

# 2011 Manpower Survey Report

## Electrical And Mechanical Services Industry

### 機電工程業

### 2011 年人力調查報告

Electrical And Mechanical Services Training Board

Vocational Training Council

職業訓練局

機電工程業訓練委員會



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Executive Summary of the  
Report on the 2011 Manpower Survey  
of the Electrical and Mechanical Services Industry

Objective

This survey was conducted between 14<sup>th</sup> March and 13<sup>th</sup> August 2011 to collect the latest manpower information of the electrical and mechanical services industry.

Coverage

2. The fieldwork of the manpower survey covered 1 173 establishments which were selected by a stratified random sampling method from a total of 9 144 establishments. These samples employed about 82% of the total workforce in the following sectors 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 including:

- (i) electrical wiring and fitting;
- (ii) air-conditioning/ventilation systems installation and maintenance;
- (iii) fire-alarm and fire-fighting equipment installation and maintenance.

Branch 2: Electrical Fitting with Water Plumbing Branch

- (i) Engineering companies of electrical fitting with water plumbing.

Branch 3: Servicing (E & M) Branch

Servicing companies of electrical and mechanical engineering services including:

- (i) lift/escalator installation and maintenance;
- (ii) telecommunications equipment, installation and maintenance;

- (iii) combined and other installation and maintenance of electrical and mechanical equipment;
- (iv) aircraft assembly and manufacture of related machinery;
- (v) electrical power generation, transmission and distribution;
- (vi) railways and cable transport;
- (vii) building services engineering;
- (viii) repair of electrical equipment; and
- (ix) repair of household appliances, home and garden equipment.

Branch 4: Supplementary Samples – Other Relevant Organizations in E & M Engineering Sector

Other relevant organizations in the electrical and mechanical engineering sector including:

- (i) major trading companies of electrical products, equipment and systems having associated service workshops;
- (ii) real estate management companies which have building services maintenance workers; and
- (iii) relevant divisions of government departments and educational institutions.

II. Sector B: Shipbuilding and Ship Repair

Branch 5: Shipyards and Boatyards, including:

- (i) building of ships and floating structures;
- (ii) building of pleasure and sporting boats; and
- (iii) repair of water transport equipment.

Branch 6: Supplementary Samples

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:

Branch 7: Gas manufacturing and distribution companies;

Branch 8: Gas installation and maintenance companies;

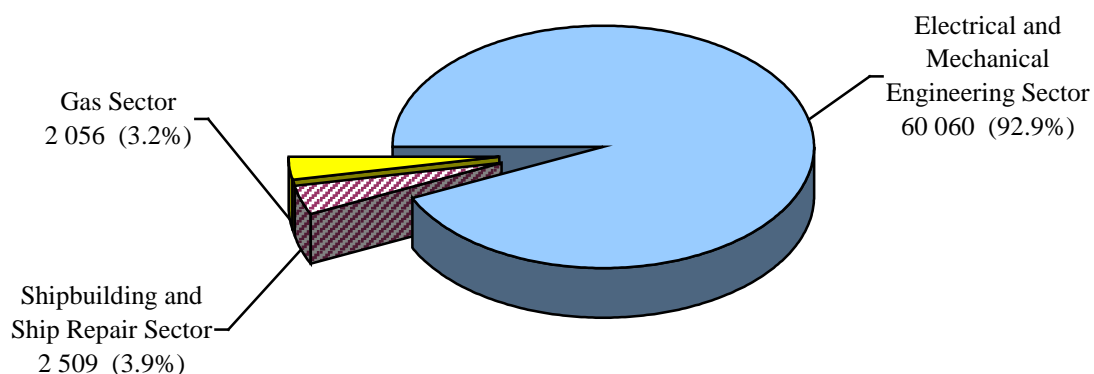
Branch 9: Supplementary Samples.

Trading companies of gas equipment having associated servicing workshops, and relevant divisions of government departments and educational institutions.

#### Survey Findings

3. The Survey revealed that at the time of survey, a total of 64 625 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 64 625 workers, 60 060 workers (92.9%) were employed in the electrical and mechanical engineering sector, 2 509 workers (3.9%) in the shipbuilding and ship repair sector, and 2 056 workers (3.2%) 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 29 284 workers of other disciplines working in the electrical and mechanical services industry. Among the 29 284 workers, 24 502 workers were employed in the electrical and mechanical engineering sector, 2 611 workers in the shipbuilding and ship repair sector and 2 171 workers in the gas sector. As a whole, the electrical and mechanical services industry employed a total of 93 909 workers at the time of the survey.

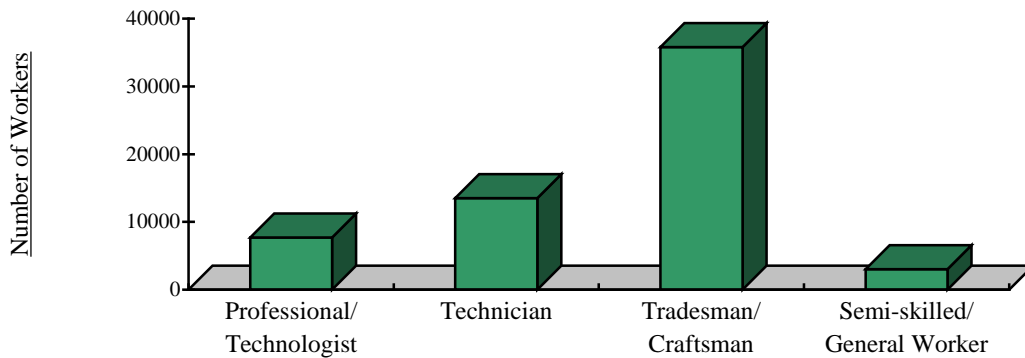
Electrical and Mechanical Engineering Sector

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

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

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	7 720	13 512	35 816	3 012	60 060
Percentage of total number of workers	12.9%	22.5%	59.6%	5.0%	100%

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



6. Employers in the electrical and mechanical engineering sector reported a total of 2 629 trainees and 2 344 vacancies, amounting to 4.4% and 3.9% respectively of the total manpower. Besides, employers forecasted that the sector would require a total of 62 170 technical workers by March 2012.

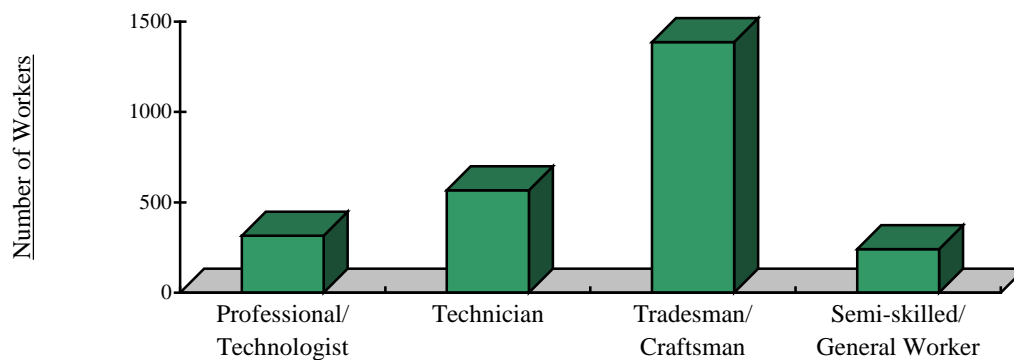
## Shipbuilding and Ship Repair Sector

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

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

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	315	566	1 387	241	2 509
Percentage of total number of workers	12.5%	22.6%	55.3%	9.6%	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 33 and 116 respectively which represented 1.3% and 4.6% of the total number of workers. Employers anticipated that by March 2012, the number of technical workers would be 2 624.

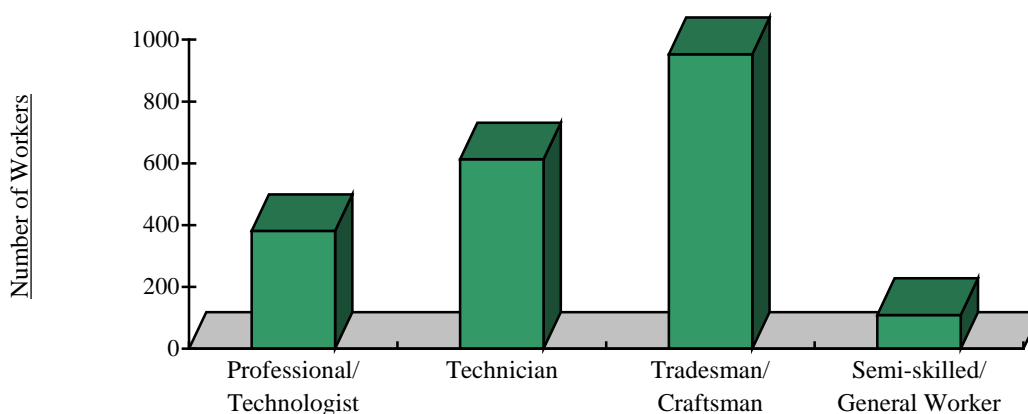
## Gas Sector

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

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

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	381	613	953	109	2 056
Percentage of total number of workers	18.5%	29.8%	46.4%	5.3%	100%

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



10. At the time of the survey, there were 101 trainees and 23 vacancies in the gas sector, representing 4.9% and 1.1% of the total manpower. Employers forecasted that the total workforce by March 2012 would be 2 088.

## Projected Manpower Training Requirements

### Electrical and Mechanical Engineering Sector

11. The survey findings showed a noticeable increase of 3.4% per annum in the overall technical manpower of electrical/mechanical engineering and related disciplines from year 2009 to 2011. By skill level, the average change per annum was 2.4% increase in professional/technologist, 3.4% increase in technician, 5.3% increase in tradesman/craftsman and 11.2% decrease in semi-skilled/general worker.

12. As the progress of major infrastructure projects has been picking up, the survey found a significant increase in the number of trainees and vacancies during the past two years, particularly in the tradesman/craftsman level. The Training Board anticipates that the trend will continue, at least in the coming five years. 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 2012 to 2014 as shown in Table 4.

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

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements 2012 – 2014</u>
Professional/Technologist	7 720	318 – 389
Technician	13 512	514 – 629
Tradesman/Craftsman	35 816	2 285 – 2 792

### Shipbuilding and Ship Repair Sector

13. The survey revealed that from year 2009 to 2011, the overall technical manpower of this sector had a slight increase of 1.8% per annum. The average change per annum by skill level was 3.6% increase in professional/technologist, 12% increase in technician, 2.6% decrease in tradesman/craftsman and 8.2% increase in semi-skilled/general worker.

14. The Training Board expects that the manpower requirements will remain stable in the coming years. Based on past and present survey data, the Training Board has projected the average annual training requirements of E & M manpower for this sector from 2012 to 2014 as shown in Table 5.

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

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements 2012 – 2014</u>
Professional/Technologist	315	22 – 27
Technician	566	40 – 49
Tradesman/Craftsman	1 387	98 – 120

Gas Sector

15. The survey reflected that the overall employment of the gas sector had an obvious increase of 8.1% per annum in the past two years. By skill level, the average change per annum was 27.4% increase in professional/technologist, 4.1% increase in technician, 7.3% increase in tradesman/craftsman and 6.4% decrease in semi-skilled/general worker. The dramatic increase in professional/technologist should be read with caution as it was discovered that in the last round of survey, some 100 workers at this skill level might have been neglected by the respondents in their completed questionnaires.

16. The Training Board anticipates that the demand for technical workers in the gas sector will maintain a mild growth in the coming years. The Training Board has projected the average annual training requirements for year 2012 to 2014 as shown in Table 6.

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

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements 2012 – 2014</u>
Professional/Technologist	381	15 – 19
Technician	613	25 – 30
Tradesman/Craftsman	953	39 – 47



## Major Conclusions and Recommendations

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

- (a) **Business Outlook**

The demand of E&M workers, especially in the contracting branch of the E&M engineering sector is expected to grow significantly from 2012 onward when the construction works of major infrastructure projects will be completed one by one.
- (b) **Training of Professionals/Technologists**

The supply of local university graduates in 2011 to 2013, supplemented with overseas graduates and technicians upgraded through part-time degree programmes meet the projected training requirements of major disciplines of the E&M services industry.
- (c) **Training of Technicians**

The output of graduates from technician level courses offered by local universities, Hong Kong Institute of Vocational Education and Youth College in major disciplines of the E&M services industry will be greater than the projected training requirements for 2011 to 2013. Given that some of these graduates will join other industry sectors (e.g. construction), the manpower supply is considered as matching with the market demand.
- (d) **Training of Tradesmen/Craftsmen**
  - (i) The supply of tradesman/craftsman through formal training programmes in 2011 to 2013 can only meet about 23% of the demand from the E&M engineering sector and the shipbuilding and ship repair sector. Although some semi-skilled/general workers can upgrade themselves to the tradesman/craftsman level by means of on-the-job training / skills upgrading training or passing relevant trade tests, the supply is still considered as far from adequate for supporting the major infrastructure projects in the coming few years.
  - (ii) The training capacities of pre-employment training programmes should be increased and more skills upgrading courses should be offered to in-service semi-skilled workers so that they can upgrade to tradesmen/craftsmen. Anyway, training providers should consider recent years' enrolment and employment rates when planning their training capacity.
- (e) **Training of Semi-skilled/General Workers**

In view of the manpower shortage in the coming few years, more semi-skilled/general workers should be trained up via retraining programmes and /or short courses in order to relieve the workload of tradesmen/craftsmen. To boost the enrolment rate of retraining programmes, more attractive incentive/subsidizing schemes should be introduced.

- (f) Trade Tests  
E&M workers should be encouraged to take trade tests recognized by the Government.
  
- (g) Registration of Construction Workers  
Employers should encourage their E&M workers working in construction site to register as qualified workers under the Construction Workers Registration Ordinance.

# 機電工程業

## 2011年人力調查報告摘要

### 目的

是次調查於2011年3月14日至8月13日期間進行，旨在蒐集機電工程業的最新人力資料。

### 調查範圍

2. 調查採用分層隨機抽樣法，從合共9 144間機構中抽選出1 173間作為調查對象。這些抽樣機構的僱員人數，約佔機電工程業總人力的82%，分屬下列行業：

#### I. 行業 A：機電工程

##### 門類 I：承造

負責下列機電系統及設備的承造商：

- (i) 電線鋪設及電器裝設；
- (ii) 空氣調節／通風系統安裝及保養；
- (iii) 火警及滅火設備安裝及保養。

##### 門類 II：水電工程

- (i) 電器裝設兼水管鋪設。

##### 門類 III：服務

提供下列機電工程服務的機構：

- (i) 升降機／自動梯安裝及保養；
- (ii) 電訊設備安裝及保養；
- (iii) 綜合及其他電器及機械設備安裝及保養；
- (iv) 飛行器裝嵌及相關機械的製造；
- (v) 發電、輸電及配電；

- (vi) 鐵路及纜索運輸；
- (vii) 屋宇設備工程服務；
- (viii) 電力設備維修；以及
- (ix) 家用器具及庭園設備修理。

門類 IV：補充抽樣－其他與機電工程行業相關之機構

包括下列與機電工程行業相關之機構

- (i) 專營電氣產品、設備與系統，並設有維修服務工場的主要貿易公司；
- (ii) 聘有屋宇設備保養人員的物業管理公司；以及
- (iii) 有關政府部門及教育機構。

## II. 行業 B：船舶修建

門類 V：包括下列船廠及艇廠：

- (i) 船舶及浮動結構體的製造；
- (ii) 娛樂及運動用小艇的製造；以及
- (iii) 海上運輸設備維修。

門類 VI：補充抽樣

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：

門類 VII：燃氣製造及配送公司；

門類 VIII：燃氣供應系統安裝及保養公司；

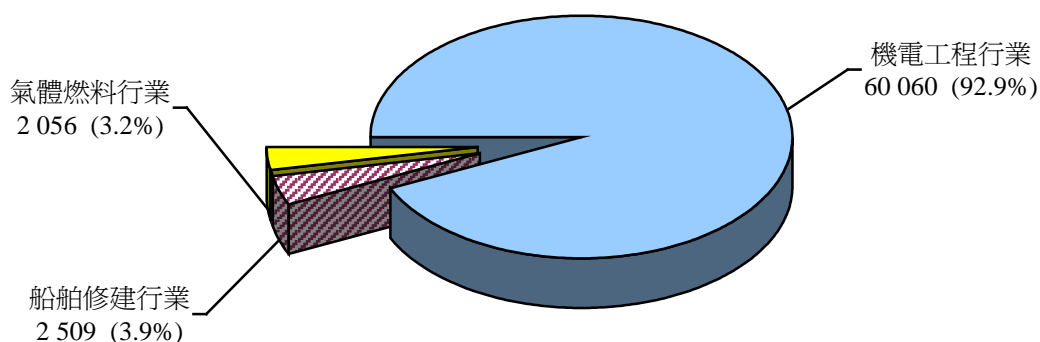
門類 IX：補充抽樣

設有維修服務工場的氣體燃料設備貿易公司，以及有關政府部門及教育機構。

## 調查結果

3. 是次調查顯示，調查期間，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從業員共有64 625人，其中60 060人（92.9%）屬機電工程行業，2 509人（3.9%）屬船舶修建行業，2 056人（3.2%）屬氣體燃料行業。機電工程僱員按行業劃分的分布見圖1：

圖 1 機電工程僱員按行業劃分的分布情況



4. 調查又顯示，業內從事其他職務的僱員共有29 284人，其中24 502人從事機電工程行業，2 611人從事船舶修建行業，2 171人從事氣體燃料行業。整體而言，調查期間，整個機電工程業共僱有93 909人。

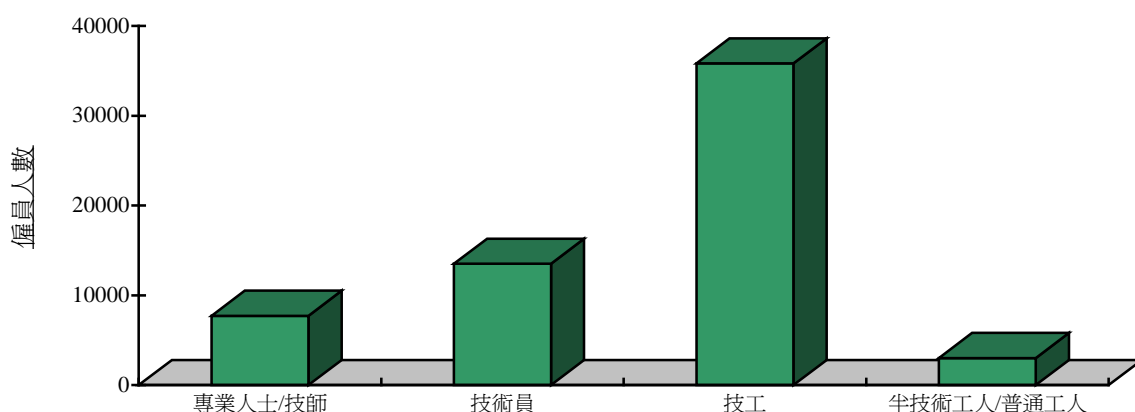
## 機電工程行業

5. 機電工程行業各技能等級僱員分布情況見表1及圖2：

表 1 機電工程行業各技能等級僱員分布情況

	專業人士／ 技師	技術員	技工	半技術工人／ 普通工人	總數
	7 720	13 512	35 816	3 012	60 060
佔僱員總數 百分比	12.9%	22.5%	59.6%	5.0%	100%

圖 2 機電工程行業各技能等級僱員分布情況



6. 根據僱主填報的資料，機電工程行業共有2 629名受訓者及2 344個空缺，分別佔該行業總人力的4.4%及3.9%。此外，僱主預測至2012年3月時，機電工程行業將需要合共62 170名機電僱員。

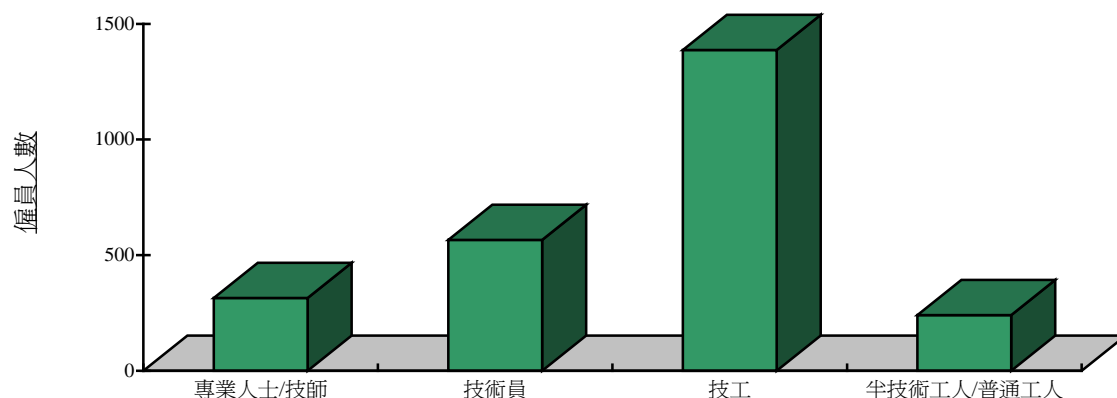
### 船舶修建行業

7. 船舶修建行業各技能等級僱員分布情況見表2及圖3。

表 2 船舶修建行業各技能等級  
機電僱員的分布情況

	專業人士／ 技師		技術員	技工		半技術工人 ／ 普通工人	總數
	技師	技師		技工	技工		
僱員總數	315	566	1 387	241	2 509		
佔僱員總數 百分比	12.5%	22.6%	55.3%	9.6%	100%		

圖 3 船舶修建行業各技能等級  
機電僱員的分布情況



8. 調查期間，僱主填報的受訓者人數及空缺數目分別為33人及116個，佔船舶修造行業僱員總數的1.3%及4.6%。僱主預測至2012年3月時，該行業的機電僱員人數將為2 624人。

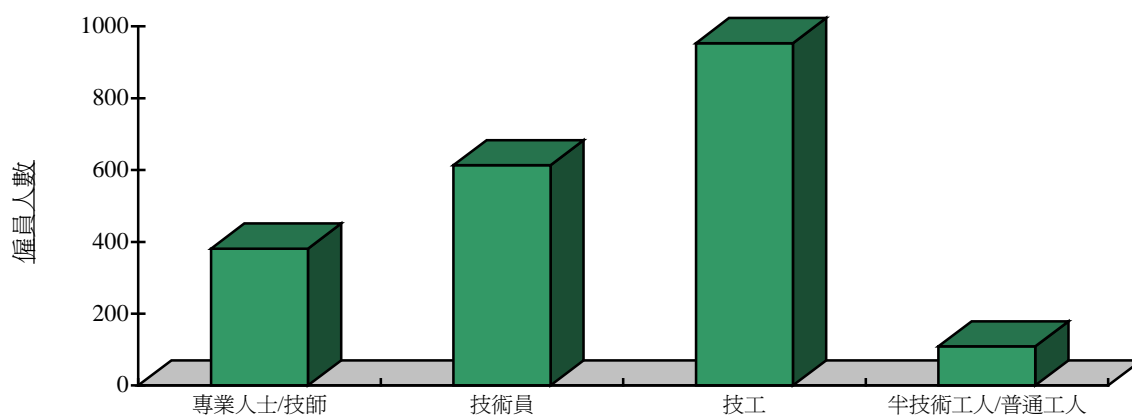
### 氣體燃料行業

9. 氣體燃料行業各技能等級僱員分布情況見表3及圖4。

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
	381	613	953	109	2 056
佔僱員總數 百分比	18.5%	29.8%	46.4%	5.3%	100%

圖 4 氣體燃料行業各技能等級機電僱員的分布情況



10. 調查期間，氣體燃料行業共有101名受訓者及23個空缺，分別佔該行業總人力的4.9%及1.1%。僱主預測至2012年3月時，業內的總人力將為2 088人。

### 推算未來人力訓練需求

#### 機電工程行業

11. 調查結果顯示，2009至2011年間，機電工程工種及相關職務的整體技術人力錄得升幅，平均每年增加3.4%。若按技能等級劃分，則專業人士／技師、

技術員、技工級的僱員人數每年平均增長2.4%、3.4%及5.3%，而半技術工人／普通工人級的僱員人數則平均每年下跌11.2%。

12. 由於多項大型基建項目加快進程，是次調查發現，過去兩年機電工程行業的受訓者人數及空缺數目大幅增加，其中以技工級的升幅尤為顯著。本會預測，至少在未來五年內，升勢將會持續。本會根據以往及最新的人力調查數據，推算2012至2014年各技能等級（專業人士／技師、技術員、技工）平均每年所需訓練的機電僱員數目，結果見表4。

表 4 推算機電工程行業每年所需訓練的機電僱員數目

技能等級	調查期間的 僱員人數	推算2012至2014年 平均每年需要訓練的人手
專業人士／技師	7 720	318 – 389
技術員	13 512	514 – 629
技工	35 816	2 285 – 2 792

#### 船舶修建行業

13. 調查顯示，2009至2011年間，船舶修建行業的整體技術人力平均每年微升1.8%。若按技能等級劃分，則專業人士／技師、技術員、半技術工人／普通工人級的僱員人數每年平均增長3.6%、12%及8.2%，而技工級的僱員人數則平均每年下跌2.6%。

14. 本會預期，未來數年船舶修建行業的人力需求將維持穩定。本會根據以往及最新的人力調查數據，推算2012至2014年業內平均每年所需訓練的機電僱員數目，結果見表5。

表 5 推算船舶修建行業每年所需訓練的機電僱員數目

技能等級	調查期間的 僱員人數	推算2012至2014年 平均每年需要訓練的人手
專業人士／技師	315	22 – 27
技術員	566	40 – 49
技工	1 387	98 – 120



## 氣體燃料行業

15. 調查反映過去兩年，氣體燃料行業的僱員總數有顯著升幅，平均每年增加8.1%。若按技能等級劃分，則專業人士／技師、技術員、技工級的僱員人數每年平均增長27.4%、4.1%及7.3%；而半技術工人／普通工人級的僱員人數則平均每年下跌6.4%。專業人士／技師級的僱員人數大幅增加；然而，由於對上一次調查發現，填覆機構漏報約100名該技能等級僱員的資料；因此，分析有關數據時，宜加注意。

16. 本會預期未來數年，氣體燃料行業對技術僱員的需求將保持溫和的增長。本會推算2012至2014年業內平均每年所需訓練的機電僱員數目，結果見表6。

表 6 推算氣體燃料行業  
每年所需訓練的機電僱員數目

技能等級	調查期間的 僱員人數	推算2012至2014年 平均每年需要訓練的人手
專業人士／技師	381	15 – 19
技術員	613	25 – 30
技工	953	39 – 47

## 主要結論及建議

17. 本會的主要結論及建議扼述如下：

(a) 業務展望

隨著大型基建項目的建造工程陸續竣工，預期由2012年起，業界對機電從業員，特別是機電工程行業內「承造門類」機電從業員的需求將急增。

(b) 專業人士／技師訓練

2011至2013年間，本地大學相關學科的畢業生人數，加上海外畢業生，以及通過修讀兼讀制學士課程而晉身專業人士／技師的技術員，大致能應付預計的機電工程業訓練需求。

(c) 技術員訓練

預計修讀本地大學、香港專業教育學院[IVE]及青年學院機電學科技術員課程的畢業生人數，將較2011至2013年間的推算人力訓練需求為高。不過，由於部分畢業生會投身如建造業等其他行業，故畢業生的供應亦可算能配合市場需求。

- (d) 技工訓練
  - (i) 2011 至2013 年間，透過正式訓練為機電工程及船舶修建行業提供的技工級人力，只能滿足大約23%的預測需求。雖然部分半技術工人／普通工人會透過在職培訓、技能提升訓練或通過相關技能測驗而成為合格技工，但相信仍不足以應付未來幾年大型基建項目的人力需求。
  - (ii) 本會建議增加職前訓練課程的學額，開辦更多技能提升訓練課程，以協助現職半技術工人取得認可資歷，成為合格技工。訓練機構擬訂訓練名額時，應同時考慮近年的報讀人數及畢業生就業率。
- (e) 半技術工人／普通工人訓練

考慮到未來幾年人手短缺，本會建議透過開辦再培訓課程及／或短期課程，訓練更多半技術工人／普通工人，以紓緩技工的工作量。為改善本業再培訓課程的報讀情況，本會建議推出更具吸引力的獎勵／資助計劃。
- (f) 技能測驗

機電工程業僱主應鼓勵工人參加技能測驗，以取得政府認可的資格。
- (g) 建造業工人註冊

僱主應鼓勵在建築地盤工作的機電工人根據《建造業工人註冊條例》的規定，註冊成為合資格工人。

## 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 between 14<sup>th</sup> March and 13<sup>th</sup> August 2011 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 2012;
- (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 2012; 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 including:

- (i) electrical wiring and fitting (HSIC : 432101);
- (ii) air-conditioning/ventilation systems installation and maintenance (HSIC : 432201); and
- (iii) fire-alarm and fire-fighting equipment installation and maintenance (HSIC : 432103).

Branch 2: Electrical Fitting with Water Plumbing Branch

- (i) Engineering companies of electrical fitting with water plumbing (HSIC : 432102).

Branch 3: Servicing (E&M) Branch

Servicing companies of electrical and mechanical engineering services including:

- (i) lift/escalator installation and maintenance (HSIC : 432901)\*;
- (ii) telecommunications equipment, installation and maintenance (HSIC : 432106)\*;
- (iii) combined and other installation and maintenance of electrical and mechanical equipment (HSIC : 432199)\*;
- (iv) aircraft assembly and manufacture of related machinery (HSIC : 303000);
- (v) electrical power generation, transmission and distribution (HSIC : 351000);
- (vi) railways and cable transport (HSIC : 491000);
- (vii) building services engineering (HSIC : 711400);
- (viii) repair of electrical equipment (HSIC : 331400); and

- (ix) repair of household appliances, home and garden equipment (HSIC : 953200).

Branch 4: Supplementary Samples – Other Relevant Organizations in E&M Engineering Sector

Other relevant organizations in the electrical and mechanical engineering sector including:

- (i) major trading companies of electrical products, equipment and systems having associated service workshops;
- (ii) real estate management companies which have building services maintenance workers; and
- (iii) relevant divisions of government departments and educational institutions.

II. Sector B: Shipbuilding and Ship Repair

Branch 5: Shipyards and Boatyards, including:

- (i) building of ships and floating structures (HSIC : 301100);
- (ii) building of pleasure and sporting boats (HSIC : 301200);  
and
- (iii) repair of water transport equipment (HSIC : 331500).

Branch 6: Supplementary Samples - 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:

Branch 7: Gas manufacturing and distribution companies (HSIC : 352000);

Branch 8: Gas installation and maintenance companies (HSIC : 432204); and

Branch 9: Supplementary Samples - Trading companies of gas equipment having associated servicing workshops, and relevant divisions of government departments and educational institutions.

1.5 The survey covered a total of 9 144 establishments, including 8 662 establishments in the electrical and mechanical engineering sector, 299 in the shipbuilding and ship repair sector, and 183 in the gas sector. Of these 9 144 establishments, 8 995 were included in the Hong Kong Standard Classification (HSIC) listed in paragraph 1.4.

1.6 In view of the limited manpower available for the fieldwork, a stratified random sampling method was adopted to select 1 024 samples out of the 8 995 establishments in the HSICs. Together with 149 selected organizations, a total of 1 173 establishments were covered and about 82% 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 19A, 19B, 19C and 19D) 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 1 173 establishments, 826 supplied the information and 31 refused to do so. The remaining ones were either closed, no technical manpower, engaged in other trades, failure to contact or temporarily ceased operation. The effective response rate was 97.4%.

## 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 2011 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 November 2011 for public access.

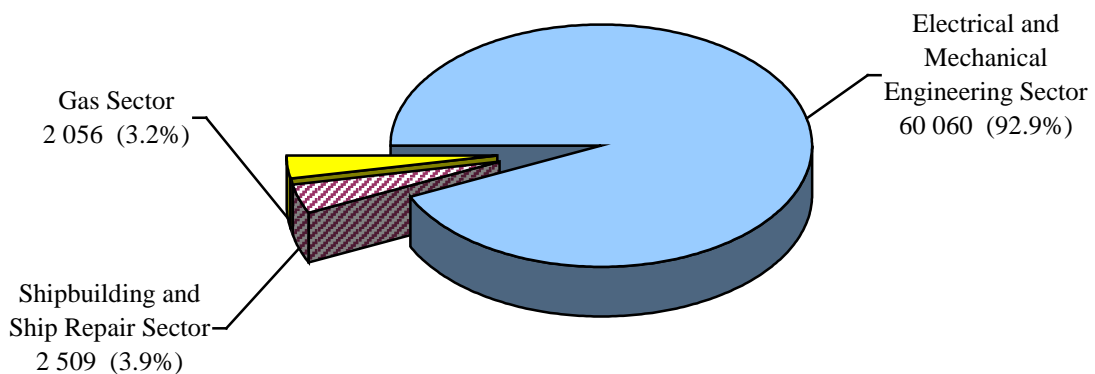
## SECTION II

### SUMMARY OF SURVEY FINDINGS

#### Number of Workers Employed

2.1 The survey revealed that in the period of 14<sup>th</sup> March to 13<sup>th</sup> August 2011, a total of 64 625 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 64 625 workers, 60 060 workers (92.9%) were employed in the electrical and mechanical engineering sector, 2 509 workers (3.9%) in the shipbuilding and ship repair sector, and 2 056 workers (3.2%) 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 29 284 workers of other disciplines working in the electrical and mechanical services industry at the time of survey. Among the 29 284 workers, 24 502 workers were employed in the electrical and mechanical engineering sector, 2 611 workers in the shipbuilding and ship repair sector and 2 171 workers in the gas sector.



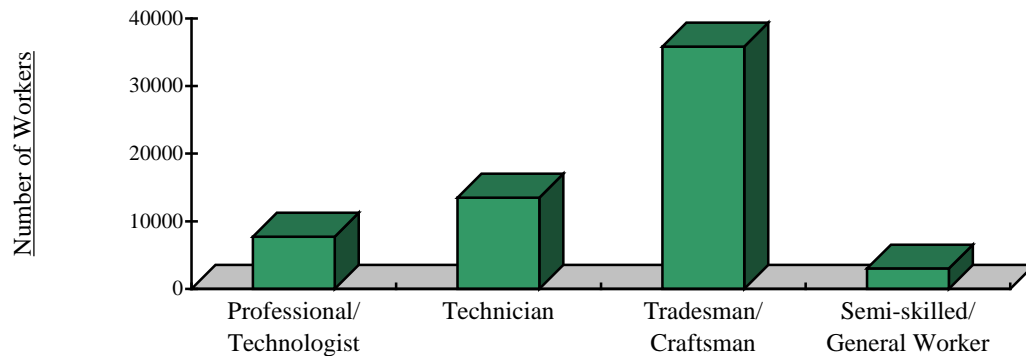
## Electrical and Mechanical Engineering Sector

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

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

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	<u>Semi-skilled/ General Worker</u>	<u>Total</u>
	7 720	13 512	35 816	3 012	60 060
Percentage of total number of workers	12.9%	22.5%	59.6%	5.0%	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 (E&M) branch, Electrical Fitting with Water Plumbing branch, Servicing (E&M) branch and Supplementary Samples are in Appendices 5, 6, 7 and 8 respectively.

2.5 Since many companies were engaged in both contracting and servicing works, respondents of this round of survey were asked to estimate their manpower devoted to these two types of businesses. The finding was that within the E&M Engineering sector, about 43.1% of manpower were devoted to contracting work, while the other 56.9% of manpower were devoted to servicing work. In terms of head counts, they were equivalent to 25 907 and 34 153 workers for contracting and servicing businesses respectively. The detailed breakdown is shown in Table 2.2.

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

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Estimated Manpower for Contracting</u>	<u>Estimated Manpower for Servicing</u>
Professional/Technologist	7 720	4 180 (54.1%)	3 540 (45.9%)
Technician	13 512	5 141 (38.0%)	8 371 (62.0%)
Tradesman/Craftsman	35 816	15 431 (43.1%)	20 385 (56.9%)
Semi-skilled/General Worker	3 012	1 155 (38.3%)	1 857 (61.7%)
<b>Total</b>	<b>60 060</b>	<b>25 907 (43.1%)</b>	<b>34 153 (56.9%)</b>

2.6 For comparison, if the classification method of the previous rounds of survey was adopted, i.e. assuming all workers of each industry code serve solely for either contracting or servicing, the distribution of workers in the E&M Engineering Sector is shown in Table 2.3.

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

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Estimated Manpower for Contracting</u>	<u>Estimated Manpower for Servicing</u>
Professional/Technologist	7 720	2 129 (27.6%)	5 591 (72.4%)
Technician	13 512	3 890 (29.8%)	9 622 (71.2%)
Tradesman/Craftsman	35 816	16 811 (46.9%)	19 005 (53.1%)
Semi-skilled/General Worker	3 012	1 487 (49.4%)	1 525 (50.6%)
<b>Total</b>	<b>60 060</b>	<b>24 317 (40.5%)</b>	<b>35 743 (59.5%)</b>

N.B. After examining the information provided by respondents, i.e. Appendix 9, the Training Board decided that in addition to Branch 1, Branch 3(ii), i.e. Industry Code 432106 (Telecommunication equipment installation and maintenance) of the E&M engineering sector is also classified as contracting. Branch 3(iii), i.e. Industry Code 432199 (Combined and other installation and maintenance of E&M equipment) is classified as 50% contracting and 50% servicing. All others are classified as servicing.

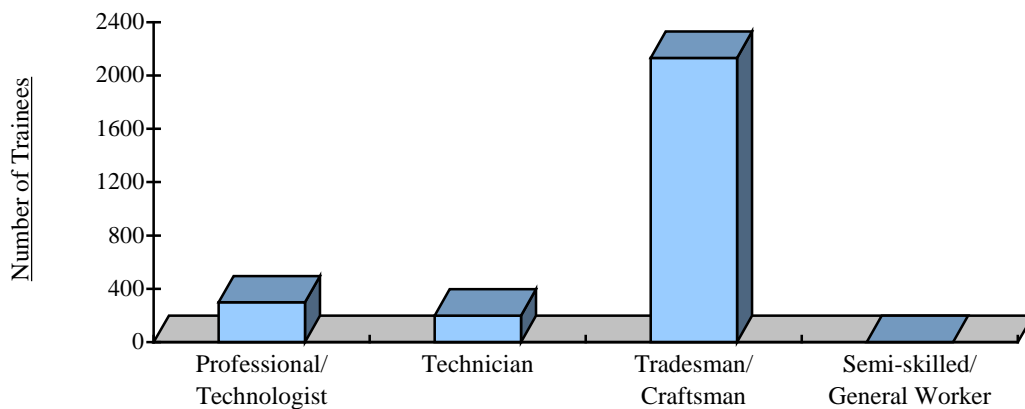
2.7 The manpower statistics, based on industry code and job levels of the electrical and mechanical engineering sector are tabulated in Appendix 9.

2.8 At the time of the survey, there were 2 629 trainees under various forms of training in the electrical and mechanical engineering sector, representing 4.4% of the total workforce. Their distribution by job level is shown in Table 2.4 and Figure 2.3.

Table 2.4 Distribution of Trainees by Job Level of the Electrical and Mechanical Engineering Sector

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Trainees</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	7 720	298	3.9%
Technician	13 512	199	1.5%
Tradesman/Craftsman	35 816	2 132	6.0%
Semi-skilled/General Worker	3 012	-	-
<b>Total</b>	<b>60 060</b>	<b>2 629</b>	<b>4.4%</b>

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

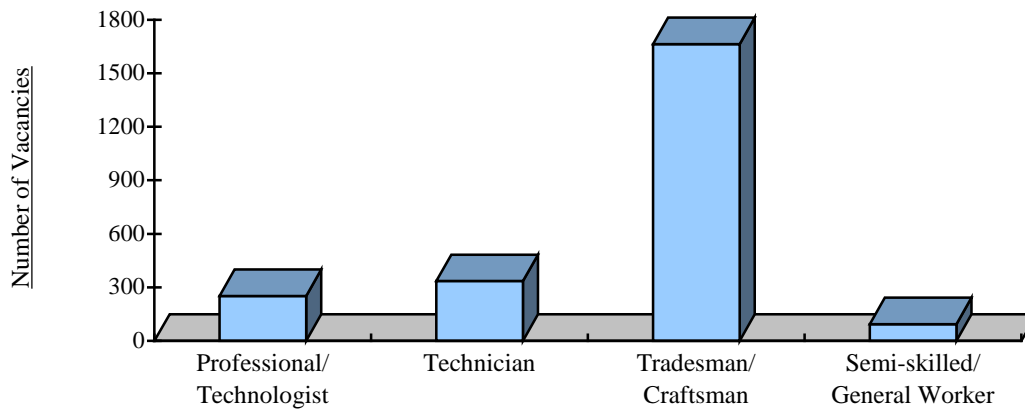


2.9 Employers reported a total of 2 344 vacancies, representing about 3.9% of the total manpower of the electrical and mechanical engineering sector. The distribution of the vacancies by job level is shown in Table 2.5 and Figure 2.4.

Table 2.5 Distribution of Vacancies by Job Level of the Electrical and Mechanical Engineering Sector

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Vacancies</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	7 720	252	3.3%
Technician	13 512	335	2.5%
Tradesman/Craftsman	35 816	1 663	4.6%
Semi-skilled/General Worker	3 012	94	3.1%
Total	60 060	2 344	3.9%

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

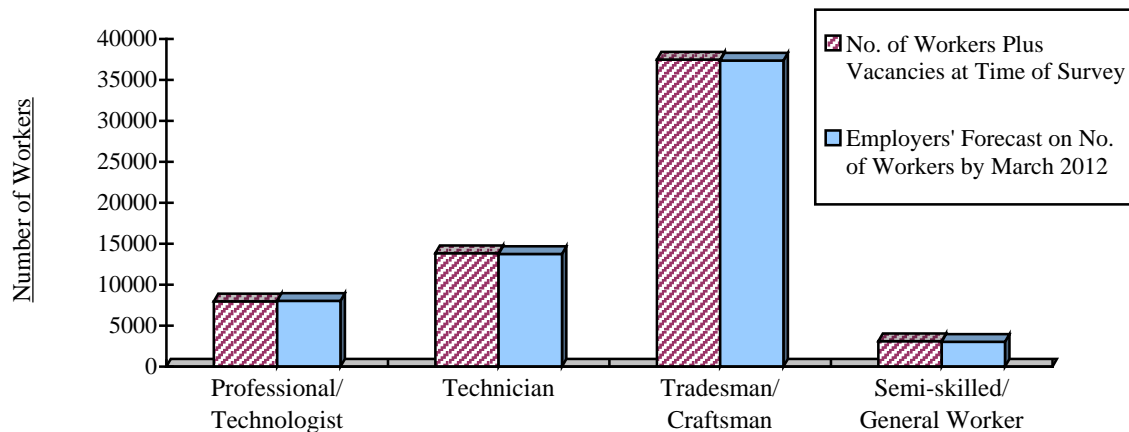


2.10 Employers forecasted a total of 62 170 E&M workers by March 2012 in the electrical and mechanical engineering sector, indicating a view of a marginal forecasted annual drop of 0.38%. Their distribution by job level is shown in Table 2.6 and Figure 2.5.

Table 2.6 Distribution of Forecasted Number of Workers by Job Level of the Electrical and Mechanical Engineering Sector

<u>Job Level</u>	<u>Number of Workers Plus Vacancies at Time of Survey</u>	<u>Employers' Forecast on Number of Workers by March 2012</u>
Professional/Technologist	7 972	8 022
Technician	13 847	13 751
Tradesman/Craftsman	37 479	37 371
Semi-skilled/General Worker	3 106	3 026
Total	62 404	62 170

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



2.11 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 2012 at each principal job of the electrical and mechanical engineering sector are given in Appendix 3.

2.12 The monthly income range of E&M workers at each job level of the electrical and mechanical engineering sector is shown in Table 2.7:

Table 2.7 Average Monthly Income of Workers of the Electrical and Mechanical Engineering Sector

Monthly Average Income Range	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/	All
				General Worker	
Under \$9 000	-	178	2 283	1 113	3 574
\$9 001 - \$12 000	-	1 018	9 458	1 709	12 185
\$12 001 - \$15 000	37	2 535	12 046	54	14 672
\$15 001 - \$18 000	497	3 367	6 993	12	10 869
\$18 001 - \$25 000	1 396	3 620	1 859	-	6 875
\$25 001 - \$35 000	2 469	1 916	162	-	4 547
Over \$35 000	2 759	173	-	-	2 932
Unspecified	562	705	3 015	124	4 406
<b>Total</b>	7 720	13 512	35 816	3 012	60 060

2.13 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.

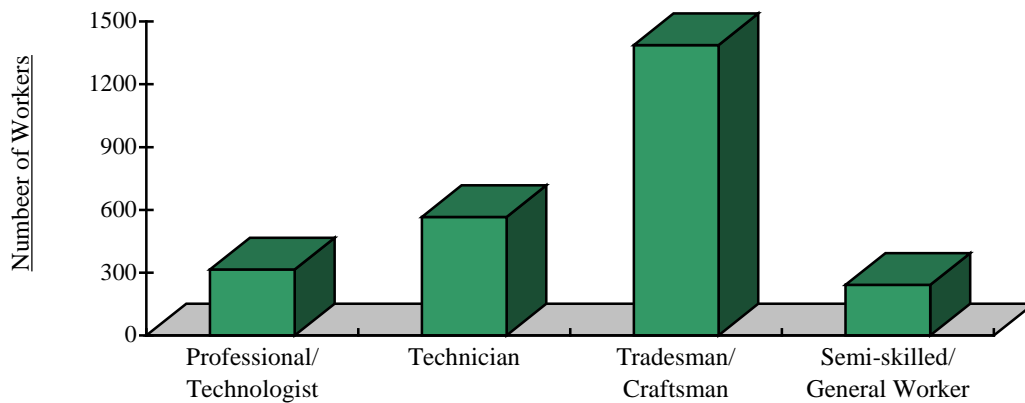
#### Shipbuilding and Ship Repair Sector

2.14 The manpower statistics of the shipbuilding and ship repair sector are tabulated in Appendix 11. The distribution of E&M workers by job level of the shipbuilding and ship repair sector is shown in Table 2.8 and Figure 2.6.

Table 2.8 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
	315	566	1 387	241	2 509
Percentage of total number of workers	12.5%	22.6%	55.3 %	9.6%	100%

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



2.15 At the time of the survey, there were 33 trainees under various forms of training in the shipbuilding and ship repair sector, representing 1.3% of the total workforce. Their distribution by job level is shown in Table 2.9.

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

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Trainees</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	315	-	-
Technician	566	14	2.5%
Tradesman/Craftsman	1 387	19	1.4%
Semi-skilled/General Worker	241	-	-
<b>Total</b>	<b>2 509</b>	<b>33</b>	<b>1.3%</b>

2.16 Employers reported a total of 116 vacancies, representing about 4.6% of the total E&M workforce of the shipbuilding and ship repair sector. Their distribution by job level is shown in Table 2.10.

Table 2.10 Distribution of E&M Vacancies by Job Level of the Shipbuilding and Ship Repair Sector

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Vacancies</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	315	6	1.9%
Technician	566	13	2.3%
Tradesman/Craftsman	1 387	77	5.6%
Semi-skilled/General Worker	241	20	8.3%
Total	2 509	116	4.6%

2.17 Employers forecasted a total of 2 624 E&M workers by March 2012 in the shipbuilding and ship repair sector, indicating a view of a marginal forecasted annual decrease of 0.04%. Their distribution by job level is shown in Table 2.11.

Table 2.11 Distribution of Forecasted Number of E&M Workers by Job Level of the Shipbuilding and Ship Repair Sector

<u>Job Level</u>	<u>Number of Workers Plus Vacancies at Time of Survey</u>	<u>Employers' Forecast on Number of Workers by March 2012</u>
Professional/Technologist	321	320
Technician	579	579
Tradesman/Craftsman	1 464	1 464
Semi-skilled/General Worker	261	261
Total	2 625	2 624

2.18 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 2012 at each principal job of the shipbuilding and ship repair sector are given in Appendix 11.

2.19 The monthly income range of E&M workers at each job level of the shipbuilding and ship repair sector is shown in Table 2.12.



Table 2.12 Average Monthly Income of E&M Workers of the Shipbuilding and Ship Repair Sector

Monthly Average <u>Income Range</u>	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	Semi-skilled/ <u>General</u>	<u>All</u>
				<u>Worker</u>	
Under \$9 000	-	5	56	32	93
\$9 001 - \$12 000	-	3	208	168	379
\$12 001 - \$15 000	-	62	620	23	705
\$15 001 - \$18 000	1	58	224	16	299
\$18 001 - \$25 000	58	190	189	-	437
\$25 001 - \$35 000	58	4	6	-	68
Over \$35 000	84	38	-	-	122
Unspecified	114	206	84	2	406
<b>Total</b>	315	566	1 387	241	2 509

2.20 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 12.

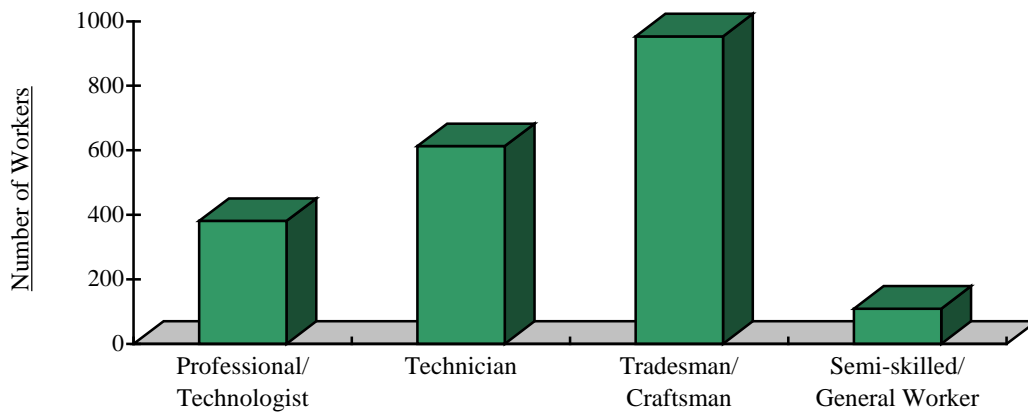
### Gas Sector

2.21 The manpower statistics of the gas sector are tabulated in Appendix 13. The distribution of E&M workers by job level of the sector is shown in Table 2.13 and Figure 2.7.

Table 2.13 Distribution of E&M workers by Job Level of the Gas Sector

	<u>Professional/ Technologist</u>	<u>Technician</u>	<u>Tradesman/ Craftsman</u>	Semi-skilled/ <u>General</u>	<u>Total</u>
	<u>Worker</u>				
	381	613	953	109	2 056
Percentage of total number of workers	18.5%	29.8%	46.4%	5.3%	100%

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



2.22 At the time of the survey, there were 101 trainees under various forms of training in the gas sector, representing 4.9% of the total workforce. Their distribution by job level is shown in Table 2.14.

Table 2.14 Distribution of E&M Trainees by Job Level of the Gas Sector

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Trainees</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	381	9	2.4%
Technician	613	4	0.7%
Tradesman/Craftsman	953	88	9.2%
Semi-skilled/General Worker	109	-	-
Total	2 056	101	4.9%

2.23 Employers reported 23 vacancies at the time of the survey, representing about 1.1% of the total E&M manpower of the gas sector. The distribution by job level is shown in Table 2.15.

Table 2.15 Distribution of E&M Vacancies by Job Level of the Gas Sector

<u>Job Level</u>	<u>Number of Workers Employed</u>	<u>Number of Vacancies</u>	<u>Percentage of Workers at the Same Level</u>
Professional/Technologist	381	4	1.0%
Technician	613	6	1.0%
Tradesman/Craftsman	953	13	1.4%
Semi-skilled/General Worker	109	-	-
Total	2 056	23	1.1%

2.24 Employers forecasted a total E&M workforce of 2 088 by March 2012 in the gas sector, indicating a view of a marginal forecasted annual growth of 0.4%. Their distribution by job level is shown in Table 2.16.

Table 2.16 Distribution of Forecasted Number of E&M Workers by Job Level of the Gas Sector

<u>Job Level</u>	<u>Number of Workers Plus Vacancies at Time of Survey</u>	<u>Employers' Forecast on Number of Workers by March 2012</u>
Professional/Technologist	385	391
Technician	619	618
Tradesman/Craftsman	966	970
Semi-skilled/General Worker	109	109
Total	2 079	2 088

2.25 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 2012 at each principal job of the gas sector are given in Appendix 13.

2.26 The monthly income range of E&M workers at each job level of the gas sector is shown in Table 2.17.

Table 2.17 Average Monthly Income of E&M Workers of the Gas Sector

Monthly Average <u>Income Range</u>	Professional/ <u>Technologist</u>	Technician	Semi-skilled/		<u>All</u>
			Tradesman/ <u>Craftsman</u>	General <u>Worker</u>	
Under \$9 000	-	-	17	20	37
\$9 001 - \$12 000	3	44	259	75	381
\$12 001 - \$15 000	2	347	399	6	754
\$15 001 - \$18 000	-	57	23	-	80
\$18 001 - \$25 000	33	136	202	-	371
\$25 001 - \$35 000	339	12	-	-	351
Over \$35 000	4	-	-	-	4
Unspecified	-	17	53	8	78
<b>Total</b>	381	613	953	109	2056

2.27 The distribution of E&M workers by their total monthly income range for each principal job of the gas sector is tabulated in Appendix 14.

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

2.28 For assessing E&M workers participating in construction works, the Training Board conducted its seventh supplementary manpower survey in March 2011 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 974 building sites and 473 civil engineering and other sites recorded by the Census and Statistics Department at the time of the survey.

2.29 The supplementary survey revealed that there were 6 585 E&M workers of electrical/mechanical engineering and related disciplines working in the construction sites at the time of the survey. Of the 6 585 workers, 5 789 workers (87.9%) were employed in 189 building sites and 796 workers (12.1%) in 74 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 2011 manpower survey of the electrical and mechanical services industry which was conducted on establishment basis.

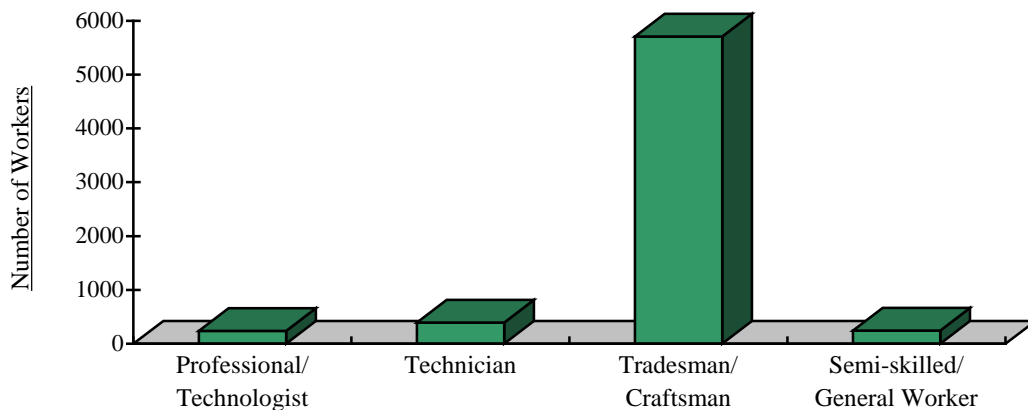
2.30 The distribution of workers by job level is shown in Table 2.18 and Figure 2.8.

Table 2.18 Distribution of E&M Workers Working in Construction Sites

<u>Job Level</u>	<u>Number of Workers</u>		<u>Percentage of Total Number Employed</u>
Professional/Technologist	240	(114)	3.6%
Technician	395	(259)	6.0%
Tradesman/Craftsman	5 706	(5 913)	86.7%
Semi-skilled/General Worker	244	(180)	3.7%
Total:	6 585	(6 466)	100%

(Figures in brackets are the corresponding data collected in the sixth supplementary manpower survey conducted in March 2009).

Figure 2.8 Distribution of E&M Workers Working in Construction Sites



2.31 The manpower statistics of E&M workers working in construction sites are tabulated in Appendix 10.

#### Manpower Supply Situation in 2010/11

2.32 Employers' view on the manpower supply situation during the 12 months before the survey is listed in Appendix 15.

## 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 Between 14<sup>th</sup> March and 13<sup>th</sup> August 2011, the electrical and mechanical engineering sector employed a total of 60 060 E&M workers, representing an increase of 3.4% per annum when compared with 56 260 E&M workers found in the last survey conducted in March 2009. The distribution of the workforce by job level and by branch in 2011 is shown in Table 3.1.

Table 3.1: Distribution of E&M Workers in the Electrical and Mechanical Engineering Sector by Job Level and by Branch

<u>Job Level</u>	<u>Contracting Branch</u>	<u>Servicing Branch</u>	<u>Total</u>
Professional/Technologist	2 129 (4 180)	5 591 (3 540)	7 720
Technician	3 890 (5 141)	9 622 (8 371)	13 512
Tradesman/Craftsman	16 811 (15 431)	19 005 (20 385)	35 816
Semi-Skilled/General Worker	1 487 (1 155)	1 525 (1 857)	3 012
Total	24 317 (25 907)	35 743 (34 153)	60 060

#### Note:

(a) Contracting branch refers to Branch 1, Branch 3(ii) and 50% of Branch 3(iii) under the scope of the 2011 E&M Services Industry Manpower Survey (see paragraph 1.4).

- (b) The numbers in brackets are collected from employers according to their perception of the manpower devoted in contracting and servicing works.

### Manpower Changes of the E&M Engineering Sector

3.3 The survey revealed that there was an increase of 3.4% per annum in the overall employment of the electrical and mechanical engineering sector in the past two years. The annual manpower increase in professional/technologist, technician and tradesman/craftsman levels were 2.4%, 3.4% and 5.3% respectively. On the other hand, the number of semi-skilled/general workers recorded a decline of 11.2% per annum as many workers have upgraded themselves to tradesmen/craftsmen during the past two years.

3.4 At the time of survey, the following principal jobs had vacancies of 5% or more: Fire Services Engineer, Control and Instrumentation Engineer, Safety Officer, Draughtsman, Fire Services Technician, Telecommunication Technician, Building Services Mechanic, Refrigeration/ Air-conditioning/Ventilation Mechanic (Electrical Control), Mechanical Fitter/ Machinist, Fire Services Electrical Fitter, Communication System Mechanic.

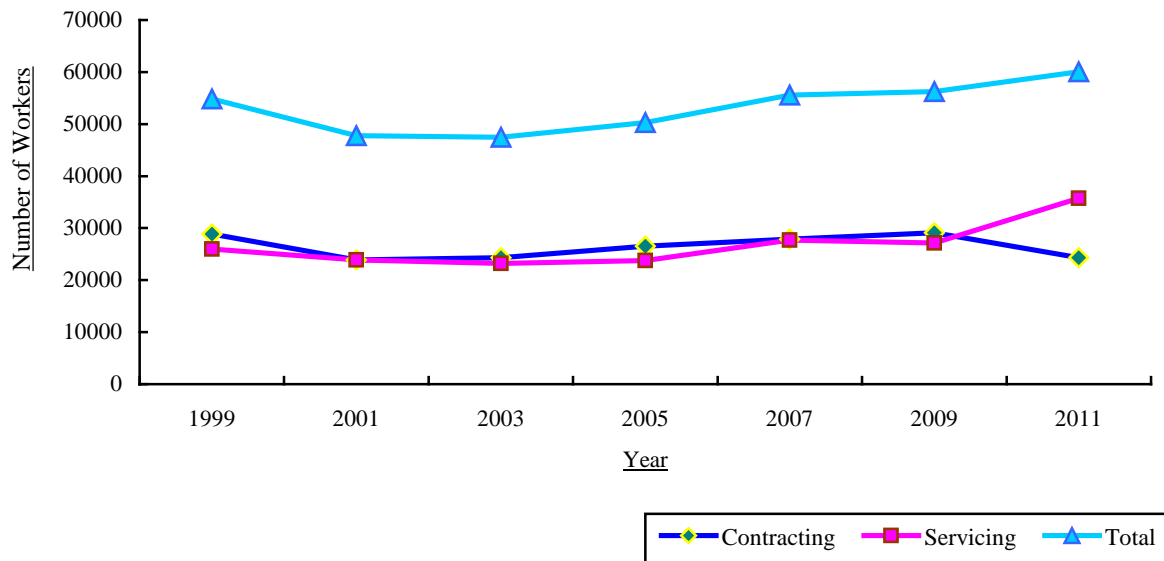
3.5 The manpower changes of the E&M engineering sector from 1999 to 2011 are shown in Table 3.2 and Figure 3.1.

Table 3.2 Manpower Changes of the Electrical and Mechanical Engineering Sector between 1999 and 2011

<u>Year of Survey</u>	<u>Number of Workers Employed</u>		
	<u>Contracting Branch</u>	<u>Servicing Branch</u>	<u>Total</u>
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
2011	24 317*	35 743*	60 060

\* The composition of contracting and servicing branches was revised in the 2011 manpower survey. In particular, HSIC 432901 (Lift and Escalator Installation and Maintenance) was moved from contracting to servicing.

Figure 3.1 Manpower Changes of the Electrical and Mechanical Engineering Sector between 1999 and 2011



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 2007 manpower survey had overtaken the peak figure recorded in 1999. The number of workers is still in the rising trend. As major infrastructure projects have been in full swing one after another, the rising trend has aggravated and the number of workers had a noticeable increase of 3.4% per annum in the past 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 except 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 2011 showed that the number of trainees has rebounded and a sharp rise of 28.3% per annum was found during the past two years (Table 3.3 and Figure 3.2). The rebound was particularly strong (37% per annum) in the tradesman/craftsman level which indicated a great demand for workers at that job level.

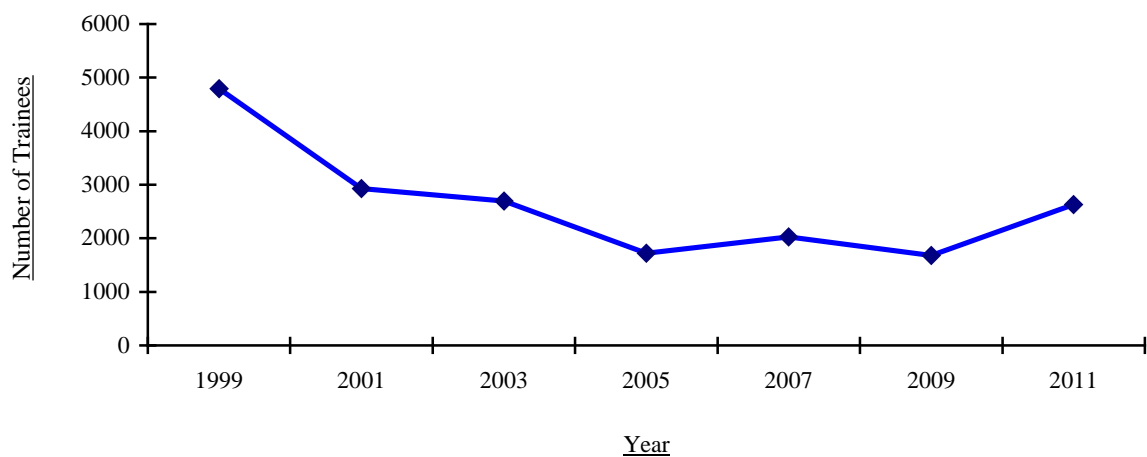
Table 3.3 Changes on Number of Trainees of the E&M Engineering Sector

<u>Year of Survey</u>	<u>Number of Workers Employed</u>	<u>Number of Trainees</u>	<u>Percentage of Workers</u>
1999	54 814	4 794	8.7%
2001	47 799	2 931	6.1%



2003	47 492	2 694	5.7%
2005	50 268	1 722	3.4%
2007	55 563	2 028	3.6%
2009	56 260	1 679	3.0%
2011	60 060	2 629	4.4%

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



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

3.8 The major infrastructure projects will approach full swing in the coming five years. Following the completion of construction works, the demand of E&M workers in the contracting branch of the E&M engineering sector is expected to surge from 2012 onward.

3.9 The government's subsidizing schemes like "Operation Building Bright" and "Building Maintenance Grant Scheme for Elderly Owners" will continue to create more job opportunities for the servicing branch. A steady manpower growth is anticipated.

3.10 When compared with the registration numbers of the Construction Workers Registration Authority (CWRA) as at October 2011 (Table 3.4), it is noted that a few principal jobs at the tradesman/craftsman level have more workers employed at the time of survey than the numbers of Registered Skilled workers (RSW) of the designated trades. This means that employers will probably encounter difficulties in recruiting enough skilled workers when the contracting business blooms in the coming years.

Table 3.4 Principal Jobs at Tradesman/Craftsman Level with More Workers than the Number of Registrations in CWRA

<u>E&amp;M Trade</u>	<u>Number of Workers employed in the 2011 Manpower Survey</u>	<u>Number of Registered Skilled Workers (RSW) Recorded by CWRA</u>	<u>Number of Registered Semi-skilled Workers (RSS) Recorded by CWRA</u>
Electrical Wireman	902	326	2 715
RACV (Unitary System)	1 885	415	547
RACV (Air System)	782	331	385
RACV (Thermal Insulation)	211	116	27
Mechanical Fitter / Machinist	3 303	594	565
Fire Services Electrical Fitter	843	401	160
Fire Services Mechanical Fitter	1 141	634	568
Communication System Mechanic	2 129	1 929	123

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

3.11 Comparing with the figures of 2009 manpower survey, the number of vacancies reported by employers at the time of the survey increased significantly (Table 3.5). The employers were generally optimistic on the prospect of the sector as reflected by employers' one-year forecast shown in Table 3.6.

Table 3.5 Changes on Number of Vacancies of the E&M Engineering Sector

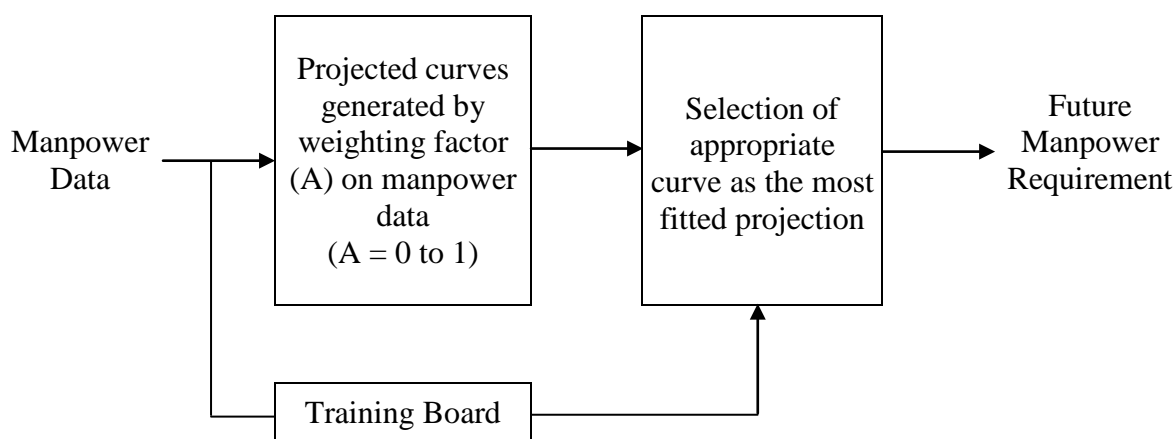
<u>Job Level</u>	<u>No. of Vacancies in 2009</u>	<u>No. of Vacancies in 2011</u>	<u>Growth during the past 2 years</u>
Professional / Technologist	106	252	137.7%
Technician	144	335	132.6%
Tradesman / Craftsman	662	1 663	151.2%
Semi-skilled / General Worker	51	94	84.3%
Total	963	2 344	143.4%

Table 3.6 Distribution of Vacancies and Forecasted Number of E&M Workers of the Electrical and Mechanical Engineering Sector

<u>Skill Level</u>	<u>No. Employed at the Date of Survey</u>	<u>Reported Vacancies</u>		<u>Employers' One-Year Forecast</u>  <u>Number of Workers by March 2012</u>
		<u>Number</u>	<u>Percentage</u>	
Professional/Technologist	7 720	252	3.3%	8 022 (+3.9%)
Technician	13 512	335	2.5%	13 751 (+1.8%)
Tradesman/Craftsman	35 816	1 663	4.6%	37 371 (+4.3%)
Semi-skilled/General Worker	3 012	94	3.1%	3 026 (+0.5%)
<b>Total</b>	<b>60 060</b>	<b>2 344</b>	<b>3.9%</b>	<b>62 170 (+3.5%)</b>

Projected Manpower Training Requirements for the E&M Engineering Sector

3.12 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 weighted 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.

3.13 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.

3.14 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)'.

3.15 In the 2005, 2007 & 2009 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.

3.16 For the 2011 manpower survey, with consideration of the uncertainty on the volume of construction projects and external factors similar to previous rounds of manpower surveys, the Training Board decided to adopt the AFM again for projecting the manpower requirements for year 2012 to 2014.

3.17 Overall speaking, the percentages of technical workers of age over 50 in the E&M engineering sector was not particularly high (except fire service mechanical fitter, general welder, mechanical fitter, RACV mechanic (thermal insulation)), the Training Board recommended a wastage rate of 3% be adopted.

3.18 Based on the above considerations, the annual training requirements of manpower to cover the growth (projected with AFM) and the replacement for wastage (3%) at the professional/ technologist, technician and tradesman/craftsman skill levels from year 2012 to 2014 for the E&M engineering sector are shown in Table 3.7.

Table 3.7 Projected Annual E&M Manpower Training Requirement of the Electrical and Mechanical Engineering Sector

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2012 - 2014</u>
Professional/Technologist	7 720	318 – 389 (254 – 311)
Technician	13 512	514 – 629 (437 – 537)
Tradesman/Craftsman	35 816	2 285 – 2 792 (1 116 – 1 364)

Note: The numbers in brackets were the annual training requirements for 2010-2012 projected by the E&M Services Training Board in 2009.

### Shipbuilding and Ship Repair Sector

#### Manpower Changes

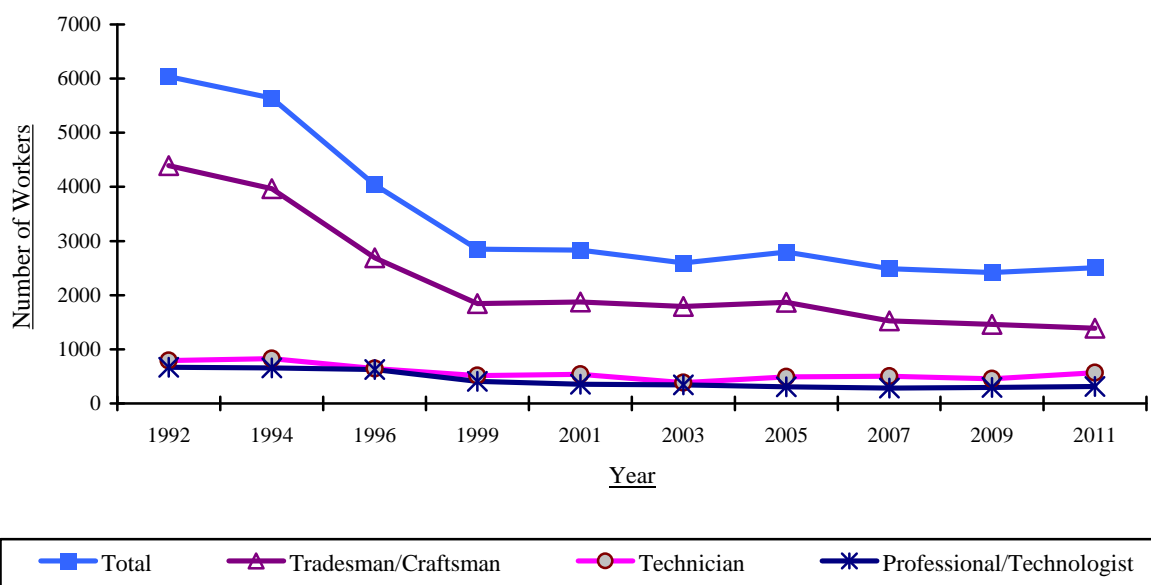
3.19 The manpower changes at professional/technologist, technician and tradesman/craftsman levels of the shipbuilding and ship repair sector from 1992 to 2011 are shown in Table 3.8 and Figure 3.3.

Table 3.8 E&M Manpower Changes of the Shipbuilding and Ship Repair Sector

<u>Year of Survey</u>	<u>Professional/Technologist</u>	<u>Technician</u>	<u>Tradesman/Craftsman</u>	<u>Total Manpower*</u>
1992	668	790	4 392	6 034
1994	659	825	3 966	5 641
1996	624	647	2 690	4 038
1999	407	513	1 844	2 849
2001	354	539	1 872	2 834
2003	344	387	1 791	2 597
2005	307	490	1 871	2 794
2007	281	502	1 526	2 488
2009	294	457	1 463	2 421
2011	315	566	1 387	2 509

\* 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



3.20 The figures indicate that the overall workforce of the sector had an increase of 1.8% per annum in the past two years. The variation of the overall manpower has been moderate since 1999.

#### Business Outlook of the Shipbuilding and Ship Repair Sector

3.21 The ship repair and maintenance business, as well as the manpower demand, will remain steady in the coming few years. Nevertheless, the aging of the workforce will require more new blood to compensate for the wastage.

#### Projected Manpower Training Requirements for the Shipbuilding and Ship Repair Sector

3.22 Considering the steady manpower trend, the Training Board continues to adopt the 'adaptive filtering method' (AFM) to project the manpower requirements in the shipbuilding and ship repair sector for 2012-2014.

3.23 Since several years ago, over 33% technical workers of the Shipbuilding and Ship Repair sector were of age above 50. The Training Board recommended a wastage rate of 6% be adopted.

3.24 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 from 2012 to 2014 which are shown in Table 3.9.

Table 3.9 Projected Annual E&M Manpower Training Requirement of the Shipbuilding and Ship Repair Sector

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2012- 2014</u>
Professional/Technologist	315	22 – 27
Technician	566	40 – 49
Tradesman/Craftsman	1 387	98 – 120

Gas Sector

Manpower Changes

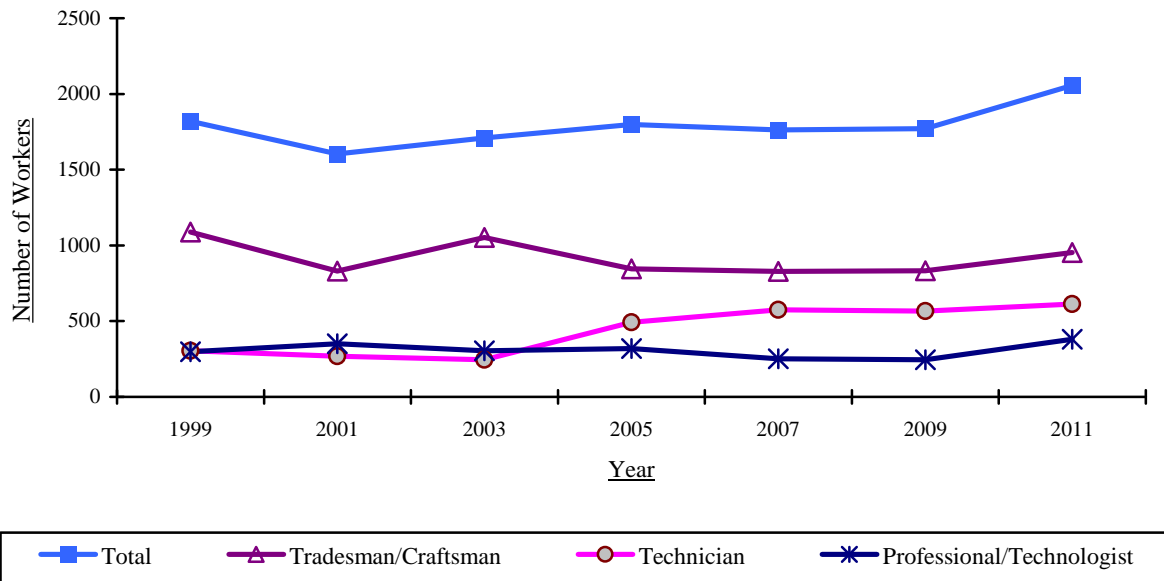
3.25 The manpower changes at the three skill levels of the gas sector from the first survey in 1999 to this survey are shown in Table 3.10 and Figure 3.4.

Table 3.10 E&M Manpower Changes of the Gas Sector

<u>Year of Survey</u>	<u>Professional/Technologist</u>	<u>Technician</u>	<u>Tradesman/Craftsman</u>	<u>Total Manpower*</u>
1999	298	304	1 088	1 820
2001	350	268	830	1 604
2003	304	245	1 052	1 710
2005	320	493	845	1 799
2007	252	575	828	1 762
2009	246	567	832	1 770
2011	381	613	953	2 056

\* 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



3.26 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

3.27 With the increasing supply of public housing in the coming years, it is anticipated that there will be a positive manpower growth in the Gas sector.

### Projected Manpower Training Requirements for the Gas Sector

3.28 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 2012-2014.

3.29 By considering the findings in previous surveys, the Training Board decided to adopt a wastage rate of 3% for projecting the future training requirements.

3.30 Based on the above considerations, the Training Board has projected the average annual training requirements of E&M manpower for the gas sector from year 2012 to 2014 which are shown in Table 3.11.



Table 3.11 Projected Annual E&M Manpower Training Requirement of the Gas Sector

<u>Skill Level</u>	<u>No. of Workers at the Date of Survey</u>	<u>Projected Average Annual Training Requirements for 2012 - 2014</u>
Professional/Technologist	381	15 – 19
Technician	613	25 – 30
Tradesman/Craftsman	953	39 – 47

3.31 The Training Board will conduct another manpower survey in 2013 to review and update the manpower requirements of the electrical and mechanical services industry.

## SECTION IV

### RECOMMENDATIONS

4.1 With consideration on the local economic situation as well as the business nature of the electrical and mechanical (E&M) services industry, the Training Board anticipates the demand for properly trained technical manpower for the three sectors of the industry from 2012 to 2014 will be as follows:

- (i) E&M engineering sector: as at November 2011, among the ten major infrastructure projects, the construction work of the Kai Tak Cruise Terminal, the MTR South Island Line (East) and the Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link (XRL) were in progress and targeted for completion in 2013 to 2015 respectively. The construction of the Hong Kong-Zhuhai-Macao Bridge and the MTR Shatin to Central Link (SCL) were scheduled to commence in late 2011 and 2012 and targeted for completion in 2016 to 2020. These, together with the progress in West Kowloon Cultural District and the proposed offshore wind farm projects, have been or will be stimulating the demand of manpower in building and construction related E&M service trades, particularly from 2012 onwards. In addition, subsidizing schemes introduced by the HKSAR Government such as Operation Building Bright, Building Maintenance Grant Scheme for elderly Owners, continue to create more job opportunities for E&M workers. In this regard, the demand for E&M workers, especially in contracting business, is expected to increase significantly in the coming few years.
- (ii) Shipbuilding and ship repair sector: according to the statistics of the Marine Department, when comparing 2010 with 2009, there was a +6.4% growth in the total capacities (in term of Net register tonnage (NRT)) of vessels arriving in Hong Kong. The first half of 2011 continued to record a growth of +8.2% compared to the same period of last year. The figures indicate that there should be a consistent demand of manpower for the ship repair and maintenance business.
- (iii) Gas sector: according to the forecast by the Hong Kong Housing Authority in September 2011, the supply of rental housing flats will increase from 11 200 in 2011/12 to 13 100 in 2012/13 and 17 100 in 2013/14. With the

increase in new residential flats, the demand for technical workers in the Gas sector should record a positive growth.

4.2 Manpower training is a long-term investment. To become a professional/technologist, a university graduate is required 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 to the E&M services industry which has 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 organized manpower training programmes at the scale recommended in paragraphs 3.18, 3.24 and 3.30. The breakdowns into the principal jobs for the three sectors are given in Appendices 16, 17 and 18 respectively.

4.3 For manpower planning at the company level, employers can take Table 4.1 as reference which expresses the number of trainees in professional/technologist, technician and craftsman/tradesman levels in terms of the existing manpower of these job levels.

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

	<u>Professional/Technologist</u>	<u>Technician</u>	<u>Tradesman/Craftsman</u>
E&M Engineering Sector	4.6%	4.2%	7.1%
Shipbuilding and Ship Repair Sector	7.8%	7.9%	7.9%
Gas Sector	4.5%	4.5%	4.5%

#### 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.

4.6 With reference to the figures in Appendices 16 to 18, the projected average annual training requirements of principal jobs at professionals/technologists level in major disciplines of the E&M services industry, from 2012 to 2014, are listed in Table 4.2.

4.7 Table 4.3 lists the projected number of graduates from full-time courses of local universities in major E&M disciplines. Due to the decline in demand, local universities no longer offer degree programmes in marine engineering. Anyway, graduates from mechanical engineering courses can take up the post of marine engineers.

4.8 It is found that the supply of local university graduates roughly match the projected training requirements of major disciplines of the E&M services industry. Although some graduates may join the Construction industry or other sectors in the job market, the inadequacy will be supplemented by overseas graduates and workers at technician level who upgrade themselves to professionals/technologists through part-time degree courses.

Figure 4.1: Training of Professionals/Technologists

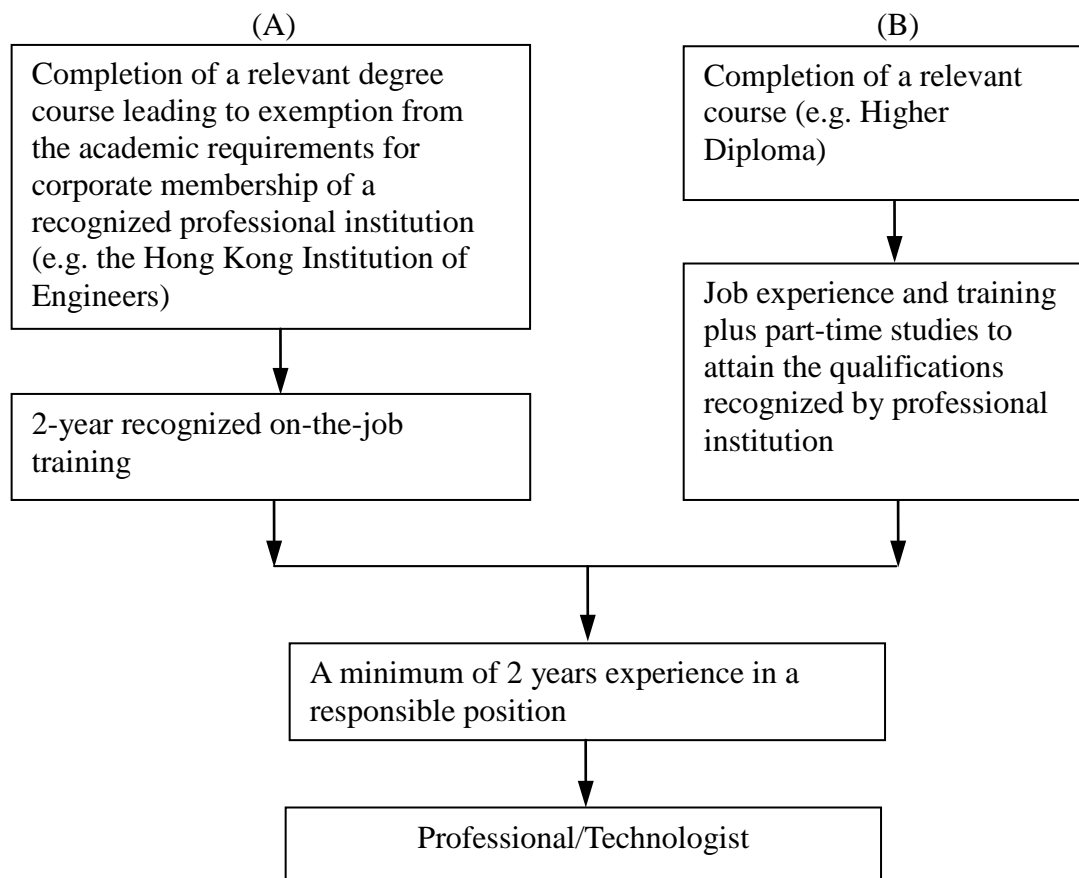


Table 4.2: Projected Average Annual Requirement of Professionals/Technologists in Major Disciplines of the E&M Services Industry from 2012 to 2014

<u>Job Title</u>	<u>No. Employed at 2011 Manpower Survey</u>	<u>Projected Average Annual Training Requirement</u>
Building Services Engineer (E&M Engineering Sector)	852	35 – 43
Electrical Engineer (E&M Engineering Sector)	2 332	95 – 117
(Shipbuilding & Repair Sector)	24	2
(Gas Sector)	11	0 – 1
Refrigeration/Air-conditioning/ Ventilation Engineer	791	33 – 40
Mechanical Engineer (E&M Engineering Sector)	1 108	46 – 56
(Shipbuilding & Repair Sector)*	130	9 – 11
(Gas Sector)	85	3 – 4
Plumbing and Drainage Engineer	111	5 – 6
Lift/Escalator Engineer	208	9 – 10
Fire Services Engineer	371	15 – 19
Engineering Manager	1 101	45 – 55
Safety Officer (E&M Engineering Sector)	137	6 – 7
(Shipbuilding & Repair Sector)	21	1 – 2
(Gas Sector)	22	1
Gas Engineer (Gas Sector)	263	11 – 13
<b>Total</b>	<b>7 567</b>	<b>316 - 387</b>

\* including Marine Engineer

Table 4.3: Projected No. of Local University Graduates (Full-time Degree Courses) from 2011 to 2013 for Major Disciplines of the E&M Services Industry

<u>Institution</u>	<u>Programme</u>	<u>Projected No. of Local Graduates</u>		
		<u>2011</u>	<u>2012</u>	<u>2013</u>
City University of Hong Kong, HK Polytechnic University, The University of Hong Kong	B Eng - Building Services Engineering	135	110	105
HK Polytechnic University, The University of Hong Kong	B Eng - Electrical Engineering	60	55	55
HK Polytechnic University, The University of Hong Kong, HK University of Science & Technology	B Eng - Mechanical Engineering	190	180	165
Total		385	345	325

#### Engineering Graduate Training Scheme (EGTS)

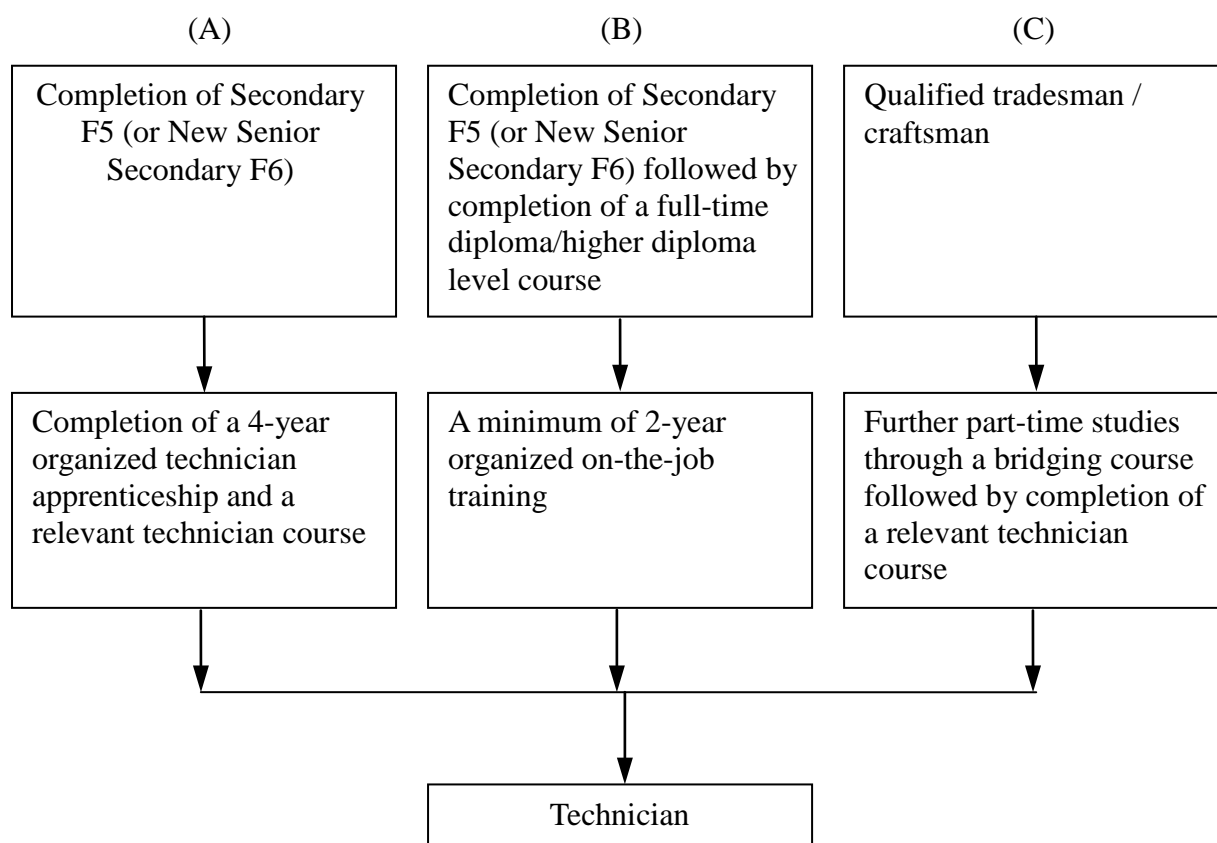
4.9 To bring about more well-structured practical training opportunities for engineering graduates, the Committee on Technologist Training of the Vocational Training Council is operating a subsidy scheme in providing engineering graduates with 18 months of practical training of a standard acceptable 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 Polytechnic University and City University of Hong Kong offer full-time Higher Diploma / Associate Degree technician level courses in building services engineering and electrical engineering.

4.13 The Hong Kong Institute of Vocational Education (IVE) of the Vocational Training Council offers full-time and part-time Higher Diploma technician level courses in aircraft maintenance engineering, electrical engineering, mechanical engineering, building services engineering, facilities management, environmental engineering and intelligent building technology.

4.14 The Youth College (YC) of the Vocational Training Council offers Diploma in Vocational Education (DVE) Programme in aircraft maintenance, electrical engineering, mechanical engineering and building services engineering streams. Graduates with DVE or Technician Foundation Certificate (TFC) awards may take up technician trainee posts in the E&M services industry. Employers are urged to employ these graduates as technician/supervisor apprentices/trainees because they have received proper basic training before joining the industry.

4.15 With reference to Appendices 16 to 18, the projected average annual training requirements of principal jobs at technician level in major disciplines of the E&M services industry, from 2012 to 2014, are listed in table 4.4.

Table 4.4: Projected Average Annual Requirement of Technicians in Major Disciplines of the E&M Services Industry from 2012 to 2014

<u>Job Title</u>	<u>No. Employed at 2011 Manpower Survey</u>	<u>Projected Average Annual Training Requirement</u>
Supervisor		
(E&M Engineering Sector)	3 265	123 – 152
(Shipbuilding & Repair Sector)	241	17 – 21
(Gas Sector)	204	8 – 10
Building Services Technician	1 751	67 – 82
Draughtsman		
(E&M Engineering Sector)	697	27 – 32
(Shipbuilding & Repair Sector)	3	0
Electrical Engineering Technician		
(E&M Engineering Sector)	1 814	68 – 84
(Shipbuilding & Repair Sector)	37	3
(Gas Sector)	5	0
Refrigeration/Air-conditioning/ Ventilation Technician	1 226	47 – 57
Mechanical Engineering Technician		
(E&M Engineering Sector)	1 634	62 – 76
(Shipbuilding & Repair Sector)	248	17 – 22
(Gas Sector)	44	2
Lift/Escalator Technician	622	24 – 29
Fire Services Technician	467	18 – 22
Electrical Instrument & Meter Technician	78	3 – 4
Office Equipment Service Technician	87	3 – 4
Assistant Safety Officer/Safety Supervisor		
(E&M Engineering Sector)	68	3
(Shipbuilding & Repair Sector)	8	1
(Gas Sector)	39	2
Gas Engineering Technician		
(Gas Sector)	321	13 – 16
<b>Total</b>	<b>12 859</b>	<b>508 – 622</b>



Table 4.5: Projected Local Supply of Technicians for Key E&M Trades from 2011 to 2013

<u>Institution</u>	<u>Programme</u>	<u>No. of Graduates Entering E&amp;M Services Industry as Technicians</u>		
		<u>2011</u>	<u>2012</u>	<u>2013</u>
HK Polytechnic University, City University of Hong Kong	Full-time HD / ASc courses <sup>(a)</sup> :			
	- Building Services Engineering	60	55	60
	- Electrical Engineering	25	15	15
	Sub-total	85	70	75
IVE	Full-time HD courses <sup>(b)</sup> :			
	- Aircraft Maintenance Eng.	55	50	50
	- Building Services Eng.	60	60	70
	- E&M Services	30	35	35
	- Electrical Engineering	200	185	210
	- Environmental Engineering and Energy Management	45	55	60
	- Facilities Management	45	45	45
	- Intelligent Building Technology & Automation Engineering	20	20	25
	- Mechanical Engineering	95	110	105
Sub-total	550	560	600	
Youth College	Full-time DVE Programme <sup>(c)</sup> (graduates with DVE or TFC awards):			
	- Aircraft Maintenance	15	5	20
	- Building Services Engineering stream (specialized in Air-conditioning & Refrigeration or Building Services)	85	25	75
	- Electrical Engineering stream – specialized in Electrical Installation or Lift & Escalator	85	35	85
	- Mechanical Engineering stream	70	20	50
	Sub-total	255	85	230
Construction Industry Council Training Academy	Full-time Diploma course:			
	- Building Services Supervisor	40	40	40
Grand Total		930	755	945

#### Note

- (a) It is assumed that about 50% of Higher Diploma / Associate Degree students from the universities would enter the job market upon graduation. The other 50% would pursue further study in Degree courses. The numbers have already been halved.
- (b) According to the statistics in recent years, about 15% to 40% (depending on which courses) of IVE HD graduates in E&M disciplines would pursue further study in degree programmes. The numbers in Table 4.5 are the estimate of the number of graduates who actually enter the job market.
- (c) It is assumed that about 25% of graduates who achieve the DVE award from the DVE programme would enter the job market. The other 75% would pursue further study in HD courses. About 20% of graduates who exit the DVE programme with TFC award would enter the job market as technician trainees. The numbers in Table 4.5 are the sums of the 25% DVE and 20% TFC graduates. In 2011, the planned intake of S5 school leavers for the DVE programme was reduced because of the introduction of the New Senior Secondary Curriculum in that gap year. The reduced intake affects the number of DVE graduates in 2012.

4.16 The projected supply of technicians from 2011 to 2013 for key E&M trades is shown in Table 4.5. 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. Similarly, 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.

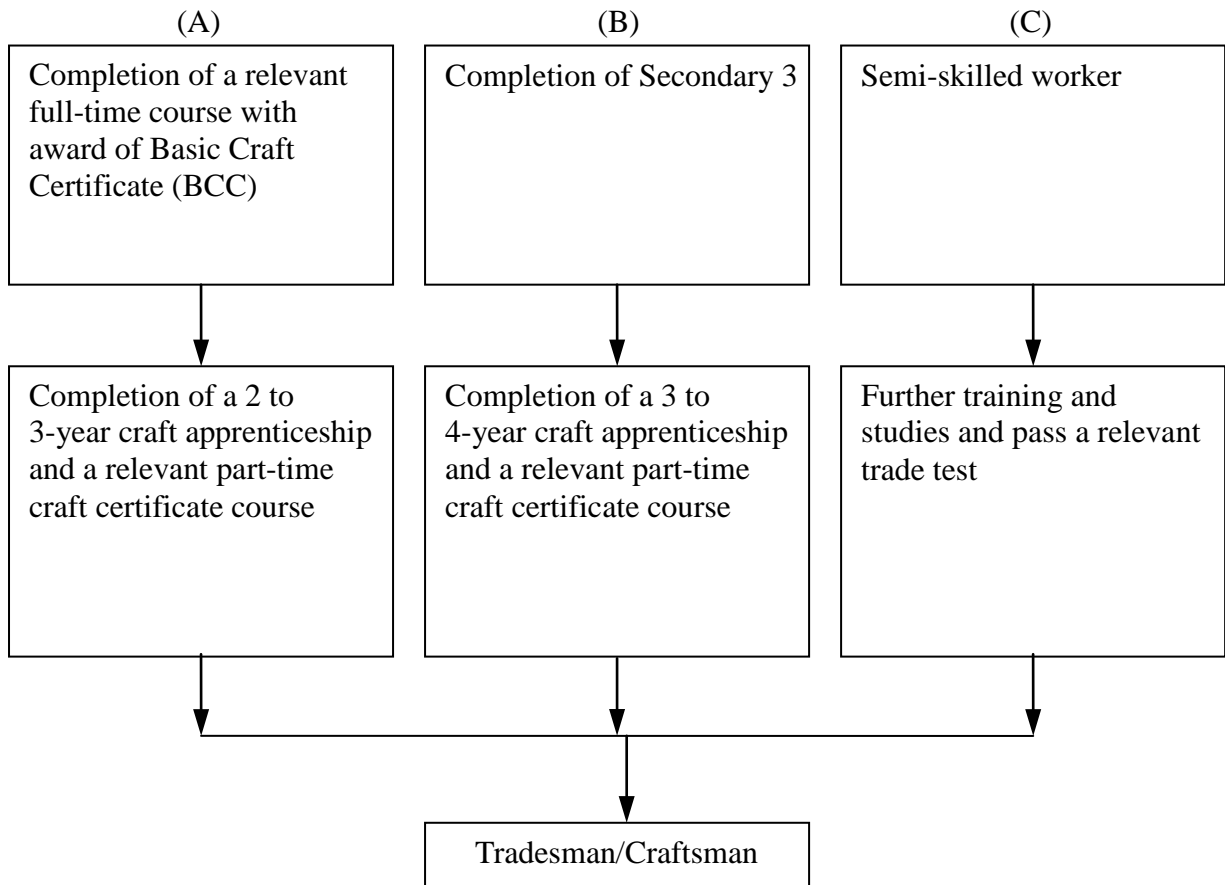
4.17 From Tables 4.4 and 4.5, it is noted that the output of graduates from technician courses in major disciplines of the E&M services industry will be greater than the projected training requirement in the coming few years. However, some graduates may be attracted by other industry sectors, e.g. Construction industry and some DVE/TFC graduates may be employed as craft apprentices, instead of technician apprentices. By taking the above-mentioned factors into account, the supply of graduates from technician courses is considered as matching with the market demand.

#### Training of Tradesmen/Craftsmen

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

4.19 The common routes for training tradesmen/craftsmen are 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 E&M services industry are mainly offered by the Youth College of the Vocational Training Council for S3 school leavers. Apart from the full-time DVE programme (i.e. pre-employment training course), Craft Certificate courses are offered in part-time day mode for registered craft apprentices. The Construction Industry Council Training Academy (CICTA) also offers two Basic Craft courses on E&M trades, namely electrical installation, plumbing and pipe-fitting.

4.22 Again, with reference to Appendices 16 to 18, the projected average annual training requirements of principal jobs at tradesman/craftsman level in major disciplines of the E&M services industry, from 2012 to 2014, are listed in Table 4.6.

Table 4.6: Projected Average Annual Training Requirement of Tradesmen/Craftsmen in Major Disciplines of the E&M Services Industry from 2012 to 2014

<u>Job Title</u>	<u>No. Employed at 2011 Manpower Survey</u>	<u>Projected Average Annual Training Requirement</u>
Foreman/Chargehand	4 645	296 – 362
Building Services Mechanic	1 554	99 – 121
Electrician/Electrical Fitter (E&M Engineering Sector)	9 515	607 – 743
(Shipbuilding & Ship Repair Sector)	163	12 – 14
(Gas Sector)	24	1
Control Panel Assembler	28	2
Electrical Wireman	902	58 – 70
Refrigeration/Air-conditioning/ Ventilation Mechanic (E&M Engineering Sector)		
- Electrical Control	3 531	225 – 275
- Unitary System	1 885	120 – 147
- Air System	782	50 – 61
- Thermal Insulation	211	13 – 16
- Water System)	103	7 – 8
(Shipbuilding & Ship Repair Sector)	25	2
Plumber and Pipe Fitter (E&M Engineering Sector)	384	24 – 30
(Shipbuilding & Ship Repair Sector)	84	6 – 7
Mechanical Fitter/Machinist (E&M Engineering Sector)	3 303	211 – 257
(Shipbuilding & Ship Repair Sector)	513	36 – 45
(Gas Sector)	47	2
Lift/Escalator Mechanic	2 631	168 – 205
Fire Services Mechanical Fitter	1 141	73 – 89
Fire Services Electrical Fitter	843	54 – 66
Cable Jointer (Power)	324	21 – 25
Overhead Linesman	404	26 – 31
Electrical Appliances Service Mechanic	803	51 – 63

<u>Job Title</u>	<u>No. Employed at 2011 Manpower Survey</u>	<u>Projected Average Annual Training Requirement</u>
Welder (E&M Engineering Sector)	175	11 – 14
(Shipbuilding & Ship Repair Sector)	76	5 – 7
(Gas Sector)	2	0
Ship Classification Qualified Welder (Shipbuilding & Ship Repair Sector)	20	1 – 2
Gas Distribution Fitter (LPG) (Gas Sector)	44	2
Gas Distribution Fitter (Town Gas) (Gas Sector)	195	8 – 10
Gas Utilization Fitter (Domestic) (Gas Sector)	524	21 – 26
Gas Utilization Fitter (Non-domestic) (Gas Sector)	117	5 – 6
<b>Total</b>	<b>34 998</b>	<b>2 217 – 2 709</b>

4.23 Table 4.7 show the projected average annual supply of tradesmen/craftsmen in key E&M trades in 2011 to 2013. It is expected that a majority of graduates would enter employment as craft apprentices and continue to receive formal training by enrolling in part-time day mode Craft Certificate courses. For comparison, the projected enrolment figures of Craft Certificate courses are listed in Table 4.8. It should be noted that there are some craft apprentices who entered into employment without studying in DVE programme before (i.e. path B in Figure 4.3).

4.24 No matter how the numbers are counted (i.e. whether to adopt the figures in Table 4.7 or Table 4.8), it is obvious that the supply of new tradesmen/craftsmen for the E&M services industry are less than 600 per year from 2011 to 2013, which is far from sufficient. Compared to the training requirements as calculated in Table 4.6 (i.e. some 2 500 new bloods required per annum), only about 23% of the manpower demand at the tradesman/craftsman level can be met via formal training. Although there are some qualified tradesmen/craftsmen who attained their qualifications through on-the-job training / skills upgrading training or passing relevant trade tests, the supply is still considered to be inadequate for supporting the major infrastructure projects in the coming years.

4.25 To provide sufficient qualified tradesmen/craftsmen to the E&M services industry for sustainable development, the Training Board recommends training providers to increase their pre-employment training places for E&M disciplines and offer more skills upgrading courses for in-service semi-skilled workers so that they can migrate to qualified tradesmen/craftsmen.

4.26 Considering that youngsters have more choices nowadays, employers should keep on promoting the image and prospects of the industry so that more secondary school leavers will consider E&M services industry for their career.

Table 4.7: Projected Local Supply of Craftsmen/Tradesmen for Key E&M Trades from 2011 to 2013

<u>Institution</u>	<u>Programme</u>	<u>Projected No. of Graduates Entering Job Market as Craftsmen/Tradesmen</u>		
		<u>2011</u>	<u>2012</u>	<u>2013</u>
Youth College	DVE (Building Services Engineering Stream) – specialized in Air-conditioning & Refrigeration or Building Services	135	120	160
	DVE (Electrical Engineering Stream) – specialized in Electrical Installation or Lift & Escalator	175	150	160
	DVE (Mechanical Engineering Stream)	90	85	85
	DVE (Gas Services Engineering Stream)	30	45	45
Sub-total		430	400	450
Construction Industry Council Training Academy	Basic Craft Courses:			
	- Electrical Installation	80	80	80
	- Plumbing and Pipe-fitting	60	60	60
Sub-total		140	140	140
<b>Grand Total</b>		<b>570</b>	<b>540</b>	<b>590</b>

Note

- (a) The projection is based on the following assumptions:
- Nearly 100% of the students from DVE (Gas Engineering Stream) would enter the job market after one year of study and getting the Basic Craft Certificate (BCC) award.
  - For other E&M streams of the DVE programme, about 50% of the S3 intakes would exit the programme with the BCC award and enter the job market as craft apprentices after one year of study. About 20% of the S3 intakes would exit the

programme with the Technician Foundation Certificate (TFC) award and enter the job market as craft apprentices after two years of study. The numbers in Table 4.7 represent the sum of these graduates (i.e. totally 70% of the S3 intakes).

- (b) The number of graduates in 2012 was projected based on the enrolment figures in AY2011/12.
- (c) The number of graduates in 2013 was projected based on the course plans for AY2012/13.

Table 4.8: Projected Number of Registered Apprentices of E&M Trades Enrolling in PTD Mode Craft Certificate Courses from 2011 to 2013

<u>Institution</u>	<u>Programme</u>	<u>Projected Annual Enrolments</u>
Youth College	Craft Certificate in Air-conditioning & Refrigeration	100
	Craft Certificate in Building Services	60
	Craft Certificate in Electrical Engineering	185
	Craft Certificate in Lift and Escalator Engineering	70
	Craft Certificate in Mechanical Engineering	60
	Craft Certificate in Gas Services Engineering	25
Total		500

Note

- (a) The projection is based on the enrolment figures of AY2011/12.
- (b) The numbers include craftsmen/tradesmen trainees in paths (A) and (B) of Figure 4.3.
- (c) Most of the Craft Certificate course intakes are those graduates listed in Table 4.7 (i.e. path (A)).

Training of Semi-skilled/General Workers

4.27 Semi-skilled/general workers are normally assigned to repetitive work requiring only a narrow range of skills and short period of training. In view of the manpower shortage in the coming years, the Training Board recommends more semi-skilled / general workers be trained up to help relieving the workload of tradesmen/craftsmen. This can be achieved by means of retraining programmes and short courses. Due to the relatively unpleasant working environment and more demanding knowledge and skills, not many people will consider E&M services as their choice for retraining. The Training Board recommends

more attractive incentive/subsidizing schemes be offered so as to boost the enrolment of the retraining programmes.

4.28 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 E&M services industry. The Skills Upgrading Scheme (now known as SUS-Plus) 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.

#### Pro-Act Training and Development Centres of the Vocational Training Council

4.29 The Pro-Act(Electrical), Pro-Act(Mechanical), Pro-Act(Gas) and Pro-Act(Welding) Centres of the Vocational Training Council provide the following types of training and skill assessment for the E&M 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 for skill assessment of in-service workers.

#### Trade Testing for Electricians, Lift and Escalator Workers

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 E&M 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 The Training Board is currently developing trade test for Lift and Escalator workers. These new trade tests are planned to be offered in the 2<sup>nd</sup> half of 2012.

4.33 Employers are urged to encourage their electricians, lift and escalator workers to take the trade test so that their tradesman/craftsman status can be formally recognized.

#### Specified Training Courses and Trade Tests for Construction Workers of E&M Trades

4.34 Under an Agreement with the Construction Industry Council Training Academy (CICTA), the Vocational Training Council was appointed by the CICTA to offer Specified Training Courses (STC) on 12 E&M construction trades to the registered skilled workers (provisional) under the Construction Workers Registration Ordinance (CWRO) for equipping them for registration before expiry of the 3-year provisional period.

4.35 Before September 2010, VTC was entrusted by CICTA to conduct trade tests (TT) and intermediate trade tests (ITT) for 12 E&M trades of the construction industry. Although these TT and ITT are now conducted by CICTA, Pro-Act Centres of VTC continue to train up DVE students to attempt ITT so that they can be registered as qualified workers under the CWRO.

4.36 E&M contractors for construction works are urged to encourage their E&M workers to take the TT and ITT, as well as their registered skilled workers (provisional) to attend the specified training courses, so as to meet the CWRO requirements.

#### New Technology Training Scheme (NTTS)

4.37 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

4.38 The Training Boards' major conclusions and recommendations are summarised below:

(a) Training of Professionals/Technologists:

The supply of local university graduates roughly matches the projected training requirements of major disciplines of the E&M services industry. Although some graduates may join the Construction industry or other sectors in the job market, the inadequacy will be supplemented by overseas graduates and workers at technician level who upgrade themselves to professionals/technologists through part-time degree courses.

(b) Training of Technicians:

The supply of graduates from technician courses in major disciplines of the E&M services industry will be greater than the projected training requirement in the coming years. However, some graduates may be attracted by other industry sectors, e.g. Construction industry and some DVE/TFC graduates may choose to begin their career as craft apprentices. By taking these factors into account, the supply of graduates from technician courses is considered as matching with the market demand.

(c) Training of Tradesmen/Craftsmen:

- (i) The supply of tradesmen/craftsmen via formal training programmes like DVE and Craft Certificate can only meet about 23% of the projected training requirement of the E&M engineering sector and the shipbuilding & ship repair sector in 2011 to 2013. Although there are some qualified tradesmen/craftsmen who attained their qualifications through on-the-job training / skills upgrading training or passing relevant trade tests, the supply is still considered to be inadequate for supporting the major infrastructure projects in the coming years.
- (ii) It is recommended that training capacities of pre-employment training courses at tradesmen/craftsmen level be increased and more skills upgrading courses be offered to in-service semi-skilled workers so as to enable them to attain recognized qualifications as tradesmen/craftsmen.
- (iii) The projected training requirements of gas distribution fitters in the gas sector are met by the output of the DVE programme (Gas Services Engineering stream) in the coming years.

(d) Training of Semi-skilled/General Workers:

In view of the manpower shortage in tradesman/craftsman level, it is recommended that more semi-skilled / general workers be trained up to help relieving the workload of tradesmen/craftsmen. This can be achieved by means of retraining programmes and short courses. To boost the enrolment rate of the retraining programmes, it is further recommended that more attractive incentive/subsidizing schemes be introduced.

- (e) The projected training requirements listed in Tables 4.2, 4.4 and 4.6 are for reference purpose only. Training providers should further consider the enrolment figures and employment rates of the graduates when planning their training capacities.
- (f) The projected training requirements are worked out by means of trend analysis, i.e. AFM. Given that the scale of the major infrastructure projects is too large, the sudden surge of manpower requirement from 2012 onwards probably cannot be fully estimated by means of trend analysis. The Training Board will closely monitor the situation and take the latest development into consideration when conducting the 2013 E&M services industry manpower survey.
- (g) The Qualifications Framework (QF) launched by the HKSAR 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.
- (h) Employers should encourage their employees to take the trade tests for recognition by the Government.
- (i) E&M contractors for construction works should encourage their E&M workers to register as qualified workers under the Construction Workers Registration Ordinance.

# 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[VTC]。根據職權範圍，本會須負責調查機電工程業的人力需求，並向 VTC 提供有關發展訓練設施的建議，以應付業界的需要。本會委員由主要行業公會、職工會、專業團體、教育／培訓機構及政府部門提名出任。委員名單及職權範圍分別載於附錄 1 及附錄 2。

### 人力調查

1.2 本會按照職權規定，於 2011 年 3 月 14 日至 8 月 13 日期間進行機電工程業人力調查，蒐集最新人力資料，以評估業內的人力需求及培訓需要。是次調查由政府統計處[統計處]協助進行。

1.3 調查所得資料如下：

- (i) 調查期間機電工程業的僱員人數；
- (ii) 僱主預測至 2012 年 3 月時的僱員人數；
- (iii) 調查期間的空缺數目；
- (iv) 調查期間正在受訓的僱員人數；
- (v) 僱主預測至 2012 年 3 月時正在受訓的僱員人數；  
以及
- (vi) 僱員的平均收入。

## 調查範圍

1.4 是次調查涵蓋下列行業及門類：

### I. 行業 A：機電工程

門類 I：承造

負責下列機電系統及設備的承造商：

- (i) 電線鋪設及電器裝設（HSIC：432101）；
- (ii) 空氣調節／通風系統安裝及保養（HSIC：432201）；以及
- (iii) 火警及滅火設備安裝及保養（HSIC：432103）。

門類 II：水電工程

- (i) 電器裝設兼水管鋪設（HSIC：432102）。

門類 III：服務

提供下列機電工程服務的機構：

- (i) 升降機／自動梯安裝及保養（HSIC：432901）\*；
- (ii) 電訊設備安裝及保養（HSIC：432106）\*；
- (iii) 綜合及其他電器及機械設備安裝及保養（HSIC：432199）\*；
- (iv) 飛行器裝嵌及相關機械的製造（HSIC：303000）；
- (v) 發電、輸電及配電（HSIC：351000）；
- (vi) 鐵路及纜索運輸（HSIC：491000）；
- (vii) 屋宇設備工程服務（HSIC：711400）；
- (viii) 電力設備維修（HSIC：331400）；以及
- (ix) 家用器具及庭園設備修理（HSIC：953200）。

門類 IV：補充抽樣 – 其他與機電工程行業相關之機構

包括下列與機電工程行業相關之機構：

- (i) 專營電氣產品、設備與系統，並設有維修服務工場的主要貿易公司；
- (ii) 聘有屋宇設備保養人員的物業管理公司；以及
- (iii) 有關政府部門及教育機構。

## II. 行業 B：船舶修建

門類 V：包括下列船廠及艇廠：

- (i) 船舶及浮動結構體的製造（HSIC：301100）；
- (ii) 娛樂及運動用小艇的製造（HSIC：301200）；以及
- (iii) 海上運輸設備維修（HSIC：331500）。

門類 VI：補充抽樣 – 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：

門類 VII：燃氣製造及配送公司  
（HSIC：352000）；

門類 VIII：燃氣供應系統安裝及保養公司  
（HSIC：432204）；以及

門類 IX：補充抽樣 – 設有維修服務工場的氣體燃料設備貿易公司，以及有關政府部門及教育機構。

1.5 是次調查的對象涵蓋業內合共 9 144 間機構，包括 8 662 間機電工程業機構、299 間船舶修建行業機構，以及 183 間氣體燃料業機構。在 9 144 間機構中，8 995 間列載於《香港標準行業分類》[Hong Kong Standard Industrial Classification, HSIC]內（見本章第 1.4 段的列表）。

1.6 鑑於調查人手有限，本會採用分層隨機抽樣法，從 HSIC 所載的 8 995 間機構中，抽選出 1 024 間作為調查對象；再加上 149 間特選機構，即合共涵蓋 1 173 間機構，而涉及的僱員人數約佔業內總人力的 82%。

### 調查方法

1.7 實地調查展開前兩周，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 19A、19B、19C 及 19D）一併寄給各選定機構。

1.8 實地調查進行期間，統計處的人員預約到訪各選定機構，收集填妥的調查表，並協助僱主填報相關資料。

1.9 調查完畢後，負責人員複查所有填妥的調查表，並在有需要時與填覆機構核實。調查表隨後由統計處整理，並把所得數字用適當因數倍大，以反映機電工程業內各行業的整體人力狀況。

### 宣傳

1.10 本會於調查進行前聯絡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 1 173 間受訪機構中，826 間提供所需資料、31 間拒絕回覆，其餘則已結業、沒有聘請技術人員、轉營其他行業、未能聯絡上或暫時停業。是次調查的有效回應率為 97.4%。

### 人力調查報告

1.12 本報告刊載有關人力調查的結果、本會對機電工程業內三大行業的每年訓練需求預測，以及為應付該些需求而提出的建議措施。報告內提及的「僱員」和「從業員」均指從事機電工程業主要職務的人員，而「受訓者」則指正在接受各種訓練的僱員及學徒。

1.13 本會在完成資料蒐集及整理後，隨即於 2011 年 11 月，將載有調查結果摘要的《2011 年機電工程業人力統計報告書》上載 VTC 網頁，供公眾參閱。

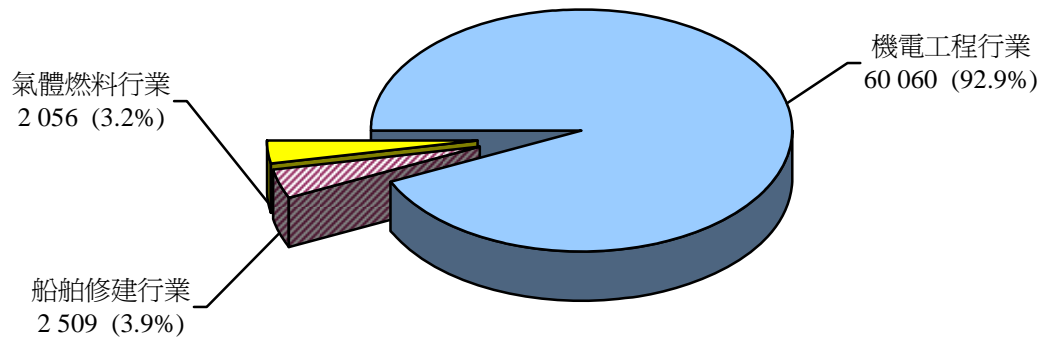
## 第二章

### 調查結果摘要

#### 僱員人數

2.1 是次調查顯示，於 2011 年 3 月 14 日至 8 月 13 日期間，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從業員共有 64 625 人，其中 60 060 人（92.9%）屬機電工程行業，2 509 人（3.9%）屬船舶修建行業，2 056 人（3.2%）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，於 2011 年 3 至 8 月，業內從事其他職務的僱員共有 29 284 人，其中 24 502 人從事機電工程行業，2 611 人從事船舶修建行業，2 171 人從事氣體燃料行業。



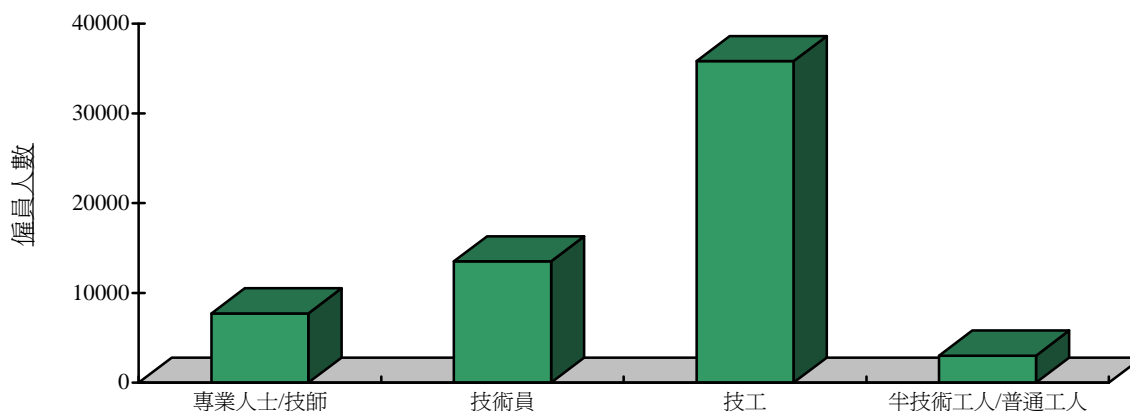
## 機電工程行業

2.3 機電工程行業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

	專業人士／ 技師	技術員	技工	半技術工人／ 普通工人	總數
	7 720	13 512	35 816	3 012	60 060
佔僱員總數 百分比	12.9%	22.5%	59.6%	5.0%	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；而承造、電器裝設兼水管鋪設、服務門類，以及補充抽樣機構的人力統計數字，分別見附錄 5、6、7 及 8。

2.5 由於很多機構兼營承造及服務門類業務，是次調查請受訪機構估計它們投放於這兩個門類工作的人力。結果顯示，機電工程行業的人力中，有 43.1% 從事承造門類工作，其餘 56.9% 則從事服務門類工作，僱員人數分別為 25 907 及 34 153 人。詳細數字見表 2.2。

表 2.2 機電工程行業各技能等級僱員分布情況

技能等級	僱員人數	從事承造門類的估計僱員人數	從事服務門類的估計僱員人數
專業人士／技師	7 720	4 180 (54.1%)	3 540 (45.9%)
技術員	13 512	5 141 (38.0%)	8 371 (62.0%)
技工	35 816	15 431 (43.1%)	20 385 (56.9%)
半技術工人／普通工人	3 012	1 155 (38.3%)	1 857 (61.7%)
總數	60 060	25 907 (43.1%)	34 153 (56.9%)

2.6 為便於比較，現採用與先前調查相同的分類方法，即假設每一行業分類機構只單一從事承造或服務門類工作。按此假設得出的機電工程行業僱員分布數字載於表 2.3。

表 2.3 機電工程行業各技能等級僱員分布情況

技能等級	僱員人數	從事承造門類的估計僱員人數	從事服務門類的估計僱員人數
專業人士／技師	7 720	2 129 (27.6%)	5 591 (72.4%)
技術員	13 512	3 890 (29.8%)	9 622 (71.2%)
技工	35 816	16 811 (46.9%)	19 005 (53.1%)
半技術工人／普通工人	3 012	1 487 (49.4%)	1 525 (50.6%)
總數	60 060	24 317 (40.5%)	35 743 (59.5%)

註：分析受訪機構提供的資料（載於附錄 9）後，本會決定，機電工程行業內除門類 I 的機構外，門類 III (ii) 的機構（行業編碼 432106：電訊設備安裝及保養），亦歸類為「承造門類」。而門類 III (iii)（行業編碼 432199：綜合及其他電器及機械設備安裝及保養）的機構，50% 歸「承造門類」、50% 歸「服務門類」；其他各類型機構均歸類為「服務門類」。

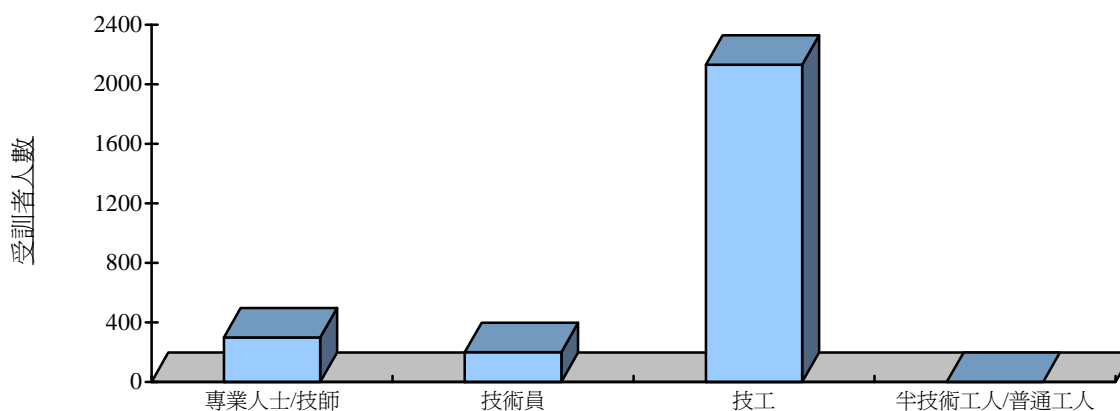
2.7 按行業編碼及技能等級排列的機電工程行業人力數字載於附錄 9。

2.8 調查期間，機電工程行業有 2 629 人接受各類訓練，佔總人力的 4.4%。各技能等級的分布情況見下表 2.4 及圖 2.3：

表 2.4 機電工程行業  
各技能等級受訓者的分布

技能等級	僱員人數	受訓者 人數	佔同級僱員 人數百分比
專業人士／ 技師	7 720	298	3.9%
技術員	13 512	199	1.5%
技工	35 816	2 132	6.0%
半技術工人／ 普通工人	3 012	-	-
總數	60 060	2 629	4.4%

圖 2.3 機電工程行業  
各技能等級受訓者的分布情況

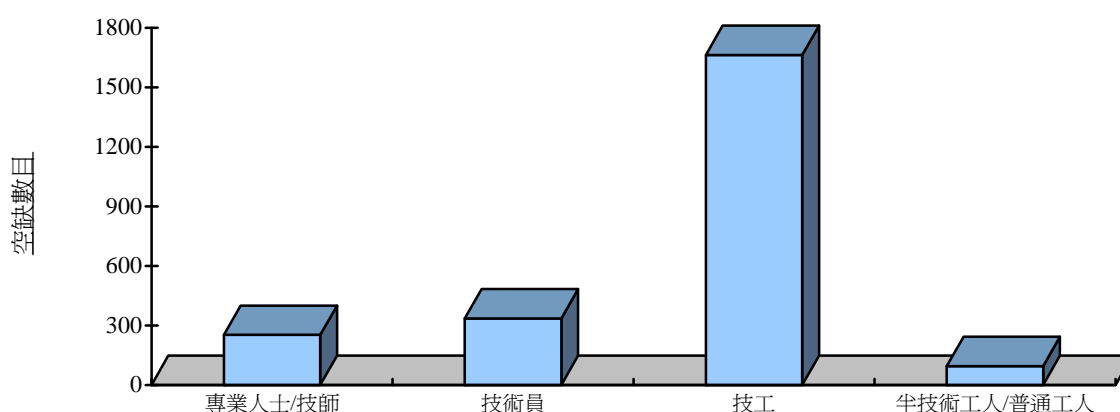


2.9 僱主填報的空缺有 2 344 個，約佔機電工程行業僱員總數的 3.9%。各技能等級空缺數目的分布情況如下：

表 2.5 機電工程行業  
各技能等級空缺數目的分布情況

技能等級	僱員人數	空缺數目	佔同級僱員 人數百分比
專業人士／ 技師	7 720	252	3.3%
技術員	13 512	335	2.5%
技工	35 816	1 663	4.6%
半技術工人／ 普通工人	3 012	94	3.1%
總數	60 060	2 344	3.9%

圖 2.4 機電工程行業  
各技能等級空缺數目的分布情況

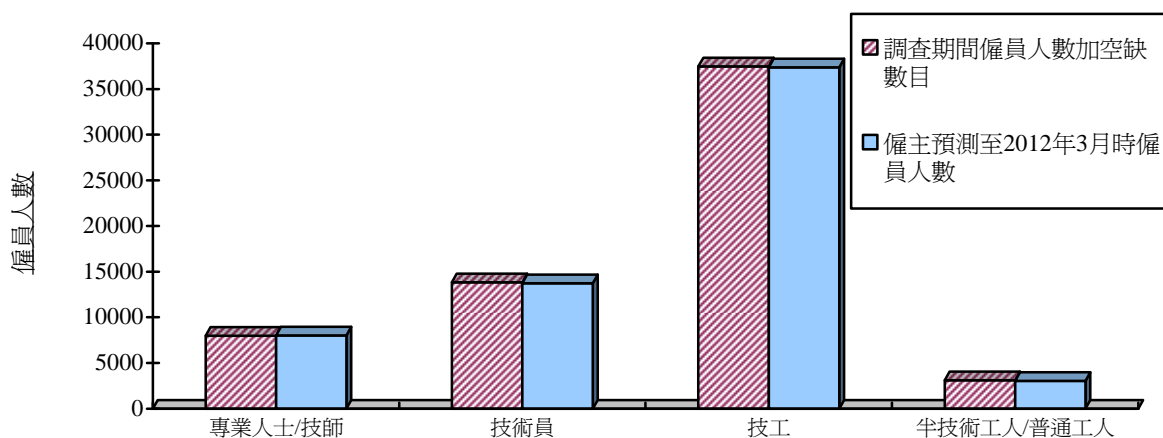


2.10 僱主預測至 2012 年 3 月時，機電工程行業將有機電僱員 62 170 人，按年微降 0.38%，各技能等級的分布情況如下：

表 2.6 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 2012 年 3 月時僱員人數
專業人士／技師	7 972	8 022
技術員	13 847	13 751
技工	37 479	37 371
半技術工人／普通工人	3 106	3 026
總數	62 404	62 170

圖 2.5 機電工程行業預測僱員人數  
(按技能等級劃分)



2.11 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 2012 年 3 月時各工種的僱員人數，可參考附錄 3。

2.12 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 2.7 機電工程僱員平均每月收入

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
\$9 000 以下	-	178	2 283	1 113	3 574
\$9 001 - \$12 000	-	1 018	9 458	1 709	12 185
\$12 001 - \$15 000	37	2 535	12 046	54	14 672
\$15 001 - \$18 000	497	3 367	6 993	12	10 869
\$18 001 - \$25 000	1 396	3 620	1 859	-	6 875
\$25 001 - \$35 000	2 469	1 916	162	-	4 547
\$35 000 以上	2 759	173	-	-	2 932
未有說明	562	705	3 015	124	4 406
<b>總數</b>	<b>7 720</b>	<b>13 512</b>	<b>35 816</b>	<b>3 012</b>	<b>60 060</b>

2.13 根據每月總收入幅度劃分的機電工程行業各主要職務僱員分布情況，可參考附錄 4。

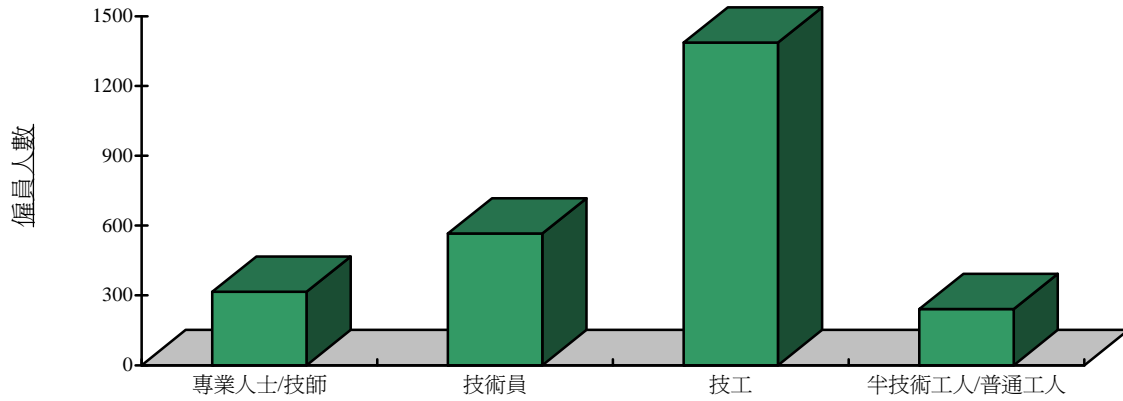
#### 船舶修建行業

2.14 船舶修建行業的人力統計數字見附錄 11。各技能等級機電僱員的分布情況見表 2.8 及圖 2.6：

表 2.8 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
	315	566	1 387	241	2 509
佔僱員 總數百分比	12.5%	22.6%	55.3 %	9.6%	100%

圖 2.6 船舶修建行業各技能等級  
機電僱員的分布情況



2.15 調查期間，業內有 33 人接受各類訓練，佔行業總人力的 1.3%。各技能等級的分布情況如下：

表 2.9 船舶修建行業各技能等級  
機電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 人數百分比
專業人士／技師	315	-	-
技術員	566	14	2.5%
技工	1 387	19	1.4%
半技術工人／ 普通工人	241	-	-
總數	2 509	33	1.3%

2.16 僱主填報的空缺數目有 116 個，約佔船舶修建行業內機電僱員總數的 4.6%。各技能等級空缺數目的分布如下：

表 2.10 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 人數百分比
專業人士／技師	315	6	1.9%
技術員	566	13	2.3%
技工	1 387	77	5.6%
半技術工人／ 普通工人	241	20	8.3%
總數	2 509	116	4.6%

2.17 僱主預測至 2012 年 3 月時，船舶修建行業會有機電僱員 2 624 人，按年微跌 0.04%，各技能等級的分布情況如下：

表 2.11 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 2012 年 3 月時僱員人數
專業人士／技師	321	320
技術員	579	579
技工	1 464	1 464
半技術工人／ 普通工人	261	261
總數	2 625	2 624



2.18 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 2012 年 3 月時各工種的僱員人數，可參考附錄 11。

2.19 各技能等級的機電僱員每月收入幅度如下：

表 2.12 船舶修建行業機電僱員的平均每月收入

每月平均 收入幅度	專業人士／		技工	半技術工人／		總數
	技師	技術員		普通工人		
\$9 000 以下	-	5	56	32	93	
\$9 001 - \$12 000	-	3	208	168	379	
\$12 001 - \$15 000	-	62	620	23	705	
\$15 001 - \$18 000	1	58	224	16	299	
\$18 001 - \$25 000	58	190	189	-	437	
\$25 001 - \$35 000	58	4	6	-	68	
\$35 000 以上	84	38	-	-	122	
未有說明	114	206	84	2	406	
<b>總數</b>	<b>315</b>	<b>566</b>	<b>1 387</b>	<b>241</b>	<b>2 509</b>	

2.20 根據每月總收入幅度劃分的各主要職務僱員分布情況，可參考附錄 12。

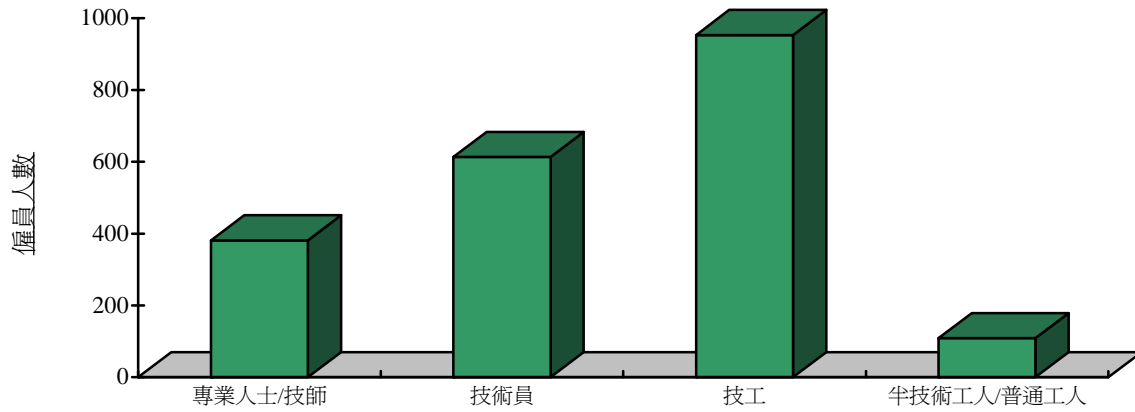
#### 氣體燃料行業

2.21 氣體燃料行業的人力統計數字見附錄 13。該業各技能等級機電僱員的分布情況見表 2.13 及圖 2.7：

表 2.13 氣體燃料行業各技能等級機電僱員的分布情況

	專業人士／		技工	半技術工人／		總數
	技師	技術員		普通工人		
	381	613	953	109	2 056	
佔僱員 總數百分比	18.5%	29.8%	46.4%	5.3%	100%	

表 2.7 氣體燃料行業各技能等級機電僱員的分布情況



2.22 調查期間，業內有 101 人接受各類訓練，佔僱員總數的 4.9%。各技能等級的分布情況如下：

表 2.14 氣體燃料行業各技能等級機電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比
專業人士／技師	381	9	2.4%
技術員	613	4	0.7%
技工	953	88	9.2%
半技術工人／普通工人	109	-	-
總數	2 056	101	4.9%

2.23 僱主填報的空缺有 23 個，約佔氣體燃料行業機電僱員總數的 1.1%。各技能等級空缺數目的分布情況如下：

表 2.15 氣體燃料行業機電僱員空缺數目  
(按技能等級劃分)

<u>技能等級</u>	<u>僱員人數</u>	<u>空缺數目</u>	<u>佔同級僱員 人數百分比</u>
專業人士／技師	381	4	1.0%
技術員	613	6	1.0%
技工	953	13	1.4%
半技術工人／普通工人	109	-	-
總數	2 056	23	1.1%

2.24 僱主預測至 2012 年 3 月時，氣體燃料行業將有機電僱員 2 088 人，按年微增 0.4%。各技能等級的分布情況如下：

表 2.16 氣體燃料行業機電僱員的預測人數  
(按技能等級劃分)

<u>技能等級</u>	<u>調查期間 僱員人數加 空缺數目</u>	<u>僱主預測至 2012 年 3 月時僱員人數</u>
專業人士／技師	385	391
技術員	619	618
技工	966	970
半技術工人／普通工人	109	109
總數	2 079	2 088

2.25 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 2012 年 3 月時各工種的僱員人數，可參考附錄 13。

2.26 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 2.17 氣體燃料行業的機電僱員平均每月收入

每月平均 收入幅度	專業人士／		技工	半技術工人／		總數
	技師	技術員		普通工人		
\$9 000 以下	-	-	17	20		37
\$9 001 - \$12 000	3	44	259	75		381
\$12 001 - \$15 000	2	347	399	6		754
\$15 001 - \$18 000	-	57	23	-		80
\$18 001 - \$25 000	33	136	202	-		371
\$25 001 - \$35 000	339	12	-	-		351
\$35 000 以上	4	-	-	-		4
未有說明	-	17	53	8		78
<b>總數</b>	<b>381</b>	<b>613</b>	<b>953</b>	<b>109</b>		<b>2056</b>

2.27 根據每月總收入幅度劃分的各主要職務僱員分布情況，可參考附錄 14。

### 地盤機電人力

2.28 為評估地盤機電人力狀況，本會在 2011 年 3 月進行第七次補充調查，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 974 個屋宇地盤，以及 473 個土木工程及其他地盤。

2.29 補充調查顯示，於調查期間，共有 6 585 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 5 789 人 (87.9%) 在 189 個屋宇地盤工作，796 人 (12.1%) 在 74 個土木工程及其他地盤工作。補充調查的人力數據，已包括在 2011 年人力調查各受訪機構填報的人力資料內，並納入為機電工程行業統計數字。

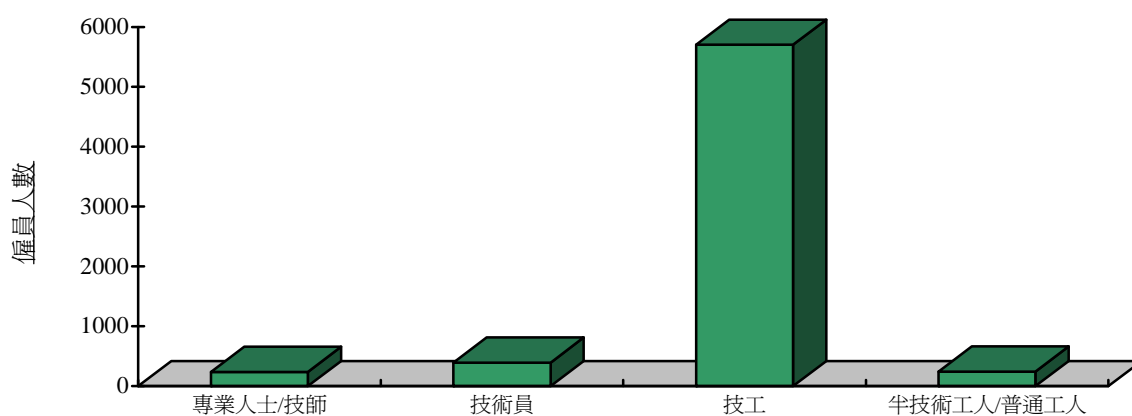
2.30 各技能等級從業員的分布情況如下：

表 2.18 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
			百分比
專業人士／技師	240	(114)	3.6%
技術員	395	(259)	6.0%
技工	5 706	(5 913)	86.7%
半技術工人／普通工人	244	(180)	3.7%
總數	6 585	(6 466)	100%

(括號內數字為 2009 年 3 月第六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



2.31 地盤機電人力統計數字見附錄 10。

### 2010/11 年人力供應情況

2.32 有關僱主對調查進行前 12 個月業內人力供應情況的看法，可參考附錄 15。

## 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，認為所得資料大致可反映調查期間機電工程業內機電工程、船舶修建、以及氣體燃料三大行業的就業情況。

#### 機電工程行業

3.2 2011年3月14日至8月13日期間，機電工程行業共有從業員60 060名，與上次調查（2009年3月）所錄得的56 260人比較，平均每年增長3.4%。表3.1按技能等級及門類列載機電工程行業2011年的人力分布情況。

表 3.1: 機電工程行業的人力分布情況  
(按技能等級及門類劃分)

技能等級	承造門類	服務門類	總數
專業人士／技師	2 129 (4 180)	5 591 (3 540)	7 720
技術員	3 890 (5 141)	9 622 (8 371)	13 512
技工	16 811 (15 431)	19 005 (20 385)	35 816
半技術工人／ 普通工人	1 487 (1 155)	1 525 (1 857)	3 012
總數	24 317 (25 907)	35 743 (34 153)	60 060

註：

- (a) 「承造門類」是指2011年人力調查範圍內被歸類為門類 I、門類 III(ii) 的機構，以及門類 III(iii) 其中 50% 的機構（詳情請參閱第一章第 1.4 段）。

(b) 括號內的數字由僱主提供，反映僱主對「承造」及「服務」門類工程所投放的人力。

### 機電工程行業的人力變化

3.3 調查顯示，機電工程行業在過去兩年的整體僱員人數平均每年增長 3.4%。其中，專業人士／技師、技術員、技工級的僱員人數每年分別增長 2.4%、3.4% 及 5.3%。然而，鑑於不少半技術工人／普通工人級僱員在過去兩年內積極提升技能，並獲晉升至技工級，致使該級別的僱員人數錄得跌幅，平均每年下跌 11.2%。

3.4 調查期間，業內部分主要職務錄得 5% 或以上的空缺額，其中包括：消防設備工程師、控制及儀器工程師、安全主任、繪圖員、消防設備技術員、電訊技術員、屋宇設備技工、空調製冷設備技工（電力控制）、機械打磨裝配工／機床工、消防電氣裝配工，以及電訊系統裝配工。

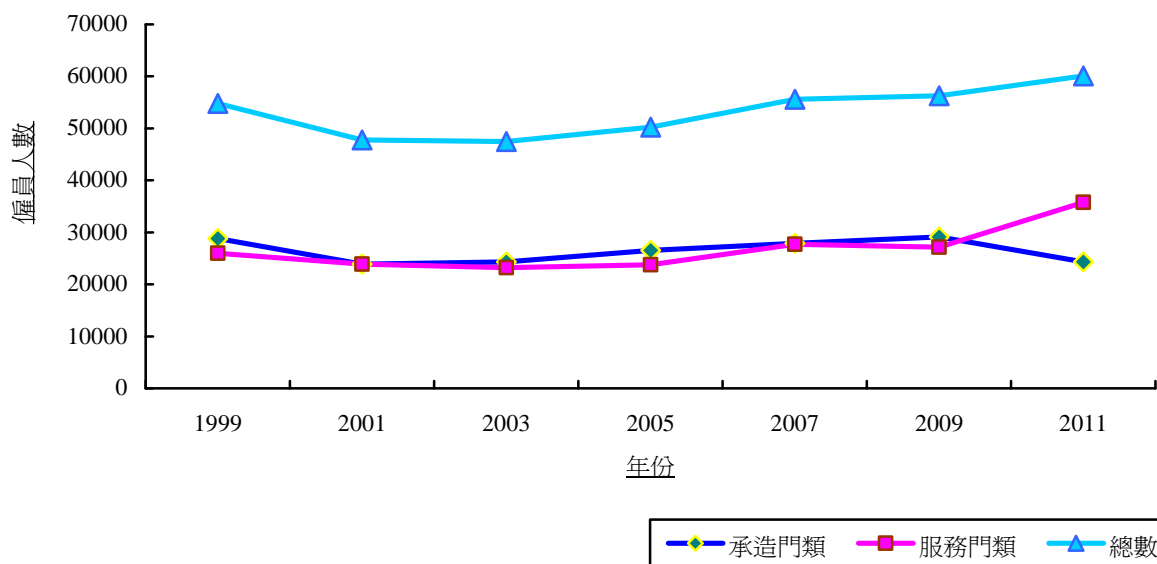
3.5 1999 至 2011 年間，機電工程行業的人力變化見表 3.2 及圖 3.1。

表 3.2  
1999 至 2011 年間  
機電工程行業的人力變化

調查年份	僱員人數		
	承造門類	服務門類	總數
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
2011	24 317*	35 743*	60 060

\* 於是次 2011 年調查中，本會修訂了「承造」及「服務」門類所涵蓋的機構，最主要的變動為將「升降機及自動梯安裝及保養」（HSIC：432901）由「承造」門類轉至「服務」門類。

圖 3.1 1999 至 2011 年間  
機電工程行業的人力變化



3.6 機電工程行業的僱員人數於 1999 年攀升至高峰，隨後於 2003 年跌至低谷。隨著香港與鄰近地區的經濟於 2003 年後轉趨蓬勃，業內的僱員人數逐漸回升；2007 年調查錄得的僱員人數更超越 1999 年的數字。其後，業內的僱員人數仍然保持升勢。過去兩年，由於大型基建項目陸續上馬，僱員人數的升勢加劇，平均每年錄得 3.4% 的明顯升幅。

3.7 自 1999 年起的人力調查顯示，機電工程行業的受訓者人數持續下跌，直至 2007 年，業界因採用大型飛機庫而須僱用更多機械工程、飛機工程維修服務技工及受訓者以應付需要，故此受訓人數有所回升。是次調查結果顯示，過去兩年，受訓者人數有所增加，而且平均每年錄得 28.3% 的顯著增長（見表 3.3 及圖 3.2）。其中，「技工級」的回升強度尤其顯著（平均每年增長 37%），顯示業內對該技能等級僱員的需求殷切。

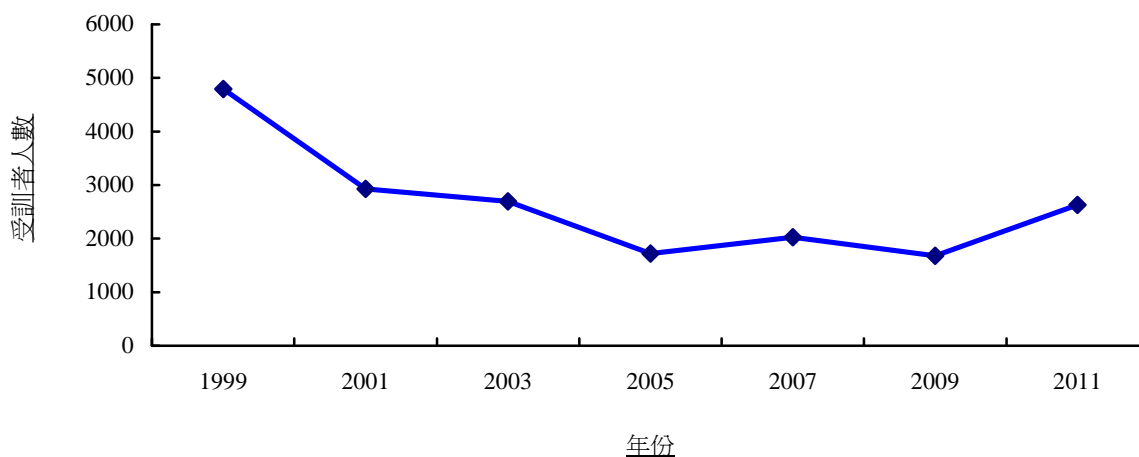
表 3.3 機電工程行業受訓者人數的變化

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%
2011	60 060	2 629	4.4%

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

3.8 未來五年，大型基建項目將陸續進入全面施工階段。隨著建造工程逐漸竣工，預期由 2012 年起，業界對「承造門類」機電從業員的需求將急增。

3.9 政府推行的資助計劃，如「樓宇更新大行動」及「長者維修自住物業津貼計劃」，將繼續為「服務門類」的機電從業員創造更多就業機會。本會預期該門類的人力將錄得穩定增長。

3.10 本會比對建造業工人註冊管理局[CWRA]截至 2011 年 10 月時的註冊人數（見表 3.4），發現調查期間部分技工級主要職務的僱員人數較相關工種的註冊熟練技工[RSW]人數為多。這表示當承造業務在未來數年發展蓬勃時，僱主或未能招聘足夠的熟練技工應付需要。

表 3.4 僱員人數較 CWRA 註冊人數為多的技工級主要職務

<u>機電工程工種</u>	<u>2011 年人力調查僱員人數</u>	<u>CWRA 註冊熟練技工人數</u>	<u>CWRA 註冊半技術工人數</u>
電氣佈線工	902	326	2 715
空調製冷設備技工 (獨立系統)	1 885	415	547
空調製冷設備技工 (送風系統)	782	331	385
空調製冷設備技工(保溫)	211	116	27
機械打磨裝配工／機床工	3 303	594	565
消防電氣裝配工	843	401	160
消防機械裝配工	1 141	634	568
電訊系統裝配工	2 129	1 929	123

僱主填報的空缺數目及  
對未來一年機電工程行業的人力預測

3.11 與 2009 年人力調查的數字比較，是次調查期間僱主填報的空缺數目大幅增加（見表 3.5）。從表 3.6 所載僱主對未來一年機電工程行業的人力預測可見，僱主對業界的前景普遍感到樂觀。

表 3.5 機電工程行業空缺數目的變化

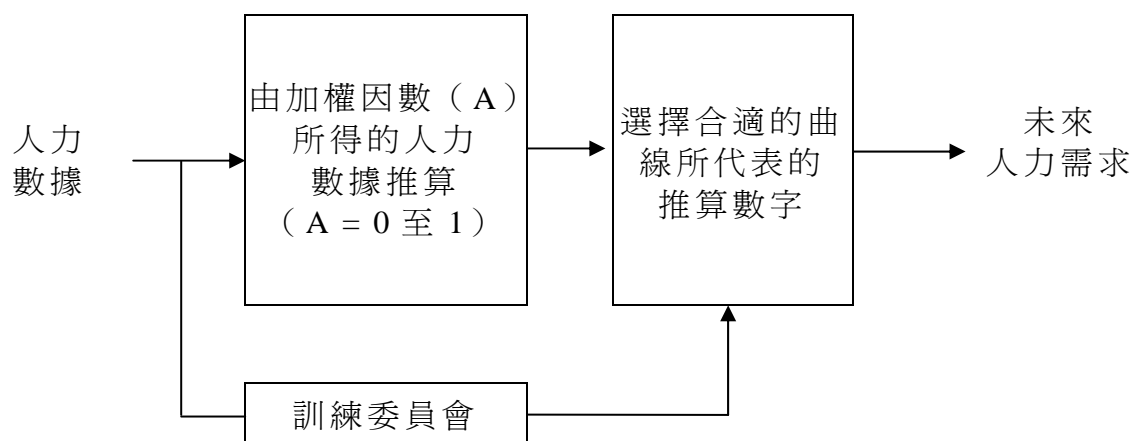
<u>技能等級</u>	<u>2009 年 空缺數目</u>	<u>2011 年 空缺數目</u>	<u>過去兩年的增幅</u>
專業人士／技師	106	252	137.7%
技術員	144	335	132.6%
技工	662	1 663	151.2%
半技術工人／普通工人	51	94	84.3%
總數	963	2 344	143.4%

表 3.6 機電工程行業的空缺分布及僱主預測的機電僱員數目

技能等級	調查期間的 僱員人數	僱主填報的 空缺數目		僱主對未來一年的 人力預測 至 2012 年 3 月時的 僱員人數
		人數	百分比	
專業人士／技師	7 720	252	3.3%	8 022 (+3.9%)
技術員	13 512	335	2.5%	13 751 (+1.8%)
技工	35 816	1 663	4.6%	37 371 (+4.3%)
半技術工人／ 普通工人	3 012	94	3.1%	3 026 (+0.5%)
總數	60 060	2 344	3.9%	62 170 (+3.5%)

### 機電工程行業的人力訓練需求推算

3.12 機電工程行業以往的人力調查一般採用「調節過濾法」[*Adaptive Filtering Method, AFM*]來推算未來的人力需求。AFM 是一種趨勢分析技巧，以加權指數平滑法進行「曲線擬合」，詳細說明如下：



AFM 將過往的人力數據加以權衡，愈新近的數據所佔的比重愈大，因此對推算結果的影響亦較大。不過，較新近的數據所佔的比重亦可透過加權因數 (A) 來調節。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。

3.13 1997 與 2001 年的人力調查中，本會採用「線性回歸法」[*Linear Regression Method, LRM*]推算出機電工程行業「承造門類」的人力需求（此方法根據人力需求與各類樓宇建築成本之間的相互關係推算出人力需求數字）；而「服務門類」的人力需求則以 AFM 來推算。本會將兩個門類的人力推算數字相加，得出機電工程行業未來每年的整體人力需求。

3.14 於 2003 年的人力調查中，本會採用統計模型分析法推算人力需求。此方法是根據機電工程行業整體技術人力與主要因素－「地盤樓宇建築工程總值」[*GVCW*]之間的相互關係推算出人力需求。

3.15 2005、2007 及 2009 年的人力調查中，機電工程行業的技術人力分布有所改變，由新建築工程轉移至樓宇翻新及裝修工程，因而導致整體技術人力與主要因素 GVCW 之間的相互關係可信指數下跌（低於建議採用的標準）。本會在考慮過建造項目數量、外圍影響等不明朗因素，以及可供使用的人力推算方法後，決定採用 AFM 來推算人力需求。

3.16 至於是次 2011 年人力調查，本會考慮到建造項目數量、外圍因素等皆與往年調查的情況相若，因此決定再次採用 AFM，以推算 2012 至 2014 年的人力需求。

3.17 整體而言，機電工程行業內 50 歲以上的技術人員所佔的比率並不特別高（「消防機械裝配工」、「一般焊接工」、「機械打磨裝配工」及「空調製冷設備技工（保溫）」等職務除外）。因此，本會建議將流失率定於 3%。

3.18 鑑於上述因素，機電工程行業於 2012 至 2014 年，為應付人力需求增長（AFM 推算所得數字）及填補各技能等級（專業人士／技師、技術員、技工）的流失人力（3%），平均每年須訓練的僱員人數見表 3.7。

表 3.7 推算機電工程行業每年所需訓練的機電僱員數目

<u>技能等級</u>	<u>調查期間的 僱員人數</u>	<u>推算 2012 至 2014 年 平均每年需要訓練的人手</u>
專業人士／技師	7 720	318 – 389 (254 – 311)
技術員	13 512	514 – 629 (437 – 537)
技工	35 816	2 285 – 2 792 (1 116 – 1 364)

註：括號內為本會於 2009 年就 2010 至 2012 年每年所需訓練人手的推算數字。

### 船舶修建行業

#### 人力變化

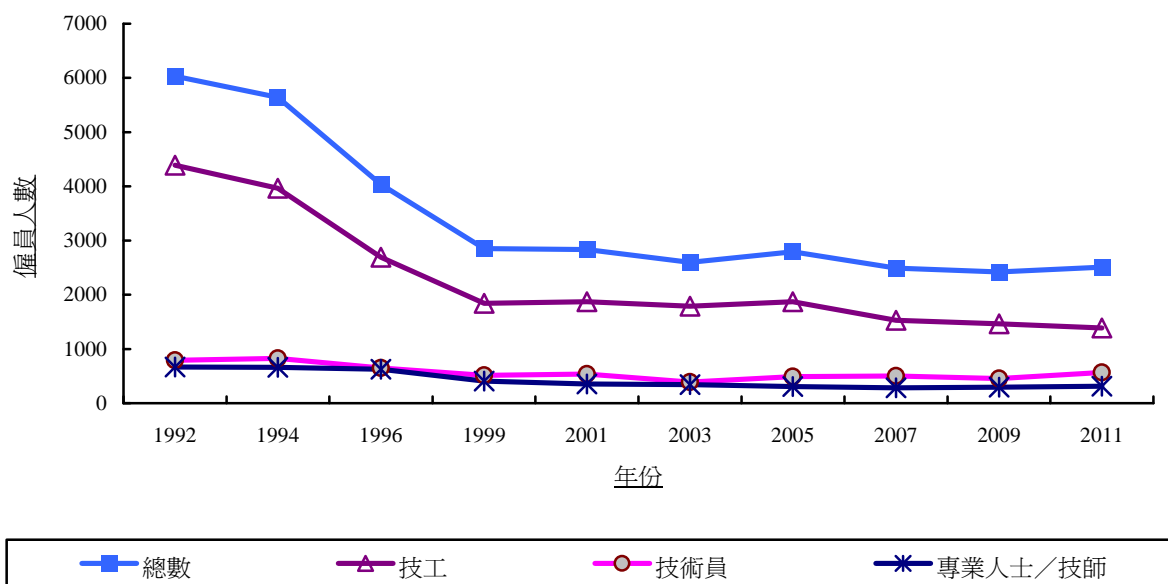
3.19 1992 至 2011 年間，船舶修建行業各技能等級（專業人士／技師、技術員、技工）的人力變化見表 3.8 及圖 3.3。

表 3.8 船舶修建行業機電人力的變化

<u>調查年份</u>	<u>專業人士／ 技師</u>	<u>技術員</u>	<u>技工</u>	<u>總人力*</u>
1992	668	790	4 392	6 034
1994	659	825	3 966	5 641
1996	624	647	2 690	4 038
1999	407	513	1 844	2 849
2001	354	539	1 872	2 834
2003	344	387	1 791	2 597
2005	307	490	1 871	2 794
2007	281	502	1 526	2 488
2009	294	457	1 463	2 421
2011	315	566	1 387	2 509

\* 總人力數字包括專業人士／技師、技術員、技工及半技術工人／普通工人級的僱員人數。

圖 3.3 船舶修建行業機電人力的變化



3.20 上述數字顯示，過去兩年，船舶修建行業的整體人力平均每年增加 1.8%，而自 1999 年起，業內的整體人力變化不大。

### 船舶修建行業的業務展望

3.21 預期未來數年，船舶修建行業的業務及人力需求將維持穩定。儘管如此，面對從業員老化的問題，業界須吸納更多新血，以填補流失人員所騰出來的空缺。

### 船舶修建行業的人力訓練需求推算

3.22 由於業內的人力需求趨勢穩定，故本會繼續採用 AFM 推算 2012 至 2014 年船舶修建行業的人力需求。

3.23 由數年前開始，業內有超過 33% 的技術僱員年逾 50 歲。因此，本會建議將流失率定於 6%。

3.24 綜合上述因素，本會推算 2012 至 2014 年船舶修建行業平均每年所需訓練的機電僱員數目如下：

表 3.9 推算船舶修建行業每年所需訓練的機電僱員數目

<u>技能等級</u>	<u>調查期間的 僱員人數</u>	<u>推算 2012 至 2014 年 平均每年需要訓練的人手</u>
專業人士／技師	315	22 – 27
技術員	566	40 – 49
技工	1 387	98 – 120

### 氣體燃料行業

#### 人力變化

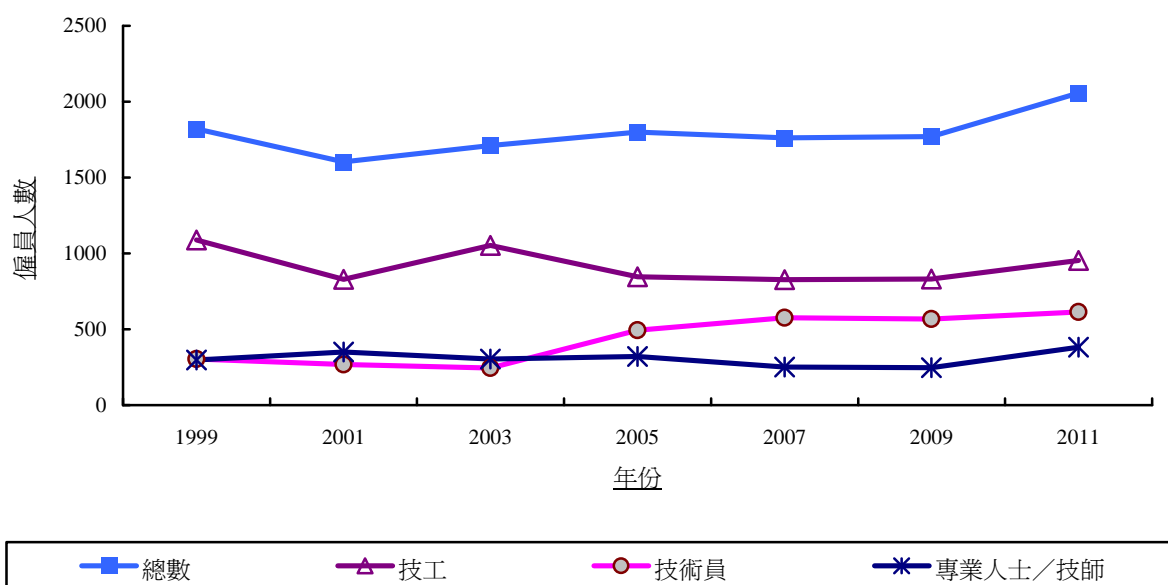
3.25 1999 年氣體燃料行業首次進行人力調查至今，業內三個技能等級的人力變化見表 3.10 及圖 3.4。

表 3.10 氣體燃料行業機電人力的變化

<u>調查年份</u>	<u>專業人士／ 技師</u>	<u>技術員</u>	<u>技工</u>	<u>總人力*</u>
1999	298	304	1 088	1 820
2001	350	268	830	1 604
2003	304	245	1 052	1 710
2005	320	493	845	1 799
2007	252	575	828	1 762
2009	246	567	832	1 770
2011	381	613	953	2 056

\* 總人力數字包括專業人士／技師、技術員、技工及半技術工人／普通工人級別的僱員人數。

圖 3.4 氣體燃料行業機電人力的變化



3.26 上述數字顯示，過去兩年，氣體燃料行業的整體人力變化不大。

#### 氣體燃料行業的業務展望

3.27 隨著未來數年公共房屋的供應上升，預期氣體燃料行業的人力將錄得正增長。

#### 氣體燃料行業的人力訓練需求推算

3.28 由於業內的整體人力需求趨勢穩定，故本會決定採用 AFM 推算氣體燃料行業 2012 至 2014 年的人力需求。

3.29 本會參考以往的調查結果，決定在推算未來的訓練需求時，將流失率定於 3%。

3.30 綜合上述因素，本會推算 2012 至 2014 年氣體燃料行業平均每年所需訓練的機電僱員數目見表 3.11。



表 3.11 推算氣體燃料行業每年所需訓練的機電僱員數目

<u>技能等級</u>	<u>調查期間的 僱員人數</u>	<u>推算 2012 至 2014 年 平均每年需要訓練的人手</u>
專業人士／技師	381	15 – 19
技術員	613	25 – 30
技工	953	39 – 47

3.31 本會將於 2013 年進行另一次機電工程業人力調查，以評估及更新業內的人力需求。

## 第四章

### 建議

4.1 考慮過本地經濟狀況，以及機電工程的業務性質，本會預測 2012 至 2014 年三大行業對幹練技術人力的需求如下：

- (i) 機電工程行業：截至 2011 年 11 月，十大基建項目中，啓德郵輪碼頭、港鐵南港島線（東段）及廣深港高速鐵路香港段的工程正在進行，預料會分別於 2013 至 2015 年間完成。至於港珠澳大橋及港鐵沙田至中環線（沙中線）的興建工作，已定於 2011 年底及 2012 年展開，預計於 2016 至 2020 年間竣工。連同西九龍文化區及擬興建的海上風力發電場，這些工程項目經已或將會刺激與建築及營造相關的機電人力需求，尤其 2012 年開始需求會更為明顯。此外，香港特區政府推出的「樓宇更新大行動」、「長者維修自住物業津貼計劃」等資助計劃，繼續為機電僱員創造就業機會。基於上述發展，預計未來幾年，對機電僱員的需求會大增，其中，承造門類機構的新增人力需求會尤其顯著；
- (ii) 船舶修建行業：根據海事處的統計數字，2010 年抵港船舶總量（以淨註冊噸位計）較 2009 年增加 6.4%；2011 年上半年亦較去年同期增長 8.2%。這些數字顯示，船舶修建人力的需求應會持續。
- (iii) 氣體燃料行業：據香港房屋委員會 2011 年 9 月的預測，租屋單位的供應會由 2011/12 年的 11 200 個，增至 2012/13 年的 13 100 個及 2013/14 年的 17 100 個。隨著新供應的租住單位增加，對氣體燃料技術僱員的需求會有增長。

4.2 人力訓練是長遠的投資。大學畢業生一般須接受兩年認可在職訓練，以及最少兩年擔任要職的經驗，才能成為專業人士／技師。訓練技術員或技工則需 3 至 4 年。機電工程業尤其需要受過良好訓練的人力，才能滿足工作質素及安全方面的嚴格要求。為確保有足夠的技術人力，本會建議業界根據第 3.18、3.24 及 3.30 各段所列數字，推行有系統的人力訓練方案。三大行業按主要職務劃分的有關數字，分別見附錄 16、17 及 18。

4.3 僱主為機構策劃人力時，可參考表 4.1 的規模；每年須培訓專業人士／技師、技術員及技工人數所佔各技能等級現有人手的百分比列載如下：

表 4.1 每年培訓人數佔各行業各技能等級人手的百分比

	<u>專業人士／技師</u>	<u>技術員</u>	<u>技工</u>
機電工程行業	4.6%	4.2%	7.1%
船舶修建行業	7.8%	7.9%	7.9%
氣體燃料行業	4.5%	4.5%	4.5%

#### 專業人士／技師訓練

4.4 要成為專業人士／技師，須具備有關專業學會正式會員所需資歷及經驗，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，緊貼科技發展，採用最新技術，以及督導和培訓下屬。

4.5 專業人士／技師在改進管理及創新技術方面，擔當十分重要的角色。本會建議採用圖 4.1 的訓練途徑。

4.6 按附錄 16 至 18 的數字，2012 至 2014 年間機電工程業專業人士／技師級主要職務的推算每年平均訓練需求見表 4.2。

4.7 表 4.3 列出本地大學機電工程相關學科全日制課程的預計畢業人數。由於需求下降，本地大學不再開辦輪機工程學位課程，然而，輪機工程師可由機械工程畢業生出任。

4.8 資料顯示，本地大學相關學科的畢業生人數，大致能應付預計的機電工程業人力需求，雖然部分畢業生或會加入建造業或其他行業，但業內短缺的人手，可由海外畢業生及修讀兼讀制學士課程晉身專業人士／技師的技術員填補。

圖 4.1: 專業人士／技師訓練

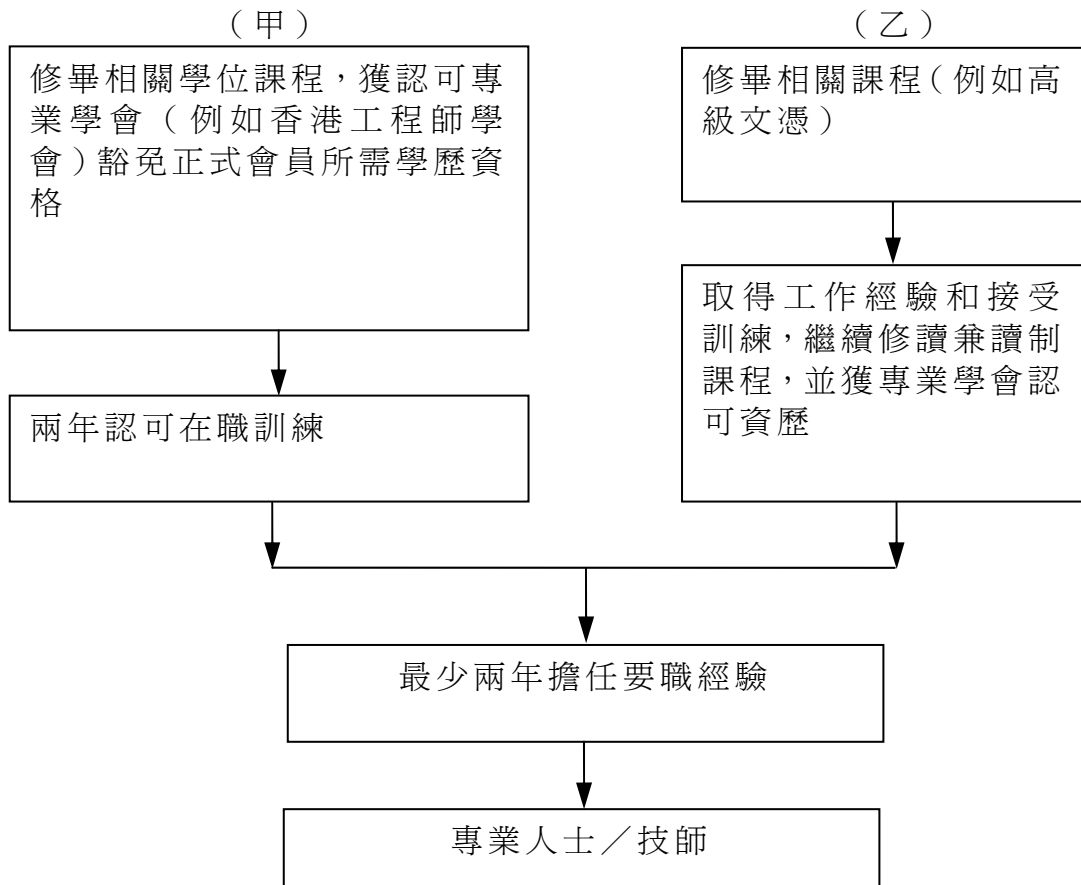


表 4.2: 機電工程業專業人士／技師級主要職務  
推算 2012 至 2014 年間平均每年訓練需求

職稱	2011 年調查時的僱員人數	推算平均每年訓練人數
屋宇設備工程師 (機電工程行業)	852	35 - 43
電機工程師 (機電工程行業)	2 332	95 - 117
(船舶修建行業)	24	2
(氣體燃料行業)	11	0 - 1
冷凝／空氣調節／ 通風設備工程師	791	33 - 40
機械工程師 (機電工程行業)	1 108	46 - 56
(船舶修建行業)*	130	9 - 11
(氣體燃料行業)	85	3 - 4
水喉及渠務工程師	111	5 - 6
升降機／自動梯工程師	208	9 - 10
消防設備工程師	371	15 - 19
工程經理	1 101	45 - 55
安全主任 (機電工程行業)	137	6 - 7
(船舶修建行業)	21	1 - 2
(氣體燃料行業)	22	1
氣體燃料工程師 (氣體燃料行業)	263	11 - 13
總數	7 567	316 - 387

\* 包括輪機工程師

表 4.3: 本地大學全日制學位課程  
推算 2011 至 2013 年間畢業生人數  
(擔任機電工程業主要職務)

院校	課程	預計畢業生人數		
		2011	2012	2013
香港城市大學 香港理工大學 香港大學	工學士 (屋宇裝備工程學)	135	110	105
香港理工大學 香港大學	工學士 (電機工程學)	60	55	55
香港理工大學 香港大學 香港科技大學	工學士 (機械工程學)	190	180	165
總數		385	345	325

#### 工科畢業生訓練計劃

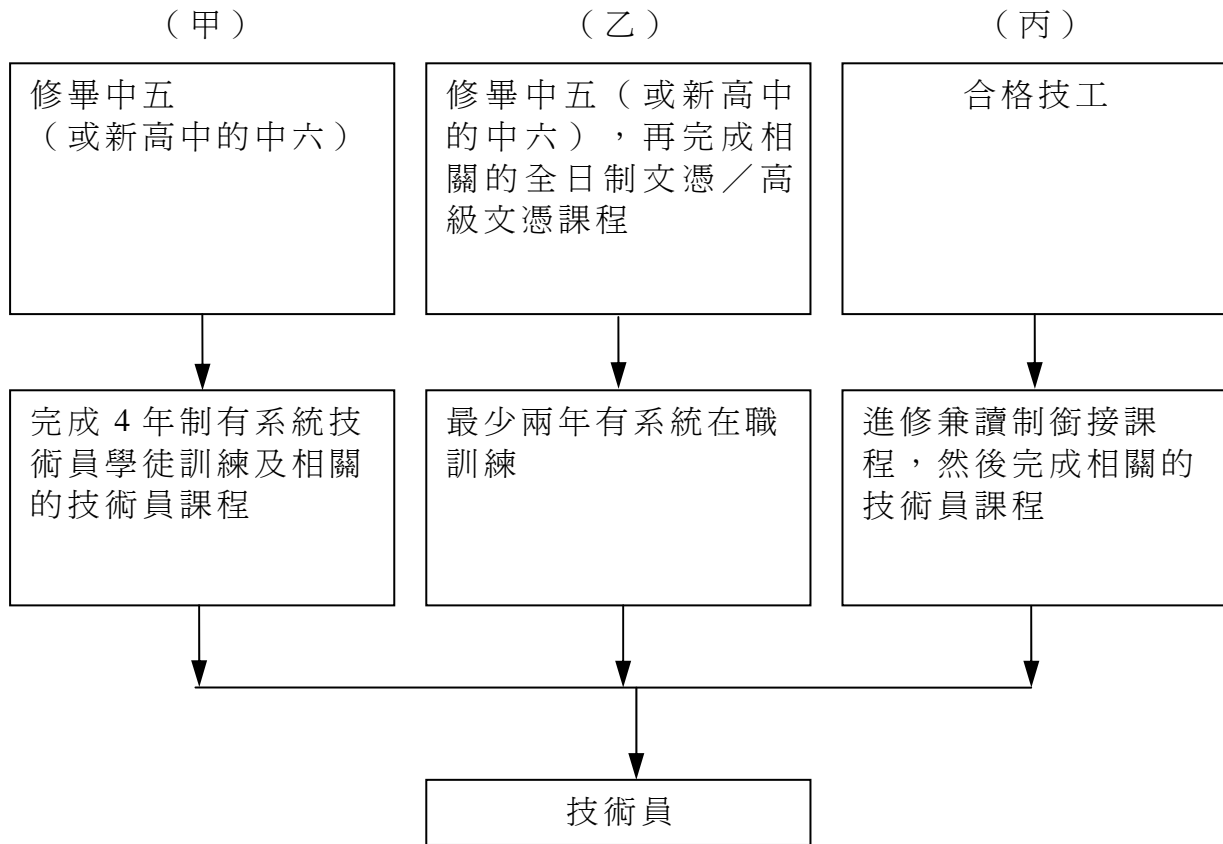
4.9 職業訓練局[VTC]轄下技師訓練委員會推行此項資助計劃，讓工科畢業生有更多機會接受有系統的實務訓練。工科畢業生可接受為期 18 個月的實務訓練，以符合香港工程師學會正式會員的資格標準。受訓的畢業生可經由僱主獲得薪金津貼。VTC 的技師訓練組亦提供免費服務，協助僱主招聘畢業生並支援與工科畢業生訓練有關事宜。本會籲請僱主利用這項計劃訓練工程師。

#### 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，憑所受教育培訓和實務經驗，一般能在專業人士／技師的督導下，運用已確立的方法和程序擔任技術性質的工作。

4.11 訓練技術員的一般途徑見圖 4.2。

圖 4.2: 訓練技術員



4.12 香港理工大學及香港城市大學均有開辦技術員程度的屋宇裝備工程及電機工程全日制高級文憑／副學士課程。

4.13 VTC 轄下香港專業教育學院 [IVE] 開辦技術員程度的飛機維修工程、電機工程、機械工程、屋宇裝備工程、設施管理、環境工程、智能屋宇科技全日制和兼讀制高級文憑課程。

4.14 VTC 的青年學院開辦中專教育文憑 [DVE] 課程，亦設有飛機維修、電機工程、機械工程及屋宇裝備工程等分流。持有 DVE 或技術員基礎證書 [TFC] 的畢業生，可在業內擔任見習技術員職位。這類畢業生在入職前已接受適當的基本訓練，本會促請僱主聘請他們為見習技術員、技術員學徒或見習監督。

4.15 按附錄 16 至 18 的數字，機電工程業技術員級主要職務推算 2012 至 2014 年間平均每年訓練需求見表 4.4。

表 4.4: 機電工程業技術員級主要職務  
推算 2012 至 2014 年間平均每年訓練需求

職稱	2011 年調查時 僱員人數	推算平均每年 訓練人數
監督		
(機電工程行業)	3 265	123 – 152
(船舶修建行業)	241	17 – 21
(氣體燃料行業)	204	8 – 10
屋宇設備技術員	1 751	67 – 82
繪圖員		
(機電工程行業)	697	27 – 32
(船舶修建行業)	3	0
電機工程技術員		
(機電工程行業)	1 814	68 – 84
(船舶修建行業)	37	3
(氣體燃料行業)	5	0
冷凝／空氣調節／通風設備技術員	1 226	47 – 57
機械工程技術員		
(機電工程行業)	1 634	62 – 76
(船舶修建行業)	248	17 – 22
(氣體燃料行業)	44	2
升降機／自動梯技術員	622	24 – 29
消防設備技術員	467	18 – 22
電工儀器技術員	78	3 – 4
辦公室設備維修技術員	87	3 – 4
助理安全主任／安全督導員		
(機電工程行業)	68	3
(船舶修建行業)	8	1
(氣體燃料行業)	39	2
氣體燃料工程技術員		
(氣體燃料行業)	321	13 – 16
總數	12 859	508 – 622



表 4.5: 機電工程相關學科  
2011 至 2013 年間本地技術員畢業生人數

院校	課程	可投身機電工程業的相關 學科技術員畢業生人數		
		2011	2012	2013
香港理工大學 香港城市大學	全日制高級文憑／ 副學士課程 <sup>(a)</sup> ：			
	- 屋宇裝備工程學	60	55	60
	- 電機工程學	25	15	15
	小計	85	70	75
香港專業教育學 院[IVE]	全日制高級文憑課程 <sup>(b)</sup> ：			
	- 飛機維修工程	55	50	50
	- 屋宇裝備工程	60	60	70
	- 機電科技應用	30	35	35
	- 電機工程	200	185	210
	- 環境工程及能源管理	45	55	60
	- 設施管理	45	45	45
	- 智能屋宇科技及自動化 工程	20	20	25
	- 機械工程	95	110	105
	小計	550	560	600
青年學院	全日制中專教育文憑課程 <sup>(c)</sup> (取得 DVE 或 TFC 學歷)：			
	- 飛機維修	15	5	20
	- 屋宇裝備工程分流(專修空 調製冷或屋宇裝備)	85	25	75
	- 電機工程分流(專修電氣安 裝或升降機及自動梯)	85	35	85
	- 機械工程分流	70	20	50
小計	255	85	230	
建造業議會訓練 學院	全日制文憑課程：			
	- 屋宇裝備監工	40	40	40
總計		930	755	945

## 註

- (a) 假設大學高級文憑／副學士課程學生大約 50% 就業，其餘 50% 升讀學位課程。表 4.5 所列數字已按此調整。
- (b) 根據近幾年的統計，IVE 機電學科高級文憑課程的畢業生大約 15% 至 40%（視課程而定）升讀學位課程。表 4.5 所列數字，為確實就業畢業生的估計人數。
- (c) 假設取得 DVE 學歷的畢業生大約 25% 就業，其餘 75% 升讀高級文憑課程；另有約 20% 取得 TFC 學歷的畢業生選擇就業，擔任見習技術員。表 4.5 所列數字，乃 25% DVE 畢業生及 20% TFC 畢業生的人數總和。由於推出新高中課程關係，2011 年成為調適年，DVE 課程減少擬訂的中五收生名額，2012 年的畢業生人數亦相應減少。

4.16 2011 至 2013 年間可投身機電工程業的相關課程技術員畢業生推算數字見表 4.5。由於氣體燃料工程市場規模小，本地院校並無開辦這類技術員課程。現職氣體燃料工程技術員大多為屋宇裝備或機械工程學科畢業生。輪機工程及海事科技技術員課程亦因需求日減，自 2004 年起已停辦；所需的船舶修建技術員職位可由電機或機械工程技術員課程畢業生擔任。

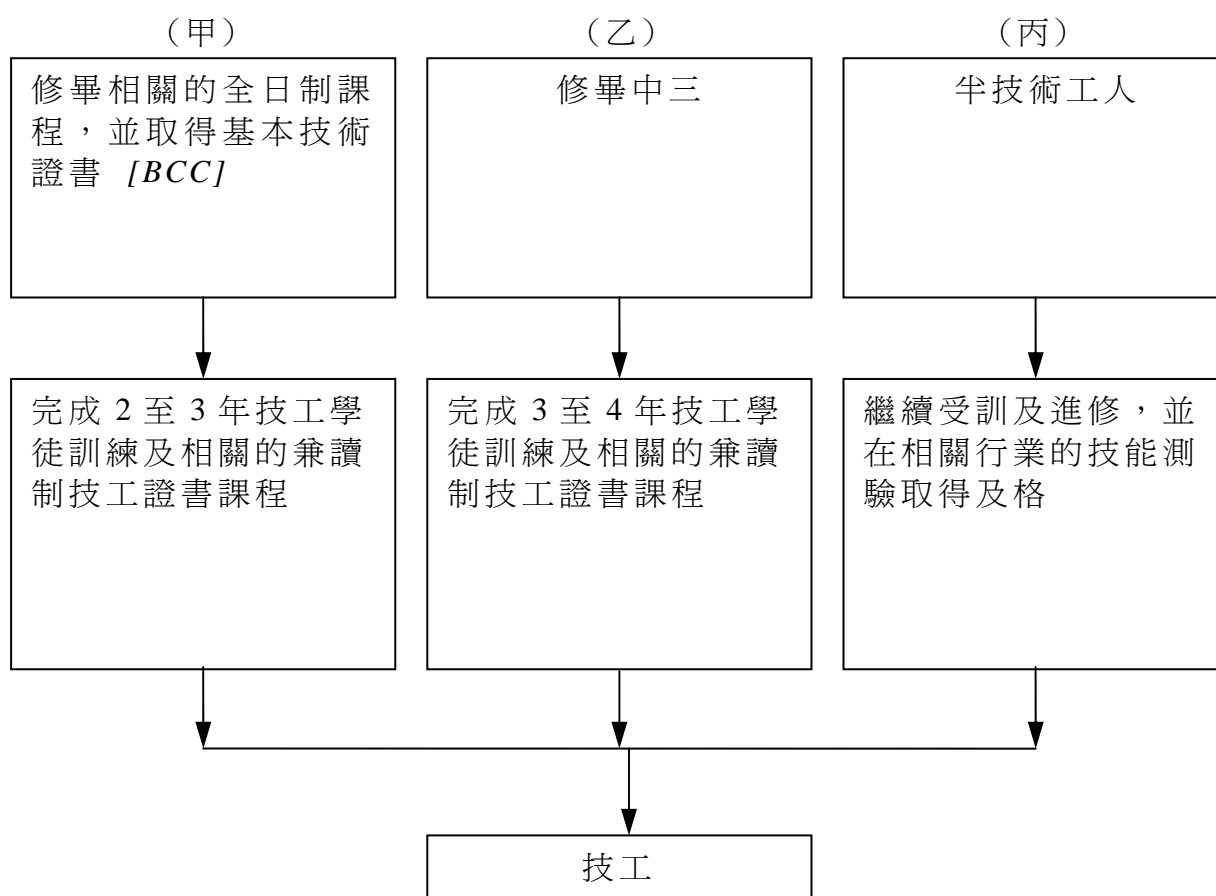
4.17 表 4.4 及 4.5 的數據顯示，未來幾年機電工程主要學科技術員課程的畢業生人數，會供過於求。不過，部分畢業生會投身如建造業等其他行業，部分 DVE／TFC 畢業生則會受聘為技工學徒，而非技術員學徒。考慮到上述因素，畢業生的供應亦可算配合市場需求。

## 技工訓練

4.18 技工憑熟練技術，能夠在所屬行業將多方面的技能應用到工作上，只需極少指導和監督。技工不單要有實際技能，還須具備相關的理論知識，以便適應新科技發展。本會建議青年人參加學徒訓練計劃，接受所需實務訓練及技術教育，成為合格技工。

4.19 訓練技工的一般途徑見圖 4.3。

圖 4.3: 技工訓練



4.20 本會建議採用訓練途徑（甲），因為訓練期較短，而且受聘者已接受過若干基本訓練，在學徒訓練之初，即可投入工作。

4.21 以中三離校生為對象的機電工程行業各類技工課程，主要由 VTC 轄下青年學院提供。除了開辦全日制中專教育文憑課程（屬職前訓練課程），亦設有日間兼讀制技工證書課程，供註冊技工學徒修讀。此外，建造業議會訓練學院開設了電器裝置及水喉潔具兩項基本工藝課程。

4.22 按附錄 16 至 18 的數字，機電工程業技工級主要職務 2012 至 2014 年間推算平均每年的訓練需求見表 4.6。

表 4.6: 機電工程業技工級主要職務  
推算 2012 至 2014 年間平均每年訓練需求

職稱	2011 年 調查時的僱員人數	推算平均每年 訓練人數
管工／領工	4 645	296 – 362
屋宇設備技工	1 554	99 – 121
電工／電氣打磨裝配技工		
(機電工程行業)	9 515	607 – 743
(船舶修建行業)	163	12 – 14
(氣體燃料行業)	24	1
控制板裝配工	28	2
電氣佈線工	902	58 – 70
空調製冷設備技工		
(機電工程行業)		
- 電力控制	3 531	225 – 275
- 獨立系統	1 885	120 – 147
- 送風系統	782	50 – 61
- 保溫系統	211	13 – 16
- 水系統	103	7 – 8
(船舶修建行業)	25	2
喉管工		
(機電工程行業)	384	24 – 30
(船舶修建行業)	84	6 – 7
機械打磨裝配工／機床工		
(機電工程行業)	3 303	211 – 257
(船舶修建行業)	513	36 – 45
(氣體燃料行業)	47	2
升降機／自動梯技工	2 631	168 – 205
消防機械裝配工	1 141	73 – 89
消防電氣裝配工	843	54 – 66
強電流電纜接駁技工	324	21 – 25
架空電線技工	404	26 – 31

職稱	2011 年 調查時的僱員人數	推算平均每年 訓練人數
電器用具維修技工	803	51 – 63
焊接技工		
(機電工程行業)	175	11 – 14
(船舶修建行業)	76	5 – 7
(氣體燃料行業)	2	0
船級協會認可焊接工 (船舶修建行業)	20	1 – 2
氣體燃料輸送技工(石油氣) (氣體燃料行業)	44	2
氣體燃料輸送技工(煤氣) (氣體燃料行業)	195	8 – 10
氣體燃料用戶裝置技工(住宅式) (氣體燃料行業)	524	21 – 26
氣體燃料用戶裝置技工(非住宅式) (氣體燃料行業)	117	5 – 6
總數	34 998	2 217 – 2 709

4.23 表 4.7 列載 2011 至 2013 年間可擔任機電工程業主要職務的技工畢業生推算數字。預料大部分畢業生會受僱為技工學徒，並透過修讀日間兼讀制技工證書課程，繼續接受正式訓練。表 4.8 推算各類技工證書課程的修讀人數，以供比較。值得注意的是，受僱的技工學徒中，有部分人未曾修讀過中專教育文憑課程（即圖 4.3 所示的訓練途徑（乙））。

4.24 不論以何種方式計算（即採用表 4.7 或表 4.8 的數字），2011 至 2013 年間每年為機電工程業新供應的技工均少於 600 個，明顯不足。與表 4.6 的訓練需求（即每年約 2500 個新人）比較，正式訓練只能提供大約 23% 的技工級人力。雖然有部分從業員會透過在職培訓、技能提升訓練或參加相關技能測驗而成為合格技工，但相信仍不足以應付未來幾年大型基建項目的人力需求。

4.25 為培訓足夠合格技工支援機電工程業持續發展，本會建議訓練機構增加機電學科職前培訓名額，以及為現職半技術工人開辦更多技能提升課程，訓練他們成為合格技工。

4.26 青年人現今的選擇較以前多，僱主應繼續宣傳機電工程業的形象及前景，以吸引更多中學畢業生考慮入行。

表 4.7: 機電工程相關學科  
推算 2011 至 2013 年間本地技工畢業生人數

院校	課程	受僱為技工 的推算畢業生人數		
		2011	2012	2013
青年學院	中專教育文憑課程（屋宇裝備工程分流）－專修空調製冷或屋宇裝備	135	120	160
	中專教育文憑課程（電機工程分流）－專修電機或升降機及自動梯	175	150	160
	中專教育文憑課程（機械工程分流）	90	85	85
	中專教育文憑課程（氣體燃料工程分流）	30	45	45
小計		430	400	450
建造業議會訓練學院	基本工藝課程			
	- 電器裝置	80	80	80
	- 水喉潔具	60	60	60
小計		140	140	140
總計		570	540	590

註

(a) 推算數字基於以下假設：

- 中專教育文憑課程（氣體燃料工程分流）的學生，修讀 1 年並取得基本技術證書後，近 100% 選擇就業。
- 以中三學歷入讀中專教育文憑課程其他機電分流的學生，大約 50% 修讀 1 年後，選擇以基本技術證書結業，並受僱為技工學徒；大約 20% 修讀 2 年後，選擇以技術員基礎證書結業，並受僱為技工學徒。表 4.7 的數字乃該等畢業生人數的總和（即以中三學歷入讀學生人

- 數的 70%)。
- (b) 2012 年的畢業生人數根據 2011/12 學年入讀人數推算。
- (c) 2013 年的畢業生人數根據 2012/13 學年課程計劃推算。

表 4.8: 2011 至 2013 年間修讀日間兼讀制技工證書課程機電工程註冊學徒推算人數

院校	課程	推算每年入讀人數
青年學院	空調製冷技工證書	100
	屋宇裝備技工證書	60
	電機工程技工證書	185
	升降機及自動梯技工證書	70
	機械工程技工證書	60
	氣體燃料工程技工證書	25
總數		500

註

- (a) 按 2011/12 學年入讀人數推算所得。
- (b) 數字包括圖 4.3 所示途徑 (甲) 及 (乙) 的技工學徒。
- (c) 技工證書課程所取錄學生大多為表 4.7 的畢業生 (即採用途徑 (甲))。

### 半技術工人／普通工人訓練

4.27 半技術工人／普通工人通常擔任性質重複的工作，要求的技能較少，訓練時間亦較短。考慮到未來幾年人手短缺，本會建議培訓更多半技術工人／普通工人，以紓緩技工的工作量；為此，須開辦更多再培訓課程及短期課程。不過，鑑於業內工作環境相對欠佳，知識及技能要求又較高，選擇機電工程行業再培訓課程的人為數不多；本會建議推出更具吸引力的獎勵／資助計劃，以改善本業再培訓課程的報讀情況。

4.28 現時市場競爭日趨激烈，僱主必須經常為這類員工提供在職增修訓練，充實他們的工作內容，以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，為半技術工人及未合資格的技工提供技能提升訓練，以改進他們的工作質素，從而提升機電工程業的作業水平及安全標準。2001 年設立的技能提升計劃 (現稱「新技能提升計劃」)，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。

## 職業訓練局卓越培訓發展中心

4.29 職業訓練局轄下的多間卓越培訓發展中心，如電機業、機械業、氣體燃料業、焊接業等，為機電工程業提供以下幾方面的訓練及技能評估：

- (a) 為本業初入行人士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) 有助增進知識和技能的在職技能提升課程；
- (c) 大專院校工科生及工科畢業生基本實務訓練；
- (d) 評估從業員技能水平的技能測驗。

## 電工、升降機及自動梯工人技能測驗

4.30 VTC 自 1989 年起，推行自願參加性質的技能測驗及證書頒發制度，目的為：

- (a) 協助業界選聘合適人才；
- (b) 使未受過正規訓練的人士亦能取得認可資格；
- (c) 釐定技術水平，並提高技術人員的地位；
- (d) 使技術人員的技術水平獲得認可，並能獲有關機構發牌或准予註冊；
- (e) 為技術人員設立技能等級，作為事業晉升階梯。

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

4.32 本會正籌劃升降機及自動梯工人技能測驗，預計可於 2012 年下半年推行。

4.33 僱主應鼓勵屬下電工、升降機及自動梯工人參加技能測驗，以便取得獲正式認可的技術資格。



## 為從事機電工種的建築工人而設的特定訓練課程及技能測驗

4.34 根據與建造業議會訓練學院的協議，VTC 負責為該學院開辦 12 個建造業機電工種的特定訓練課程，供根據《建造業工人註冊條例》「臨時註冊」的技術工人修讀，協助他們於 3 年臨時期限屆滿前取得註冊資格。

4.35 2010 年 9 月前，VTC 受建造業議會訓練學院所託，為建造業 12 個機電工種舉辦技能測驗及中級工藝測試。目前，有關技能測驗及中工測試已交由訓練學院負責，但 VTC 各卓越培訓發展中心仍繼續透過培訓，讓中專教育文憑課程學生參加中級工藝測試，以便他們能符合《建造業工人註冊條例》的要求，註冊為合格工人。

4.36 本會籲請承造建築工程機電項目的承辦商支持工人參加技能測驗及中工測試，並鼓勵臨時註冊技術工人參加特定訓練課程，從而符合《建造業工人註冊條例》的規定。

## 新科技培訓計劃

4.37 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，讓僱員學習新科技。合資格申請資助的訓練方式包括：海外訓練或在職實習，以及為個別公司特設的本地課程／在職實習。本會建議僱主利用這項計劃讓僱員接受新科技培訓。

## 主要結論及建議摘要

4.38 本會的主要結論及建議扼述如下：

(a) 專業人士／技師訓練：

本地大學相關學科的畢業生人數，大致能應付預計的機電工程業訓練需求。雖然部分畢業生或會加入建造業或其他行業，惟不足之數可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／技師填補。

(b) 技術員訓練：

未來幾年，機電學科技術員課程的畢業生會供過於求。不過，部分畢業生會投身如建造業等其他行業，而部分中專教育文憑／技術員基礎證書畢業生則會入職為技工學徒。考慮到這些因素，畢業生的供應亦可算能配合市場需求。

(c) 技工訓練：

- (i) 2011 至 2013 年間，透過正式訓練（如中專教育文憑及技工證書課程）為機電工程及船舶修建行業提供的技工級人力，只能滿足大約 23% 的預測需求。雖然部分從業員會透過在職培訓、技能提升訓練或通過相關技能測驗而成為合格技工，但相信仍不足以應付未來幾年大型基建項目的人力需求；
- (ii) 本會建議增加技工級職前訓練課程的學額，開辦更多技能提升訓練課程，以協助現職半技術工人取得認可資歷，成為合格技工；
- (iii) 未來幾年，預期中專教育文憑課程（氣體燃料工程分流）的畢業生人數，應足以應付業界對氣體燃料輸送技工的訓練需求。

(d) 半技術工人／普通工人訓練：

由於未來幾年技工人手短缺，本會建議開辦再培訓課程及短期課程，培訓更多半技術工人／普通工人，以紓緩技工的工作量。此外，亦建議推出更具吸引力的獎勵／資助計劃，以改善本業再培訓課程的報讀情況；

- (e) 表 4.2、4.4 及 4.6 的訓練需求推算只可作為參考；訓練機構擬訂訓練名額時，應同時考慮報讀人數及畢業生的就業率；
- (f) 本會預測訓練需求時，是採用調節過濾法作趨勢分析。由於大型基建項目的規模龐大，趨勢分析或未能完全估計 2012 年起急增的人力需求。本會將密切注視行業情況，並於進行 2013 年人力調查時考慮最新的發展。
- (g) 政府推出跨界別七級制資歷架構[QF]，涵蓋學術及職業資歷。資歷架構提供統一的資歷標準，清楚展示各級的銜接階梯，讓進修人士定下清晰目標及方向，取得具質素保證的資歷。機電業設立資歷架構後，僱員可根據行業需要學習知識及技能，定下清晰的進修途徑，發展事業；
- (h) 僱主應鼓勵僱員參加技能測驗，以取得政府認可的資格；
- (i) 承造建築工程機電項目的承辦商，應鼓勵工人根據《建造業工人註冊條例》的規定，註冊為合資格工人。

Electrical and Mechanical Services Training Board

Membership

(As at 1<sup>st</sup> November 2011)

Chairman

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

Vice- Chairman

Ir LOK Tat-hong, Howard (nominated by the Hong Kong Electrical and Mechanical Contractors' Association)

Members

Ir Dr CHUNG Chi-yung (nominated by a Local University)

Mr CHUNG Fuk-wai, Simon (nominated by an Electrical and Mechanical Engineering Consulting Company)

Mr KWAN Sun-chuen (nominated by Hong Kong Electrical Contractors' Association Ltd)

Mr LAI Wah-hing (nominated by the Lift and Escalator Contractors Association)

Mr LAU Siu-hung, Anthony (nominated by the Hong Kong & Kowloon Electric Trade Association)

Ir LEE Chun-ming, Angus (nominated by an Electric Railway Company)

Mr LEUNG Chung-fai, Fernando (nominated by an Ocean-going Vessel Repairing Company)

Ir LEUNG Wai-hung, Alex (nominated by the Hong Kong Institution of Engineers)

Ir LI Ka-fai, Ken (nominated by the Association of Registered Fire Service Installation Contractors of Hong Kong Ltd.)

Ir LUI Kin-hung (nominated by an Aircraft Engineering Company)

Mr MAK Chi-chui	(nominated by a Local Craft Repairing Company)
Ir SHIU Siu-ming, Alex	(nominated by a Professional Body of the Building Services Operation and Maintenance Sector)
Ir TO Wing-ming, James	(nominated by the Hong Kong and China Gas Company Ltd.)
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 YAN Man-kit, Andrew	(representative of the Director of Electrical and Mechanical Services)
Mr YU Yiu-kwong, Alvin	(representative of the Commissioner for Labour)
Ir TANG Sing-sum	(representative of the Executive Director of the Vocational Training Council)

Secretary

Mr FUNG Ming-kong, Steve	(Vocational Training Council)
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機電工程業訓練委員會  
委員名單

(二零一一年十一月一日)

主席：

冼泳霖工程師 (香港空調及冷凍商會有限公司提名)

副主席：

樂達航工程師 (香港機電工程商協會提名)

委員：

鍾志勇博士工程師 (一間本地大學提名)  
鍾福維先生 (一間電機及機械工程顧問公司提名)  
關新全先生 (香港電器工程商會有限公司提名)  
黎華興先生 (電梯業協會提名)  
劉少雄先生 (港九電業總會提名)  
李俊明工程師 (一間電氣化鐵路公司提名)  
梁仲徽先生 (一間遠洋輪船維修公司提名)  
梁偉雄工程師 (香港工程師學會提名)  
李家輝工程師 (香港註冊消防工程公司商會有限公司提名)  
雷健雄工程師 (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)  
蕭少鳴工程師 (一間屋宇設備運行及裝修專業團體提名)  
杜永明工程師 (香港中華煤氣有限公司提名)  
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)  
甄文傑先生 (機電工程署署長代表)  
余耀光先生 (勞工處處長代表)  
鄧勝森工程師 (職業訓練局執行幹事代表)

秘書

馮明港先生 (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. 為本業舉辦有關專業教育及訓練的研討會與會議。
12. 就業內訓練委員會工作、有關職訓局專業教育及訓練課程的宣傳事宜提供意見。
13. 每年向局方呈交訓練委員會工作報告，以及相關學科課程發展策略建議。
14. 根據《職業訓練局條例》第 7 條，負責局方所委派的其他工作。

THE WHOLE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR

整個機電工程行業

MANPOWER STATISTICS

人力狀況

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者 人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Trainees by March 2012 估計2012年 3月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計2012年 3月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>					
Building Services Engineer 屋宇設備工程師	852	58	28	25	895
Electrical Engineer 電機工程師	2 332	90	91	80	2 433
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備 工程師	791	26	18	23	812
Mechanical Engineer 機械工程師	1 108	37	40	37	1 156
Plumbing and Drainage Engineer 水喉及渠務工程師	111	46	5	42	119
Lift/Escalator Engineer 升降機／自動梯工程師	208	-	2	-	210
Fire Services Engineer 消防設備工程師	371	7	23	5	394
Electronics Engineer 電子工程師	559	20	11	17	571
Control and Instrumentation Engineer 控制及儀器工程師	150	5	7	3	165
Engineering Manager 工程經理	1 101	9	20	9	1 125
Safety Officer 安全主任	137	-	7	-	142
Sub-total 小計	7 720	298	252	241	8 022



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 2012 估計2012年 3月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計2012年 3月時的 僱員人數
<b>TECHNICIAN LEVEL 技術員級</b>					
Supervisor 監督	3 265	39	40	30	3 306
Building Services Technician 屋宇設備技術員	1 751	34	58	35	1 737
Draughtsman 繪圖員	697	2	43	11	742
Electrical Engineering Technician 電機工程技術員	1 814	33	44	51	1 851
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	1 226	29	21	55	1 251
Mechanical Engineering Technician 機械工程技術員	1 634	19	19	26	1 652
Lift/Escalator Technician 升降機／自動梯技術員	622	2	2	2	624
Fire Services Technician 消防設備技術員	467	6	23	8	490
Electrical Instrument and Meter Technician 電工儀器技術員	78	-	1	-	79
Electronics Technician 電子技術員	1 050	18	27	17	1 064
Telecommunication Technician 電訊技術員	753	17	54	21	799
Office Equipment Service Technician 辦公室設備維修技術員	87	-	-	-	87
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	68	-	3	-	69
Sub-total 小計	13 512	199	335	256	13 751

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 2012 估計2012年 3月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計2012年 3月時的 僱員人數
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	4 645	70	98	69	4 658
Building Services Mechanic 屋宇設備技工	1 554	83	82	72	1 596
Electrician/Electrical Fitter 電工／電氣打磨裝配工	9 515	551	490	735	9 848
Control Panel Assembler 控制板裝配工	28	4	-	-	32
Electrical Wireman 電氣佈線工	902	22	7	22	909
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	3 531	408	191	472	3 615
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	1 885	262	72	339	1 917
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	782	81	-	43	797
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫) / 保溫技工	211	-	-	-	211
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	103	-	-	-	103
Plumber and Pipe Fitter 喉管工	384	5	10	1	400

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 2012 估計2012年 3月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計2012年 3月時的 僱員人數
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>					
Mechanical Fitter/Machinist 機械打磨裝配工/機床工	3 303	441	224	184	3 768
Lift Mechanic 升降機技工	2 507	43	17	50	2 524
Escalator Mechanic 自動梯技工	124	2	2	10	126
Fire Services Electrical Fitter 消防電氣裝配工	843	-	67	20	910
Fire Services Mechanical Fitter 消防機械裝配工	1 141	67	22	87	1 218
Cable Jointer (Power) 強電流電纜接駁技工	324	10	3	9	327
Overhead Linesman 架空電線技工	404	19	7	23	411
Electrical Appliances Service Mechanic 電器用具維修技工	803	9	8	19	812
Welder 焊接工	175	1	6	2	171
Carpenter 木工	139	-	5	-	145
Painter 髹漆工	127	-	2	-	119
AV and RF Mechanic 影音及射頻技工	236	5	1	5	236
Building Security System Mechanic 屋宇防盜系統技工	21	-	-	-	21
Communication System Mechanic 電訊系統裝配工	2 129	49	349	167	2 497
Sub-total 小計	35 816	2 132	1 663	2 329	37 371

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 2012 估計2012年 3月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計2012年 3月時的 僱員人數
<b>SEMI-SKILLED WORKER/GENERAL WORKER</b> 半技術工人／普通工人					
Labourer 雜工	945	-	24	-	917
Semi-skilled Worker 半技術工人	2 067	-	70	-	2 109
Sub-total 小計	3 012	-	94	-	3 026
<b>GRAND TOTAL</b> 總 計	<b>60 060</b>	<b>2 629</b>	<b>2 344</b>	<b>2 826</b>	<b>62 170</b>

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 \$9,001 以下	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>								
Building Services Engineer 屋宇設備工程師	-	-	-	42	266	231	208	105
Electrical Engineer 電機工程師	-	-	14	32	238	977	888	183
Refrigeration/ Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／ 通風設備工程師	-	-	-	157	358	228	17	31
Mechanical Engineer 機械工程師	-	-	-	2	68	412	561	65
Plumbing and Drainage Engineer 水喉及渠務工程師	-	-	-	40	39	24	7	1
Lift/Escalator Engineer 升降機／自動梯工程師	-	-	-	6	99	63	1	39
Fire Services Engineer 消防設備工程師	-	-	-	72	96	109	31	63
Electronics Engineer 電子工程師	-	-	-	59	95	217	179	9
Control and Instrumentation Engineer 控制及儀器工程師	-	-	-	-	26	19	105	-
Engineering Manager 工程經理	-	-	10	83	92	115	740	61
Safety Officer 安全主任	-	-	13	4	19	74	22	5
Sub-total 小計	-	-	37	497	1 396	2 469	2 759	562
<b>TECHNICIAN LEVEL 技術員級</b>								
Supervisor 監督	-	91	343	629	1916	102	13	171
Building Services Technician 屋宇設備技術員	-	63	697	17	555	235	102	82
Draughtsman 繪圖員	27	126	280	126	80	30	-	28

Job Title 職稱	Under \$9,001 以下	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>TECHNICIAN LEVEL (Continued) 技術員級 (續)</b>								
Electrical Engineering Technician 電機工程技術員	-	53	131	801	138	568	1	122
Refrigeration/ Air-conditioning/ Ventilation Technician 冷凝／空氣調節／ 通風設備技術員	-	298	233	452	132	90	-	21
Mechanical Engineering Technician 機械工程技術員	-	5	232	336	590	372	-	99
Lift/Escalator Technician 升降機／自動梯技術員	-	-	293	192	43	27	11	56
Fire Services Technician 消防設備技術員	-	75	106	130	33	62	5	56
Electrical Instrument and Meter Technician 電工儀器技術員	-	-	5	48	-	-	25	-
Electronics Technician 電子技術員	-	54	25	372	112	411	16	60
Telecommunication Technician 電訊技術員	150	227	83	255	10	18	-	10
Office Equipment Service Technician 辦公室設備維修技術員	-	-	87	-	-	-	-	-
Assistant Safety Officer/ Safety Supervisor 助理安全主任／ 安全監督	1	26	20	9	11	1	-	-
Sub-total 小計	178	1 018	2 535	3 367	3 620	1 916	173	705
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>								
Foreman/Chargehand 管工／領工	170	518	627	2 349	508	77	-	396
Building Services Mechanic 屋宇設備技工	24	945	437	37	5	-	-	106
Electrician/Electrical Fitter 電工／電氣打磨裝配工	790	2 081	3 568	1 583	996	45	-	452
Control Panel Assembler 控制板裝配工	-	5	15	8	-	-	-	-
Electrical Wireman 電氣佈線工	20	412	355	60	-	-	-	55
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工 (電力控制)	89	1 877	861	322	20	20	-	342

Job Title 職稱	Under \$9,001 以下	\$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)	196	656	551	221	20	20	-	221
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	45	56	426	151	20	-	-	84
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/Thermal 空調製冷設備技工(保 溫)/保溫技工	55	38	38	-	80	-	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工 (水系統)	45	22	33	3	-	-	-	-
Plumber and Pipe Fitter 喉管工	7	51	264	36	1	-	-	25
Mechanical Fitter/ Machinist 機械打磨裝配工/ 機床工	24	568	2 466	196	8	-	-	41
Lift Mechanic 升降機技工	366	200	835	612	68	-	-	426
Escalator Mechanic 自動梯技工	-	-	-	50	69	-	-	5
Fire Services Electrical Fitter 消防電氣裝配工	3	352	316	59	-	-	-	113
Fire Services Mechanical Fitter 消防機械裝配工	-	459	146	331	20	-	-	185
Cable Joiner (Power) 強電流電纜接駁技工	-	-	5	308	-	-	-	11
Overhead Linesman 架空電線技工	-	11	147	246	-	-	-	-
Electrical Appliances Service Mechanic 電器用具服務技工	283	108	168	80	20	-	-	144
Welder 焊接工	-	144	1	26	-	-	-	4

Job Title 職稱	Under \$9,001 以下	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>								
Carpenter 木工	-	55	75	1	4	-	-	4
Painter 髹漆工	-	90	4	21	-	-	-	12
AV and RF Mechanic 影音及射頻技工	-	50	151	5	20	-	-	10
Building Security System Mechanic 屋宇防盜系統技工	-	11	10	-	-	-	-	-
Communication System Mechanic 電訊系統裝配工	166	749	547	288	-	-	-	379
Sub-total 小計	2 283	9 458	12 046	6 993	1 859	162	-	3015
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人</b>								
Labourer 雜工	224	644	13	-	-	-	-	64
Semi-skilled Worker 半技術工人	889	1 065	41	12	-	-	-	60
Sub-total 小計	1 113	1 709	54	12	-	-	-	124
<b>GRAND TOTAL</b> 總計	<b>3 574</b>	<b>12 185</b>	<b>14 672</b>	<b>10 869</b>	<b>6 875</b>	<b>4 547</b>	<b>2 932</b>	<b>4 406</b>



THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR

機電工程行業

BRANCH I: CONTRACTING (E&M)

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 2012 估計2012年 3月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計2012年 3月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>					
Building Services Engineer 屋宇設備工程師	80	6	-	2	93
Electrical Engineer 電機工程師	218	4	22	9	241
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備 工程師	577	3	8	8	585
Mechanical Engineer 機械工程師	24	1	-	1	24
Fire Services Engineer 消防設備工程師	257	-	20	-	277
Electronics Engineer 電子工程師	142	-	-	-	142
Engineering Manager 工程經理	292	-	2	-	294
Safety Officer 安全主任	32	-	3	-	35
Sub-total 小計	1 622	14	55	20	1 691

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 2012 估計2012年 3月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計2012年 3月時的 僱員人數
<b>TECHNICIAN LEVEL 技術員級</b>					
Supervisor 監督	523	-	1	-	525
Building Services Technician 屋宇設備技術員	31	-	-	-	31
Draughtsman 繪圖員	286	-	32	10	319
Electrical Engineering Technician 電機工程技術員	354	-	-	-	354
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝/空氣調節/通風設備 技術員	848	4	1	14	850
Mechanical Engineering Technician 機械工程技術員	33	-	-	-	33
Fire Services Technician 消防設備技術員	421	3	20	3	441
Electronics Technician 電子技術員	139	-	-	-	139
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	30	-	-	-	30
Sub-total 小計	2 665	7	54	27	2 722
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>					
Foreman/Chargehand 管工/領工	1 685	-	-	-	1 681
Building Services Mechanic 屋宇設備技工	75	10	-	10	75
Electrician/Electrical Fitter 電工/電氣打磨裝配工	3 847	230	260	366	3 947
Electrical Wireman 電氣佈線工	765	20	5	20	770

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 2012 估計2012年 3月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計2012年 3月時的 僱員人數
TRADESMAN/craftsman LEVEL (Continued) 技工級 (續)					
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	2 768	389	119	435	2 827
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	1 446	195	20	272	1 466
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	611	40	-	40	586
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫) /保溫 技工	168	-	-	-	168
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	85	-	-	-	85
Plumber and Pipe Fitter 喉管工	21	-	-	-	21
Mechanical Fitter/Machinist 機械打磨裝配工/機床工	13	-	-	-	13
Fire Services Electrical Fitter 消防電氣裝配工	799	-	65	20	864
Fire Services Mechanical Fitter 消防機械裝配工	1 125	67	20	87	1 200
Electrical Appliances Service Mechanic 電器用具服務技工	20	-	-	-	20
Welder 焊接工	84	-	-	-	84

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 2012 估計2012年 3月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計2012年 3月時的 僱員人數
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>					
Painter 髹漆工	40	-	-	-	40
AV and RF Mechanic 影音及射頻技工	70	-	-	-	70
Communication System Mechanic 電訊系統裝配工	80	-	-	-	80
Sub-total 小計	13 702	951	489	1 250	13 997
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人</b>					
Labourer 雜工	215	-	-	-	211
Semi-skilled Worker 半技術工人	824	-	30	-	849
Sub-total 小計	1 039	-	30	-	1 060
<b>GRAND TOTAL</b> 總 計	<b>19 028</b>	<b>972</b>	<b>628</b>	<b>1 297</b>	<b>19 470</b>

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR

機電工程行業

BRANCH II: ELECTRICAL FITTING AND WATER PLUMBING

門類 II: 水電工程

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 2012 估計 2012 年 3 月時的受訓 者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>					
Building Services Engineer 屋宇設備工程師	46	-	5	-	51
Electrical Engineer 電機工程師	13	-	-	-	13
Engineering Manager 工程經理	12	-	-	-	12
Safety Officer 安全主任	2	-	-	-	2
Sub-total 小計	73	-	5	-	78
<b>TECHNICIAN LEVEL 技術員級</b>					
Supervisor 監督	47	-	-	-	47
Building Services Technician 屋宇設備技術員	10	-	-	-	10
Draughtsman 繪圖員	5	-	-	-	5
Electrical Engineering Technician 電機工程技術員	40	-	-	-	40

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者 人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Trainees by March 2012 估計 2012 年 3 月時的受訓 者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>TECHNICIAN LEVEL (Continued) 技術員級 (續)</b>					
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝/空氣調節/通風設備 技術員	1	2	-	2	1
Mechanical Engineering Technician 機械工程技術員	2	-	-	-	2
Assistant Safety Officer/ Safety Supervisor 辦公室設備維修技術員	5	-	-	-	5
Sub-total 小計	110	2	-	2	110
<b>TRADESMAN/ CRAFTSMAN LEVEL 技工級</b>					
Foreman/Chargehand 管工/領工	388	-	5	-	388
Building Services Mechanic 屋宇設備技工	144	5	13	5	147
Electrician/Electrical Fitter 電工/電氣打磨裝配工	2 127	63	97	133	2 241
Electrical Wireman 電氣佈線工	5	-	-	-	5
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	9	-	-	-	9
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	1	-	-	-	1
Plumber and Pipe Fitter 喉管工	141	1	2	1	144
Mechanical Fitter/Machinist 機械打磨裝配工/機床工	5	-	-	-	5

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 2012 估計 2012 年 3 月時的受訓 者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
TRADESMAN/craftsman LEVEL (Continued) 技工級 (續)					
Carpenter 木工	10	-	-	-	10
Sub-total 小計	2 830	69	117	139	2 950
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人					
Labourer 雜工	22	-	-	-	22
Semi-skilled Worker 半技術工人	181	-	-	-	181
Sub-total 小計	203	-	-	-	203
GRAND TOTAL 總 計	3 216	71	122	141	3 341

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR

機電工程行業

BRANCH III: SERVICING (E&M)

門類 III: 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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>					
Building Services Engineer 屋宇設備工程師	304	16	10	16	314
Electrical Engineer 電機工程師	1 448	31	44	41	1 506
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備 工程師	97	3	7	5	107
Mechanical Engineer 機械工程師	861	24	36	29	904
Plumbing and Drainage Engineer 水喉及渠務工程師	81	32	5	32	89
Lift/Escalator Engineer 升降機／自動梯工程師	207	-	2	-	209
Fire Services Engineer 消防設備工程師	63	-	3	-	66
Electronics Engineer 電子工程師	232	6	10	5	242
Control and Instrumentation Engineer 控制及儀器工程師	121	5	2	3	131



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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL (Continued) 專業人士／技師級 (續)</b>					
Engineering Manager 工程經理	585	-	18	-	607
Safety Officer 安全主任	81	-	4	-	83
Sub-total 小計	4 080	117	141	131	4 258
<b>TECHNICIAN LEVEL 技術員級</b>					
Supervisor 監督	2 079	33	19	28	2 105
Building Services Technician 屋宇設備技術員	550	28	14	31	564
Draughtsman 繪圖員	306	-	11	-	317
Electrical Engineering Technician 電機工程技術員	896	33	19	49	920
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	143	22	10	37	153
Mechanical Engineering Technician 機械工程技術員	1 137	19	10	26	1 149
Lift/Escalator Technician 升降機／自動梯技術	611	2	2	2	613
Fire Services Technician 消防設備技術員	33	3	3	5	36
Electrical Instrument and Meter Technician 電工儀器技術員	53	-	-	-	53
Electronics Technician 電子技術員	353	17	8	16	361
Telecommunication Technician 電訊技術員	594	3	43	4	637

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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 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	87	-	-	-	87
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全督導員	33	-	3	-	34
Sub-total 小計	6 875	160	142	198	7 029
TRADESMAN/ CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	791	-	6	-	793
Building Services Mechanic 屋宇設備技工	414	40	47	41	421
Electrician/Electrical Fitter 電工／電氣打磨裝配工	2 805	205	43	160	2 899
Control Panel Assembler 控制板裝配工	8	-	-	-	8
Electrical Wireman 電氣佈線工	120	-	-	-	120
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	353	-	2	-	355
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	386	60	52	60	398
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	154	40	-	-	194

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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 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	37	-	-	-	37
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	10	-	-	-	10
Plumber and Pipe Fitter 喉管工	204	-	7	-	211
Mechanical Fitter/Machinist 機械打磨裝配工/機床工	2 361	360	40	60	2 732
Lift Mechanic 升降機技工	2 507	43	17	50	2 524
Escalator Mechanic 自動梯技工	124	2	2	10	126
Fire Services Electrical Fitter 消防電氣裝配工	44	-	2	-	46
Fire Services Mechanical Fitter 消防機械裝配工	16	-	2	-	18
Cable Jointer (Power) 強電流電纜接駁技工	324	10	3	9	327
Overhead Linesman 架空電線技工	404	19	7	23	411
Electrical Appliances Service Mechanic 電器用具服務技工	778	7	7	17	785
Welder 焊接工	80	-	6	-	76
Carpenter 木工	92	-	1	-	93
Painter 髹漆工	39	-	2	-	31
AV and RF Mechanic 影音及射頻技工	159	5	-	5	159

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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>					
Building Security System Mechanic 屋宇防盜系統技工	21	-	-	-	21
Communication System Mechanic 電訊系統裝配工	2 024	49	328	167	2 379
Sub-total 小計	14 255	840	574	602	15 174
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人</b>					
Labourer 雜工	480	-	6	-	466
Semi-skilled Worker 半技術工人	704	-	17	-	691
Sub-total 小計	1 184	-	23	-	1 157
<b>GRAND TOTAL 總 計</b>	<b>26 394</b>	<b>1 117</b>	<b>880</b>	<b>931</b>	<b>27 618</b>

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR

機電工程行業

BRANCH IV: SUPPLEMENTARY SAMPLES

補充抽樣

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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>					
Building Services Engineer 屋宇設備工程師	422	36	13	7	437
Electrical Engineer 電機工程師	653	55	25	30	673
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備 工程師	117	20	3	10	120
Mechanical Engineer 機械工程師	223	12	4	7	228
Plumbing and Drainage Engineer 水喉及渠務工程師	30	14	-	10	30
Lift/Escalator Engineer 升降機／自動梯工程師	1	-	-	-	1
Fire Services Engineer 消防設備工程師	51	7	-	5	51
Electronics Engineer 電子工程師	185	14	1	12	187
Control and Instrumentation Engineer 控制及儀器工程師	29	-	5	-	34

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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL (Continued) 專業人士／技師級 (續)</b>					
Engineering Manager 工程經理	212	9	-	9	212
Safety Officer 安全主任	22	-	-	-	22
Sub-total 小計	1 945	167	51	90	1 995
<b>TECHNICIAN LEVEL 技術員級</b>					
Supervisor 監督	616	6	20	2	629
Building Services Technician 屋宇設備技術員	1 160	6	44	4	1 132
Draughtsman 繪圖員	100	2	-	1	101
Electrical Engineering Technician 電機工程技術員	524	-	25	2	537
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	234	1	10	2	247
Mechanical Engineering Technician 機械工程技術員	462	-	9	-	468
Lift/Escalator Technician 升降機／自動梯技術	11	-	-	-	11
Fire Services Technician 消防設備技術員	13	-	-	-	13
Electrical Instrument and Meter Technician 電工儀器技術員	25	-	1	-	26
Electronics Technician 電子技術員	558	1	19	1	564
Telecommunication Technician 電訊技術員	159	14	11	17	162

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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
TECHNICIAN LEVEL (Continued) 技術員級 (續)					
Sub-total 小計	3 862	30	139	29	3 890
TRADESMAN/ CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	1 781	70	87	69	1 796
Building Services Mechanic 屋宇設備技工	921	28	22	16	953
Electrician/Electrical Fitter 電工／電氣打磨裝配工	736	53	90	76	761
Control Panel Assembler 控制板裝配工	20	4	-	-	24
Electrical Wireman 電氣佈線工	12	2	2	2	14
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	401	19	70	37	424
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	53	7	-	7	53
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	16	1	-	3	16
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
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	8	-	-	-	8

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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>					
Plumber and Pipe Fitter 喉管工	18	4	1	-	24
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	924	81	184	124	1 018
Electrical Appliances Service Mechanic 電器用具服務技工	5	2	1	2	7
Welder 焊接工	11	1	-	2	11
Carpenter 木工	37	-	4	-	42
Painter 髹漆工	48	-	-	-	48
AV and RF Mechanic 影音及射頻技工	7	-	1	-	7
Communication System Mechanic 電訊系統裝配工	25	-	21	-	38
Sub-total 小計	5 029	272	483	338	5 250
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人</b>					
Labourer 雜工	228	-	18	-	218
Semi-skilled Worker 半技術工人	358	-	23	-	388
Sub-total 小計	586	-	41	-	606
<b>GRAND TOTAL</b> 總 計	<b>11 422</b>	<b>469</b>	<b>714</b>	<b>457</b>	<b>11 741</b>



**THE WHOLE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR**

整個機電工程行業

**MANPOWER STATISTICS (SUBDIVIDED BY INDUSTRY CODE)**

人力狀況 (以行業編號細分)

**TABLE 1 : ALL TECHNICAL JOB LEVELS**

圖表一：所有技術職級

Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
<b>Branch 1: Contracting (E&amp;M)</b> 門類 I: 承造					
432101 Electrical wiring and fitting 電線鋪設及電器裝設	6 834	63.4%	4 336	36.6%	2 498
432103 Fire alarm and fire fighting equipment, installation and maintenance 火警及滅火設備安裝及保養	3 326	73.6%	2 449	26.4%	877
432201 Air-conditioning and ventilation system, installation and maintenance 空氣調節及通風系統安裝及保養	8 868	69.9%	6 196	30.1%	2 672
Sub-total 小計	19 028	68.2%	12 981	31.8%	6 047
<b>Branch 2 : Electrical Fitting with Water Plumbing</b> 門類 II: 水電工程					
432102 Engineering companies of the electrical fitting with water plumbing 電器裝設兼水管鋪設	3 216	55.4%	1 782	44.6%	1 434
Sub-total 小計	3 216	55.4%	1 782	44.6%	1 434

Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
<b>Branch 3 : Servicing (E&amp;M)</b> 門類 III : 服務					
303000 Aircraft assembly and manufacture of related machinery 飛行器裝嵌及相關機械的製造	4 457	1.3%	57	98.7%	4 400
331400 Repair of electrical equipment 電力設備維修	326	26.4%	86	73.6%	240
351000 Electric power generation, transmission and distribution 發電、輸電及配電	2 994	35.0%	1 049	65.0%	1 945
432106 Telecommunications equipment, installation and maintenance 電訊設備安裝及保養	3 689	72.9%	2 691	27.1%	998
432199 Combined and other installation and maintenance of electrical and mechanical equipment 綜合及其他電器及機械設備安裝 及保養	3 200	54.5%	1 745	45.5%	1 455
432901 Lift and escalator installation and maintenance 升降機及電動扶梯安裝及保養	3 886	7.3%	282	92.7%	3 604
491000 Railway and cable transport 鐵路及纜索運輸	4 090	47.0%	1 921	53.0%	2 169
711400 Building services engineering 屋宇設備工程服務	1 034	89.2%	922	10.8%	112
953200 Repair of household appliances, home and garden equipment 家用器具及庭園設備修理	2 718	16.0%	436	84.0%	2 282
<b>Sub-total 小計</b>	<b>26 394</b>	<b>34.8%</b>	<b>9 189</b>	<b>65.2%</b>	<b>17 205</b>

Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣					
400000 Other Relevant Organizations in E&M Engineering Sector 其他與機電工程行業相關之機構	11 422	17.1%	1 955	82.9%	9 467
Sub-total 小計	11 422	17.1%	1 955	82.9%	9 467
GRAND TOTAL 總計	60 060	43.1%	25 907	56.9%	34 153

TABLE 2 : PROFESSIONAL/TECHNOLOGIST LEVEL

圖表二：專業人士／技師級

Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>					
<b>Branch 1: Contracting (E&amp;M)</b> 門類 I：承造					
432101 Electrical wiring and fitting 電線鋪設及電器裝設	417	83.7%	349	16.3%	68
432103 Fire alarm and fire fighting equipment, installation and maintenance 火警及滅火設備安裝及保養	394	81.7%	322	18.3%	72
432201 Air-conditioning and ventilation system, installation and maintenance 空氣調節及通風系統安裝及保養	811	76.4%	620	23.6%	191
Sub-total 小計	1 622	79.6%	1 291	20.4%	331
<b>Branch 2 : Electrical Fitting with Water Plumbing</b> 門類 II：水電工程					
432102 Engineering companies of the electrical fitting with water plumbing 電器裝設兼水管鋪設	73	74.0%	54	26.0%	19
Sub-total 小計	73	74.0%	54	26.0%	19
<b>Branch 3 : Servicing (E&amp;M)</b> 門類 III：服務					
303000 Aircraft assembly and manufacture of related machinery 飛行器裝嵌及相關機械的製造	455	4.2%	19	95.8%	436
331400 Repair of electrical equipment 電力設備維修	7	0.0%	0	100.0%	7

Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
351000 Electric power generation, transmission and distribution 發電、輸電及配電	1 159	40.6%	470	59.4%	689
432106 Telecommunications equipment, installation and maintenance 電訊設備安裝及保養	169	78.7%	133	21.3%	36
432199 Combined and other installation and maintenance of electrical and mechanical equipment 綜合及其他電器及機械設備安裝 及保養	676	64.5%	436	35.5%	240
432901 Lift and escalator installation and maintenance 升降機及電動扶梯安裝及保養	277	10.8%	30	89.2%	247
491000 Railway and cable transport 鐵路及纜索運輸	510	48.6%	248	51.4%	262
711400 Building services engineering 屋宇設備工程服務	825	88.0%	726	12.0%	99
953200 Repair of household appliances, home and garden equipment 家用器具及庭園設備修理	2	0.0%	0	100.0%	2
Sub-total 小計	4 080	50.5%	2 062	49.5%	2 018
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣					
400000 Other Relevant Organizations in E&M Engineering Sector 其他與機電工程行業相關之機構	1 945	39.7%	773	60.3%	1 172
Sub-total 小計	1 945	39.7%	773	60.3%	1 172
GRAND TOTAL 總計	7 720	54.1%	4 180	45.9%	3 540

**TABLE 3 : TECHNICIAN LEVEL**

圖表三：技術員級

Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
<b>TECHNICIAN LEVEL 技術員級</b>					
<b>Branch 1: Contracting (E&amp;M)</b> 門類 I: 承造					
432101 Electrical wiring and fitting 電線鋪設及電器裝設	610	74.4%	454	25.6%	156
432103 Fire alarm and fire fighting equipment, installation and maintenance 火警及滅火設備安裝及保養	652	80.5%	525	19.5%	127
432201 Air-conditioning and ventilation system, installation and maintenance 空氣調節及通風系統安裝及保養	1 403	72.6%	1 019	27.4%	384
Sub-total 小計	2 665	75.0%	1 998	25.0%	667
<b>Branch 2 : Electrical Fitting with Water Plumbing</b> 門類 II: 水電工程					
432102 Engineering companies of the electrical fitting with water plumbing 電器裝設兼水管鋪設	110	56.4%	62	43.6%	48
Sub-total 小計	110	56.4%	62	43.6%	48
<b>Branch 3 : Servicing (E&amp;M)</b> 門類 III: 服務					
303000 Aircraft assembly and manufacture of related machinery 飛行器裝嵌及相關機械的製造	1 421	1.1%	15	98.9%	1 406
331400 Repair of electrical equipment 電力設備維修	109	15.6%	17	84.4%	92

Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
351000 Electric power generation, transmission and distribution 發電、輸電及配電	543	14.7%	80	85.3%	463
432106 Telecommunications equipment, installation and maintenance 電訊設備安裝及保養	890	72.5%	645	27.5%	245
432199 Combined and other installation and maintenance of electrical and mechanical equipment 綜合及其他電器及機械設備安裝 及保養	670	50.4%	338	49.6%	332
432901 Lift and escalator installation and maintenance 升降機及電動扶梯安裝及保養	835	6.3%	53	93.7%	782
491000 Railway and cable transport 鐵路及纜索運輸	1 980	49.6%	982	50.4%	998
711400 Building services engineering 屋宇設備工程服務	204	94.1%	192	5.9%	12
953200 Repair of household appliances, home and garden equipment 家用器具及庭園設備修理	223	0.0%	0	100.0%	223
Sub-total 小計	6 875	33.8%	2 322	66.2%	4 553
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣					
400000 Other Relevant Organizations in E&M Engineering Sector 其他與機電工程行業相關之機構	3 862	19.7%	759	80.3%	3 103
Sub-total 小計	3 862	19.7%	759	80.3%	3 103
GRAND TOTAL 總計	13 512	38.0%	5 141	62.0%	8 371

TABLE 4 : TRADESMAN/CRAFTSMAN LEVEL

圖表四: 技工級

Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>					
<b>Branch 1: Contracting (E&amp;M)</b> 門類 I: 承造					
432101 Electrical wiring and fitting 電線鋪設及電器裝設	5 225	63.0%	3 292	37.0%	1 933
432103 Fire alarm and fire fighting equipment, installation and maintenance 火警及滅火設備安裝及保養	2 259	70.0%	1 582	30.0%	677
432201 Air-conditioning and ventilation system, installation and maintenance 空氣調節及通風系統安裝及保養	6 218	68.6%	4 266	31.4%	1 952
Sub-total 小計	13 702	66.7%	9 140	33.3%	4 562
<b>Branch 2 : Electrical Fitting with Water Plumbing</b> 門類 II: 水電工程					
432102 Engineering companies of the electrical fitting with water plumbing 電器裝設兼水管鋪設	2 830	55.1%	1 559	44.9%	1 271
Sub-total 小計	2 830	55.1%	1 559	44.9%	1 271
<b>Branch 3 : Servicing (E&amp;M)</b> 門類 III: 服務					
303000 Aircraft assembly and manufacture of related machinery 飛行器裝嵌及相關機械的製造	2 191	1.0%	21	99.0%	2 170
331400 Repair of electrical equipment 電力設備維修	210	32.9%	69	67.1%	141



Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
351000 Electric power generation, transmission and distribution 發電、輸電及配電	1 277	39.1%	499	60.9%	778
432106 Telecommunications equipment, installation and maintenance 電訊設備安裝及保養	2 255	71.3%	1 608	28.7%	647
432199 Combined and other installation and maintenance of electrical and mechanical equipment 綜合及其他電器及機械設備安裝 及保養	1 708	52.8%	901	47.2%	807
432901 Lift and escalator installation and maintenance 升降機及電動扶梯安裝及保養	2 769	7.2%	199	92.8%	2 570
491000 Railway and cable transport 鐵路及纜索運輸	1 534	43.5%	668	56.5%	866
711400 Building services engineering 屋宇設備工程服務	5	80.0%	4	20.0%	1
953200 Repair of household appliances, home and garden equipment 家用器具及庭園設備修理	2 306	18.3%	423	81.7%	1 883
Sub-total 小計	14 255	30.8%	4 392	69.2%	9 863
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣					
400000 Other Relevant Organizations in E&M Engineering Sector 其他與機電工程行業相關之機構	5 029	6.8%	340	93.2%	4 689
Sub-total 小計	5 029	6.8%	340	93.2%	4 689
GRAND TOTAL 總計	35 816	43.1%	15 431	56.9%	20 385

TABLE 5 : SEMI-SKILLED WORKER/GENERAL WORKER

圖表五：半技術工人／普通工人

Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
<b>SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人</b>					
<b>Branch 1: Contracting (E&amp;M) 門類 I: 承造</b>					
432101 Electrical wiring and fitting 電線鋪設及電器裝設	582	41.4%	241	58.6%	341
432103 Fire alarm and fire fighting equipment, installation and maintenance 火警及滅火設備安裝及保養	21	95.2%	20	4.8%	1
432201 Air-conditioning and ventilation system, installation and maintenance 空氣調節及通風系統安裝及保養	436	66.7%	291	33.3%	145
Sub-total 小計	1 039	53.1%	552	46.9%	487
<b>Branch 2 : Electrical Fitting with Water Plumbing 門類 II: 水電工程</b>					
432102 Engineering companies of the electrical fitting with water plumbing 電器裝設兼水管鋪設	203	52.7%	107	47.3%	96
Sub-total 小計	203	52.7%	107	47.3%	96
<b>Branch 3 : Servicing (E&amp;M) 門類 III: 服務</b>					
303000 Aircraft assembly and manufacture of related machinery 飛行器裝嵌及相關機械的製造	390	0.5%	2	99.5%	388
331400 Repair of electrical equipment 電力設備維修	0	-	-	-	-

Job Title 職稱	No. of Employees 僱員人數	Estimated Manpower for Contracting 估計從事「承造」 工作類別的人力		Estimated Manpower for Servicing 估計從事「維修服務」 工作類別的人力	
		Percentage (百份比)	Head Count (人數)	Percentage (百份比)	Head Count (人數)
351000 Electric power generation, transmission and distribution 發電、輸電及配電	15	0.0%	0	100.0%	15
432106 Telecommunications equipment, installation and maintenance 電訊設備安裝及保養	375	81.3%	305	18.7%	71
432199 Combined and other installation and maintenance of electrical and mechanical equipment 綜合及其他電器及機械設備安裝 及保養	146	47.9%	70	52.1%	76
432901 Lift and escalator installation and maintenance 升降機及電動扶梯安裝及保養	5	0.0%	0	100.0%	5
491000 Railway and cable transport 鐵路及纜索運輸	66	34.8%	23	65.2%	43
711400 Building services engineering 屋宇設備工程服務	0	-	-	-	-
953200 Repair of household appliances, home and garden equipment 家用器具及庭園設備修理	187	7.0%	13	93.0%	174
Sub-total 小計	1 184	34.9%	413	65.1%	771
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣					
400000 Other Relevant Organizations in E&M Engineering Sector 其他與機電工程行業相關之機構	586	14.2%	83	85.8%	503
Sub-total 小計	586	14.2%	83	85.8%	503
GRAND TOTAL 總計	3 012	38.3%	1 155	61.7%	1 857

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

**MANPOWER STATISTICS**  
人力狀況

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>			
Building Services Engineer 屋宇設備工程師	47	-	-
Electrical Engineer 電機工程師	80	2	-
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	5	-	-
Mechanical Engineer 機械工程師	41	2	-
Plumbing and Drainage Engineer 水喉及渠務工程師	3	-	-
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	19	-	-
Control and Instrumentation Engineer 控制及儀器工程師	1	-	-
Engineering Manager 工程經理	13	-	-
Safety Officer 安全主任	20	-	-
Sub-total 小計	240	4	-

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目
<b>TECHNICIAN LEVEL 技術員級</b>			
Supervisor 監督	21	-	-
Building Services Technician 屋宇設備技術員	41	-	-
Draughtsman 繪圖員	14	-	-
Electrical Engineering Technician 電機工程技術員	84	1	-
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	22	-	-
Mechanical Engineering Technician 機械工程技術員	35	-	-
Lift/Escalator Technician 升降機／自動梯技術員	35	-	-
Fire Services Technician 消防設備技術員	23	-	-
Electrical Instrument and Meter Technician 電工儀器技術員	18	-	-
Electronics Technician 電子技術員	37	-	-
Telecommunication Technician 電訊技術員	45	-	-
Assistant Safety Officer/ Safety Supervisor 助理安全主任/安全督導員	20	-	-
Sub-total 小計	395	1	-
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級</b>			
Foreman/Chargehand 管工/領工	71	-	-
Building Services Mechanic 屋宇設備技工	62	-	-
Electrician/Electrical Fitter 電工／電氣打磨裝配工	1 306	-	-

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)			
Control Panel Assembler 控制板裝配工	45	-	-
Electrical Wireman 電氣佈線工	975	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	445	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	516	-	-
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	347	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫)/ 保溫技工	67	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	197	-	-
Plumber and Pipe Fitter 喉管工	293	-	-
Mechanical Fitter/Machinist 機械打磨裝配工/機床工	66	-	-
Lift Mechanic 升降機技工	221	-	-
Escalator Mechanic 自動梯技工	81	-	-
Fire Services Electrical Fitter 消防電氣裝配工	283	-	-
Fire Services Mechanical Fitter 消防機械裝配工	396	-	-
Cable Jointer (Power) 強電流電纜接駁技工	8	-	-

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>			
Electrical Appliances Service Mechanic 電器用具維修技工	74	-	-
Welder 焊接工	104	-	-
AV and RF Mechanic 影音及射頻技工	3	-	-
Building Security System Mechanic 屋宇防盜系統技工	50	-	-
Communication System Mechanic 電訊系統裝配工	47	-	-
Gas Installer 氣體裝置技工	49	-	-
Sub-total 小計	5 706	-	-
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人</b>			
Labourer 雜工	208	-	-
Semi-skilled Worker 半技術工人	36	-	-
Sub-total 小計	244	-	-
<b>GRAND TOTAL</b> 總計	<b>6 585</b>	<b>5</b>	<b>-</b>

THE SHIPBUILDING AND SHIP REPAIR SECTOR

船舶修建行業

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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>					
Electrical Engineer 電機工程師	24	-	-	-	24
Marine Engineer 輪機工程師	87	-	3	-	90
Mechanical Engineer 機械工程師	43	-	-	-	43
Ship Designer/Naval Architect 船舶設計師／造船工程師	17	-	-	-	17
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	123	-	3	-	125
Safety Officer 安全主任	21	-	-	-	21
Sub-total 小計	315	-	6	-	320
<b>TECHNICIAN LEVEL 技術員級</b>					
Draughtsman 繪圖員	3	-	-	-	3
Electrical Engineering Technician 電機工程技術員	37	7	3	7	40
Electronics/ Telecommunication Technician 電子／通訊技術員	14	-	-	-	14



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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>TECHNICIAN LEVEL (Continued) 技術員級 (續)</b>					
Estimator 估計員	15	-	1	-	16
Mechanical Engineering Technician 機械工程技術員	248	6	2	6	250
Assistant Safety Officer/ Safety Supervisor 助理安全主任/安全督導員	8	-	-	-	8
Supervisor/Foreman 監督/管工	241	1	7	1	248
Sub-total 小計	566	14	13	14	579
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>					
Air-conditioning Mechanic/ Sheet Metal Worker 空氣調節技工/ 薄片金屬構造工	25	-	-	-	25
Carpenter 木工	105	-	6	-	111
Crane Driver 起重機操作工	25	-	5	-	30
Electrician 電工	163	2	4	9	167
Mechanical Fitter 機械打磨裝配工	447	11	18	27	465
GRP-Worker 玻璃纖維工	12	-	-	-	12
Machinist 機床工	66	1	9	2	75
Marine Pipeworker 船舶喉管工	84	2	5	4	89
Painter 髹漆工	153	-	6	-	159
Rigger 索具工 (喊咗工)	102	-	1	-	103

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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>					
Ship Classification Qualified Welder 船級協會認可焊接工	20	2	10	2	30
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工 (鍋爐工、造船鋼 板工、捻縫工/鐵工)	109	1	2	4	111
Welder 焊接技工	76	-	11	-	87
Sub-total 小計	1 387	19	77	48	1 464
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>					
Labourer 雜工	144	-	6	-	150
Semi-skilled Worker 半技術工人	97	-	14	-	111
Sub-total 小計	241	-	20	-	261
<b>GRAND TOTAL</b> 總計	<b>2 509</b>	<b>33</b>	<b>116</b>	<b>62</b>	<b>2 624</b>

THE SHIPBUILDING AND SHIP REPAIR SECTOR  
船舶修建行業

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 \$9,001 以下	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>								
Electrical Engineer 電機工程師	-	-	-	-	9	4	-	11
Marine Engineer 輪機工程師	-	-	-	-	37	14	35	1
Mechanical Engineer 機械工程師	-	-	-	-	-	7	4	32
Ship Designer/ Naval Architect 船舶設計師／ 造船工程師	-	-	-	-	2	7	4	4
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	-	-	-	-	2	24	32	65
Safety Officer 安全主任	-	-	-	1	8	2	9	1
Sub-total 小計	-	-	-	1	58	58	84	114
<b>TECHNICIAN LEVEL 技術員級</b>								
Draughtsman 繪圖員	-	-	-	-	1	-	-	2
Electrical Engineering Technician 電機工程技術員	-	1	-	2	5	-	6	23
Electronics/ Telecommunication Technician 電子／通訊技術員	-	-	-	8	6	-	-	-
Estimator 估計員	-	-	-	6	9	-	-	-
Mechanical Engineering Technician 機械工程技術員	-	2	16	4	43	-	32	151
Assistant Safety Officer/ Safety Supervisor 助理安全主任／ 安全監督	-	-	4	-	-	4	-	-
Supervisor/Foreman 監督／管工	5	-	42	38	126	-	-	30
Sub-total 小計	5	3	62	58	190	4	38	206

Job Title 職稱	Under \$9,001 以下	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>								
Air-conditioning Mechanic/Sheet Metal Worker 空氣調節技工/ 薄片金屬構造工	-	2	11	2	-	-	-	10
Carpenter 木工	-	11	48	40	3	-	-	3
Crane Driver 起重機操作工	-	1	21	3	-	-	-	-
Electrician 電工	20	9	64	45	-	-	-	25
Mechanical Fitter 機械打磨裝配工	15	54	241	51	43	-	-	43
GRP-Worker 玻璃纖維工	-	4	8	-	-	-	-	-
Machinist 機床工	-	23	33	-	10	-	-	-
Marine Pipeworker 船舶喉管工	5	12	42	10	15	-	-	-
Painter 髹漆工	-	14	21	31	84	-	-	3
Rigger 索具工(喊咗工)	-	4	62	36	-	-	-	-
Ship Classification Qualified Welder 船級協會認可焊接工	-	6	3	2	3	6	-	-
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工(鍋爐工、造船 鋼板工、捻縫工/鐵工)	15	37	33	1	23	-	-	-
Welder 焊接工	1	31	33	3	8	-	-	-
Sub-total 小計	56	208	620	224	189	6	-	84
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>								
Labourer 雜工	22	81	23	16	-	-	-	2
Semi-skilled Worker 半技術工人	10	87	-	-	-	-	-	-
Sub-total 小計	32	168	23	16	-	-	-	2
<b>GRAND TOTAL 總計</b>	<b>93</b>	<b>379</b>	<b>705</b>	<b>299</b>	<b>437</b>	<b>68</b>	<b>122</b>	<b>406</b>

THE GAS SECTOR  
氣體燃料行業

MANPOWER STATISTICS  
人力狀況

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者 人數	No. of Vacancies at Date of Survey 調查期間 空缺數目	Forecasted No. of Trainees by March 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>					
Electrical Engineer 電機工程師	11	-	-	-	11
Gas Engineer (Fuel Gas) 氣體工程師(氣體燃料)	263	8	3	-	266
Mechanical Engineer 機械工程師	85	1	1	-	90
Safety Officer 安全主任	22	-	-	-	24
Sub-total 小計	381	9	4	-	391
<b>TECHNICIAN LEVEL 技術員級</b>					
Electrical Engineering Technician 電機工程技術員	5	-	-	-	5
Gas Engineering Technician 氣體燃料工程技術員	321	1	3	1	324
Mechanical Engineering Technician 機械工程技術員	44	3	-	3	44
Assistant Safety Officer/Safety 助理安全主任／安全督導員	39	-	-	-	39
Supervisor/Chargehand 監督／管工	204	-	3	-	206
Sub-total 小計	613	4	6	4	618

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 2012 估計 2012 年 3 月時的 受訓者人數	Forecasted No. of Employees by March 2012 估計 2012 年 3 月時的 僱員人數
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>					
Electrician/Electrical Fitter 電工／電氣打磨裝配工	24	3	3	4	27
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	44	4	-	3	45
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	195	22	3	22	198
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工 （住宅式）	524	44	-	37	527
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工 （非住宅式）	117	15	7	16	124
Mechanical Fitter 機械打磨裝配工	47	-	-	-	47
Welder 焊接工	2	-	-	-	2
Sub-total 小計	953	88	13	82	970
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人</b>					
Driver (LPG Cylinder) 司機（石油氣瓶車）	31	-	-	-	31
Labourer 雜工	11	-	-	-	11
Semi-skilled Worker 半技術工	23	-	-	-	23
Vehicle Attendant/ Deliveryman (LPG Cylinder) 跟車／送貨員（石油氣瓶）	44	-	-	-	44
Sub-total 小計	109	-	-	-	109
<b>GRAND TOTAL 總計</b>	<b>2 056</b>	<b>101</b>	<b>23</b>	<b>86</b>	<b>2 088</b>

**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 \$9,001 以下	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>								
Electrical Engineer 電機工程師	-	-	-	-	-	8	3	-
Gas Engineer (Fuel Gas) 氣體工程師(氣體燃料)	-	-	2	-	27	233	1	-
Mechanical Engineer 機械工程師	-	3	-	-	-	82	-	-
Safety Officer 安全主任	-	-	-	-	6	16	-	-
Sub-total 小計	-	3	2	-	33	339	4	-
<b>TECHNICIAN LEVEL 技術員級</b>								
Electrical Engineering Technician 電機工程技術員	-	-	4	-	-	1	-	-
Gas Engineering Technician 氣體燃料工程技術員	-	-	267	36	9	7	-	2
Mechanical Engineering Technician 機械工程技術員	-	12	21	11	-	-	-	-
Assistant Safety Officer Safety Supervisor 助理安全主任／ 安全監督	-	-	33	3	3	-	-	-
Supervisor/Chargehand 監督／管工	-	32	22	7	124	4	-	15
Sub-total 小計	-	44	347	57	136	12	-	17
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>								
Electrician/ Electrical Fitter 電工／電氣打磨裝配工	-	-	24	-	-	-	-	-
Gas Distribution Fitter (LPG) 氣體燃料輸送技工 (石油氣)	-	15	26	-	-	-	-	3
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工 (煤氣)	-	27	151	3	4	-	-	10

Job Title 職稱	Under \$9,001 以下	\$9,001- \$12,000	\$12,001- \$15,000	\$15,001- \$18,000	\$18,001- \$25,000	\$25,001- \$35,000	Over \$35,000 以上	Unspecified 未有說明
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>								
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工 (住宅式)	17	190	140	14	132	-	-	31
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工 (非住宅式)	-	24	50	5	29	-	-	9
Mechanical Fitter 機械打磨裝配工	-	3	6	1	37	-	-	-
Welder 焊接工	-	-	2	-	-	-	-	-
Sub-total 小計	17	259	399	23	202	-	-	53
<b>SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人/普通工人</b>								
Driver (LPG Cylinder) 司機 (石油氣瓶車)	-	27	1	-	-	-	-	3
Labourer 雜工	2	9	-	-	-	-	-	-
Semi-skilled Worker 半技術工人	6	12	5	-	-	-	-	-
Vehicle Attendant/ Deliveryman (LPG Cylinder) 跟車/送貨員 (石油氣瓶)	12	27	-	-	-	-	-	5
Sub-total 小計	20	75	6	-	-	-	-	8
<b>GRAND TOTAL</b> 總計	37	381	754	80	371	351	4	78



**MANPOWER SUPPLY FOR THE INDUSTRY IN THE PAST 12 MONTHS**

過去 12 個月內，行業的人力供應情況

Job level	Very Insufficient 非常缺乏	Insufficient 缺乏	Sufficient 充裕	Very Sufficient 非常充裕	No Comment or Refusal to Answer 無意見/ 拒絕作答
<b>A. Electrical and Mechanical Engineering Sector 機電工程業</b>					
Professional / Technologist 專業人士 / 技師	6%	24%	28%	2%	40%
Trainees of Professional / Technologist 專業人士 / 技師的受訓者	6%	21%	23%	3%	47%
Technician 技術員	5%	29%	29%	3%	34%
Trainees of Technician 技術員的受訓者	6%	23%	22%	3%	46%
Tradesman / Craftsman 技工	6%	32%	34%	3%	25%
Trainees of Tradesman / Craftsman 技工的受訓者	7%	25%	25%	3%	40%
Semi-skilled Worker / General Worker 半技術 / 普通工人	4%	22%	30%	5%	40%
<b>B. Shipbuilding and Ship Repair Sector 船舶修建行業</b>					
Professional / Technologist 專業人士 / 技師	6%	31%	12%	0%	52%
Trainees of Professional / Technologist 專業人士 / 技師的受訓者	14%	20%	8%	0%	57%
Technician 技術員	4%	36%	10%	0%	50%
Trainees of Technician 技術員的受訓者	16%	22%	7%	0%	55%
Tradesman / Craftsman 技工	6%	54%	26%	0%	14%

Job level	Very Insufficient 非常缺乏	Insufficient 缺乏	Sufficient 充裕	Very Sufficient 非常充裕	No Comment or Refusal to Answer 無意見/ 拒絕作答
Trainees of Tradesman / Craftsman 技工的受訓者	29%	42%	9%	0%	20%
Semi-skilled Worker / General Worker 半技術／普通工人	4%	33%	33%	0%	30%
<b>C. Gas Sector 氣體燃料行業</b>					
Professional / Technologist 專業人士 / 技師	1%	25%	34%	1%	40%
Trainees of Professional / Technologist 專業人士 / 技師的受訓者	0%	17%	41%	1%	42%
Technician 技術員	1%	30%	38%	0%	30%
Trainees of Technician 技術員的受訓者	1%	20%	44%	1%	35%
Tradesman / Craftsman 技工	5%	30%	39%	0%	26%
Trainees of Tradesman / Craftsman 技工的受訓者	6%	21%	41%	1%	32%
Semi-skilled Worker / General Worker 半技術／普通工人	1%	24%	33%	3%	39%

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR  
機電工程行業

RECOMMENDED NUMBER OF TRAINEES  
TO BE TAKEN ON ANNUALLY BETWEEN 2012 AND 2014

2012 年至 2014 年間  
建議每年招收的受訓者人數

Job Title 職稱	No. of employees in March 2011 2011 年 3 月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2012 由 2012 年起建議 每年招收的受訓者人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>		
Building Services Engineer 屋宇設備工程師	852	35 – 43
Electrical Engineer 電機工程師	2 332	95 – 117
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備 工程師	791	33 – 40
Mechanical Engineer 機械工程師	1 108	46 – 56
Plumbing and Drainage Engineer 水喉及渠務工程師	111	5 – 6
Lift/Escalator Engineer 升降機／自動梯工程師	208	9 – 10
Fire Services Engineer 消防設備工程師	371	15 – 19
Electronics Engineer 電子工程師	559	23 – 28
Control and Instrumentation Engineer 控制及儀器工程師	150	6 – 8
Engineering Manager 工程經理	1 101	45 – 55

Job Title 職 稱	No. of employees in March 2011 2011 年 3 月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2012 由 2012 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	137	6 – 7
Sub-total 小計	7 720	318 – 389
TECHNICIAN LEVEL 技術員級		
Supervisor 監督	3 265	123 – 152
Building Services Technician 屋宇設備技術員	1 751	67 – 82
Draughtsman 繪圖員	697	27 – 32
Electrical Engineering Technician 電機工程技術員	1 814	68 – 84
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備 技術員	1 226	47 – 57
Mechanical Engineering Technician 機械工程技術員	1 634	62 – 76
Lift/Escalator Technician 升降機／自動梯技術員	622	24 – 29
Fire Services Technician 消防設備技術員	467	18 – 22
Electrical Instrument and Meter Technician 電工儀器技術員	78	3 – 4
Electronics Technician 電子技術員	1 050	40 – 49
Telecommunication Technician 電訊技術員	753	29 – 35

Job Title 職 稱	No. of employees in March 2011 2011 年 3 月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2012 由 2012 年起建議 每年招收的受訓者人數
<b>TECHNICIAN LEVEL (Continued) 技術員級 (續)</b>		
Office Equipment Service Technician 辦公室設備維修技術員	87	3 – 4
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	68	3
Sub-total 小計	13 512	514 – 629
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>		
Foreman/Chargehand 管工/領工	4 645	296 – 362
Building Services Mechanic 屋宇設備技工	1 554	99 – 121
Electrician/Electrical Fitter 電工/電氣打磨裝配工	9 515	607 – 743
Control Panel Assembler 控制板裝配工	28	2
Electrical Wireman 電氣佈線工	902	58 – 70
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	3 531	225 – 275
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	1 885	120 – 147
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	782	50 – 61

Job Title 職 稱	No. of employees in March 2011 2011 年 3 月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2012 由 2012 年起建議 每年招收的受訓者人數
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>		
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫) / 保溫 技工	211	13 – 16
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	103	7 – 8
Plumber and Pipe Fitter 喉管工	384	24 – 30
Mechanical Fitter/Machinist 機械打磨裝配工 / 機床工	3 303	211 – 257
Lift Mechanic 升降機技工	2 507	160 – 195
Escalator Mechanic 自動梯技工	124	8 – 10
Fire Services Electrical Fitter 消防電氣裝配工	843	54 – 66
Fire Services Mechanical Fitter 消防機械裝配工	1 141	73 – 89
Cable Jointer (Power) 強電流電纜接駁技工	324	21 – 25
Overhead Linesman 架空電線技工	404	26 – 31
Electrical Appliances Service Mechanic 電器用具維修技工	803	51 – 63
Welder 焊接工	175	11 – 14
Carpenter 木工	139	9 – 11
Painter 髹漆工	127	8 – 10

Job Title 職 稱	No. of employees in March 2011 2011 年 3 月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2012 由 2012 年起建議 每年招收的受訓者人數
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>		
AV and RF Mechanic 影音及射頻技工	236	15 – 18
Building Security System Mechanic 屋宇防盜系統技工	21	1 – 2
Communication System Mechanic 電訊系統裝配工	2 129	136 – 166
Sub-total 小計	35 816	2 285 – 2 792

**THE SHIPBUILDING AND SHIP REPAIR SECTOR**  
船舶修建行業

**RECOMMENDED NUMBER OF TRAINEES  
TO BE TAKEN ON ANNUALLY BETWEEN 2012 AND 2014**  
2012 年至 2014 年間  
建議每年招收的受訓者人數

Job Title 職稱	No. of employees in March 2011 2011 年 3 月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2012 由 2012 年起建議 每年招收的受訓者人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>		
Electrical Engineer 電機工程師	24	2
Marine Engineer 輪機工程師	87	6 – 7
Mechanical Engineer 機械工程師	43	3 – 4
Ship Designer/Naval Architect 船舶設計師／造船工程師	17	1
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	123	9 – 11
Safety Officer 安全主任	21	1 – 2
Sub-total 小計	315	22 – 27
<b>TECHNICIAN LEVEL 技術員級</b>		
Draughtsman 繪圖員	3	-
Electrical Engineering Technician 電機工程技術員	37	3



Job Title 職稱	No. of employees in March 2011 2011年3月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2012 由2012年起建議 每年招收的受訓者人數
<b>TECHNICIAN LEVEL (Continued) 技術員級 (續)</b>		
Electronics/ Telecommunication Technician 電子／通訊技術員	14	1
Estimator 估計員	15	1
Mechanical Engineering Technician 機械工程技術員	248	17 – 22
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全督導員	8	1
Supervisor/Foreman 監督／管工	241	17 – 21
Sub-total 小計	566	40 – 49
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>		
Air-conditioning Mechanic/ Sheet Metal Worker 空氣調節技工／ 薄片金屬構造工	25	2
Carpenter 木工	105	7 – 9
Crane Driver 起重機操作工	25	2
Electrician 電工	163	12 – 14
Mechanical Fitter 機械打磨裝配工	447	31 – 39
GRP-Worker 玻璃纖維工	12	1
Machinist 機床工	66	5 – 6
Marine Pipeworker 船舶喉管工	84	6 – 7

Job Title 職稱	No. of employees in March 2011 2011年3月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2012 由2012年起建議 每年招收的受訓者人數
<b>TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)</b>		
Painter 髹漆工	153	11 – 13
Rigger 索具工 (喊咗工)	102	7 – 9
Ship Classification Qualified Welder 船級協會認可焊接工	20	1 – 2
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工 (鍋爐工、造船鋼 板工、捻縫工/鐵工)	109	8 – 9
Welder 焊接技工	76	5 – 7
Sub-total 小計	1 387	98 – 120

THE GAS SECTOR  
氣體燃料行業

RECOMMENDED NUMBER OF TRAINEES  
TO BE TAKEN ON ANNUALLY BETWEEN 2012 AND 2014

2012 年至 2014 年間  
建議每年招收的受訓者人數

Job Title 職稱	No. of employees in March 2011 2011 年 3 月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2012 由 2012 年起建議 每年招收的受訓者人數
<b>PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級</b>		
Electrical Engineer 電機工程師	11	0 – 1
Gas Engineer (Fuel Gas) 氣體工程師(氣體燃料)	263	11 – 13
Mechanical Engineer 機械工程師	85	3 – 4
Safety Officer 安全主任	22	1
Sub-total 小計	381	15 – 19
<b>TECHNICIAN LEVEL 技術員級</b>		
Electrical Engineering Technician 電機工程技術員	5	-
Gas Engineering Technician 氣體燃料工程技術員	321	13 – 16
Mechanical Engineering Technician 機械工程技術員	44	2
Assistant Safety Officer/Safety 助理安全主任/安全督導員	39	2
Supervisor/Chargehand 監督／管工	204	8 – 10
Sub-total 小計	613	25 – 30

Job Title 職稱	No. of employees in March 2011 2011年3月時 的僱員人數	Recommended no. of trainees to be taken on annually from 2012 由2012年起建議 每年招收的受訓者人數
<b>TRADESMAN/CRAFTSMAN LEVEL 技工級</b>		
Electrician/Electrical Fitter 電工／電氣打磨裝配工	24	1
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	44	2
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	195	8 - 10
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工 （住宅式）	524	21 - 26
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工 （非住宅式）	117	5 - 6
Mechanical Fitter 機械打磨裝配工	47	2
Welder 焊接技工	2	-
Sub-total 小計	953	39 - 47

**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 2011 MANPOWER SURVEY OF THE ELECTRICAL AND MECHANICAL SERVICES INDUSTRY**  
機電工程業 2011 年人力調查

**QUESTIONNAIRE**  
調查表

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

For Official Use Only: 此欄毋須填寫	Rec. Type	Survey Code	Industry Code	Establishment No.	Enumerator's No.	Editor's No.	Check Digit	No. of Employees Covered by the Questionnaire
	1	0 4 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: \_\_\_\_\_ TOTAL NO. OF PERSONS ENGAGED: \_\_\_\_\_  
機構名稱 僱員總人數

ADDRESS: \_\_\_\_\_  
地址

TYPE OF SERVICE: \_\_\_\_\_  
服務性質

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

TEL. NO.: \_\_\_\_\_ FAX NO.: \_\_\_\_\_  
電話 圖文傳真

E-MAIL: \_\_\_\_\_  
電郵





(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	* 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:	
	Title 職稱 (See Appendix D) (參閱附錄D)	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	<p>Note 1 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。</p>
41	Cable Joiner (Power) 強電流電纜接駁工	2   3   1   7	2						
42	Overhead Linesman 架空電線技工	2   3   1   8	2						
43	Electrical Appliances Service Mechanic 電器用具服務技工	2   3   1   9	2						
44	Welder 銲接工	2   3   2   0	2						
45	Carpenter 木工	2   3   2   1	2						
46	Painter 髹漆工	2   3   2   2	2						
47	AV and RF Mechanic 影音及射頻技工	2   3   2   3	2						
48	Building Security System Mechanic 屋宇防盜系統技工	2   3   2   4	2						
49	Communication System Mechanic 電訊系統裝配工	2   3   2   5	2						
50	Labourer 雜工	2   4   0   1	2						
51	Semi-skilled Worker 半技術工	2   4   0   2	2						
52									
53									
54									



The 2011 Manpower Survey of the  
Electrical and Mechanical Services Industry  
機電工程業 2011 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為電機工程技術員，但間中亦須擔任繪圖員的工作，則應歸類為電機工程技術員而非繪圖員）。

- (d) If an electrical and mechanical (E & M) engineering professional/technologist normally plays only managerial role for E & M engineering projects or services, and sometimes offers professional engineering advices and decisions on the projects or services, please classify such professional/technologist as engineering manager. (Please refer to job description of job code 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，請將此等人員歸類為工程經理。（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 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. Questionnaire Part II, Q.4 – “Contracting” and “Servicing” work  
(only applicable to establishment engaged in electrical and mechanical engineering)  
調查表第二部份問題四 – 「承造」及「維修服務」工作類別  
(只適用於從事機電工程的機構填寫)

“Contracting” involves works of design, planning, installation, testing and commissioning of various electrical and mechanical equipments and systems.

“Servicing” involves works of maintaining and repairing of electrical and mechanical equipments and systems, including the provision of energy supply and public utilities services in this manpower survey.

「承造」指設計、規劃、安裝、測試及投運試驗各種機電設備和系統的工作。

「維修服務」指保養和修理機電設備和系統的工作。在本人力調查中亦包括提供能源及公用事業服務等。

12. Example  
例子

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

Example 例子

(A) Principal Jobs 主要職務	(B) 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	* 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:
For Official Use Only 此欄毋須填寫		8-10	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   2	2   2	0   0	1   1	0   0	
2 Electrical Engineer 電機工程師	2	1   0   2	3   3	5   5	1   1	1   1	1   1	
12 Supervisor 監督	2	2   0   1	6   6	7   7	0   0	0   0	2   2	
13 Building Services Technician 屋宇設備技術員	2	2   0   2	4   4	4   4	0   0	1   1	3   3	
14 Draughtsman 繪圖員	2	2   0   3	2   2	2   2	0   0	1   1	3   3	
15 Electrical Engineering Technician 電機工程技術員	2	2   0   4	6   6	8   8	1   1	2   2	1   1	
26 Building Services Mechanic 屋宇設備技工	2	3   0   2	1   1	1   1	1   1	1   1	1   1	
27 Electrician/Electrical Fitter 電工/電氣打磨裝配工	2	3   0   3	5   5	8   8	1   1	4   4	1   1	
50 Labourer 雜工	2	4   0   1	2   2	1   1	0   0	0   0	0   0	
51 Semi-skilled Worker 半技術工	2	4   0   2	6   6	6   6	0   0	0   0	0   0	

Note 1 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。

**General Definition of Job Levels  
in the Electrical & Mechanical Services Industry**

**機電工程業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/She should be competent in analyzing and solving a wide range of technical problems. Furthermore, he/she 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/her sub-ordinates.

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 a person who occupies a position between the professional/technologist and the tradesman/craftsman. His/Her education, training and practical experience enable him/her 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 who is able to apply his/her skills to a wide range of jobs within his/her trade, with minimum direction and supervision. A tradesman/craftsman possesses not only practical skills but also related theoretical knowledge which enables him/her to adapt himself/herself 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，亦需有相關的理論知識，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

A semi-skilled/general worker is normally assigned to perform 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。

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

機電工程行業主要職務的工作說明

Code 編號	Job Title 職稱	Job Description 工作說明
<b>PROFESSIONAL/TECHNOLOGIST      專業人士／技師</b>		
101	Building Services Engineer 屋宇設備工程師	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项冷凝、空氣處理及電機設備，並就該方面提供意見；策劃及管理其發展、製造、建造、安裝、操作、保養及修理。
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 plumbing and drainage engineering problems; designs and advises on plumbing 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工作，但會間常提出專業工程建議及決定。此職位需由具備專業資歷的人士擔任。
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： (甲) 空調系統，包括冷凝、空氣處理及通風設備； (乙) 冷藏庫、製冰及其他冷凝設備； (丙) 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： (甲) 獨立安裝的空調系統和通風設備； (乙) 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
<b>TRADESMAN/CRAFTSMAN (Continued)      技工 (續)</b>		
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
<b>TRADESMAN/CRAFTSMAN (Continued)  技工（續）</b>		
317	Cable Jointer (Power)  強電流電纜接駁工	Joins 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	Fits, assembles, installs, maintains and repairs 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 related to electrical and mechanical engineering. 擔任與機電工程有關的一般雜務工作。
402	Semi-skilled Worker 半技術工	Assists skilled craftsmen in the industry. 協助業內的技工工作。



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

船舶修建行業主要職務工作說明

Code 編號	Job Title 職稱	Job Description 工作說明
<b>PROFESSIONAL/TECHNOLOGIST 專業人士／技師</b>		
151	Electrical Engineer  電機工程師	Carries out research on electrical engineering problems; designs electrical systems and plans and supervises their construction, installation, operation, maintenance and repair; and advises employers, associates or clients on electrical engineering matters. 研究電機工程問題；設計電氣系統，策劃與監督系統的建造、裝設、操作、保養及修理；向僱主、同僚或顧客提供關於電機工程的意見。
152	Marine Engineer  輪機工程師	Studies, designs and advises on propulsion systems, power plants, heating and ventilating systems, steering gear, pumps and other mechanical and electrical equipment, construction, installation, maintenance and repair. 研究、設計及就船舶推進系統、動力裝置、暖氣與通風系統、操舵裝置、泵、其他機械與電機設備的建造、裝設、保養及修理提供專業意見。
153	Mechanical Engineer  機械工程師	Carries out research on mechanical engineering problems; designs and advises on mechanically functioning, plant and equipment; and plans and supervises their development, manufacture, construction, installation, operation, maintenance and repair. 研究機械工程問題；設計機械設備，並提供專業意見。計劃及監督機械設備的發展、生產、建造、裝設、操作、保養及修理。
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
<b>PROFESSIONAL/TECHNOLOGIST (Continued) 專業人士／技師（續）</b>		
155	Ship Repairs Manager/ Superintendent  船舶修理主管或 船舶修理監督	<p>(A) Shipping Company: Organises and directs the repair and maintenance of ships; acts as company consultant on design, technical, cost and related matters.</p> <p>(B) Dockyard/Shipyard: Organises and directs the building, repair and maintenance; discusses and negotiates with owner's representatives on design, technical, cost and related matters.</p> <p>(甲) 船務工程公司方面的工作： 策劃與指導船舶的維修及保養；在設計、技術、成本及有關事宜方面擔任公司顧問。</p> <p>(乙) 船廠方面的工作： 策劃與指導建造、維修及保養工作；就設計、技術、成本及有關事宜與船東代表研討及洽商。</p>
156	Safety Officer  安全主任	<p>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.</p> <p>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。</p>
<b>TECHNICIAN 技術員</b>		
251	Draughtsman  繪圖員	<p>Prepares structural, layout, detail and assembly drawings or circuit diagrams for the maintenance and repair of plants, equipment and ship structures.</p> <p>繪製結構圖、配置圖、明細圖、裝配圖或線路圖，用以保養及維修船隻結構，船上裝置及設備。</p>

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
<b>TRADESMAN 技工</b>		
351	Air-conditioning Mechanic/Sheet Metal Worker 空氣調節技工/ 薄片金屬構造工	Fits, assembles, erects, installs, commissions, services, operates, maintains and repairs air-conditioning plant and ducting fitted on-board ships. 安裝、組合、裝配、設置、測試、檢修、操作、保養及維修船上的空氣調節系統及風槽。
352	Carpenter 木工	Constructs and repairs wooden vessels, and carries out structural wood work. 建造及修理木船，並從事與船舶建造有關的木工。
353	Crane Driver 起重機操作工	Operates various types of cranes. 操作各類起重機。
354	Electrician 電工	Tests, overhauls and installs electrical plant and equipment, and wiring for power and lighting. 測試、檢查及安裝電氣設備和供電及照明的佈線。
355	Mechanical Fitter 機械打磨裝配工	Fits, assembles, erects, installs, services, repairs and tests plant and machinery on board or in workshop; and making tools for performing the above duties. 負責打磨、裝配、保養、修理及測試船上或工場內的機械，並製造工具以完成上述任務。
356	GRP - Worker 玻璃纖維工	Constructs, repairs and assembles vessels and articles from glass reinforced plastic material (GRP). 使用玻璃纖維建造、修理及組合船隻與用具。
357	Machinist 機床工	Sets up and operates machine tools, to machine parts according 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/噉咗工	Responsible for the rigging of ship's derricks, masts, lifeboat davits, staging and other rope work. 負責船上吊杆、船桅、救生艇吊架、架板及其他的索具裝配工作。

Code 編號	Job Title 職稱	Job Description 工作說明
<b>TRADESMAN (Continued) 技工 (續)</b>		
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 according 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。
<b>SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人</b>		
451	Labourer  雜工	Undertakes general cleaning work of shipbuilding and ship repair, removal of industrial waste and handling of materials. 擔任有關船舶修建工程的各種清潔工作，清理工業廢料及搬運物料。
452	Semi-skilled Worker 半技術工	Assists skilled craftsmen in the industry. 協助業內技工工作。

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

氣體燃料行業主要職務的工作說明

Code 編號	Job Title 職稱	Job Description 工作說明
<b>PROFESSIONAL/TECHNOLOGIST 專業人士／技師</b>		
171	Electrical Engineer  電機工程師	<p>Designs and advises on electrical systems and equipment of fuel gas production plant; and plans and supervises their development, construction, installation, operation, maintenance and repair.</p> <p>設計氣體燃料製造廠房的電機系統及設備，並就該方面提供意見；策劃及管理其發展、建造、安裝、操作、保養及修理。</p>
172	Gas Engineer (Fuel Gas)  氣體工程師 (氣體燃料)	<p>Designs and advises on supply or utilization of gas. Plans, supervises and coordinates their development, construction, installation, operation, maintenance and repair.</p> <p>設計氣體燃料的供應或應用，並就該方面提供意見。策劃、監督及協調其發展、建造、安裝、操作、保養及修理。</p>
173	Mechanical Engineer  機械工程師	<p>Designs and advises on mechanical equipment of fuel gas production plant; and plans and supervises their development, construction, installation, operation, maintenance and repair.</p> <p>設計氣體燃料製造廠房的機械裝置及設備，並就該方面提供意見；策劃及管理其發展、建造、安裝、操作、保養及修理。</p>
174	Safety Officer  安全主任	<p>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.</p> <p>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。</p>

Code 編號	Job Title 職稱	Job Description 工作說明
<b>TECHNICIAN 技術員</b>		
271	Electrical Engineering Technician  電機工程技術員	<p>Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, manufacture, installation, operation, maintenance and repair of electrical systems and equipment.</p> <p>單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、製造、安裝、操作、保養及修理電機裝置及設備。</p>
272	Gas Engineering Technician  氣體燃料工程技術員	<p>Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, installation, operation, maintenance and repair of equipment concerned with the supply or utilization of gas. Assists to plan, coordinate and supervise their projects.</p> <p>單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、安裝、操作、保養及修理氣體燃料的供應或應用的設備。並協助工程師策劃、協調及管理有關計劃。</p>
273	Mechanical Engineering Technician  機械工程技術員	<p>Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, construction, installation, efficient operation, maintenance and repair of mechanical plant and equipment.</p> <p>單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、建造、安裝、有效操作、保養及修理機械裝置及設備。</p>
274	Assistant Safety Officer/Safety Supervisor  助理安全主任／安全督導員	<p>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.</p> <p>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。</p>

Code 編號	Job Title 職稱	Job Description 工作說明
<b>TECHNICIAN (Continued) 技術員 (續)</b>		
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。
<b>TRADESMAN/CRAFTSMAN 技工</b>		
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
<b>TRADESMAN/CRAFTSMAN (Continued) 技工 (續)</b>		
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。
<b>SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人</b>		
471	Driver (LPG Cylinder Wagon)  司機 (石油氣瓶車)	Operates wagons to deliver LPG cylinders.  駕駛石油氣瓶車運送石油氣瓶。
472	Labourer  雜工	Undertakes general labouring work of gas sector.  擔任有關氣體燃料行業的一般雜務工作。
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。