
Tradesman/Craftsman	19 130 (18 682)	13 234 (14 747)	32 364 (33 429)	-1.6%
Semi-Skilled/General Worker	2 067 (1 772)	1 811 (1 684)	3 878 (3 456)	+5.9%
Total	29 101 (27 880)	27 159 (27 683)	56 260 (55 563)	
Average Annual Change in %	+2.2%	-1.0%	+0.6%	

Note:
Figures in brackets represent the corresponding numbers collected in the 2007 manpower survey.

Manpower Changes of the E & M Engineering Sector

3.3 The survey revealed that there was a slight increase of 0.6% per annum in the overall employment of the electrical and mechanical engineering sector in the past two years. The professional/technologist and technician manpower had increases of 6.7% and 2.0% per annum respectively. On the other hand, the number of tradesmen indicated a decrease of 1.6% per annum. At the semi-skilled worker/general worker level, the number of workers showed an apparent increase of 5.9% per annum.

3.4 The decrease of tradesmen was mainly recorded in the servicing branch. When considering the manpower by trades, it is found that sharp decreases were recorded in refrigeration/air-conditioning/ventilation engineering trades.

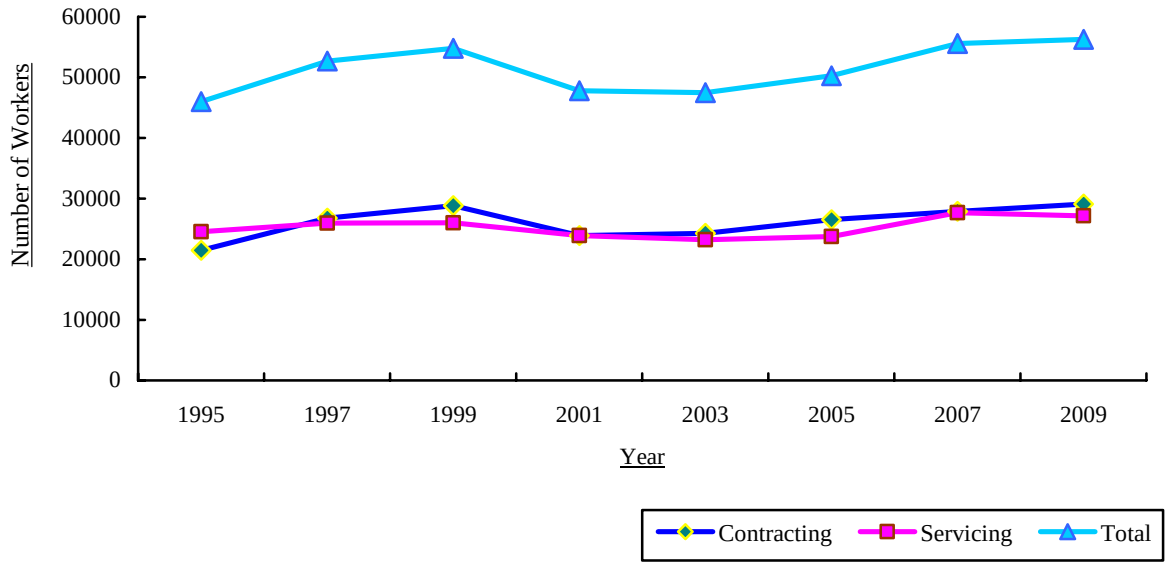
3.5 The manpower changes of the E&M engineering sector from 1995 to 2009 are shown in Table 3.2 and Figure 3.1.

Table 3.2 Manpower Changes of the Electrical and Mechanical Engineering Sector between 1995 and 2009

Year of Survey	Number of Workers Employed		
	Contracting Branch	Servicing Branch	Total
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
2009	29 101	27 159	56 260

* 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 2009



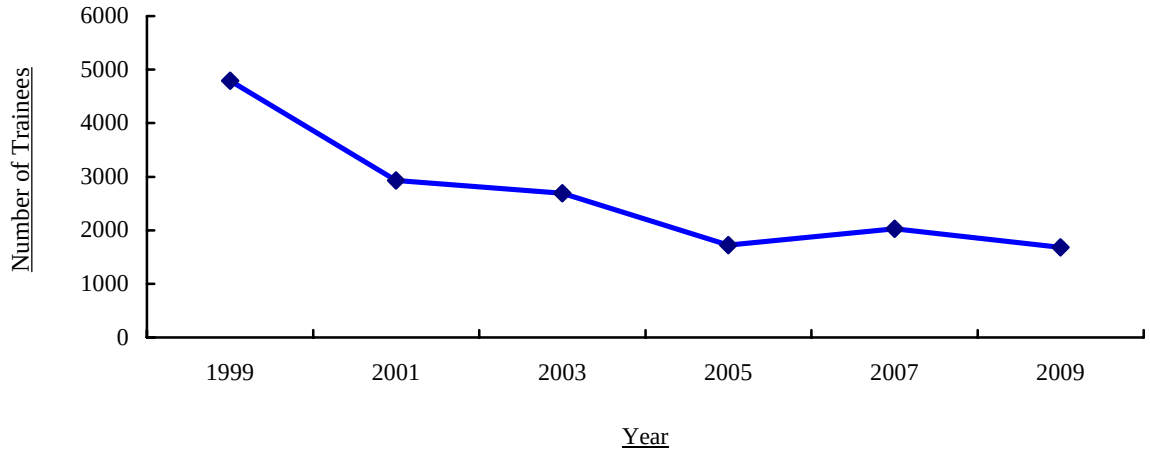
3.6 The manpower employed in the E&M engineering sector had seen its peak and trough in 1999 and 2003 respectively. Following the upturn of the economy of Hong Kong and vicinity regions after 2003, the number of workers rebounded and in the 2007manpower survey had overtaken the peak figure recorded in 1999. The number of workers is still in the rising trend. But the financial tsunami also had its toll on the E&M engineering sector. The rising trend has slowed down and the number of workers had a slight average increase of 0.6% per annum in the pass two years

3.7 The numbers of trainees in the E&M engineering sector surveyed in the manpower surveys since 1999 showed a persistent decline until 2007 when more workers and trainees in mechanical engineering and aircraft engineering services trades were employed to cope with the demand arising from the launch of large scale hangar. The findings from the survey in March/April 2009 showed that the number of trainees is back on to the declining track. The number of trainees had a decreased of 9.0% per annum in the past two years. 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

Year of Survey	Number of Workers Employed	Number of Trainees	Percentage of Workers
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%
2009	56 260	1 679	3.0%

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 efforts spent by the Government to speed up the major infrastructure and non-residential projects may not benefit the E&M workers at the moment. Because planning takes time and in particular job opportunities for E&M workers arising from the construction projects will normally come after the projects reached their construction peaks. The Training Board anticipated that the demand for E&M workers for the construction projects in the next few years will remain steady. More employment opportunities for the E&M workers will come after 2012/2013 when the major infrastructure projects reach their construction peaks.

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. With the gradual recovery of Hong Kong's economy and the subsidizing schemes inclusive of "Operation Building Bright" and "Building Maintenance Grant Scheme for Elderly Owners" introduced by the government to create more job opportunities, the Training Board anticipates that there will be a steady additional demand for servicing and maintenance workers in this branch.

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

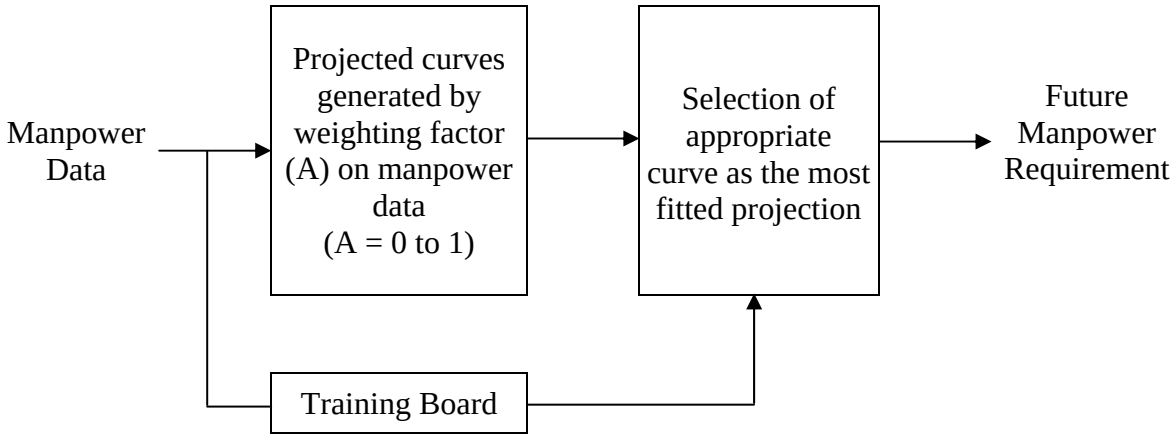
3.10 Comparing with the figures of 2007 manpower survey, the number of vacancies reported by employers at the time of the survey decreased moderately. However employers were generally optimistic on the prospect of the sector as reflected by employers' one-year forecast shown in Table 3.4.

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

Skill Level	No. Employed at the Date of Survey	Reported Vacancies		Employers' One-Year Forecast
		Number	Percentage	Number of Workers by March 2010
Professional/Technologist	7 369	106	1.4%	7 408
Technician	12 649	144	1.1%	12 774
Tradesman/Craftsman	32 364	662	2.0%	32 713
Semi-skilled/General Worker	3 878	51	1.3%	3 760
Total	56 260	963	1.7%	56 655

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 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 for each year 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 modeling 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 and 2007 manpower surveys, 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 2009 manpower survey, with consideration of the uncertainty on the volume of construction projects and external factors similar to the 2005 and 2007 manpower surveys, the Training Board decides to adopt the AFM again for projecting the manpower requirements for year 2010 to 2012.

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 2010 to 2012 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

Level	No. of Workers at the Date of Survey	Projected Average Annual Training Requirements for 2010 - 2012
Professional/Technologist	7 369	254 – 311
Technician	12 649	437 – 537
Tradesman/Craftsman	32 364	1 116 – 1 364

Shipbuilding and Ship Repair Sector

Manpower Changes

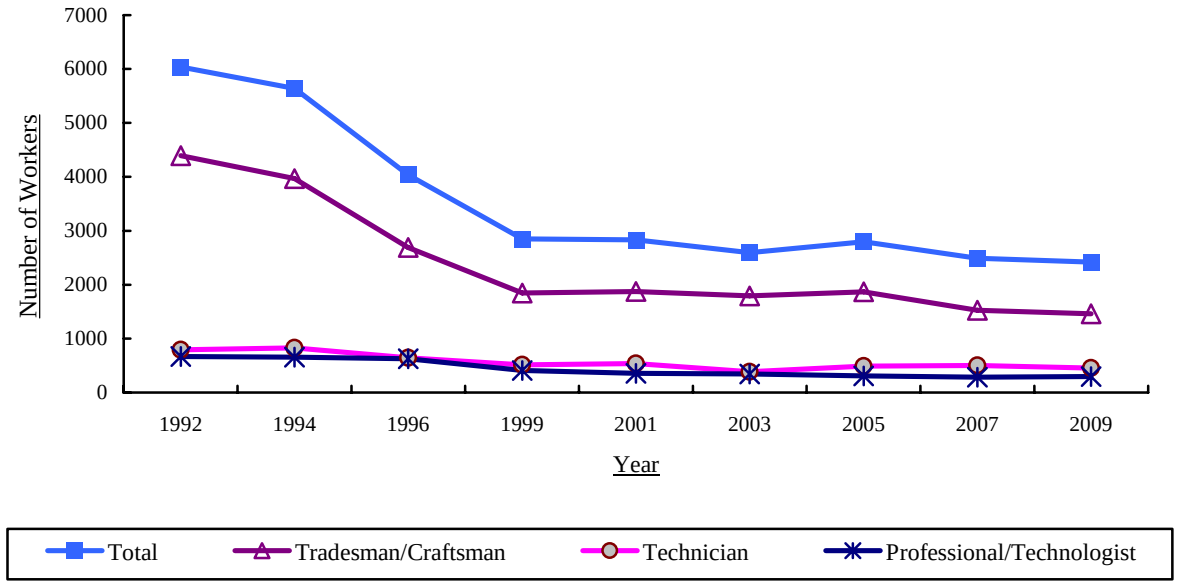
3.18 The manpower changes at professional/technologist, technician and tradesman/craftsman levels of the shipbuilding and ship repair sector from 1992 to 2009 are shown in Table 3.6 and Figure 3.3.

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

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower*
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
2009	294	457	1 463	2 421

* Total manpower figures included manpower at professional/technologist, technician, tradesman/craftsman and semi-skilled/general worker levels.

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 decrease of 1.4% 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 global financial crisis has bitten into the shipbuilding industry. However there is no significant drop in the total capacities of vessels arriving in Hong Kong. The ship repair and maintenance business remained steady. 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 2010-2012.

3.22 With a consideration that the percentages of technical workers of age over 50 collected in 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 2010 to 2012 is shown in Table 3.7.

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

Level	No. of Workers at the Date of Survey	Projected Average Annual Training Requirements for 2010 - 2012
Professional/Technologist	294	12 – 15
Technician	457	19 – 23
Tradesman/Craftsman	1 463	61 – 74

Gas Sector

Manpower Changes

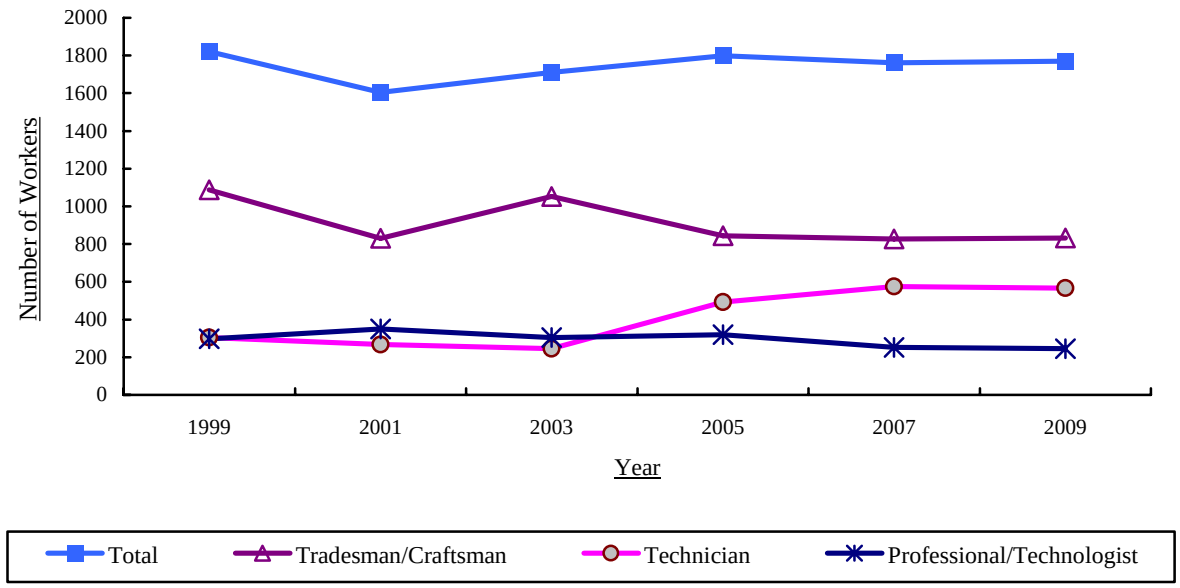
3.24 The manpower changes at the three skill levels of the gas sector from the first survey in 1999 to this survey are shown in Table 3.8 and Figure 3.4.

Table 3.8 E & M Manpower Changes of the Gas Sector

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower*
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
2009	246	567	832	1 770

* Total manpower figures included manpower at professional/technologist, technician, tradesman/craftsman and semi-skilled/general worker levels.

Figure 3.4 E & M Manpower Changes of the Gas Sector



3.25 The figures show that the overall manpower of the gas sector had no significant change in the past two years.

Business Outlook of the Gas Sector

3.26 One major factor affecting the employment opportunities of gas sector workers is the number of residential construction projects. With no sign of rebound on the number of new residential constructions, the Training Board anticipates 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 By merits of steady manpower trend in the overall manpower, the Training Board decides to adopt the 'adaptive filtering method' (AFM) to project the manpower requirements in the gas sector for 2010-2012.

3.28 By considering the findings in previous surveys, 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 2010 to 2012 is shown in Table 3.9.

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

Level	No. of Workers at the Date of Survey	Projected Average Annual Training Requirements for 2010 - 2012
Professional/Technologist	246	7 – 8
Technician	567	16 – 19
Tradesman/Craftsman	832	23 – 28

3.30 The Training Board will conduct another manpower survey in 2011 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 2010 to 2012 will be as follows:

(i) E & M engineering sector: the local economy is gradually recovering from the financial tsunami. Infrastructure projects such as the construction of the Hong Kong-Zhuhai-Macao Bridge, the Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link are in progress. Construction work of MTR West Island Line, advance works for the Kai Tak Cruise Terminal and design of the West Kowloon Cultural District has started. All these projects will stimulate the demand of manpower in building and construction related E & M service trades. In addition, subsidizing schemes introduced by the HKSAR Government will also create more job opportunities. In this regard, the demand for building and construction related E & M workers in the sector is expected to increase steadily in the coming years.

ii) Shipbuilding and ship repair sector: there is no significant drop in the total capacities of vessels arriving in Hong Kong. The ship repair and maintenance business remained steady. The manpower requirements in the sector will remain stable.

(iii) Gas sector: with no sign of rebound on the number of new residential constructions, the demand for technical workers in the 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 3.8% 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

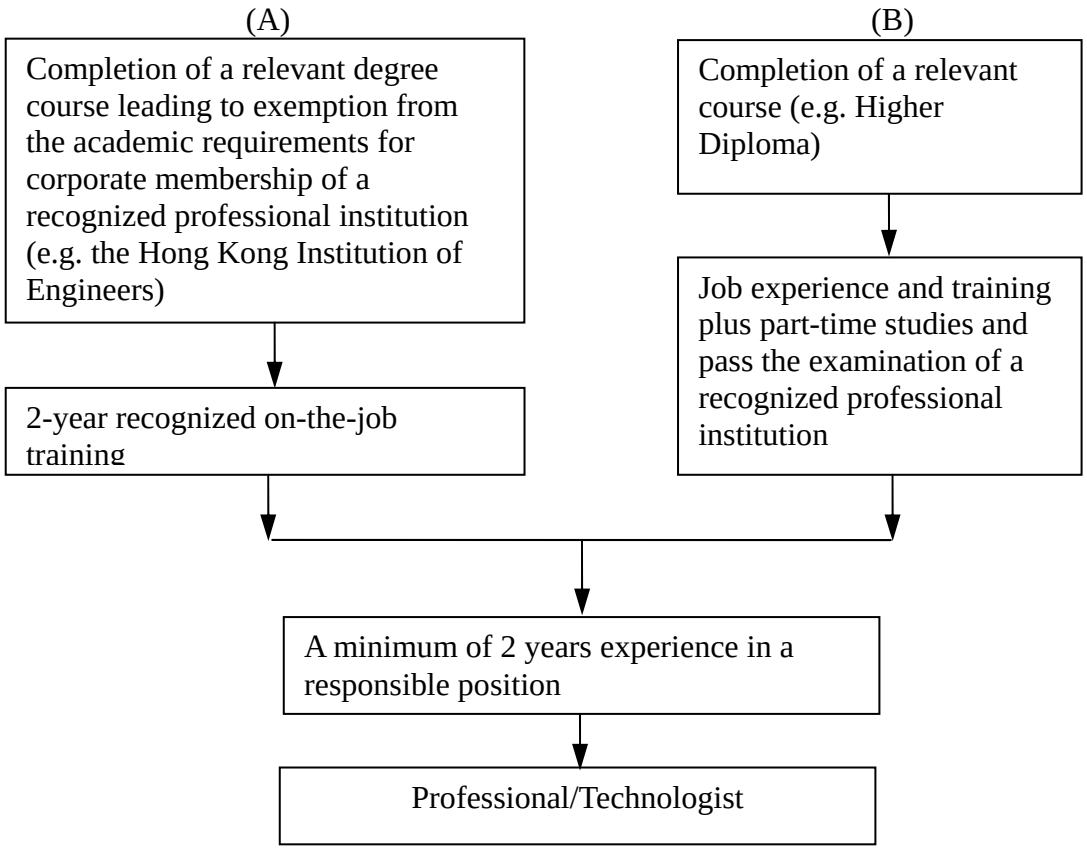
	Professional/Technologist	Technician	Tradesman/Craftsman
E & M Engineering Sector	3.8%	3.9%	3.8%
Shipbuilding and Ship Repair Sector	4.6%	4.6%	4.6%
Gas Sector	3.0%	3.1%	3.1%

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 2010 to 2012 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 2010 to 2012

Job Title	No. Employed at Date of Survey	Projected Average Annual Training Requirement
Building Services Engineer		
(E & M Engineering Sector)	804	28 – 34
(Construction Industry)	1 102	79 – 97
Electrical Engineer		
(E & M Engineering Sector)	2 203	76 – 93
(Gas Sector)	22	1 – 1
(Construction Industry)	318	23 – 28
Engineering Manager	1 104	38 – 46
Fire Services Engineer	355	12 – 15
Lift/Escalator Engineer	237	8 – 10
Mechanical Engineer		
(E & M Engineering Sector)	1 212	42 – 51
(Gas Sector)	62	2 – 2
(Construction Industry)	403	29 – 35
Refrigeration/Air-conditioning/ Ventilation Engineer	584	20 – 25
Plumbing and Drainage Engineer	114	4 – 5
Safety Officer		
(E & M Engineering Sector)	141	5 – 6
(Gas Sector)	9	
Gas Engineer (Gas Sector)	153	4 – 5
	8 823	371 – 453

Table 4.3: Projected No. of Local Universities Graduates from 2009 to 2011 (Degree Courses) for Major Disciplines of E & M Engineering and Gas Sectors
(Sources: University Grants Committee and Graduation)

Institution	Programme	Projected No. of Local Graduates 2009	2010	2011
Full-time Courses				
City University of Hong Kong	B Eng (Building Services Eng)	33	33	34
HK Polytechnic University	B Eng (Electrical Eng)	80	64	61
	B Eng (Building Services Eng)	56	70	62
	B Eng * (Mechanical Eng)	31	33	50
HK University of Science & Technology	B Eng (Mechanical Eng (Building Services))	31	8	10
	B Eng * (Mechanical Eng)	40	38	43
The University of Hong Kong	B Eng (Building Services Eng)	19	19	16
	B Eng (Electrical Eng)	41	14	10
	B Eng * (Mechanical Eng)	51	26	27
	Total	382	305	313

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 overseas graduates and 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 has been 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)

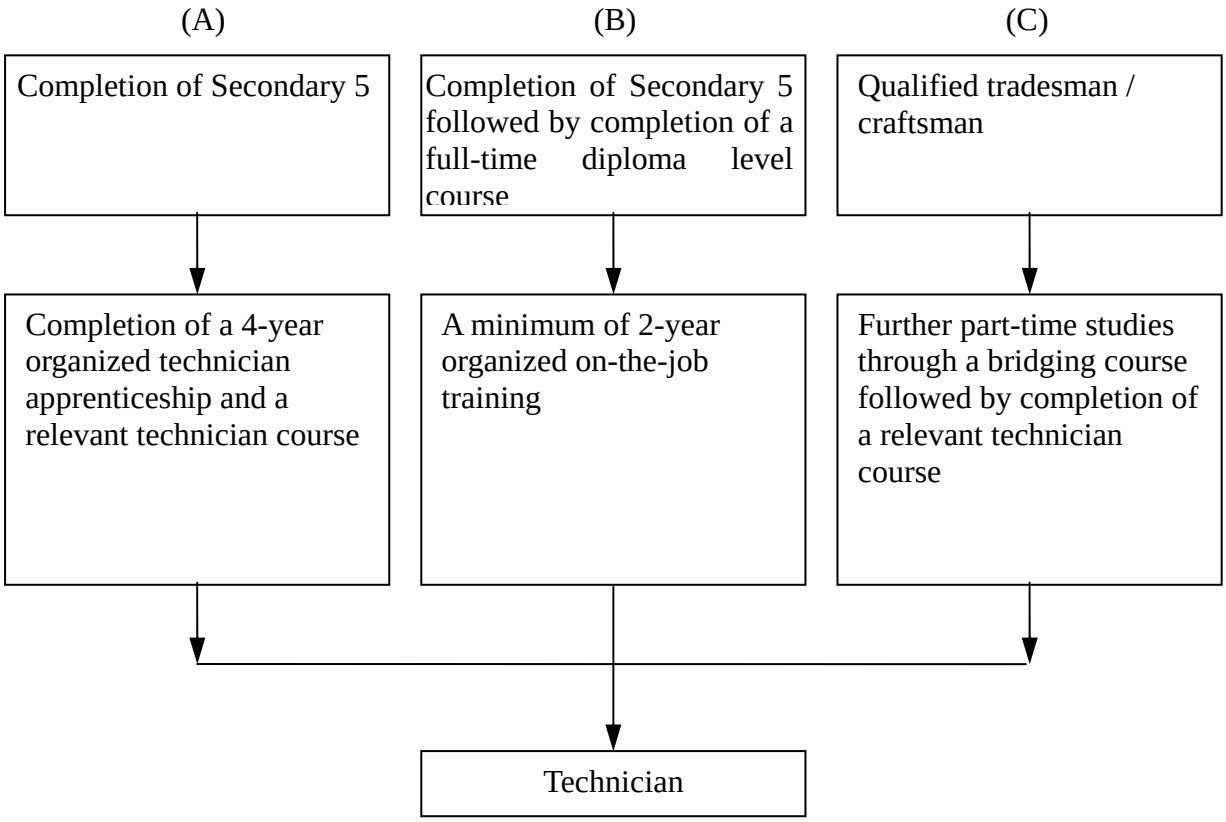
4.9 To bring about more well-structured practical training opportunities for engineering graduates, the Committee on Technologist Training of the Vocational Training Council is operating a subsidy scheme in providing engineering graduates with 18 months of practical training of a standard acceptable 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 courses and part-time day /part-time evening technician level courses in electrical engineering, intelligent building technology, 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 2010 to 2012 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 2010 to 2012

Job Title	No. Employed at Date of Survey	Projected Average Annual Training Requirement
Building Services Technician	1 801	62 – 76
Draughtsman	538	19 – 23
Electrical Engineering Technician		
(E & M Engineering Sector)	1 853	64 – 79
(Gas Sector)	7	
Electrical Instrument & Meter Technician	65	2 – 3
Fire Services Technician	319	11 – 14
Lift/Escalator Technician	688	24 – 29
Mechanical Engineering Technician		
(E & M Engineering Sector)	1 530	53 – 65
(Gas Sector)	67	2 – 2
Refrigeration/Air-conditioning/ Ventilation Technician	926	32 – 39
Supervisor		
(E & M Engineering Sector)	3 151	109 – 134
(Gas Sector)	136	4 – 5
Office Equipment Service Technician	29	1 – 1
Gas Engineering Technician	342	10 – 11
Assistant Safety Officer/Safety Supervisor		
(E & M Engineering Sector)	61	2 – 3
(Gas Sector)	15	0 – 1
	11 528	395 – 485

Table 4.5: Projected Local Supply of Technician Graduates for the E & M Engineering and Gas Sectors from 2009 to 2011
(Sources: University Grants Committee and Graduation, and IVE Course Plan)

Institution	Programme	Projected No. of Graduates 2009	2010	2011
HK Polytechnic University	Higher Diploma (Building Services Eng.)+	29	28	27
	Higher Diploma (Electrical Eng.)+	16	18	14
City University of Hong Kong	Associate Degree (Building Services Eng.)+	38	28	37
IVE (VTC)	Full-time Higher Diploma Courses:			
	- Building Services	72	65	71
	- Electrical Engineering	217	239	215
	- Mechanical Engineering*	68	69	79
	- Facilities Management	25	57	46
	- Aircraft Maintenance	65	65	57
	- E & M Services	32	23	38
	- Energy Management*	31	12	30
	- Intelligent Building Technology and Automation Engineering	33	40	33
	Full-time Sub-total	626	644	647
	PTD Higher Diploma/ Certificate Courses:			
	- Building Services	28	40	40
	- Electrical Engineering	21	56	20
	PTD Sub-total	49	96	60
	Total	675	740	707

Institution	Programme	Projected No. of Graduates 2009	2010	2011
Youth College (VTC)	Full-time Diploma in Vocational Education Programme (Technician Level) △	343	495	495
	- Electrical, Air-Cond. & Refrig., Bldg. Services and Welding Engineering			

Note

+ : 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.

△: Graduates from Diploma in Vocational Education Programme may continue their study in Higher Diploma Courses.

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 greater than the projected training requirement in coming years. However, a considerable proportion of graduates from the higher diploma/associate degree 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

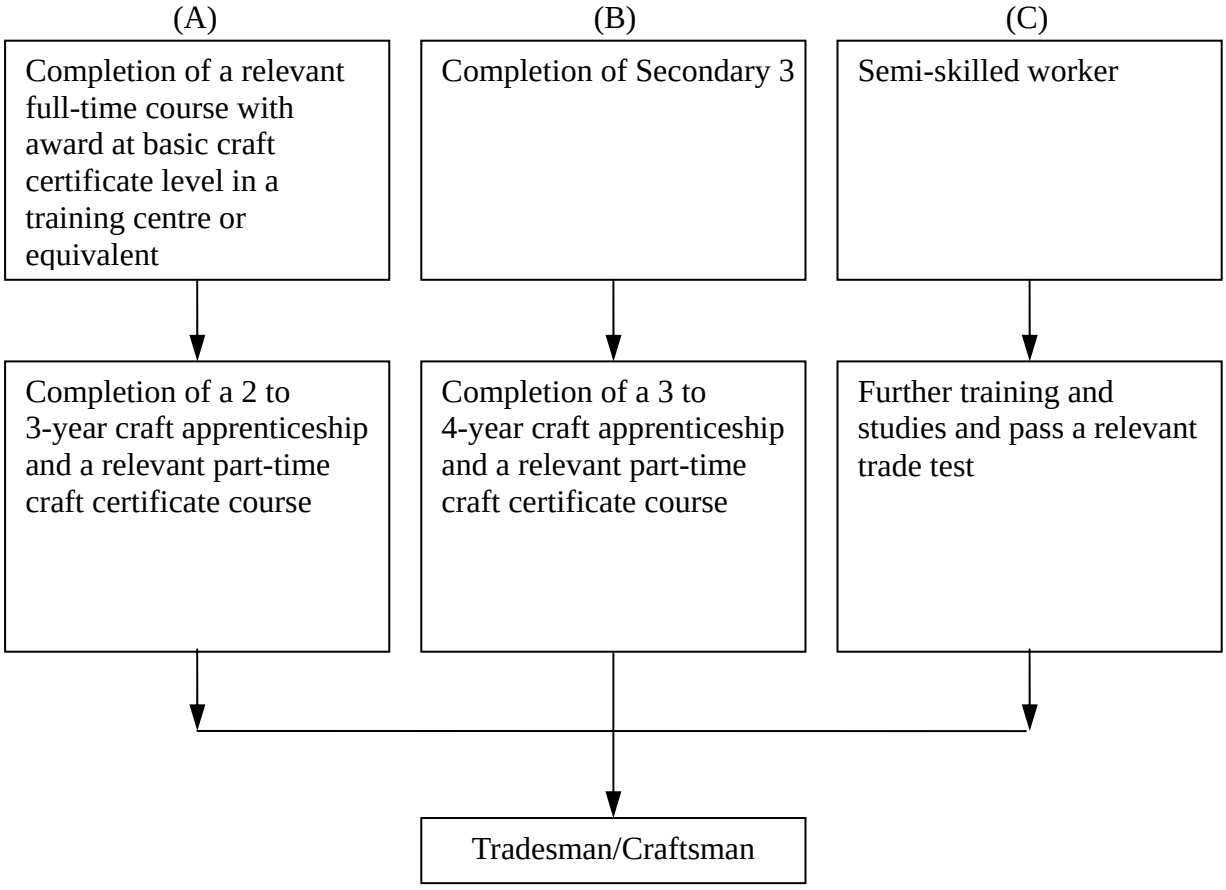
4.17 Since 2004, the technician courses for marine engineering and maritime technology had ceased because of diminishing demand. However, graduates from electrical or mechanical engineering technician courses can take up jobs as shipbuilding and ship repair technicians.

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 2010 to 2012:

Table 4.6: Projected Average Annual Training Requirement of Tradesmen/Craftsmen in Key E & M Trades from 2010 to 2012

Job Title	No. Employed at Date of Survey	Projected Average Annual Training Requirement
[+]Foreman/Chargehand	3 102	107 – 131
Electrician/Electrical Fitter		
(E & M Engineering Sector)	8 946	308 – 377
(Shipbuilding & Ship Repair Sector)	128	5 – 7
(Gas Sector)	27	1 – 1
Control Panel Assembler	10	-
Electrical Wireman	1 093	38 – 46
[+]Fire Services Mechanical Fitter	1 102	38 – 46
[+]Fire Services Electrical Fitter	702	24 – 30
Refrigeration/Air-conditioning/ Ventilation Mechanic		
(E & M Engineering Sector)		
- Electrical Control	2 950	102 – 124
- Unitary System	2 073	71 – 87
- Air System	582	20 – 25
- Thermal Insulation	139	5 – 6
- Water System)	68	2 – 3
(Shipbuilding & Ship Repair Sector)	23	1 – 1
[+]Lift/Escalator Mechanic	2 964	102 – 125
[+]Building Services Mechanic	1 381	48 – 58
Mechanical Fitter/Machinist		
(E & M Engineering Sector)	2 993	103 – 126
(Shipbuilding & Ship Repair Sector)	591	25 – 30
(Gas Sector)	20	1 – 1

Job Title	No. Employed at Date of Survey	Projected Average Annual Training Requirement
[+]Cable Jointer (Power)	278	10 – 12
[+]Overhead Linesman	313	11 – 13
Plumber and Pipe Fitter		
(E & M Engineering Sector)	452	16 – 19
(Shipbuilding & Ship Repair Sector)	95	4 – 5
[+]Electrical Appliances Service Mechanic	567	19 – 24
[+]Ship Classification Qualified Welder		
(Shipbuilding & Ship Repair Sector)	22	1 – 1
[+]Welder		
(E & M Engineering Sector)	184	6 – 8
(Shipbuilding & Ship Repair Sector)	73	3 – 4
	30 878	1 071 – 1 310

Note

[+] : E & M Engineering Sector

Table 4.7: Projected Local Supply of Craft Graduates in E & M Engineering Disciplines from 2009 to 2011
(Sources : IVE Course Plans, Youth College Course, and Training Centres Course Plans)

Institution	Programme	Projected No. of Graduates 2009	2010	2011
Youth College (VTC)	Full-time Basic Craft Courses (BCC)/ Diploma in Vocational Studies (DVS) in Electrical, Air-Cond. & Refrig., Lift Engineering, Bldg. Services, Fire Services and Welding and Fabrication	443*	-	-
	*Full-time Diploma in Vocational Education Programme (BCC/ DVS award) - Electrical, Air-Cond. & Refrig., Lift, Bldg. Services, Fire Services and Welding Engineering	-	445*	445*
IVE (VTC)	Part-time Day Craft Certificate Courses in Electrical Engineering, Lift Maintenance & Repair, Air-Cond. & Refrig., Building Services and Pipefitting	349	357	343
	Total	792	802	788

Note

* Graduates from diploma in vocational education programme (basic craft certificate courses/ technician foundation certificate award) 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 2010 to 2012.

Gas Sector

4.26 The projected average annual requirements of tradesmen/craftsmen of gas discipline from 2010 to 2012 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 2010 to 2012

Job Title	No. Employed at Date of Survey	Projected Average Annual Training Requirement
Gas Distribution Fitter (LPG)	9	–
Gas Distribution Fitter (Town Gas)	209	6 – 7
Gas Utilization Fitter (Domestic)	391	11 – 13
Gas Utilization Fitter (Non-domestic)	167	4 – 6
	776	21 – 26

Table 4.9: Projected Local Supply of Craft Graduates in Gas Discipline from 2009 to 2011

Institution	Programme	Projected No. of Graduates 2009	2010	2011
Gas Industry Training Centre (VTC)	1-year Full-time Basic Craft Certificate (BCC) Courses in Gas Utilization	32*	-	-
	*1-year Full-time Diploma in Vocational Education Programme (BCC award) - Gas Services Engineering	-	44*	44*
	3-year PTD Craft Certificate in Gas Services Engineering	32	32	32

Note

* Graduates from diploma in vocational education programme (basic craft certificate / technician foundation certificate award) may join apprenticeship and attend part-time craft certificate courses.

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) Credit based multi-entry/multi-exit training courses on vocational education in E & M disciplines at technician and craft levels for new entrants of the industry.

(b) Upgrading courses for upgrading and updating the knowledge and skills of in-service personnel in the industry.

(c) Basic practical training for engineering students of the tertiary institutions and engineering graduate trainees.

(d) 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 Council Training Academy (CICTA), the Vocational Training Council was appointed by the CICTA as its agent to conduct the trade tests (TT) and intermediate trade tests (ITT) on 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 CICTA 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 projected training requirements of the major disciplines of the E & M engineering and gas sectors will be slightly higher than the supply of professionals/technologist from local graduates (paragraph 4.7). However, the inadequacy will be compensated by overseas graduates and workers at technician level who upgrade themselves to professionals/ technologists by part-time degree programmes. The demand of professionals/technologists in the shipbuilding and ship repair sector can be matched by the graduates of mechanical engineering degree programmes (paragraph 4.8).

(b) Training of Technicians:

(i) the supply of graduates from technician courses in major disciplines of the E & M engineering sector and the gas sector is sufficient to match with the market demand in the coming years (paragraphs 4.15 and 4.16);

(ii) the demand for technicians in the shipbuilding and ship repair sector can be matched by the graduates from the E & M engineering technician courses (paragraph 4.17).

(c) Training of Tradesmen/Craftsmen:

(i) the projected supply of tradesmen/craftsmen from craft courses in key trades of the E & M engineering sector and the shipbuilding & ship repair sector may be insufficient to meet the projected demand in the coming years (paragraphs 4.23 and 4.24). It is recommended that training capacities of pre-employment training courses at tradesmen/craftsmen level should be increased and more upgrading training courses should be offered to in-service semi-skilled workers so as to attain recognized qualifications as tradesmen/craftsmen.

(ii) the projected supply of tradesmen/craftsmen in the gas sector meets the projected training requirement in the coming years (paragraph 4.26)

(d) Training demand of the three sectors of the electrical and mechanical services industry is indicated in terms of quantity only as represented by the projected training requirements. Enrolment and employment/placement results should be considered when training providers plan their training capacity.

(e) The Qualifications Framework (QF) launched by the Government is a seven-level cross-sectoral hierarchy covering both academic and vocational qualifications. With unified standards of qualifications and clear indication of the articulation ladders between them, the QF enables learners to set clear goals and direction for obtaining quality-assumed qualifications. With the establishment of QF for the E & M industry, employees will be able to acquire knowledge and skills according to industry needs and pursue their career development with a clear learning pathway.

(f) Trade Tests and Intermediate Trade Tests - employers should encourage their employees to take the trade tests/intermediate trade tests for recognition by the Government (paragraphs 4.32).

(g) Registration of Construction Workers – E & M contractors for construction works should encourage their E & M workers to register as qualified workers under the Construction Workers Registration Ordinance (paragraphs 4.35).

第一章

緒　論

機電工程業訓練委員會

1.1　機電工程業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，並就發展訓練設施向職業訓練局提出建議，以應付業內所需。訓練委員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。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　機電工程業訓練委員會(下稱本會)按職權規定，於 2009 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 2010 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；

(v)　僱主預測至 2010 年 3 月時的受訓僱員人數；及

(vi)　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 8 909 間機構，包括機電工程行業 8 419 間機構、船舶修建行業 305 間機構，以及氣體燃料行業 185 間機構。8 909 間機構中，8 812 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，本會採用分層隨機抽樣法，從香港標準行業分類所覆蓋的 8 909 間機構中，選出 915 間作爲調查對象；加上 97 間特選機構，目標調查機構共有 1 012 間，僱員數目約佔業內僱員總數的 69.6%。

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 、15C 及 15D），寄予選定機構。

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

1.9　　調查完畢後，有關人員審核填妥的調查表，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　　本會於調查進行前致函有關僱主協會及行業公會，籲請向其會員宣傳是次調查。

調查反應

1.11　　1 012 間接受調查機構之中，801 間提供所需資料，17 間未有作覆。餘下的 194 間機構，或已結業、遷址，或轉營其他行業。調查的有效回應率爲 98%。

人力調查報告

1.12　　本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的人士，而「受訓者」則指正在接受各種訓練的僱員或學徒。

1.13　　資料經收集及處理後，輯成 2009 年人力統計報告，羅列是次調查所得摘要數字。本會已於 2009 年 10 月將人力統計報告上載職業訓練局網頁，供公眾參閱。

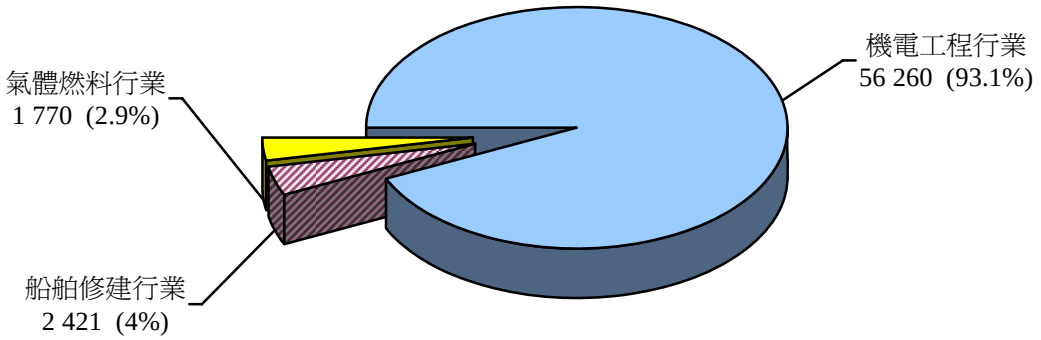
第二章

調查結果摘要

僱員人數

2.1　　是次調查顯示，於 2009 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 60 451 人，其中 56 260 人（93.1%）屬機電工程行業，2 421 人（4%）屬船舶修建行業，1 770 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，2009 年 3／4 月時，業內從事其他職務的僱員共有 27 141 人，其中 22 554 人從事機電工程行業，2 644 人從事船舶修建行業，1 943 人從事氣體燃料行業。

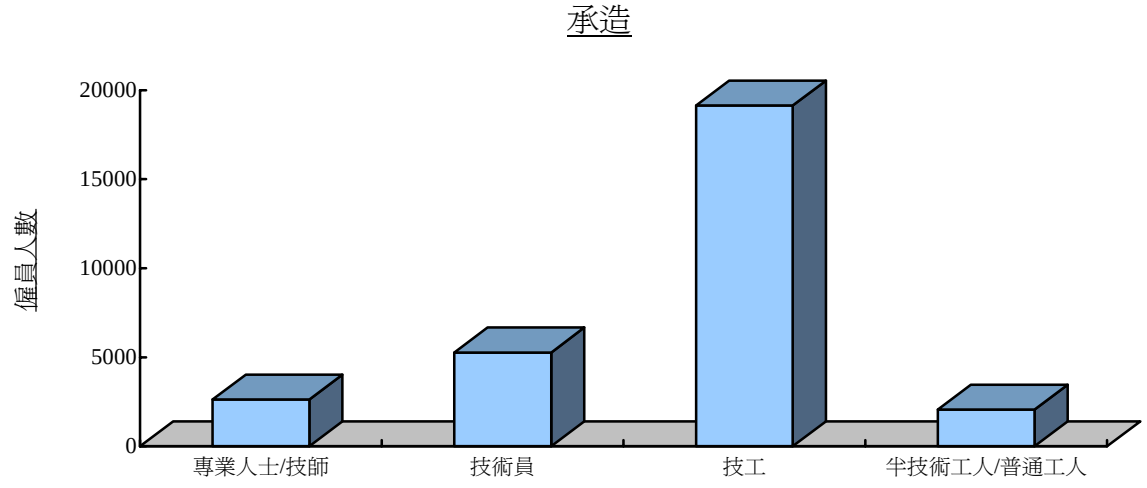
機電工程行業

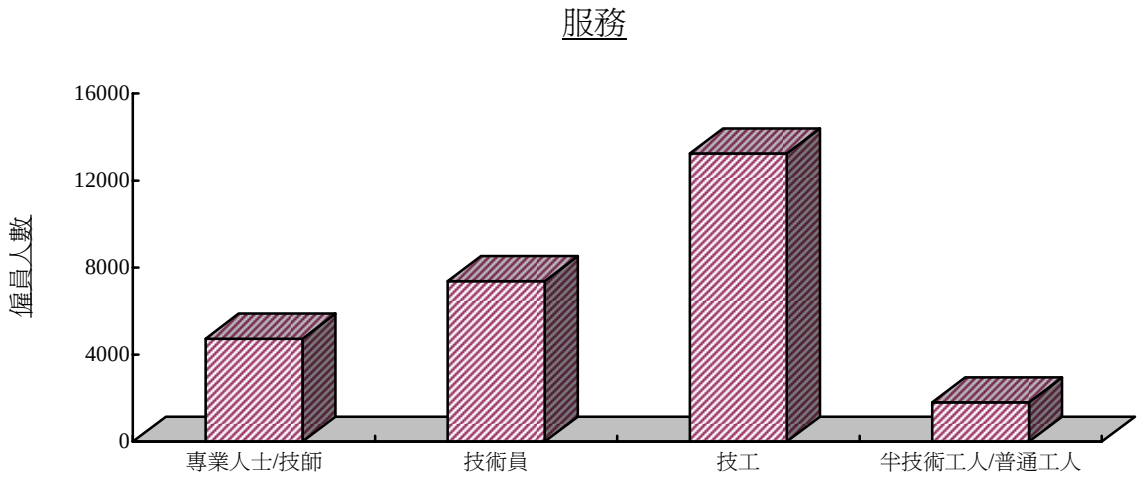
2.3 機電工程行業兩個門類各技能等級僱員分布情況如下：

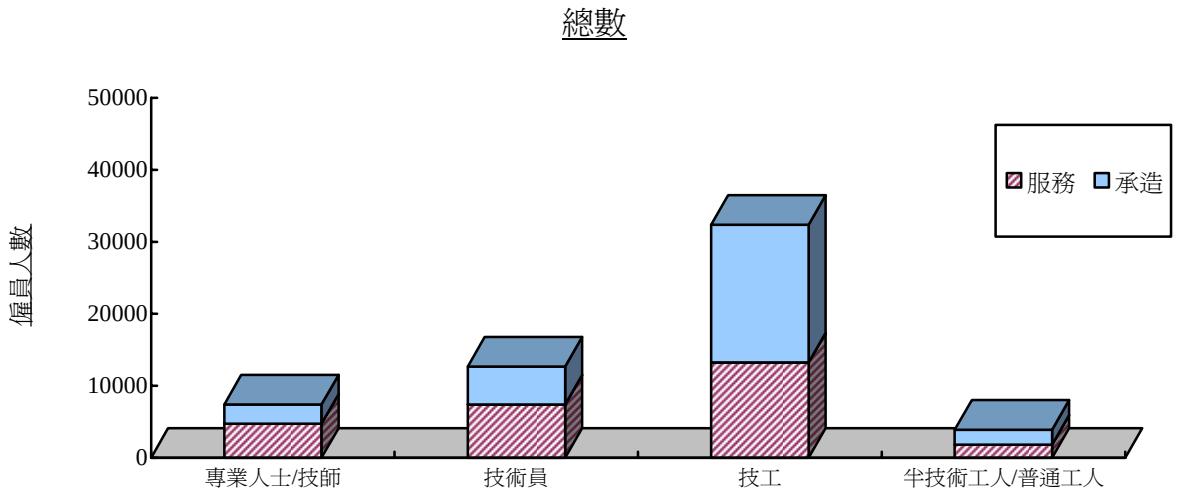
表 2.1 機電工程行業各技能等級僱員分布情況

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	2 634	5 270	19 130	2 067	29 101
服務	4 735	7 379	13 234	1 811	27 159
小計	7 369	12 649	32 364	3 878	56 260
佔僱員總數百分率	13.1%	22.5%	57.5%	6.9%	100%

圖 2.2 機電工程行業各技能等級僱員分布情況







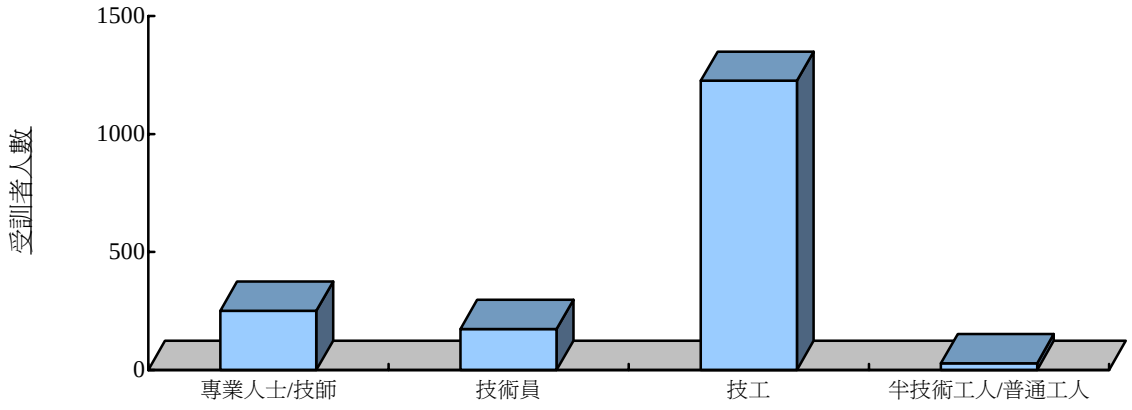
2.4 整個機電工程行業的人力統計數字見附錄 3;承造及服務門類的人力統計數字，分別見附錄 5 及附錄 6。

2.5 調查期間，機電工程行業有 1 679 人接受各類訓練，佔總人力的 3.0%。各技能等級的分布情況見下表 2.2 及圖 2.3：

表 2.2　機電工程行業
各技能等級受訓者的分布情況

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	7 369	251	3.4%
技術員	12 649	174	1.4%
技工	32 364	1 226	3.8%
半技術工人／普通工人	3 878	28	0.7%
總　數	56 260	1 679	3.0%

圖 2.3　機電工程行業
各技能等級受訓者分布情況

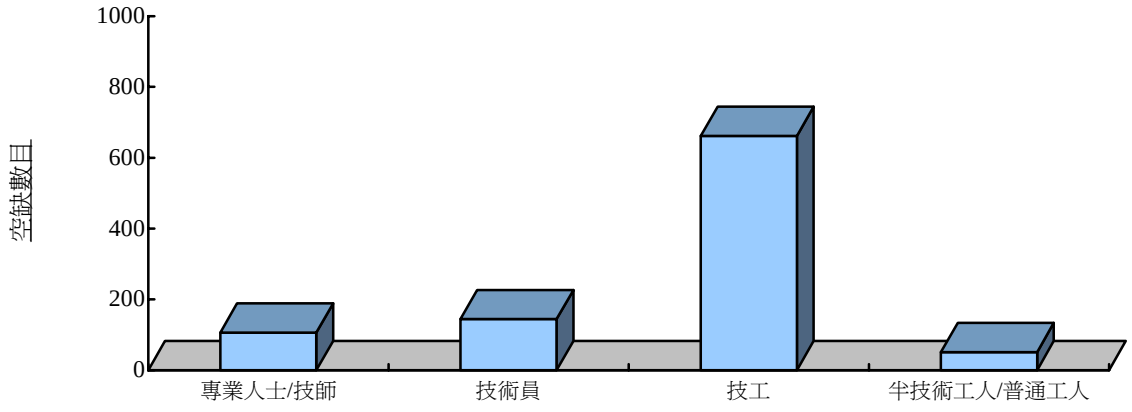


2.6　　僱主填報的空缺有 963 個，約佔機電工程行業僱員總數的 1.7%。各技能等級空缺數目的分布情況如下：

表 2.3　機電工程行業僱員空缺數目
(按技能等級劃分)

技能等級	僱員人數	空缺數目	佔同級僱員人數百分率
專業人士／技師	7 369	106	1.4%
技術員	12 649	144	1.1%
技工	32 364	662	2.0%
半技術工人／普通工人	3 878	51	1.3%
總　數	56 260	963	1.7%

圖 2.4　機電工程行業
各技能等級空缺數目分布情況

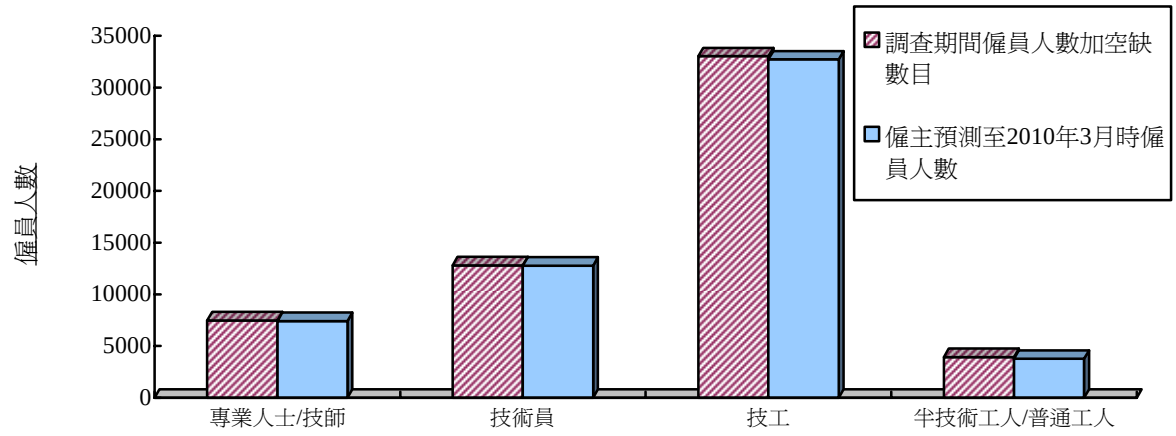


2.7 僱主預測至2010年3月時，機電工程行業將有機電僱員56 655人，按年微降1%，各技能等級的分布情況如下：

表2.4 機電工程行業預測僱員人數
(按技能等級劃分)

技能等級	調查期間僱員人數加空缺數目	僱主預測至2010年3月時僱員人數
專業人士／技師	7 475	7 408
技術員	12 793	12 774
技工	33 026	32 713
半技術工人／普通工人	3 929	3 760
總　數	57 223	56 655

圖2.5 機電工程行業預測僱員人數
(按技能等級劃分)



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2010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機電僱員每月收入幅度如下：

表 2.5 機電工程僱員每月平均收入幅度分布

每月平均收入幅度	專業人士／技師	技術員	技工	半技術工人／普通工人	總數
$6 000 以下	-	-	31	189	220
$6 001 - $9 000	-	36	2 917	1 471	4 424
$9 001 - $12 000	28	609	13 091	2 159	15 887
$12 001 - $15 000	82	2 452	11 179	31	13 744
$15 001 - $18 000	366	3 283	3 791	-	7 440
$18 001 - $25 000	1 214	4 275	686	-	6 175
$25 001 - $35 000	2 413	1 284	21	-	3 718
$35 000 以上	1 765	218	-	-	1 983
未有說明	1 501	492	648	28	2 669
總 數	7 369	12 649	32 364	3 878	56 260

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。

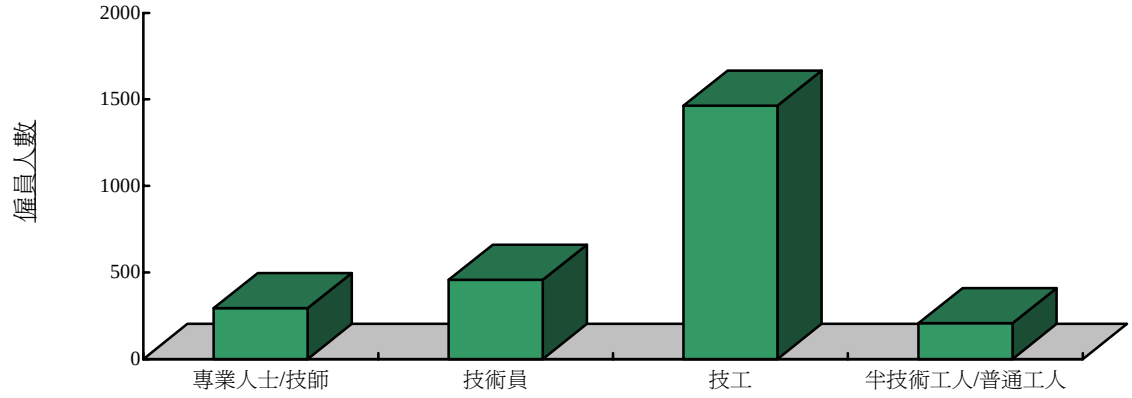
船舶修建行業

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

	專業人士／技師	技術員	技工	半技術工人／普通工人	總數
	294	457	1 463	207	2 421
佔僱員總數百分率	12.1%	18.9%	60.4%	8.6%	100%

圖 2.6　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 72 人接受各類訓練，佔行業總人力的 3.0%。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

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	294	3	1.0%
技術員	457	2	0.43%
技工	1 463	67	4.6%
半技術工人／普通工人	207	-	-
總　數	2 421	72	3.0%

2.13 僱主填報的空缺數目有 36 個，約佔船舶修建行業內機電僱員總數的 1.5%。各技能等級空缺數目的分布如下：

表 2.8 船舶修建行業機電僱員空缺數目
(按技能等級劃分)

技能等級	僱員人數	空缺數目	佔同級僱員人數百分率
專業人士／技師	294	1	0.3%
技術員	457	9	2.0%
技工	1 463	22	1.5%
半技術工人／普通工人	207	4	1.9%
總 數	2 421	36	1.5%

2.14 僱主預測至 2010 年 3 月時，船舶修建行業會有機電僱員 2 475 人，按年微增 0.7%，各技能等級的分布情況如下：

表 2.9 船舶修建行業機電僱員的預測人數
(按技能等級劃分)

技能等級	調查期間僱員人數加空缺數目	僱主預測至 2010 年 3 月時僱員人數
專業人士／技師	295	295
技術員	466	467
技工	1 485	1 502
半技術工人／普通工人	211	211
總 數	2 457	2 475

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 2010 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平均收入幅度分布

每月平均收入幅度	專業人士／技師	技術員	技工	半技術工人／普通工人	總數
$6 000 以下	-	5	5	21	31
$6 001 - $9 000	-	-	67	59	126
$9 001 - $12 000	-	32	446	122	600
$12 001 - $15 000	-	139	828	-	967
$15 001 - $18 000	13	90	52	-	155
$18 001 - $25 000	36	189	35	-	260
$25 001 - $35 000	86	1	-	-	87
$35 000 以上	155	-	-	-	155
未有說明	4	1	30	5	40
總數	294	457	1 463	207	2 421

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。

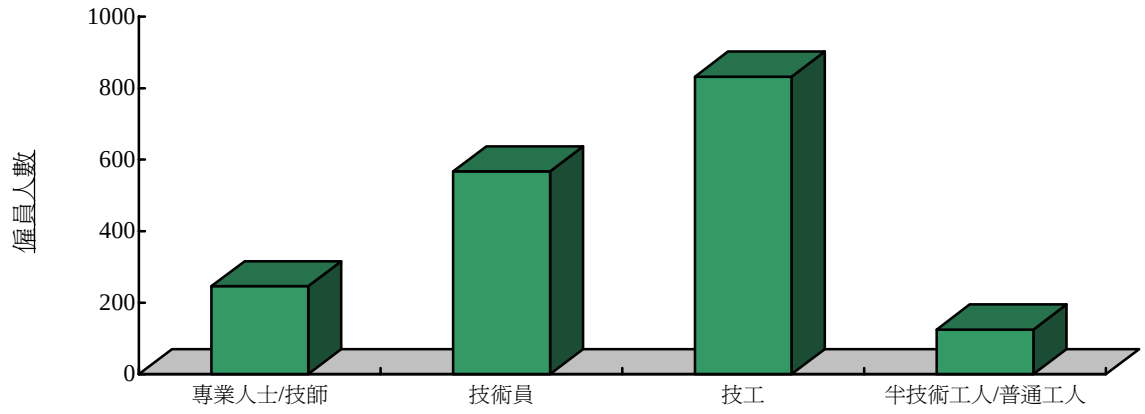
氣體燃料行業

2.18 氣體燃料行業的人力統計數字見附錄 10。該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

	專業人士／技師	技術員	技工	半技術工人／普通工人	總數
	246	567	832	125	1 770
佔僱員總數百分率	13.9%	32.0%	47%	7.1%	100%

圖 2.7　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 35 人接受各類訓練，佔僱員總數的 2.0%。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	246	-	-
技術員	567	-	-
技工	832	35	4.2%
半技術工人／普通工人	125	-	-
總　數	1 770	35	2.0%

2.20　僱主填報的空缺有 8 個，約佔氣體燃料行業機電僱員總數的 0.5%。各技能等級空缺數目的分布情況如下：

表 2.13　氣體燃料行業機電僱員空缺數目
(按技能等級劃分)

技能等級	僱員人數	空缺數目	佔同級僱員人數百分率
專業人士／技師	246	-	-
技術員	567	6	1.1%
技工	832	-	-
半技術工人／普通工人	125	2	1.6%
總　數	1 770	8	0.5%

2.21　僱主預測至 2010 年 3 月時，氣體燃料行業將有機電僱員 1 764 人，按年微跌 0.8%。各技能等級的分布情況如下：

表 2.14　氣體燃料行業機電僱員的預測人數
(按技能等級劃分)

技能等級	調查期間僱員人數加空缺數目	僱主預測至 2010 年 3 月時僱員人數
專業人士／技師	246	247
技術員	573	567
技工	832	828
半技術工人／普通工人	127	122
總　數	1 778	1 764

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 2010 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機電僱員每月收入幅度如下：

表 2.15 氣體燃料行業的機電僱員的每月平均收入幅度分布

每月平均收入幅度	專業人士／技師	技術員	技工	半技術工人／普通工人	總數
$6 000 以下	-	-	-	1	1
$6 001 - $9 000	-	-	80	46	126
$9 001 - $12 000	-	20	354	78	452
$12 001 - $15 000	-	375	343	-	718
$15 001 - $18 000	43	63	40	-	146
$18 001 - $25 000	7	75	10	-	92
$25 001 - $35 000	172	34	-	-	206
$35 000 以上	24	-	-	-	24
未有說明	-	-	5	-	5
總 數	246	567	832	125	1 770

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 爲評估地盤機電人力狀況，機電工程業訓練委員會在 2009 年 3 月進行第六次補充調查，蒐集於地盤工作的機電從業員最新人力資料。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 867 個屋宇地盤，以及 421 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 6 466 名機電從業員在地盤從事機電工程工種及相關主要職務，其中 5 809 人（89.8%）在屋宇地盤工作，657 人（10.2%）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。

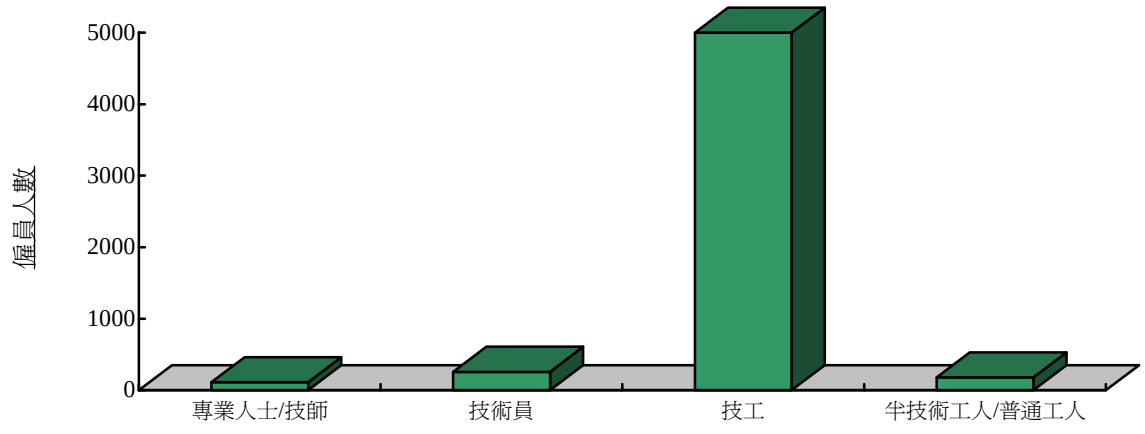
2.27　　各技能等級從業員的分布情況如下：

表 2.16　地盤機電從業員的分布情況

技能等級	僱員人數		佔僱員總數百分率
專業人士／技師	114	(72)	1.8%
技術員	259	(164)	4.0%
技工	5 913	(4 216)	91.4%
半技術工人／普通工人	180	(34)	2.8%
總　數	6 466	(4 486)	100%

（括弧內數字爲 2007 年 3 月第五次補充調查所得的同類數據。）

圖 2.8　地盤機電從業員的分布情況



2.28　　地盤機電人力統計數字見附錄 7。

第三章

觀察所得與結論

概況

3.1 本會仔細審閱是次調查結果後,認爲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各主要職務的就業情況。

機電工程行業

3.2 2009 年 3／4 月時，機電工程行業僱員共有 56 260 人，與 2007 年 3 月調查所得的 55 563 人比較，平均每年輕微增長 0.6%。2007 至 2009 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	2 634 (2 272)	4 735 (4 243)	7 369 (6 515)	+6.4%
技術員	5 270 (5 154)	7 379 (7 009)	12 649 (12 163)	+2.0%
技工	19 130 (18 682)	13 234 (14 747)	32 364 (33 429)	-1.6%
半技術工人／普通工人	2 067 (1 772)	1 811 (1 684)	3 878 (3 456)	+5.9%
總數	29 101 (27 880)	27 159 (27 683)	56 260 (55 563)	
平均每年變化百分率	+2.2%	-1.0%	+0.6%	

註：
括弧內爲 2007 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輕微增長 0.6%。其中,專業人士／技師及技術員分別每年增加 6.7%及 2.0%。另一方面,技工人數每年下跌 1.6%。半技術工人／普通工人則錄得每年 5.9%的顯著增幅。

3.4 技工人數下降,主要於服務門類錄得。按職務劃分,冷凝／空氣調節／通風設備工程跌幅最爲明顯。

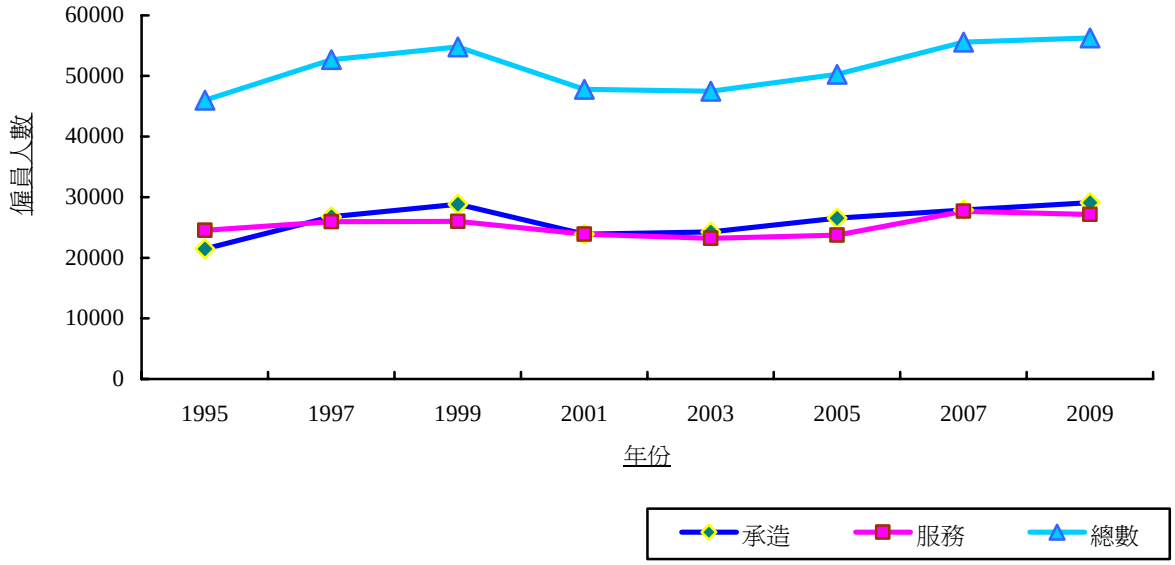
3.5 1995 至 2009 年間,機電工程行業的人力變化如下:

表 3.2 1995 至 2009 年機電工程行業人力變化

	從業員人數		
調查年份	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
2009	29 101	27 159	56 260

* 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 2009 年的機電工程行業人力變化



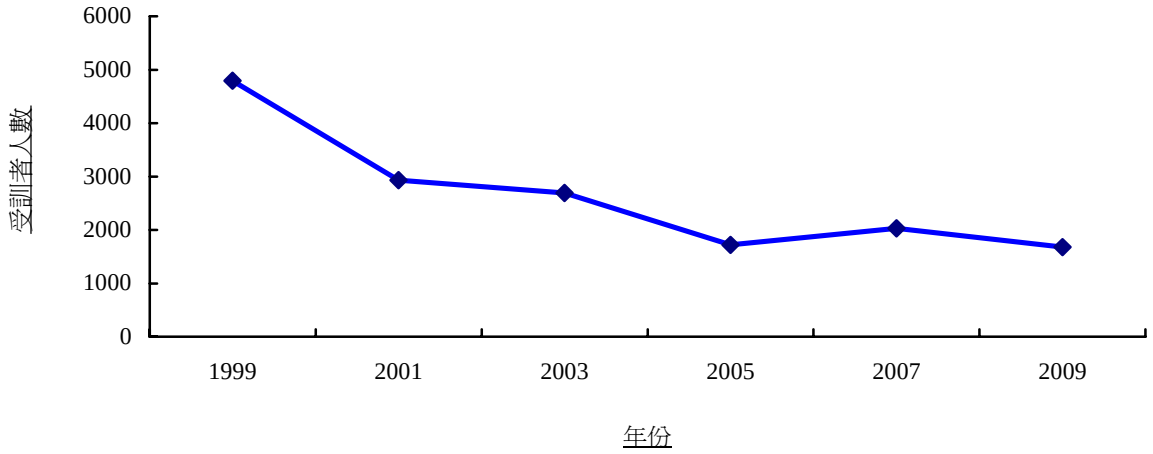
3.6　　機電工程行業僱用的人力於 1999 年攀升至高峰，其後於 2003 年跌至低谷。隨著香港及鄰近地區經濟於 2003 年後轉趨蓬勃，僱員數目回升；於 2007 年的調查中，人數更超過 1999 年的高峰期。雖然大體上僱員人數繼續保持攀升走勢，但同時金融海嘯亦對機電業造成影響。過去兩年，上升趨勢放緩，僱員人數每年平均輕微增加 0.6%。

3.7　　自 1999 年起的人力調查顯示，機電業受訓者人數持續下跌，直至 2007 年，由於業內採用大型飛機庫，需僱用更多機械工程及飛機工程業僱員及受訓者，受訓者人數才止跌回升。2009 年 3／4 月調查結果顯示，受訓者人數重現下跌的跡象。過去兩年，受訓者人數每年下跌 9.0%。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

調查年份	僱員人數	受訓者人數	佔僱員人數的百分比
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%
2009	56 260	1 679	3.0%

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　　政府致力加快大型基建及非住宅項目，機電業僱員未必能即時受惠於這些項目。由於項目規劃需時，特別是建造項目爲機電僱員所帶來的就業機會，一般於項目達到建築高峰期時才來臨。本會預計，未來幾年建造項目對機電僱員的需求將保持穩定。相信至 2012／13 左右，大型基建項目建造期會進入高峰，市場將提供更多就業機會予機電僱員。

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。隨著香港經濟逐步復甦，加上政府推行資助計劃，包括「樓宇更新大行動」及「長者維修自住物業津貼計劃」等，將創造更多就業機會，本會預期維修及保養工程將會有穩定的新增需求。

僱主填報的空缺數目及對未來一年的預測

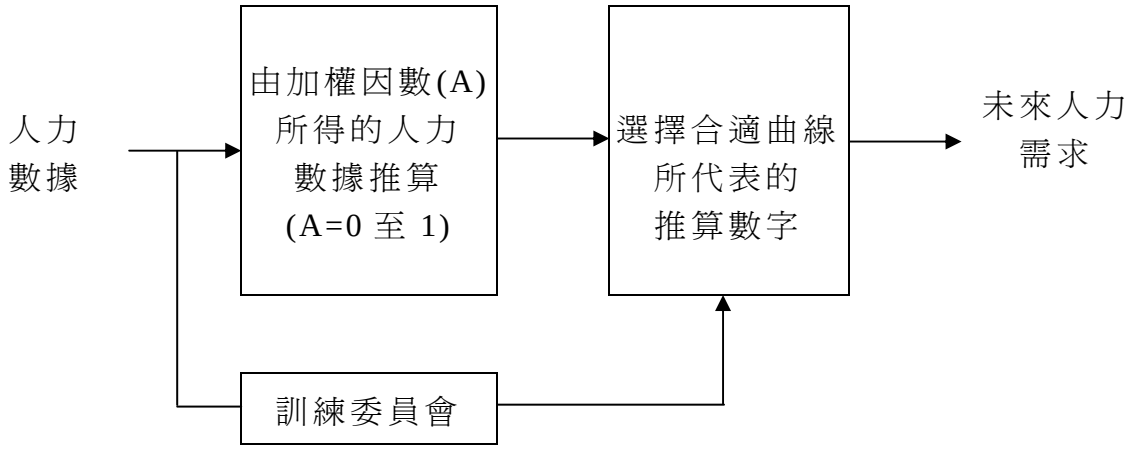
3.10 與 2007 年人力調查的數字比較，調查期間僱主填報的空缺數目輕微下跌。然而，從以下未來一年僱員人數的預測可見，僱主一般對行業前景樂觀。

表 3.4 機電工程行業僱員的空缺分布及預測人數

技能等級	調查時的僱員人數	填報空缺數目		未來一年預測僱員人數
		人數	百分率	至 2010 年 3 月的僱員人數
專業人士／技師	7 369	106	1.4%	7 408
技術員	12 649	144	1.1%	12 774
技工	32 364	662	2.0%	32 713
半技術工人／普通工人	3 878	51	1.3%	3 760
總 數	56 260	963	1.7%	56 655

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。調節過濾法屬趨勢分析技巧，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，對推算結果的影響亦較大；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；而服務門類的人力需求則以調節過濾法推算。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 及 2007 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「地盤樓宇建築工程總值(GVCW)」這個主要因素的相關性，其可信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 2009 年人力調查而言，考慮到建造項目的數量及外圍因素不明朗，情況與 2005 及 2007 年相若，本會決定再次採用「調節過濾法」，以預測 2010 至 2012 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，本會估計流失率爲 3%。

3.17 鑑於以上因素，機電工程行業在 2010 至 2012 年，爲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

技能等級	調查時的僱員人數	2010 至 2012 年平均每年訓練需求
專業人士／技師	7 369	254 – 311
技術員	12 649	437 – 537
技工	32 364	1 116 – 1 364

船舶修建行業

人力變化

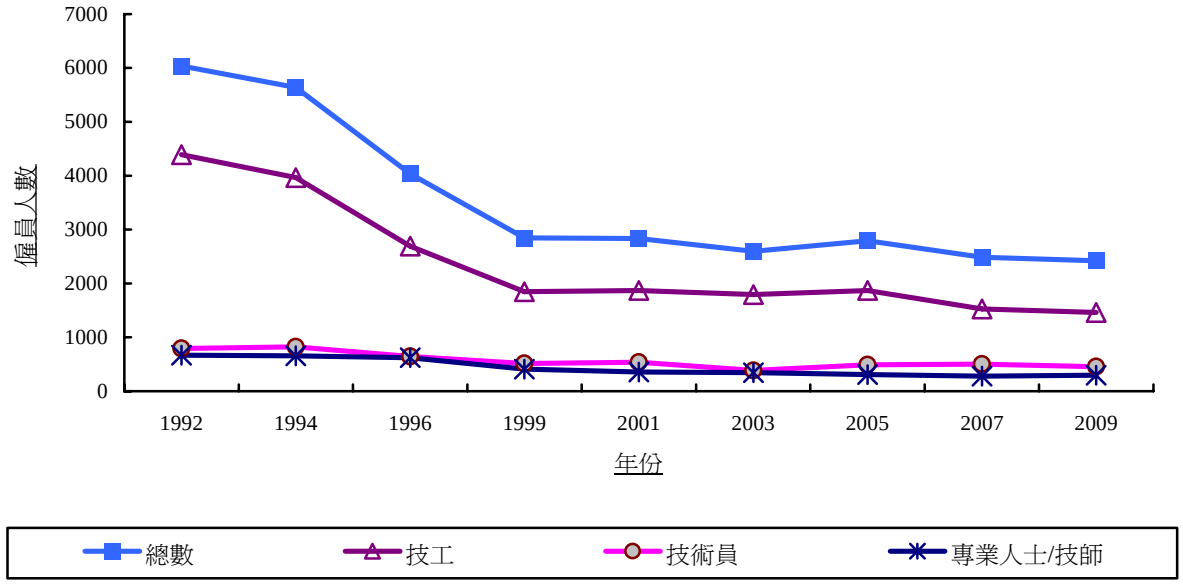
3.18 1992 至 2009 年間，船舶修建行業專業人士／技師、技術員及技工級的人力變化如下：

表 3.6　　船舶修建行業機電僱員的人力變化

調查年份	專業人士／技師	技術員	技工	總人力*
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
2009	294	457	1 463	2 421

* 總人力數字包括專業人士／技師、技術員、技工及半技術工人／普通工人各級的人數。

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，船舶修建行業整體人力每年下降 1.4%。由 1999 年起，整體機電僱員的人力變化不大。

船舶修建行業業務展望

3.20 全球金融危機對造船業造成打擊。然而，到港船舶的總數量並無明顯下跌，船舶維修和保養業務仍然維持穩定。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。

船舶修建行業的未來人力需求

3.21 考慮到人力將維持穩定，本會繼續採用「調節過濾法」推算 2010 至 2012 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，本會預測船舶修建行業機電人力在 2010 至 2012 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

技能等級	調查時的僱員人數	2010 至 2012 年平均每年訓練需求
專業人士／技師	294	12 – 15
技術員	457	19 – 23
技工	1 463	61 – 74

氣體燃料行業

人力變化

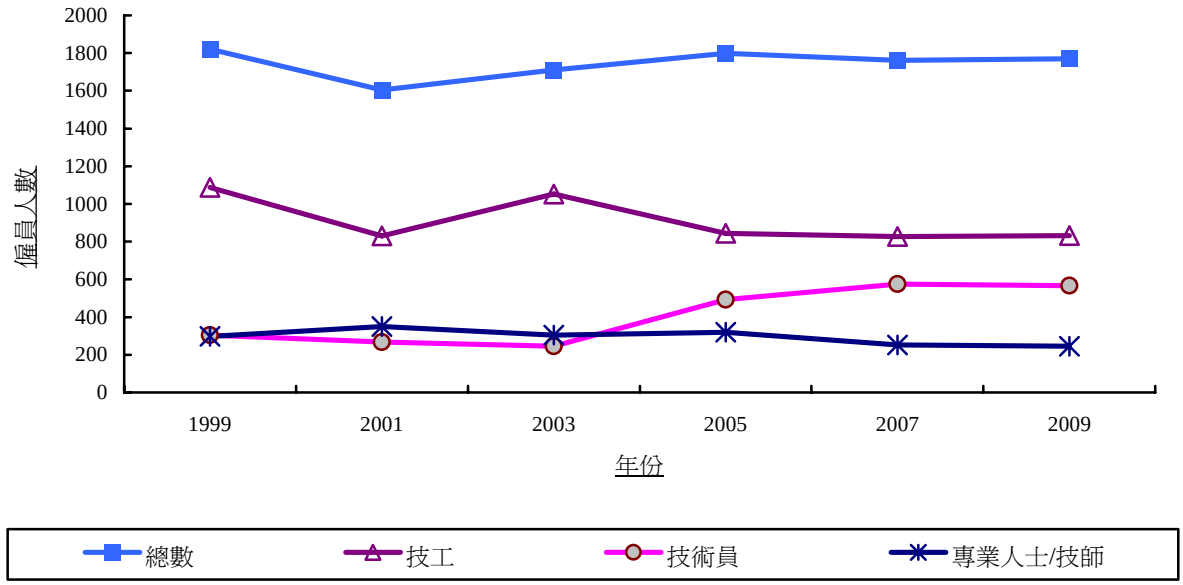
3.24 1999 年氣體燃料行業首次進行人力調查至今，行業內三個技能等級的人力變化如下：

表 3.8　　氣體燃料行業機電僱員的人力變化

調查年份	專業人士／技師	技術員	技工	總人力*
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
2009	246	567	832	1 770

*總人力數字包括專業人士／技師、技術員、技工及半技術工人／普通工人各級的人數。

圖 3.4　　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，本行業整體人力變化不大。

氣體燃料行業業務展望

3.26 影響氣體燃料業僱員就業機會的一個主要因素是住宅建築項目數量。由於新建住宅項目數量並無回升跡象，本會預期，氣體燃料行業未來幾年的技術人力需求將會維持於相若水平。

氣體燃料行業的未來人力需求

3.27 基於整體人力需求的趨勢穩定，本會決定採用「調節過濾法」，以預測 2010 至 2012 年氣體燃料業的人力需求。

3.28 參考以往調查結果，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，本會預測氣體燃料行業在2010至2012年，平均每年需要訓練人手如下：

表 3.9 預計氣體燃料行業每年的機電人力訓練需求

技能等級	調查時的僱員人數	2010 至 2012 年平均每年訓練需求
專業人士／技師	246	7 – 8
技術員	567	16 – 19
技工	832	23 – 28

3.30 本會將在 2011 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，2010 至 2012 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：本地經濟逐步從金融海嘯中復甦。基建項目例如興建港珠澳大橋、廣深港高速鐵路香港段工程等均已啓動。港鐵西港島線的建築工程、啓德遊輪碼頭的前期工程及西九龍文化區的設計亦已開展。上述工程均會增加業內機電僱員的需求。此外，香港特區政府推出的資助計劃，將創造更多就業機會。因此，預期未來幾年，業內對建築及建造相關機電僱員的需求將會穩定增長。

ii) 船舶修建行業：訪港船舶總數並無大幅下降，船舶維修及保養業務維持穩定。業內人力需求將維持穩定。

(iii) 氣體燃料行業：新建住宅項目數量並無回升趨勢，業內對技術人員的需求將維持穩定。

4.2　　人力訓練是長遠的投資；一名大學畢業生要成爲專業人士／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。爲確保有足夠的技術人力，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 3.8%。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各技能等級人數的百分率

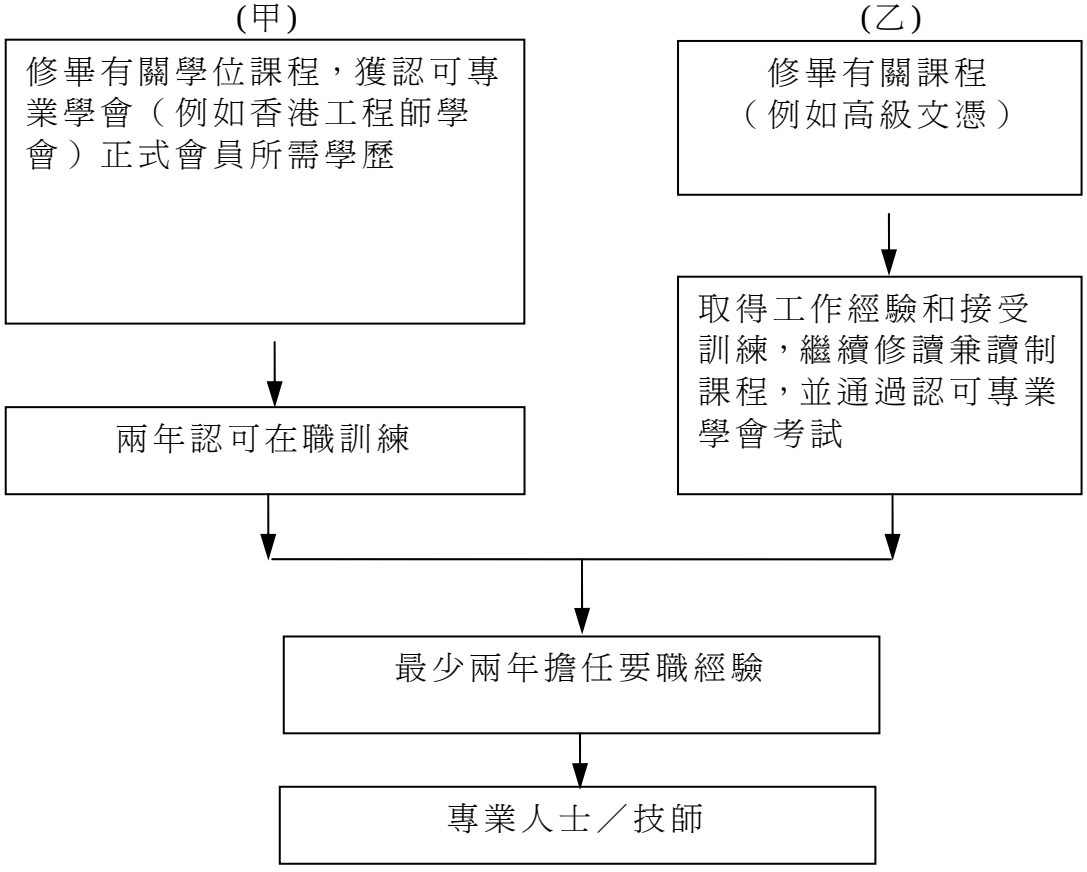
	專業人士／技師	技術員	技工
機電工程行業	3.8%	3.9%	3.8%
船舶修建行業	4.6%	4.6%	4.6%
氣體燃料行業	3.0%	3.1%	3.1%

專業人士／技師訓練

4.4 要成爲專業人士／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 2010 至 2012 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 2010 至 2012 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		
（機電工程行業）	804	28 – 34
（建造業）	1 102	79 – 97
電機工程師		
（機電工程行業）	2 203	76 – 93
（氣體燃料行業）	22	1 – 1
（建造業）	318	23 – 28
工程經理	1 104	38 – 46
消防設備工程師	355	12 – 15
升降機／自動梯工程師	237	8 – 10
機械工程師		
（機電工程行業）	1 212	42 – 51
（氣體燃料行業）	62	2 – 2
（建造業）	403	29 – 35
冷凝／空氣調節／通風設備工程師	584	20 – 25
水喉及渠務工程師	114	4 – 5
安全主任		
（機電工程行業）	141	5 – 6
（氣體燃料行業）	9	
氣體燃料工程師（氣體燃料行業）	153	4 – 5
	8 823	371 – 453

表 4.3: 預計 2009 至 2011 年間
可投身機電工程及氣體燃料行業的
本地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 2009	2010	2011
全日制課程				
香港城市大學	工學士 (屋宇裝備工程學)	33	33	34
香港理工大學	工學士 (電機工程學)	80	64	61
	工學士 (屋宇裝備工程學)	56	70	62
	工學士* (機械工程學)	31	33	50
香港科技大學	工程學學士 (機械工程學(屋宇裝備))	31	8	10
	工程學學士* (機械工程學)	40	38	43
香港大學	工學士 (屋宇裝備工程學)	19	19	16
	工學士 (電機工程學)	41	14	10
	工學士* (機械工程學)	51	26	27
	總數	382	305	313

註

* 假設 50% 的機械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，不足之數將由海外畢業生及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

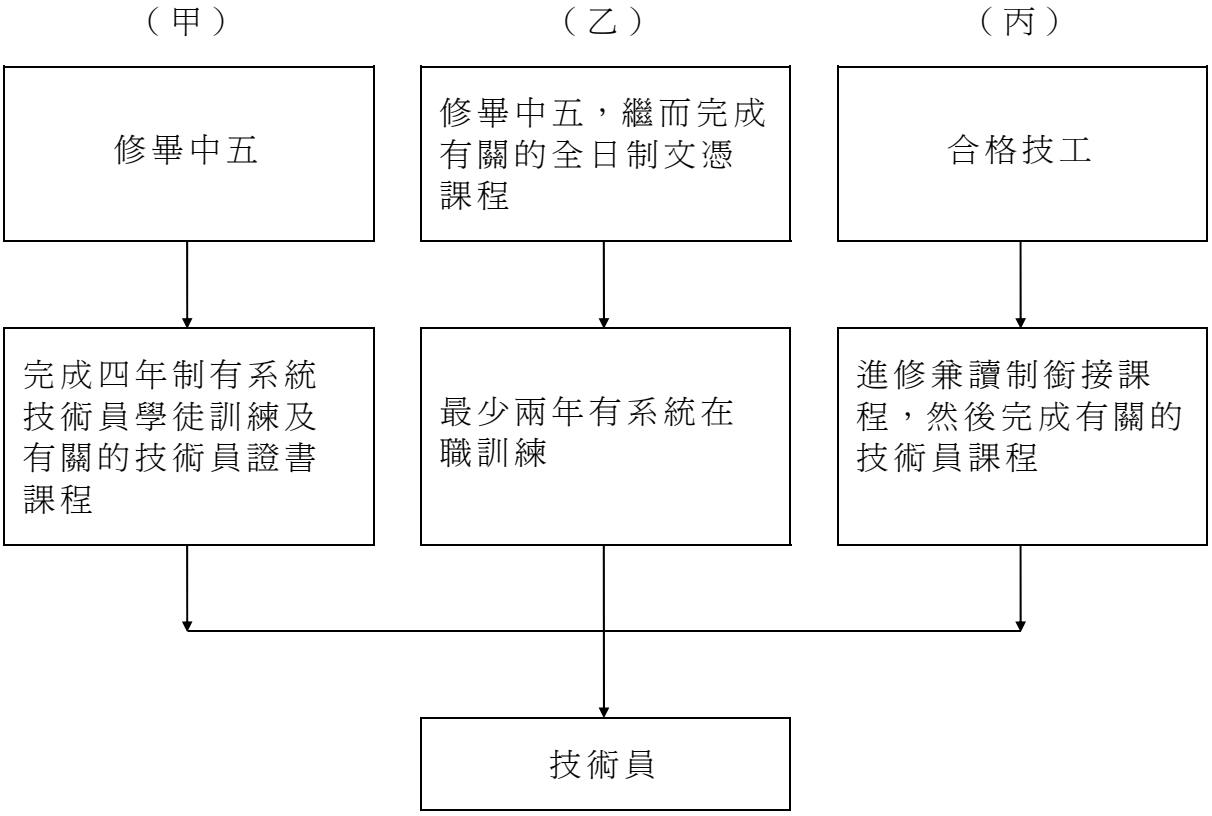
4.9 爲使工科畢業生有更多機會接受有系統的實務訓練，職業訓練局屬下技師訓練委員會推行一項資助計劃，協助工科畢業生獲得爲期 18 個月的實務訓練，以符合香港工程師學會正式會員資格。受訓的畢業生可以獲得津貼，每月透過僱主發放，作爲薪金的一部分。技師訓練組亦提供免費服務，協助僱主招聘畢業生，並就一切與工科畢業生訓練有關的事宜，提供協助。本會建議僱主利用這項計劃訓練其工程師。

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、智能屋宇科技、屋宇設備工程、設施管理等全日制高級文憑課程、日間兼讀制和夜間兼讀制技術員課程。

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爲技術員／管工、學徒／受訓者，因爲他們投身本業前，已接受適當的基本訓練。

機電工程及氣體燃料行業

4.14 2010 至 2012 年間，機電工程及氣體燃料兩個行業平均每年的預計技術員訓練需求，以及供應情況如下：

表 4.4: 預計 2010 至 2012 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訓練需求

職 稱	調查時的僱員人數	平均每年需訓練人數
屋宇設備技術員	1 801	62 – 76
繪圖員	538	19 – 23
電機工程技術員		
（機電工程行業）	1 853	64 – 79
（氣體燃料行業）	7	
電工儀器技術員	65	2 – 3
消防設備技術員	319	11 – 14
升降機／自動梯技術員	688	24 – 29
機械工程技術員		
（機電工程行業）	1 530	53 – 65
（氣體燃料行業）	67	2 – 2
冷凝／空氣調節／通風設備技術員	926	32 – 39
監督		
（機電工程行業）	3 151	109 – 134
（氣體燃料行業）	136	4 – 5
辦公室設備維修技術員	29	1 – 1
氣體燃料工程技術員	342	10 – 11
助理安全主任／安全督導員		
（機電工程行業）	61	2 – 3
（氣體燃料行業）	15	0 – 1
	11 528	395 – 485

表 4.5: 預計 2009 至 2011 年間
可投身機電工程及氣體燃料行業的
本地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 IVE 課程計劃）

院 校	課 程	預計畢業生人數 2009	2010	2011
香港理工大學	高級文憑 (屋宇裝備工程學)†	29	28	27
	高級文憑 (電機工程學) †	16	18	14
香港城市大學	副學士 (屋宇裝備工程學) †	38	28	37
IVE （職業訓練局）	全日制高級文憑課程：			
	–屋宇設備	72	65	71
	–電機工程	217	239	215
	–機械工程*	68	69	79
	–設施管理	25	57	46
	–飛機維修	65	65	57
	–機電服務	32	23	38
	–能源管理*	31	12	30
	–智能屋宇科技及自動化工程	33	40	33
	全日制小計	626	644	647
	日間兼讀制高級文憑／證書課程：			
	–屋宇設備	28	40	40
	–電機工程	21	56	20
	日間兼讀制課程小計	49	96	60
	總 數	675	740	707

院 校	課 程	預計畢業生人數 2009	2010	2011
青年學院 (職業訓練局)	全日制中專教育文憑 (技術員級) △ -電機、空調製冷、屋宇設備及焊接工程	343	495	495

註

+ 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。

△ 中專教育文憑課程畢業生可升讀高級文憑課程。

4.15 表 4.4 、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，會供過於求。然而，高級文憑／副學士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，IVE 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，大部分爲屋宇裝備或機械工程學科畢業生。表 4.4、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

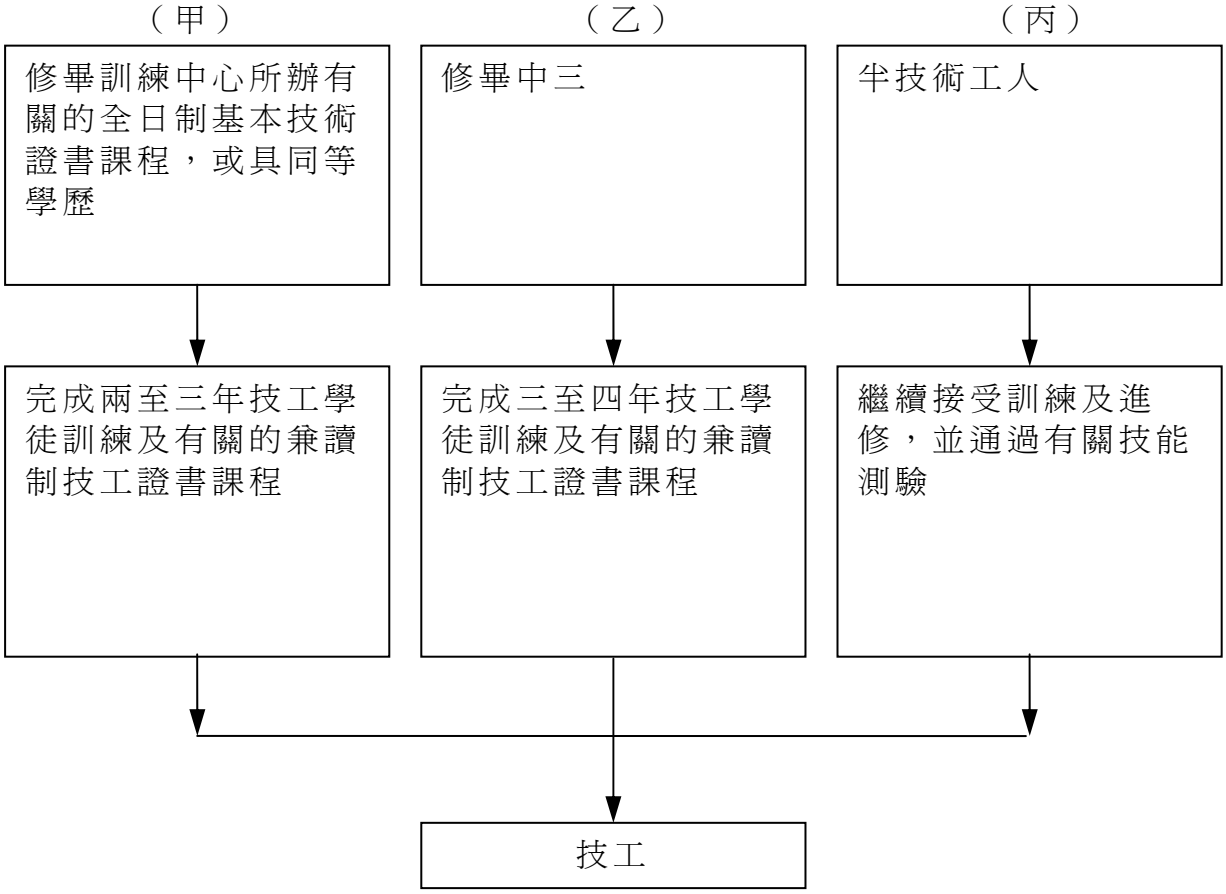
4.17 由於需求日減，輪機工程及海事科技技術員課程自 2004 年起已停辦；但是，電機或機械工程技術員課程畢業生可擔任船舶修建技術員。

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，亦須掌握相關的理論知識，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，以成爲合格技工。

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），因爲訓練期較短，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 IVE、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 下列兩表爲 2010 至 2012 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 2010 至 2012 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	3 102	107 – 131
電工／電氣打磨裝配技工		
（機電工程行業）	8 946	308 – 377
（船舶修建行業）	128	5 – 7
（氣體燃料行業）	27	1 – 1
控制板裝配工	10	-
電氣佈線工	1 093	38 – 46
+消防機械裝配工	1 102	38 – 46
+消防電氣裝配工	702	24 – 30
空調製冷設備技工		
（機電工程行業）		
- 電力控制	2 950	102 – 124
- 獨立系統	2 073	71 – 87
- 送風系統	582	20 – 25
- 保溫	139	5 – 6
- 水系統	68	2 – 3
（船舶修建行業）	23	1 – 1
+升降機／自動梯技工	2 964	102 – 125
+屋宇設備技工	1 381	48 – 58
機械打磨裝配工／機床工		
（機電工程行業）	2 993	103 – 126
（船舶修建行業）	591	25 – 30
（氣體燃料行業）	20	1 – 1
+強電流電纜接駁技工	278	10 – 12
+架空電線技工	313	11 – 13

職 稱	調查時的 僱員人數	平均每年 需訓練人數
喉管工		
（機電工程行業）	452	16 – 19
（船舶修建行業）	95	4 – 5
+電器用具維修技工	567	19 – 24
+船級協會認可焊接工 （船舶修建工程行業）	22	1 – 1
+焊接技工		
（機電工程行業）	184	6 – 8
（船舶修建行業）	73	3 – 4
	30 878	1 071 – 1 310

註
+ 機電工程行業

表 4.7: 預計 2009 至 2011 年間
機電工程學科本地技工畢業生供應情況
（資料來源：IVE、青年學院及
訓練中心課程計劃）

院 校	課 程	預計畢業生人數 2009	2010	2011
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、空氣調節及冷凝、電梯工程、屋宇設備、消防設備及焊接和裝設）	443*	-	-
	*全日制中專教育文憑課程(頒授基本技術證書／中專文憑) - 電機、空氣調節及冷凝、電梯工程、屋宇設備、消防設備及焊接工程	-	445*	445*

院 校	課 程	預計畢業生人數 2009	2010	2011
IVE （職業訓練局）	日間兼讀制技工證書課程（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）	349	357	343
	總數	792	802	788

註

* 中專教育文憑課程畢業生(獲頒基本技術證書／技術員基礎證書)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、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 該行業技工職位的技能要求與機電工程行業相似。表 4.6、4.7 顯示，2010 至 2012 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 2010 至 2012 年技工級主要職務平均每年預計訓練需求見表 4.8、4.9。

表 4.8: 預計 2010 至 2012 年間氣體燃料行業
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）	9	–
氣體燃料輸送技工（煤氣）	209	6 – 7
氣體燃料用戶裝置技工（住宅式）	391	11 – 13
氣體燃料用戶裝置技工（非住宅式）	167	4 – 6
	776	21 – 26

表 4.9: 預計 2009 至 2011 年間氣體燃料學科
本地技工畢業生供應情況

院校	課程	預計畢業生人數 2009	2010	2011
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*	-	-
	*一年全日制氣體燃料裝備工程中專教育文憑課程(頒發基本技術證書)	-	44*	44*
	三年日間兼讀制氣體燃料裝備工程技工證書課程	32	32	32

註

* 中專教育文憑課程畢業生(獲頒基本技術證書／技術員基礎證書)或會參加學徒訓練計劃，並修讀兼讀制技工證書課程。

4.27 表 4.8、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／普通工人通常負責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，僱主必須經常爲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，並提高他們的生產力。另一方面，本會建議，特區政府應考慮撥出更多資源，爲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作業水平及安全標準。技能提升計劃於 2001 年設立，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，爲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) 爲本業初入行者而設的學分制多階進出專業教育訓練課程(包括技術員及技工程度)。

(b) 有助提升知識和技能的在職技能提升課程。

(c) 專上院校工科生及工科畢業生基本實務訓練。

(d) 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 職業訓練局自 1989 年起，推行自願參加性質的技能測驗及證書頒發制度，目的爲：

(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，分別作爲 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訓練學院達成協議，獲委擔任該學院代理，舉辦建造類別機電工種技能測驗及中級工藝測試，供技術及半技術級的建造工程機電工人參加。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訓練學院委託，爲根據《建造業工人註冊條例》獲「臨時註冊」的技術工人，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，以及爲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) 機電工程及氣體燃料業主要工種的訓練需求，預期將會輕微高於可充當專業人士／技師的本地畢業生人數(第 4.7 段)。不過，不足之數將由海外畢業生及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。船舶修建業的專業人士／技師需求可由機械工程學位課程畢業生滿足(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，將可應付需求（第 4.15、4.16 段）。

(ii) 預測機電工程技術員課程的畢業生人數，將可應付船舶修建行業的需求（第 4.17 段）。

(c) 技工訓練：

(i) 未來幾年，預計技工課程畢業生的供應將不能滿足機電工程及船舶修建行業的需求（第 4.23、4.24 段）。本會建議增加技工級職前訓練課程的學額，開辦更多訓練課程，提升在職半技術工人取得認可資歷，成爲合格技工。

(ii) 預期氣體燃料行業的技工人力供應，可應付未來幾年預計訓練需求（第 4.26 段）。

(d) 機電工程業內三個行業的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) 政府推出的資歷架構(QF)，採跨界別七級制，涵蓋學歷及職業資格。資歷架構提供統一的資歷標準，清楚展示升學階梯，讓進修人士可訂下清晰目標及方向，取得具有質素保證的資歷。機電業設立資歷架構後，僱員可根據行業需求學習知識及技能，訂下清晰的進修途徑，追求事業發展。

(f) 技能測驗及中級工藝測試 — 僱主應鼓勵僱員參加技能測驗及中級工藝測試，以取得政府認可資格（第 4.32 段）。

(g) 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，註冊爲合資格工人(第 4.35 段)。

Appendix 1

Electrical and Mechanical Services Training Board

Membership
(As at 1st November 2009)

Chairman

Ir SYNN Raymond Cheung	(nominated by The Hong Kong Air Conditioning and Refrigeration Association Ltd)

Members

Dr CHAN Tze-fun	(nominated by a Local University)
Mr CHUNG Fuk-wai, Simon	(nominated by an Electrical and Mechanical Engineering Consulting Company)
Mr FOK Chan-ming, Peter	(nominated by The Lift and Escalator Contractors Association)
Mr HO Pui-sum	(nominated by The Association of Registered Fire Service Installation Contractors of Hong Kong Ltd.)
Mr HUNG Cheung-kwong	(nominated by a professional body of the building services operation and maintenance sector)
Mr KWAN Sun-chuen	(nominated by Hong Kong Electrical Contractors' Association Ltd)
Mr LAU Siu-hung, Anthony	(nominated by the Hong Kong & Kowloon Electric Trade Association)
Mr LEE Kwok-wai	(nominated by an Ocean-going Vessel Repairing Company)
Mr LEUNG Ping-him	(nominated by the Hong Kong and China Gas Company Ltd.)
Ir LEUNG Wai-hung, Alex	(nominated by The Hong Kong Institution of Engineers)
Mr LI Chu-wai	(nominated by an Electric Railway Company)
Ir LOK Tat-hong, Howard	(nominated by the Hong Kong Electrical and Mechanical Contractors' Association)

Mr LUI Kin-hung	(nominated by an Aircraft Engineering Company)
Mr MAK Chi-chui	(nominated by a local craft repairing company)
Mr WAN Yiu-cheong	(nominated by the Hong Kong and Kowloon Electrical Engineering and Appliances Trade Workers Union)
Mr WONG Koon-chung	(nominated by an Electricity Supply Company)
Mr YIP Siu-ping	(nominated by a LP gas supply company)
Mr LEUNG Yiu-hong	(representative of the Director of Electrical and Mechanical Services)
Mr YU Yiu-kwong, Alvin	(representative of the representative of the Commissioner for Labour)
Mr CHU Kwai-luen, Albert	(representative of the Executive Director of the Vocational Training Council)

Secretary

Mr AU Kwok-kuen, Coogan	(Vocational Training Council)

附錄1

機電工程業訓練委員會
委員名單

(二零零九年十一月一日)

主席 ：

冼泳霖工程師	(香港空調及冷凍商會有限公司提名)

委員 ：

陳梓芬博士	(一 間本地大學提名)
鍾福維先生	(一間機電工程顧問公司提名)
霍燦明先生	(電梯業協會提名)
何沛森先生	(香港註冊消防工程公司商會有限公司提名)
孔祥光先生	(一間屋宇設備運行及裝修專業團體提名)
關新全先生	(香港電器工程商會有限公司提名)
劉少雄先生	(港九電業總會提名)
李國威先生	(一間遠洋輪船維修公司提名)
梁秉謙先生	(香港中華煤氣有限公司提名)
梁偉雄工程師	(香港工程師學會提名)
李主惠先生	(一間電氣化鐵路公司提名)
樂達航工程師	(香港機電工程商協會提名)
雷健雄先生	(一間飛機工程公司提名)
麥志釗先生	(一間本地船隻維修公司提名)
溫耀昌先生	(港九電器工程電業器材職工會提名)
王冠忠先生	(一間電力公司提名)
葉兆炳先生	(一間石油氣供應商提名)
梁耀康先生	(機電工程署署長代表)
余耀光先生	(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

區國權先生	(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、課程發展及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，訂定每種技能所需的訓練期。

8. 對技術評估、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. 爲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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 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	804	38	28	36	816
Electrical Engineer 電機工程師	2 203	71	32	70	2 209
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	584	46	6	34	597
Mechanical Engineer 機械工程師	1 212	47	17	42	1 219
Plumbing and Drainage Engineer 水喉及渠務工程師	114	19	-	10	119
Lift/Escalator Engineer 升降機／自動梯工程師	237	1	1	1	233
Fire Services Engineer 消防設備工程師	355	16	5	12	361
Electronics Engineer 電子工程師	572	2	9	-	576
Control and Instrumentation Engineer 控制及儀器工程師	43	2	-	1	44
Engineering Manager 工程經理	1 104	9	7	9	1 099

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL (Continued)　專業人士／技師級 (續)					
Safety Officer 安全主任	141	-	1	-	135
Sub-total 小計	7 369	251	106	215	7 408
TECHNICIAN LEVEL　技術員級					
Supervisor 監督	3 151	20	27	20	3 093
Building Services Technician 屋宇設備技術員	1 801	25	48	49	1 879
Draughtsman 繪圖員	538	8	2	2	542
Electrical Engineering Technician 電機工程技術員	1 853	61	26	54	1 893
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	926	31	7	29	938
Mechanical Engineering Technician 機械工程技術員	1 530	17	10	18	1544
Lift/Escalator Technician 升降機／自動梯技術員	688	-	-	-	685
Fire Services Technician 消防設備技術員	319	1	-	1	325
Electrical Instrument and Meter Technician 電工儀器技術員	65	-	-	-	65
Electronics Technician 電子技術員	930	11	16	11	946
Telecommunication Technician 電訊技術員	758	-	8	-	776

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
TECHNICIAN LEVEL (Continued) 技術員級 (續)					
Office Equipment Service Technician 辦公室設備維修技術員	29	-	-	-	29
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	61	-	-	-	59
Sub-total 小計	12 649	174	144	184	12 774
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	3 102	10	111	-	3 141
Building Services Mechanic 屋宇設備技工	1 381	36	39	42	1 444
Electrician/Electrical Fitter 電工／電氣打磨裝配工	8 946	353	201	370	9 096
Control Panel Assembler 控制板裝配工	10	-	-	-	10
Electrical Wireman 電氣佈線工	1 093	-	-	-	870
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	2 950	154	77	163	3 040
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	2 073	91	17	91	1 928
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Air System)/ Sheet Metal Worker 空調製冷設備技工(送風系統) ／簿片金屬構造工	582	7	96	1	684

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)					
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫) ／保溫技工	139	1	-	1	139
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	68	1	-	1	68
Plumber and Pipe Fitter 喉管工	452	-	2	-	448
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	2 993	446	93	109	3 396
Lift Mechanic 升降機技工	2 960	106	9	117	2 978
Escalator Mechanic 自動梯技工	4	-	-	-	4
Fire Services Electrical Fitter 消防電氣裝配工	702	-	-	-	701
Fire Services Mechanical Fitter 消防機械裝配工	1 102	18	-	18	967
Cable Jointer (Power) 強電流電纜接駁技工	278	2	1	3	279
Overhead Linesman 架空電線技工	313	-	3	-	317
Electrical Appliances Service Mechanic 電器用具維修技工	567	-	-	2	567
Welder 焊接工	184	-	-	-	174
Carpenter 木工	162	-	-	-	150

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)					
Painter 髹漆工	76	-	-	-	54
AV and RF Mechanic 影音及射頻技工	280	1	5	-	328
Building Security System Mechanic 屋宇防盜系統技工	31	-	1	-	32
Communication System Mechanic 電訊系統裝配工	1 916	-	7	-	1 898
Sub-total 小計	32 364	1 226	662	918	32 713
SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人					
Labourer 雜工	1 145	-	12	-	1 085
Semi-skilled Worker 半技術工人	2 733	28	39	14	2 675
Sub-total 小計	3 878	28	51	14	3 760
GRAND TOTAL 總 計	56 260	1 679	963	1 331	56 655

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR
機電工程行業

DISTRIBUTION OF EMPLOYEES BY MONTHLY INCOME RANGE
按每月收入幅度劃分的僱員人數分布情況

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	-	-	-	14	17	197	255	260	61
Electrical Engineer 電機工程師	-	-	-	28	45	247	858	278	747
Refrigeration/ Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	-	-	-	28	141	195	155	40	25
Mechanical Engineer 機械工程師	-	-	-	-	44	100	423	372	273
Plumbing and Drainage Engineer 水喉及渠務工程師	-	-	14	-	10	8	72	2	8
Lift/Escalator Engineer 升降機／自動梯工程師	-	-	-	-	34	157	31	15	-
Fire Services Engineer 消防設備工程師	-	-	14	-	34	116	98	57	36
Electronics Engineer 電子工程師	-	-	-	--	-	81	224	139	128
Control and Instrumentation Engineer 控制及儀器工程師	-	-	-	-	-	-	42	1	-
Engineering Manager 工程經理	-	-	-	-	30	84	187	583	220
Safety Officer 安全主任	-	-	-	12	11	29	68	18	3
Sub-total 小計	-	-	28	82	366	1 214	2 413	1 765	1 501
TECHNICIAN LEVEL 技術員級									
Supervisor 監督	-	-	-	279	1 078	1 027	668	-	99
Building Services Technician 屋宇設備技術員	-	-	30	616	80	530	284	218	43
Draughtsman 繪圖員	-	18	65	126	107	62	74	-	86
Electrical Engineering Technician 電機工程技術員	-	-	98	337	428	783	60	-	147

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)									
Refrigeration/ Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	-	-	82	315	358	112	22	-	37
Mechanical Engineering Technician 機械工程技術員	-	-	34	393	113	886	86	-	18
Lift/Escalator Technician 升降機／自動梯技術員	-	-	7	180	406	86	9	-	-
Fire Services Technician 消防設備技術員	-	-	64	62	150	17	-	-	26
Electrical Instrument and Meter Technician 電工儀器技術員	-	-	1	4	57	-	-	-	3
Electronics Technician 電子技術員	-	12	18	27	62	702	78	-	31
Telecommunication Technician 電訊技術員	-	-	187	111	412	43	3	-	2
Office Equipment Service Technician 辦公室設備維修技術員	-	-	-	-	29	-	-	-	-
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全監督	-	6	23	2	3	27	-	-	-
Sub-total 小計	-	36	609	2 452	3 283	4 275	1 284	218	492
TRADESMAN/CRAFTSMAN LEVEL 技工級									
Foreman/Chargehand 管工／領工	-	76	330	814	1 635	182	-	-	65
Building Services Mechanic 屋宇設備技工	-	127	667	485	42	24	-	-	36
Electrician/Electrical Fitter 電工／電氣打磨裝配工	31	1 167	3 521	3 283	583	84	21	-	256
Control Panel Assembler 控制板裝配工	-	-	-	2	8	-	-	-	-
Electrical Wireman 電氣佈線工	-	321	577	171	-	24	-	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工 (電力控制)	-	21	1 683	898	140	48	-	-	160

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)									
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary Control) 空調製冷設備技工 (獨立系統)	-	243	1 301	498	31	-	-	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Air System)/Sheet Metal Worker 空調製冷設備技工 (送風系統)/ 薄片金屬構造工	-	17	303	232	30	-	-	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/Thermal 空調製冷設備技工(保溫)/保溫技工	-	35	26	78	-	-	-	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工 (水系統)	-	11	26	19	12	-	-	-	-
Plumber and Pipe Fitter 喉管工	-	38	278	91	7	-	-	-	38
Mechanical Fitter/ Machinist 機械打磨裝配工／機床工	-	24	1 210	1 692	50	-	-	-	17
Lift Mechanic 升降機技工	-	325	454	1 373	484	324	-	-	-
Escalator Mechanic 自動梯技工	-	4	-	-	-	-	-	-	-
Fire Services Electrical Fitter 消防電氣裝配工	-	-	219	338	112	-	-	-	33
Fire Services Mechanical Fitter 消防機械裝配工	-	37	361	352	346	-	-	-	6
Cable Jointer (Power) 強電流電纜接駁技工	-	-	125	81	72	-	-	-	-
Overhead Linesman 架空電線技工	-	-	131	164	18	-	-	-	-
Electrical Appliances Service Mechanic 電器用具服務技工	-	70	347	136	-	-	-	-	14
Welder 焊接工	-	-	74	31	79	-	-	-	-

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)									
Carpenter 木工	-	12	48	89	1	-	-	-	12
Painter 髹漆工	-	12	29	15	20	-	-	-	-
AV and RF Mechanic 影音及射頻技工	-	83	95	87	15	-	-	-	-
Building Security System Mechanic 屋宇防盜系統技工	-	13	18	-	-	-	-	-	-
Communication System Mechanic 電訊系統裝配工	-	281	1 268	250	106	-	-	-	11
Sub-total 小計	31	2 917	13 091	11 179	3 791	686	21	-	648
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人									
Labourer 雜工	115	303	711	-	-	-	-	-	16
Semi-skilled Worker 半技術工人	74	1 168	1 448	31	-	-	-	-	12
Sub-total 小計	189	1 471	2159	31	-	-	-	-	28
GRAND TOTAL 總 計	220	4 424	15 887	13 744	7 440	6 175	3 718	1 983	2 669

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 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	171	6	-	8	147
Electrical Engineer 電機工程師	503	10	-	10	477
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	445	18	4	12	456
Mechanical Engineer 機械工程師	159	-	7	-	152
Plumbing and Drainage Engineer 水喉及渠務工程師	8	-	-	-	8
Lift/Escalator Engineer 升降機／自動梯工程師	234	1	1	1	230
Fire Services Engineer 消防設備工程師	269	2	-	-	271
Electronics Engineer 電子工程師	168	-	-	-	168
Control and Instrumentation Engineer 控制及儀器工程師	24	-	-	-	24

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL (Continued) 專業人士／技師級 (續)					
Engineering Manager 工程經理	568	-	3	-	561
Safety Officer 安全主任	85	-	1	-	83
Sub-total 小計	2 634	37	16	31	2 577
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	1 419	-	1	-	1 353
Building Services Technician 屋宇設備技術員	212	17	24	41	236
Draughtsman 繪圖員	346	6	-	-	351
Electrical Engineering Technician 電機工程技術員	683	14	-	8	689
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	781	29	6	27	789
Mechanical Engineering Technician 機械工程技術員	90	-	1	-	88
Lift/Escalator Technician 升降機／自動梯技術	679	-	-	-	676
Fire Services Technician 消防設備技術員	310	1	-	1	316
Electrical Instrument and Meter Technician 電工儀器技術員	30	-	-	-	30
Electronics Technician 電子技術員	160	2	-	2	160
Telecommunication Technician 電訊技術員	498	-	-	-	498

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
TECHNICIAN LEVEL (Continued) 技術員級 (續)					
Office Equipment Service Technician 辦公室設備維修技術員	1	-	-	-	1
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	61	-	-	-	59
Sub-total 小計	5 270	69	32	79	5 246
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	1 341	10	10	-	1 295
Building Services Mechanic 屋宇設備技工	283	35	18	41	323
Electrician/Electrical Fitter 電工／電氣打磨裝配工	4 060	163	72	187	4 163
Control Panel Assembler 控制板裝配工	2	-	-	-	2
Electrical Wireman 電氣佈線工	1 065	-	-	-	849
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	2 362	154	22	150	2 390
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	1 715	91	3	91	1 568
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Air System)/ Sheet Metal Worker 空調製冷設備技工(送風系統／簿片金屬構造工	422	1	96	1	518

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年3月時的僱員人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)					
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫) ／保溫技工	133	1	-	1	133
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	49	1	-	1	49
Plumber and Pipe Fitter 喉管工	135	-	-	-	135
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	167	-	23	-	180
Lift Mechanic 升降機技工	2 960	106	9	117	2 978
Escalator Mechanic 自動梯技工	4	-	-	-	4
Fire Services Electrical Fitter 消防電氣裝配工	688	-	-	-	687
Fire Services Mechanical Fitter 消防機械裝配工	1 096	18	-	18	961
Cable Jointer (Power) 強電流電纜接駁技工	215	-	-	-	215
Overhead Linesman 架空電線技工	176	-	-	-	176
Electrical Appliances Service Mechanic 電器用具服務技工	144	-	-	-	144
Welder 焊接工	153	-	-	-	143
Carpenter 木工	9	-	-	-	9
Painter 髹漆工	27	-	-	-	17

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)					
AV and RF Mechanic 影音及射頻技工	93	-	-	-	141
Building Security System Mechanic 屋宇防盜系統技工	31	-	1	-	32
Communication System Mechanic 電訊系統裝配工	1 800	-	-	-	1 782
Sub-total 小計	19 130	580	254	607	18 894
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人					
Labourer 雜工	396	-	-	-	330
Semi-skilled Worker 半技術工人	1 671	14	30	-	1 595
Sub-total 小計	2 067	14	30	-	1 925
GRAND TOTAL 總 計	29 101	700	332	717	28 642

Appendix 6
附錄 6

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計2010年3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	633	32	28	28	669
Electrical Engineer 電機工程師	1 700	61	32	60	1 732
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	139	28	2	22	141
Mechanical Engineer 機械工程師	1 053	47	10	42	1 067
Plumbing and Drainage Engineer 水喉及渠務工程師	106	19	-	10	111
Lift/Escalator Engineer 升降機／自動梯工程師	3	-	-	-	3
Fire Services Engineer 消防設備工程師	86	14	5	12	90
Electronics Engineer 電子工程師	404	2	9	-	408
Control and Instrumentation Engineer 控制及儀器工程師	19	2	-	1	20

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計2010年3月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL (Continued) 專業人士／技師級 (續)					
Engineering Manager 工程經理	536	9	4	9	538
Safety Officer 安全主任	56	-	-	-	52
Sub-total 小計	4 735	214	90	184	4 831
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	1 732	20	26	20	1 740
Building Services Technician 屋宇設備技術員	1 589	8	24	8	1 643
Draughtsman 繪圖員	192	2	2	2	191
Electrical Engineering Technician 電機工程技術員	1 170	47	26	46	1 204
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	145	2	1	2	149
Mechanical Engineering Technician 機械工程技術員	1 440	17	9	18	1 456
Lift/Escalator Technician 升降機／自動梯技術	9	-	-	-	9
Fire Services Technician 消防設備技術員	9	-	-	-	9
Electrical Instrument and Meter Technician 電工儀器技術員	35	-	-	-	35
Electronics Technician 電子技術員	770	9	16	9	786
Telecommunication Technician 電訊技術員	260	-	8	-	278

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計2010年3月時的僱員人數
TECHNICIAN LEVEL (Continued) 技術員級 (續)					
Office Equipment Service Technician 辦公室設備維修技術員	28	-	-	-	28
Sub-total 小計	7 379	105	112	105	7 528
TRADESMAN/ CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	1 761	-	101	-	1 846
Building Services Mechanic 屋宇設備技工	1 098	1	21	1	1 121
Electrician/Electrical Fitter 電工／電氣打磨裝配工	4 886	190	129	183	4 933
Control Panel Assembler 控制板裝配工	8	-	-	-	8
Electrical Wireman 電氣佈線工	28	-	-	-	21
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	588	-	55	13	650
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	358	-	14	-	360
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Air System)/ Sheet Metal Worker 空調製冷設備技工(送風系統)／簿片金屬構造工	160	6	-	-	166
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	6	-	-	-	6

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計2010年3月時的僱員人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)					
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	19	-	-	-	19
Plumber and Pipe Fitter 喉管工	317	-	2	-	313
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	2 826	446	70	109	3 216
Fire Services Electrical Fitter 消防電氣裝配工	14	-	-	-	14
Fire Services Mechanical Fitter 消防機械裝配工	6	-	-	-	6
Cable Jointer (Power) 強電流電纜接駁技工	63	2	1	3	64
Overhead Linesman 架空電線技工	137	-	3	-	141
Electrical Appliances Service Mechanic 電器用具服務技工	423	-	-	2	423
Welder 焊接工	31	-	-	-	31
Carpenter 木工	153	-	-	-	141
Painter 髹漆工	49	-	-	-	37
AV and RF Mechanic 影音及射頻技工	187	1	5	-	187
Communication System Mechanic 電訊系統裝配工	116	-	7	-	116
Sub-total 小計	13 234	646	408	311	13 819
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人					
Labourer 雜工	749	-	12	-	755

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 Trainees by March 2010 估計2010年3月時的受訓者人數	Forecasted No. of Employees by March 2010 估計2010年3月時的僱員人數
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL (Continued) 半技術工人／普通工人 (續)					
Semi-skilled Worker 半技術工人	1 062	14	9	14	1 080
Sub-total 小計	1 811	14	21	14	1 835
GRAND TOTAL 總 計	27 159	979	631	614	28 013

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	11	1	-
Electrical Engineer 電機工程師	46	2	-
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	14	-	-
Mechanical Engineer 機械工程師	15	-	-
Plumbing and Drainage Engineer 水喉及渠務工程師	-	-	-
Lift/Escalator Engineer 升降機／自動梯工程師	4	-	-
Fire Services Engineer 消防設備工程師	7	-	-
Electronics Engineer 電子工程師	11	-	-
Control and Instrumentation Engineer 控制及儀器工程師	-	-	-
Safety Officer 安全主任	6	-	-
Sub-total 小計	114	3	-
TECHNICIAN LEVEL　技術員級			
Supervisor 監督	26	-	-

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）			
Building Services Technician 屋宇設備技術員	9	-	-
Draughtsman 繪圖員	4	-	-
Electrical Engineering Technician 電機工程技術員	70	1	-
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	24	-	-
Mechanical Engineering Technician 機械工程技術員	27	3	-
Lift/Escalator Technician 升降機／自動梯技術員	16	-	-
Fire Services Technician 消防設備技術員	27	-	-
Electrical Instrument and Meter Technician 電工儀器技術員	20	-	-
Electronics Technician 電子技術員	18	-	-
Telecommunication Technician 電訊技術員	8	-	-
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	10	-	-
Sub-total 小計	259	4	-
TRADESMAN/CRAFTSMAN LEVEL 技工級			
Foreman/Chargehand 管工/領工	81	-	-
Building Services Mechanic 屋宇設備技工	30	-	-
Electrician/Electrical Fitter 電工／電氣打磨裝配工	1 281	-	-
Control Panel Assembler 控制板裝配工	46	-	-

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/CRAFTSMAN LEVEL (Continued) 技工級 (續)			
Electrical Wireman 電氣佈線工	1 044	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	496	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	559	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Air System)/ Sheet Metal Worker 空調製冷設備技工(送風系統)/ 簿片金屬構造工	402	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫)/ 保溫技工	61	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	214	-	-
Plumber and Pipe Fitter 喉管工	293	-	-
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	65	-	-
Lift Mechanic 升降機技工	258	-	-
Escalator Mechanic 自動梯技工	95	-	-
Fire Services Electrical Fitter 消防電氣裝配工	237	-	-
Fire Services Mechanical Fitter 消防機械裝配工	462	-	-
Cable Jointer (Power) 強電流電纜接駁技工	12	-	-
Overhead Linesman 架空電線技工	-	-	-

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
TRADESMAN LEVEL (Continued) 技工級（續）			
Electrical Appliances Service Mechanic 電器用具維修技工	80	-	-
Welder 焊接工	56	-	-
Building Security System Mechanic 屋宇防盜系統技工	10	-	-
Communication System Mechanic 電訊系統裝配工	74	-	-
Gas Installer 氣體裝置技工	57	-	-
Sub-total 小計	5 913	-	-
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人			
Labourer 雜工	150	-	-
Semi-skilled Worker 半技術工人	30	-	-
Sub-total 小計	180	-	-
GRAND TOTAL 總 計	6 466	7	-

Appendix 8
附錄 8

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 Trainees by March 2010 估計 2010 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Electrical Engineer 電機工程師	12	-	-	-	12
Marine Engineer 輪機工程師	98	1	-	1	98
Mechanical Engineer 機械工程師	29	-	1	0	30
Ship Designer/Naval Architect 船舶設計師／造船工程師	21	-	-	-	21
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	110	2	-	2	110
Safety Officer 安全主任	24	-	-	-	24
Sub-total 小計	294	3	1	3	295
TECHNICIAN LEVEL 技術員級					
Draughtsman 繪圖員	2	-	-	-	2
Electrical Engineering Technician 電機工程技術員	30	-	1	-	32
Electronics/ Telecommunication Technician 電子／通訊技術員	26	-	1	-	27

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 Trainees by March 2010 估計 2010 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
TECHNICIAN LEVEL (Continued) 技術員級（續）					
Estimator 估計員	16	-	-	-	16
Mechanical Engineering Technician 機械工程技術員	172	2	4	2	176
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全督導員	13	-	1	-	14
Supervisor/Foreman 監督／管工	198	-	2	-	200
Sub-total 小計	457	2	9	2	467
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	23	-	-	-	23
Carpenter 木工	124	-	-	-	124
Crane Driver 起重機操作工	47	-	-	-	47
Electrician 電工	128	16	5	16	133
Mechanical Fitter 機械打磨裝配工	504	31	6	33	519
GRP-Worker 玻璃纖維工	18	-	-	-	18
Machinist 機床工	87	7	2	8	89
Marine Pipeworker 船舶喉管工	95	1	-	3	95
Painter 髹漆工	124	-	2	-	126
Rigger 索具工（喊吔工）	120	-	-	-	120

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 Trainees by March 2010 估計 2010 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級（續）					
Ship Classification Qualified Welder 船級協會認可焊接工	22	4	-	3	26
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工（鍋爐工、造船鋼板工、捻縫工／鐵工）	98	4	7	6	105
Welder 焊接技工	73	4	-	4	77
Sub-total 小計	1 463	67	22	73	1 502
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人					
Labourer 雜工	116	-	-	1	116
Semi-skilled Worker 半技術工人	91	-	4	1	95
Sub-total 小計	207	-	4	2	211
GRAND TOTAL 總　計	2 421	72	36	80	2 475

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

DISTRIBUTION OF EMPLOYEES BY MONTHLY INCOME RANGE
按每月收入幅度劃分的僱員人數分布情況

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	-	-	-	-	-	6	4	2	-
Marine Engineer 輪機工程師	-	-	-	-	5	12	20	59	2
Mechanical Engineer 機械工程師	-	-	-	-	-	2	26	-	1
Ship Designer/ Naval Architect 船舶設計師／造船工程師	-	-	-	-	-	1	3	17	-
Ship Repairs Manager/ Superintendent 船舶修理主管／船舶修理監督	-	-	-	-	4	9	27	69	1
Safety Officer 安全主任	-	-	-	-	4	6	6	8	-
Sub-total 小計	-	-	-	-	13	36	86	155	4
TECHNICIAN LEVEL 技術員級									
Draughtsman 繪圖員	-	-	-	1	-	1	-	-	-
Electrical Engineering Technician 電機工程技術員	-	-	-	6	4	20	-	-	-
Electronics/ Telecommunication Technician 電子／通訊技術員	-	-	5	-	7	14	-	-	-
Estimator 估計員	-	-	-	-	16	-	-	-	-
Mechanical Engineering Technician 機械工程技術員	5	-	16	93	12	45	-	-	1
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全監督	-	-	5	-	3	5	-	-	-
Supervisor/Foreman 監督／管工	-	-	6	39	48	104	1	-	-
Sub-total 小計	5	-	32	139	90	189	1	-	1

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	15	-	-	-	-	-
Carpenter 木工	-	5	36	78	5	-	-	-	-
Crane Driver 起重機操作工	-	-	31	16	-	-	-	-	-
Electrician 電工	-	5	48	73	2	-	-	-	-
Mechanical Fitter 機械打磨裝配工	5	10	170	239	15	35	-	-	30
GRP-Worker 玻璃纖維工	-	10	3	2	3	-	-	-	-
Machinist 機床工	-	-	57	26	4	-	-	-	-
Marine Pipeworker 船舶喉管工	-	10	24	56	5	-	-	-	-
Painter 髹漆工	-	25	9	77	13	-	-	-	-
Rigger 索具工（喊吔工）	-	-	8	111	1	-	-	-	-
Ship Classification Qualified Welder 船級協會認可焊接工	-	2	9	7	4	-	-	-	-
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工（鍋爐工、造船鋼板工、捻縫工／鐵工）	-	-	28	70	-	-	-	-	-
Welder 焊接工	-	-	15	58	-	-	-	-	-
Sub-total 小計	5	67	446	828	52	35	-	-	30
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人									
Labourer 雜工	21	34	61	-	-	-	-	-	-
Semi-skilled Worker 半技術工人	-	25	61	-	-	-	-	-	5
Sub-total 小計	21	59	122	-	-	-	-	-	5
GRAND TOTAL 總　計	31	126	600	967	155	260	87	155	40

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 Trainees by March 2010 估計 2010 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Electrical Engineer 電機工程師	22	-	-	-	22
Gas Engineer (Fuel Gas) 氣體工程師(氣體燃料)	153	-	-	-	154
Mechanical Engineer 機械工程師	62	-	-	-	62
Safety Officer 安全主任	9	-	-	-	9
Sub-total 小計	246	-	-	-	247
TECHNICIAN LEVEL 技術員級					
Electrical Engineering Technician 電機工程技術員	7	-	6	-	7
Gas Engineering Technician 氣體燃料工程技術員	342	-	-	-	340
Mechanical Engineering Technician 機械工程技術員	67	-	-	-	69
Assistant Safety Officer/Safety 助理安全主任／安全督導員	15	-	-	-	15
Supervisor/Chargehand 監督／管工	136	-	-	-	136
Sub-total 小計	567	-	6	-	567

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 Trainees by March 2010 估計 2010 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2010 估計 2010 年 3 月時的僱員人數
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Electrician/Electrical Fitter 電工／電氣打磨裝配工	27	1	-	1	27
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	9	-	-	-	9
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	209	21	-	21	209
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工（住宅式）	391	7	-	5	390
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工（非住宅式）	167	6	-	5	164
Mechanical Fitter 機械打磨裝配工	20	-	-	-	20
Welder 焊接技工	9	-	-	-	9
Sub-total 小計	832	35	-	32	828
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	-	-	-	16
Labourer 雜工	40	-	-	-	37
Semi-skilled Worker 半技術工	48	-	-	-	46
Vehicle Attendant/ Deliveryman (LPG Cyliner) 跟車／送貨員（石油氣瓶）	21	-	2	-	23
Sub-total 小計	125	-	2	-	122
GRAND TOTAL 總 計	1 770	35	8	32	1 764

THE GAS SECTOR
氣體燃料行業

DISTRIBUTION OF EMPLOYEES BY MONTHLY INCOME RANGE
按每月收入幅度劃分的僱員人數分布情況

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	-	3	8	-
Gas Engineer (Fuel Gas) 氣體工程師(氣體燃料)	-	-	-	-	32	4	101	16	-
Mechanical Engineer 機械工程師	-	-	-	-	-	3	59	-	-
Safety Officer 安全主任	-	-	-	-	-	-	9	-	-
Sub-total 小計	-	-	-	-	43	7	172	24	-
TECHNICIAN LEVEL 技術員級									
Electrical Engineering Technician 電機工程技術員	-	-	-	6	1	-	-	-	-
Gas Engineering Technician 氣體燃料工程技術員	-	-	13	297	22	10	-	-	-
Mechanical Engineering Technician 機械工程技術員	-	-	-	33	-	-	34	-	-
Assistant Saftey Officer Safety Supervisor 助理安全主任／安全監督	-	-	-	3	-	12	-	-	-
Supervisor/Chargehand 監督／管工	-	-	7	36	40	53	-	-	-
Sub-total 小計	-	-	20	375	63	75	34	-	-
TRADESMAN/CRAFTSMAN LEVEL 技工級									
Electrician/ Electrical Fitter 電工／電氣打磨裝配工	-	-	9	5	5	8	-	-	-
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	-	-	3	4	-	2	-	-	-
Gas Dsitribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	-	25	6	178	-	-	-	-	-

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 (Domestic) 氣體燃料用戶裝置技工（住宅式）	-	53	236	83	14	-	-	-	5
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工（非住宅式）	-	2	87	62	16	-	-	-	-
Mechanical Fitter 機械打磨裝配工	-	-	13	7	-	-	-	-	--
Welder 焊接技工	-	-	-	4	5	-	-	-	-
Sub-total 小計	-	80	354	343	40	10	-	-	5
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）	-	3	13	-	-	-	-	-	-
Labourer 雜工	-	30	10	-	-	-	-	-	-
Semi-skilled Worker 半技術工人		10	38	-	-	-	-	-	-
Vehicle Attendant/ Deliveryman (LPG Cylinder) 跟車／送貨員（石油氣瓶）	1	3	17	-		-	-	-	-
Sub-total 小計	1	46	78	-	-	-	-	-	-
GRAND TOTAL 總　計	1	126	452	718	146	92	206	24	5

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR
機 電 工 程 行 業

RECOMMENDED NUMBER OF TRAINEES
TO BE TAKEN ON ANNUALLY BETWEEN 2010 AND 2012
2010 年 至 2012 年 間
建 議 每 年 招 收 的 受 訓 者 人 數

Job Title 職 稱	No. of employees in March 2009 2009 年 3 月時的僱員人數	Recommended no. of trainees to be taken on annually from 2010 由 2010 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	804	28 – 34
Electrical Engineer 電機工程師	2 203	76 – 93
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	584	20 – 25
Mechanical Engineer 機械工程師	1 212	42 – 51
Plumbing and Drainage Engineer 水喉及渠務工程師	114	4 – 5
Lift/Escalator Engineer 升降機／自動梯工程師	237	8 – 10
Fire Services Engineer 消防設備工程師	355	12 – 15
Electronics Engineer 電子工程師	572	20 – 24
Control and Instrumentation Engineer 控制及儀器工程師	43	1 – 2
Engineering Manager 工程經理	1 104	38 – 46

Job Title 職 稱	No. of employees in March 2009 2009 年 3 月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2010 由 2010 年起建議 每年招收的受訓者人數
PROFESSIONAL/TECHNOLOGIST LEVEL (Continued) 專業人士／技師級 (續)		
Safety Officer 安全主任	141	5 – 6
Sub-total 小計	7 369	254 -311
TECHNICIAN LEVEL 技術員級		
Supervisor 監督	3 151	109 – 134
Building Services Technician 屋宇設備技術員	1 801	62 – 76
Draughtsman 繪圖員	538	19 – 23
Electrical Engineering Technician 電機工程技術員	1 853	64 – 79
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	926	32 – 39
Mechanical Engineering Technician 機械工程技術員	1 530	53 – 65
Lift/Escalator Technician 升降機／自動梯技術員	688	24 – 29
Fire Services Technician 消防設備技術員	319	11 – 14
Electrical Instrument and Meter Technician 電工儀器技術員	65	2 – 3
Electronics Technician 電子技術員	930	32 – 39
Telecommunication Technician 電訊技術員	758	26 – 32

Job Title 職 稱	No. of employees in March 2009 2009 年 3 月時的僱員人數	Recommended no. of trainees to be taken on annually from 2010 由 2010 年起建議每年招收的受訓者人數
TECHNICIAN LEVEL (Continued) 技術員級 (續)		
Office Equipment Service Technician 辦公室設備維修技術員	29	1 – 1
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	61	2 – 3
Sub-total 小計	12 649	437 – 537
TRADESMAN/CRAFTSMAN LEVEL 技工級		
Foreman/Chargehand 管工／領工	3 102	107 – 131
Building Services Mechanic 屋宇設備技工	1 381	48 – 58
Electrician/Electrical Fitter 電工／電氣打磨裝配工	8 946	308 – 377
Control Panel Assembler 控制板裝配工	10	-
Electrical Wireman 電氣佈線工	1 093	38 – 46
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	2 950	102 – 124
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	2 073	71 – 87
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Air System)/ Sheet Metal Worker 空調製冷設備技工(送風系統) ／簿片金屬構造工	582	20 – 25

Job Title 職 稱	No. of employees in March 2009 2009 年 3 月時的僱員人數	Recommended no. of trainees to be taken on annually from 2010 由 2010 年起建議每年招收的受訓者人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)		
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫) ／保溫技工	139	5 – 6
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	68	2 – 3
Plumber and Pipe Fitter 喉管工	452	16 – 19
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	2 993	103 – 126
Lift Mechanic 升降機技工	2 960	102 – 125
Escalator Mechanic 自動梯技工	4	-
Fire Services Electrical Fitter 消防電氣裝配工	702	24 -30
Fire Services Mechanical Fitter 消防機械裝配工	1 102	38 – 46
Cable Jointer (Power) 強電流電纜接駁技工	278	10 – 12
Overhead Linesman 架空電線技工	313	11 – 13
Electrical Appliances Service Mechanic 電器用具維修技工	567	19 – 24
Welder 焊接工	184	6 – 8
Carpenter 木工	162	6 – 7
Painter 髹漆工	76	3 – 3

Job Title 職 稱	No. of employees in March 2009 2009 年 3 月時的僱員人數	Recommended no. of trainees to be taken on annually from 2010 由 2010 年起建議每年招收的受訓者人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)		
AV and RF Mechanic 影音及射頻技工	280	10 – 12
Building Security System Mechanic 屋宇防盜系統技工	31	1 – 1
Communication System Mechanic 電訊系統裝配工	1 916	66 – 81
Sub-total 小計	32 364	1 116 – 1 364

Appendix 13
附錄 13

THE SHIPBUILDING AND SHIP REPAIR SECTOR
船 舶 修 建 工 程 行 業

RECOMMENDED NUMBER OF TRAINEES
TO BE TAKEN ON ANNUALLY BETWEEN 2010 AND 2012
2010 年 至 2012 年 間
建 議 每 年 招 收 的 受 訓 者 人 數

Job Title 職稱	No. of employees in March 2009 2009 年 3 月時的僱員人數	Recommended no. of trainees to be taken on annually from 2010 由 2010 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	12	1 – 1
Marine Engineer 輪機工程師	98	4 – 5
Mechanical Engineer 機械工程師	29	1 – 1
Ship Designer/Naval Architect 船舶設計師／造船工程師	21	1 – 1
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	110	4 – 6
Safety Officer 安全主任	24	1 – 1
Sub-total 小計	294	12 – 15
TECHNICIAN LEVEL 技術員級		
Draughtsman 繪圖員	2	-
Electrical Engineering Technician 電機工程技術員	30	1 – 1
Electronics/ Telecommunication Technician 電子／通訊技術員	26	1 – 1

Job Title 職稱	No. of employees in March 2009 2009 年 3 月時的僱員人數	Recommended no. of trainees to be taken on annually from 2010 由 2010 年起建議每年招收的受訓者人數
TECHNICIAN LEVEL (Continued) 技術員級（續）		
Estimator 估計員	16	1 – 1
Mechanical Engineering Technician 機械工程技術員	172	7 – 9
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全督導員	13	1 – 1
Supervisor/Foreman 監督／管工	198	8 – 10
Sub-total 小計	457	19 – 23
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	23	1 – 1
Carpenter 木工	124	5 – 6
Crane Driver 起重機操作工	47	2 – 2
Electrician 電工	128	5 – 7
Mechanical Fitter 機械打磨裝配工	504	21 – 25
GRP-Worker 玻璃纖維工	18	1 – 1
Machinist 機床工	87	4 – 5
Marine Pipeworker 船舶喉管工	95	4 – 5
Painter 髹漆工	124	5 – 6
Rigger 索具工（喊吔工）	120	5 – 6

Job Title 職稱	No. of employees in March 2009 2009 年 3 月時的僱員人數	Recommended no. of trainees to be taken on annually from 2010 由 2010 年起建議每年招收的受訓者人數
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級（續）		
Ship Classification Qualified Welder 船級協會認可焊接工	22	1 – 1
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工（鍋爐工、造船鋼板工、捻縫工／鐵工）	98	4 – 5
Welder 焊接技工	73	3 – 4
Sub-total 小計	1 463	61 – 74

THE GAS SECTOR
氣 體 燃 料 行 業

RECOMMENDED NUMBER OF TRAINEES TO BE TAKEN ON ANNUALLY BETWEEN 2010 AND 2012
2010 年 至 2012 年 間
建 議 每 年 招 收 的 受 訓 者 人 數

Job Title 職稱	No. of employees in March 2009 2009 年 3 月時的僱員人數	Recommended no. of trainees to be taken on annually from 2010 由 2010 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	22	1 – 1
Gas Engineer (Fuel Gas) 氣體工程師(氣體燃料)	153	4 – 5
Mechanical Engineer 機械工程師	62	2 – 2
Safety Officer 安全主任	9	-
Sub-total 小計	246	7 – 8
TECHNICIAN LEVEL 技術員級		
Electrical Engineering Technician 電機工程技術員	7	-
Gas Engineering Technician 氣體燃料工程技術員	342	10 – 11
Mechanical Engineering Technician 機械工程技術員	67	2 – 2
Assistant Safety Officer/Safety 助理安全主任/安全督導員	15	0 – 1
Supervisor/Chargehand 監督／管工	136	4 – 5
Sub-total 小計	567	16 – 19

Job Title 職稱	No. of employees in March 2009 2009 年 3 月時的僱員人數	Recommended no. of trainees to be taken on annually from 2010 由 2010 年起建議每年招收的受訓者人數
TRADESMAN/CRAFTSMAN LEVEL 技工級		
Electrician/Electrical Fitter 電工／電氣打磨裝配工	27	1 – 1
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	9	-
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	209	6 – 7
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工（住宅式）	391	11 – 13
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工（非住宅式）	167	4 – 6
Mechanical Fitter 機械打磨裝配工	20	1 – 1
Welder 焊接技工	9	-
Sub-total 小計	832	23 - 28

CONFIDENTIAL WHEN ENTERED WITH DATA	填入數據後即成 **機密文件**

VOCATIONAL TRAINING COUNCIL
職業訓練局

THE 2009 MANPOWER SURVEY OF THE ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機電工程業2009年人力調查

QUESTIONNAIRE
調查表

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

160

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

NAME OF ESTABLISHMENT: _____ ADDRESS: _____
機構名稱 地址

TYPE OF SERVICE: _____ TOTAL NO. OF PERSONS ENGAGED: _____
服務性質 僱員總數

NAME OF PERSON TO CONTACT: _____ POSITION: _____
聯絡人姓名 (28–47) 職位

TEL. NO.: _____ - _____ FAX NO.: _____
電話 (48–55 / 56–63) 圖文傳真

E-MAIL: _____
電郵 (64–98)

VTC-EM-09

	(A) Principal Jobs 主要職務			(B) Average Monthly Income 每月平均收入	(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	(G) Forecast of No. of Trainees 12 Months from Now 預計12個月後受訓者人數
	Title 職稱 (See Appendix D) (參閱附錄D)	Rec. Type	Job Code 職位編號	Code* 編號					
	For Official Use Only 此欄毋須填寫 →		8-10	11	12-15	16-19	20-22	23-25	26-28
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	Plumbing and Drainage Engineer (水喉及渠務工程師)	2	1 0 5						
6	Lift ／ Escalator Engineer (升降機／自動梯工程師)	2	1 0 6						
7	Fire Services Engineer (消防設備工程師)	2	1 0 7						
8	Electronics Engineer (電子工程師)	2	1 0 8						
9	Control and Instrumentation Engineer (控制及儀器工程師)	2	1 0 9						
10	Engineering Manager (工程經理)	2	1 1 0						
11	Safety Officer (安全主任)	2	1 1 1						
12	Supervisor (監督)	2	2 0 1						
13	Building Services Technician (屋宇設備技術員)	2	2 0 2						
14	Draughtsman (繪圖員)	2	2 0 3						
15	Electrical Engineering Technician (電機工程技術員)	2	2 0 4						
16	Refrigeration/ Air-conditioning/ Ventilation Technician (冷凝／空氣調節／通風設備技術員)	2	2 0 5						

* Enter in column (B) the employee's average monthly income range according to the following codes:
請將僱員每月平均收入幅度按照下列編號填入（B）欄內：

Average Monthly Income Range 每月平均收入幅度	Code 編號
$6,000 or below 或以下	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 The term 'trainees' includes all trainees receiving any form of training and apprentices under a contract of apprenticeship.

附註一 「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。

17	Mechanical Engineering Technician (機械工程技術員)	2	2 0 6							
18	Lift/Escalator Technician (升降機／自動梯技術員)	2	2 0 7							
19	Fire Services Technician (消防設備技術員)	2	2 0 8							
20	Electrical Instrument and Meter Technician (電工儀器技術員)	2	2 0 9							
21	Electronics Technician (電子技術員)	2	2 1 0							
22	Telecommunication Technician (電訊技術員)	2	2 1 1							
23	Office Equipment Service Technician (辦公室設備維修技術員)	2	2 1 2							
24	Assistant Safety Officer/Safety Supervisor (助理安全主任／安全督導員)	2	2 1 3							
25	Foreman/Chargehand (管工／領工)	2	3 0 1							
26	Building Services Mechanic (屋宇設備技工)	2	3 0 2							
27	Electrician/Electrical Fitter (電工／電氣打磨裝配工)	2	3 0 3							
28	Control Panel Assembler (控制板裝配工)	2	3 0 4							
29	Electrical Wireman (電氣佈線工)	2	3 0 5							
30	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) (空調製冷設備技工(電力控制))	2	3 0 6							
31	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) (空調製冷設備技工(獨立系統))	2	3 0 7							
32	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Air System)/ Sheet Metal Worker (空調製冷設備技工(送風系統)/薄片金屬構造工)	2	3 0 8							
33	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman (空調製冷設備技工(保溫)/保溫技工)	2	3 0 9							
34	Refrigeration/ Air-conditioning/Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	2	3 1 0							
35	Plumber and Pipe Fitter (喉管工)	2	3 1 1							
36	Mechanical Fitter/ Machinist (機械打磨裝配工／機床工)	2	3 1 2							
37	Lift Mechanic (升降機技工)	2	3 1 3							
38	Escalator Mechanic (自動梯技工)	2	3 1 4							
39	Fire Services Electrical Fitter (消防電氣裝配工)	2	3 1 5							
40	Fire Services Mechanical Fitter (消防機械裝配工)	2	3 1 6							

	(A) Principal Jobs 主要職務			(B) Average Monthly Income 每月平均收入	(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	(G) Forecast of No. of Trainees 12 Months from Now 預計12個月後受訓者人數
	Title 職稱 (See Appendix D) (參閱附錄D)	Rec. Type	Job Code 職位編號	Code* 編號					
	For Official Use Only 此欄毋須填寫 →		8-10	11	12-15	16-19	20-22	23-25	26-28
41	Cable Jointer (Power) (強電流電纜接駁工)	2	3 1 7						
42	Overhead Linesman (架空電線技工)	2	3 1 8						
43	Electrical Appliances Service Mechanic (電器用具服務技工)	2	3 1 9						
44	Welder (銲接工)	2	3 2 0						
45	Carpenter (木工)	2	3 2 1						
46	Painter (髹漆工)	2	3 2 2						
47	AV and RF Mechanic (影音及射頻技工)	2	3 2 3						
48	Building Security System Mechanic (屋宇防盜系統技工)	2	3 2 4						
49	Communication System Mechanic (電訊系統裝配工)	2	3 2 5						
50	Labourer (雜工)	2	4 0 1						
51	Semi-skilled Worker (半技術工)	2	4 0 2						
52		2							
53		2							
54		2							
55		2							

* Enter in column (B) the employee's average monthly income range according to the following codes:
請將僱員每月平均收入幅度按照下列編號填入（B）欄內：

Average Monthly Income Range 每月平均收入幅度	Code 編號
$6,000 or below 或以下	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 The term 'trainees' includes all trainees receiving any form of training and apprentices under a contract of apprenticeship.

附註一 「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。

56		2								
57		2								
58		2								
59		2								
60		2								
61		2								
62		2								
63		2								
64		2								
65		2								
66		2								
67		2								
68		2								
69		2								
70		2								
71		2								
72		2								
73		2								
74		2								
75		2								
76		2								
77		2								
78		2								
79		2								
80		2								

The 2009 Manpower Survey of the Electrical and Mechanical Services Industry
機電工程業 2009 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 'G') 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 'G'），並在貴機構不適用的欄內填寫零（0）。

3. For general definition of job levels, please refer to Appendix C. For detailed job descriptions, please refer to Appendix D.
有關技能等級的一般定義請參閱附錄 C。有關詳細的工作說明，請參閱附錄 D。

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 D.
   請瀏覽 'A' 欄，選取適用於貴機構的職稱。有關詳細的工作說明，請參閱附錄 D。

   (b) Please add in column 'A' titles of any technical jobs not mentioned in job descriptions, briefly describe them and indicate their skill levels.
   如貴機構另有技術性職稱未載於工作說明，請一併填入 'A' 欄內，並扼要說明其工作性質及技能等級。

(c) Please classify an employee according to his/her main duty irrespective of any additional secondary duties he/she may be required to perform (e.g. a technician, who works mainly as an electrical engineering technician but is also required to perform the work of a draughtsman occasionally, should be classified as an electrical engineering technician 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爲電機工程技術員，但間中亦須擔任繪圖員的工作，則應歸類爲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 110)
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，請將此等人員歸類爲工程經理。（請參閱工作編號 110 的工作說明）。

5. Average Monthly Income Range of Employees - Column 'B'
僱員每月平均收入幅度 —— 'B' 欄

Please enter into this column the code of the average 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平均收入幅度的編號，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. Forecast of Number of Trainees 12 Months from Now – Column "G"
預計十二個月後受訓者人數——"G" 欄

The forecast of number of trainees means the number of employees undergoing training 12 months from now.
預計的受訓者人數指貴機構於十二個月後的受訓者總數。

11. Example
例子

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

Example 例子

	(A) Principal Jobs 主要職務 Title 職稱 (See Appendix D) (參閱附錄D)	Rec. Type	Job Code 職位編號	(B) Average Monthly Income 每月平均收入 Code* 編號	(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	(G) Forecast of No. of Trainees 12 Months from Now 預計12個月後受訓者人數
	For Official Use Only 此欄毋須填寫 →		8-10	11	12-15	16-19	20-22	23-25	26-28
1	Building Services Engineer（屋宇設備工程師）	2	1 0 1	8	2	2	0	1	0
2	Electrical Engineer（電機工程師）	2	1 0 2	7	3	5	1	1	1
12	Supervisor（監督）	2	2 0 1	6	6	7	0	0	2
13	Building Services Technician（屋宇設備技術員）	2	2 0 2	5	4	4	0	1	3
14	Draughtsman（繪圖員）	2	2 0 3	4	2	2	0	1	3
15	Electrical Engineering Technician（電機工程技術員）	2	2 0 4	5	6	8	1	2	1
26	Building Services Mechanic（屋宇設備技工）	2	3 0 2	4	1 0	1 1	1	1	1
27	Electrician/Electrical Fitter（電工／電氣打磨裝配工）	2	3 0 3	4	1 5	1 8	1	4	1
50	Labourer（雜工）	2	4 0 1	2	2	1	0	0	0
51	Semi-skilled Worker（半技術工）	2	4 0 2	2	6	6	0	0	0

* Enter in column (B) the employee's average monthly income range according to the following codes:
請將僱員每月平均收入幅度按照下列編號填入（B）欄內：

Average Monthly Income Range 每月平均收入幅度	Code 編號
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$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 The term 'trainees' includes all trainees receiving any form of training and apprentices under a contract of apprenticeship.

附註一 「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。

General Definition of Job Levels
in the Electrical & Mechanical Services Industry
機電工程業各技能等級的一般定義

Professionals/Technologists
專業人士／技師

A professional/technologist is a person who has the qualification and experience equivalent to that 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 judgment, to keep abreast of technology, to apply the latest techniques and to supervise/develop his sub-ordinates.
要成爲專業人士／技師，須具備相當於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。

Technicians
技術員

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.
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。

Tradesmen/Craftsmen
技工

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.
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。

Semi-skilled/General Workers
半技術工人／普通工人

Semi-skilled/general workers are normally assigned to repetitive work requiring only a narrow range of skills and short period of training.
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。

Appendix 15D
附錄 15D
(E&M)

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	Designs and advises on building services facilities in buildings. Plans, supervises and coordinates their installation, testing, maintenance and repair. 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。
102	Electrical Engineer 電機工程師	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. 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。
103	Refrigeration/ Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	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. 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項冷凝、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。
104	Mechanical Engineer 機械工程師	Researches into mechanical engineering problems; designs and advises on mechanical plant and equipment; plans and supervises their development, manufacture, construction, installation, operation, maintenance and repair. 研究機械工程問題；設計機械裝置及設備，並就該方面提供意見；策劃及管理其發展、製造、建造、安裝、操作、保養及修理。

Code 編號	Job Title 職稱	Job Description 工作說明
PROFESSIONAL/TECHNOLOGIST (Continued)　專業人士／技師（續）		
105	Plumbing and Drainage Engineer 水喉及渠務工程師	Researches into pluming and drainage engineering problems; designs and advises on pluming and drainage plant and equipment; plans and supervises their development, manufacture, construction, installation, operation, maintenance and repair. 研究水喉及渠務工程問題；設計水喉及渠務裝置和設備，並就該方面提供意見；策劃及管理其發展、製造、建造、安裝、操作、保養及修理。
106	Lift/Escalator Engineer 升降機／自動梯工程師	Researches into electrical and mechanical engineering problems related to lift and escalator systems; designs and advises on mechanical and electrical equipment for lift and escalator systems; plans and supervises their development, manufacture, construction, installation, operation, maintenance and repair. 研究有關升降機和自動梯系統的電機及機械工程問題；設計升降機和自動梯系統的機械及電機設備，並就該方面提供意見；策劃及管理其發展、製造、建造、安裝、操作、保養及修理。
107	Fire Services Engineer 消防設備工程師	Researches into fire service problems; designs and advises on fire services systems and equipment; and plans and supervises their development, construction, manufacture, installation, operation, maintenance and repair. 研究消防設備問題；設計消防系統及設備，並就該方面提供意見；策劃及管理其發展、建造、製造、安裝、操作、保養及修理。
108	Electronics Engineer 電子工程師	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. 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。
109	Control and Instrumentation Engineer 控制及儀器工程師	Designs and advises on electrical and mechanical measuring, control and test instruments; and plans and supervises their development, construction, installation, operation and maintenance. 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。

Code 編號	Job Title 職稱	Job Description 工作說明
PROFESSIONAL/TECHNOLOGIST (Continued)　專業人士／技師（續）		
110	Engineering Manager 工程經理	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. 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運作，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。
111	Safety Officer 安全主任	Assists the employer of a workplace or a construction site in promoting the safety and health of persons employed therein, including the inspection of workplace, plants, equipment or works processes to identify any risks and to advise on preventive measures; investigates accidents and dangerous occurrences and makes recommendations to prevent similar accidents. 協助工作場所或建築地盤的東主從事促進僱員安全及健康的工作，包括視察廠房、設備或一般鑒別工作危險的程序，並就預防措施提供意見；調查意外及危險事故的成因，並就如何避免發生同類意外提供意見。
TECHNICIAN　技術員		
201	Supervisor 監督	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. 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。
202	Building Services Technician 屋宇設備技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, installation, operation, maintenance and repair of building services systems and equipment. Assists to plan, coordinate and supervise their projects. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、安裝、操作、保養及修理屋宇裝置及設備。並協助工程師策劃、協調及管理有關計劃。

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

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued)		技術員（續）
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、測試及校準電錶及電工儀器。
210	Electronics Technician 電子技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, construction, installation, operation, maintenance and repair of electronic devices and equipment other than telecommunication systems. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、建造、安裝、操作、保養及修理電子裝置及設備（電訊系統除外）。
211	Telecommunication Technician 電訊技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, installation, operation, maintenance and repair of telecommunication systems and equipment. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、安裝、操作、保養及修理電訊系統及設備。
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。

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued)		技術員（續）
213	Assistant Safety Officer/Safety Supervisor 助理安全主任／ 安全督導員	Assists the employer and Safety Officer, where appropriate, in promoting safety and health of persons employed in a workplace or a construction site. Advises employee on safety standards, and supervises the observance of such standards for the promotion of safety at work. Implementing industrial safety training. 協助東主及安全主任，從事促進工作場所或建築地盤僱員的安全及健康工作；向員工提供有關安全標準的意見，並監督這些標準的切實執行，以促進工作安全。推行工業安全訓練。
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 other than refrigeration/air-conditioning/ventilation electrical control, low voltage switchboards and control panels. 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（控制板及空調製冷設備電力控制除外）。
304	Control Panel Assembler 控制板裝配工	Fits, assembles, installs and repairs low voltage switchboards and control panels, for electrical plants and equipment. 裝配、組合、安裝及修理用於電氣裝置及設備的低電壓電線制箱及控制板。
305	Electrical Wireman 電氣佈線工	Installs and lays wiring for electrical systems and equipment. 安裝和敷設用於電氣裝置及設備的電線。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued)　技工（續）		
306	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工 (電力控制)	Fits, assembles, installs, commissions, maintains and repairs electrical control for: (a) air-conditioning systems including refrigerating, air-handling and ventilation equipment; (b) cold stores, ice-making and other refrigerating equipment; (c) air-conditioning and ventilation equipment forming part of fire services systems. 裝配、組合、安裝、試動、保養和修理用於下列設備的電力控制： (a) 空調系統，包括冷凝、空氣處理及通風設備； (b) 冷藏庫、製冰及其他冷凝設備； (c) 與消防系統有關連的空調系統及通風設備等。
307	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工 (獨立系統)	Fits, assembles, installs, commissions, maintains and repairs: (a) unitary air-conditioning systems including refrigerating, air-handling and ventilation equipment; (b) unitary cold stores, ice-making and other refrigerating equipment. 裝配、組合、安裝、試動、保養和修理： (a) 獨立安裝的空調系統和通風設備； (b) 獨立安裝的冷藏庫、製冰及其他冷凝設備。
308	Refrigeration/ Air-conditioning/ Ventilation Mechanic(Air System)/ Sheet Metal Worker 空調製冷設備技工 (送風系統)/薄片金屬構造工	Fabricates, installs and repairs sheet metal assemblies and products (including ventilation ducting, dampers, fire resistant board and fittings). 製造、裝置及修理薄片金屬組合及製品(包括通風槽，風閘，防火板及有關裝置)。
309	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工 (保溫)/保溫技工	Prepares, fits, fixes and repairs thermal insulations of air-conditioning and refrigeration plants. 準備、裝配、設置和修理空氣調節及冷凝裝置的保溫設備。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued)　技工（續）		
310	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	Fits, assembles, installs, commissions, maintains and repairs water systems for air-conditioning systems (including air-handling and water condensing equipment). 裝配、組合、安裝、試動、保養和修理用於空調系統(包括空氣處理及水冷凝設備)的水系統。
311	Plumber and Pipe Fitter 喉管工	Assembles, installs and maintains pipes, fittings and fixtures for conveying gases and liquids other than refrigeration, air-conditioning, ventilation and 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（消防及空調製冷設備喉管除外）。
312	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。
313	Lift Mechanic 升降機技工	Installs, adjusts, services, maintains and repairs various types of lifts. 安裝、校正、檢修、保養及修理各類升降機設備。
314	Escalator Mechanic 自動梯技工	Installs, adjusts, services, maintains and repairs various types of escalators. 安裝、校正、檢修、保養及修理各類自動梯設備。
315	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。
316	Fire Services Mechanical Fitter 消防機械裝配工	Installs, tests, maintains, repairs and inspects fire services piping systems and mechanical parts of fire services systems. 安裝、測試、保養、修理及查驗消防設備喉管及消防系統機械設備。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued)　技工（續）		
317	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。
318	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。
319	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）。
320	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。
321	Carpenter 木工	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。
322	Painter 髹漆工	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。
323	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。
324	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。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued) 技工（續）		
325	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 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	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. 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。
172	Gas Engineer (Fuel Gas) 氣體工程師 （氣體燃料）	Designs and advises on supply or utilization of gas. Plans, supervises and coordinates their development, construction, installation, operation, maintenance and repair. 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。
173	Mechanical Engineer 機械工程師	Designs and advises on mechanical equipment of fuel gas production plant; and plans and supervises their development, construction, installation, operation, maintenance and repair. 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。
174	Safety Officer 安全主任	Assists the employer of a workplace in promoting the safety and health of persons employed therein, including the inspection of workplace, plants, equipment or works processes to identify any risks and to advise on preventive measures; investigates accidents and dangerous occurrences and makes recommendations to prevent similar accidents. 協助工作場所的東主從事促進僱員安全及健康的工作，包括視察廠房、設備或一般鑒別工作危險的程序，並就預防措施提供意見；調查意外及危險事故的成因，並就如何避免發生同類意外提供意見。

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN 技術員		
271	Electrical Engineering Technician 電機工程技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, manufacture, installation, operation, maintenance and repair of electrical systems and equipment. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、製造、安裝、操作、保養及修理電機裝置及設備。
272	Gas Engineering Technician 氣體燃料工程技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, installation, operation, maintenance and repair of equipment concerned with the supply or utilization of gas. Assists to plan, coordinate and supervise their projects. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、安裝、操作、保養及修理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。
273	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。
274	Assistant Safety Officer/Safety Supervisor 助理安全主任／ 安全督導員	Assists the employer and Safety Officer, where appropriate, in promoting safety and health of persons employed in a workplace. Advises employee on safety standards, and supervises the observance of such standards for the promotion of safety at work. Implementing industrial safety training. 協助東主及安全主任，從事促進工作場所僱員的安全及健康工作；向員工提供有關安全標準的意見，並監督這些標準的切實執行，以促進工作安全。推行工業安全訓練。

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

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

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	(A) Shipping Company: Organises and directs the repair and maintenance of ships; acts as company consultant on design, technical, cost and related matters. (B) Dockyard/Shipyard: Organises and directs the building, repair and maintenance; discusses and negotiates with owner's representatives on design, technical, cost and related matters. (甲) 船務工程公司方面的工作： 策劃與指導船舶的維修及保養；在設計、技術、成本及有關事宜方面擔任公司顧問。 (乙) 船廠方面的工作： 策劃與指導建造、維修及保養工作；就設計、技術、成本及有關事宜與船東代表研討及洽商。
156	Safety Officer 安全主任	Assists the employer of a workplace in promoting the safety and health of persons employed therein, including the inspection of workplace, plants, equipment or works processes to identify any risks and to advise on preventive measures; investigates accidents and dangerous occurrences and makes recommendations to prevent similar accidents. 協助工作場所的東主從事促進僱員安全及健康的工作，包括視察廠房、設備或一般鑒別工作危險的程序，並就預防措施提供意見；調查意外及危險事故的成因，並就如何避免發生同類意外提供意見。
TECHNICIAN 技術員		
251	Draughtsman 繪圖員	Prepares structural, layout, detail and assembly drawings or circuit diagrams for the maintenance and repair of plants, equipment and ship structures. 繪製結構圖、配置圖、明細圖、裝配圖或線路圖，用以保養及維修船隻結構，船上裝置及設備。

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued) 技術員（續）		
252	Electrical Engineering Technician 電機工程技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, installation, operation, maintenance and repair of electrical systems and equipment. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、安裝、操作、保養及修理電機裝置及設備。
253	Electronics/ Telecommunication Technician 電子／通訊技術員	Carries out installation and repairing of marine electronic/telecommunication equipment. 安裝及修理船用電子／通訊設備。
254	Estimator 估計員	Obtains basic data and sets up detailed cost sheets for materials, overhead and labour in the preparation of tenders for shipbuilding and ship repair work; takes off quantities for work. 獲取基本資料，並詳細開列工料成本及雜項開支，以備競投船舶建造與修理工程之用。計算工程進度。
255	Mechanical Engineering Technician 機械工程技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, construction, installation, efficient operation, maintenance and repair of mechanical plant and equipment. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、建造、安裝、有效操作、保養及修理機械裝置及設備。
256	Assistant Safety Officer/Safety Supervisor 助理安全主任／ 安全督導員	Assists the employer and Safety Officer, where appropriate, in promoting safety and health of persons employed in a workplace. Advises employee on safety standards, and supervises the observance of such standards for the promotion of safety at work. Implementing industrial safety training. 協助東主及安全主任，從事促進工作場所僱員的安全及健康工作；向員工提供有關安全標準的意見，並監督這些標準的切實執行，以促進工作安全。推行工業安全訓練。
257	Supervisor/Foreman 監督／管工	Controls groups or teams of craftsmen or other workers. 管理若干組或若干隊技工或其他工人。

Code 編號	Job Title 職稱	Job Description 工作說明
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。
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。

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