2015 Manpower Survey Report

Electrical And Mechanical Services Industry

機電工程業

2015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 2015 Manpower Survey of the Electrical and Mechanical Services Industry

Objective

This survey was conducted between 16th March and 17th July 2015 to collect the latest manpower information of the electrical and mechanical services industry.

Coverage

2. The fieldwork of the manpower survey covered 1 236 establishments which were selected by a stratified random sampling method from a total of 9 868 establishments. These samples employed about 80% 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) fire-alarm and fire-fighting equipment installation and maintenance;

(iii) telecommunications equipment, installation and maintenance; and

(iv) air-conditioning/ventilation systems installation and maintenance.

Branch 2: Electrical Fitting with Water Plumbing Branch

Engineering companies of electrical fitting with water plumbing.

Branch 3: Servicing (E & M) Branch

Servicing companies of electrical and mechanical engineering services including:

(i) aircraft assembly and manufacture of related machinery;

(ii) repair of electrical equipment;

(iii) electrical power generation, transmission and distribution;

(iv) combined and other installation and maintenance of electrical and mechanical equipment;

(v) combined and other ventilation, gas and water fitting, installation and maintenance;

(vi) lift/escalator installation and maintenance;

(vii) railways and cable transport;

(viii) building services engineering; and

(ix) repair of household appliances, home and garden equipment.

Branch 4: Supplementary Samples

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; and

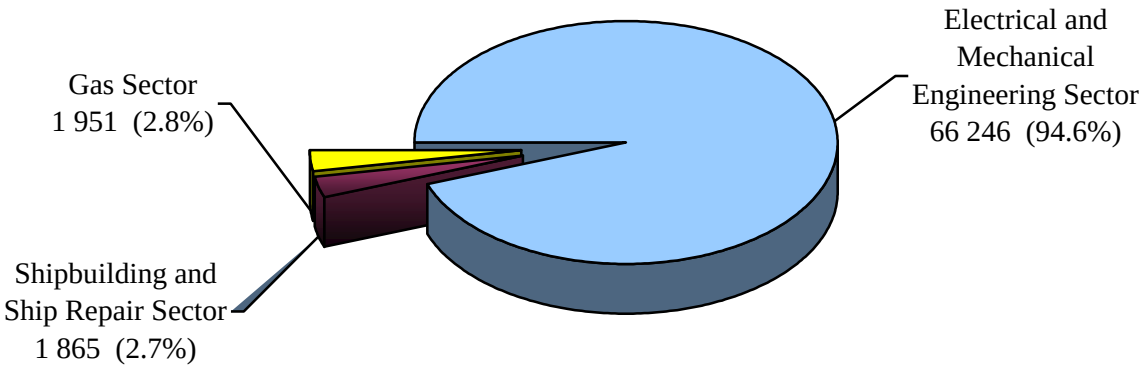
Branch 9: Supplementary Samples.

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 70 062 workers and 3 414 trainees were employed in the principal jobs of electrical/mechanical engineering and related disciplines of the electrical and mechanical services industry in Hong Kong. Of the 70 062 workers, 66 246 (94.6%) were employed in the electrical and mechanical engineering sector, 1 865 (2.7%) in the shipbuilding and ship repair sector, and 1 951 (2.8%) 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 35 570 workers of other disciplines working in the electrical and mechanical services industry. Among them, 33 578 workers were employed in the electrical and mechanical engineering sector, 827 workers in the shipbuilding and ship repair sector and 1 165 workers in the gas sector. As a whole, the electrical and mechanical services industry employed a total of 105 632 workers at the time of the survey.

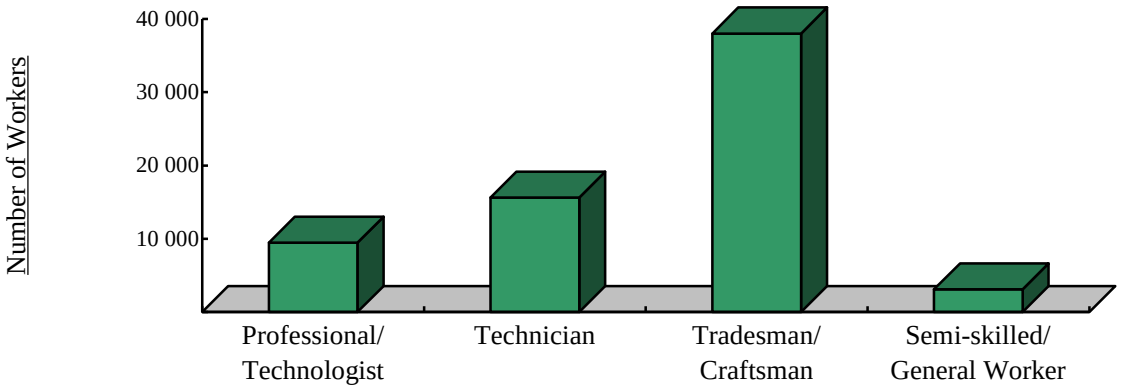
Electrical and Mechanical Engineering Sector

5. The distribution of workers by job 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

	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
	9 475	15 653	38 017	3 101	66 246
Percentage of total number of workers	14%	24%	57%	5%	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 3 337 trainees and 3 966 vacancies, amounting to 5% and 6% respectively of the total manpower. Besides, employers forecasted that the sector would require a total of 70 357 technical workers by March 2016.

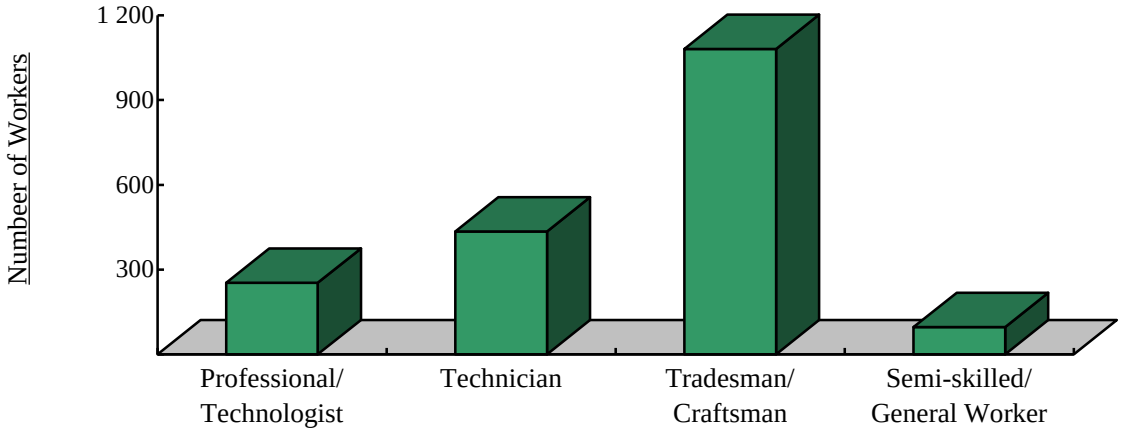
Shipbuilding and Ship Repair Sector

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

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

	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
	253	435	1 081	96	1 865
Percentage of total number of workers	14%	23%	58%	5%	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 31 and 121 respectively which represented 1.7% and 6.5% of the total number of workers. Employers anticipated that by March 2016, the number of technical workers would be 1 983.

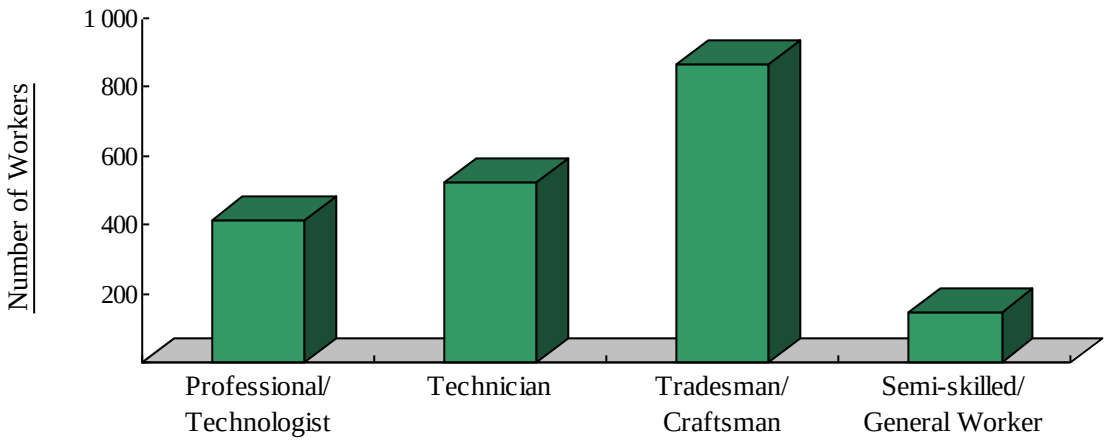
Gas Sector

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

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

	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
	411	526	869	145	1 951
Percentage of total number of workers	21%	27%	45%	7%	100%

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



10. At the time of the survey, there were 46 trainees and 38 vacancies in the gas sector, representing 2.4% and 1.9% of the total manpower. Employers forecasted that the total workforce by March 2016 would be 1 986.

Projected Manpower Training Requirements

Electrical and Mechanical Engineering Sector

11. The survey findings showed an average increase of 2.4% per annum in the overall technical manpower of electrical/mechanical engineering and related disciplines from year 2013 to 2015. By job level, the annual manpower increases in professional/technologist, technician, tradesman/craftsman and semi-skilled/general worker levels were 2.4%, 2.7%, 2.3% and 2.9% respectively.

12. With the planned completion of four rail projects from 2016 to 2021 and the development of arts and cultural facilities in the West Kowloon Cultural District starting from 2016, together with the increasing supply of land and housing, the Training Board anticipates that strong manpower demand in the E&M engineering sector will continue in the coming years. Based on past and present survey data and consideration of workers' age profile and the vacancy numbers at the time of survey, the Training Board has projected the average annual training requirements of E&M manpower at the professional/technologist, technician and tradesman/craftsman levels for year 2016 to 2018 as shown in Table 4.

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

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2016 – 2018
Professional/Technologist	9 475	464
Technician	15 653	846
Tradesman/Craftsman	38 017	2 160

Shipbuilding and Ship Repair Sector

13. Following the sharp decrease from 2011 to 2013, the manpower of the shipbuilding and ship repair sector has been stabilized during the past 2 years, with a minimal drop of 0.3% per annum. The measures taken by employers, i.e. diversification of business to land-based engineering and contracting services, have proved to be effective.

14. Based on past and present survey data and consideration of the wastage rate of the sector, the Training Board has projected the average annual training requirements of E&M manpower for the shipbuilding and ship repair sector from 2016 to 2018 as shown in Table 5.

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

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2016 – 2018
Professional/Technologist	253	14
Technician	435	24
Tradesman/Craftsman	1 081	61

Gas Sector

15. The survey reflected that the overall manpower of the gas sector had remained very steady during the past two years, with a mild increase of 0.6% per annum.

16. Considering that the HKSAR Government is determined to increase the land and housing supply which will stimulate gas consumption, the Training Board anticipates that the demand for technical workers in the gas sector will maintain a steady growth in the coming years. The Training Board has projected the average annual training requirements for year 2016 to 2018 as shown in Table 6.

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

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2016 – 2018
Professional/Technologist	411	11
Technician	526	15
Tradesman/Craftsman	869	26

Major Conclusions and Recommendations

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

(a) Business Outlook
Considering that four rail projects are now in full swing, followed by the development in the West Kowloon Cultural District and the Three-runway System as well as the increasing supply of land and housing, the Training Board anticipates a persistent demand of technical manpower in the E&M services industry for the years ahead, in both contracting and maintenance works.

(b) Training of Professionals/Technologists
The annual supply of local university graduates from full-time E&M related degree programmes exceeds the projected annual training requirements of the E&M services industry for about 29%, from 2016 to 2018. Given that not 100% of the graduates will enter into employment and work for the E&M services industry, the manpower supply and demand are considered as roughly matching.

(c) Training of Technicians
The estimated annual supply of graduates from technician level programmes offered by local universities, Hong Kong Institute of Vocational Education and Youth College in major disciplines of the E&M services industry looks 27% higher than the projected annual training requirements for 2016 to 2018. Similar to the case of professionals/ technologists, some of the graduates will join other industry sectors or establishments outside the scope of the survey. Hence, the manpower supply and demand at the technician level is also considered as matching.

(d) Training of Tradesmen/Craftsmen
(i) The estimated number of newly-registered craft apprentices of E&M trades per annum, from 2016 to 2018, amounts to only 46% of the projected annual training requirements. 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 inadequate for supporting the development of the industry.

(ii) With the assistance of incentive schemes such as the Trainee Subsidy Scheme and the Earn & Learn Pilot Scheme, the Training Board recommends training providers to increase the capacities of pre-employment training programmes. In addition, more skills upgrading courses should be offered to in-service semi-skilled workers to enable them to upgrade to tradesmen/craftsmen.

(e) 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 the Contractor Cooperative Training Scheme (CCTS) which is managed by the Construction Industry Council.

(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
2015年人力調查報告摘要

目的

是次調查於2015年3月16日至7月17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9 868間機構中抽選出1 236間為調查對象。這些抽樣機構的僱員人數，約佔機電工程業總人力的80%，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) 火警及滅火設備安裝及保養；

(iii) 電訊設備安裝及保養；以及

(iv) 空氣調節／通風系統安裝及保養。

門類 II：水電工程

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) 飛行器裝嵌及相關機械的製造；

(ii) 電力設備維修；

(iii) 發電、輸電及配電；

(iv) 綜合及其他電器及機械設備安裝及保養；

(v) 綜合及其他通風、燃氣及水務設備安裝及保養；

(vi) 升降機／電動扶梯安裝及保養；

(vii) 鐵路及纜索運輸；

(viii) 屋宇設備工程服務；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；

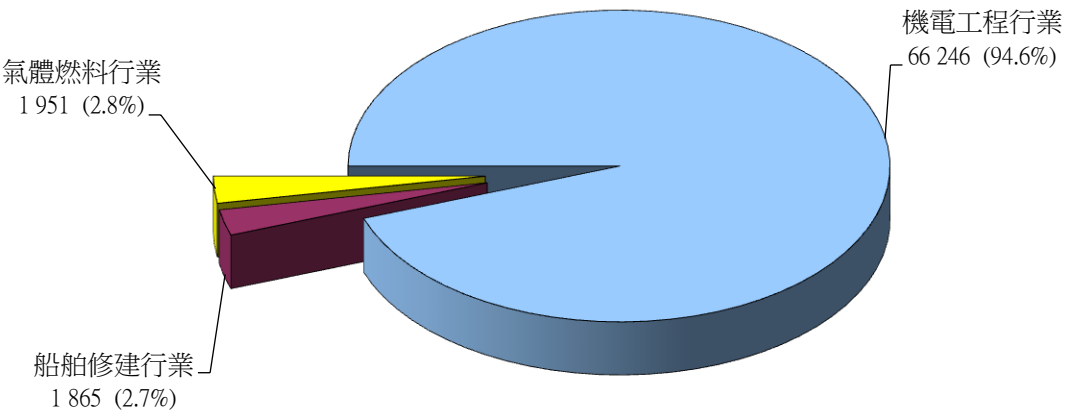
門類 VIII：燃氣供應系統安裝及保養公司 ；以及

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。

調查結果

3. 是次調查顯示，於調查期間，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及受訓者分別有70 062及3 414人。 在70 062名從業員中，66 246人（94.6%） 屬機電工程行業，1 865人（2.7%）屬船舶修建行業，1 951人（2.8%）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，調查期間業內從事其他職務的僱員共有35 570人，其中33 578 人受僱於機電工程行業，827人受僱於船舶修建行業，1 165人於氣體燃料行業任職。整體而言，調查期間，整個機電工程業共僱有105 632人。

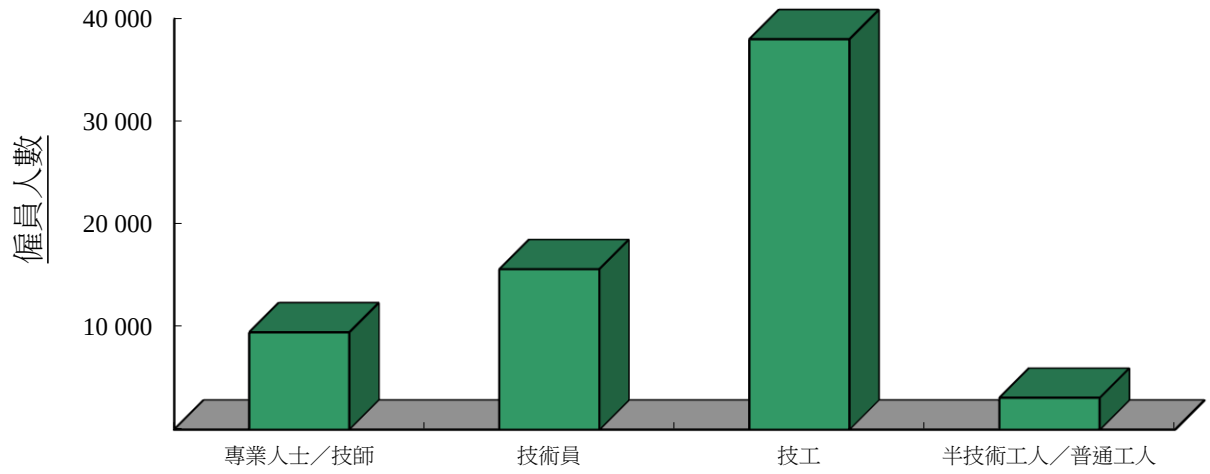
機電工程行業

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
	9 475	15 653	38 017	3 101	66 246
佔僱員總數百分比	14%	24%	57%	5%	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3 337名受訓者及 3 966個空缺，分別佔該行業總人力的5%及6%。 此外，僱主預測至2016年3月時，機電工程行業將需要合共70 357名機電僱員。

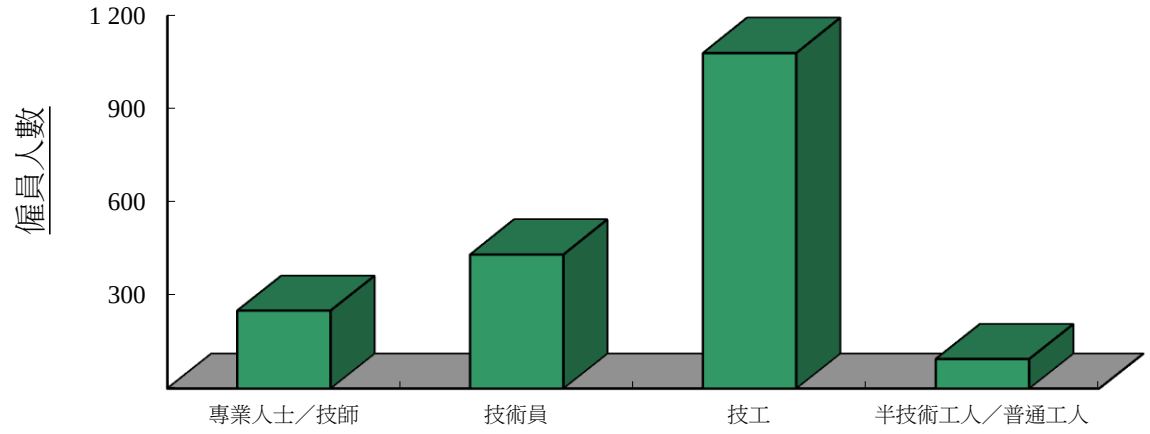
船舶修建行業

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
	253	435	1 081	96	1 865
佔僱員總數百分比	14%	23%	58%	5%	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31人及121個，佔船舶修建行業僱員總數的1.7%及6.5%。僱主預測至2016年3月時，該行業的機電僱員人數將為1 983人。

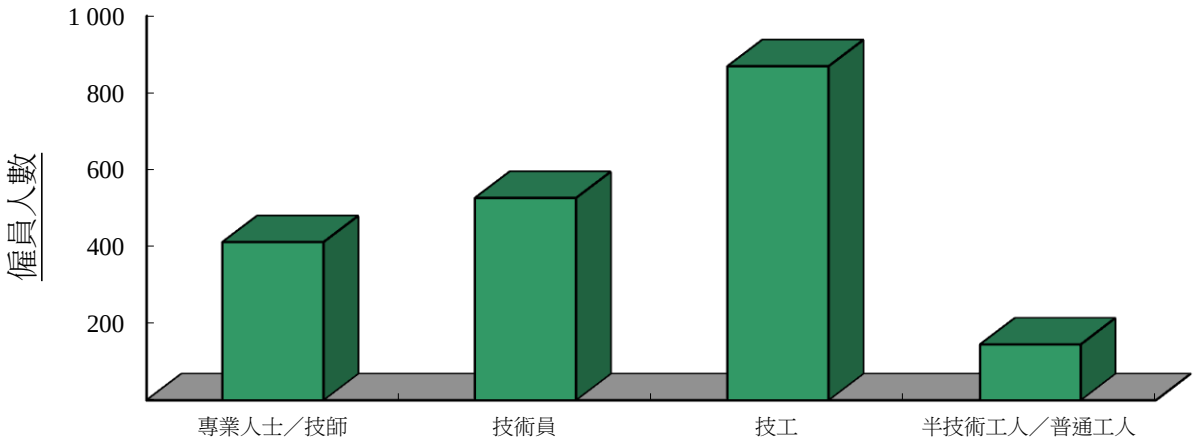
氣體燃料行業

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
	411	526	869	145	1 951
佔僱員總數百分比	21%	27%	45%	7%	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46名受訓者及38個空缺，分別佔該行業總人力的2.4%及1.9%。僱主預測至2016年3月時，業內的總人力將為1 986人。

推算未來人力訓練需求

機電工程行業

11. 調查結果顯示，2013至2015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2.4%。若按技能等級劃分，則專業人士／技師、技術員、技工及半技術工人／普通工人級的僱員人數，分別每年平均增長2.4%、 2.7%、 2.3% 及2.9%。

12. 2016至2021年間將有四個鐵路項目竣工，而2016年起，西九文化區的藝術及文化設施亦會陸續施工，加上土地及房屋供應持續增加，本會相信機電工程行業未來幾年的人力需求仍然強大。本會根據以往及最新的人力調查數據、業內僱員的年齡分布，以及調查期間的空缺額，推算2016至2018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2016至2018年平均每年需要訓練的人手
專業人士／技師	9 475	464
技術員	15 653	846
技工	38 017	2 160

船舶修建行業

13. 船舶修建行業的僱員人數在2011至2013年間大幅下降後，過去兩年漸趨穩定，每年錄得0.3%的輕微跌幅。船舶修建行業僱主逐漸將業務擴展至陸上工程及承造服務，調查結果顯示這些應對措施奏效。

14. 本會根據以往及最新的人力調查數據，以及行業的流失率，推算2016至2018年船舶修建行業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2016至2018年平均每年需要訓練的人手
專業人士／技師	253	14
技術員	435	24
技工	1 081	61

氣體燃料行業

15. 過去兩年，氣體燃料行業的整體人力保持穩健，每年微增0.6%。

16. 鑑於香港政府決心增加土地及房屋供應，應會刺激氣體消耗量，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平穩增長。本會推算2016至2018年氣體燃料行業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2016至2018年平均每年需要訓練的人手
專業人士／技師	411	11
技術員	526	15
技工	869	26

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

四個鐵路項目正全速進行，隨後西九文化區將有多個藝術及文化設施陸續施工，而三跑道系統工程亦會展開，加上土地及房屋供應持續增加，預期未來數年，業界對從事「承造」及「服務」工作的機電從業員將保持殷切需求。

(b) 專業人士／技師訓練
修讀本地大學相關學科全日制課程的畢業生人數，預料將較2016至2018年間的推算人力訓練需求高出約29%。不過，由於畢業生不會全部就業及投身機電工程行業，故畢業生的供應大致配合市場需求。

(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2016至2018年間的推算人力訓練需求高出約27%。不過，與專業人士／技師的情況相同，由於部分畢業生會投身其他並不在是次調查範圍內的行業或機構，故畢業生的供應大致配合市場需求。

(d) 技工訓練

(i) 2016至2018年間，預計新註冊的機電工程技工學徒人數，只能滿足46%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業界發展所需的人力。

(ii) 本會建議院校善用機電業（建築）學員培訓津貼計劃和「職」學創前路先導計劃等資助，增加職前訓練課程的學額。此外，可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。

(e) 半技術工人／普通工人訓練

因應技工人手短缺，本會建議訓練更多半技術工人／普通工人，以紓緩技工的工作量。建造業議會推出的「承建商合作培訓計劃」有助推動這方面的工作。

(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 16th March and 17th July 2015 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 12 months after the survey;

(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 12 months after the survey; 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) fire-alarm and fire-fighting equipment installation and maintenance (HSIC : 432103);

(iii) telecommunications equipment installation and maintenance (HSIC : 432106); and

(iv) air-conditioning and ventilation systems installation and maintenance (HSIC : 432201).

Branch 2: Electrical Fitting with Water Plumbing Branch

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) aircraft assembly and manufacture of related machinery (HSIC : 303000);

(ii) repair of electrical equipment (HSIC : 331400);

(iii) electrical power generation, transmission and distribution (HSIC : 351000);

(iv) combined and other installation and maintenance of electrical and mechanical equipment (HSIC : 432199);

(v) Combined and other ventilation, gas and water fitting, installation and maintenance (HSIC: 432299);

(vi) lift and escalator installation and maintenance (HSIC : 432901);

(vii) railway and cable transport (HSIC : 491000);

(viii) building services engineering (HSIC : 711400); 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 9 868 establishments, including 9 389 establishments in the electrical and mechanical engineering sector, 311 in the shipbuilding and ship repair sector, and 168 in the gas sector. Of these 9 868 establishments, 9 700 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 1 068 samples out of the 9 700 establishments in the HSICs. Together with some 168 supplementary samples, a total of 1 236 establishments were included and they employed about 80% of the total workforce of the industry. The sampling plan is shown in Appendix 3.

Method of the Survey

1.7 One week before the fieldwork, a questionnaire together with explanatory notes, and a description of the principal jobs and other survey documents (Appendices 4A, 4B, 4C and 4D) were sent to the chosen organisations.

1.8 During the fieldwork period, staff of the C&SD made telephone contacts with or visited individual establishments to assist respondents in completing questionnaires or to collect completed ones.

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 1 236 selected establishments, 896 supplied the information and 27 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[1] was 97.1%.

[1] $$\text{effective response rate} = \frac{\text{responded + partially responded}}{\text{responded + partially responded + refusal}} = \frac{896+11}{896+11+27} = 97.1\%$$

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 2015 manpower statistical report which presented a summary of the survey findings of the electrical and mechanical services industry on the web site of the Vocational Training Council in October 2015 for public access.

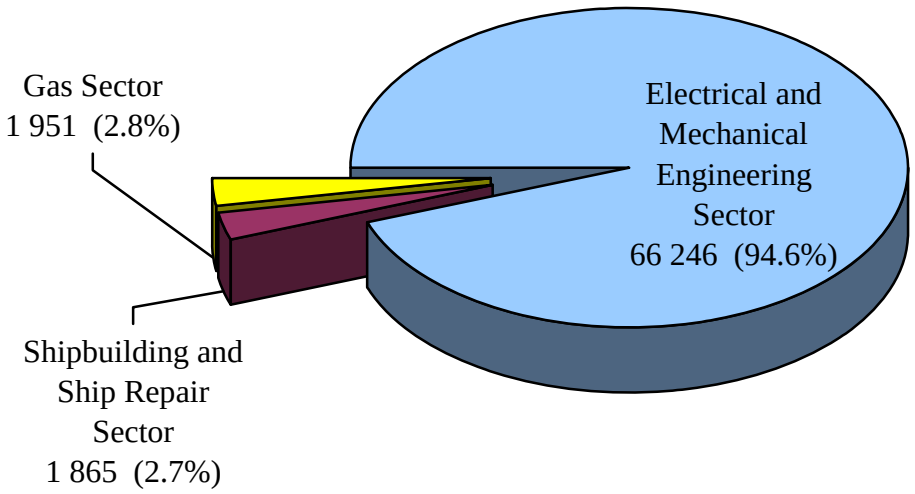
SECTION II

SUMMARY OF SURVEY FINDINGS

Number of Workers Employed

2.1 The survey revealed that at the time of survey, a total of 70 062 workers and 3 414 trainees were employed in the principal jobs of electrical/mechanical engineering and related disciplines in the electrical and mechanical services industry of Hong Kong. Of the 70 062 workers, 66 246 (94.6%) were employed in the electrical and mechanical engineering sector, 1 865 (2.7%) in the shipbuilding and ship repair sector, and 1 951 (2.8%) 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 35 570 workers of other disciplines employed in the electrical and mechanical services industry at the time of survey. Among them, 33 578 workers were employed in the electrical and mechanical engineering sector, 827 workers in the shipbuilding and ship repair sector and 1 165 workers in the gas sector.

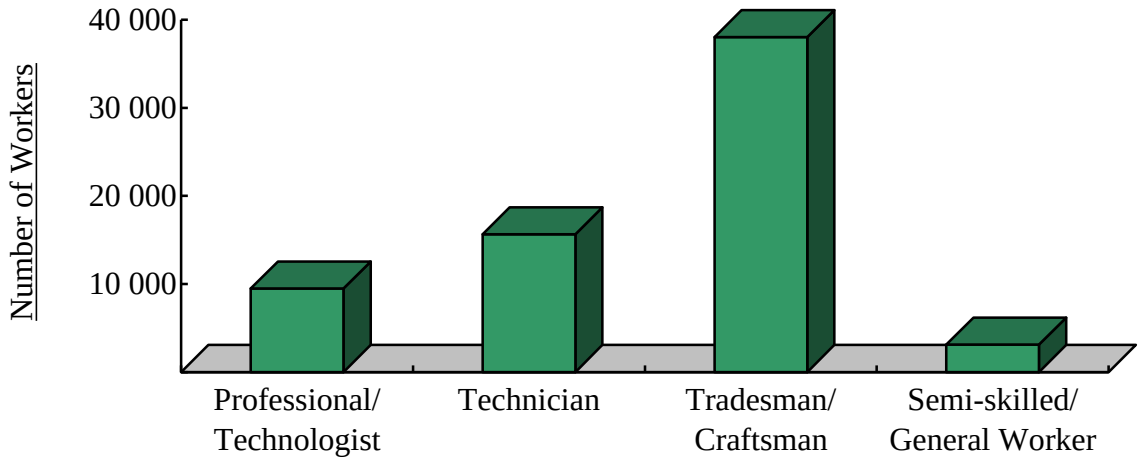
Electrical and Mechanical Engineering Sector

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

	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
	9 475	15 653	38 017	3 101	66 246
Percentage of total number of workers	14%	24%	57%	5%	100%

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



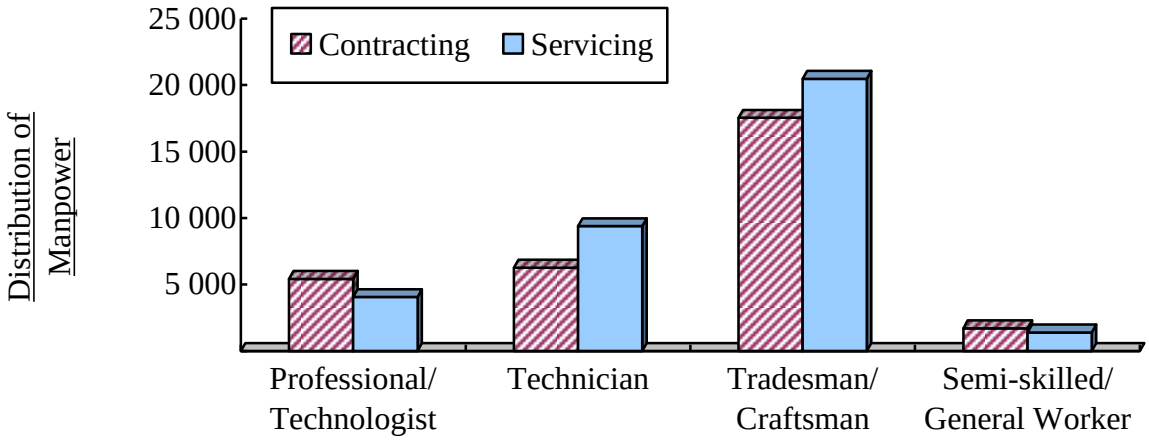
2.4 The manpower statistics of the whole electrical and mechanical engineering sector are tabulated in Appendix 5 while that of its Contracting (E&M) branch, Electrical Fitting with Water Plumbing branch, Servicing (E&M) branch and Supplementary Samples are in Appendices 6 to 9.

2.5 Respondents of the E&M Engineering sector estimated that about 47% and 53% of manpower were devoted to contracting and servicing works respectively, representing 30 942 and 35 304 workers in terms of headcount. The detailed breakdown is shown in Table 2.2 and Figure 2.3.

Table 2.2 Estimated Manpower for Contracting and Servicing Works in the Electrical and Mechanical Engineering Sector

Job level	Number of Workers Employed	Estimated Manpower for Contracting	Estimated Manpower for Servicing
Professional/Technologist	9 475	5 421 (57%)	4 054 (43%)
Technician	15 653	6 266 (40%)	9 387 (60%)
Tradesman/Craftsman	38 017	17 546 (46%)	20 471 (54%)
Semi-skilled/General Worker	3 101	1 709 (55%)	1 392 (45%)
Total	**66 246**	**30 942 (47%)**	**35 304 (53%)**

Figure 2.3 Estimated Manpower for Contracting and Servicing Works in the Electrical and Mechanical Engineering Sector



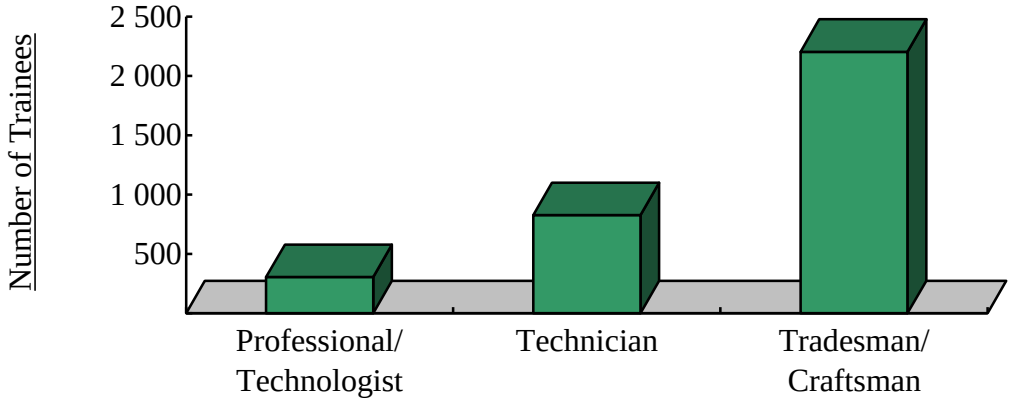
2.6 The breakdown of manpower engaged in contracting and servicing work of different branches of the electrical and mechanical engineering sector is tabulated in Appendix 10.

2.7 At the time of the survey, there were 3 337 trainees under various forms of training in the electrical and mechanical engineering sector, representing 5% of the total workforce. Their distribution by job level is shown in Table 2.3 and Figure 2.4.

Table 2.3 Distribution of Trainees by Job level of the Electrical and Mechanical Engineering Sector

Job level	Number of Workers Employed	Number of Trainees	Percentage of Workers at the Same Level
Professional/Technologist	9 475	305	3.2%
Technician	15 653	827	5.3%
Tradesman/Craftsman	38 017	2 205	5.8%
Semi-skilled/General Worker	3 101	-	-
Total	**66 246**	**3 337**	**5.0%**

Figure 2.4 Distribution of Trainees by Job level of the Electrical and Mechanical Engineering Sector

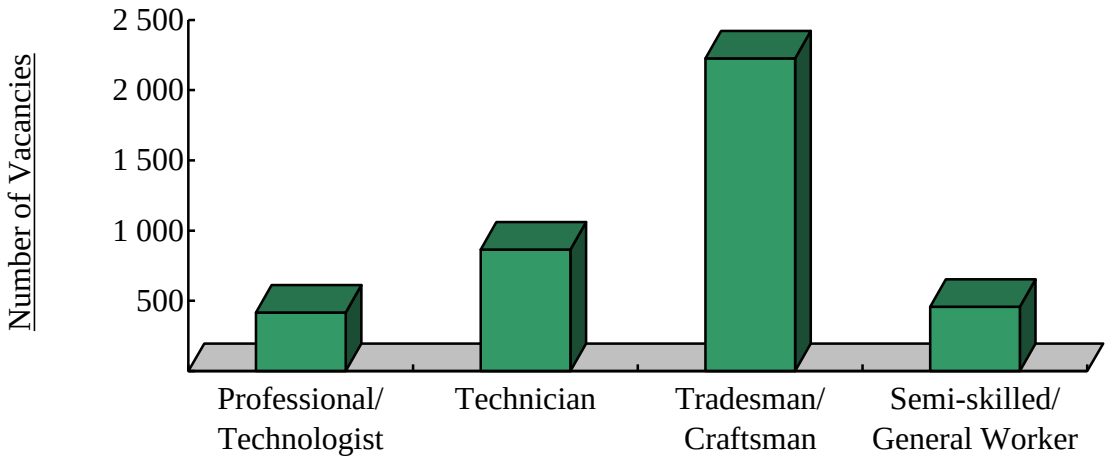


2.8 Employers reported a total of 3 966 vacancies, representing 6% of the total manpower of the electrical and mechanical engineering sector. The distribution of the vacancies by job level is shown in Table 2.4 and Figure 2.5.

Table 2.4 Distribution of Vacancies by Job level of the Electrical and Mechanical Engineering Sector

Job level	Number of Workers Employed	Number of Vacancies	Percentage of Workers at the Same Level
Professional/Technologist	9 475	417	4.4%
Technician	15 653	865	5.5%
Tradesman/Craftsman	38 017	2 227	5.9%
Semi-skilled/General Worker	3 101	457	14.7%
Total	**66 246**	**3 966**	**6.0%**

Figure 2.5 Distribution of Vacancies by Job level of the Electrical and Mechanical Engineering Sector



2.9 Employers forecasted a total of 70 357 E&M workers by March 2016 in the electrical and mechanical engineering sector. The number is very close to the sum of the employed manpower and vacancies at the time of survey, indicating that employers anticipated the vacancies would be filled within 12 months. The distribution of the forecasted manpower by job level is shown in Table 2.5.

Table 2.5 Distribution of Forecasted Number of Workers by Job level of the Electrical and Mechanical Engineering Sector

Job level	Number of Workers Plus Vacancies at Time of Survey	Employers' Forecast on Number of Workers by March 2016
Professional/Technologist	9 892	9 921
Technician	16 518	16 534
Tradesman/Craftsman	40 244	40 329
Semi-skilled/General Worker	3 558	3 573
Total	**70 212**	**70 357**

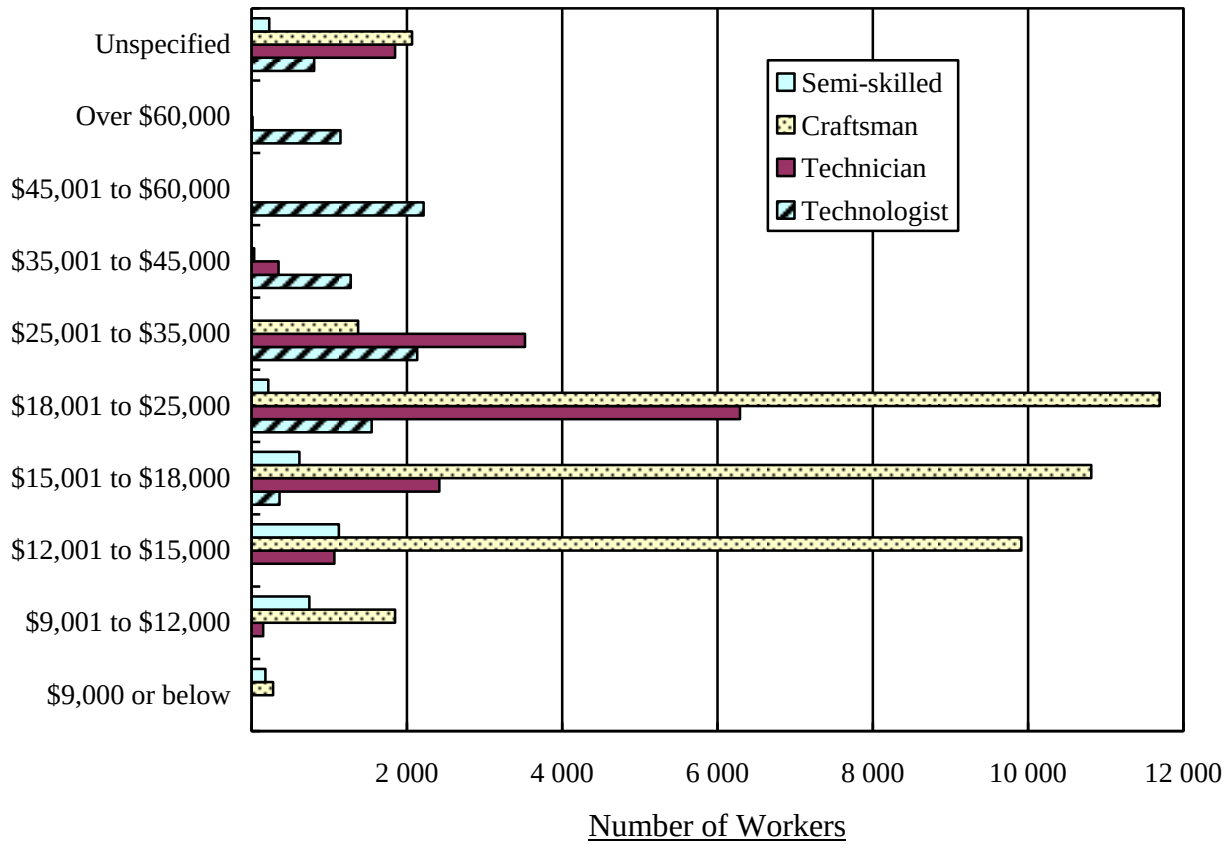
2.10 The distribution of trainees among the principal jobs, the number of vacancies at the time of survey and the forecasted number of workers by March 2016 at each principal job of the electrical and mechanical engineering sector are given in Appendix 5.

2.11 The monthly income range of E&M workers at each job level of the electrical and mechanical engineering sector is shown in Table 2.6 and Figure 2.6.

Table 2.6 Average Monthly Income of Workers of the Electrical and Mechanical Engineering Sector

Monthly Average Income Range	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	All
$9 000 or below	-	-	275	176	451
$9 001 - $12 000	-	147	1 846	742	2 735
$12 001 - $15 000	-	1 065	9 914	1 123	12 102
$15 001 - $18 000	359	2 418	10 816	615	14 208
$18 001 - $25 000	1 546	6 290	11 696	214	19 746
$25 001 - $35 000	2 131	3 520	1 371	5	7 027
$35 001 - $45 000	1 275	346	31	-	1 652
$45 001 - $60 000	2 215	5	-	-	2 220
Over $60 000	1 144	13	-	-	1 157
Unspecified	805	1 849	2 068	226	4 948
Total	**9 475**	**15 653**	**38 017**	**3 101**	**66 246**

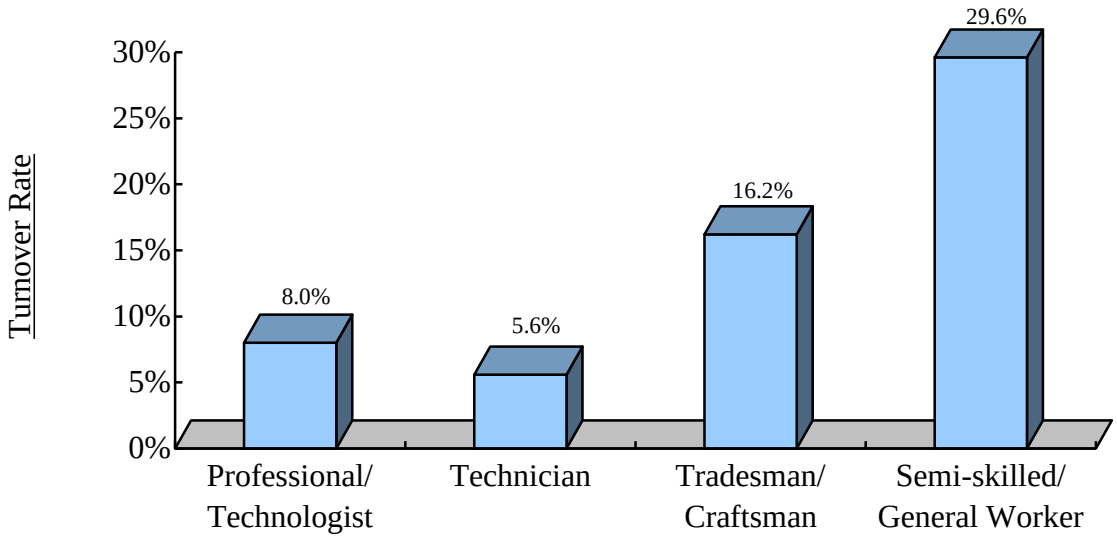
Figure 2.6 Average Monthly Income of Workers of the Electrical and Mechanical Engineering Sector



2.12 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 11.

2.13 Employers reported that a total of 8 694 workers left their companies within the 12 months before the survey. The turnover rate of each job level is shown in Figure 2.7.

Figure 2.7 Turnover Rate by Job level of the Electrical and Mechanical Engineering Sector



2.14 A total of 165 workers were deployed to work outside Hong Kong for more than 6 months during the one year before the survey.

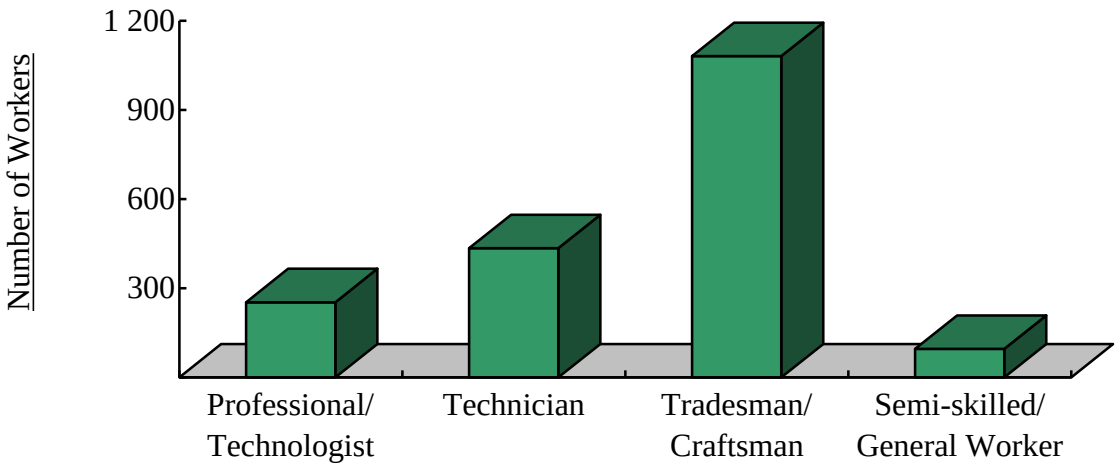
Shipbuilding and Ship Repair Sector

2.15 The manpower statistics of the shipbuilding and ship repair sector are tabulated in Appendix 12. The distribution of E&M workers by job level of the sector is shown in Table 2.7 and Figure 2.8.

Table 2.7 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
	253	435	1 081	96	1 865
Percentage of total number of workers	14%	23%	58%	5%	100%

Figure 2.8 Distribution of E&M Workers by Job level of the Shipbuilding and Ship Repair Sector



2.16 At the time of the survey, there were 31 trainees under various forms of training in the shipbuilding and ship repair sector, representing 1.7% of the total workforce. Their distribution by job level is shown in Table 2.8.

Table 2.8 Distribution of E&M Trainees by Job level of the Shipbuilding and Ship Repair Sector

Job level	Number of Workers Employed	Number of Trainees	Percentage of Workers at the Same Level
Professional/Technologist	253	1	0.4%
Technician	435	6	1.4%
Tradesman/Craftsman	1 081	24	2.2%
Semi-skilled/General Worker	96	-	-
Total	**1 865**	**31**	**1.7%**

2.17 Employers reported a total of 121 vacancies, representing 6.5% of the total E&M workforce of the shipbuilding and ship repair sector. Their distribution by job level is shown in Table 2.9.

Table 2.9 Distribution of E&M Vacancies by Job level of the Shipbuilding and Ship Repair Sector

Job level	Number of Workers Employed	Number of Vacancies	Percentage of Workers at the Same Level
Professional/Technologist	253	7	2.8%
Technician	435	24	5.5%
Tradesman/Craftsman	1 081	89	8.2%
Semi-skilled/General Worker	96	1	1.0%
Total	**1 865**	**121**	**6.5%**

2.18 Employers forecasted a total of 1 983 E&M workers by March 2016 in the shipbuilding and ship repair sector. The number is very close to the sum of the employed manpower and vacancies at the time of survey, indicating that employers anticipated the vacancies would be filled within 12 months. The distribution of the forecasted manpower by job level is shown in Table 2.10.

Table 2.10 Distribution of Forecasted Number of E&M Workers by Job level of the Shipbuilding and Ship Repair Sector

Job level	Number of Workers Plus Vacancies at Time of Survey	Employers' Forecast on Number of Workers by March 2016
Professional/Technologist	260	253
Technician	459	460
Tradesman/Craftsman	1 170	1 173
Semi-skilled/General Worker	97	97
Total	**1 986**	**1 983**

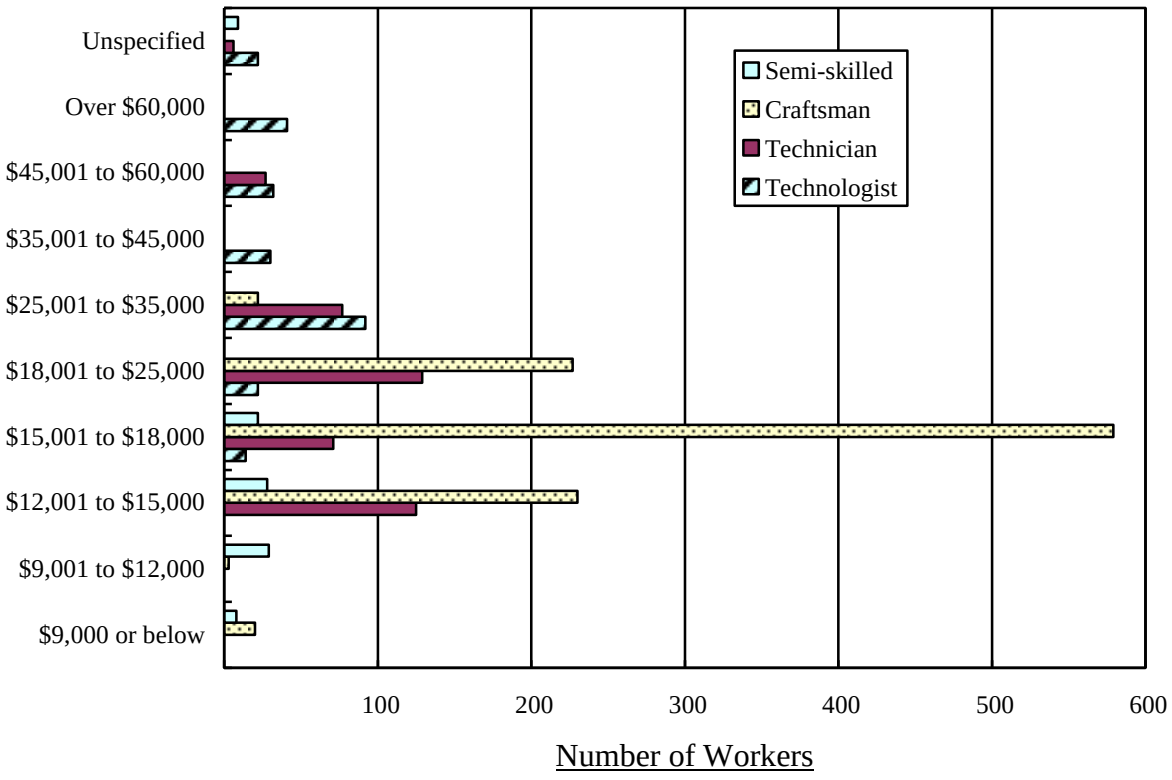
2.19 The distribution of trainees among the principal jobs, the number of vacancies at the time of survey and the forecasted number of workers by March 2016 at each principal job of the shipbuilding and ship repair sector are given in Appendix 12.

2.20 The monthly income range of E&M workers at each job level of the shipbuilding and ship repair sector is shown in Table 2.11 and Figure 2.9.

Table 2.11 Average Monthly Income of E&M Workers of the Shipbuilding and Ship Repair Sector

Monthly Average Income Range	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	All
$9 000 or below	-	-	20	8	28
$9 001 - $12 000	-	-	3	29	32
$12 001 - $15 000	-	125	230	28	383
$15 001 - $18 000	14	71	579	22	686
$18 001 - $25 000	22	129	227	-	378
$25 001 - $35 000	92	77	22	-	191
$35 001 - $45 000	30	-	-	-	30
$45 001 - $60 000	32	27	-	-	59
Over $60 000	41	-	-	-	41
Unspecified	22	6	-	9	37
Total	**253**	**435**	**1 081**	**96**	**1 865**

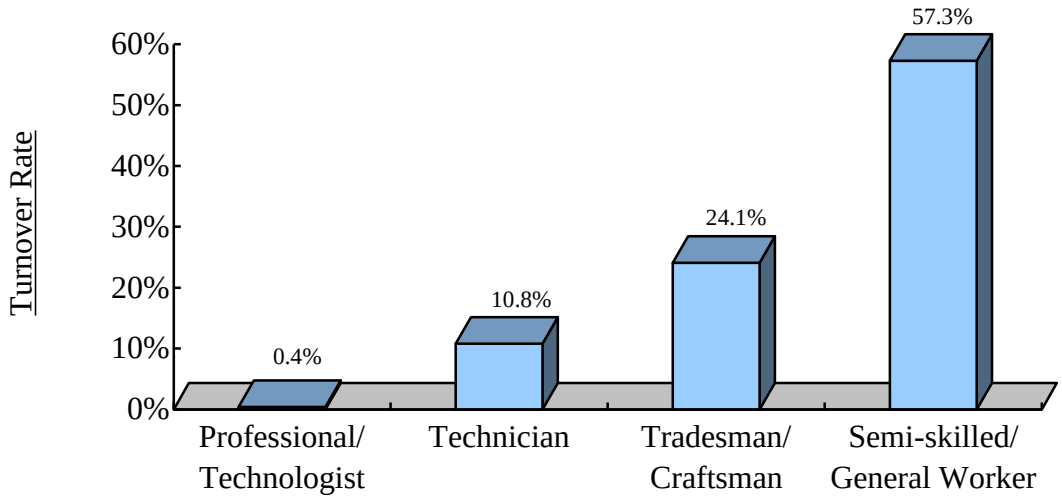
Figure 2.9 Average Monthly Income of E&M Workers of the Shipbuilding and Ship Repair Sector



2.21 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 13.

2.22 Employers reported that a total of 363 workers left their companies within the 12 months before the survey. The turnover rate of each job level is shown in Figure 2.10.

Figure 2.10 Turnover Rate by Job level of the Shipbuilding and Ship Repair Sector



2.23 A total of 14 workers were deployed to work outside Hong Kong for more than 6 months during the one year before the survey.

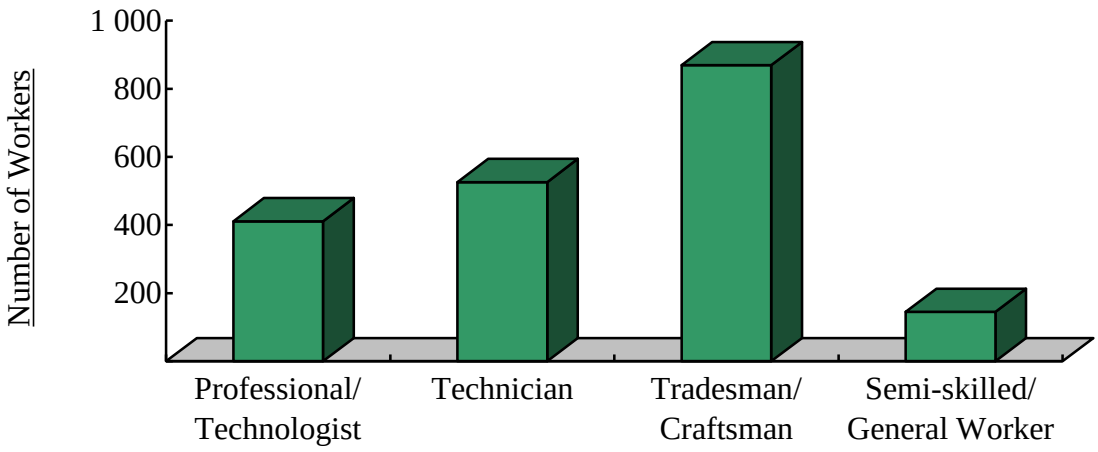
Gas Sector

2.24 The manpower statistics of the gas sector are tabulated in Appendix 14. The distribution of E&M workers by job level of the sector is shown in Table 2.12 and Figure 2.11.

Table 2.12 Distribution of E&M workers by Job level of the Gas Sector

	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	Total
	411	526	869	145	1 951
Percentage of total number of workers	21%	27%	45%	7%	100%

Figure 2.11 Distribution of E&M Workers by Job level of the Gas Sector



2.25 At the time of the survey, there were 46 trainees under various forms of training in the gas sector, representing 2.4% of the total workforce. Their distribution by job level is shown in Table 2.13.

Table 2.13 Distribution of E&M Trainees by Job level of the Gas Sector

Job level	Number of Workers Employed	Number of Trainees	Percentage of Workers at the Same Level
Professional/Technologist	411	1	0.2%
Technician	526	3	0.6%
Tradesman/Craftsman	869	42	4.8%
Semi-skilled/General Worker	145	-	-
Total	**1 951**	**46**	**2.4%**

2.26 Employers reported 38 vacancies at the time of the survey, representing 1.9% of the total E&M manpower of the gas sector. The distribution by job level is shown in Table 2.14.

Table 2.14 Distribution of E&M Vacancies by Job level of the Gas Sector

Job level	Number of Workers Employed	Number of Vacancies	Percentage of Workers at the Same Level
Professional/Technologist	411	3	0.7%
Technician	526	12	2.3%
Tradesman/Craftsman	869	19	2.2%
Semi-skilled/General Worker	145	4	2.8%
Total	**1 951**	**38**	**1.9%**

2.27 Employers forecasted a total of 1 986 E&M workers by March 2016 in the gas sector, indicating the vacancies at the time of survey would be completely filled within 12 months. The distribution of the forecasted manpower by job level is shown in Table 2.15.

Table 2.15 Distribution of Forecasted Number of E&M Workers by Job level of the Gas Sector

Job level	Number of Workers Plus Vacancies at Time of Survey	Employers' Forecast on Number of Workers by March 2016
Professional/Technologist	414	414
Technician	538	535
Tradesman/Craftsman	888	888
Semi-skilled/General Worker	149	149
Total	**1 989**	**1 986**

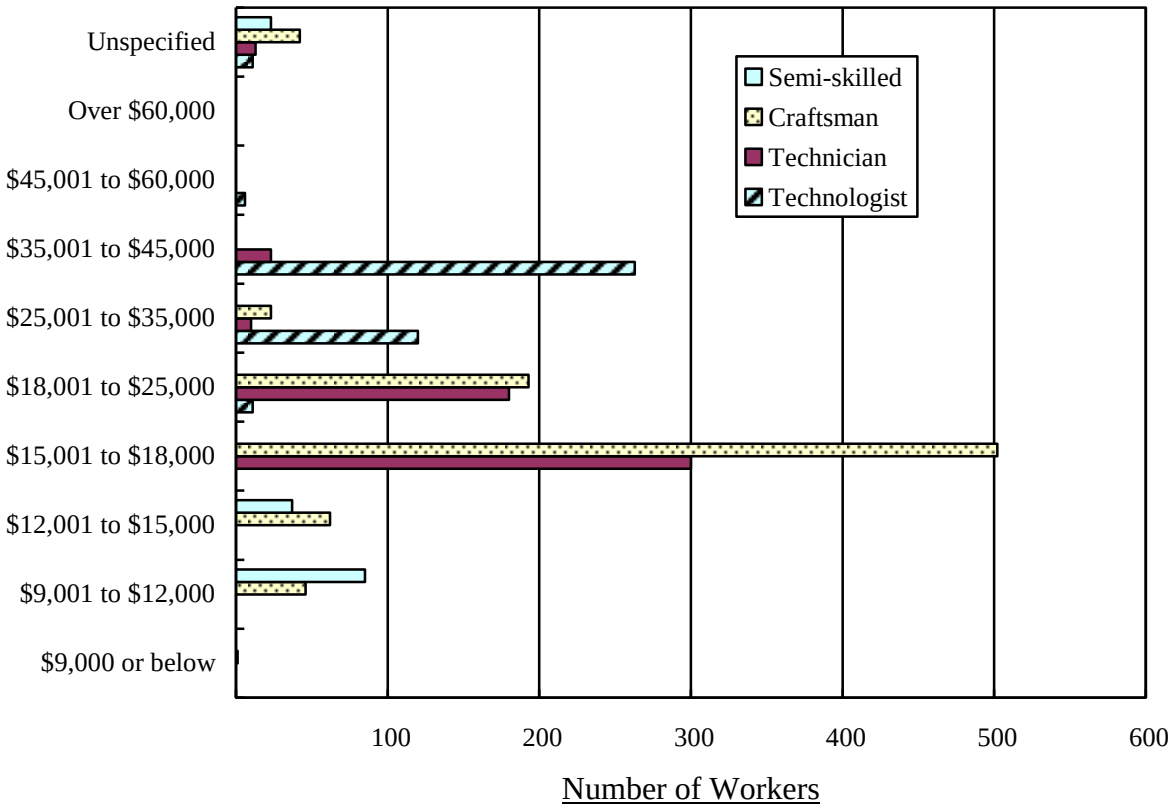
2.28 The distribution of trainees among the principal jobs, the number of vacancies at the time of the survey and the forecasted number of workers by March 2016 at each principal job of the gas sector are given in Appendix 14.

2.29 The monthly income range of E&M workers at each job level of the gas sector is shown in Table 2.16 and Figure 2.12.

Table 2.16 Average Monthly Income of E&M Workers of the Gas Sector

Monthly Average Income Range	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General Worker	All
$9 000 or below	-	-	1	-	1
$9 001 - $12 000	-	-	46	85	131
$12 001 - $15 000	-	-	62	37	99
$15 001 - $18 000	-	300	502	-	802
$18 001 - $25 000	11	180	193	-	384
$25 001 - $35 000	120	10	23	-	153
$35 001 - $45 000	263	23	-	-	286
$45 001 - $60 000	6	-	-	-	6
Over $60 000	-	-	-	-	-
Unspecified	11	13	42	23	89
Total	**411**	**526**	**869**	**145**	**1 951**

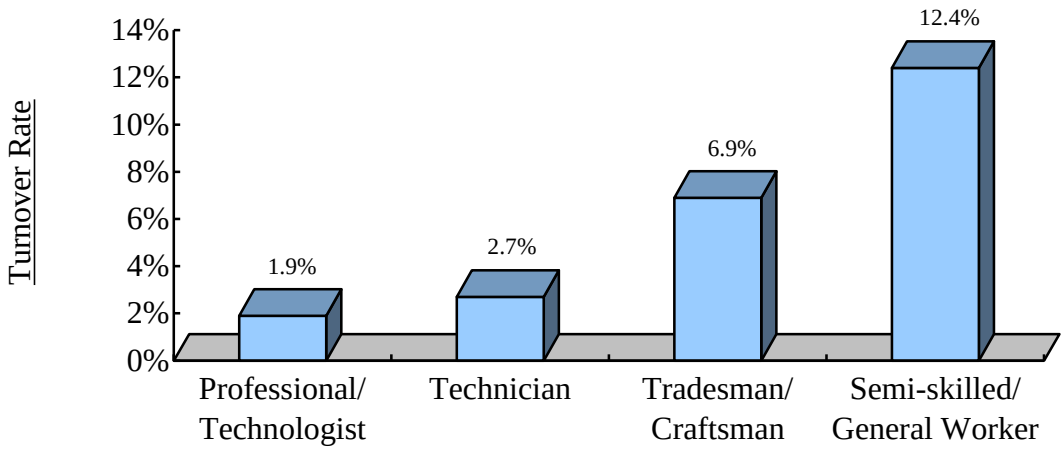
Figure 2.12 Average Monthly Income of E&M Workers of the Gas Sector



2.30 The distribution of E&M workers by their total monthly income range for each principal job of the gas sector is tabulated in Appendix 15.

2.31 Employers reported that a total of 100 workers left their companies within the 12 months before the survey. The turnover rate of each job level is shown in Figure 2.13.

Figure 2.13 Turnover Rate by Job level of the Gas Sector



2.32 No worker was deployed to work outside Hong Kong for more than 6 months during the one year before the survey.

Hong Kong E&M Workers Employed in Macau

2.33 At the time of survey, employers reported that their subsidiary/associated companies employed a total of 511 Hong Kong E&M workers in Macau. The distribution is summarized in Table 2.17.

Table 2.17 Number of Hong Kong E&M Workers Employed in Macau at the Time of Survey

Job level	E&M Engineering Sector	Shipbuilding and Ship Repair Sector	Gas Sector
Professional/Technologist	145	-	-
Technician	155	-	1
Tradesman/Craftsman	210	-	-
Total	**510**	**-**	**1**

Manpower Supply Situation in 2014/15

2.34 Employers' view on the manpower supply situation during the 12 months before the survey is listed in Appendix 16.

E&M Workers Working in Construction Sites

2.35 For assessing E&M workers participating in construction works, the Training Board conducted its ninth supplementary manpower survey in 2015 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 1 327 building sites and 564 civil engineering and other sites recorded by the Census and Statistics Department at the time of the survey.

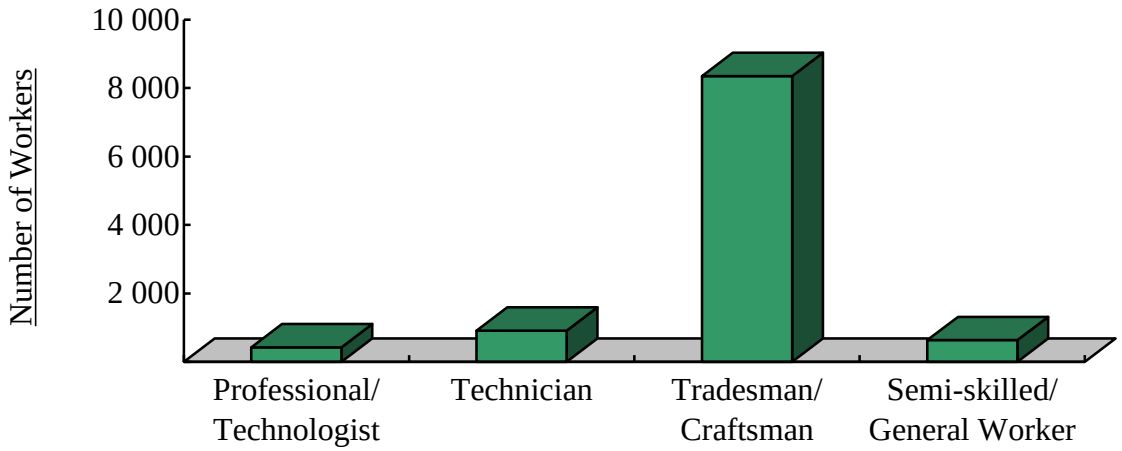
2.36 The supplementary survey revealed that on 16th March 2015 (the reference date of the survey), there were 10 317 workers of electrical/mechanical engineering and related disciplines working in the construction sites. Of the 10 317 workers, 8 164 workers (79%) were employed in building sites and 2 153 workers (21%) worked in civil engineering and other sites. It should be noted that the workers counted in the supplementary survey were subset of the manpower of the E&M engineering sector which was estimated in the main manpower survey on establishment basis.

2.37 The distribution of workers by job level is shown in Table 2.18 and Figure 2.14.

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

Job level	Number of Workers	Percentage of Total Number Employed
Professional/Technologist	422	4%
Technician	912	9%
Tradesman/Craftsman	8 350	81%
Semi-skilled/General Worker	633	6%
Total:	**10 317**	**100%**

Figure 2.14 Distribution of E&M Workers Working in Construction Sites



2.38 The manpower statistics of E&M workers working in construction sites are tabulated in Appendix 17.

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

Manpower Changes

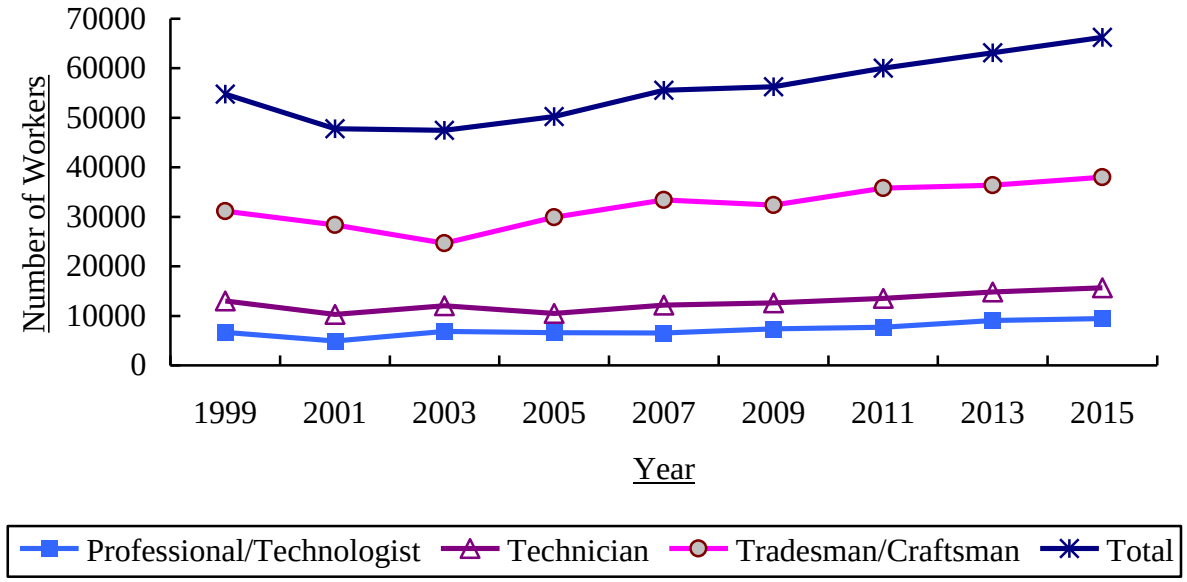
3.2 The manpower changes at professional/technologist, technician and tradesman/craftsman levels of the of the E&M engineering sector from 1999 to 2015 are shown in Table 3.1 and Figure 3.1.

Table 3.1 Manpower Changes of the Electrical and Mechanical Engineering Sector between 1999 and 2015

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower[1]
1999	6 684	13 038	31 116	54 814
2001	4 931	10 312	28 340	47 799
2003	6 883	12 072	24 685	47 492
2005	6 584	10 506	29 894	50 268
2007	6 515	12 163	33 429	55 563
2009	7 369	12 649	32 364	56 260
2011	7 720	13 512	35 816	60 060
2013	9 042	14 828	36 362	63 159
2015	9 475	15 653	38 017	66 246

[1] including semi-skilled / general workers

Figure 3.1 Manpower Changes of the Electrical and Mechanical Engineering Sector between 1999 and 2015



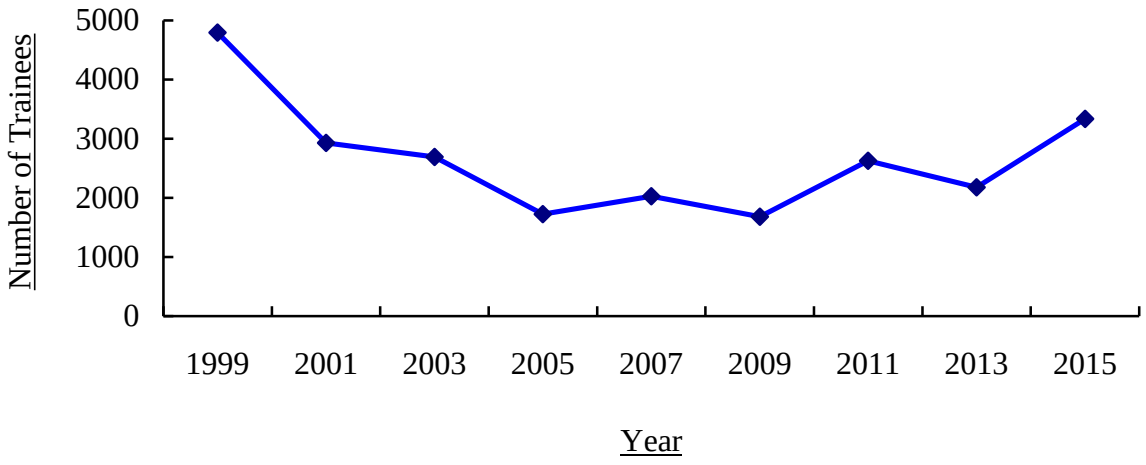
3.3 The manpower employed in the E&M engineering sector had seen its peak and trough in 1999 and 2003 respectively. Following the upturn of the economy of Hong Kong and vicinity regions after 2003, the number of workers rebounded and in the 2007 manpower survey had overtaken the peak figure recorded in 1999. The number of workers is still in the rising trend. As major infrastructure projects have been in full swing, the rising trend has aggravated and the number of workers increased by 2.4% per annum during the past two years. The annual manpower increase in professional/technologist, technician, tradesman/craftsman and semi-skilled/general worker levels were 2.4%, 2.7%, 2.3% and 2.9% respectively.

3.4 The numbers of trainees in the E&M engineering sector reported 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. With the commencement of the mega infrastructure projects in early 2010s, the number of trainees has rebounded (Table 3.2 and Figure 3.2), particularly in the tradesman/craftsman level.

Table 3.2 Number of Trainees in the E&M Engineering Sector

Year of Survey	Number of Workers Employed	Number of Trainees	Percentage of Workers
1999	54 814	4 794	8.7%
2001	47 799	2 931	6.1%
2003	47 492	2 694	5.7%
2005	50 268	1 722	3.4%
2007	55 563	2 028	3.6%
2009	56 260	1 679	3.0%
2011	60 060	2 629	4.4%
2013	63 159	2 179	3.5%
2015	66 246	3 337	5.0%

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

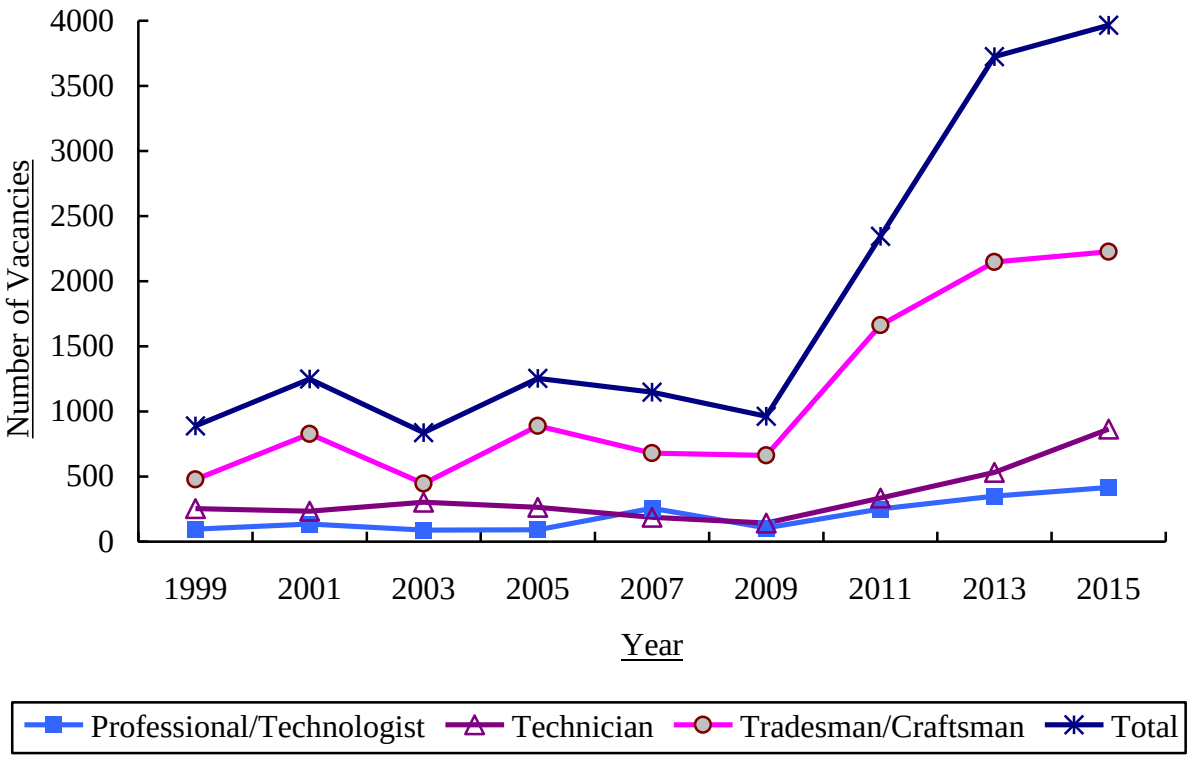


3.5 As shown in Table 3.3 and Figure 3.3, the number of vacancies reported by employers of the E&M engineering sector kept on rising during the past two years. At the time of survey, 26 out of 59 principal jobs had vacancy rates of 5% or higher. Seven principal jobs, namely (i) Aircraft Maintenance Engineer, (ii) Aircraft Maintenance Technician, (iii) Lift / Escalator Technician, (iv) Escalator Mechanic, (v) Refrigeration / Air-conditioning / Ventilation Mechanic (Unitary System), (vi) Fire Services Electrical Fitter and (vii) Semi-skilled Worker, recorded vacancy rates of 10% or higher.

Table 3.3 Number of Vacancies in the Electrical and Mechanical Engineering Sector from 1999 to 2015

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total No. of Vacancies[1]
1999	97	254	477	890
2001	135	235	827	1 248
2003	89	302	445	837
2005	91	264	888	1 254
2007	256	188	680	1 149
2009	106	144	662	963
2011	252	335	1 663	2 344
2013	349	533	2 147	3 725
2015	417	865	2 227	3 966

Figure 3.3 Number of Vacancies in the Electrical and Mechanical Engineering Sector from 1999 to 2015



[1] including semi-skilled / general workers

Business Outlook of the E&M Engineering Sector

3.6 Strong manpower demand in the E&M engineering sector will continue in the coming years as four rail projects are now in full swing with the timeline shown below:

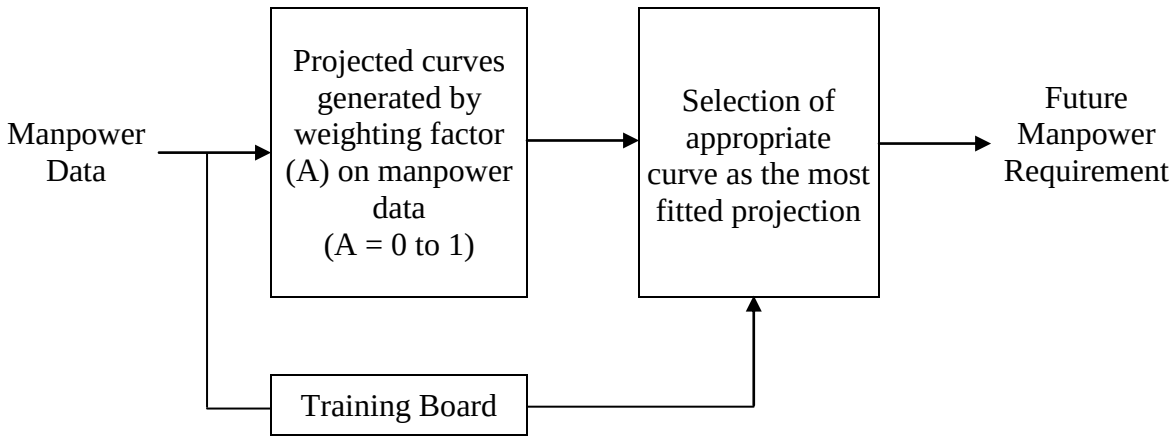
Rail Project		Target Date of Competition
(i)	Kwun Tong Line Extension	3rd or 4th quarter of 2016
(ii)	South Island Line (East)	end of 2016
(iii)	Guangzhou-Shenzhen-Hong Kong Express Rail Link	3rd quarter of 2018
(iv)	Shatin to Central Link	2019 – Tai Wai to Hung Hum 2021 – Hung Hum to Admiralty

3.7 In addition to the rail projects, a mix of arts and cultural facilities in the West Kowloon Cultural District will come on stream starting from 2016, followed by the Three-runway System project. The mega infrastructure projects mentioned above, together with the increasing supply of land and housing, ensure the prosperity of the E&M engineering sector in the years ahead.

Projected Manpower Training Requirements for the E&M Engineering Sector

3.8 Over the years, the 'adaptive filtering method' (AFM) has been the prime tool adopted by Training Boards of engineering industries 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 Figure 3.4.

Figure 3.4 Adaptive Filtering Method



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). The higher the value of 'A', the heavier the

weightings of the more recent data are. Based on factors such as market trends, technological developments, and other social-economical factors, the Training Board decides on the most appropriate manpower projections.

3.9 Apart from AFM, the E&M Services Training Board once adopted the 'liner regression method' (LRM) in 1997 and 2001 to project the manpower requirements of the contracting branch of the E&M engineering sector. LRM is based on the assumption that there is a linear correlation between manpower and the construction costs of all buildings, including public and private residential and non-residential buildings. Given the uncertainty on the volume of new buildings completed each year, LRM has not been chosen again in previous rounds of manpower survey.

3.10 In 2003, the E&M Services Training Board adopted statistical modelling to project the manpower for the E&M engineering sector. Statistical modelling is based on the correlation of the manpower with a set of identified economic indicators, such as gross value of construction works on building at construction sites, gross fixed capital formation, total stocks of flats, consumption of electricity and gas etc. Due to the difficulty in identifying suitable economic indicators which lead to a high correlation factor with manpower, statistical modelling was abandoned since the 2005 manpower survey.

3.11 For the 2015 manpower survey, with consideration of the factors similar to previous rounds, the Training Board decided to adopt the AFM again for projecting the manpower requirements for year 2016 to 2018.

3.12 Based on the findings of the 2015 and previous rounds of manpower surveys, the manpower at different job levels projected by AFM are shown in Figure 3.5 to Figure 3.7.

Figure 3.5 Manpower Projection of Professional/Technologist for the E&M Engineering Sector

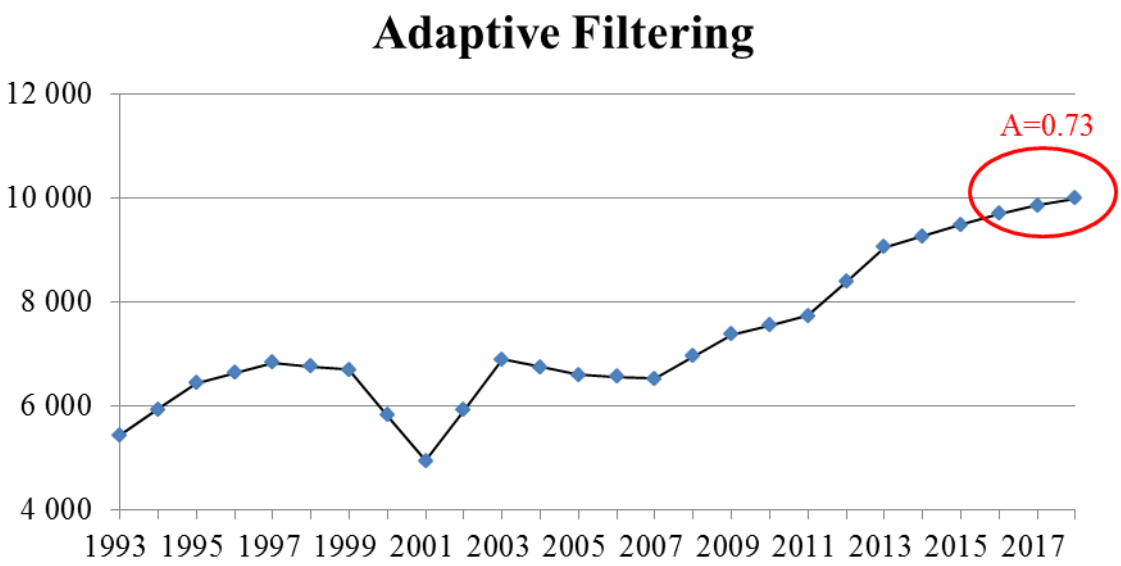


Figure 3.6 Manpower Projection of Technician for the E&M Engineering Sector

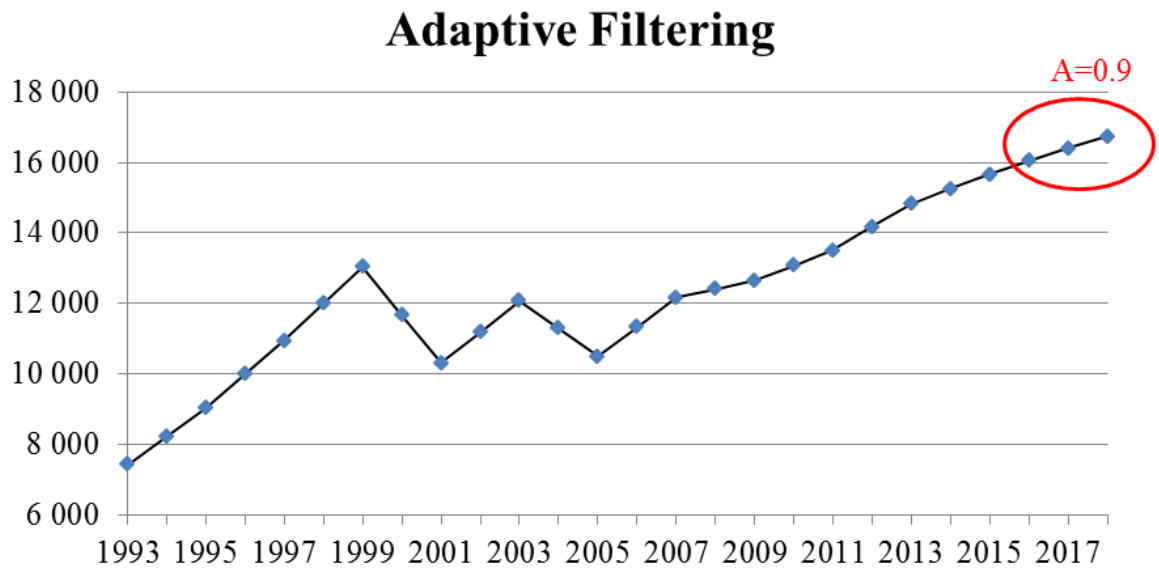
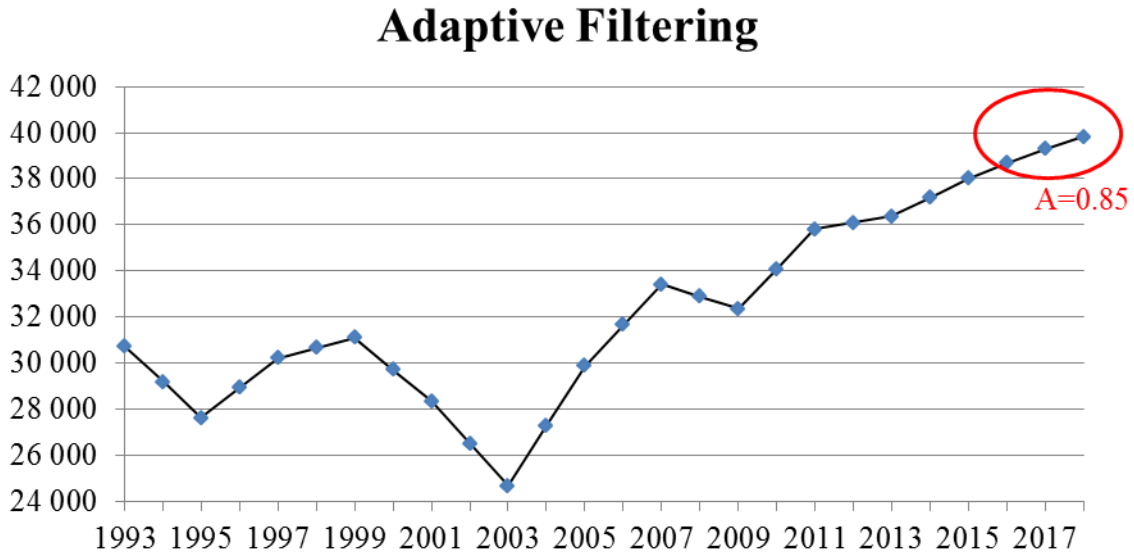


Figure 3.7 Manpower Projection of Tradesman/Craftsman for the E&M Engineering Sector



3.13 After taking into consideration the number of vacancies at the time of survey, the Training Board decided to adopt A=0.73, A=0.9 and A=0.85 respectively for the projection of manpower at the professional/technologist, technician and tradesman/craftsman levels. The forecast manpower for 2016 to 2018 is shown in Table 3.4.

Table 3.4 Forecast Manpower of the E&M Engineering Sector

Year	Professional (A = 0.73)	Technician (A = 0.9)	Tradesman/ Craftsman (A = 0.85)
2016	9 686	16 039	38 690
2017	9 853	16 399	39 293
2018	9 990	16 735	39 827

3.14 The Training Board continued to adopt 3% as the annual wastage rate of professional/technologists and technicians. Whereas, 4% was chosen as the wastage rate of tradesmen/craftsmen after considering the latest age profile of E&M workers published by the Construction Industry Council (CIC).

3.15 Based on the above considerations, the annual training requirements of manpower to cover the growth (projected with AFM) and replacement for wastage at the professional/ technologist, technician and tradesman/craftsman job levels from year 2016 to 2018 for the E&M engineering sector are calculated and shown in Table 3.5.

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

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2016 - 2018
Professional/Technologist	9 475	464 (673)[1]
Technician	15 653	846 (846)
Tradesman/Craftsman	38 017	2 160 (1 327)

[1] The numbers in brackets were the annual training requirements for 2014-2016 projected by the E&M Services Training Board in 2013.

Shipbuilding and Ship Repair Sector

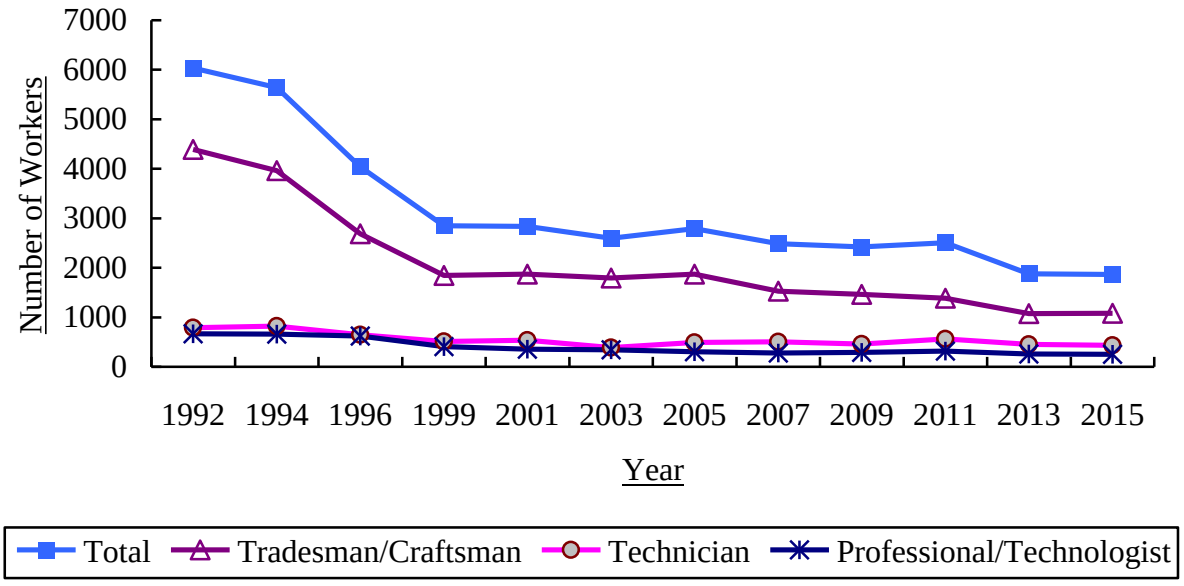
Manpower Changes

3.16 The manpower changes at professional/technologist, technician and tradesman/craftsman levels of the shipbuilding and ship repair sector from 1992 to 2015 are shown in Table 3.6 and Figure 3.8.

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

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower[1]
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
2013	259	454	1 076	1 876
2015	253	435	1 081	1 865

Figure 3.8 Manpower Changes of the Shipbuilding and Ship Repair Sector between 1992 and 2015



[1] including semi-skilled / general workers

3.17 The figures indicate that after the sharp decrease from 2011 to 2013, the manpower of the shipbuilding and ship repair sector has been stabilized during the past 2 years, with a minimal drop of 0.3% per annum.

3.18 At the time of survey, the number of vacancies in the shipbuilding and ship repair sector amounted to 6.5% of the workforce. Among the 28 principal jobs of the sector, half of them had vacancy rates of 5% or higher. Eight principal jobs, namely (i) Mechanical Engineer, (ii) Ship Designer / Naval Architect, (iii) Supervisor / Chargehand, (iv) Electrician, (v) machinist, (vi) Painter, (vii) Steel Worker and (viii) Welder recorded vacancy rates of 10% or higher.

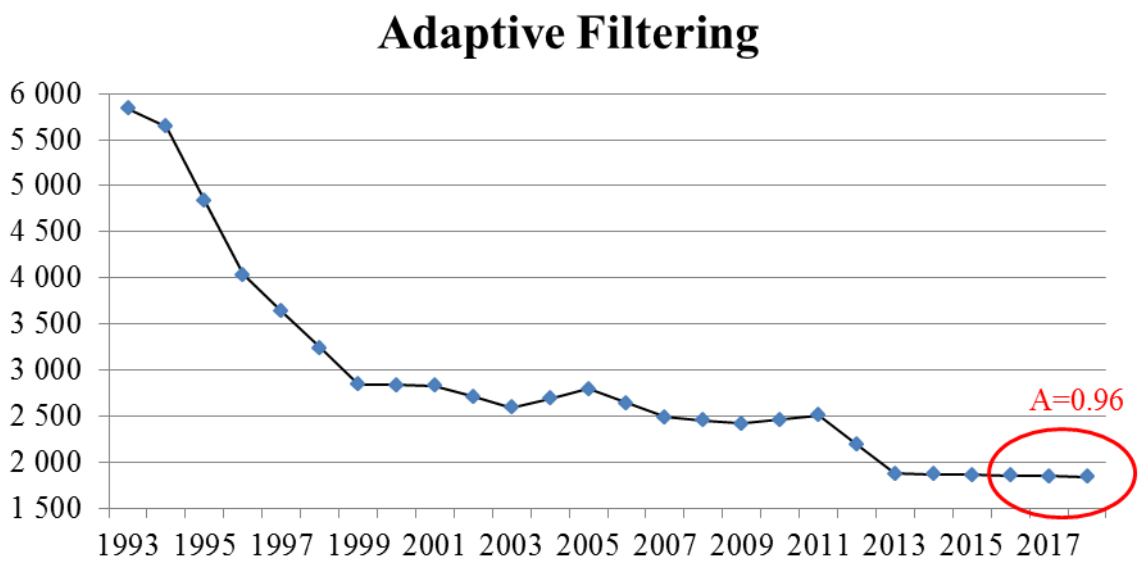
Business Outlook of the Shipbuilding and Ship Repair Sector

3.19 With a view to reducing the impact of fierce competition from Mainland competitors, employers of the shipbuilding and ship repair sector have been diversifying their business during the past decade to land-based engineering and contracting services, e.g. installation, modification and refurbishment of heavy industrial equipment and plant processes; motor overhaul and rewinding, installation and certification of both HV and LV electrical and control systems. The measures have proved to be effective as this round of survey revealed that the manpower of the shipbuilding and ship repair sector has ceased to fall and become stable.

Projected Manpower Training Requirements for the Shipbuilding and Ship Repair Sector

3.20 Considering that the size of the workforce is relatively small, the Training Board applied 'adaptive filtering method' (AFM) to the total manpower of the sector for manpower forecast. The result is shown in Figure 3.9.

Figure 3.9 Manpower Projection for the Shipbuilding and Ship Repair Sector



3.21 The Training Board decided to adopt the best fitted curve (A=0.96) for manpower projection of the shipbuilding and ship repair sector. The forecast total manpower of the sector for 2016 to 2018 are 1 858, 1 852 and 1 846 workers respectively.

3.22 The annual wastage rate of 6% was applied to the shipbuilding and ship repair sector since 2001 as to reflect the aging problem of the workforce. Although many aged workers have already retired in recent years, the wastage rate of the sector is still relatively high as some workers moved to the E&M engineering sector or the construction industry. The Training Board decided to keep the annual wastage rate at 6% for the shipbuilding and ship repair sector.

3.23 Based on the above considerations, the Training Board has determined the average annual training requirements of E&M manpower for the shipbuilding and ship repair sector from 2016 to 2018 which are shown in Table 3.7.

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

Job level	No. of Workers at the Date of Survey	Projected Average Annual Training Requirements for 2016 - 2018
Professional/Technologist	253	14 *(18)*[1]
Technician	435	24 *(31)*
Tradesman/Craftsman	1 081	61 *(73)*

[1] The numbers in brackets were the annual training requirements for 2014-2016 projected by the E&M Services Training Board in 2013

Gas Sector

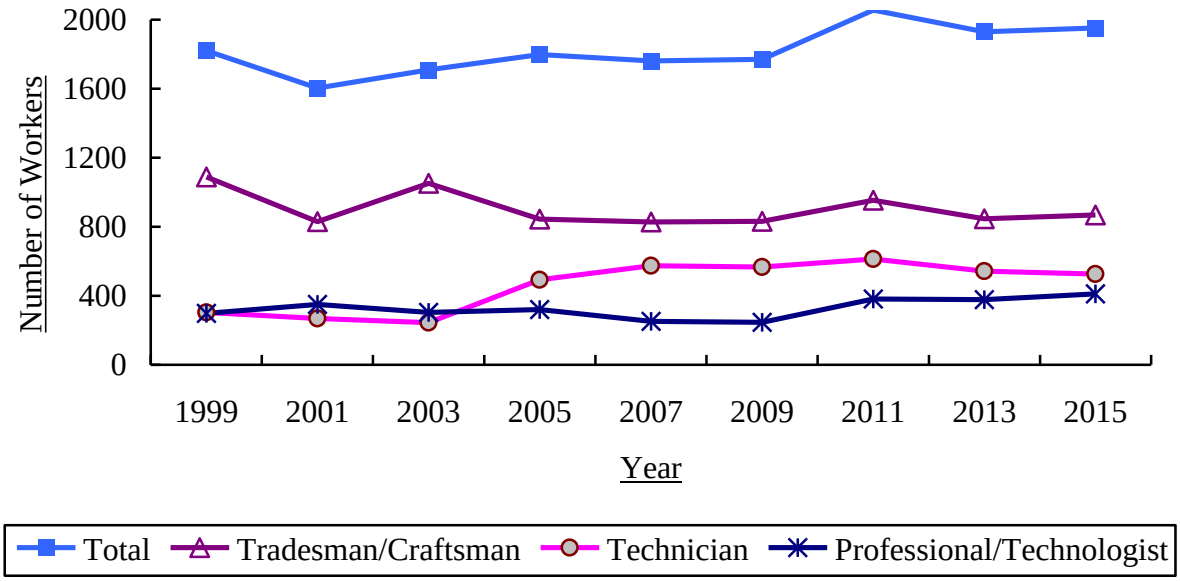
Manpower Changes

3.24 The manpower changes at the three job levels of the gas sector from the first survey in 1999 to this round are shown in Table 3.8 and Figure 3.10.

Table 3.8 E&M Manpower Changes of the Gas Sector

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower[1]
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
2013	378	542	846	1 929
2015	411	526	869	1 951

Figure 3.10 E&M Manpower Changes of the Gas Sector



[1] including semi-skilled / general workers

3.25 The figures indicate that the overall manpower of the gas sector had remained very steady during the past two years, with a mild increase of 0.6% per annum.

3.26 At the time of survey, the number of vacancies in the gas sector amounted to 1.9% of the workforce. Among the 21 principal jobs of the sector, 6 had vacancy rates of 5% or higher.

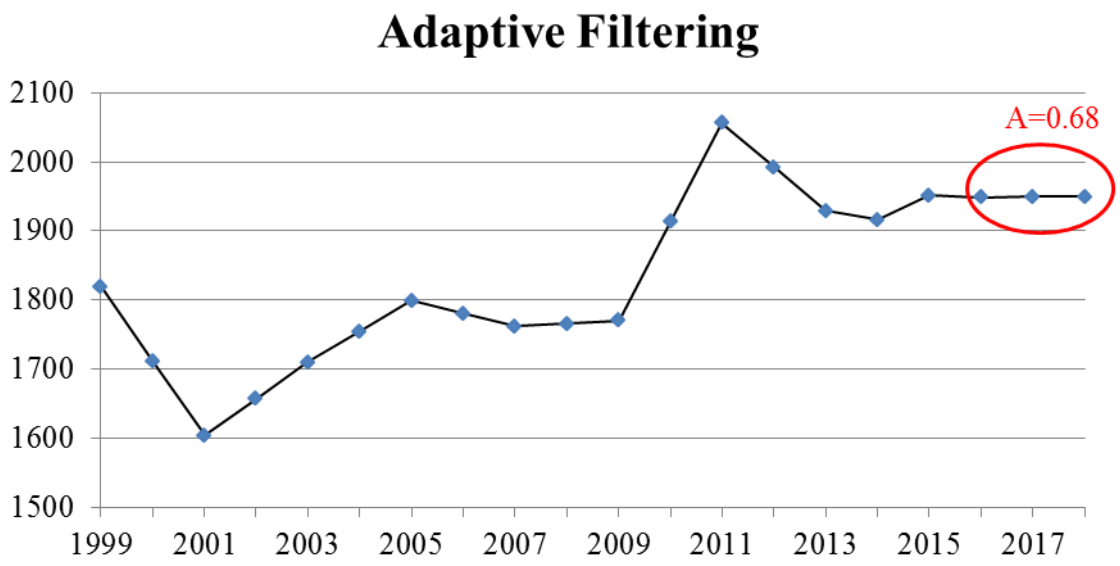
Business Outlook of the Gas Sector

3.27 The HKSAR Government is determined to increase the land and housing supply in the coming years. The rising internal demand, coupled with the present favourable employment conditions, will surely stimulate gas consumption. A steady business growth in the gas sector is anticipated.

Projected Manpower Training Requirements for the Gas Sector

3.28 Considering that the size of the workforce is relatively small, the Training Board applied 'adaptive filtering method' (AFM) to the total manpower of the sector for manpower forecast. The result is shown in Figure 3.11.

Figure 3.11 Manpower Projection for the Gas Sector



3.29 The Training Board decided to adopt the best fitted curve (A=0.68) for manpower projection of the gas sector. A steady workforce of 1 949 workers are forecast for 2016 to 2018.

3.30 The Training Board decided to adopt 3% as the annual wastage rate of the gas sector. The annual training requirements from 2016 to 2018 are calculated and shown in Table 3.9.

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

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2016 - 2018
Professional/Technologist	411	11 (*14*)[1]
Technician	526	15 *(20)*
Tradesman/Craftsman	869	26 (*32)*

3.31 The Training Board will conduct another manpower survey in 2017 to review and update the manpower requirements of the electrical and mechanical services industry.

[1] The numbers in brackets were the annual training requirements for 2014-2016 projected by the E&M Services Training Board in 2013

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 2016 to 2018 will be as follows:

(i) E&M engineering sector: With the delay in rail projects, the peak of manpower demand for E&M contracting work has not arrived till 2016. After that, some of the workers will be engaged in new building works while some others will be absorbed by the servicing branches, e.g. railway operation and maintenance, of the E&M engineering sector.

(ii) Shipbuilding and ship repair sector: Given the critical time frame, labour market competitive forces and rapid growth expected in the local ship repair industry over the next few years, employers will need more skilled workers to meet the existing and future job openings in the ship repair sector as well as the directly affiliated metal plate and fabrication sector. Welders, marine fitters, electricians, pipefitters / sprinkler installers, supervisors, machine fitters and marine engine mechanics will continue to be in high demand.

(iii) Gas sector: The HKSAR Government is determined to stabilize the residential property market and has set a target to supply 480 000 units in the coming 10 years. From FY2015/16 to FY2018/19, a total of 77 900 public flats and as many as 83 000 private flats would be made available[1]. With the steady supply in new residential flats, a persistent demand for technical workers in the Gas Sector is anticipated.

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 2 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 3.15, 3.23 and 3.30.

[1] Source: Forecast by the Transport and Housing Bureau and the Hong Kong Housing Authority in June 2015.

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 tradesman/craftsman levels, in terms of the existing manpower of these job levels.

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

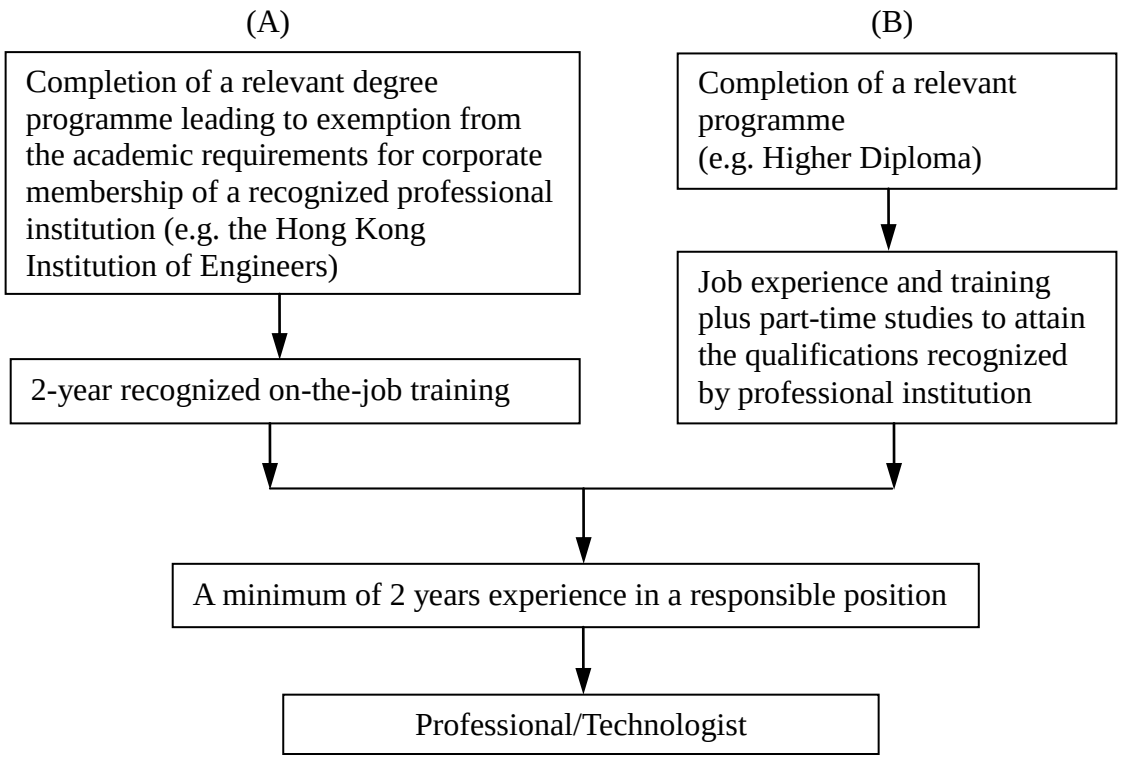
	Professional/Technologist	Technician	Tradesman/Craftsman
E&M Engineering Sector	4.9%	5.4%	5.7%
Shipbuilding and Ship Repair Sector	5.6%	5.6%	5.6%
Gas Sector	3.0%	3.0%	3.0%

Training of Professionals/Technologists

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

4.5 Professionals/technologists play an important role in bringing about improvements in management and technological innovations. The Training Board recommends that professional/technologists should be trained as shown in Figure 4.1.

Figure 4.1 Training of Professionals/Technologists



4.6 With reference to the figures in paragraphs 3.15, 3.23 and 3.30, the projected average annual training requirements of principal jobs at professional/technologist level of the E&M services industry, from 2016 to 2018, are about 500 persons.

4.7 Table 4.2 lists the estimated number of graduates per annum from full-time programmes 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 programmes can take up the post of marine engineers.

Table 4.2 Estimated Local Supply of University Graduates from Full-time Degree Programmes in 2016 to 2018 for Major Disciplines of the E&M Services Industry

Institution[1]	Programme	Estimated No. of Local Graduates per Annum
CityU, HKU, PolyU	B Eng - Building Services Engineering	115
HKU, PolyU	B Eng - Electrical Engineering	110
HKU, HKUST, PolyU	B Eng - Mechanical Engineering	270
CUHK	B Eng - Mechanical & Automation Engineering	80
PolyU	B Eng – Air Transport Engineering	40
	B Eng – Transportation Systems Engineering	30
	Total	**645**

4.8 At first glance, it seems that the annual supply of local university graduates from full-time degree programmes exceeds the projected annual training requirements of the E&M services industry for about 29%, from 2016 to 2018. Nevertheless, not 100% of these graduates will enter into employment and work for the E&M services industry. In addition, there are some employers, in particular those from the estate and property management sector, who do not fall into the scope of this manpower survey but in fact employ a significant number of graduates from E&M engineering programmes. Hence, the manpower supply and demand at the professional/technologist level should be considered as roughly matching.

[1] CityU : City University of Hong Kong
CUHK : The Chinese University of Hong Kong
HKU : The University of Hong Kong
HKUST : Hong Kong University of Science and Technology
PolyU : The Hong Kong Polytechnic University

Engineering Graduate Training Scheme (EGTS)

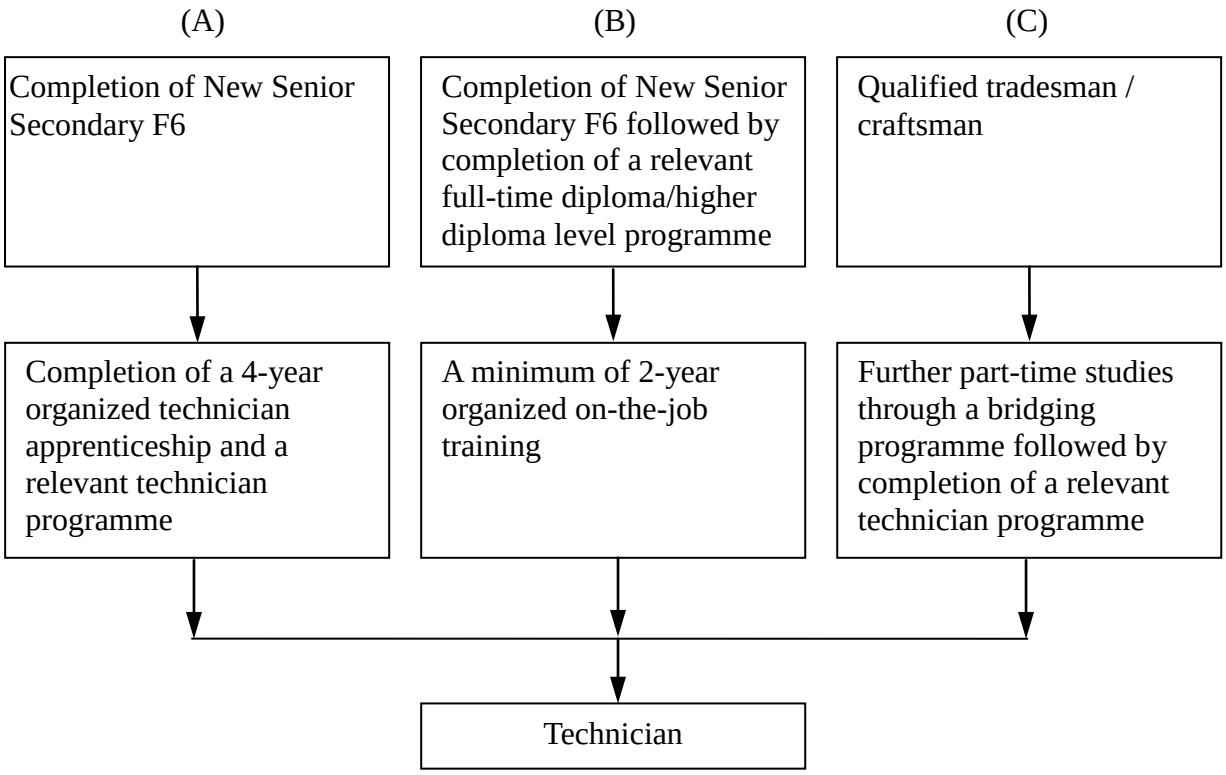
4.9 To bring about more well-structured practical training opportunities for engineering graduates, the Committee on Technologist Training of the Vocational Training Council is operating a subsidy scheme in providing engineering graduates with 18 months of practical training of a standard acceptable 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 programmes 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 programmes for pre-employment and in-service training in aircraft maintenance engineering, building services engineering, electrical engineering and mechanical engineering.

4.14 The Youth College (YC) of the Vocational Training Council offers Diploma of Vocational Education [1] (DVE) Programme in aircraft maintenance, building services engineering, electrical engineering and mechanical engineering. Graduates with DVE or Certificate of Technician Foundation Studies[2] (TFC) awards may take up technician trainee posts in the E&M services industry. Employers are urged to employ these graduates as technician trainees, technician apprentices, or supervisor trainees because they have received proper basic training before joining the industry.

4.15 With reference to the figures in paragraphs 3.15, 3.23 and 3.30, the projected average annual training requirements of principal jobs at technician level of the E&M services industry, from 2016 to 2018, are about 900 persons.

4.16 The estimated supply of technicians from 2016 to 2018 for key E&M trades is shown in Table 4.3. In view of small market size, there is no specific technician programme 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 programmes. Similarly, since 2004, the technician programmes for marine engineering and maritime technology had ceased because of diminishing demand. However, graduates from electrical or mechanical engineering technician programmes can take up jobs as shipbuilding and ship repair technicians.

[1] previously called “Diploma in Vocational Education”
[2] previously called “Technician Foundation Certificate”

Table 4.3 Estimated Local Supply of Technicians from Full-time Programmes in 2016 to 2018 for Major Disciplines of the E&M Services Industry

Institution	Programme	Estimated No. of Graduates Entering into Employment per Annum
CityU, PolyU	Full-time HD /ASc programmes[1]:	
	- Building Services Engineering	55
	- Electrical Engineering	15
	Sub-total	70
IVE	Full-time HD programmes[2]:	
	- Aircraft Maintenance Engineering	60
	- Building Services Engineering	265
	- Electrical Engineering	370
	- Mechanical Engineering	205
	Sub-total	900
Youth College	Full-time DVE Programme[3] (graduates with DVE award):	
	- Aircraft Maintenance	50
	- Building Services Engineering	35
	- Electrical Engineering	55
	- Mechanical Engineering	30
	Sub-total	170
	Grand Total	**1 140**

[1] It is assumed that about 60% of the Higher Diploma / Associate Degree graduates from Universities will articulate to Degree programmes. The numbers in Table 4.3 refer to those 40% graduates who enter employment.

[2] Students' further study rate in AY2013/14 has been taken into consideration. Table 4.3 shows the estimated number of graduates who will enter employment.

[3] The majority of graduates with the DVE award are S6 intakes. The numbers in Table 4.3 were estimated based on the employment rate in AY2014/15 and the admission numbers in AY2015/16.

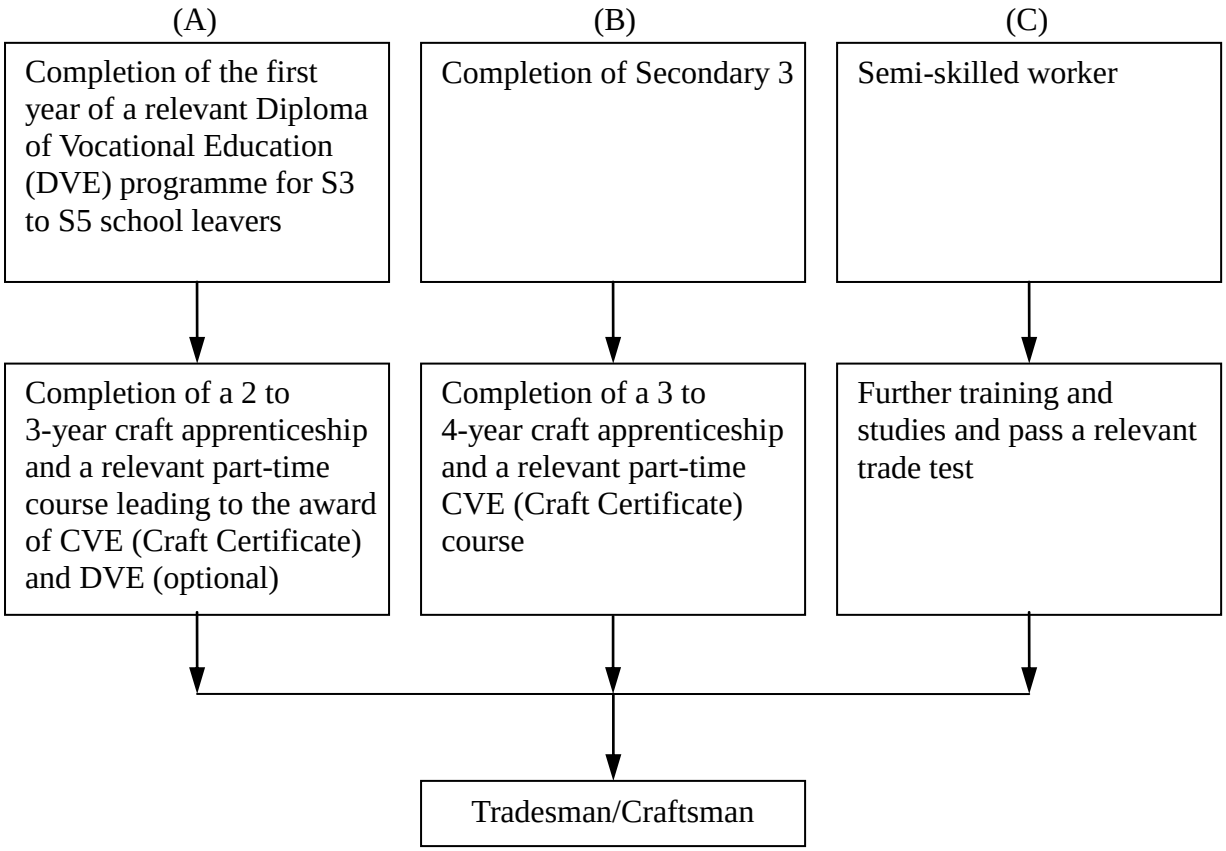
4.17 Similar to the case of the professional/technologist level, the annual supply of technicians from full-time programmes looks larger than the projected annual training requirements of the E&M services industry for 27%, from 2016 to 2018. Once again, it should be considered that some graduates will join other industries and some others will work with employers outside the scope of the manpower survey. Hence, the manpower supply and demand at the technician level should also be considered as matching.

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 will 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 level training programmes in various trades of the E&M services industry are mainly offered by the Youth College of the Vocational Training Council for S3 to S5 school leavers. Apart from full-time DVE programmes (i.e. pre-employment training programme), part-time mode DVE and Certificate of Vocational Education (CVE)[1] programmes are offered for registered craft apprentices[2]. The Construction Industry Council (CIC) also offers two Basic Craft courses on E&M trades, namely electrical installation, plumbing and pipe-fitting.

4.22 With reference to the figures in paragraphs 3.15, 3.23 and 3.30, the projected average annual training requirements of principal jobs at tradesman/craftsman level of the E&M services industry, from 2016 to 2018, are about 2 300 persons.

4.23 Table 4.4 show the estimated average annual supply of tradesman/craftsman trainees for key E&M trades from full-time training programmes offered by VTC in 2016 to 2018.

Table 4.4 Estimated Local Supply of Tradesman/Craftsman Trainees from Full-time DVE Programmes in 2016 to 2018 for Key E&M Trades of the E&M Services Industry

Institution	Programme	Estimated No. of Graduates Entering into Employment Per Annum[3]
Youth College	Full-time DVE Programme (S3 to S5 Intakes):	
	- Air-conditioning & Refrigeration	110
	- Building Services Engineering	85
	- Electrical Engineering	150
	- Fire Services Engineering	20
	- Gas Services Engineering	35
	- Lift & Escalator Engineering	50
	- Mechanical Engineering	90
	- Telecommunications & Surveillance Technology	45
	- Welding Technology & Inspection	10
	Total	**595**

[1] previously called "Craft Certificate"
[2] also known as "Diploma apprentices"
[3] The numbers were estimated based on the employment rate in AY2014/15 and the admission numbers in AY2015/16.

4.24 Graduates of the full-time programmes mentioned in paragraph 4.23 normally work as craft apprentices and continue to receive formal training by enrolling in part-time-day mode DVE or CVE courses. There are some other youngsters who join the E&M services industry as craft apprentices without studying in full-time DVE programme before (i.e. path B in Figure 4.3). Based on the estimated annual new intakes of the part-time-day DVE and CVE courses, the overall supply of craftsman/tradesman trainees (including paths (A) and path (B) in Figure 4.3) in 2016 to 2018 is listed in Table 4.5.

Table 4.5 Estimated Number of Newly Registered Craft Apprentices of E&M Trades Enrolling in PTD mode DVE or CVE Courses in 2016 to 2018

Institution	Programmes	Estimated No. of New Intakes per Annum[1]
Youth College	DVE / CVE in Air-conditioning & Refrigeration	205
	DVE / CVE in Building Services Engineering	80
	DVE / CVE in Electrical Engineering	325
	CVE in Gas Services Engineering	30
	DVE / CVE in Lift and Escalator Engineering	185
	DVE / CVE in Mechanical Engineering	160
	DVE in Aircraft Maintenance	20
	DVE in Digital Electronics Technology	45
	Total	**1 050**

4.25 Comparing the numbers in paragraph 4.22 and Table 4.5, it is found that the estimated number of newly-registered craft apprentices of E&M trades per annum, from 2016 to 2018, amounts to only 46% of the projected annual training requirements. 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 manpower supply is still inadequate to support the development of the industry.

4.26 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

[1] The projection is based on the enrolment figures of AY2015/16.

upgrading programmes for in-service semi-skilled workers so that they can migrate to qualified tradesmen/craftsmen.

4.27 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.

Trainee Subsidy Scheme (TSS)

4.28 To meet the persistent high manpower demand in the E&M services industry for Hong Kong's infrastructure and building development, the Trainee Subsidy Scheme (TSS) was launched since AY2013/14, with the collaboration of the Construction Industry Council (CIC), the Hong Kong Federation of E&M Contractors Ltd. (HKFEMC) and the VTC. Under the scheme, S3 intakes of 7 DVE programmes related to E&M engineering, namely Building Services Engineering, Air-conditioning & Refrigeration Engineering, Fire Services Engineering, Electrical Engineering, Lift & Escalator Engineering, Mechanical Engineering, Welding Technology & Inspection, can receive monthly subsidy ($1,400 x 11 months) from CIC and 90-hour workplace attachment at member companies of HKFEMC during the first year of full-time study in the programmes. Upon completion of the one year full-time study and joining CIC-recognized companies as apprentices, students will received another $15,400 encouragement subsidy from CIC during the apprenticeship period. In AY2014/15, the scheme extended to cover 2 more DVE programmes of S3 intakes (Gas Services Engineering, Telecommunications and Surveillance Technology) and 4 DVE programmes of S6 intakes (Building Services Engineering, Electrical Engineering, Mechanical Engineering and Construction).

Earn & Learn Pilot Scheme (ELS)

4.29 With the approval of funding by the Financial Committee of the Legislative Council in July 2014, the Earn & Learn Pilot Scheme (also known as Pilot Training & Support Scheme) was officially launched. The scheme offers vocational education and training by integrating structured apprenticeship training programmes with clear career progression pathways. Under the scheme, in addition to a guaranteed salary, the apprentice will receive $72,000 allowance from the Government and $30,800 from the participating industry (e.g. the TSS subsidy for the E&M services industry) during the apprenticeship period, such that the young people can earn a steady income while equipping themselves with knowledge and skills to pursue a promising career. To further enhance the attractiveness of the scheme, VTC also revamped its training programmes so that a craft apprentice can attain the DVE qualification, in addition to CVE within the apprenticeship period. Since the introduction of the scheme, a noticeable increase in the enrolment rate and retention rate of the related DVE programmes has been observed.

Training of Semi-skilled/General Workers

4.30 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 at the tradesman/craftsman level, 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 programmes. 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. A good example was CIC's Contractor Cooperative Training Scheme (CCTS) which was extended to cover E&M trades since FY2013/14.

4.31 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 more resources be devoted to 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 and the Advanced Construction Manpower Training Scheme - Pilot Scheme (Structured On-the-job and Skills Enhancement Courses) recently launched by CIC serve the purpose.

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

4.32 The Pro-Act(Electrical), Pro-Act(Gas), Pro-Act(Mechanical) 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 programmes on vocational education in E&M disciplines at technician and craft levels for new entrants of the industry.

(b) Upgrading programmes 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

4.33 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.

4.34 The E&M Services Training Board is responsible for designing and conducting trade test 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. With the advice from the Training Board, the VTC will continuously review and streamline the operations of the trade test to avoid prolonged waiting for the test.

4.35 To support workers' registration under the Lifts and Escalators Ordinance (Cap. 618), the E&M Services Training Board launched 2 new trade tests for lift mechanics and escalator mechanics respectively since December 2012.

4.36 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

4.37 CIC offers Specified Training Courses (STC) to registered skilled workers (provisional) under the Construction Workers Registration Ordinance (CWRO) for equipping them for registration before expiry of the 3-year provisional period.

4.38 Before September 2010, VTC was entrusted by CIC 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 CIC, 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.

4.39 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)

4.40 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 programmes or working attachments; and tailor-made local training programmes/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

4.41 The Training Boards' major conclusions and recommendations for manpower training of 2016 to 2018 are summarised below:

(a) Training of Professionals/Technologists:

The annual supply of local university graduates from full-time degree programmes roughly matches the projected annual training requirements of the E&M services industry for 2016 to 2018.

(b) Training of Technicians:

The annual supply of technicians from full-time programmes offered by CityU, PolyU, IVE and Youth College fulfills the projected annual training requirements of the E&M services industry for 2016 to 2018.

(c) Training of Tradesmen/Craftsmen:

(i) The newly-registered craft apprentices per annum amounts to only 46% of the projected annual training requirements of the E&M services industry for 2016 to 2018. 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 inadequate to support the development of the industry.

(ii) With the assistance of incentive schemes such as TSS and ELS, it is recommended that training capacities of pre-employment programmes at tradesman/craftsman level be increased. In addition, more skills upgrading programmes should be offered to in-service semi-skilled workers to enable them to attain recognized qualifications as tradesmen/craftsmen.

(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 CIC's Contractor Cooperative Training Scheme (CCTS).

(e) The Qualifications Framework (QF) launched by the HKSAR Government is a seven-level cross-sector 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-assured qualifications. With the establishment of QF for the E&M industry, employees will be able to acquire knowledge and skills according to industry needs and pursue their career development with a clear learning pathway.

(f) Employers should encourage their employees to take trade tests recognized by the Government.

(g) 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，以應付業界所需。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 2015 年 3 月 16 日至 7 月 17 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) 僱主預測未來 12 個月的僱員人數；

(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) 僱主預測未來 12 個月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) 火警及滅火設備安裝及保養（HSIC：432103）；

(iii) 電訊設備安裝及保養（HSIC：432106）；以及

(iv) 空氣調節／通風系統安裝及保養（HSIC：432201）。

門類 II：水電工程

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) 飛行器裝嵌及相關機械的製造（HSIC：303000）；

(ii) 電力設備維修（HSIC：331400）；

(iii) 發電、輸電及配電（HSIC：351000）；

(iv) 綜合及其他電器及機械設備安裝及保養（HSIC：432199）；

(v) 綜合及其他通風、燃氣及水務設備安裝及保養（HSIC：432299）；

(vi) 升降機／電動扶梯安裝及保養（HSIC：432901）；

(vii) 鐵路及纜索運輸（HSIC：491000）；

(viii) 屋宇設備工程服務（HSIC：711400）；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 9 868 間機構，包括 9 389 間機電工程業機構、311 間船舶修建行業機構，以及 168 間氣體燃料業機構。在 9 868 間機構中，9 700 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 9 700 間機構中，抽選出 1 068 間作為調查對象；再加上 168 間補充抽樣機構，即合共涵蓋 1 236 間機構，而涉及的僱員人數約佔業內總人力的 80%。調查的抽樣細則載於附錄 3。

調查方法

1.7 調查展開前一周，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 4A、4B、4C 及 4D ）一併寄給各選定機構。

1.8 調查進行期間，統計處的人員致電或到訪各選定機構，協助僱主填報相關資料，並收集填妥的調查表。

1.9 調查完畢後，負責人員複查所有填妥的調查表，於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 1 236 間抽樣機構中，896 間提供所需資料、27 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[1]為 97.1%。

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 2015 年 10 月，將載有調查結果摘要的《2015 年機電工程業人力統計報告書》上載 VTC 網頁，供公眾參閱。

[1] 有效回應率= $\frac{\text{完整回覆} + \text{不完整回覆}}{\text{完整回覆} + \text{不完整回覆} + \text{拒絕回覆}} = \frac{896+11}{896+11+27} = 97.1\%$

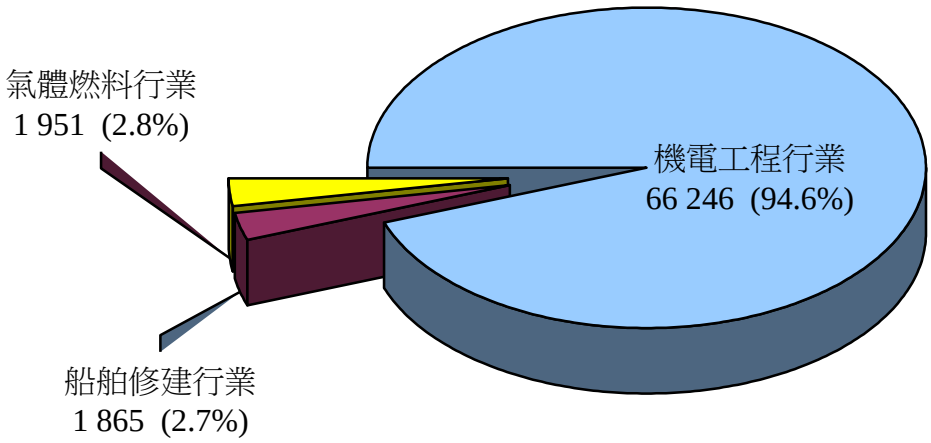
第二章

調查結果摘要

僱員人數

2.1　　是次調查顯示，於調查期間，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及受訓者分別有 70 062 及 3 414 人。 在 70 062 名從業員中，66 246 人（94.6%） 屬機電工程行業，1 865 人（2.7%）屬船舶修建行業，1 951 人（2.8%）屬氣體燃料行業。機電工程僱員按行業劃分的分布見圖 2.1。

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，調查期間業內從事其他職務的僱員共有 35 570 人，其中 33 578 人從事機電工程行業，827 人從事船舶修建行業，1 165 人從事氣體燃料行業。

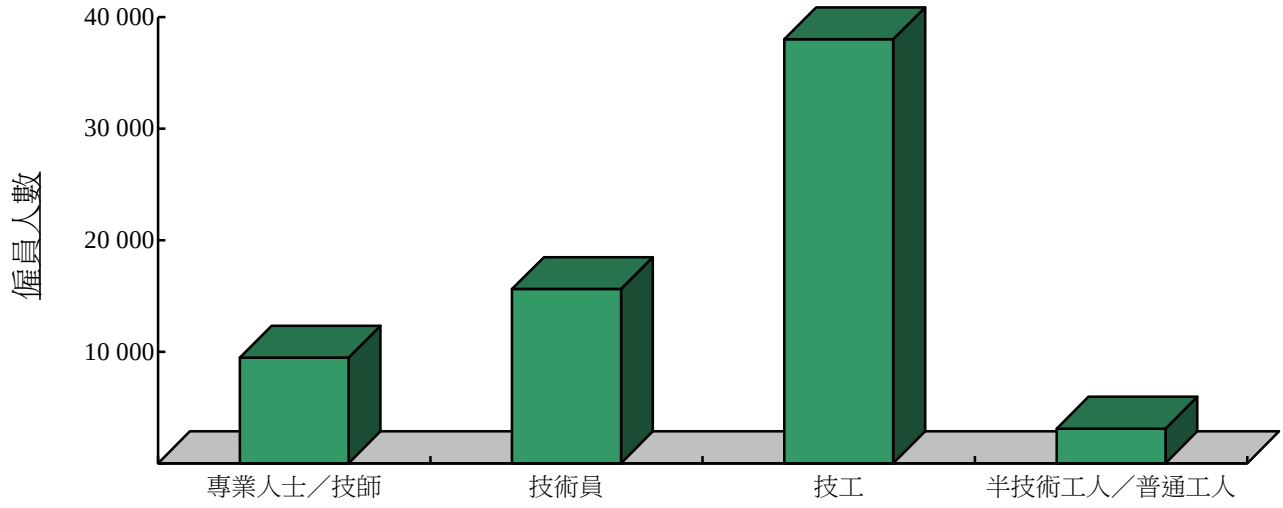
機電工程行業

2.3 機電工程行業各技能等級僱員分布情況見表 2.1 及圖 2.2。

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
	9 475	15 653	38 017	3 101	66 246
佔僱員總數百分比	14%	24%	57%	5%	100%

圖 2.2 機電工程行業各技能等級僱員分布情況



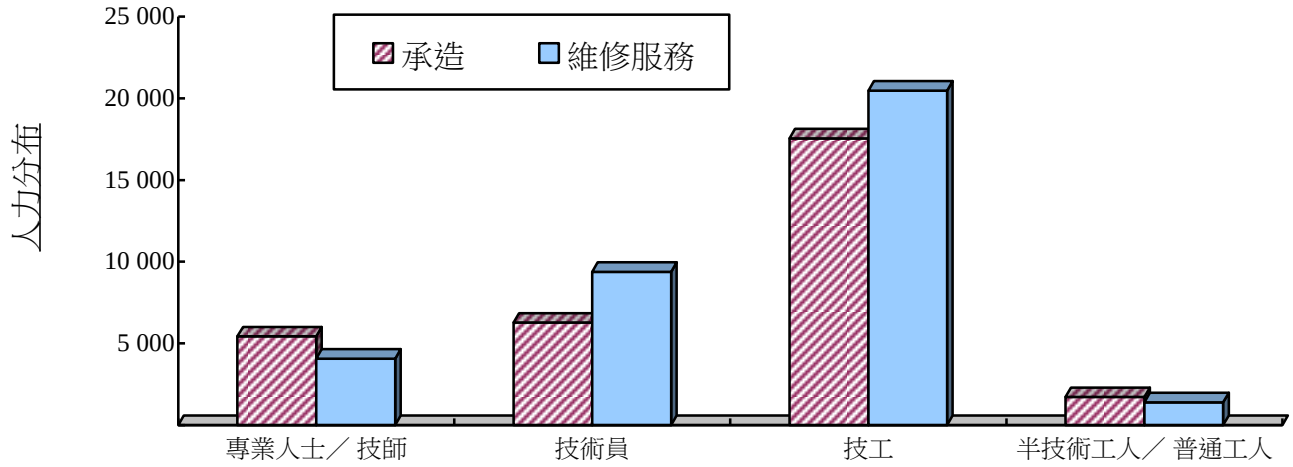
2.4 整個機電工程行業的人力統計數字見附錄 5；而承造、電器裝設兼水管鋪設、服務門類，以及補充抽樣機構的人力統計數字，分別見附錄 6 至 9。

2.5 機電工程行業的受訪機構估計，有約 47%人力從事「承造」工作，其餘約 53%則從事「維修服務」工作，僱員人數分別為 30 942 及 35 304 人。詳細數字見表 2.2 及圖 2.3。

表 2.2　估計從事機電工程行業承造及維修服務工作的人力

技能等級	僱員人數	估計從事承造工作的僱員人數	估計從事維修服務工作的僱員人數
專業人士／技師	9 475	5 421 (57%)	4 054 (43%)
技術員	15 653	6 266 (40%)	9 387 (60%)
技工	38 017	17 546 (46%)	20 471 (54%)
半技術工人／普通工人	3 101	1 709 (55%)	1 392 (45%)
總數	**66 246**	**30 942 (47%)**	**35 304 (53%)**

圖 2.3　估計從事機電工程行業承造及維修服務工作的人力



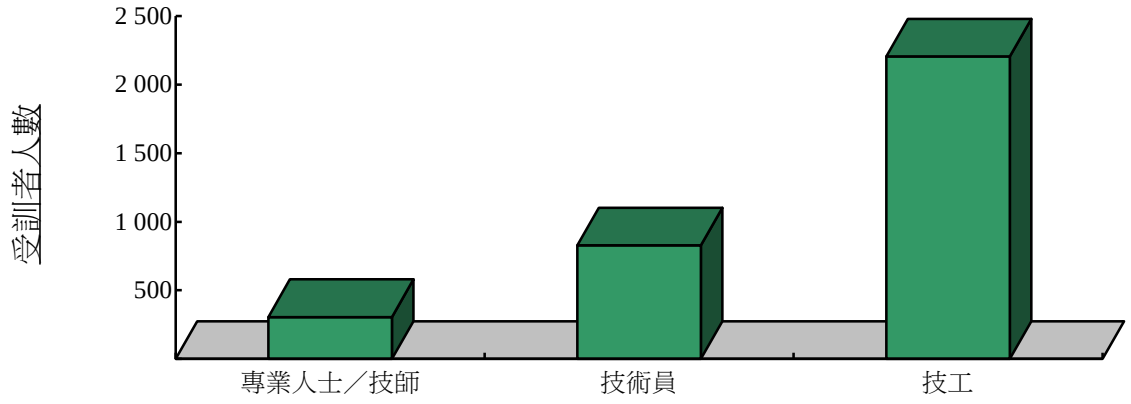
2.6　機電工程行業各門類中，從事承造及維修服務工作的人力分布數字，詳載於附錄 10。

2.7 在調查期間，機電工程行業有 3 337 人接受各類訓練，佔總人力的 5%；按技能等級的分布情況見表 2.3 及圖 2.4。

表 2.3 機電工程行業各技能等級受訓者的分布情況

技能等級	僱員人數	受訓者人數	佔同級僱員人數百分比
專業人士／技師	9 475	305	3.2%
技術員	15 653	827	5.3%
技工	38 017	2 205	5.8%
半技術工人／普通工人	3 101	-	-
總數	**66 246**	**3 337**	**5.0%**

圖 2.4 機電工程行業各技能等級受訓者的分布情況

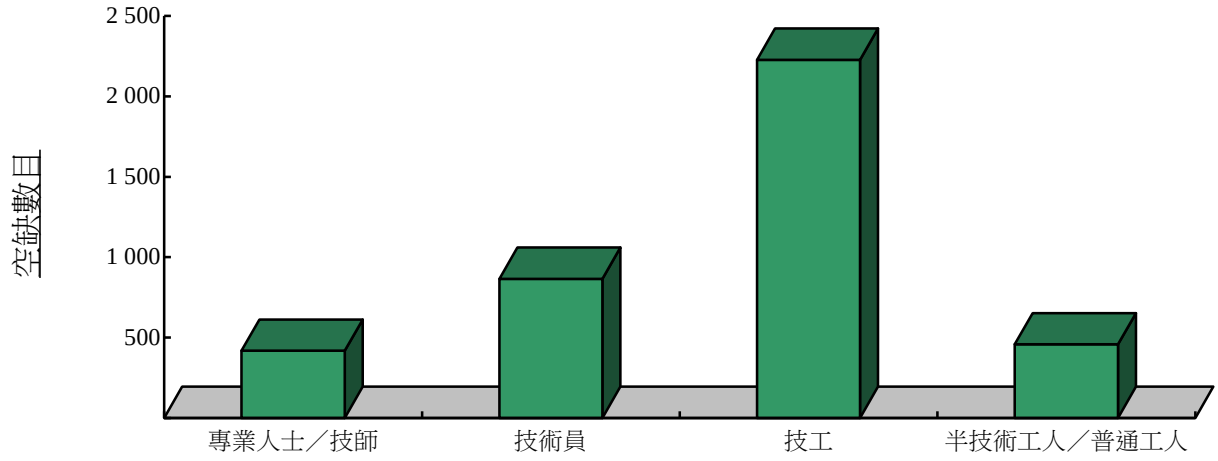


2.8 僱主填報的空缺有 3 966 個，佔機電工程行業僱員總數的 6%。各技能等級空缺數目的分布情況見表 2.4 及圖 2.5。

表 2.4　　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	9 475	417	4.4%
技術員	15 653	865	5.5%
技工	38 017	2 227	5.9%
半技術工人／普通工人	3 101	457	14.7%
總數	**66 246**	**3 966**	**6.0%**

圖 2.5　　機電工程行業各技能等級空缺數目的分布情況



2.9　　僱主預測至 2016 年 3 月，機電工程行業將有機電僱員 70 357 人，數字與調查期間的僱員人數及空缺額總和非常接近，反映僱主預期空缺可於 12 個月內填補。各技能等級的預測僱員人數見表 2.5。

表 2.5　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2016年3月的 僱員人數
專業人士／技師	9 892	9 921
技術員	16 518	16 534
技工	40 244	40 329
半技術工人／普通工人	3 558	3 573
總數	**70 212**	**70 357**

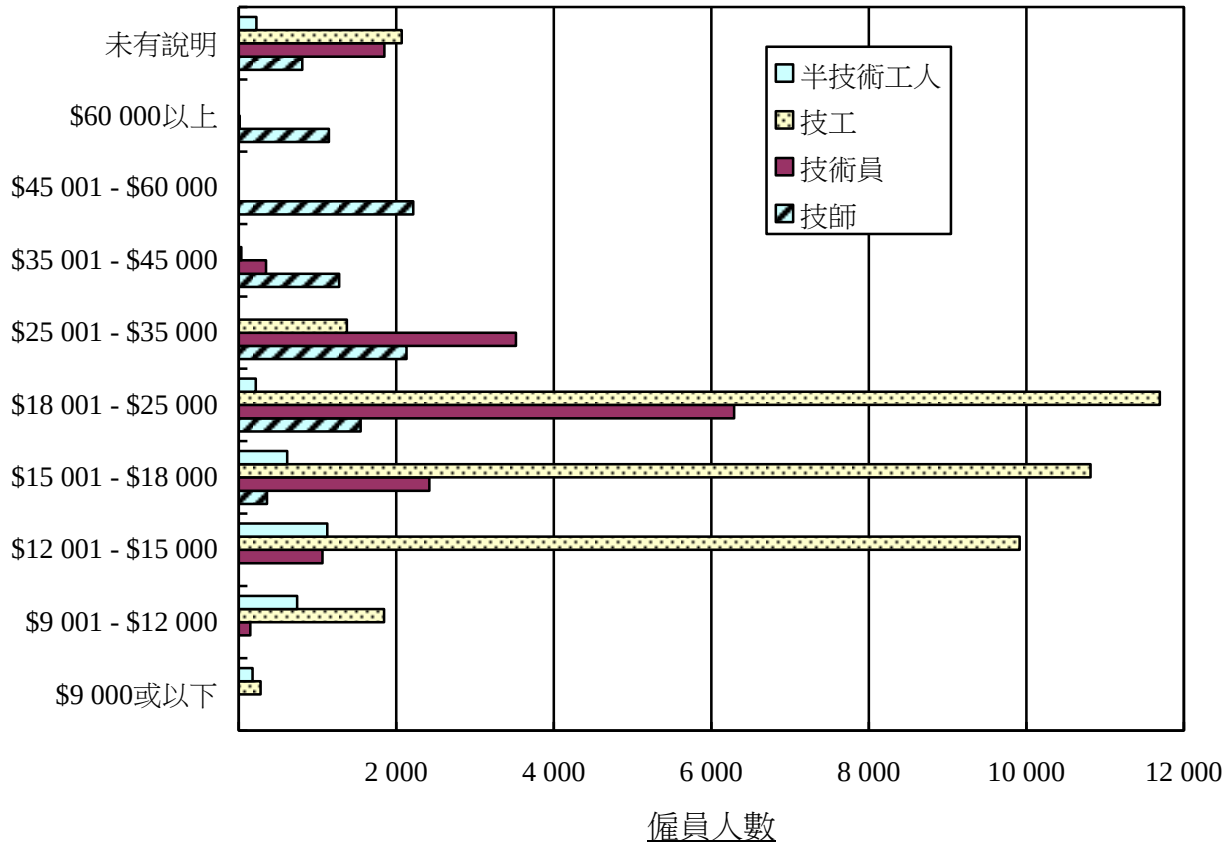
2.10　在調查期間，機電工程行業各主要職務的受訓者人數及空缺數目，以及預測至 2016 年 3 月時各工種的僱員人數，可參考附錄 5。

2.11　機電工程行業各技能等級的機電僱員每月收入幅度載於表 2.6 及圖 2.6。

表 2.6　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 或以下	-	-	275	176	451
$9 001 - $12 000	-	147	1 846	742	2 735
$12 001 - $15 000	-	1 065	9 914	1 123	12 102
$15 001 - $18 000	359	2 418	10 816	615	14 208
$18 001 - $25 000	1 546	6 290	11 696	214	19 746
$25 001 - $35 000	2 131	3 520	1 371	5	7 027
$35 001 - $45 000	1 275	346	31	-	1 652
$45 001 - $60 000	2 215	5	-	-	2 220
$60 000 以上	1 144	13	-	-	1 157
未有說明	805	1 849	2 068	226	4 948
總數	**9 475**	**15 653**	**38 017**	**3 101**	**66 246**

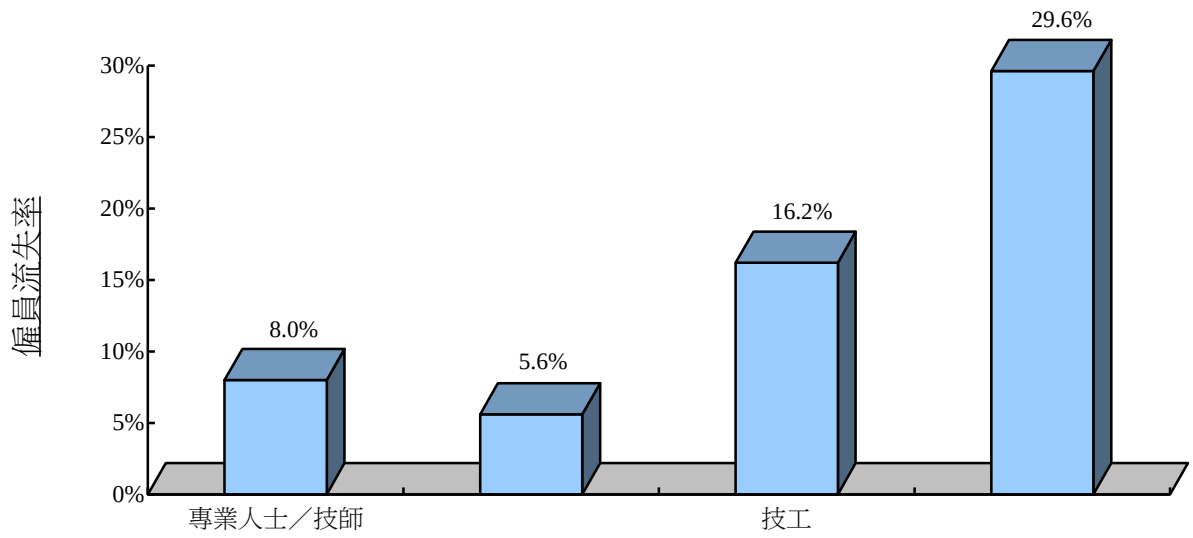
圖 2.6　　機電工程僱員平均每月收入



2.12　　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 11。

2.13　　僱主填報的資料顯示，在調查進行前 12 個月內有 8 694 名僱員離職。各技能等級的僱員流失率見圖 2.7。

圖 2.7　機電工程行業各技能等級的僱員流失率



2.14　調查進行前一年內，有 165 名僱員被調派往香港以外地方工作超過 6 個月。

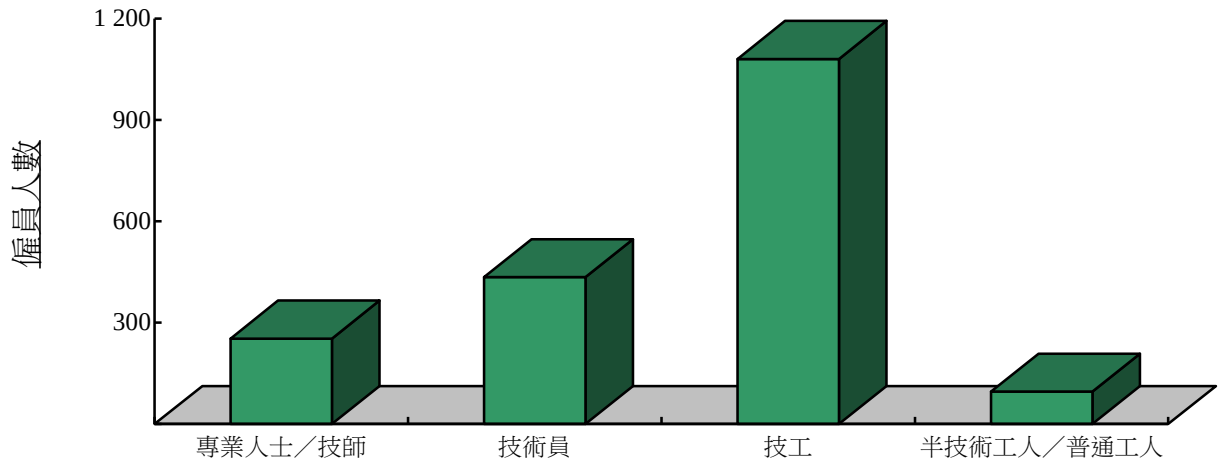
船舶修建行業

2.15　船舶修建行業的人力統計數字見附錄 12。各技能等級機電僱員的分布情況見表 2.7 及圖 2.8。

表 2.7　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
	253	435	1 081	96	1 865
佔僱員總數百分比	14%	23%	58%	5%	100%

圖 2.8　　船舶修建行業各技能等級機電僱員的分布情況



2.16　　在調查期間，業內有 31 人接受各類訓練，佔行業總人力的 1.7%；按技能等級的分布情況載於表 2.8。

表 2.8　　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	253	1	0.4%
技術員	435	6	1.4%
技工	1 081	24	2.2%
半技術工人／普通工人	96	-	-
總數	**1 865**	**31**	**1.7%**

2.17　　僱主填報的空缺數目有 121 個，佔船舶修建行業內機電僱員總數的 6.5%。各技能等級空缺數目的分布載於表 2.9。

表 2.9　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	253	7	2.8%
技術員	435	24	5.5%
技工	1 081	89	8.2%
半技術工人／普通工人	96	1	1.0%
總數	**1 865**	**121**	**6.5%**

2.18　僱主預測至 2016 年 3 月時，船舶修建行業會有機電僱員 1 983 人，數字與調查期間的僱員人數及空缺額總和非常接近，反映僱主預期空缺可於 12 個月內填補。各技能等級的預測僱員人數見表 2.10。

表 2.10　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2016年3月的僱員人數
專業人士／技師	260	253
技術員	459	460
技工	1 170	1 173
半技術工人／普通工人	97	97
總數	**1 986**	**1 983**

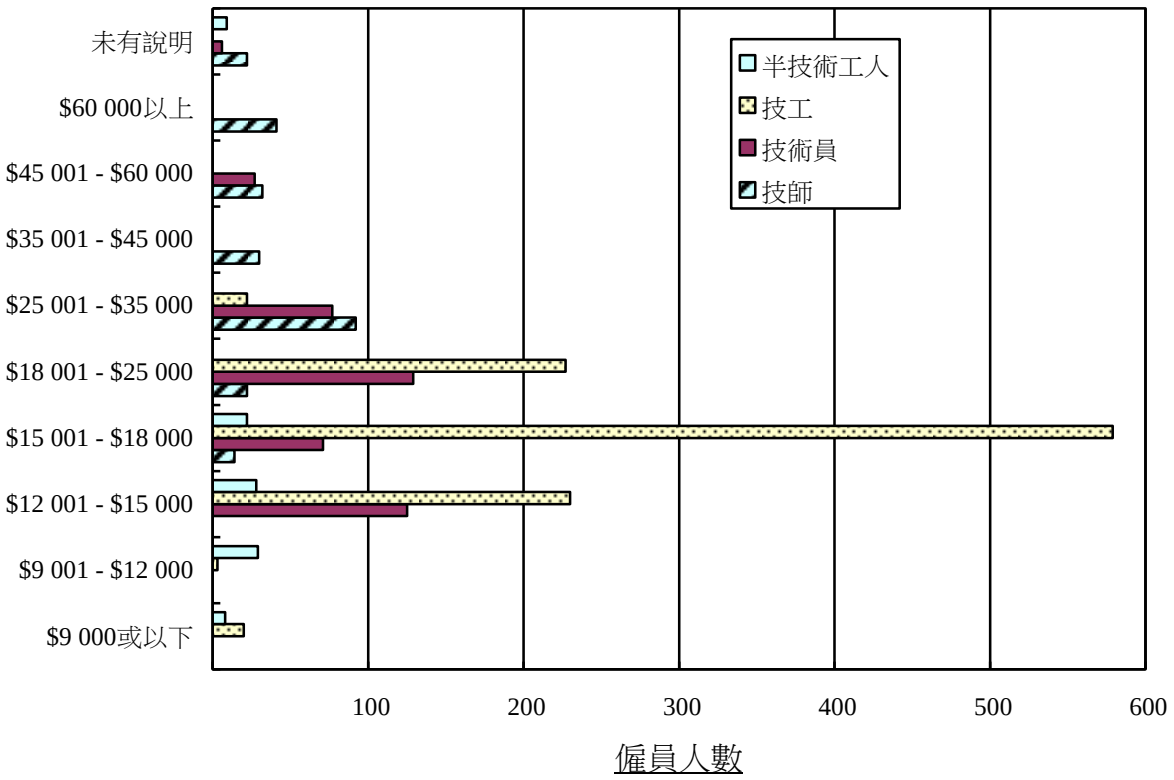
2.19　在調查期間， 船舶修建行業各主要職務的受訓者人數及空缺數目，以及預測至 2016 年 3 月時各工種的僱員人數，可參考附錄 12。

2.20　船舶修建行業各技能等級的機電僱員每月收入幅度載於表 2.11 及圖 2.9。

表 2.11　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／技師	技術員	技工	半技術工／普通工人	總數
$9 000 或以下	-	-	20	8	28
$9 001 - $12 000	-	-	3	29	32
$12 001 - $15 000	-	125	230	28	383
$15 001 - $18 000	14	71	579	22	686
$18 001 - $25 000	22	129	227	-	378
$25 001 - $35 000	92	77	22	-	191
$35 001 - $45 000	30	-	-	-	30
$45 001 - $60 000	32	27	-	-	59
$60 000 以上	41	-	-	-	41
未有說明	22	6	-	9	37
總數	**253**	**435**	**1 081**	**96**	**1 865**

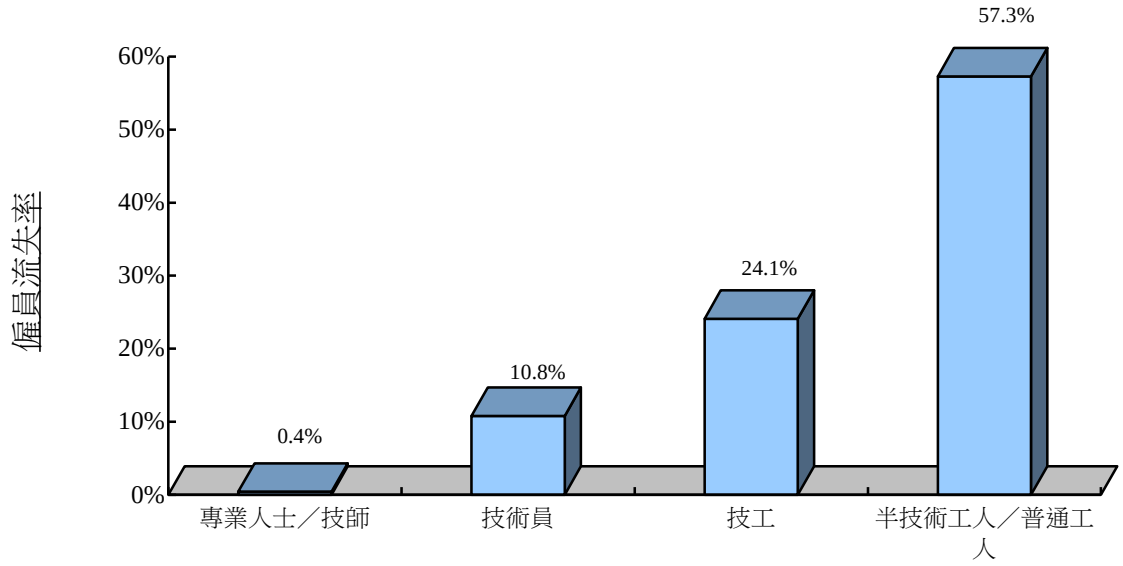
圖 2.9　船舶修建行業機電僱員的平均每月收入



2.21 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 13。

2.22 僱主填報的資料顯示，在調查進行前 12 個月內有 363 名僱員離職。各技能等級的僱員流失率見圖 2.10。

圖 2.10 船舶修建行業各技能等級的僱員流失率



2.23 調查進行前一年內，有 14 名僱員被調派往香港以外地方工作超過 6 個月。

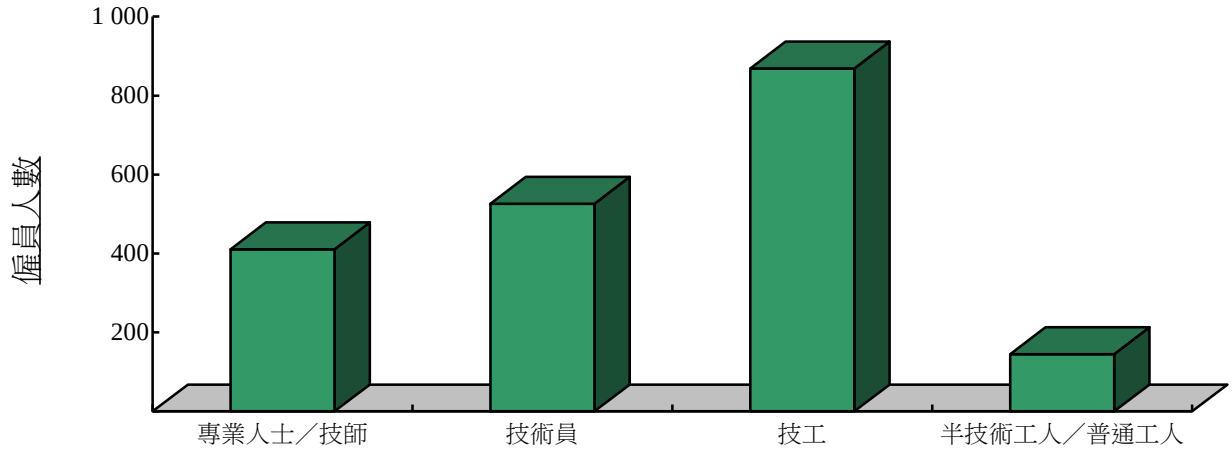
氣體燃料行業

2.24 氣體燃料行業的人力統計數字見附錄 14。該業各技能等級機電僱員的分布情況見表 2.12 及圖 2.11。

表 2.12 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
	411	526	869	145	1 951
佔僱員總數百分比	21%	27%	45%	7%	100%

圖 2.11　氣體燃料行業各技能等級機電僱員的分布情況



2.25　在調查期間，業內有 46 人接受各類訓練，佔僱員總數的 2.4%；按技能等級的分布情況見表 2.13。

表 2.13　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	411	1	0.2%
技術員	526	3	0.6%
技工	869	42	4.8%
半技術工人／普通工人	145	-	-
總數	**1 951**	**46**	**2.4%**

2.26　僱主填報的空缺有 38 個， 佔氣體燃料行業機電僱員總數的 1.9%。各技能等級空缺數目的分布情況見表 2.14。

表 2.14　氣體燃料行業機電僱員空缺數目（按技能等級劃分）

技能等級	僱員人數	空缺數目	佔同級僱員人數百分比
專業人士／技師	411	3	0.7%
技術員	526	12	2.3%
技工	869	19	2.2%
半技術工人／普通工人	145	4	2.8%
總數	**1 951**	**38**	**1.9%**

2.27　僱主預測至 2016 年 3 月時，氣體燃料行業將有機電僱員 1 986 人，顯示調查期間的空缺將於 12 個月內全數填補。各技能等級的預測僱員人數見表 2.15。

表 2.15　氣體燃料行業機電僱員的預測人數(按技能等級劃分)

技能等級	調查期間僱員人數加空缺數目	僱主預測2016年3月的僱員人數
專業人士／技師	414	414
技術員	538	535
技工	888	888
半技術工人／普通工人	149	149
總數	**1 989**	**1 986**

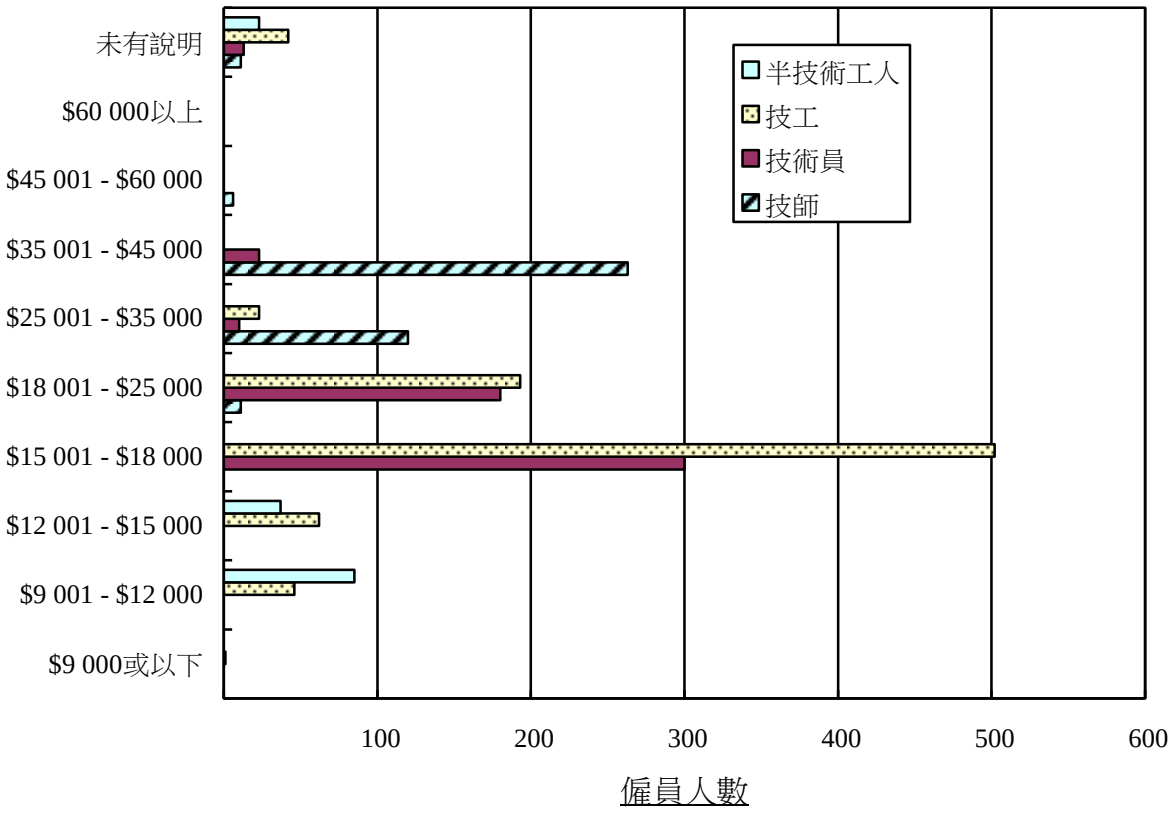
2.28　在調查期間，氣體燃料行業各主要職務的受訓者人數及空缺數目，以及預測至 2016 年 3 月時各工種的僱員人數，可參考附錄 14。

2.29　氣體燃料行業各技能等級的機電僱員每月收入幅度見表 2.16 及圖 2.12。

表 2.16　氣體燃料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／技師	技術員	技工	半技術工人／普通工人	總數
$9 000 或以下	-	-	1	-	1
$9 001 - $12 000	-	-	46	85	131
$12 001 - $15 000	-	-	62	37	99
$15 001 - $18 000	-	300	502	-	802
$18 001 - $25 000	11	180	193	-	384
$25 001 - $35 000	120	10	23	-	153
$35 001 - $45 000	263	23	-	-	286
$45 001 - $60 000	6	-	-	-	6
$60 000 以上	-	-	-	-	-
未有說明	11	13	42	23	89
總數	**411**	**526**	**869**	**145**	**1 951**

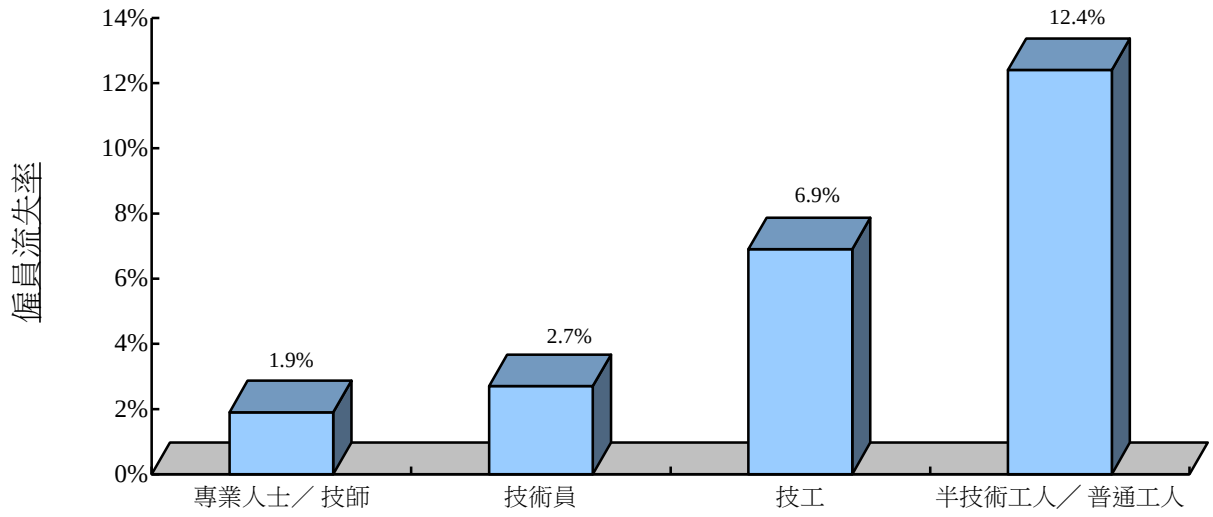
圖 2.12　氣體燃料行業機電僱員的平均每月收入



2.30　　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 15。

2.31　　僱主填報的資料顯示，在調查進行前 12 個月內有 100 名僱員離職。各技能等級的僱員流失率見圖 2.13。

圖 2.13　　氣體燃料行業各技能等級的僱員流失率



2.32　　調查進行前一年內，沒有僱員被調派往香港以外地方工作超過 6 個月。

在澳門受僱的香港機電從業員

2.33 在調查期間，僱主填報其附屬／相聯公司在澳門聘用的香港機電從業員有511 人；分布情況見表 2.17。

表 2.17 調查期間在澳門受僱的香港機電從業員人數

技能等級	機電工程行業	船舶修建行業	氣體燃料行業
專業人士／技師	145	-	-
技術員	155	-	1
技工	210	-	-
總數	**510**	**-**	**1**

2014/15 年人力供應情況

2.34 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 16。

地盤機電人力

2.35 為評估地盤機電人力狀況，本會在 2015 年進行第九次補充調查，蒐集於地盤工作的機電從業員最新人力資料。蒐集所得的資料有助更全面地分析機電工程業的人力狀況。補充調查包括於調查期間，政府統計處紀錄的所有地盤，包括 1 327 個屋宇地盤，以及 564 個土木工程及其他地盤。

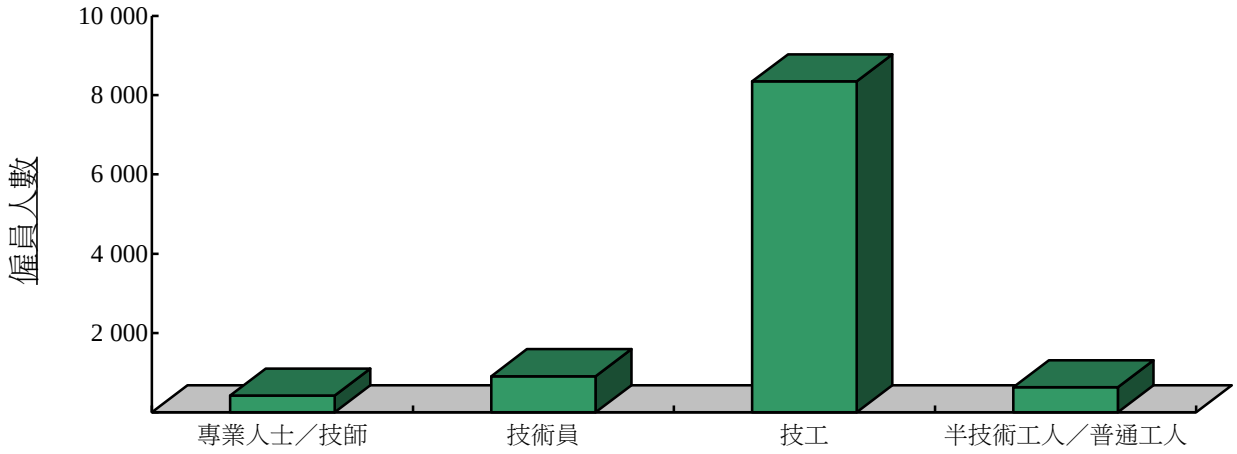
2.36 補充調查顯示，於 2015 年 3 月 16 日（即調查的特定參考日），共有 10 317 名機電從業員在地盤從事機電工程工種及相關主要職務，其中 8 164 人（79%）在屋宇地盤工作，2 153 人（21%）在土木工程及其他地盤工作。補充調查的人力數據，已包括在是次人力調查各受訪機構填報的人力資料內，並納入為機電工程行業統計數字。

2.37　　各技能等級從業員的分布情況見表 2.18 及圖 2.14。

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	422	4%
技術員	912	9%
技工	8 350	81%
半技術工人／普通工人	633	6%
總數	**10 317**	**100%**

圖 2.14　地盤機電從業員的分布情況



2.38　　地盤機電人力統計數字見附錄 17。

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

人力變化

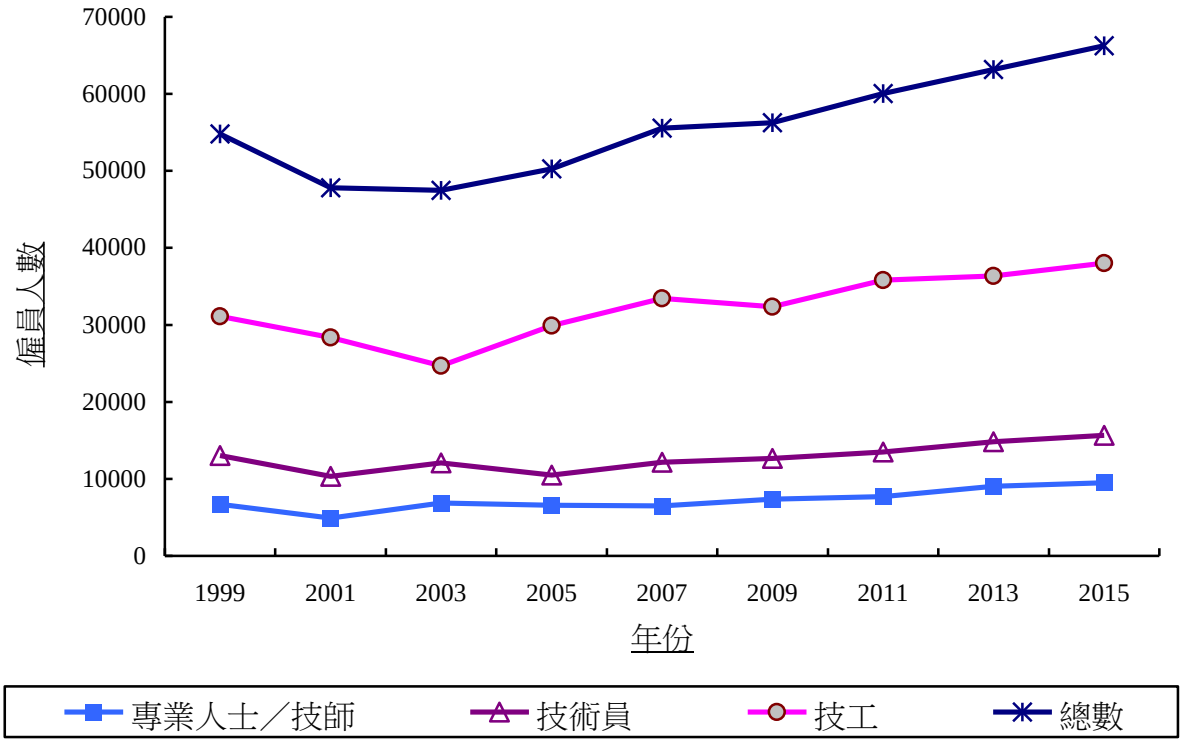
3.2 1999 至 2015 年間，機電工程行業各技能等級（專業人士／技師、技術員及技工）的人力變化，見表 3.1 及圖 3.1。

表 3.1 機電工程行業的人力變化（1999 至 2015 年）

調查年份	專業人士／技師	技術員	技工	總人力[1]
1999	6 684	13 038	31 116	54 814
2001	4 931	10 312	28 340	47 799
2003	6 883	12 072	24 685	47 492
2005	6 584	10 506	29 894	50 268
2007	6 515	12 163	33 429	55 563
2009	7 369	12 649	32 364	56 260
2011	7 720	13 512	35 816	60 060
2013	9 042	14 828	36 362	63 159
2015	9 475	15 653	38 017	66 246

[1] 包括半技術工人／普通工人

圖 3.1　　機電工程行業的人力變化（1999 至 2015 年）



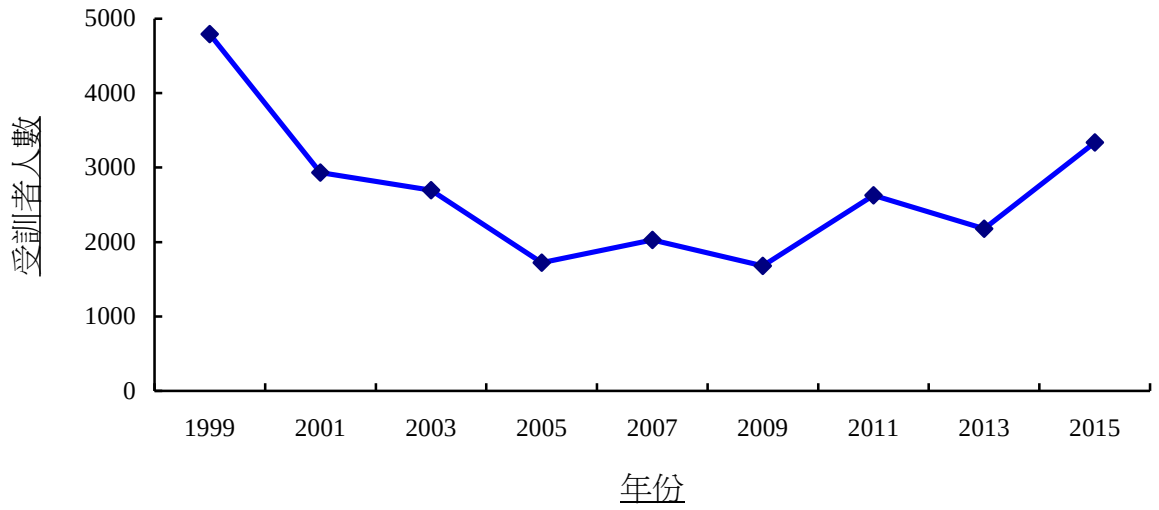
3.3　　機電工程行業的僱員人數於 1999 年攀升至高峰，隨後於 2003 年跌至低谷。隨著香港與鄰近地區的經濟於 2003 年後轉趨蓬勃，業內的僱員人數逐漸回升；2007 年調查錄得的僱員人數更超越 1999 年的數字。其後，業內的僱員人數仍然保持升勢。過去兩年，由於大型基建項目陸續上馬，僱員人數的升勢更強，平均每年增加 2.4%。其中，專業人士／技師、技術員、技工及半技術工人／普通工人的僱員人數，每年分別增長 2.4%、2.7%、2.3%及 2.9%。

3.4　　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。隨著 2010 年代初大型基建項目開始動工，業內受訓者的人數增加，當中以「技工級」的回升幅度尤為顯著（見表 3.2 及圖 3.2）。

表 3.2　機電工程行業受訓者人數

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%
2013	63 159	2 179	3.5%
2015	66 246	3 337	5.0%

圖 3.2　機電工程行業受訓者人數

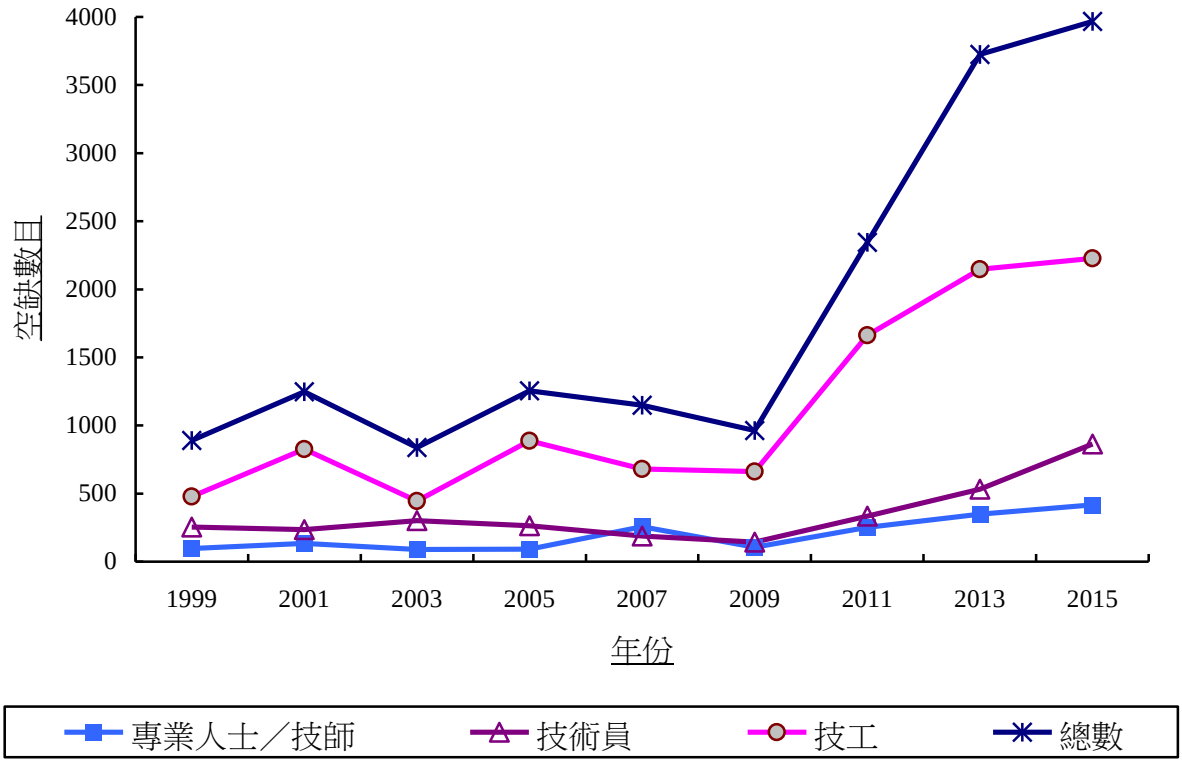


3.5　　如表 3.3 及圖 3.3 所示，據僱主填報的資料，機電工程行業的職位空缺數目在過去兩年持續上升。調查期間，在 59 個主要職務中，有 26 個的空缺率達 5%或以上。其中七個主要職務的空缺率達 10%或以上，包括：(i) 飛機維修工程師；(ii) 飛機維修技術員；(iii) 升降機／自動梯技術員；(iv) 自動梯技工；(v) 空調製冷設備技工（獨立系統）；(vi) 消防電氣裝配工；以及 (vii) 半技術工。

表 3.3　　機電工程行業的空缺數目（1999 至 2015 年）

調查年份	專業人士／技師	技術員	技工	總人力[1]
1999	97	254	477	890
2001	135	235	827	1 248
2003	89	302	445	837
2005	91	264	888	1 254
2007	256	188	680	1 149
2009	106	144	662	963
2011	252	335	1 663	2 344
2013	349	533	2 147	3 725
2015	417	865	2 227	3 966

圖 3.3　　機電工程行業的空缺數目（1999 至 2015 年）



[1] 包括半技術工人／普通工人

機電工程行業的業務展望

3.6 由於四個鐵路項目正進行得如火如荼，機電工程行業的人力需求未來數年料持續強勁。該等鐵路項目的目標完工日期如下：

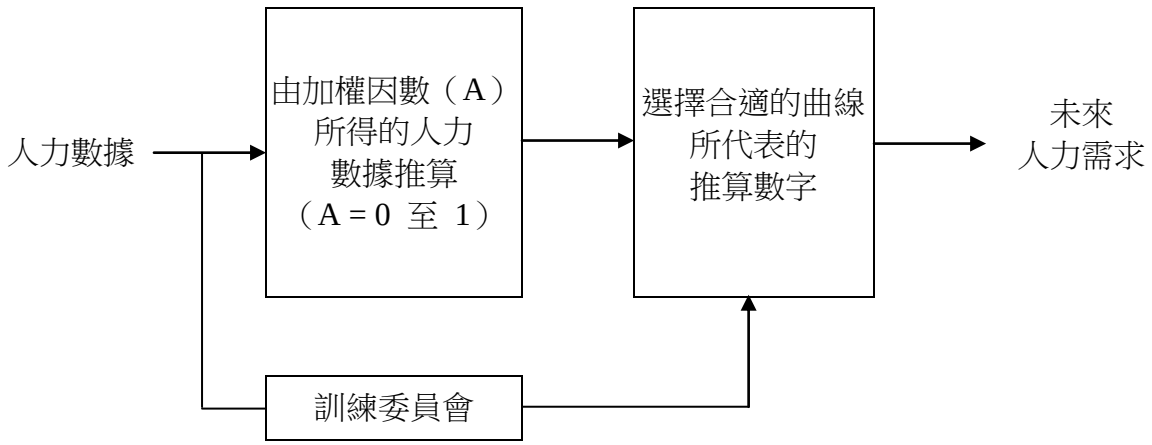
鐵路項目	目標完工日期
(i) 觀塘綫延綫	2016 年第三季或第四季
(ii) 南港島綫（東段）	2016 年末
(iii) 廣深港高速鐵路	2018 年第三季
(iv) 沙田至中環綫	2019 年 – 大圍至紅磡
	2021 年 – 紅磡至金鐘

3.7 2016 年起，除了有鐵路項目陸續竣工，西九文化區將有多個藝術及文化設施準備施工，而三跑道系統工程亦會展開。這些大型基建項目，加上土地及房屋供應持續增加，料會帶動機電工程行業今後多年蓬勃發展。

機電工程行業的人力訓練需求推算

3.8 多個工程行業訓練委員會的人力調查過往一直採用「調節過濾法」[Adaptive Filtering Method, AFM]作為主要工具，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」，詳細說明見圖 3.4。

圖 3.4 調節過濾法



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。A值愈高，愈新近的數據所佔的比重愈大。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。

3.9 除了 AFM 這種分析技巧，本會曾於 1997 年及 2001 年採用「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。LRM 假設人力需求與各類樓宇建築成本（包括公共及私人住宅及非住宅樓宇）之間有線性關係，不過由於每年新落成的樓宇數量不定，因此近年的人力調查已不再採用 LRM。

3.10 2003 年，本會採用統計模型分析法推算機電工程行業的人力需求。統計模型分析法是根據一系列與人力需求相關的特定經濟指標，例如地盤樓宇建築工程總值、固定資本形成總額、單位總存量、耗電及耗氣量等，用以推算人力需求。鑑於難以識別與人力需求密切相關的合適經濟指標，故人力調查自 2005 年起已棄用統計模型分析法。

3.11 在 2015 年人力調查中，由於各項因素皆與往年調查的情況相若，因此本會決定再次採用 AFM，以推算 2016 至 2018 年的人力需求。

3.12 本會根據 2015 年及以往人力調查結果，採用 AFM 推算各技能等級的人力，所得數字載於圖 3.5 至圖 3.7。

圖 3.5 機電工程行業人力推算（專業人士／技師）

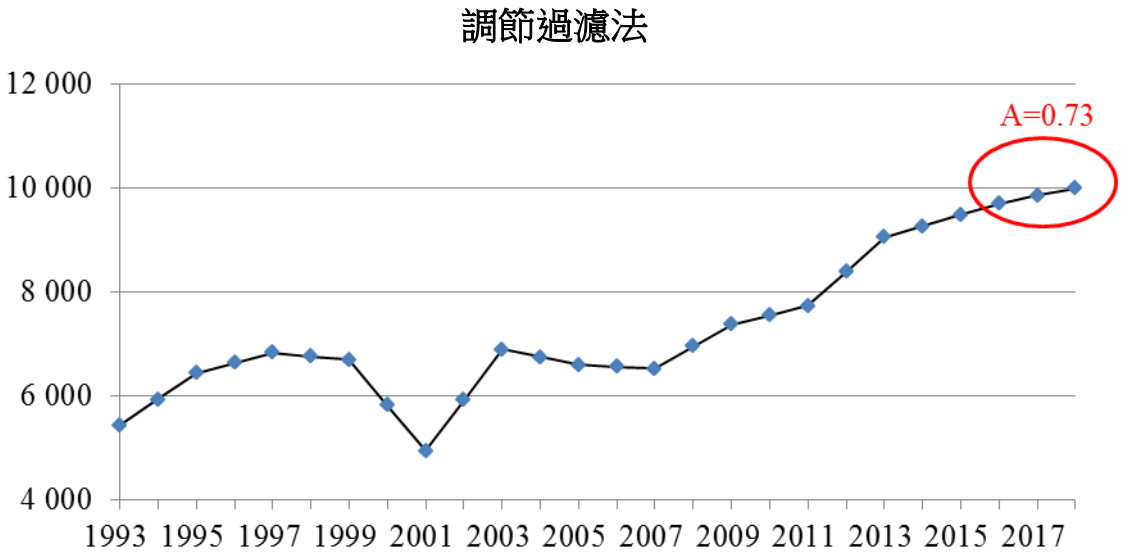


圖 3.6　　機電工程行業人力推算（技術員）

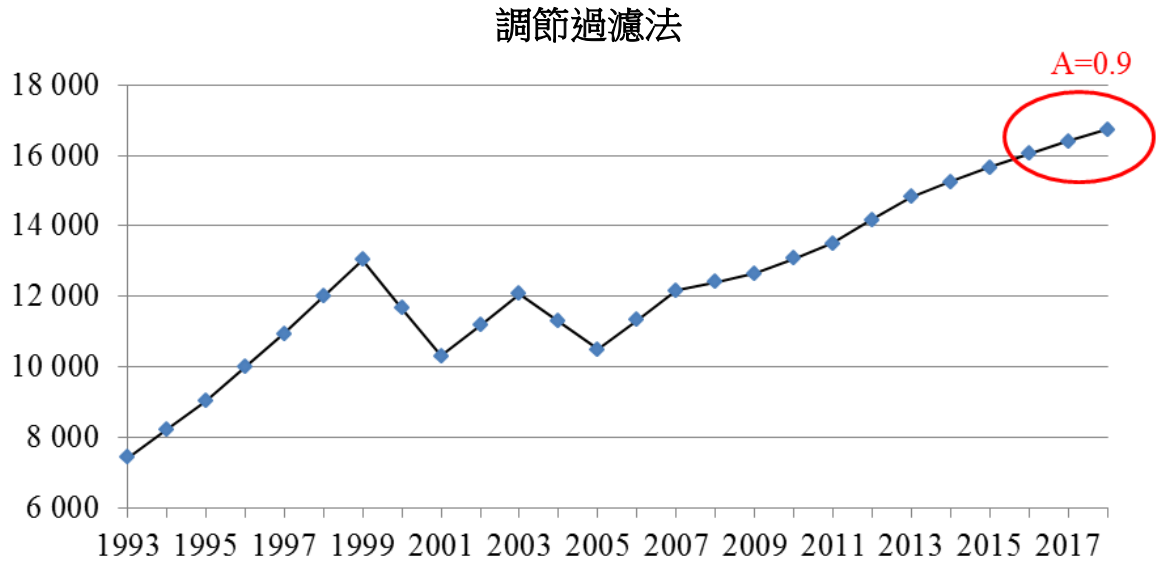
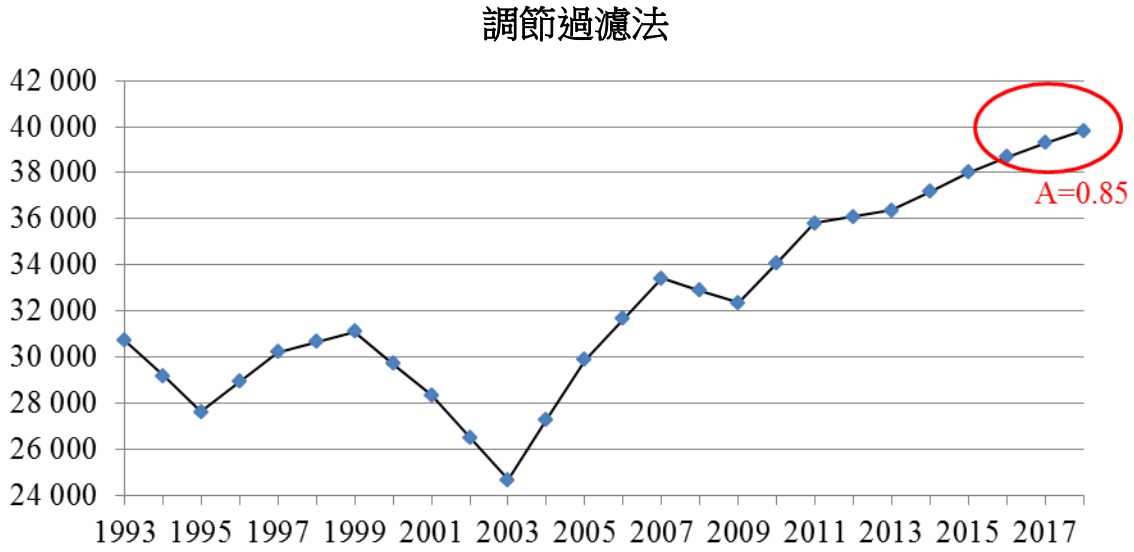


圖 3.7　機電工程行業人力推算（技工）



3.13　　考慮到調查期間業界的空缺額，本會決定分別採用 A=0.73、A=0.9 及 A=0.85 的數值，推算專業人士／技師、技術員和技工等級的人力。2016 至 2018 年的預測人力載於表 3.4。

表 3.4　機電工程行業人力預測

年份	專業人士 (A = 0.73)	技術員 (A = 0.9)	技工 (A = 0.85)
2016	9 686	16 039	38 690
2017	9 853	16 399	39 293
2018	9 990	16 735	39 827

3.14　本會繼續將專業人士／技師及技術員的每年流失率定為 3%，另考慮到建造業議會[CIC]所公布電機工程行業僱員的最新年齡結構後，決定將技工的流失率定為 4%。

3.15　鑑於上述因素，機電工程行業於 2016 至 2018 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、技術員及技工）的流失人力，平均每年需要訓練的僱員人數見表 3.5。

表 3.5　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2016至2018年平均每年需要訓練的人手
專業人士／技師	9 475	464 (673)[1]
技術員	15 653	846 (846)
技工	38 017	2 160 (1 327)

[1] 括號內的數字為本會於 2013 年時對本業 2014 至 2016 年每年訓練需求的推算數字。

船舶修建行業

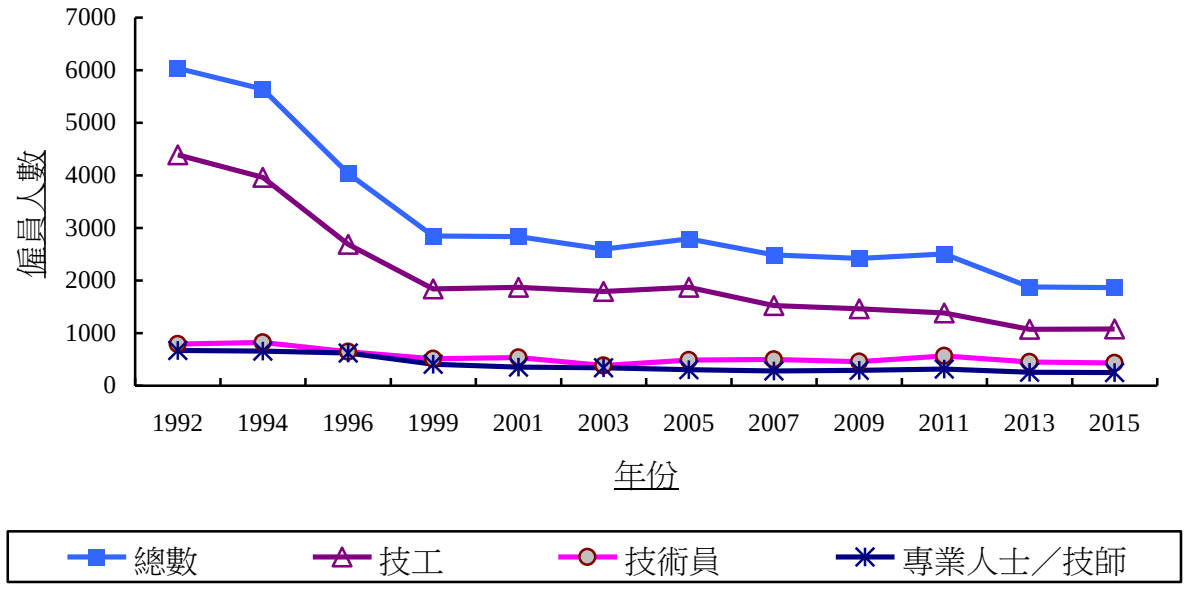
人力變化

3.16 1992 至 2015 年間，船舶修建行業各技能等級（專業人士／技師、技術員及技工）的人力變化，見表 3.6 及圖 3.8。

表 3.6 船舶修建行業機電人力的變化

調查年份	專業人士／技師	技術員	技工	總人力[1]
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
2013	259	454	1 076	1 876
2015	253	435	1 081	1 865

圖 3.8 船舶修建行業的人力變化（1992 至 2015 年）



[1] 包括半技術工人／普通工人

3.17 上述數字顯示，船舶修建行業的僱員人數在 2011 至 2013 年間大幅下降後，過去兩年漸趨穩定，每年錄得 0.3%的輕微跌幅。

3.18 調查期間，船舶修建行業的空缺數目佔整體人力的 6.5%，在 28 個主要職務中，有半數的空缺率達 5%或以上。其中八個主要職務的空缺率達 10%或以上，包括：(i) 機械工程師；(ii) 船舶設計師／造船工程師；(iii) 監督／管工；(iv) 電工；(v) 機床工；(vi) 髹漆工；(vii) 鋼鐵工；以及 (viii) 焊接工。

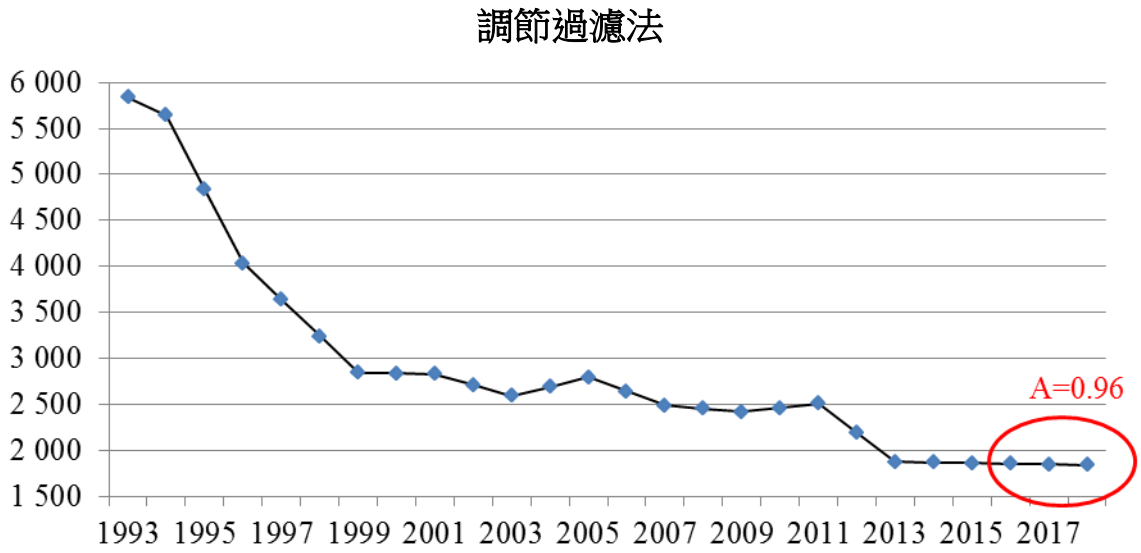
船舶修建行業的業務展望

3.19 為了減輕內地同業激烈競爭所帶來的影響，過去十年，船舶修建行業僱主逐漸將業務擴展至陸上工程及承造服務，例如安裝、改裝及翻新重型工業設備及廠房裝置、電動機大修和更換線圈、安裝並檢定高壓及低壓電氣及控制系統。是次調查顯示，船舶修建行業的人力已止跌回穩，證明相關應對措施奏效。

船舶修建行業的人力訓練需求推算

3.20 由於船舶修建行業的僱員人數相對較少，故本會決定採用 AFM 推算業界的總人力需求，有關結果見圖 3.9。

圖 3.9 船舶修建行業人力推算



3.21 本會決定採用 A=0.96 為船舶修建行業人力推算最合適的曲線。預測 2016 至 2018 年船舶修建行業的總人力分別為 1 858、1 852 及 1 846 名僱員。

3.22 本會自 2001 年起將船舶修建行業的每年流失率定為 6%，以反映業內人力老化的問題。雖然近年不少年老僱員已退休，但流失率仍然相對高企，主要由於部分業內僱員轉投機電工程或建造行業。因此，本會決定維持船舶修建行業的每年流失率為 6%。

3.23 綜合上述因素，本會推算 2016 至 2018 年船舶修建行業平均每年所需訓練的機電僱員數目載於表 3.7。

表 3.7 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2016至2018年平均每年需要訓練的人手
專業人士／技師	253	14 *(18)*[1]
技術員	435	24 *(31)*
技工	1 081	61 *(73)*

[1] 括號內的數字為本會於 2013 年時對本業 2014 至 2016 年每年訓練需求的推算數字。

氣體燃料行業

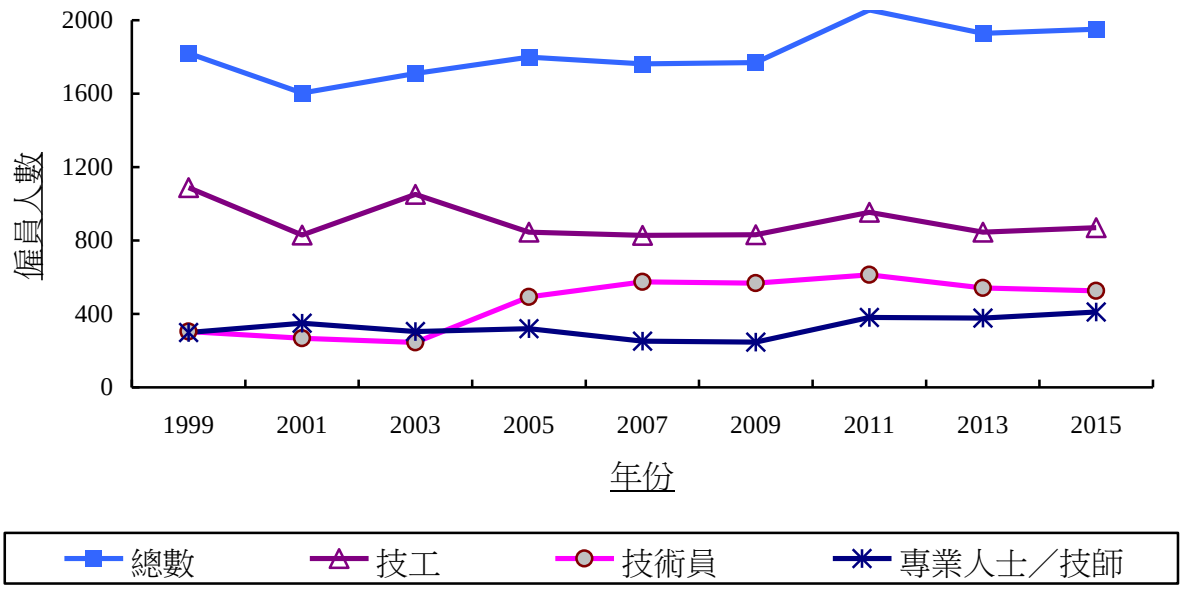
人力變化

3.24 1999 年氣體燃料行業首次進行人力調查至今，業內三個技能等級的人力變化見表 3.8 及圖 3.10。

表 3.8 氣體燃料行業機電人力的變化

調查年份	專業人士／技師	技術員	技工	總人力[1]
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
2013	378	542	846	1 929
2015	411	526	869	1 951

圖 3.10 氣體燃料行業機電人力的變化



[1] 包括半技術工人／普通工人

3.25 上述數字顯示，過去兩年，氣體燃料行業的整體人力保持穩健，每年錄得0.6%的溫和增長。

3.26 調查期間，氣體燃料行業的空缺數目佔整體人力的 1.9%，在 21 個主要職務中，有六個的空缺率達 5%或以上。

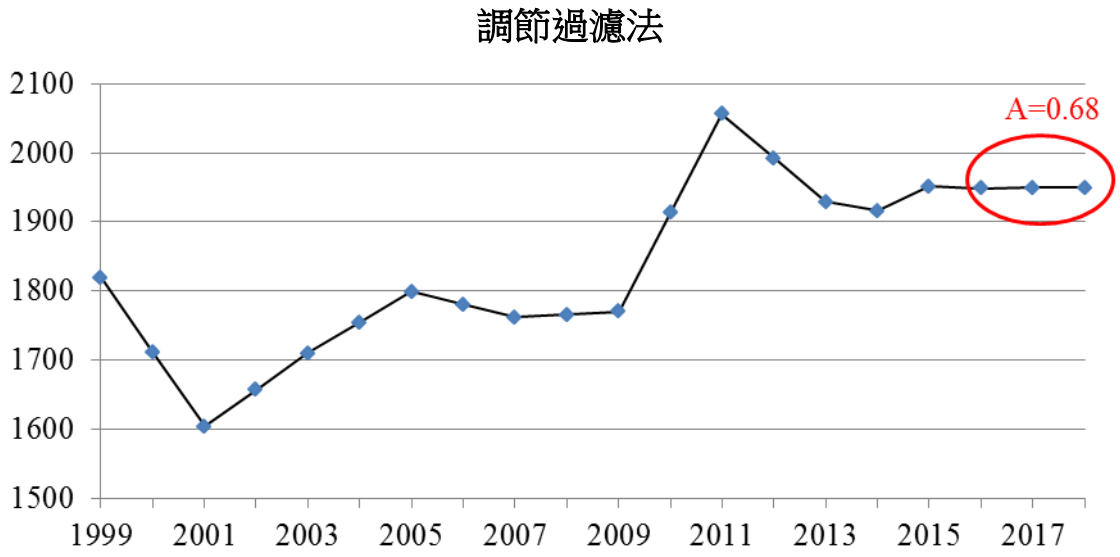
氣體燃料行業的業務展望

3.27 香港政府決心於未來數年內增加土地及房屋供應。內需持續增加，加上目前有利的就業環境，定會刺激氣體消耗量，預料氣體燃料行業未來會穩定增長。

氣體燃料行業的人力訓練需求推算

3.28 由於氣體燃料行業的僱員人數相對較少，故本會決定採用 AFM 推算業界的總人力需求，有關結果見圖 3.11。

圖 3.11 氣體燃料行業人力推算



3.29 本會決定採用 A=0.68 為氣體燃料行業人力推算最合適的曲線。2016 至 2018 年業內的人力料保持平穩，有僱員 1 949 人。

3.30 本會決定將氣體燃料行業的每年流失率定為 3%，並推算 2016 至 2018 年業內平均每年所需訓練的機電僱員數目，詳細結果載於表 3.9。

表 3.9 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2016至2018年平均每年需要訓練的人手
專業人士／技師	411	11 (*14*)[1]
技術員	526	15 *(20)*
技工	869	26 (*32)*

3.31 本會將於 2017 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。

[1] 括號內的數字為本會於 2013 年時對本業 2014 至 2016 年每年訓練需求的推算數字。

第四章

建議

4.1 考慮到本地經濟狀況，以及機電工程的業務性質，本會預計 2016 至 2018 年三大行業對曾接受適當訓練技術人員的需求如下：

(i) 機電工程行業：由於鐵路項目有所延遲，預料負責承造工作機電人力的需求會在 2016 年才達至高峰。及後，估計部分人員將會轉投新建樓宇工程項目，另一部分則會為機電工程行業的「服務」門類所吸納，例如鐵路營運及保養。

(ii) 船舶修建行業：業界需要在極短時間提供船舶維修服務，加上不同行業在勞工市場競逐人才、本地船舶維修業未來數年或會快速增長等因素，均令僱主需要更多技術人員，以填補現有和日後出現的空缺，與行業直接相關的金屬板材加工業，技術人員需求也會相應增加。焊接工、船舶打磨裝配工、電工、喉管／灑水裝置裝配工、監督、機器裝配工及船舶引擎技工的需求估計持續高企。

(iii) 氣體燃料行業：香港政府決心穩定住宅物業市場，未來十年單位供應目標定為 48 萬個。由 2015/16 至 2018/19 財政年度，公共房屋和私人住宅供應的單位總數估計分別有 77 900 個和 83 000 個[1]。由於新建成的住宅單位陸續推出，氣體燃料行業對技術人力的需求料保持平穩。

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兩至四年。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 3.15、3.23 及 3.30 各段所列數字，推行有系統的人力訓練方案。

[1] 來源：運輸及房屋局和香港房屋委員會於 2015 年 6 月預測的數字。

4.3 表 4.1 列載每年需要培訓的專業人士／技師、技術員及技工人數佔現有人手的百分比。僱主為機構策劃人力時，可參考有關數字。

表 4.1 每年需要培訓的人數（按技能等級及行業劃分）

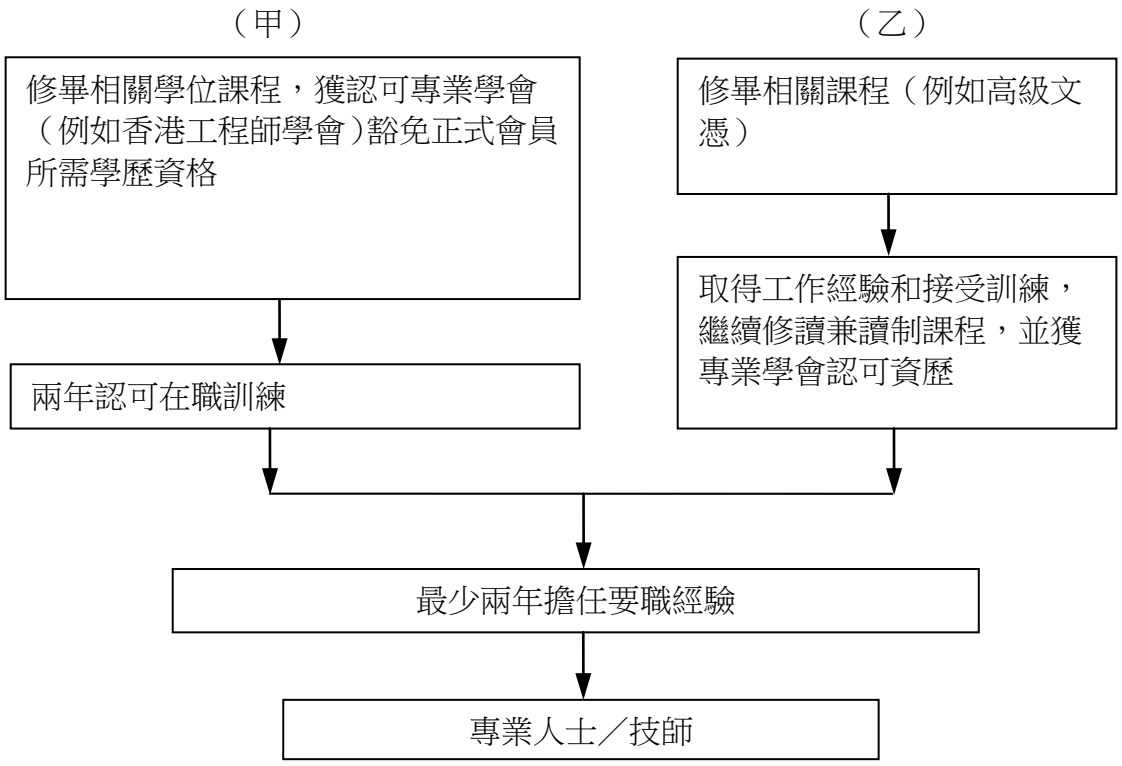
	專業人士／技師	技術員	技工
機電工程行業	4.9%	5.4%	5.7%
船舶修建行業	5.6%	5.6%	5.6%
氣體燃料行業	3.0%	3.0%	3.0%

專業人士／技師訓練

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

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。

圖 4.1 專業人士／技師訓練



4.6 參考第 3.15、3.23 及 3.30 各段的數字後，推算 2016 至 2018 年間機電工程業專業人士／技師級主要職務的每年平均訓練需求約為 500 人。

4.7 表 4.2 列出預計本地大學機電工程相關學科全日制課程每年的畢業生人數。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擔任。

表 4.2 推算 2016 至 2018 年間
本地大學全日制學位課程畢業生人數
（擔任機電工程業主要職務）

院校[1]	課程	預計每年本地畢業生人數
城大、港大、理大	工學士（屋宇裝備工程學）	115
港大、理大	工學士（電機工程學）	110
港大、科大、理大	工學士（機械工程學）	270
中大	工學士（機械與自動化工程學）	80
理大	工學士（民航工程學）	40
	工學士（運輸系統工程學）	30
	總數	**645**

4.8 僅從畢業人數來看，2016 至 2018 年本地大學全日制學位課程每年的畢業生人數，預計會比機電工程業每年的推算人力訓練需求多出約 29%。然而，上述畢業生未必全部選擇就業，並投身機電工程業工作。另外，部分僱主，特別是地產及物業管理行業的僱主，雖然並不屬於是次人力調查的對象，但實際上會僱用不少機電工程課程畢業生。故此，專業人士／技師級的人力供求可算是大致相符。

[1] 城大： 香港城市大學
中大： 香港中文大學
港大： 香港大學
科大： 香港科技大學
理大： 香港理工大學

工科畢業生訓練計劃

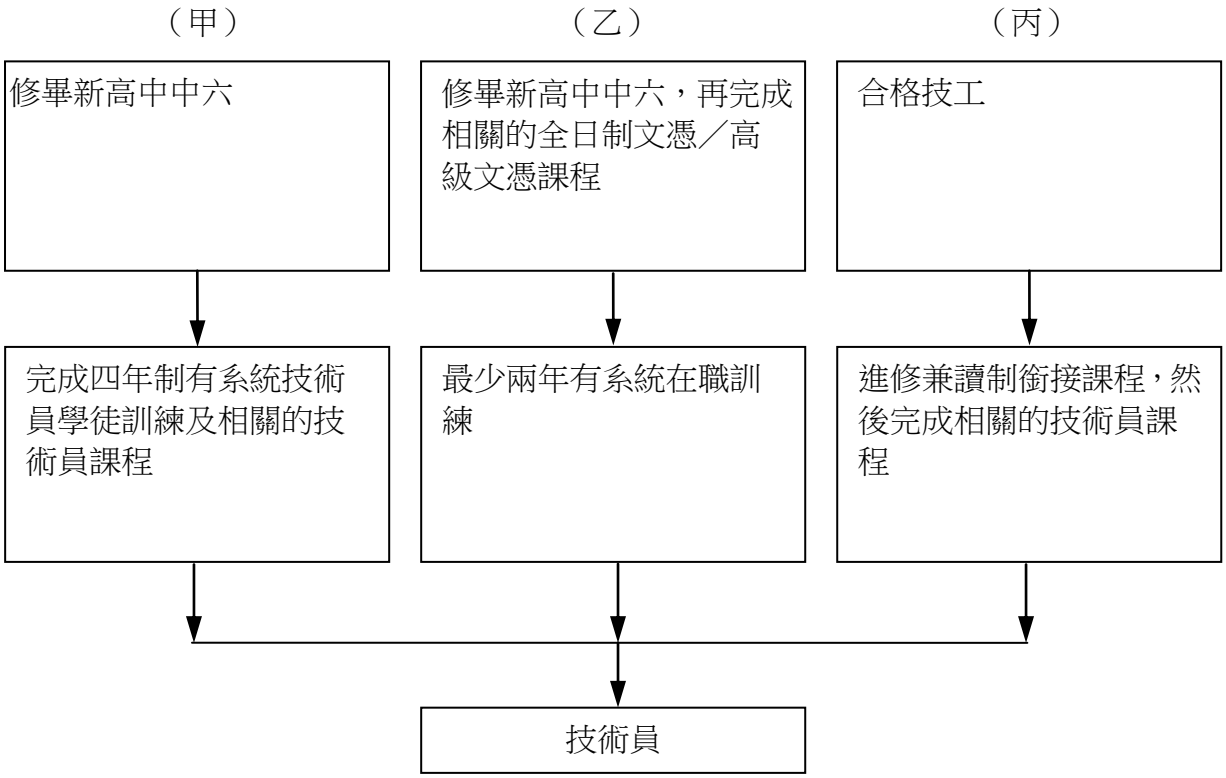
4.9 職業訓練局[VTC]轄下技師訓練委員會負責推行此項資助計劃，讓工科畢業生有更多機會接受有系統的實務訓練。工科畢業生可接受為期 18 個月的實務訓練，以符合香港工程師學會正式會員的資格標準。受訓的畢業生可經由僱主獲得薪金津貼。VTC 的技師訓練組亦提供免費服務，協助僱主招聘畢業生並支援與工科畢業生訓練有關事宜。本會籲請僱主利用此項計劃訓練工程師。

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，須具備相當學歷、工作經驗及曾接受實務訓練，一般可在專業人士／技師的督導下，運用已確立的技術和方法完成工作。

4.11 訓練技術員的三大途徑見圖 4.2。

圖 4.2 技術員訓練



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[lVE]開辦技術員程度的飛機維修工程、屋宇裝備工程、電機工程及機械工程全日制和兼讀制高級文憑課程，提供職前及在職培訓。

4.14 VTC 的青年學院開辦飛機維修、屋宇裝備工程、電機工程及機械工程職專文憑[1][DVE]課程。持有職專文憑或技術員基礎證書[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 參考第 3.15、3.23 及 3.30 各段的數字後，推算 2016 至 2018 年間機電工程業技術員級主要職務的每年平均訓練需求約為 900 人。

4.16 2016 至 2018 年間可投身機電工程業的相關技術員課程畢業生估計人數見表 4.3。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。

[1] 前稱「中專教育文憑」

表 4.3: 推算 2016 至 2018 年間
全日制技術員課程畢業生人數
（擔任機電工程業主要職務）

院校	課程	預計每年受僱畢業生人數
城大、理大	全日制高級文憑／副學士課程[1]：	
	- 屋宇裝備工程學	55
	- 電機工程學	15
	小計	70
IVE	全日制高級文憑課程[2]：	
	- 飛機維修工程	60
	- 屋宇裝備工程	265
	- 電機工程	370
	- 機械工程	205
	小計	900
青年學院	全日制職專文憑課程[3] （持職專文憑學歷的畢業生）：	
	- 飛機維修	50
	- 屋宇裝備工程	35
	- 電機工程	55
	- 機械工程	30
	小計	170
	總計	**1 140**

[1] 上表所列的數字假設 60%大學高級文憑／副學士課程畢業生升讀學位課程，其餘 40%選擇就業。
[2] 預計投身社會工作的畢業生人數，於推算時已考慮 2013/14 學年的升學率。
[3] 大部分持職專文憑學歷的畢業生已完成中六。上表所列的數字是根據 2014/15 學年的就業率及 2015/16 學年的入學率推算所得。

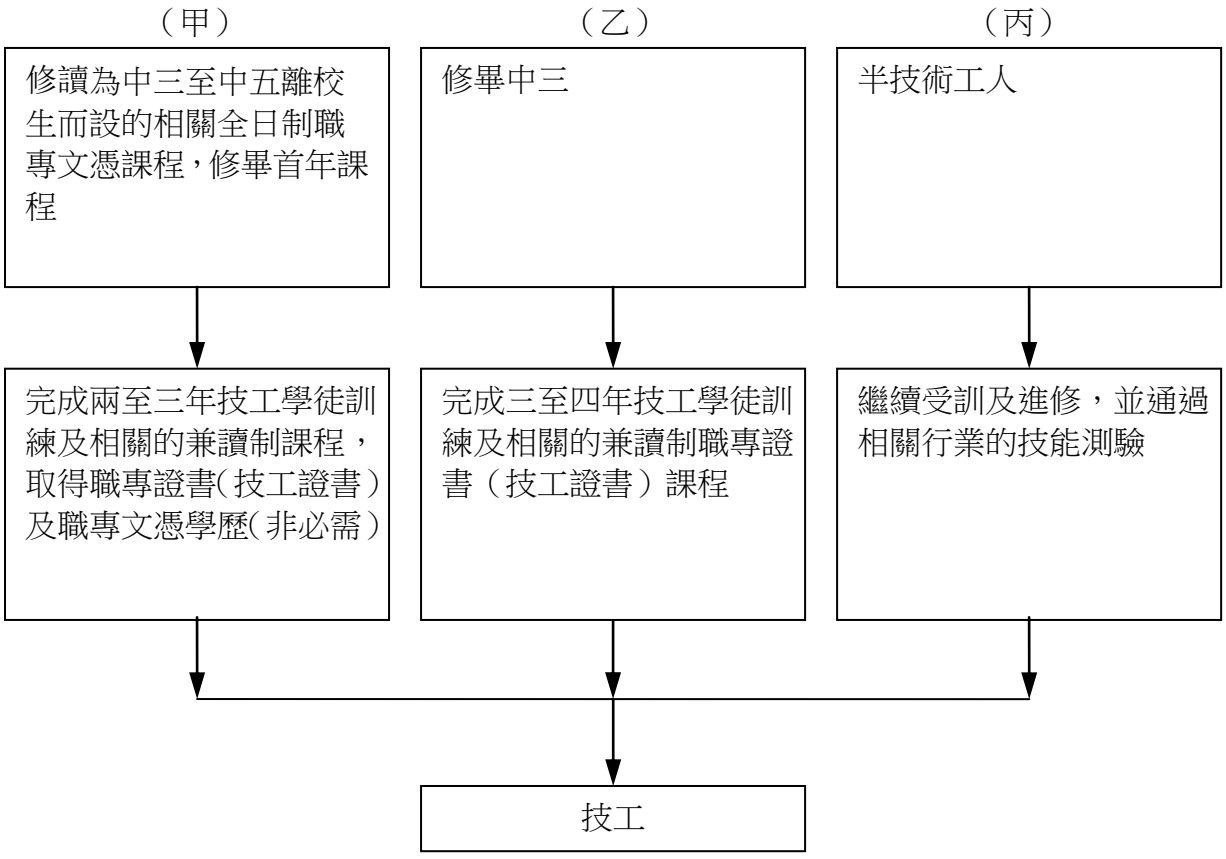
4.17 2016 至 2018 年，預計本地大學全日制課程每年的技術員畢業生人數，比機電工程業每年的推算人力訓練需求多出約 27%，與專業人士／技師級的情況相似。不過，考慮到部分畢業生會投身其他行業，亦有部分畢業生受僱的機構並不在是次調查範圍內，故技術員級的人力供求也可算是大致相符。

技工訓練

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

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，即可擔任工作。

4.21 以中三至中五離校生為對象的機電工程業各類技工課程，主要由 VTC 轄下青年學院提供。除了開辦全日制職專文憑課程（屬職前訓練課程），亦設有兼讀制職專文憑及職專證書[1]課程，供註冊技工學徒[2]修讀。此外，建造業議會[CIC]開設了電器裝置及水喉潔具兩項基本工藝課程。

4.22 參考第 3.15、3.23 及 3.30 各段的數字後，推算 2016 至 2018 年間機電工程業技工級主要職務的每年平均訓練需求約為 2 300 人。

4.23 表 4.4 列載 2016 至 2018 年間，VTC 全日制訓練課程畢業生擔任機電工程業主要職務見習技工的推算每年平均人數。

表 4.4: 推算2016至2018年間
成為見習技工的全日制職專文憑課程畢業生人數
（擔任機電工程業主要職務）

院校	課程	預計每年受僱畢業生人數[3]
青年學院	全日制職專文憑課程（中三至中五生）：	
	- 空調製冷	110
	- 屋宇裝備工程	85
	- 電機工程	150
	- 消防裝備工程	20
	- 氣體燃料工程	35
	- 升降機及自動梯工程	50
	- 機械工程	90
	- 通訊及智能監控科技	45
	- 焊接科技及檢定	10
	總數	**595**

[1] 前稱「技工證書」
[2] 又稱「文憑學徒」
[3] 數字根據 2014/15 學年的就業率及 2015/16 學年的入學率推算所得。

4.24 第 4.23 段提及的全日制課程畢業生通常先受聘為技工學徒，再修讀日間兼讀制職專文憑或職專證書課程，接受正式訓練。另有部分青年人未曾修讀過全日制職專文憑（即圖 4.3 所示的訓練途徑（乙）），也投身機電工程業成為技工學徒。根據日間兼讀制職專文憑及職專證書課程預計每年的新生人數，推算 2016 至 2018 年的見習技工（包括圖 4.3 所示的訓練途徑（甲）及途徑（乙））總人數見表 4.5。

表 4.5: 推算 2016 至 2018 年間
修讀日間兼讀制職專文憑／職專證書課程
新註冊機電工程技工學徒人數

院校	課程	預計每年新生人數[1]
青年學院	職專文憑／職專證書（空調製冷）	205
	職專文憑／職專證書（屋宇裝備工程）	80
	職專文憑／職專證書（電機工程）	325
	職專證書（氣體燃料工程）	30
	職專文憑／職專證書（升降機及自動梯工程）	185
	職專文憑／職專證書（機械工程）	160
	職專文憑（飛機維修）	20
	職專文憑（數碼電子科技）	45
	總數	**1 050**

4.25 本會比較第 4.22 段及表 4.5 的數字，發現 2016 至 2018 年每年新註冊機電工程技工學徒的估計人數，僅能滿足推算每年所需訓練人手的 46%。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，但是人力供應仍不足以支持行業發展。

4.26 為培訓足夠合格技工支援機電工程業持續發展，本會建議培訓機構增加機電學科職前培訓名額，並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。

[1] 數字根據 2015/16 學年的入學人數推算所得。

4.27 現時青年人的出路選擇較以往多，僱主應繼續宣傳機電工程業的形象及前景，以吸引更多中學離校生考慮入行。

機電業（建築）學員培訓津貼計劃

4.28 香港持續發展基建及建築項目，機電工程業對人手需求殷切，為配合相關需求，建造業議會[CIC]、香港機電工程商聯會[HKFEMC]及 VTC 自 2013/14 學年起，攜手推出「機電業（建築）學員培訓津貼計劃」。計劃適用於為中三程度學生而設的七個機電工程相關的職專文憑課程：屋宇裝備工程、空調製冷工程、消防裝備工程、電機工程、升降機及自動梯工程、機械工程、焊接科技及檢定。入讀學生可享有 CIC 每月津貼（1,400 元 x 11 個月），修讀全日制課程首年期間，可獲安排在 HKFEMC 成員公司進行 90 小時工作實習。完成一年全日制課程，並投身 CIC 認可公司成為學徒，學生可於受訓期間額外獲得 15,400 元的獎勵津貼。2014/15 學年，津貼計劃涵蓋多兩個供中三生修讀的職專文憑課程（氣體燃料工程、通訊及智能監控科技），以及四個供中六生修讀的職專文憑課程（屋宇裝備工程、電機工程、機械工程、建造工程）。

「職」學創前路先導計劃

4.29 獲立法會財務委員會 2014 年 7 月批准撥款後，「職」學創前路先導計劃（又名「職業教育和就業支援計劃」）正式啟動。計劃提供職業教育及培訓，結合有系統的學徒訓練和清晰的職業發展路徑於一身。在受訓期間，學徒除了獲得特定薪酬，還可獲政府發放 72,000 元津貼和參與行業的 30,800 元津貼（例如機電業（建築）學員培訓津貼計劃的資助金）。參與計劃的青年人能夠一邊賺取穩定收入，一邊學習知識和技能，開創理想的事業前景。為了進一步提高計劃的吸引力，VTC 亦革新培訓課程，技工學徒在受訓期間，除了能取得職專證書，也能考獲職專文憑資格。自計劃推出以來，相關職專文憑課程的入學率及留讀率顯著上升。

半技術工人／普通工人訓練

4.30 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。考慮到技工級人手短缺，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／津貼計劃，以改善本業再培訓課程的報讀情況。CIC 推出的「承建商合作培訓計劃」屬成功例子，自 2013/14 財政年度已擴展至機電工程業。

4.31 現時市場競爭日趨激烈，僱主應為半技術工人／普通工人提供在職增修訓練，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，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」），以及 CIC 近期推出的進階工藝培訓計劃－先導計劃（「系統性在職培訓」及「技術提升課程」），均能推動這方面的工作。

VTC 轄下的卓越培訓發展中心

4.32 VTC 轄下的多間卓越培訓發展中心，如電機業、氣體燃料業、機械業、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機電工程學科專業教育訓練課程（包括技術員及技工級）；

(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

4.33 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，目的如下：

(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；以及

(e) 為技術人員設立技能等級，作為事業晉升階梯。

4.34 本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。VTC 接受本會的建議，將繼續檢討並簡化技能測驗的運作程序，以免輪候測驗的時間過長。

4.35 為協助從業員按《升降機及自動梯條例》（第 618 章）進行註冊，本會自 2012 年 12 月特別為升降機技工及自動梯技工推出兩項新的技能測驗。

4.36 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工資格。

為從事機電工種的建築工人而設的指明訓練課程及技能測驗

4.37 CIC 開辦指明訓練課程，供根據《建造業工人註冊條例》「臨時註冊」的技術工人修讀，協助他們於三年臨時期限屆滿前取得註冊資格。

4.38 2010 年 9 月前，VTC 受 CIC 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 CIC 負責，但 VTC 各卓越培訓發展中心仍繼續提供培訓，讓職專文憑課程學生參加中工測試，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。

4.39 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指明訓練課程，從而符合《建造業工人註冊條例》的規定。

新科技培訓計劃

4.40 新科技培訓計劃向本地僱主提供資助，最高可達訓練開支的 50%，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

4.41 本會對 2016 至 2018 年人力訓練的主要結論及建議扼述如下：

(a) 專業人士／技師訓練：

2016 至 2018 年本地大學全日制機電工程學科學位課程每年的畢業生人數，大致能配合本會推算業界每年所需的訓練人手。

(b) 技術員訓練：

2016 至 2018 年城大、理大、IVE 及青年學院全日制技術員課程每年的畢業生人數，能滿足本會推算機電工程業每年所需訓練的人手。

(c) 技工訓練：

(i) 2016 至 2018 年機電工程每年新註冊技工學徒的估計人數，僅能滿足業內每年所需訓練人手的 46%。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，但相信仍不足以支持業界發展。

(ii) 在機電業（建築）學員培訓津貼計劃及「職」學創前路先導計劃等獎勵計劃的推動下，本會建議增加技工級職前訓練課程的學額，並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。

(d) 半技術工人／普通工人訓練

由於技工人手短缺，本會建議透過 CIC 的「承建商合作培訓計劃」，培訓更多半技術工人／普通工人，以紓緩技工的工作量。

(e) 香港特區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，循清晰的進修途徑發展事業。

(f) 僱主應鼓勵僱員參加政府認可的技能測驗，取得相關資格。

(g) 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。

Appendix 1

Electrical and Mechanical Services Training Board

Membership
(As at 1st November 2015)

Chairman

Mr CHONG Kin-lit, Paul, MH	(ad personam)

Members

Ir CHAN Chi-ming	(nominated by a Local Craft Repairing Company)
Ir CHAN Kwok-wai, Weller	(nominated by an Electric Railway Company)
Ir CHAN Loong, Geoffrey	(nominated by the Hong Kong Institution of Engineers)
Mr CHAN Yun-fu	(nominated by the Hong Kong and Kowloon Electrical Engineering and Appliances Trade Workers Union)
Ir Dr CHUNG Wai-nang	(nominated by an Aircraft Engineering Company)
Mr LAI Wah-hing	(nominated by the Lift and Escalator Contractors Association)
Professor LAM Chuen-chun, David	(nominated by a Local University)
Mr LEUNG Chung-fai, Fernando	(nominated by an Ocean-going Vessel Repairing Company)
Mr NG Liu-kai, Brian	(nominated by the Hong Kong & Kowloon Electric Trade Association)
Ir TO Wang-kam	(nominated by an Electrical and Mechanical Engineering Consulting Company)
Ir TO Wing-ming, James	(nominated by the Hong Kong and China Gas Company Ltd.)
Ir TO Yip-lam	(nominated by an Electricity Supply Company)
Ir TSANG Hing-cheung, Gilbert	(nominated by the Hong Kong Electrical and Mechanical Contractors' Association)

Ir WAI Yip-kin	(nominated by Hong Kong Electrical Contractors' Association Ltd)
Ir Dr WONG Chun-sing	(nominated by a Professional Body of the Building Services Operation and Maintenance Sector)
Ir WU Chi-fai	(nominated by the Hong Kong Air Conditioning and Refrigeration Association Ltd)
Mr YIU Chow-leung	(nominated by a LP Gas Supply Company)
Mr YU Hing-wai	(nominated by the Association of Registered Fire Service Installation Contractors of Hong Kong Ltd.)
Mr HO Pak-chuen	(representative of the Commissioner for Labour)
Mr YAN Man-kit, Andrew	(representative of the Director of Electrical and Mechanical Services)
Dr CHAN Wan-ching, Lawrence	(representative of the Executive Director of the Vocational Training Council)

Secretary

Mr FUNG Ming-kong, Steve	(Vocational Training Council)

機電工程業訓練委員會
委員名單

(二零一五年十一月一日)

主席 ：

莊堅烈先生, MH	(獨立人士)

委員 ：

陳志明工程師	(一間本地船隻維修公司提名)
陳國偉工程師	(一間電氣化鐵路公司提名)
陳龍工程師	(香港工程師學會提名)
陳潤富先生	(港九電器工程電業器材職工會提名)
鍾偉能博士工程師	(一間飛機工程公司提名)
黎華興先生	(電梯業協會提名)
林銓振教授	(一間本地大學提名)
梁仲徽先生	(一間遠洋輪船維修公司提名)
吳旅佳先生	(港九電業總會提名)
杜宏金工程師	(一間電機及機械工程顧問公司提名)
杜永明工程師	(香港中華煤氣有限公司提名)
杜業林工程師	(一間電力公司提名)
曾慶祥工程師	(香港機電工程商協會提名)
韋業堅工程師	(香港電器工程商會提名)
黃振聲博士工程師	(一間屋宇設備運行及裝修專業團體提名)
胡志輝工程師	(香港空調及冷凍商會有限公司提名)
姚秋樑先生	(一間石油氣供應商)
余慶為先生	(香港註冊消防工程公司商會有限公司提名)
賀百川先生	(勞工處處長代表)
甄文傑先生	(機電工程署署長代表)
陳雲青博士	(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。

2015 Manpower Survey of the Electrical and Mechanical Services Industry
2015 機電工程業人力調查

Sampling Plan (Q3/2014)
抽樣方案（2014年第三季）

Branch 門類	HSIC v2.0 香港標準行業分類 2.0 版	Employment Size 僱員人數	Stratum 分層	No. of Establishments 機構數目	Sampling Fraction 樣本百分	Total Sample Size 樣本總數
I Electrical and Mechanical Engineering Sector 機電工程						
1. Contracting (E&M) 承造 - Electrical wiring and fitting 電線鋪設及電器裝設 - Fire alarm and fire fighting equipment, installation and maintenance 火警及滅火設備安裝及保養 - Telecommunications equipment, installation and maintenance 電訊設備安裝及保養 - Air-conditioning and ventilation system, installation and maintenance 空氣調節 ／通風系統安裝及保養	432101, 432103, 432106 & 432201	1-9	1	4 612	0.05	233
		10-49	2	469	0.20	95
		50-99	3	18	1.00	18
		100 & over 及以上	4	19	1.00	19
		Sub-total 分類總數		**5 118**		**365**
2. Electrical Fitting with Water Plumbing 電器裝備兼水管鋪設	432102	1-9	1	1 355	0.25	340
		10-49	2	24	1.00	24
		50-99	3	1	1.00	1
		100 & over 及以上	4	2	1.00	2
		Sub-total 分類總數		**1 382**		**367**
3. Servicing (E&M) 服務 - Aircraft assembly and repair 飛行器裝嵌及相關機械的製造 - Repair of electrical equipment 電力設備維修 - Electric power generation, transmission and distribution 發電、輸電及配電 - Combined and other installation and maintenance of electrical and mechanical equipment 綜合及其他電器及機械設安裝及保養 - Combined and other ventilation, gas and water fitting, installation and maintenance 綜合及其他通風、燃氣及水務設備安裝及保養 - Lift and escalator, installation and maintenance 升降機／電動夫梯安裝及保養 - Railway and cable transport 鐵路纜索運輸 - Building services engineering 屋宇設備工程服務 - Repair of household appliances, home and garden equipment 家用器具及庭園設備修理	303000, 331400, 351000, 432199, 432299, 432901, 491000, 711400 & 953200	1-9	1	2 540	0.05	129
		10-49	2	165	0.20	35
		50-99	3	17	1.00	17
		100 & over 及以上	4	40	1.00	40
		Sub-total 分類總數		**2 762**		**221**
***4. Supplementary Samples 附加調查機構** (Electrical and Mechanical Engineering Sector 機電工程)		**Sub-total 分類總數**		**127**	1.00	**127**
II Shipbuilding and Ship Repair Sector 船舶修建						
5. Shipyards and Boatyards 船廠及艇廠	301100, 301200 & 331500	1-9	1	268	0.10	27
		10-49	2	17	1.00	17
		50-99	3	2	1.00	2
		100 & over 及以上	4	3	1.00	3
		Sub-total 分類總數		**290**		**49**
***6. Supplementary Samples 附加調查機構** (Shipbuilding and Ship Repair Sector 船舶修建)		**Sub-total 分類總數**		**21**	1.00	**21**
III Gas Sector 氣體燃料						
7. Gas Supply 燃氣供應	352000	1-9	1	1	1.00	1
		10-49	2	3	1.00	3
		50-99	3	-	1.00	0
		100 & over 及以上	4	1	1.00	1
		Sub-total 分類總數		**5**		**5**
8. Gas Fitting, Installation and Maintenance 燃氣配件、安裝及保養	432204	1-9	1	126	0.35	44
		10-49	2	16	1.00	16
		50-99	3	1	1.00	1
		100 & over及以上	4	-	-	-
		Sub-total 分類總數		**143**		**61**
***9. Supplementary Samples 附加調查機構** (Gas Sector 汽體燃料)		**Sub-total 分類總數**		**20**	1.00	**20**
Total 總數				**9 868**		**1 236**

Notes: * Data Collect at company level.
註: * 以公司名義收集數據

Survey Reference Date: **16 March 2015**
統計日期：**2015年3月16日**

Appendix 4A
附錄 4A

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 2015 MANPOWER SURVEY OF THE ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機 電 工 程 業 2015 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						
	1	2 3	4 5 6 7 8 9	10 11 12 13 14 15	16 17	18 19	20 21 22	23 24 25 26 27

NAME OF ESTABLISHMENT: _____
機 構 名 稱

TOTAL NO. OF PERSONS ENGAGED: _____
僱 員 總 人 數

ADDRESS: _____
地 址

TYPE OF SERVICE: _____
服 務 性 質

NAME OF PERSON TO CONTACT: _____ (28 – 47)
聯 絡 人 姓 名

POSITION: _____
職 位

TEL. NO.: _____ (48 – 55) - _____ (56 – 63)
電 話

FAX NO.: _____
圖 文 傳 真

E-MAIL: _____ (64 – 98)
電 郵

VTC-EM-01

Part I (第一部份)

E

Sheet 1
第 1 頁

	(A) Principal Jobs 主要職務			(B) Average Monthly Income 每月平均收入	(C) No. of Employees as at Survey Reference Date (excl. trainees) 統計日期的僱員人數（受訓者除外）	(D) Forecast of No. of Employees 12 Months from Survey Reference Date (excl. trainees) 預計統計日期12個月後僱員人數（受訓者除外）	(E) No. of Vacancies as at Survey Reference Date (excl. trainees) 統計日期的空缺額(受訓者除外)	(F) No. of Trainees as at Survey Reference Date 統計日期的受訓者人數	(G) Forecast of No. of Trainees 12 Months from Survey Reference Date 預計統計日期12個月後受訓者人數
	Job Title 職稱 (See Appendix D) (參閱附錄D)	Rec. Type	Job Code 職位編號	Code* 編號					
	For Official Use Only 此欄毋須填寫 →		8-10	11	12-15	16-19	20-22	23-25	26-28
1	Building Services Engineer 屋宇設備工程師	2	1 0 1						
2	Electrical Engineer 電機工程師	2	1 0 2						
3	Refrigeration/Air-conditioning/Ventilation Engineer 冷凝／空氣調節／通風設備工程師	2	1 0 3						
4	Mechanical Engineer 機械工程師	2	1 0 4						
5	Plumbing and Drainage Engineer 水喉及渠務工程師	2	1 0 5						
6	Lift/Escalator Engineer 升降機／自動梯工程師	2	1 0 6						
7	Fire Services Engineer 消防設備工程師	2	1 0 7						
8	Electronics Engineer 電子工程師	2	1 0 8						
9	Control and Instrumentation Engineer 控制及儀器工程師	2	1 0 9						
10	Engineering Manager 工程經理	2	1 1 0						
11	Safety Officer 安全主任	2	1 1 1						
12	Aircraft Maintenance Engineer 飛機維修工程師	2	1 1 2						
13	Supervisor 監督	2	2 0 1						

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

Average Monthly Income Range 每月平均收入幅度	Code 編號
$9,000 or below 或以下	1
$9,001 - $12,000	2
$12,001 - $15,000	3
$15,001 - $18,000	4
$18,001 - $25,000	5
$25,001 - $35,000	6
$35,001 - $45,000	7
$45,001 - $60,000	8
Over $60,000 以上	9

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

附註：「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。

14	Building Services Technician 屋宇設備技術員	2	2	0	2						
15	Draughtsman 繪圖員	2	2	0	3						
16	Electrical Engineering Technician 電機工程技術員	2	2	0	4						
17	Refrigeration/Air-conditioning/Ventilation Technician 冷凝／空氣調節／通風設備技術員	2	2	0	5						
18	Mechanical Engineering Technician 機械工程技術員	2	2	0	6						
19	Lift/Escalator Technician 升降機／自動梯技術員	2	2	0	7						
20	Fire Services Technician 消防設備技術員	2	2	0	8						
21	Electrical Instrument and Meter Technician 電工儀器技術員	2	2	0	9						
22	Electronics Technician 電子技術員	2	2	1	0						
23	Telecommunication Technician 電訊技術員	2	2	1	1						
24	Office Equipment Service Technician 辦公室設備維修技術員	2	2	1	2						
25	Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	2	2	1	3						
26	Aircraft Maintenance Technician 飛機維修技術員	2	2	1	4						
27	Rolling Stock Technician 鐵道車輛技術員	2	2	1	5						
28	Railway Signalling Technician 鐵路訊號技術員	2	2	1	6						
29	Foreman/Chargehand 管工／領工	2	3	0	1						
30	Building Services Mechanic 屋宇設備技工	2	3	0	2						
31	Electrician/Electrical Fitter 電工／電氣打磨裝配工	2	3	0	3						
32	Control Panel Assembler 控制板裝配工	2	3	0	4						
33	Electrical Wireman 電氣佈線工	2	3	0	5						
34	Refrigeration/Air-conditioning/Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	2	3	0	6						
35	Refrigeration/Air-conditioning/Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	2	3	0	7						
36	Refrigeration/Air-conditioning/Ventilation Mechanic (Air System)/Sheet Metal Worker 空調製冷設備技工(送風系統)／薄片金屬構造工	2	3	0	8						

37	Refrigeration/Air-conditioning/Ventilation Mechanic (Thermal Insulation)/Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	2	3	0	9						
38	Refrigeration/Air-conditioning/Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	2	3	1	0						
39	Plumber and Pipe Fitter 喉管工	2	3	1	1						
40	Mechanical Fitter/Machinist 機械打磨裝配工／機床工	2	3	1	2						
41	Lift Mechanic 升降機技工	2	3	1	3						
42	Escalator Mechanic 自動梯技工	2	3	1	4						
43	Fire Services Electrical Fitter 消防電氣裝配工	2	3	1	5						
44	Fire Services Mechanical Fitter 消防機械裝配工	2	3	1	6						
45	Cable Jointer (Power) 強電流電纜接駁工	2	3	1	7						
46	Overhead Linesman 架空電線技工	2	3	1	8						
47	Electrical Appliances Service Mechanic 電器用具服務技工	2	3	1	9						
48	Welder 銲接工	2	3	2	0						
49	Carpenter 木工	2	3	2	1						
50	Painter 髹漆工	2	3	2	2						
51	AV and RF Mechanic 影音及射頻技工	2	3	2	3						
52	Building Security System Mechanic 屋宇防盜系統技工	2	3	2	4						
53	Communication System Mechanic 電訊系統裝配工	2	3	2	5						
54	Aircraft Maintenance Mechanic 飛機維修技工	2	3	2	9						
55	Rolling Stock Tradesman 鐵道車輛技工	2	3	3	0						
56	Railway Signalling Tradesman 鐵路訊號技工	2	3	3	1						
57	Labourer 雜工	2	4	0	1						
58	Semi-skilled Worker 半技術工	2	4	0	2						

Part I (第一部份)

S

	(A) Principal Jobs 主要職務			(B) Average Monthly Income 每月平均收入	(C) No. of Employees as at Survey Reference Date (excl. trainees) 統計日期的僱員人數（受訓者除外）	(D) Forecast of No. of Employees 12 Months from Survey Reference Date (excl. trainees) 預計統計日期12個月後僱員人數（受訓者除外）	(E) No. of Vacancies as at Survey Reference Date (excl. trainees) 統計日期的空缺額(受訓者除外)	(F) No. of Trainees as at Survey Reference Date 統計日期的受訓者人數	(G) Forecast of No. of Trainees 12 Months from Survey Reference Date 預計統計日期12個月後受訓者人數
	Job Title 職稱 (See Appendix D) (參閱附錄D)	Rec. Type	Job Code 職位編號	Code* 編號					
	For Official Use Only 此欄毋須填寫 →		8-10	11	12-15	16-19	20-22	23-25	26-28
1	Electrical Engineer 電機工程師	2	1 5 1						
2	Marine Engineer 輪機工程師	2	1 5 2						
3	Mechanical Engineer 機械工程師	2	1 5 3						
4	Ship Designer/Naval Architect 船舶設計師／造船工程師	2	1 5 4						
5	Ship Repairs Manager/Superintendent 船舶修理主管或船舶修理監督	2	1 5 5						
6	Safety Officer 安全主任	2	1 5 6						
7	Draughtsman 繪圖員	2	2 5 1						
8	Electrical Engineering Technician 電機工程技術員	2	2 5 2						
9	Electronics/Telecommunication Technician 電子／通訊技術員	2	2 5 3						
10	Estimator 估計員	2	2 5 4						
11	Mechanical Engineering Technician 機械工程技術員	2	2 5 5						
12	Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	2	2 5 6						
13	Supervisor/Chargehand 監督／管工	2	2 5 7						

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

Average Monthly Income Range 每月平均收入幅度	Code 編號
$9,000 or below 或以下	1
$9,001 - $12,000	2
$12,001 - $15,000	3
$15,001 - $18,000	4
$18,001 - $25,000	5
$25,001 - $35,000	6
$35,001 - $45,000	7
$45,001 - $60,000	8
Over $60,000 以上	9

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

附註：「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。

14	Air-conditioning Mechanic/Sheet Metal Worker 空氣調節技工／薄片金屬構造工	2	3	5	1							
15	Carpenter 木工	2	3	5	2							
16	Crane Driver 起重機操作工	2	3	5	3							
17	Electrician 電工	2	3	5	4							
18	Mechanical Fitter 機械打磨裝配工	2	3	5	5							
19	GRP - Worker 玻璃纖維工	2	3	5	6							
20	Machinist 機床工	2	3	5	7							
21	Marine Pipeworker 船舶喉管工	2	3	5	8							
22	Painter 髹漆工	2	3	5	9							
23	Rigger 索具工／喊吔工	2	3	6	0							
24	Ship Classification Qualified Welder 船級協會認可焊接工	2	3	6	1							
25	Steel Worker (Boiler Maker/Steel Plater/Blacksmith) 鋼鐵工（鍋爐工、造船鋼板工、捻縫工或鐵工）	2	3	6	2							
26	Welder 銲接工	2	3	6	3							
27	Labourer 雜工	2	4	5	1							
28	Semi-skilled Worker 半技術工	2	4	5	2							
29		2										
30		2										

Part I (第一部份)

G

	(A) Principal Jobs 主要職務			(B) Average Monthly Income 每月平均收入	(C) No. of Employees as at Survey Reference Date (excl. trainees) 統計日期的僱員人數（受訓者除外）	(D) Forecast of No. of Employees 12 Months from Survey Reference Date (excl. trainees) 預計統計日期12個月後僱員人數（受訓者除外）	(E) No. of Vacancies as at Survey Reference Date (excl. trainees) 統計日期的空缺額(受訓者除外)	(F) No. of Trainees as at Survey Reference Date 統計日期的受訓者人數	(G) Forecast of No. of Trainees 12 Months from Survey Reference Date 預計統計日期12個月後受訓者人數
	Job Title 職稱 (See Appendix D) (參閱附錄D)	Rec. Type	Job Code 職位編號	Code* 編號					
	For Official Use Only 此欄毋須填寫 →		8-10	11	12-15	16-19	20-22	23-25	26-28
1	Electrical Engineer 電機工程師	2	1 7 1						
2	Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	2	1 7 2						
3	Mechanical Engineer 機械工程師	2	1 7 3						
4	Safety Officer 安全主任	2	1 7 4						
5	Electrical Engineering Technician 電機工程技術員	2	2 7 1						
6	Gas Engineering Technician 氣體燃料工程技術員	2	2 7 2						
7	Mechanical Engineering Technician 機械工程技術員	2	2 7 3						
8	Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	2	2 7 4						
9	Supervisor/Chargehand 監督／管工	2	2 7 5						
10	Electrician/Electrical Fitter 電工／電氣打磨裝配工	2	3 7 1						
11	Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	2	3 7 2						
12	Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	2	3 7 3						
13	Gas Utilisation Fitter (Domestic) 氣體燃料應用技工（住宅式）	2	3 7 4						
14	Gas Utilisation Fitter (Non-domestic) 氣體燃料應用技工（非住宅式）	2	3 7 5						

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

Average Monthly Income Range 每月平均收入幅度	Code 編號
$9,000 or below 或以下	1
$9,001 - $12,000	2
$12,001 - $15,000	3
$15,001 - $18,000	4
$18,001 - $25,000	5
$25,001 - $35,000	6
$35,001 - $45,000	7
$45,001 - $60,000	8
Over $60,000 以上	9

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

附註: 「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。

15	Mechanical Fitter 機械打磨裝配工	2	3	7	6						
16	Welder 銲接工	2	3	7	7						
17	Driver (LPG Cylinder Wagon) 司機（石油氣瓶車）	2	4	7	1						
18	Labourer 雜工	2	4	7	2						
19	Semi-skilled Worker 半技術工	2	4	7	3						
20	Vehicle Attendant/Deliveryman (LPG Cylinder) 跟車／送貨員（石油氣瓶）	2	4	7	4						
21		2									
22		2									

THE 2015 MANPOWER SURVEY
OF THE ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機 電 工 程 業 2015年 人 力 調 查

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此欄毋須填寫

Est. No. _____

Er. No. _____

Questionnaire Part II (調查表第二部份) : Manpower Flow (人力動向)

1. Number of employees, including those who had retired, left your organisation in the past 12 months (excluding trainees):
貴機構過去12個月內離職的僱員人數（包括年屆退休而離職的僱員，但不包括受訓者）：

Professional / Technologist 專業人士／技師	Technician 技術員	Tradesman / Craftsman 技工	Semi-skilled/ General Worker 半技術／普通工人
8	11	14	17

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2. Number of employees recruited from E&M services industry by your organisation in the past 12 months (excluding new graduates, employees from other industries or trainees):
貴機構過去12個月內在機電工程業內招聘的僱員人數（不包括新畢業生、從其他行業轉任者或受訓者）：

Professional / Technologist 專業人士／技師	Technician 技術員	Tradesman / Craftsman 技工	Semi-skilled/ General Worker 半技術／普通工人
21	24	27	30

33

3. Number of employees (under the payroll of your organisation in Hong Kong) who were deployed to work outside Hong Kong for more than 6 months in the past 12 months:
過去12個月內，由貴機構香港辦事處支薪而被調派往香港以外地方工作超過6個月的僱員人數：

Professional / Technologist 專業人士／技師	Technician 技術員	Tradesman / Craftsman 技工
34	37	40

43

4. No. of Hong Kong E&M workers (on Macau payroll) employed in Macau by the subsidiary/ associated companies of your organization at date of survey:
在調查期內，受僱於貴機構在澳門的附屬公司之香港機電工程人員數目（由澳門公司發放薪金）：

Professional / Technologist 專業人士 / 技師	Technician 技術員	Tradesman / Craftsman 技工
44	47	50

53

For Organisations of Gas, Shipbuilding and Ship Repair sectors, please skip this question and go to Question 6.
從事氣體燃料行業及船舶修建工程行業的機構，請跳答問題(6)。

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此欄毋須填寫

5. For each job level, please indicate the relative percentage of manpower engaging in "Contracting" and "Servicing" work of the E&M Industry in your organisation:
(Please refer to item 12 of the Explanatory Note for definitions of "Contracting" and "Servicing".)
請填寫貴機構各職級的僱員，在從事機電工程業的「承造」及「維修服務」工作類別上相對的百分比：
(有關「承造」及「維修服務」工作類別的定義，請參閱附註內第十二項。)

	Contracting 承造	Servicing 維修服務	
(a) Professional / Technologist 專業人士／技師	___ % (54)	___ % (57)	___ (60)
(b) Technician 技術員	___ % (61)	___ % (64)	___ (67)
(c) Tradesman / Craftsman 技工	___ % (68)	___ % (71)	___ (74)
(d) Semi-skilled / General Worker 半技術／普通工人	___ % (75)	___ % (78)	___ (81)

6. What has been the situation of manpower supply for the industry in the past 12 months? (Please enter the appropriate code.)
過去12個月內，行業的人力供應情況如何？ (請填上適當編號。)

		Code 編號	Situation of Manpower Supply 人力供應情況	
(a) Professional / Technologist 專業人士／技師	___ (82)			___ (83)
Trainees of Professional / Technologist 專業人士／技師的受訓者	___ (84)	1	Very Insufficient 非常缺乏	___ (85)
		2	Insufficient 缺乏	
(b) Technician 技術員	___ (86)	3	Sufficient 充裕	___ (87)
Trainees of Technician 技術員的受訓者	___ (88)	4	Very Sufficient 非常充裕	___ (89)
(c) Tradesman / Craftsman 技工	___ (90)	5	No Comment 無意見	___ (91)
Trainees of Tradesman / Craftsman 技工的受訓者	___ (92)			___ (93)
(d) Semi-skilled / General Worker 半技術／普通工人	___ (94)			___ (95)

End of questionnaire. Thank you for your co-operation.
問卷完，多謝合作。

Appendix 4B
附 錄 4B

The 2015 Manpower Survey of the Electrical and Mechanical Services Industry
機電工程業 2015 年人力調查

Explanatory Notes
附　註

1. Please refer to the survey reference date shown on the front page of questionnaire.
請參閱調查表首頁所示的統計日期。

2. 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。

3. 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）。

4. 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。

5. Job Title - 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 the 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 the 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只擔任管理角色，但會間中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）。

6. 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。

7. Number of Employees as at Survey Reference Date (excluding trainees) - Column 'C'
統計日期的僱員人數（受訓者除外）—— 'C' 欄

For each job, please fill in the total number of employees as at survey reference date. The number should exclude trainees.
請填寫貴機構於統計日期僱用的每個職稱的員工總數。此總數不包括受訓者人數。

8. Forecast of Number of Employees 12 Months from Survey Reference Date (excluding trainees) - Column 'D'
預計統計日期 12 個月後僱員人數（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 survey reference date.
預計的僱員人數指貴機構於統計日期 12 個月後所僱用的員工總數（受訓者除外）。

9. Number of Vacancies as at Survey Reference Date (excluding trainees) - Column 'E'
統計日期的空缺額（受訓者除外）——'E' 欄

Please fill in the number of existing vacancies as at survey reference date (excluding those for trainees).
請填入貴機構在統計日期的空缺數目（受訓者空缺額除外）。

'Existing Vacancies' refer to those unfilled, immediately available job openings for which the establishment is actively trying to recruit personnel as at survey reference date.
「統計日期的空缺額」是指該職位於統計日期仍懸空，須立刻填補，而現正積極招聘人員填補。

10. Number of Trainees as at Survey Reference Date - Column 'F'
統計日期的受訓者人數——'F' 欄

Please fill in the total number of employees undergoing training as at survey reference date.
請填寫於統計日期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。

11. Forecast of Number of Trainees 12 Months from Survey Reference Date – Column "G"
預計統計日期 12 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 survey reference date.
預計的受訓者人數指貴機構於統計日期 12 個月後的受訓者總數。

12. Questionnaire Part II: Q.4 – "Contracting" and "Servicing" Work
(only applicable to establishments engaging in electrical and mechanical engineering)
調查表第二部份問題四 – 「承造」及「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。
「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。

13. 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. of Employees as at Survey Reference Date (excl. trainees) 統計日期的僱員人數（受訓者除外）	(D) Forecast of No. of Employees 12 Months from Survey Reference Date (excl. trainees) 預計統計日期12個月後僱員人數（受訓者除外）	(E) No. of Vacancies as at Survey Reference Date (excl. trainees) 統計日期的空缺額(受訓者除外)	(F) No. of Trainees as at Survey Reference Date 統計日期的受訓者人數	(G) Forecast of No. of Trainees 12 Months from Survey Reference Date 預計統計日期12個月後受訓者人數
	Job Title 職稱 (See Appendix D) (參閱附錄D)	Rec. Type	Job Code 職位編號	Code* 編號					
	For Official Use Only 此欄毋須填寫 →		8-10	11	12-15	16-19	20-22	23-25	26-28
1	Building Services Engineer 屋宇設備工程師	2	1 0 1	8	2	2	0	1	0
2	Electrical Engineer 電機工程師	2	1 0 2	7	3	5	1	1	1
13	Supervisor 監督	2	2 0 1	6	6	7	0	0	2
14	Building Services Technician 屋宇設備技術員	2	2 0 2	5	4	4	0	1	3
15	Draughtsman 繪圖員	2	2 0 3	4	2	2	0	1	3
16	Electrical Engineering Technician 電機工程技術員	2	2 0 4	5	6	8	1	2	1
30	Building Services Mechanic 屋宇設備技工	2	3 0 2	4	1 0	1 1	1	1	1
31	Electrician/Electrical Fitter 電工／電氣打磨裝配工	2	3 0 3	4	1 5	1 8	1	4	1
57	Labourer 雜工	2	4 0 1	2	2	1	0	0	0
58	Semi-skilled Worker 半技術工	2	4 0 2	2	6	6	0	0	0

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

Average Monthly Income Range 每月平均收入幅度	Code 編號
$9,000 or below 或以下	1
$9,001 - $12,000	2
$12,001 - $15,000	3
$15,001 - $18,000	4
$18,001 - $25,000	5
$25,001 - $35,000	6
$35,001 - $45,000	7
$45,001 - $60,000	8
Over $60,000 以上	9

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

Professional/Technologist
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 analysing 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。

Technician
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，須具備相當學歷、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去完成工作。

Tradesman/Craftsman

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 Worker

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。

Appendix 4D
附錄 4D
(E&M)

JOB DESCRIPTIONS FOR PRINCIPAL JOBS
IN THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR
機電工程行業主要職務的工作說明

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

Code 編號	Job Title 職稱	Job Description 工作說明
PROFESSIONAL/TECHNOLOGIST (Continued) 專業人士／技師（續）		
105	Plumbing and Drainage Engineer 水喉及渠務工程師	Researches into 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運作，但會間常提出專業工程建議及決定。此職位需由具備專業資歷的人士擔任。
111	Safety Officer 安全主任	Assists the employer of a workplace or a construction site in promoting the safety and health of persons employed therein, including the inspection of workplace, plants, equipment or works processes to identify any risks and to advise on preventive measures; investigates accidents and dangerous occurrences and makes recommendations to prevent similar accidents. 協助工作場所或建築地盤的東主從事促進僱員安全及健康的工作，包括視察廠房、設備或一般鑒別工作危險的程序，並就預防措施提供意見；調查意外及危險事故的成因，並就如何避免發生同類意外提供意見。
112	Aircraft Maintenance Engineer 飛機維修工程師	Plans, leads and supervises aircraft maintenance checks; Identifies and rectifies problems and defect; Analyses and interprets technical procedures, schematic engineering diagrams, manuals and publications; Establishes and maintains good business relationship with customers; Approves authorisation holder for issuing Certificate of Release to Service for different types of aircraft; He/She should be the holder of Category A or B Aircraft Maintenance Licence. 策劃、領導及監督飛機維修的檢驗工作；找出和矯正相關的問題和缺點；分析和詮釋技術程序、工程繪圖、手冊和刊物；與客戶建立和維繫良好商業關係；批准認可人士為各類飛機發出許可服務證明書；具備甲類或乙類航空器維修執照。

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

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

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued) 技術員（續）		
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。
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。
214	Aircraft Maintenance Technician 飛機維修技術員	Carries out aircraft maintenance and servicing tasks in a professional manner and certifies his/her own work within the scope of the approval under minimum supervision. Performs diagnostic evaluations of equipment and maintenance works to ensure quality delivery of services. Performs supervisory duties and ensures work is accomplished in accordance with the procedures and is progressively signed off. He/She should be the holder of Category A or B Aircraft Maintenance Licence. 在最少的指導下能專業地完成和保證飛機保養和維修的工作；為器材及維修工作給予準確的診斷評估，以確保有質素的服務；擔任指導的工作，並確保所有工作都能按程序完成及逐步驗收。具備甲類或乙類航空器維修執照。

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued) 技術員（續）		
215	Rolling Stock Technician 鐵道車輛技術員	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 electrical systems and mechanical equipment in rolling stock. 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、保養及修理鐵道車輛上的電機裝置和機械設備。
216	Railway Signalling Technician 鐵路訊號技術員	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 mechanical equipment in railway signalling system. 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、操作保養及修理鐵路訊號系統之電子裝置和機械設備。
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。

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

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

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

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued)　技工（續）		
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。
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。
329	Aircraft Maintenance Mechanic 飛機維修技工	Carries out aircraft maintenance/overhaul tasks under supervision to ensure optimal and safe operations. Uses aircraft documentation and maintenance publications relative to corresponding level properly. Ensures works are completed in accordance with the relevant Aircraft Maintenance manual instruction and reaches the required standards. Completes documentation relative to his/her level according to the requirements of the Civil Aviation Department. 在指導下完成飛機保養及大修的工作，以確保飛機在最理想及安全情況下運作。適當地應用相關程度的飛機保養文件及刊物。依照航空器保養手冊來進行維修工作，並達致所需標準。按民航署要求完成相關工作的記錄。
330	Rolling Stock Tradesman 鐵道車輛技工	Installs, tests, maintains and repairs electrical installations and mechanical parts of the rolling stock. 安裝、測試、保養及修理鐵道車輛上的電機裝置和機械部分。
331	Railway Signalling Tradesman 鐵路訊號技工	Installs, tests, maintains and repairs electronic devices and mechanical parts of the railway signalling system. 安裝、測試、保養及修理鐵路訊號系統之電子裝置和機械部分。

Code 編號	Job Title 職稱	Job Description 工作說明
SEMI-SKILLED WORKER/GENERAL WORKER　　半技術工人／普通工人		
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
PROFESSIONAL/TECHNOLOGIST 專業人士／技師		
151	Electrical Engineer 電機工程師	Carries out research on electrical engineering problems; designs electrical systems and plans and supervises their construction, installation, operation, maintenance and repair; and advises employers, associates or clients on electrical engineering matters. 研究電機工程問題；設計電氣系統，策劃與監督系統的建造、裝設、操作、保養及修理；向僱主、同僚或顧客提供關於電機工程的意見。
152	Marine Engineer 輪機工程師	Studies, designs and advises on propulsion systems, power plants, heating and ventilating systems, steering gear, pumps and other mechanical and electrical equipment, construction, installation, maintenance and repair. 研究、設計及就船舶推進系統、動力裝置、暖氣與通風系統、操舵裝置、泵、其他機械與電機設備的建造、裝設、保養及修理提供專業意見。
153	Mechanical Engineer 機械工程師	Carries out research on mechanical engineering problems; designs and advises on mechanically functioning, plant and equipment; and plans and supervises their development, manufacture, construction, installation, operation, maintenance and repair. 研究機械工程問題；設計機械設備，並提供專業意見。計劃及監督機械設備的發展、生產、建造、裝設、操作、保養及修理。
154	Ship Designer/Naval Architect 船舶設計師／造船工程師	Studies and prepares specifications for shipbuilding, conversion or repair. Studies, designs, and advises on the hulls and superstructures. Plans and supervises and be responsible for the overall design, their development, construction, maintenance and repair. 研究及編製建造新船、改裝船舶或修船的規格。研究、設計及就輪船的船身及上層結構提供專業意見。策劃、監督及負責輪船的全面設計、發展、構造、保養及修理。

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

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

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

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN (Continued)　技工（續）		
361	Ship Classification Qualified Welder 船級協會認可焊接工	Being certified by the ship classification societies as qualified welder to perform welding jobs 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。
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人		
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
PROFESSIONAL/TECHNOLOGIST 專業人士／技師		
171	Electrical Engineer 電機工程師	Designs and advises on electrical systems and equipment of fuel gas production plant; and plans and supervises their development, construction, installation, operation, maintenance and repair. 設計氣體燃料製造廠房的電機系統及設備，並就該方面提供意見；策劃及管理其發展、建造、安裝、操作、保養及修理。
172	Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	Designs and advises on supply or utilisation of gas. Plans, supervises and coordinates their development, construction, installation, operation, maintenance and repair. 設計氣體燃料的供應或應用，並就該方面提供意見。策劃、監督及協調其發展、建造、安裝、操作、保養及修理。
173	Mechanical Engineer 機械工程師	Designs and advises on mechanical equipment of fuel gas production plant; and plans and supervises their development, construction, installation, operation, maintenance and repair. 設計氣體燃料製造廠房的機械裝置及設備，並就該方面提供意見；策劃及管理其發展、建造、安裝、操作、保養及修理。
174	Safety Officer 安全主任	Assists the employer of a workplace in promoting the safety and health of persons employed therein, including the inspection of workplace, plants, equipment or works processes to identify any risks and to advise on preventive measures; investigates accidents and dangerous occurrences and makes recommendations to prevent similar accidents. 協助工作場所的東主從事促進僱員安全及健康的工作，包括視察廠房、設備或一般鑒別工作危險的程序，並就預防措施提供意見；調查意外及危險事故的成因，並就如何避免發生同類意外提供意見。

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

Code 編號	Job Title 職稱	Job Description 工作說明
TECHNICIAN (Continued) 技術員（續）		
275	Supervisor/ Chargehand 監督／管工	Performs supervisory duties contributory to the planning and allocation of tasks to workers and trainees, and to the inspection, quality control, installation, operation, maintenance and repair of equipment and system. 擔任管理職務，如策劃及分配工作予工人及受訓者；管理有關設備及系統的查驗、品質控制、安裝、操作、保養及修理。
TRADESMAN/CRAFTSMAN 技工		
371	Electrician/Electrical Fitter 電工／電氣打磨裝配工	Installs, tests, maintenances and repairs electrical installations in fuel gas production plants. 安裝、測試、保養和維修在氣體燃料製造廠房的電力裝置及設備。
372	Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	Installs, commissions, tests and services LPG distribution systems including storage and piping before meter point. 安裝、試用、測試及維修石油氣輸送系統，包括在石油氣錶前之石油氣貯藏及喉管鋪設。
373	Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	Installs, commissions, tests and services town gas distribution systems starting at outside the gas production works and terminating generally at one metre above ground level outside the consumer's building. 在煤氣生產處至用戶大廈通常離地一米處之間進行安裝、試用、測試及維修煤氣輸送系統。
374	Gas Utilisation Fitter (Domestic) 氣體燃料應用技工（住宅式）	Installs, commissions, tests and services all types of gas appliances together with their associated equipment, piping and gas supplies in domestic premises, including diagnostic fault finding and repairing. 安裝、試用、測試及維修住宅樓宇內一切氣體燃料用具、其附屬設備、喉管及氣體燃料供應系統。包括判斷與尋找故障及修理工作。

Code 編號	Job Title 職稱	Job Description 工作說明
TRADESMAN/CRAFTSMAN (Continued)　技工（續）		
375	Gas Utilisation Fitter (Non-domestic) 氣體燃料應用技工（非住宅式）	Installs, commissions, tests and services all types of gas appliances together with their associated equipment, piping and gas supplies in commercial and industrial premises, including diagnostic fault finding and repairing. 安裝、試用、測試及維修工商業樓宇內一切氣體燃料用具、其附屬設備、喉管及氣體燃料供應系統。包括判斷與尋找故障及修理工作。
376	Mechanical Fitter 機械打磨裝配工	Fits, assembles, erects, installs, repairs and services mechanical equipment of fuel gas production plant. 打磨、裝配、裝置、安裝、修理及檢修氣體燃料製造廠房的機械設備。
377	Welder 銲接工	Joins, cuts and deposits metals by means of an electric arc or a gas flame or by other welding or brazing processes for gas production plant and delivery system. 使用電弧、氣體火焰、黃銅銲接或其他銲接法，以接合、割切及附合金屬，用於氣體燃料製造廠房及輸送系統。
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人		
471	Driver (LPG Cylinder Wagon) 司機（石油氣瓶車）	Operates wagons to deliver LPG cylinders. 駕駛石油氣瓶車運送石油氣瓶。
472	Labourer 雜工	Undertakes general labouring work 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。

Appendix 5
附錄 5

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 2016 估計2016年3月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年3月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Building Services Engineer 屋宇設備工程師	1 304	56	72	56	1 376
Electrical Engineer 電機工程師	2 391	60	91	79	2 494
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	1 108	57	42	60	1 136
Mechanical Engineer 機械工程師	946	29	32	40	977
Plumbing and Drainage Engineer 水喉及渠務工程師	149	29	8	29	157
Lift/Escalator Engineer 升降機／自動梯工程師	311	19	6	23	317
Fire Services Engineer 消防設備工程師	501	21	25	21	525
Electronics Engineer 電子工程師	534	17	10	17	544
Control and Instrumentation Engineer 控制及儀器工程師	78	2	4	1	82
Engineering Manager 工程經理	1 450	3	30	3	1 466
Safety Officer 安全主任	209	10	7	10	216
Aircraft Maintenance Engineer 飛機維修工程師	494	2	90	-	631

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 2016 估計2016年3月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Sub-total 小計	**9 475**	**305**	**417**	**339**	**9 921**
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	3 903	16	189	8	4 100
Building Services Technician 屋宇設備技術員	1 875	54	69	62	1 949
Draughtsman 繪圖員	588	11	10	25	595
Electrical Engineering Technician 電機工程技術員	2 167	222	135	239	2 308
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	1 439	109	93	93	1 527
Mechanical Engineering Technician 機械工程技術員	1 028	124	61	121	1 084
Lift/Escalator Technician 升降機／自動梯技術員	834	2	91	2	925
Fire Services Technician 消防設備技術員	799	7	6	7	805
Electrical Instrument and Meter Technician 電工儀器技術員	62	1	-	2	62
Electronics Technician 電子技術員	804	101	31	91	835
Telecommunication Technician 電訊技術員	534	18	45	18	564
Office Equipment Service Technician 辦公室設備維修技術員	51	-	-	-	51
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	92	-	6	2	98

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 2016 估計2016年3月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Aircraft Maintenance Technician 飛機維修技術員	351	162	78	20	451
Rolling Stock Technician 鐵道車輛技術員	769	-	33	-	802
Railway Signalling Technician 鐵路訊號技術員	360	-	18	-	378
Supervisor/Chargehand 監督／管工	-	-	-	-	-
Sub-total 小計	**15 653**	**827**	**865**	**690**	**16 534**
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	4 453	12	433	12	4 893
Building Services Mechanic 屋宇設備技工	2 148	186	67	199	2 242
Electrician/Electrical Fitter 電工／電氣打磨裝配工	8 919	288	491	482	9 465
Control Panel Assembler 控制板裝配工	245	6	-	6	245
Electrical Wireman 電氣佈線工	1 372	44	5	40	1 385
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	3 268	299	99	254	3 391
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	1 914	45	220	42	2 129
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	766	128	50	132	814

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 2016 估計2016年3月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫) ／保溫技工	333	21	17	21	350
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	394	40	28	45	482
Plumber and Pipe Fitter 喉管工	699	2	16	5	727
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	2 020	248	107	259	2 102
Lift Mechanic 升降機技工	1 773	81	101	85	1 874
Escalator Mechanic 自動梯技工	940	112	166	152	1 106
Fire Services Electrical Fitter 消防電氣裝配工	632	19	112	19	744
Fire Services Mechanical Fitter 消防機械裝配工	1 302	24	60	34	1 322
Cable Jointer (Power) 強電流電纜接駁技工	262	31	8	31	274
Overhead Linesman 架空電線技工	289	12	6	5	300
Electrical Appliances Service Mechanic 電器用具維修技工	728	4	10	6	728
Welder 焊接工	88	-	-	-	88
Carpenter 木工	33	-	1	-	33
Painter 髹漆工	120	-	9	-	130
AV and RF Mechanic 影音及射頻技工	202	10	10	-	202

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 2016 估計2016年3月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Building Security System Mechanic 屋宇防盜系統技工	12	-	-	-	12
Communication System Mechanic 電訊系統裝配工	1 976	8	49	8	2 005
Aircraft Maintenance Mechanic 飛機維修技工	2 523	585	162	720	2 659
Rolling Stock Tradesman 鐵道車輛技工	580	-	-	-	580
Railway Signalling Tradesman 鐵路訊號技工	6	-	-	-	6
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工（住宅式）	20	-	-	-	20
Sub-total 小計	**38 017**	**2 205**	**2 227**	**2 557**	**40 329**
SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人					
Labourer 雜工	1 033	-	70	-	1 023
Semi-skilled Worker 半技術工人	2 068	-	387	-	2 550
Sub-total 小計	**3 101**	**-**	**457**	**-**	**3 573**
GRAND TOTAL 總 計	**66 246**	**3 337**	**3 966**	**3 586**	**70 357**

Appendix 6
附錄 6

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

BRANCH I : CONTRACTING E&M BRANCH
門 類 I: 承 造

MANPOWER STATISTICS
人 力 狀 況

Job Title 職 稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間空缺數目	Forecasted No. of Trainees by March 2016 估計2016年3月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年3月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Building Services Engineer 屋宇設備工程師	211	-	-	-	211
Electrical Engineer 電機工程師	672	10	17	12	690
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	640	10	15	13	641
Mechanical Engineer 機械工程師	68	-	-	-	74
Plumbing and Drainage Engineer 水喉及渠務工程師	11	-	1	-	12
Fire Services Engineer 消防設備工程師	376	15	20	15	396
Electronics Engineer 電子工程師	232	8	6	8	238
Engineering Manager 工程經理	531	-	1	-	516
Safety Officer 安全主任	43	-	1	-	44
Sub-total 小計	**2 784**	**43**	**61**	**48**	**2 822**

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 2016 估計2016年3月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	1 048	-	1	-	1 053
Building Services Technician 屋宇設備技術員	228	2	8	6	236
Draughtsman 繪圖員	190	3	-	3	190
Electrical Engineering Technician 電機工程技術員	637	15	5	9	642
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	881	37	51	22	927
Mechanical Engineering Technician 機械工程技術員	47	-	-	-	47
Fire Services Technician 消防設備技術員	699	4	2	4	701
Electrical Instrument and Meter Technician	5	-	-	-	5
Electronics Technician 電子技術員	155	10	-	-	155
Telecommunication Technician 電訊技術員	383	18	13	18	381
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	29	-	-	-	29
Sub-total 小計	**4 302**	**89**	**80**	**62**	**4 366**
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	1 620	-	-	-	1 627
Building Services Mechanic 屋宇設備技工	79	17	-	17	79

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 2016 估計2016年3月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Electrician/Electrical Fitter 電工／電氣打磨裝配工	4 175	43	312	249	4 467
Control Panel Assembler 控制板裝配工	193	1	-	1	193
Electrical Wireman 電氣佈線工	1 239	44	5	40	1 248
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	2 698	222	64	177	2 786
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	1 506	24	197	21	1 698
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	552	96	42	100	592
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫) ／保溫技工	240	-	5	-	245
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	283	10	21	15	364
Plumber and Pipe Fitter 喉管工	33	-	2	-	35
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	25	-	-	-	25
Fire Services Electrical Fitter 消防電氣裝配工	579	19	101	19	680
Fire Services Mechanical Fitter 消防機械裝配工	1 252	24	60	34	1 272

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 2016 估計2016年3月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Cable Jointer (Power) 強電流電纜接駁技工	60	10	-	10	60
Overhead Linesman 架空電線技工	97	-	-	-	97
Welder 焊接工	14	-	-	-	14
AV and RF Mechanic 影音及射頻技工	180	10	10	-	190
Communication System Mechanic 電訊系統裝配工	1 925	8	45	8	1 950
Sub-total 小計	**16 750**	**528**	**864**	**691**	**17 622**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人					
Labourer 雜工	491	-	-	-	391
Semi-skilled Worker 半技術工人	1 299	-	90	-	1 484
Sub-total 小計	**1 790**	**-**	**90**	**-**	**1 875**
GRAND TOTAL 總 計	**25 626**	**660**	**1 095**	**801**	**26 685**

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Building Services Engineer 屋宇設備工程師	3	-	-	-	3
Electrical Engineer 電機工程師	26	-	-	-	26
Plumbing and Drainage Engineer 水喉及渠務工程師	8	-	-	-	8
Engineering Manager 工程經理	7	-	-	-	9
Sub-total 小計	**44**	**-**	**-**	**-**	**46**
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	25	-	-	-	25
Building Services Technician 屋宇設備技術員	19	-	-	-	19
Draughtsman 繪圖員	20	-	-	-	20
Electrical Engineering Technician 電機工程技術員	37	-	4	-	41

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Electrical Instrument and Meter Technician 電工儀器技術員	4	-	-	-	4
Sub-total 小計	**105**	**-**	**4**	**-**	**109**
TRADESMAN/ CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	236	-	-	-	236
Building Services Mechanic 屋宇設備技工	330	2	2	2	332
Electrician/Electrical Fitter 電工／電氣打磨裝配工	1 650	12	41	12	1 691
Electrical Wireman 電氣佈線工	67	-	-	-	71
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	20	-	-	-	20
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	24	-	-	-	24
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	12	-	-	-	12
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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Plumber and Pipe Fitter 喉管工	398	1	4	1	414
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	4	-	-	-	4
Electrical Appliances Service Mechanic 電器用具維修技工	4	-	-	-	4
Carpenter 木工	12	-	-	-	12
Painter 髹漆工	8	-	-	-	8
Sub-total 小計	**2 799**	**15**	**47**	**15**	**2 842**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL　半技術工人／普通工人					
Labourer 雜工	62	-	-	-	62
Semi-skilled Worker 半技術工人	102	-	-	-	102
Sub-total 小計	**164**	**-**	**-**	**-**	**164**
GRAND TOTAL 總　計	**3 092**	**15**	**51**	**15**	**3 161**

Appendix 8
附錄 8

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

BRANCH III: SERVICING E&M BRANCH
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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Building Services Engineer 屋宇設備工程師	644	34	47	34	691
Electrical Engineer 電機工程師	1 187	15	38	32	1 237
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	261	7	21	7	282
Mechanical Engineer 機械工程師	415	17	21	28	431
Plumbing and Drainage Engineer 水喉及渠務工程師	57	-	7	-	64
Lift/Escalator Engineer 升降機／自動梯工程師	308	19	6	23	314
Fire Services Engineer 消防設備工程師	84	-	5	-	88
Electronics Engineer 電子工程師	142	-	1	-	143
Control and Instrumentation Engineer 控制及儀器工程師	56	2	4	1	60
Engineering Manager 工程經理	732	-	27	-	759

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Safety Officer 安全主任	99	-	2	-	101
Aircraft Maintenance Engineer 飛機維修工程師	492	2	90	-	629
Sub-total 小計	**4 477**	**96**	**269**	**125**	**4 799**
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	2 094	9	126	1	2 224
Building Services Technician 屋宇設備技術員	696	20	23	20	726
Draughtsman 繪圖員	253	8	4	18	257
Electrical Engineering Technician 電機工程技術員	983	108	66	107	1 055
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	356	41	32	45	388
Mechanical Engineering Technician 機械工程技術員	427	74	23	68	450
Lift/Escalator Technician 升降機／自動梯技術	830	2	88	2	918
Fire Services Technician 消防設備技術員	85	3	3	3	88
Electrical Instrument and Meter Technician 電工儀器技術員	28	1	-	2	28
Electronics Technician 電子技術員	135	58	2	58	137
Telecommunication Technician 電訊技術員	30	-	1	-	31

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Office Equipment Service Technician 辦公室設備維修技術員	51	-	-	-	51
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全督導員	36	-	-	-	36
Aircraft Maintenance Technician 飛機維修技術員	351	162	78	20	451
Rolling Stock Technician 鐵道車輛技術員	769	-	33	-	802
Railway Signalling Technician 鐵路訊號技術員	360	-	18	-	378
Sub-total 小計	**7 484**	**486**	**497**	**344**	**8 020**
TRADESMAN/ CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	734	-	11	-	745
Building Services Mechanic 屋宇設備技工	741	48	3	48	744
Electrician/Electrical Fitter 電工／電氣打磨裝配工	2 443	93	42	79	2 560
Control Panel Assembler 控制板裝配工	20	-	-	-	20
Electrical Wireman 電氣佈線工	49	-	-	-	49
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	293	20	9	20	302
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	247	21	11	21	258

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
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	180	20	6	20	186
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	56	20	6	20	62
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	80	20	6	20	86
Plumber and Pipe Fitter 喉管工	227	-	10	3	237
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	1 093	92	26	92	1 119
Lift Mechanic 升降機技工	1 743	80	99	84	1 842
Escalator Mechanic 自動梯技工	936	112	166	152	1 102
Fire Services Electrical Fitter 消防電氣裝配工	45	-	10	-	55
Fire Services Mechanical Fitter 消防機械裝配工	40	-	-	-	40
Cable Jointer (Power) 強電流電纜接駁技工	202	21	8	21	214
Overhead Linesman 架空電線技工	192	12	6	5	203
Electrical Appliances Service Mechanic 電器用具服務技工	713	4	10	6	723
Welder 焊接工	64	-	-	-	64
Carpenter 木工	11	-	-	-	11

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Painter 髹漆工	14	-	-	-	14
AV and RF Mechanic 影音及射頻技工	18	-	-	-	18
Building Security System Mechanic 屋宇防盜系統技工	12	-	-	-	12
Communication System Mechanic 電訊系統裝配工	17	-	-	-	17
Aircraft Maintenance Mechanic 飛機維修技工	2 523	585	162	720	2 659
Rolling Stock Tradesman 鐵道車輛技工	580	-	-	-	580
Railway Signalling Tradesman 鐵路訊號技工	6	-	-	-	6
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工（住宅式）	20	-	-	-	20
Sub-total 小計	**13 299**	**1 148**	**591**	**1 311**	**13 948**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL　半技術工人／普通工人					
Labourer 雜工	352	-	47	-	419
Semi-skilled Worker 半技術工人	462	-	280	-	742
Sub-total 小計	**814**	**-**	**327**	**-**	**1 161**
GRAND TOTAL 總　計	**26 074**	**1 730**	**1 684**	**1 780**	**27 928**

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

BRANCH IV: SUPPLEMENTARY SAMPLES
其 他 相 關 機 構

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Building Services Engineer 屋宇設備工程師	446	22	25	22	471
Electrical Engineer 電機工程師	506	35	36	35	541
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	207	40	6	40	213
Mechanical Engineer 機械工程師	463	12	11	12	472
Plumbing and Drainage Engineer 水喉及渠務工程師	73	29	-	29	73
Lift/Escalator Engineer 升降機／自動梯工程師	3	0	-	-	3
Fire Services Engineer 消防設備工程師	41	6	-	6	41
Electronics Engineer 電子工程師	160	9	3	9	163
Control and Instrumentation Engineer 控制及儀器工程師	22	-	-	-	22

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Engineering Manager 工程經理	180	3	2	3	182
Safety Officer 安全主任	67	10	4	10	71
Aircraft Maintenance Engineer 飛機維修工程師	2	-	-	-	2
Sub-total 小計	**2 170**	**166**	**87**	**166**	**2 254**
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	736	7	62	7	798
Building Services Technician 屋宇設備技術員	932	32	38	36	968
Draughtsman 繪圖員	122	-	6	4	128
Electrical Engineering Technician 電機工程技術員	510	99	60	123	570
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	202	31	10	26	212
Mechanical Engineering Technician 機械工程技術員	550	50	38	53	583
Lift/Escalator Technician 升降機／自動梯技術	4	-	3	-	7
Fire Services Technician 消防設備技術員	15	-	1	-	16
Electrical Instrument and Meter Technician 電工儀器技術員	29	-	-	-	29
Electronics Technician 電子技術員	514	33	29	33	543
Telecommunication Technician 電訊技術員	121	-	31	-	152

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	27	-	6	2	33
Sub-total 小計	**3 762**	**252**	**284**	**284**	**4 039**
TRADESMAN/ CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	1 863	12	422	12	2 285
Building Services Mechanic 屋宇設備技工	998	119	62	132	1 087
Electrician/Electrical Fitter 電工／電氣打磨裝配工	651	140	96	142	747
Control Panel Assembler 控制板裝配工	32	5	-	5	32
Electrical Wireman 電氣佈線工	17	-	-	-	17
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	257	57	26	57	283
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	137	-	12	-	149
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	22	12	2	12	24
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	31	1	6	1	37

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	23	10	1	10	24
Plumber and Pipe Fitter 喉管工	41	1	-	1	41
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	898	156	81	167	954
Lift Mechanic 升降機技工	30	1	2	1	32
Escalator Mechanic 自動梯技工	4	-	-	-	4
Fire Services Electrical Fitter 消防電氣裝配工	8	-	1	-	9
Fire Services Mechanical Fitter 消防機械裝配工	10	-	-	-	10
Electrical Appliances Service Mechanic 電器用具服務技工	11	-	-	-	11
Welder 焊接工	10	-	-	-	10
Carpenter 木工	10	-	1	-	11
Painter 髹漆工	98	-	9	-	108
AV and RF Mechanic 影音及射頻技工	4	-	-	-	4
Communication System Mechanic 電訊系統裝配工	34	-	4	-	38
Sub-total 小計	**5 189**	**514**	**725**	**540**	**5 917**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL　半技術工人／普通工人					
Labourer 雜工	128	-	23	-	151
Semi-skilled Worker 半技術工人	205	-	17	-	222

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Sub-total 小計	**333**	**-**	**40**	**-**	**373**
GRAND TOTAL 總　計	**11 454**	**932**	**1 136**	**990**	**12 583**

Appendix 10
附錄 10

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

PERCENTAGE OF MANPOWER ENGAGED IN CONTRACTING AND SERVICING WORK
從 事 承 造 及 維 修 服 務 工 作 的 人 力 分 布 情 況

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)
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Branch 1: Contracting (E&M) 門類 I : 承造	2 784	73%	2 032	27%	752
Branch 2 : Electrical Fitting with Water Plumbing Branch 門類 II : 水電工程	44	75%	33	25%	11
Branch 3 : Servicing (E & M) Branch 門類 III : 服務	4 477	42%	1 880	58%	2 597
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣	2 170	68%	1 476	32%	694
Sub-total 小計	**9 475**	**57%**	**5 421**	**43%**	**4 054**
TECHNICIAN LEVEL 技術員級					
Branch 1: Contracting (E&M) 門類 I : 承造	4 302	70%	3 011	30%	1 291
Branch 2 : Electrical Fitting with Water Plumbing Branch 門類 II : 水電工程	105	64%	67	36%	38
Branch 3 : Servicing (E & M) Branch 門類 III : 服務	7 484	24%	1 796	76%	5 688
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣	3 762	37%	1 392	63%	2 370
Sub-total 小計	**15 653**	**40%**	**6 266**	**60%**	**9 387**

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)
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Branch 1: Contracting (E&M) 門類 I : 承造	16 750	70%	11 725	30%	5 025
Branch 2 : Electrical Fitting with Water Plumbing Branch 門類 II : 水電工程	2 779	61%	1 695	39%	1 084
Branch 3 : Servicing (E & M) Branch 門類 III : 服務	13 299	24%	3 192	76%	10 107
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣	5 189	18%	934	82%	4 255
Sub-total 小計	**38 017**	**46%**	**17 546**	**54%**	**20 471**
SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人					
Branch 1: Contracting (E&M) 門類 I : 承造	1 790	70%	1 253	30%	537
Branch 2 : Electrical Fitting with Water Plumbing Branch 門類 II : 水電工程	164	62%	102	38%	62
Branch 3 : Servicing (E & M) Branch 門類 III : 服務	814	34%	277	66%	537
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣	333	23%	77	77%	256
Sub-total 小計	**3 101**	**55%**	**1 709**	**45%**	**1 392**
GRAND TOTAL 總計	**66 246**	**47%**	**30 942**	**53%**	**35 304**

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR
機電工程行業

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

Job Title 職稱	$9,000 or below 或以下	$9,001 - $12,000	$12,001 - $15,000	$15,001 - $18,000	$18,001 - $25,000	$25,001 - $35,000	$35,001 - $45,000	$45,001 - $60,000	Over $60,000 以上	Un-specified 未有說明
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級										
Building Services Engineer 屋宇設備工程師	-	-	-	3	210	250	62	549	127	103
Electrical Engineer 電機工程師	-	-	-	238	306	575	101	908	55	208
Refrigeration/ Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	-	-	-	82	267	440	141	133	5	40
Mechanical Engineer 機械工程師	-	-	-	34	110	210	7	190	274	121
Plumbing and Drainage Engineer 水喉及渠務工程師	-	-	-	1	4	65	28	30	-	21
Lift/Escalator Engineer 升降機／自動梯工程師	-	-	-	-	89	71	40	-	-	111
Fire Services Engineer 消防設備工程師	-	-	-	-	227	83	88	37	-	66
Electronics Engineer 電子工程師	-	-	-	-	155	125	20	134	98	2
Control and Instrumentation Engineer控制及儀器工程師	-	-	-	-	-	20	1	57	-	-
Engineering Manager 工程經理	-	-	-	-	140	205	282	166	585	72
Safety Officer 安全主任	-	-	-	1	38	77	47	9	-	37
Aircraft Maintenance Engineer 飛機維修工程師	-	-	-	-	-	10	458	2	-	24
Sub-total 小計	**-**	**-**	**-**	**359**	**1 546**	**2 131**	**1 275**	**2 215**	**1 144**	**805**
TECHNICIAN LEVEL 技術員級										
Supervisor 監督	-	-	11	202	1 760	1 743	26	5	13	143
Building Services Technician 屋宇設備技術員	-	12	54	522	654	293	138	-	-	202

Job Title 職稱	$9,000 or below 或以下	$9,001 - $12,000	$12,001 - $15,000	$15,001 - $18,000	$18,001 - $25,000	$25,001 - $35,000	$35,001 - $45,000	$45,001 - $60,000	Over $60,000 以上	Un-specified 未有說明
Draughtsman 繪圖員	-	2	208	98	72	73	-	-	-	132
Electrical Engineering Technician 電機工程技術員	-	24	198	465	780	230	46	-	-	424
Refrigeration/ Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	-	3	176	274	719	94	13	-	-	160
Mechanical Engineering Technician 機械工程技術員	-	10	95	67	346	246	95	-	-	169
Lift/Escalator Technician 升降機／自動梯技術員	-	-	-	198	130	85	4	-	-	417
Fire Services Technician 消防設備技術員	-	8	11	83	470	96	-	-	-	131
Electrical Instrument and Meter Technician 電工儀器技術員	-	-	-	9	-	24	24	-	-	5
Electronics Technician 電子技術員	-	80	59	94	42	510	-	-	-	19
Telecommunication Technician 電訊技術員	-	3	200	160	40	126	-	-	-	5
Office Equipment Service Technician 辦公室設備維修技術員	-	-	50	1	-	-	-	-	-	-
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全監督	-	5	3	37	21	-	-	-	-	26
Aircraft Maintenance Technician 飛機維修技術員	--	-	-	208	127	-	-	-		16
Rolling Stock Technician 鐵道車輛技術員	-	-	-	-	769	-	-	-	-	-
Railway Signalling Technician 鐵路訊號技術員	-	-	-	-	360	-	-	-	-	-
Sub-total 小計	**-**	**147**	**1 065**	**2 418**	**6 290**	**3 520**	**345**	**5**	**13**	**1 849**
TRADESMAN/CRAFTSMAN LEVEL 技工級										
Foreman/Chargehand 管工／領工	-	49	166	808	2 655	517	-	-	-	258
Building Services Mechanic 屋宇設備技工	32	25	945	459	370	12	-	-	-	305
Electrician/Electrical Fitter 電工／電氣打磨裝配工	192	457	1 413	3 092	3 188	115	20	-	-	442
Control Panel Assembler 控制板裝配工	-	-	32	170	43	-	-	-	-	-
Electrical Wireman 電氣佈線工	-	52	181	391	320	374	-	-	-	54

Job Title 職稱	$9,000 or below 或以下	$9,001 - $12,000	$12,001 - $15,000	$15,001 - $18,000	$18,001 - $25,000	$25,001 - $35,000	$35,001 - $45,000	$45,001 - $60,000	Over $60,000 以上	Un-specified 未有說明
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工 (電力控制)	-	123	883	1 156	1 007	45	-	-	-	54
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary Control) 空調製冷設備技工 (獨立系統)	-	86	457	761	582	1	-	-	-	27
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	-	10	301	410	39	1	-	-	-	5
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/Thermal 空調製冷設備技工(保溫)/保溫技工	-	-	93	182	57	-	-	-	-	1
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工 (水系統)	-	2	83	56	230	-	-	-	-	23
Plumber and Pipe Fitter 喉管工	11	87	57	161	211	60	-	-	-	112
Mechanical Fitter/ Machinist 機械打磨裝配工／機床工	-	9	681	707	480	8	1	-	-	134
Lift Mechanic 升降機技工	-	53	163	218	1 018	-	-	-	-	321
Escalator Mechanic 自動梯技工	-	64	86	77	547	-	-	-	-	166
Fire Services Electrical Fitter 消防電氣裝配工	-	2	96	322	140	38	-	-	-	34
Fire Services Mechanical Fitter 消防機械裝配工	-	41	196	709	130	188	-	-	-	38
Cable Jointer (Power) 強電流電纜接駁技工	-	-	-	62	200	-	-	-	-	-
Overhead Linesman 架空電線技工	-	-	7	52	230	-	-	-	-	-
Electrical Appliances Service Mechanic 電器用具服務技工	40	88	185	310	100	-	-	-	-	5
Welder 焊接工	-	5	-	31	17	-	10	-	-	25

Job Title 職稱	$9,000 or below 或以下	$9,001 - $12,000	$12,001 - $15,000	$15,001 - $18,000	$18,001 - $25,000	$25,001 - $35,000	$35,001 - $45,000	$45,001 - $60,000	Over $60,000 以上	Un-specified 未有說明
Carpenter 木工	-	4	15	9	5	-	-	-	-	-
Painter 髹漆工	-	12	96	2	10	-	-	-	-	-
AV and RF Mechanic 影音及射頻技工	-	85	35	80	2	-	-	-	-	-
Building Security System Mechanic 屋宇防盜系統技工	-	-	12	-	-	-	-	-	-	-
Communication System Mechanic 電訊系統裝配工	-	592	682	591	95	12	-	-	-	4
Aircraft Maintenance Mechanic 飛機維修技工	-	-	2 463	-	-	-	-	-	-	60
Rolling Stock Tradesman 鐵道車輛技工	-	-	580	-	-	-	-	-	-	-
Railway Signalling Tradesman 鐵路訊號技工	-	-	6	-	-	-	-	-	-	-
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工（住宅式）	-	-	-		20	-	-	-	-	-
Sub-total 小計	**275**	**1 846**	**9 914**	**10 816**	**11 696**	**1 371**	**31**	**-**	**-**	**2 068**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL　半技術工人／普通工人										
Labourer 雜工	34	304	491	89	17	5	-	-	-	93
Semi-skilled Worker 半技術工人	142	438	632	526	197	-	-	-	-	133
Sub-total 小計	**176**	**742**	**1 123**	**615**	**214**	**5**	**-**	**-**	**-**	**226**
GRAND TOTAL 總　計	**451**	**2 735**	**12 102**	**14 208**	**19 746**	**7 027**	**1 652**	**2 220**	**1 157**	**4 948**

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Electrical Engineer 電機工程師	33	-	-	-	33
Marine Engineer 輪機工程師	93	-	-	-	93
Mechanical Engineer 機械工程師	29	-	5	-	29
Ship Designer/Naval Architect 船舶設計師／造船工程師	12	-	2	1	14
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	71	1	-	1	69
Safety Officer 安全主任	15	-	-	-	15
Sub-total 小計	**253**	**1**	**7**	**2**	**253**
TECHNICIAN LEVEL 技術員級					
Draughtsman 繪圖員	2	-	1	-	3
Electrical Engineering Technician 電機工程技術員	44	-	2	-	48
Electronics/ Telecommunication Technician 電子／通訊技術員	7	-	-	-	7

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Estimator 估計員	14	-	1	-	15
Mechanical Engineering Technician 機械工程技術員	230	6	5	6	234
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全督導員	12	-	-	-	12
Supervisor/Foreman 監督／管工	126	-	15	-	141
Sub-total 小計	**435**	**6**	**24**	**6**	**460**
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Air-conditioning Mechanic/ Sheet Metal Worker 空氣調節技工／薄片金屬構造工	14	-	-	-	14
Carpenter 木工	90	-	5	-	95
Crane Driver 起重機操作工	25	-	-	-	25
Electrician 電工	97	7	10	6	108
Mechanical Fitter 機械打磨裝配工	332	11	18	9	352
GRP-Worker 玻璃纖維工	34	-	1	-	35
Machinist 機床工	60	-	12	1	72
Marine Pipeworker 船舶喉管工	67	3	4	3	71
Painter 髹漆工	129	-	13	-	142
Rigger 索具工（喊吔工）	83	-	4	-	87

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Ship Classification Qualified Welder 船級協會認可焊接工	14	-	1	-	15
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工（鍋爐工、造船鋼板工、捻縫工／鐵工）	65	1	12	4	77
Welder 焊接技工	71	2	9	2	80
Sub-total 小計	**1 081**	**24**	**89**	**25**	**1 173**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人					
Labourer 雜工	70	-	1	-	71
Semi-skilled Worker 半技術工人	26	-	-	-	26
Sub-total 小計	**96**	**-**	**1**	**-**	**97**
GRAND TOTAL 總　計	**1 865**	**31**	**121**	**33**	**1 983**

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	$9,000 or below 或以下	$9,001 - $12,000	$12,001 - $15,000	$15,001 - $18,000	$18,001 - $25,000	$25,001 - $35,000	$35,001 - $45,000	$45,001 - $60,000	Over $60,000 以上	Un-specified 未有說明
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級										
Electrical Engineer 電機工程師	-	-	-	-	2	26	5	-	-	-
Marine Engineer 輪機工程師	-	-	-	9	1	25	6	18	26	8
Mechanical Engineer 機械工程師	-	-	-	-	1	17	11	-	-	-
Ship Designer/ Naval Architect 船舶設計師／ 造船工程師	-	-	-	1	7	-	-	1	3	-
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	-	-	-	4	6	19	4	13	12	13
Safety Officer 安全主任	-	-	-	-	5	5	4	-	-	1
Sub-total 小計	**-**	**-**	**-**	**14**	**22**	**92**	**30**	**32**	**41**	**22**
TECHNICIAN LEVEL 技術員級										
Draughtsman 繪圖員	-	-	-	1	-	1	-	-	-	-
Electrical Engineering Technician 電機工程技術員	-	-	4	1	32	2	-	5	-	-
Electronics/ Telecommunication Technician 電子／通訊技術員	-	-	-	-	-	6	-	1	-	-
Estimator 估計員	-	-	-	-	7	7	-	-	-	-
Mechanical Engineering Technician 機械工程技術員	-	-	111	33	28	37	-	21	-	-
Assistant Safety Officer/ Safety Supervisor 助理安全主任／ 安全監督	-	-	-	6	-	-	-	-	-	6

Job Title 職稱	$9,000 or below 或以下	$9,001 - $12,000	$12,001 - $15,000	$15,001 - $18,000	$18,001 - $25,000	$25,001 - $35,000	$35,001 - $45,000	$45,001 - $60,000	Over $60,000 以上	Un-specified 未有說明
Supervisor/Foreman 監督／管工	-	-	10	30	62	24	-	-	-	-
Sub-total 小計	**-**	**-**	**125**	**71**	**129**	**77**	**-**	**27**	**-**	**6**
TRADESMAN/CRAFTSMAN LEVEL 技工級										
Air-conditioning Mechanic/Sheet Metal Worker 空氣調節技工／薄片金屬構造工	-	-	2	5	7	-	-	-	-	-
Carpenter 木工	-	-	21	67	2	-	-	-	-	-
Crane Driver 起重機操作工	-	-	2	13	10	-	-	-	-	-
Electrician 電工	-	-	14	56	27	-	-	-	-	-
Mechanical Fitter 機械打磨裝配工	20	-	84	170	39	19	-	-	-	-
GRP-Worker 玻璃纖維工	-	-	18	11	5	-	-	-	-	-
Machinist 機床工	-	3	2	37	18	-	-	-	-	-
Marine Pipeworker 船舶喉管工	-	-	4	31	32	-	-	-	-	-
Painter 髹漆工	-	-	61	47	21	-	-	-	-	-
Rigger 索具工（喊吔工）	-	-	6	74	3	-	-	-	-	-
Ship Classification Qualified Welder 船級協會認可焊接工	-	-	3	3	5	3	-	-	-	-
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工（鍋爐工、造船鋼板工、捻縫工／鐵工）	-	-	3	49	13	-	-	-	-	-
Welder 焊接工	-	-	10	16	45	-	-	-	-	-
Sub-total 小計	**20**	**3**	**230**	**579**	**227**	**22**	**-**	**-**	**-**	**-**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人										
Labourer 雜工	-	21	28	12	-	-	-	-	-	9
Semi-skilled Worker 半技術工人	8	8	-	10	-	-	-	-	-	-
Sub-total 小計	**8**	**29**	**28**	**22**	**-**	**-**	**-**	**-**	**-**	**9**
GRAND TOTAL 總 計	**28**	**32**	**383**	**686**	**378**	**191**	**30**	**59**	**41**	**37**

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Electrical Engineer 電機工程師	9	-	-	-	9
Gas Engineer (Fuel Gas) 氣體工程師(氣體燃料)	268	1	2	1	270
Mechanical Engineer 機械工程師	118	-	-	-	118
Safety Officer 安全主任	16	-	1	-	17
Sub-total 小計	**411**	**1**	**3**	**1**	**414**
TECHNICIAN LEVEL 技術員級					
Draughtsman 繪圖員	3	-	-	-	3
Electrical Engineering Technician 電機工程技術員	11	-	2	-	13
Gas Engineering Technician 氣體燃料工程技術員	304	3	9	3	310
Mechanical Engineering Technician 機械工程技術員	8	-	-	-	8
Assistant Safety Officer/Safety 助理安全主任／安全督導員	16	-	-	-	16

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Supervisor/Chargehand 監督／管工	184	-	1	-	185
Sub-total 小計	**526**	**3**	**12**	**3**	**535**
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Electrician/Electrical Fitter 電工／電氣打磨裝配工	17	-	-	-	17
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	37	1	2	2	39
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	248	1	-	1	248
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工（住宅式）	382	24	7	36	389
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工（非住宅式）	132	16	10	26	142
Mechanical Fitter 機械打磨裝配工	44	-	-	-	44
Welder 焊接工	9	-	-	-	9
Sub-total 小計	**869**	**42**	**19**	**65**	**888**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人					
Driver (LPG Cylinder) 司機（石油氣瓶車）	13	-	2	-	15
Labourer 雜工	46	-	-	-	46
Semi-skilled Worker 半技術工	59	-	-	-	59
Vehicle Attendant/ Deliveryman (LPG Cylinder) 跟車／送貨員（石油氣瓶）	27	-	2	-	29

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 2016 估計 2016 年 3 月時的受訓者人數	Forecasted No. of Employees by March 2016 估計 2016 年 3 月時的僱員人數
Sub-total 小計	**145**	**-**	**4**	**-**	**149**
GRAND TOTAL 總　計	**1 951**	**46**	**38**	**69**	**1 986**

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	$9,000 or below 或以下	$9,001 - $12,000	$12,001 - $15,000	$15,001 - $18,000	$18,001 - $25,000	$25,001 - $35,000	$35,001 - $45,000	$45,001 - $60,000	Over $60,000 以上	Un-specified 未有說明
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級										
Electrical Engineer 電機工程師	-	-	-	-	-	-	8	-	-	1
Gas Engineer (Fuel Gas) 氣體工程師(氣體燃料)	-	-	-	-	11	6	240	6	-	5
Mechanical Engineer 機械工程師	-	-	-	-	-	114	-	-	-	4
Safety Officer 安全主任	-	-	-	-	-		15	-	-	1
Sub-total 小計	**-**	**-**	**-**	**-**	**11**	**120**	**263**	**6**	**-**	**11**
TECHNICIAN LEVEL 技術員級										
Draughtsman 繪圖員	-	-	-	3	-	-	-	-	-	-
Electrical Engineering Technician 電機工程技術員	-	-	-	11	-	-	-	-	-	-
Gas Engineering Technician 氣體燃料工程技術員	-	-	-	271	14	9	5	-	-	5
Mechanical Engineering Technician 機械工程技術員	-	-	-	-	8	-	-	-	-	-
Assistant Safety Officer Safety Supervisor 助理安全主任／安全監督	-	-	-	5	2	-	3	-	-	6
Supervisor/Chargehand 監督／管工	-	-	-	10	156	1	15	-	-	2
Sub-total 小計	**-**	**-**	**-**	**300**	**180**	**10**	**23**	**-**	**-**	**13**
TRADESMAN/CRAFTSMAN LEVEL 技工級										
Electrician/ Electrical Fitter 電工／電氣打磨裝配工	-	-	-	8	3	3	-	-	-	3
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	-	-	3	20	-	-	-	-	-	14

Job Title 職稱	$9,000 or below 或以下	$9,001 - $12,000	$12,001 - $15,000	$15,001 - $18,000	$18,001 - $25,000	$25,001 - $35,000	$35,001 - $45,000	$45,001 - $60,000	Over $60,000 以上	Un-specified 未有說明
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工(煤氣）	-	-	1	223	14	-	-	-	-	10
Gas Utilization Fitter (Domestic) 氣體燃料用戶裝置技工（住宅式）	-	46	46	176	103	-	-	-	-	11
Gas Utilization Fitter (Non-domestic) 氣體燃料用戶裝置技工（非住宅式）	1	-	12	67	32	20	-	-	-	-
Mechanical Fitter 機械打磨裝配工	-	-	-	8	36	-	-	-	-	-
Welder 焊接工	-	-	-	-	5	-	-	-	-	4
Sub-total 小計	**1**	**46**	**62**	**502**	**193**	**23**	**-**	**-**	**-**	**42**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL　半技術工人／普通工人										
Driver (LPG Cylinder) 司機（石油氣瓶車）	-	-	7	-	-	-	-	-	-	6
Labourer 雜工	-	23	23	-	-	-	-	-	-	-
Semi-skilled Worker 半技術工人	-	49	5	-	-	-	-	-	-	5
Vehicle Attendant/Deliveryman (LPG Cylinder) 跟車／送貨員（石油氣瓶）	-	13	2	-	-	-	-	-	-	12
Sub-total 小計	**-**	**85**	**37**	**-**	**-**	**-**	**-**	**-**	**-**	**23**
GRAND TOTAL 總　計	**1**	**131**	**99**	**802**	**384**	**153**	**286**	**6**	**-**	**89**

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 技能等級	Very Insufficient 非常缺乏	Insufficient 缺乏	Sufficient 充裕	Very Sufficient 非常充裕
A. Electrical and Mechanical Engineering Sector 機電工程行業				
Professional / Technologist 專業人士 / 技師	1% *(18%)*	44% *(42%)*	51% *(39%)*	4% *(1%)*
Trainees of Professional / Technologist 專業人士 / 技師的受訓者	2% *(17%)*	47% *(38%)*	47% *(44%)*	4% *(1%)*
Technician 技術員	2% *(27%)*	44% *(40%)*	50% *(33%)*	4% -
Trainees of Technician 技術員的受訓者	6% *(18%)*	46% *(50%)*	44% *(31%)*	4% *(1%)*
Tradesman / Craftsman 技工	8% *(27%)*	44% *(52%)*	44% *(21%)*	4% -
Trainees of Tradesman / Craftsman 技工的受訓者	11% *(26%)*	48% *(41%)*	39% *(32%)*	2% *(1%)*
Semi-skilled Worker / General Worker 半技術／普通工人	3% *(17%)*	47% *(53%)*	48% *(29%)*	2% *(1%)*
B. Shipbuilding and Ship Repair Sector 船舶修建行業				
Professional / Technologist 專業人士 / 技師	1% *(33%)*	27% *(13%)*	72% *(53%)*	- *(1%)*
Trainees of Professional / Technologist 專業人士 / 技師的受訓者	1% *(40%)*	30% *(10%)*	69% *(50%)*	- -
Technician 技術員	14% *(36%)*	34% *(14%)*	52% *(50%)*	- -
Trainees of Technician 技術員的受訓者	1% *(44%)*	30% -	69% *(56%)*	- -
Tradesman / Craftsman 技工	25% *(28%)*	43% *(36%)*	31% *(36%)*	1% -

Job level 技能等級	Very Insufficient 非常缺乏	Insufficient 缺乏	Sufficient 充裕	Very Sufficient 非常充裕
Trainees of Tradesman / Craftsman 技工的受訓者	32% *(30%)*	35% *(20%)*	32% *(50%)*	1% -
Semi-skilled Worker / General Worker 半技術／普通工人	20% *(20%)*	47% *(20%)*	33% *(60%)*	- -
C. Gas Sector 氣體燃料行業				
Professional / Technologist 專業人士 / 技師	3% -	38% *(25%)*	59% *(75%)*	- -
Trainees of Professional / Technologist 專業人士 / 技師的受訓者	4% -	31% *(50%)*	65% *(50%)*	- -
Technician 技術員	22% *(14%)*	29% *(71%)*	49% *(14%)*	- *(1%)*
Trainees of Technician 技術員的受訓者	16% *(40%)*	42% *(60%)*	42% -	- -
Tradesman / Craftsman 技工	31% *(33%)*	34% *(33%)*	35% *(33%)*	- *(1%)*
Trainees of Tradesman / Craftsman 技工的受訓者	10% *(75%)*	46% *(25%)*	44% -	- -
Semi-skilled Worker / General Worker 半技術／普通工人	45% *(33%)*	16% *(33%)*	38% *(33%)*	1% *(1%)*

N.B. 註

a. The percentages refer to those respondents who answered Part II, Q5 of the survey questionnaire. "No comment" was not counted.
百分比是指回答了調查表第二部分第 5 條問題的受訪者。"無意見" 並不計算在內。

b. Responses from establishments employing less than 50 workers are shown in the upper half of the cells. Responses from establishments employing 50 or more workers are shown in the brackets.
單元格上半部分顯示的數字來自少於 50 名僱員的機構。僱用 50 名或以上員工的機構，其調查回應顯示在括號內。

ELECTRICAL & MECHANICAL WORKERS WORKING IN CONSTRUCTION SITES
在 建 築 地 盤 工 作 的 機 電 工 程 從 業 員

MANPOWER STATISTICS
人 力 狀 況

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間 空缺數目
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級			
Building Services Engineer 屋宇設備工程師	51	26	-
Electrical Engineer 電機工程師	143	2	6
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	16	-	-
Mechanical Engineer 機械工程師	80	7	-
Plumbing and Drainage Engineer 水喉及渠務工程師	18	-	-
Lift/Escalator Engineer 升降機／自動梯工程師	6	-	-
Fire Services Engineer 消防設備工程師	11	-	-
Electronics Engineer 電子工程師	35	2	-
Control and Instrumentation Engineer 控制及儀器工程師	3	-	-
Engineering Manager 工程經理	35	7	-
Safety Officer 安全主任	24	-	-
Sub-total 小計	**422**	**44**	**6**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間空缺數目
TECHNICIAN LEVEL 技術員級			
Supervisor 監督	176	-	-
Building Services Technician 屋宇設備技術員	67	5	-
Draughtsman 繪圖員	21	-	-
Electrical Engineering Technician 電機工程技術員	295	1	-
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	133	2	-
Mechanical Engineering Technician 機械工程技術員	37	-	-
Lift/Escalator Technician 升降機／自動梯技術員	40	-	-
Fire Services Technician 消防設備技術員	38	-	-
Electrical Instrument and Meter Technician 電工儀器技術員	7	-	-
Electronics Technician 電子技術員	63	-	-
Telecommunication Technician 電訊技術員	15	-	-
Assistant Safety Officer/ Safety Supervisor 助理安全主任/安全督導員	20	1	-
Sub-total 小計	**912**	**9**	-

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 技工級			
Electrical Fitter 電氣裝配工	2 235	3	-
Control Panel Assembler 控制板裝配工	35	-	-
Electrical Wireman 電氣佈線工	1 215	-	-
Refrigeration/Air-conditioning/ Ventilation Mechanic (Master) 空調製冷設備技工(全科)	1 011	-	3
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	133	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	162	-	-
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	344	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫)/ 保溫技工	22	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	78	-	-
Drain and Pipe Layer (Master) 地渠及喉管工(全科)	107	-	-
Drainlayer 地渠工	45	-	-
Plumber 水喉工	935	-	-
Pipelayer 敷喉管工	114	-	-

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)			
Mechanical Fitter 機械打磨裝配工	81	-	-
Lift and Escalator Mechanic (Master) 升降機及自動梯技工(全科)	129	-	-
Lift Mechanic 升降機技工	262	-	-
Escalator Mechanic 自動梯技工	59	-	-
Fire Service Mechanic (Master) 消防設備技工(全科)	606	-	-
Fire Services Electrical Fitter 消防電氣裝配工	153	-	-
Fire Services Mechanical Fitter 消防機械裝配工	156	-	-
Fire Service Portable Equipment Fitter 手提消防設備裝配工	3	-	-
Cable Jointer (Power) 強電流電纜接駁技工	7	-	-
Cable Jointer (Low Voltage) 強電流電纜接駁技工（低壓）	20	-	-
Overhead Linesman 架空電線技工	54	-	-
Electrical Appliances Service Mechanic 電器用具維修技工	65	-	-
General Welder 普通焊接工	78	-	-
Electronic Equipment Mechanic (Construction Work) (Master) 電子設備技工(建造工作) (全科)	64	-	-
Building Security System Mechanic 屋宇防盜系統技工	12	-	-
Communication System Mechanic 電訊系統裝配工	77	-	-
Gas Installer 氣體裝置技工	88	-	-
Sub-total 小計	**8 350**	**3**	**3**

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
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人			
Labourer 雜工	485	-	-
Semi-skilled Worker 半技術工人	148	-	-
Sub-total 小計	**633**	-	-
GRAND TOTAL 總　計	**10 317**	**56**	**9**