2017 Manpower Survey Report

Electrical And Mechanical Services Industry

2017 年 機 電 工 程 業

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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DEFINITION OF TERMS

Average income	"Average income" refers to the monthly income including basic wages, regular overtime pay, cost of living allowance, meal allowance, commission and bonus. It is an average figure among employees engaging in the same principal job.
Employees/workers	"Employees/workers" refer to all full-time personnel engaged (or self-employed) in the principal jobs of E&M and related disciplines at the survey reference date.
Non-technical manpower	"Non-technical manpower" refers to those people engaged in non-E&M related disciplines such as accounting, IT, human resources, etc.
Professional/technologist	"Professional/technologist" refers to 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.
Semi-skilled/general worker	"Semi-skilled/general worker" is normally assigned to perform repetitive work requiring only a narrow range of skills and short period of training.
Technical manpower	"Technical manpower" refers to those people employed in the principal jobs of the E&M Services industry.
Technician	"Technician" refers to 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.

Tradesman/craftsman	"Tradesman/craftsman" refers to 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.
Trainees	"Trainees" include all trainees receiving any form of training and apprentices under a contract of apprenticeship.
Vacancies	"Vacancies" refer to those unfilled, immediately available job openings for which the establishment is actively trying to recruit personnel at the survey reference date.
Wastage/turnover rate	"Wastage/turnover rate" is defined as the percentage of employees leaving their current jobs out of the total number of E&M employees. Wastage refers to those leaving E&M industries for taking up non-E&M related positions, emigrating or other reasons.
Vacancy rate	"Vacancy rate" is defined as the percentage of vacancies out of the total number of E&M employees.

鳴謝

承蒙各方支持，機電工程業人力調查工作順利完成。各間業界公司填覆調查問卷、政府統計處協助抽取調查機構樣本、米奧特資料搜集中心協助蒐集人力數據，機電工程業訓練委員會（本會）特此鳴謝。

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詞彙釋義

平均收入	「平均收入」是指從事相同主要職務僱員的平均月薪，包括底薪、恆常發放的超時工作補薪、生活津貼、膳食津貼、佣金及花紅。
僱員	「僱員」是指在統計日期當天，所有從事機電工程及相關行業主要職務的全職受僱（或自僱）人員。
非技術人力	「非技術人力」是指並非從事機電工程及相關行業職務的人員，例如：會計、資訊科技、人力資源等職務。
專業人士／技師	「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；熟悉科技發展，應用最新技術，以及督導和培訓下屬。
半技術工人／普通工人	「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。
技術人力	「技術人力」指受僱擔任機電工程業主要職務的人員。
技術員	「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完成工作。
技工	「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，亦需掌握相關的理論知識，才能適應日新月異的科技發展。
受訓者	「受訓者」包括正在接受各種訓練的人士，以及已簽訂學徒合約的登記學徒。
空缺	「空缺」指在統計日期當天，機構內已懸空、且正積極招聘人手但未曾填補的職位。

流失率／流動率	「流失率／流動率」均指機電工程業離職者在同業僱員總數中所佔的百分率。因轉行、移民或其他原因而不再從事機電工程業者視為流失。
空缺率	「空缺率」指機電工程業職位空缺在同業僱員總數中所佔的百分率。

I. EXECUTIVE SUMMARY

Background

1.1 The key objective of the Manpower Survey (MPS) of the Electrical and Mechanical Services (E&M) Industry is to collect up-to-date manpower information with a view to assessing the industry's manpower requirements and training needs of E&M Services industry.

1.2 The report presents the findings of the MPS of E&M Services industry **conducted from June to August 2017**.

Survey Coverage

1.3 The Survey covered the following sectors and branches of the E&M Services industry. Each sector comprised of its corresponding major branches together with a branch of supplementary samples.[1]

Electrical and Mechanical Engineering Sector
Branch 1: E&M Contracting
Branch 2: Electrical Fitting with Water Plumbing
Branch 3: E&M Servicing (E&M)
Branch 4: Supplementary Samples (Electrical and Mechanical Engineering Sector)

Shipbuilding and Ship Repair Sector
Branch 5: Shipyards and Boatyards
Branch 6: Supplementary Samples (Shipbuilding and Ship Repair Sector)

Gas Sector
Branch 7: Gas Supply
Branch 8: Gas Fitting, Installation and Maintenance
Branch 9: Supplementary Samples (Gas Sector)

Aircraft Maintenance Sector
Branch 10: Aircraft Maintenance

[1] *supplementary samples referred to prominent companies of other business natures which also employed E&M employees, such as property management companies, trading companies, consulting firms, relevant departments of Universities and Government, and so on.*

1.4 The Aircraft Maintenance sector was subsumed into the E&M Engineering sector for analysis for previous rounds of survey while in this round, it was singled out as a separate sector of E&M Services industry. To enable a due comparison, the figures of E&M Engineering sector of 2015 and before presented in this report had excluded those pertaining to aircraft maintenance companies.

Survey Methodology

Data collection

1.5 A total of 1 221 establishments was selected for the Survey, with 1 069 establishments selected basing on the stratified random sampling method and 152 establishments selected as supplementary samples.

1.6 The data collection was carried out between June and August 2017. Among the 1 221 sampled establishments, 965 were successfully enumerated and 46 refused, giving an effective response rate of 95.5%.[2] Taking into account (i) the satisfactory response rate of individual branches, (ii) the fact that majority of prominent and sizeable establishments had responded to the survey, and (iii) the grossing-up of sample results basing on statistically-grounded method, it could be concluded that the survey findings presented in this report contributed to a significant level of representativeness of the industry.

1.7 Survey data were collected through telephone interviews or face-to-face interviews with the sampled establishments based on a structured questionnaire. The questionnaire was divided into Part I and II. Part I was the major part of the questionnaire collecting manpower information (number of employees, vacancies, trainees, etc.) by level by principal job while Part II collected supplementary information related to manpower.

1.8 In respect of manpower information, 4 levels of job were classified for the E&M Services industry, namely;

(i) Professional/Technologist;
(ii) Technician;
(iii) Tradesman/Craftsman; and
(iv) Semi-skilled worker/General worker.

1.9 The list of principal jobs in Part I of the questionnaire was defined by the Training Board with detailed job description given for each job. While it was understood that the job titles adopted in the establishments might not be exactly the same as the principal jobs, respondents were required to report manpower information corresponding to the principal jobs basing on the job descriptions.

[2] *The remaining cases were regarded as invalid cases, including establishments which were suspended operation, engaged in irrelevant trade or had not employed any E&M staff and so on.*

1.10 To ensure a smooth survey implementation and accuracy of survey findings, stringent quality assurance measures were applied at various stages of the survey including, thorough training of fieldwork staff, 100% vetting of questionnaires by a dedicated team of VTC, validation of collected data through computer programming, and so on.

Data Projection for 2018-2021

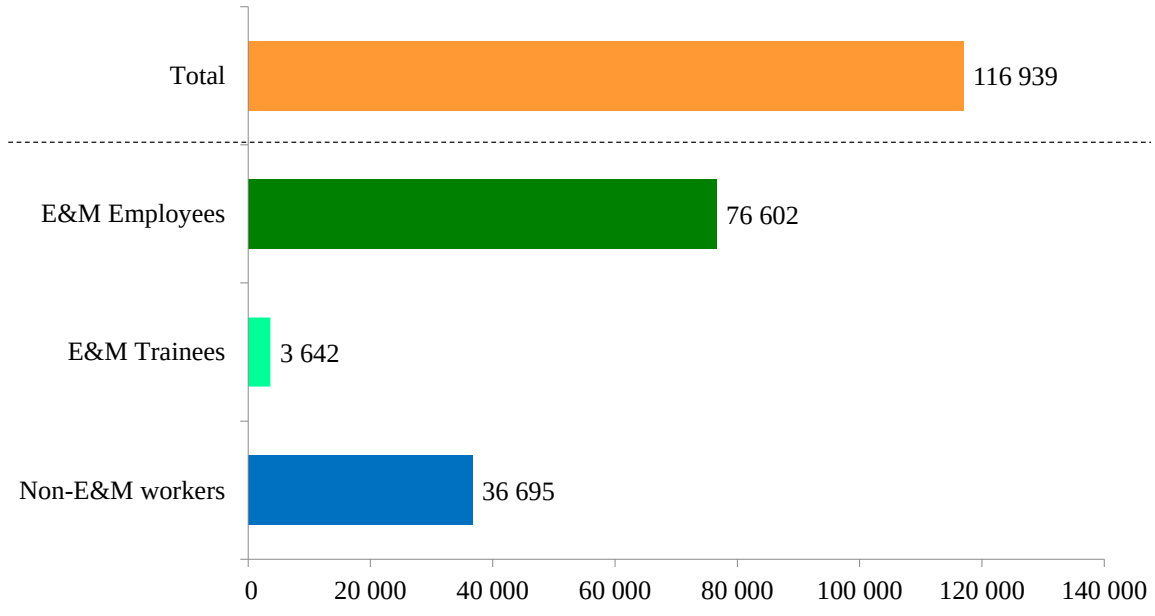
1.11 For E&M Services industry, the manpower requirements of E&M workers were projected for 2018-2021 using "Adaptive Filtering Method" (Please refer to Appendix 6 for more details.) Adaptive filtering method was actually an extrapolation of historical pattern in manpower series using the concept of "Best of fit" in Statistics, with the assumption that all other factors that might affect manpower requirements remain unchanged. However, the employers' forecast on the future manpower requirements as well as the professional advice of industry experts on the industry development had also been taken into account when deciding on the final projected manpower requirements.

Summary of Survey Findings

A. *Electrical and Mechanical Services Industry*

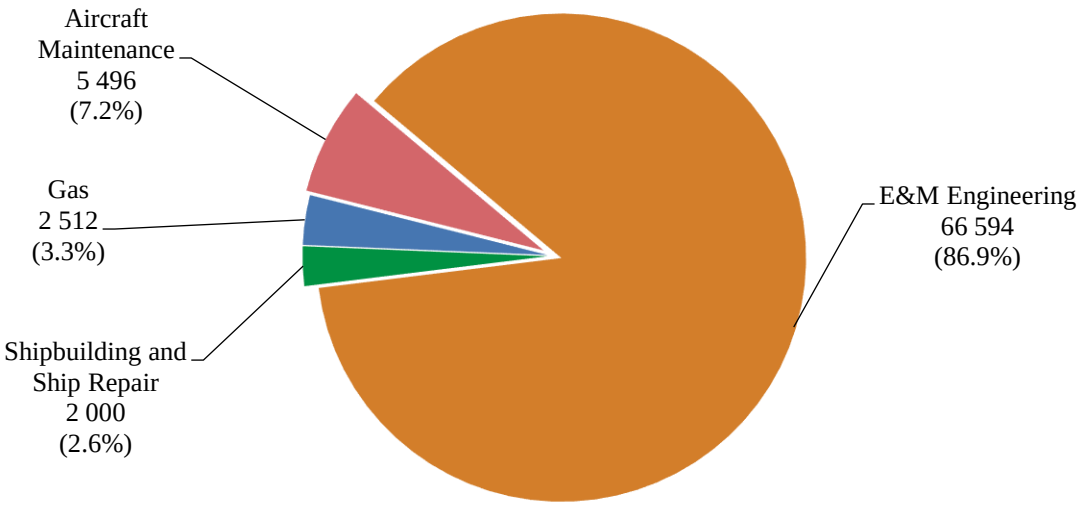
1.12. Overall speaking, there were around 117 thousands of employees serving in the E&M Services industry in Hong Kong, of which 76 602 employees and 3 642 trainees of E&M trade were present. The rest were employees of other disciplines, such as human resources, finance, administration, information technology and so on *(Figure 1.1)*.

Figure 1.1 Number of workers in the E&M Services industry, 2017



1.13 Of the 76 602 E&M employees, 66 594 (86.9%) engaged in the E&M Engineering sector, 2 000 (2.6%) in the Shipbuilding and Ship Repair sector, 2 512 (3.3%) in the Gas sector and 5 496 (7.2%) in the Aircraft Maintenance sector *(Figure 1.2)*.

Figure 1.2 Distribution of E&M employees by Sector, 2017



1.14 Generally speaking, a relatively lean manpower was noted at the highest (Professional/Technologist) and lowest (semi-skilled/general worker) levels while the middle levels (technician and tradesman/craftsman) comprised the majority of manpower of the sector. The manpower information of individual sector is presented one by one below.

B. Electrical and Mechanical Engineering Sector

Manpower

1.15 E&M Engineering sector comprised mainly of E&M contractors, engineering companies of electrical fitting with water plumbing, and companies of E&M services.

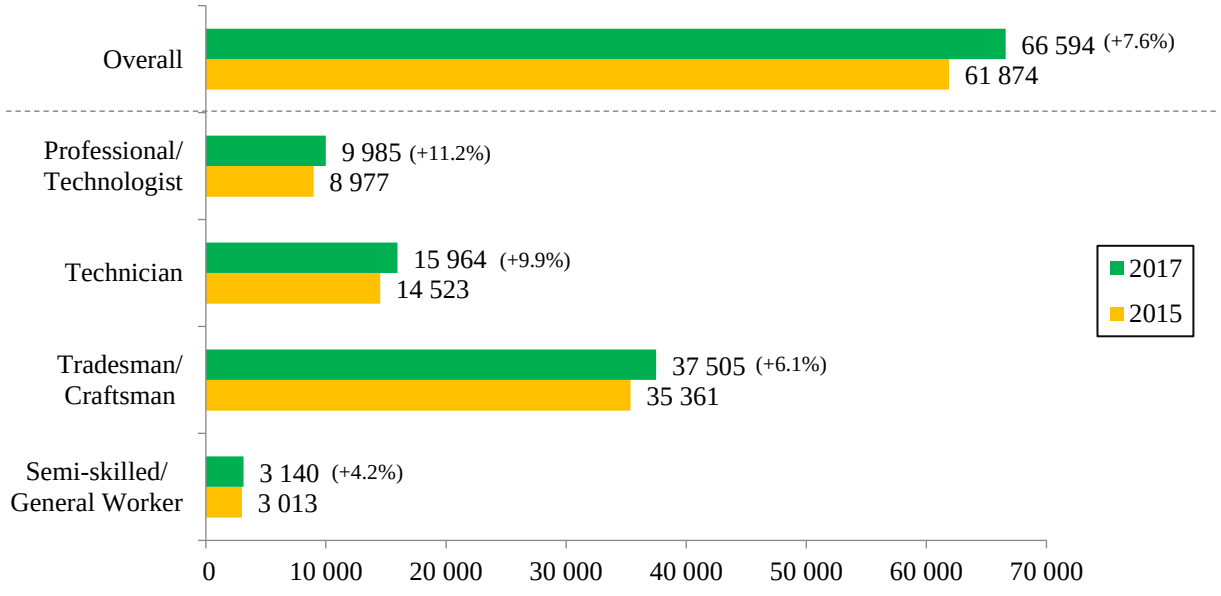
1.16 At the time of survey, a total of 66 594 E&M employees engaged in the E&M sector of which 56% were at tradesman/craftsman level, followed by 24% at technician level, 15% at professional/technologist level and 5% at semi-skilled/general worker. A total of 2 892 vacancies of E&M employees was noted across levels. The vacancy rate ranged from 4 to 7% *(Table 1.1)*.

Table 1.1 Number of E&M employees, trainees and vacancies in the E&M Engineering sector by job level, 2017

Job level	E&M Engineering Sector		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional/technologist	9 985 *(15.0%)*	407 *(13.8%)*	528 *(18.3%)*
Technician	15 964 *(24.0%)*	535 *(18.2%)*	643 *(22.2%)*
Tradesman/craftsman	37 505 *(56.3%)*	2 000 *(68.0%)*	1 506 *(52.1%)*
Semi-skilled/general worker	3 140 *(4.7%)*	N.A.	215 *(7.4%)*
Overall	**66 594** ***(100%)***	**2 942** ***(100%)***	**2 892** ***(100%)***

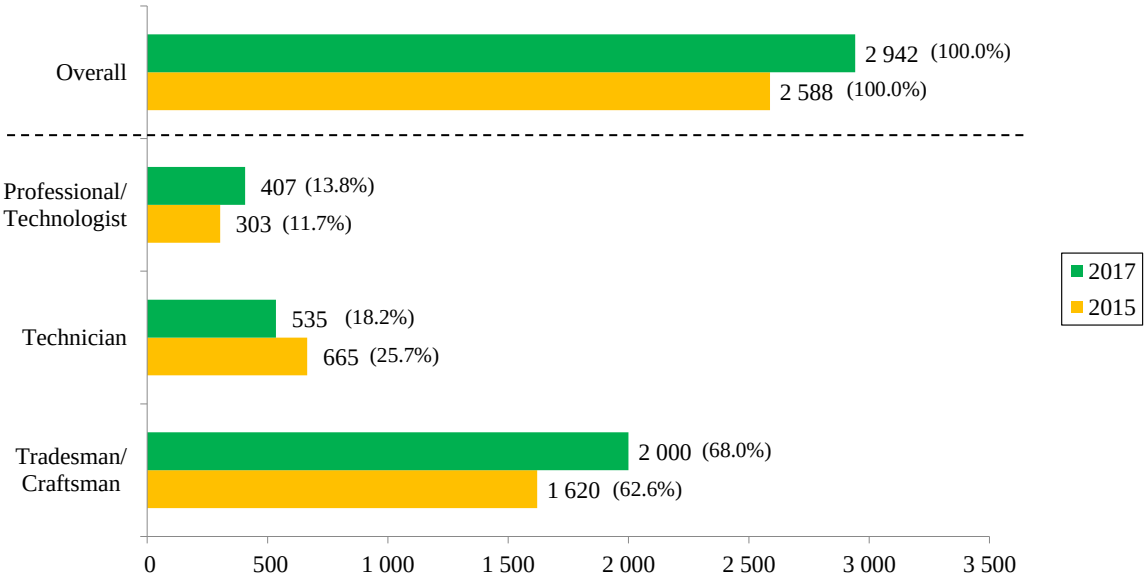
1.17 As compared with 2015, a growth in the number of E&M employees for all levels was noted, giving an overall increment of 7.6%. In particular, manpower at professional/technologist and technician levels registered an over 10% growth in 2017 as compared with two years ago. The growth was mainly attributed to some sizeable and renowned companies of E&M services *(Branch 3)* and Government departments *(Branch 4)* as a result of increased number of engineering projects *(Figure 1.3)*.

Figure 1.3 Number of E&M employees in the E&M Engineering sector by job level, 2017



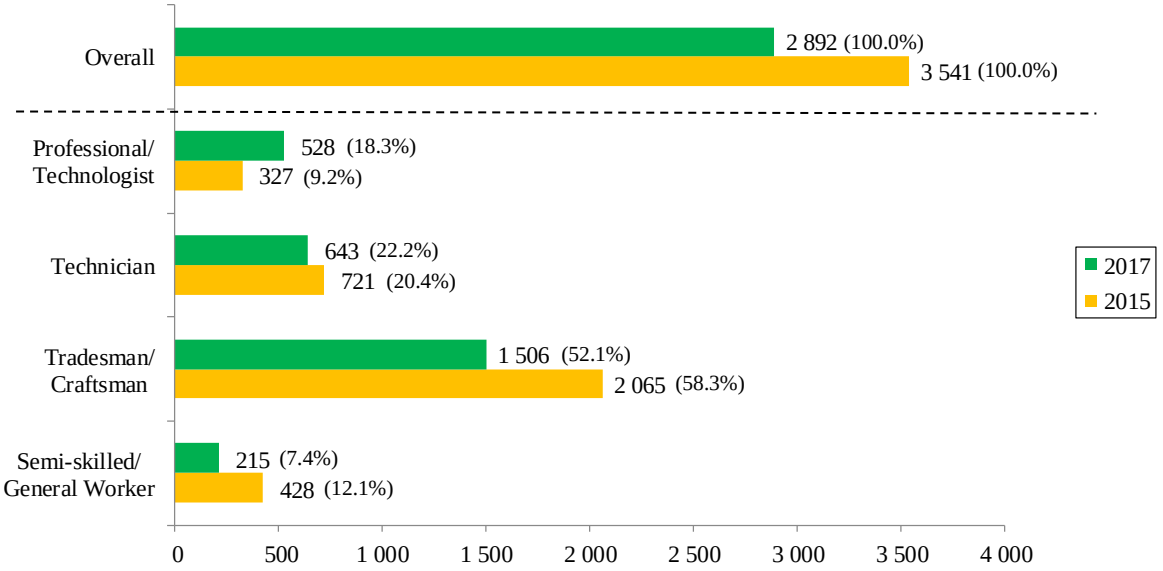
1.18 The employment of trainees, under a contract or mode of apprenticeship, was very common in the E&M engineering sector. More trainees were actually reported in 2017 than 2015 at professional/technologist and tradesman/craftsman levels, but less trainees at the technician level *(Figure 1.4)*.

Figure 1.4 Number of E&M trainees in the E&M Engineering sector by job level, 2017



1.19 With the fact that more people entered the sector as employees or trainees, it was not surprised to note the decrease in the number of vacancies from 3 541 in 2015 to 2 892 in 2017. The decrease was noted for all levels except the professional/technologist level *(Figure 1.5)*.

Figure 1.5 Number of E&M vacancies in the E&M Engineering sector by job level, 2017



Salary

1.20 The salary distribution of E&M employees of various levels is listed in *Table 1.2*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

Table 1.2 Salary distribution of E&M employees in the E&M Engineering sector by job level, 2017

Job level	E&M Engineering Sector						
	<= $12,000	$12,001 – $15,000	$15,001 – $18,000	$18,001 – $25,000	$25,001 – $35,000	$35,001 – $45,000	> $45,000
Professional/technologist	0%	*	*	11%	34%	12%	43%
Technician	1%	2%	12%	41%	34%	8%	2%
Tradesman/craftsman	2%	11%	33%	44%	10%	*	0%
Semi-skilled/general worker	6%	42%	29%	23%	0%	0%	0%
Overall	**1%**	**8%**	**23%**	**37%**	**19%**	**4%**	**7%**

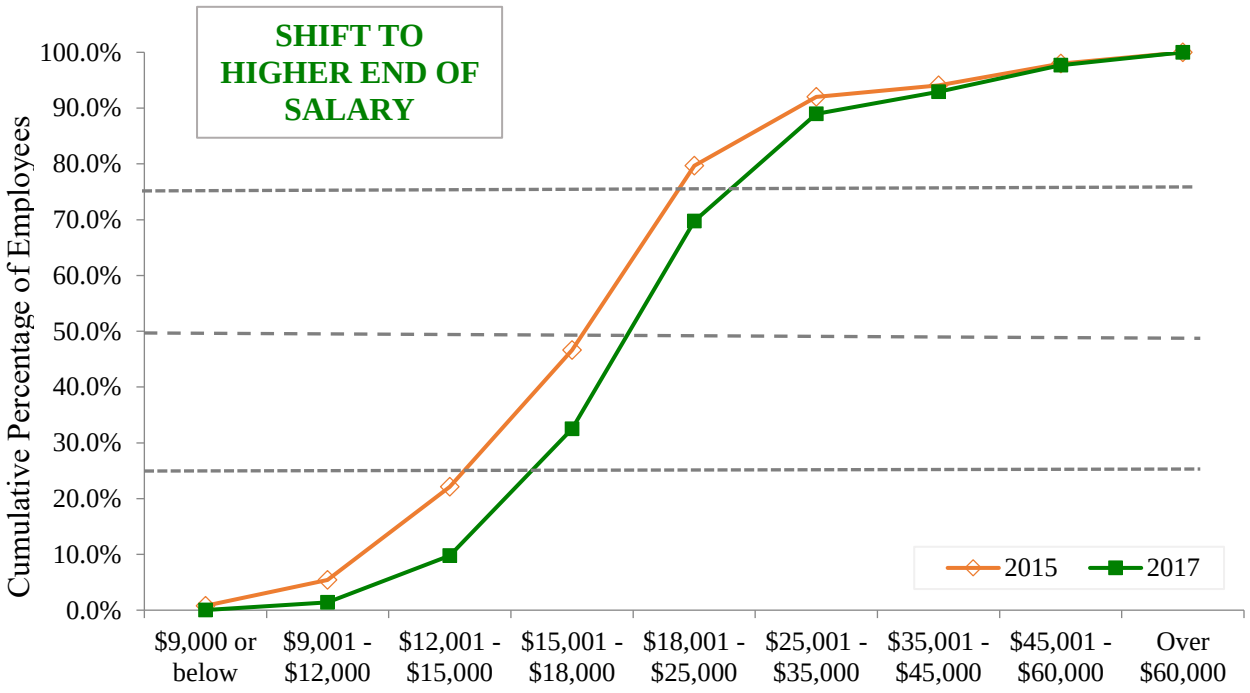
Notes :

*(1) * Less than 0.5%*

(2) A certain percentage of establishments did not provide the salary information. The above percentages were calculated on the basis of those who provided the information.

1.21 Overall speaking, a shift to higher end of salary was noted for employees of E&M Engineering sector as compared with 2015 *(Figure 1.6)*. The salary trend of 2017 against 2015 for individual level was given in *Section III, paragraph 3.19*.

Figure 1.6 Cumulative percentage of average monthly salary in E&M Engineering sector, 2017 and 2015 – Overall



Projected Manpower Training Requirement

1.22 Although several rail projects have been completed during the past few years, other ongoing or newly started major infrastructure projects, such as the Guangzhou-Shenzhen-Hong Kong Express Rail Link, the Shatin to Central Link, the West Kowloon Cultural District Development and the 10-year Hospital Development Plan, will sustain the business of the contracting branches in the coming years. Whereas, the regular operation and maintenance work of buildings and railways, including the 5-year "Operation Building Bright 2.0" project will support the manpower demand of the servicing branches.

1.23 Based on the findings of this and previous rounds of manpower survey, with consideration of workers' age profile and the vacancy numbers at the time of survey, the Training Board projected the average annual training requirements of E&M manpower for the E&M Engineering sector in 2018 to 2021 as shown in *Table 1.3*.

Table 1.3 Projected annual training requirements of E&M workers for the E&M Engineering sector in the coming 4 years

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2018 – 2021
Professional/Technologist	9 985	749
Technician	15 964	1 014
Tradesman/Craftsman	37 505	2 035

C. Shipbuilding and Ship Repair Sector

Manpower

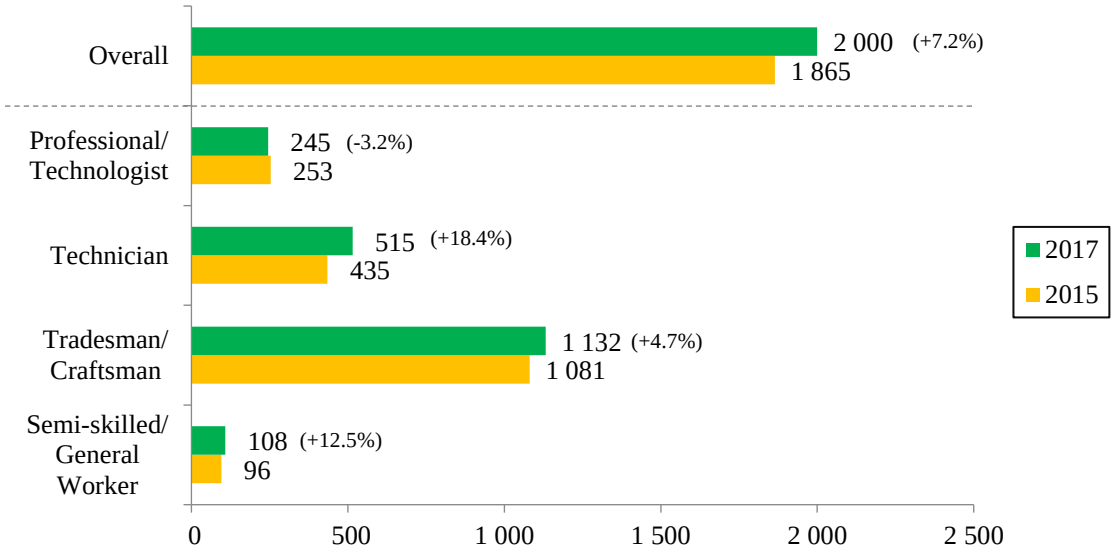
1.24 At the time of survey, a total of 2 000 E&M employees engaged in the Shipbuilding and Ship Repair Sector, of which over 56% (1,132) were employees at tradesman/craftsman level, followed by 26% at technician level, 12% at professional/technologist level and 5% at semi-skilled/general worker level. Please refer to *Table 1.4* for an overview of manpower situation of Shipbuilding and Ship Repair sector.

Table 1.4 Number of E&M employees, trainees and vacancies in the Shipbuilding and Ship Repair sector by job level, 2017

Job level	Shipbuilding and Ship Repair Sector		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional/technologist	245 *(12.3%)*	0 *(0%)*	8 *(3.1%)*
Technician	515 *(25.8%)*	11 *(36.7%)*	126 *(48.8%)*
Tradesman/craftsman	1 132 *(56.6%)*	19 *(63.3%)*	104 *(40.3%)*
Semi-skilled/general worker	108 *(5.4%)*	N.A.	20 *(7.8%)*
Overall	**2 000** ***(100%)***	**30** ***(100%)***	**258** ***(100%)***

1.25 As compared with 2015, the manpower at professional/technologist was close while the manpower at the lower levels increased, giving an overall growth of 7%. Manpower at technician level registered the largest growth of 18% (from 435 to 515). Bearing in mind that the ship business in Hong Kong was rather stable, one of the major reasons for the increase was due to the expansion of business of sizeable companies to include land engineering projects as well *(Figure 1.7)*. The same reason applied to the increase in the number of vacancies (from 121 in 2015 to 258 in 2017). The vacancy rate ranged widely from 3.3% (Professional/Technologist) to 24.5% (Technician).

Figure 1.7 Number of E&M employees in the Shipbuilding and Ship Repair sector by job level, 2017



Salary

1.26 The salary distribution of the E&M employees of Shipbuilding and Ship Repair sector of various levels is listed in *Table 1.5*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

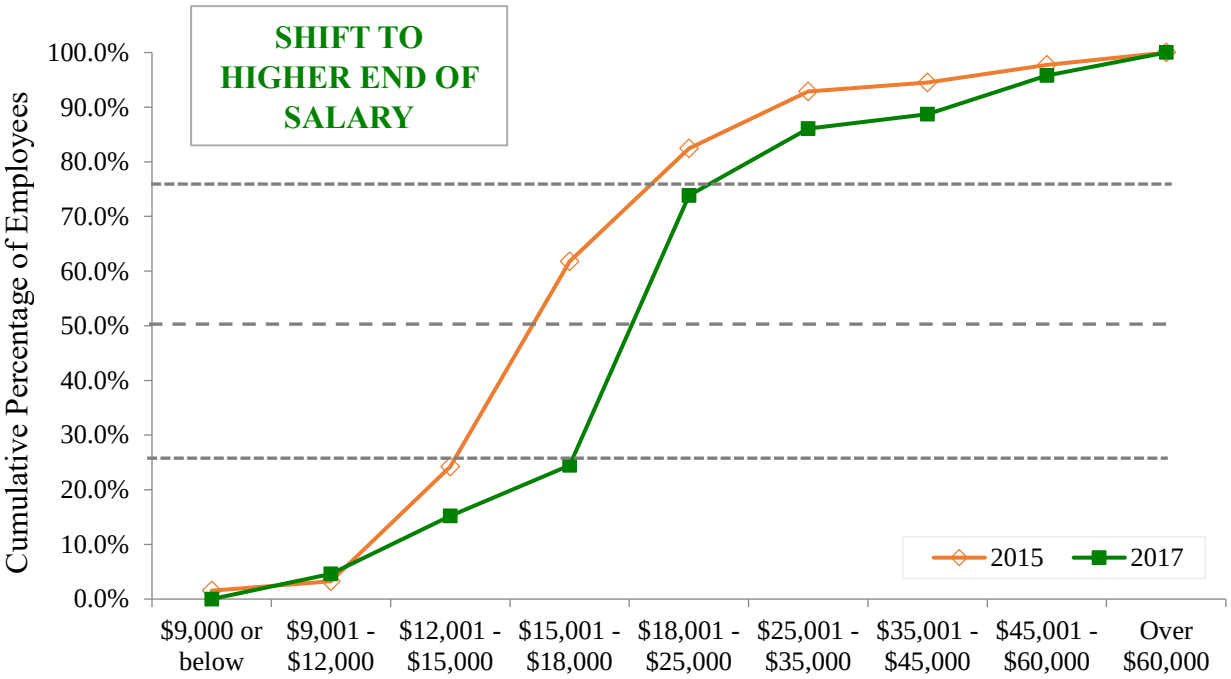
Table 1.5 Salary distribution of E&M employees in the Shipbuilding & Ship Repair sector by job level, 2017

Job level	Shipbuilding & Ship Repair Sector						
	<= $12,000	$12,001 – $15,000	$15,001 – $18,000	$18,001 – $25,000	$25,001 – $35,000	$35,001 – $45,000	> $45,000
Professional/technologist	0%	0%	0%	23%	23%	15%	39%
Technician	*	10%	6%	50%	18%	*	17%
Tradesman/craftsman	8%	10%	12%	63%	7%	0%	0%
Semi-skilled/general worker	16%	49%	30%	5%	0%	0%	0%
Overall	**5%**	**11%**	**9%**	**49%**	**12%**	**3%**	**11%**

Note:
*(1) * Less than 0.5%*
(2) A certain percentage of establishments did not provide the salary information. The above percentages were calculated on the basis of those who provided the information.

1.27 Overall speaking, an obvious shift to higher end of salary was noted for the Shipbuilding and Ship Repair sector as compared with 2015 *(Figure 1.8)*. The salary trend of 2017 against 2015 for individual level was given in *Section III, paragraph 3.33*.

Figure 1.8 Cumulative percentage of average monthly salary in the Shipbuilding & Ship Repair sector, 2017 and 2015 – Overall



Projected Manpower Training Requirement

1.28 Although the local craft repairing business, in particular the luxury and leisure boat market, remains optimistic, manpower shortage continues to be a major challenge for the Shipbuilding and Ship Repair sector. Employers need to improve their remuneration package in order to attract and retain skilled workers.

1.29 Based on the data collected from the present and past rounds of manpower survey, with consideration of the wastage rate of the sector, the Training Board projected the average annual training requirements of E&M manpower for the Shipbuilding and Ship Repair sector in 2018 to 2021 as shown in *Table 1.6*.

Table 1.6 Projected annual training requirements of E&M workers for the Shipbuilding and Ship Repair Sector in the coming 4 years

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2018 – 2021
Professional/Technologist	245	20
Technician	515	42
Tradesman/Craftsman	1 132	92

D. Gas Sector

Manpower

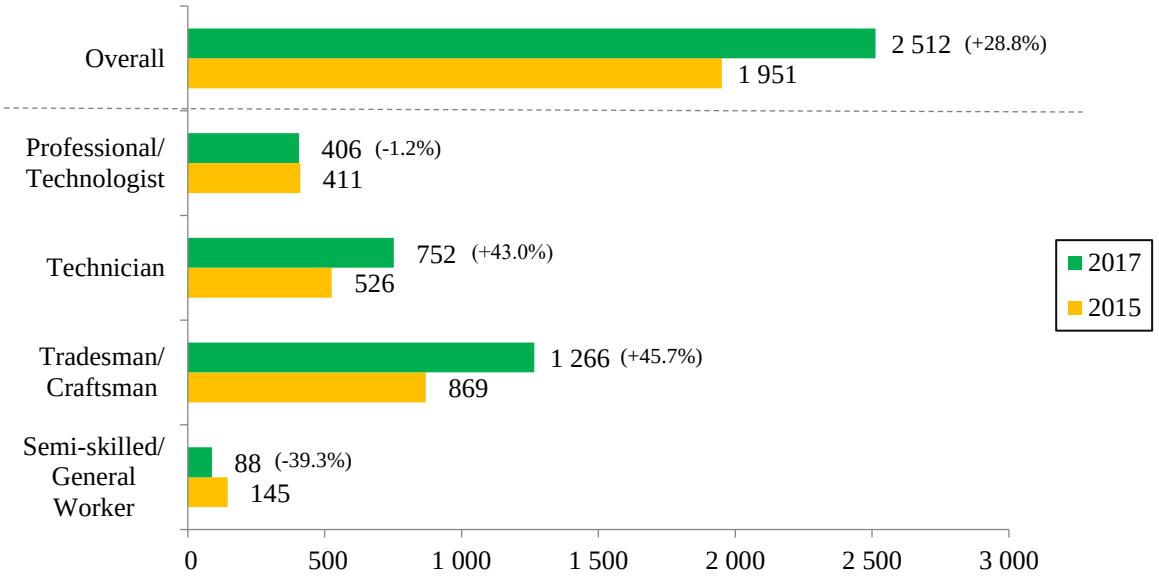
1.30 At the time of survey, a total of 2 512 E&M employees engaged in the Gas sector, of which over half employees were at tradesmen/craftsmen level, followed by 30% at technician level, 16% at professional/technologist level and 4% at semi-skilled/general worker. Please refer to *Table 1.7* for an overview of manpower situation of Gas sector.

Table 1.7 Number of E&M employees, trainees and vacancies in the Gas sector by job level, 2017

Job level	**Gas sector**		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional/technologist	406 *(16.2%)*	10 *(16.9%)*	0 *(0%)*
Technician	752 *(29.9%)*	20 *(33.9%)*	9 *(14.5%)*
Tradesman/craftsman	1 266 *(50.4%)*	29 *(49.2%)*	40 *(64.5%)*
Semi-skilled/general worker	88 *(3.5%)*	N.A.	13 *(21.0%)*
Overall	**2 512** ***(100%)***	**59** ***(100%)***	**62** ***(100%)***

1.31 As compared with 2015, an overall increase of almost 30% was noted in the number of employees of Gas sector as 2 respondents claimed that their manpower had been underestimated in previous rounds of the survey. The manpower at professional/technologist level was more or less the same while there was a significant increase in manpower at both technician and tradesman/craftsman levels *(Figure 1.9)*.

Figure 1.9 Number of employees in the Gas sector by job level, 2017 and 2015



Salary

1.32 The salary distribution of the E&M employees of Gas sector of various levels is listed in *Table 1.8*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

Table 1.8 Salary distribution of E&M employees in the Gas sector by job level, 2017

Job level	Gas Sector						
	<= $12,000	$12,001 – $15,000	$15,001 – $18,000	$18,001 – $25,000	$25,001 – $35,000	$35,001 – $45,000	> $45,000
Professional/technologist	0%	0%	1%	3%	10%	80%	6%
Technician	0%	1%	49%	23%	20%	7%	0%
Tradesman/craftsman	3%	39%	22%	32%	4%	0%	0%
Semi-skilled/general worker	13%	36%	31%	20%	0%	0%	0%
Overall	**2%**	**22%**	**27%**	**24%**	**9%**	**14%**	**1%**

Note:
(1) A certain percentage of establishments did not provide the salary information. The above percentages were calculated on the basis of those who provided the information.

1.33 Overall speaking, the salary of employees of Gas sector followed a similar pattern as 2015 and no obvious change was noted. The salary trend of 2017 against 2015 for individual level was given in *Section III, paragraph 3.46*.

Projected Manpower Training Requirement

1.34 Considering that the HKSAR Government is determined to increase the 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 projected the average annual training requirements for 2018 to 2021 as

shown in *Table 1.9*.

Table 1.9 Projected annual training requirements of E&M workers for the Gas sector in the coming 4 years

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2018 – 2021
Professional/Technologist	406	9
Technician	752	19
Tradesman/Craftsman	1 266	62

E. Aircraft Maintenance Sector

Manpower

1.35 At the time of survey, a total of 5 496 E&M employees engaged in the Aircraft Maintenance sector, of which over half of the employees were at tradesman/craftsman level, followed by 26% at technician level, 13% at professional/technologist level and 11% at semi-skilled/general worker level. Please refer to *Table 1.10* for an overview of manpower situation of the Aircraft Maintenance Sector.

Table 1.10 Number of E&M employees, trainees and vacancies in the Aircraft Maintenance sector by job level, 2017

Job level	**Aircraft Maintenance Sector**		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional/technologist	685 *(12.5%)*	0 *(0%)*	37 *(7.2%)*
Technician	1 415 *(25.7%)*	23 *(3.8%)*	149 *(29.0%)*
Tradesman/craftsman	2 798 *(50.9%)*	588 *(96.2%)*	190 *(37.0%)*
Semi-skilled/general worker	598 *(10.9%)*	N.A.	138 *(26.8%)*
Overall	**5 496** ***(100%)***	**611** ***(100%)***	**514** ***(100%)***

1.36 The Aircraft Maintenance sector was singled out as a separate sector of E&M Services industry in this round of survey. In order to increase the representativeness of the results, the number of companies was increased from 6 in 2015 to 12 in 2017. As the base was rather small, extra caution should be exercised to interpret the figures. Also, due to the large difference in scope in 2017 as compared with 2015, comparison with past results would not be presented in the report.

Salary

1.37 The salary distribution of the E&M employees of Aircraft Maintenance sector of various levels is listed in *Table 1.11*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

Table 1.11 Salary distribution of E&M employees in the Aircraft Maintenance sector by job level, 2017

Job level	Aircraft Maintenance Sector						
	<= $12,000	$12,001 – $15,000	$15,001 – $18,000	$18,001 – $25,000	$25,001 – $35,000	$35,001 – $45,000	> $45,000
Professional/technologist	0%	0%	0%	0%	2%	98%	0%
Technician	0%	0%	15%	85%	0%	0%	0%
Tradesman/craftsman	0%	4%	71%	25%	0%	0%	0%
Semi-skilled/general worker	72%	6%	22%	0%	0%	0%	0%
Overall	**9%**	**3%**	**43%**	**34%**	*	**11%**	**0%**

Notes:
*(1) * Less than 0.5%*
(2) A certain percentage of establishments did not provide the salary information. The above percentages were calculated on the basis of those who provided the information.

1.38 The salary of employees at various levels is presented in *Section III, paragraph 3.57*.

Projected Manpower Training Requirements

1.39 With the completion of the Three-runway System by 2024, the number of workers directly employed in the airport area will double. Maintenance positions like engineers and mechanics will continue to be difficult to fill as skilled workers are always of high demand in the Aircraft Maintenance sector. Based on employers' one-year forecast, the Training Board projected the annual training requirements for year 2018 as shown in *Table 1.12*.

Table 1.12 Projected training requirements of E&M workers in 2018, for the Aircraft Maintenance sector

Job level	No. of Workers at the Time of Survey	Projected Training Requirements for 2018
Professional/Technologist	685	56
Technician	1 415	188
Tradesman/Craftsman	2 798	290

Major Conclusions and Recommendations

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

(a) Training of Professionals/Technologists:

(i) The annual supply of local university graduates from full-time degree programmes is slightly less than the projected annual training requirements. The shortage can be filled up by internal promotion or graduates returned from overseas.

(ii) The Engineering Graduate Training Scheme (EGTS) and New Technology Training Scheme (NTTS) are recommended to employers for their engineering graduates' practical training and staff training on new technologies. The EGTS is particularly beneficial to graduates from overseas universities as few of them have received approved practical training in their Degree programme. The scheme can arrange 8 weeks of basic workshop training in VTC's Pro-Act Training and Development Centres which are HKIE's approved training establishments.

(b) Training of Technicians:

(i) The annual supply of technicians from full-time and part-time-day programmes offered by CityU, PolyU, IVE and Youth College marginally meet the projected annual training requirements.

(ii) The Engineering Training Subsidy Scheme (ETSS) piloted from AY 2016/17 to AY 2018/19 is recommended to working adults who want to pursue higher qualifications by enrolling in VTC's designated professional part-time programmes.

(c) Training of Tradesmen/Craftsmen:

(i) The newly-registered Diploma apprentices per annum amounts to about 50% of the projected annual training requirements. The other 50% will need to be filled up by qualified tradesmen/craftsmen who attained their qualifications through on-the-job training/skills upgrading training or passing relevant trade test.

(ii) The findings of this round of survey revealed that compared with 2 years ago, there were noticeable increase in the number of tradesman/craftsman trainees and significant decrease in the number of vacancies. This, to a certain extent, can be attributed to the effectiveness of the Trainee Subsidy Scheme (TSS) and the Earn & Learn Pilot Scheme (ELS) in attracting and retaining new bloods. Employers are urged to support the schemes. It is also recommended that training providers increase their pre-employment training places and offer more skills upgrading programmes to enable semi-skilled

workers upgrade to qualified tradesmen/ craftsmen.

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

(i) As reflected from the findings of this and previous rounds of manpower survey, the supply of tradesman/craftsman for the E&M Services industry cannot rely on apprenticeship training alone. It is recommended that more semi-skilled / general workers be trained up who can later upgrade to tradesman/craftsman.

(ii) Contractors of the lift & escalator branch have been actively participating in CIC's Contractor Cooperative Training Scheme (CCTS). Compared with 2 years ago, the number of lift/escalator mechanics reported by respondents increased for about 20%. The Training Board recommends CCTS to employers who want to fulfill their manpower need with the "First-hire-then-train" approach.

(e) Trade Tests

(i) Trade test is one of the routes that allow semi-skilled workers to migrate to qualified tradesman/craftsman. Employers should encourage their workers in electrical installations, lift and escalator engineering, if unregistered, to take VTC's trade tests.

(ii) E&M contractors for construction works should encourage their E&M workers to take CIC's trade tests or intermediate trade tests, in order to register and comply with the Construction Workers Registration Ordinance (CWRO).

(f) Promotion of VPET and STEM Education

(i) In order to attract more youngsters to study engineering-related programmes, there is a need to raise the awareness and status of vocational education and skills training across the society, The Training Board recommends that employers continue to support youth skills competitions, e.g. the WorldSkills Competition, by nominating their young, talent workers to join the competitions.

(ii) Close collaboration between VTC's STEM Education Centres and the industry is recommended, to promote STEM education and share experience on technology-enhanced learning.

II. INTRODUCTION

Background

2.1 The Electrical and Mechanical (E&M) Services Training Board of the Vocational training Council is required by its terms of reference to determine the manpower demand of the E&M 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 3* respectively.

2.2 In pursuance of its terms of reference, the Training Board conducted the Manpower Survey (the Survey) of the Electrical and Mechanical Services Industry from **June to August 2017** to collect up-to-date manpower information with a view to assessing the industry's manpower requirements and training needs. This report presents the findings of the survey concerned.

Survey Objective

2.3 The objective of the Survey is to collect the latest manpower information of the Electrical and Mechanical Services industry. Specifically, the Survey aims –

(a) to collect up-to-date manpower information by principal jobs in related disciplines of the electrical and mechanical services industry;
(b) to assess the technical manpower structure;
(c) to forecast training requirements in the near future; and
(d) to recommend to the Council the development of training strategies to meet such needs.

Survey Coverage

2.4 The Survey covered the following sectors and branches of the electrical and mechanical services industry:

I. Electrical and Mechanical Engineering Sector

Branch 1: Contracting (E&M) – 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 – Engineering companies of electrical fitting with water plumbing (HSIC: 432102).

Branch 3: Servicing (E&M) – Servicing companies of electrical and mechanical engineering services including:

(i) repair of electrical equipment (HSIC: 331400);
(ii) repair of rail transport equipment (HSIC: 331500)
(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 appliance, home and garden equipment (HSIC: 953200).

Branch 4: Supplementary Samples – Organisations of other business natures which also employed E&M employees 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, etc.

II. <u>Shipbuilding and Ship Repair Sector</u>

Branch 5: Shipyards and Boatyards – Shipyards and boatyards companies, including:

(i) building of shops 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. Gas Sector

Branch 7: Gas Supply – Gas manufacturing and distribution companies (HSIC: 352000).

Branch 8: Gas Fitting, Installation and Maintenance – Gas fitting, installation and maintenance companies (HSIC: 432204).

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

IV. Aircraft Maintenance Sector

Branch 10: Aircraft Maintenance – Aircraft assembly and manufacture of related machinery, including:

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

(ii) repair of air transport equipment (HSIC: 331500).

Sample Design

2.5 The sample design and selection were done by the Census & Statistics Department (C&SD) of the HKSAR in collaboration with the VTC. To ensure the selection of a representative sample and to facilitate subgroup analysis, a total of 1 221 establishments were invited for survey. Out of this 1 221 establishments, 1 069 were selected by C&SD from the Central Register of Establishments (CRE)[3] using a statistically scientific method of stratified random sampling (comprising strata of establishments stratified by three levels which were sector, branch and employment size). The remaining 152 companies (supplementary sample) was recommended for inclusion in the survey by the Training Board. These companies were prominent companies of other business natures which also employed E&M employees, such as property management companies, trading companies, consulting firms, relevant departments of Universities and Government.

Questionnaire Design

2.6 Survey data were collected through the use of a structured questionnaire. Three separate questionnaires were designed to cater for the principal jobs applicable to the respective sectors:

[3] *The Census and Statistics Department maintains a computerised Central Register of Establishments which contains information relating to some 400 000 active establishments in Hong Kong. Information kept in the Register is updated on a quarterly basis through feedback from various surveys of the department and administrative returns from relevant government departments.*

(a) Questionnaire for the Electrical and Mechanical Engineering Sector and Aircraft Maintenance Sector (Questionnaire E)
(b) Questionnaire for the Shipbuilding and Ship Repair Sector (Questionnaire S)
(c) Questionnaire for the Gas Sector (Questionnaire G)

2.7 Sample of questionnaire, explanatory notes and job descriptions for principal jobs for E&M Engineering sector are given in *Appendix 4*.

Data Collection Method

2.8 A survey pack, containing a notification letter and a survey questionnaire, together with the explanatory notes and a list of principal jobs with job descriptions, was mailed to each of the invited establishments one week before the fieldwork. Responsible persons of the establishments were asked to provide information regarding the manpower situation in their establishments at the time of survey.

2.9 In respect of manpower information, 4 levels of job were classified for the E&M Services industry, namely;

(i) Professional/Technologist;
(ii) Technician;
(iii) Tradesman/Craftsman; and
(iv) Semi-skilled worker/General worker.

2.10 The list of principal jobs in Part I of the questionnaire was defined by the Training Board with detailed job description given for each job. While it was understood that the job titles adopted in the establishments might not be exactly the same as the principal jobs, respondents were required to report manpower information corresponding to the principal jobs basing on the job descriptions.

2.11 During the fieldwork period, enumerators made telephone contacts with or visited individual establishments to assist respondents in completing questionnaires or to collect completed ones.

Quality Control Measures

2.12 Various measures were taken to assure the quality of the survey data collected. These included prior fieldwork preparation, thorough training of fieldwork staff, monitoring of the fieldwork execution, measures to increase the response rate, checking of the completed questionnaires, double data entry and validation of the collected data.

(a) Prior fieldwork preparation

Before the commencement of fieldwork, efforts were made to collect contact telephone numbers of the sampled establishments as far as possible. In addition, sampled establishments belonged to the same business organisations were grouped together to facilitate the fieldwork execution.

(b) Thorough training of fieldwork staff

- VTC organised an industry briefing workshop to familiarise the fieldwork staff with industry related knowledge.
- An intensive briefing and training session was given to all fieldwork staff involved to ensure that they had a good understanding of the survey objectives, the contents of the questionnaires and the operational procedures. Representatives of VTC had participated as guest speakers in the briefing session to answer and clarify queries.

(c) Monitoring of the fieldwork execution

- Well-trained enumerators who are experienced in conducting establishment surveys were deployed to conduct the fieldwork. The fieldwork progress and the work of enumerators were closely monitored by fieldwork supervisors. Debriefing sessions were held twice a week to discuss and solve the problems encountered and to review the quality of the questionnaires completed.
- Joint field visits to a number of establishments were made by staff of VTC to ensure that fieldwork was properly conducted.

(d) Measures to increase the response rate

A number of measures were employed to increase the response rate. In particular, assistance from the Training Board and trade associations was rendered in persuading and soliciting cooperation from their members to participate in the Survey.

(e) Checking of the completed questionnaires

- Completed questionnaires returned by each enumerator were subject to sample check by an independent team of experienced checkers to verify if field visits had really been made.
- ALL the completed questionnaires had undergone vetting process by staff of VTC. Dubious cases identified were followed up by telephone and field verification with the parties concerned.

(f) Double data entry and validation of the collected data

A double data entry system was adopted to minimise the risk of incorrect data entry. Besides, all input data were subject to computer validation and dubious cases identified were followed up through field verification.

Fieldwork Period and Enumeration Results

2.13 The data collection was carried out between June and August 2017. Among the 1,221 sampled establishments, 965 were successfully enumerated and 46 refused, giving an effective response rate of 95.5%.[4] Taking into account (i) the satisfactory response rate of individual branches, (ii) the fact that majority of prominent and sizeable establishments had responded to the survey, and (iii) the grossing-up of sample results basing on statistically-grounded method, it could be concluded that the survey findings presented in this report contributed to a significant level of representativeness of the industry. The response rate achieved for individual sector/branch was also adequate to produce meaningful breakdown by sector *(Table 2.1)*.

Table 2.1 Number of establishments successfully enumerated by sector

Sector	No. of establishments sampled	No. of valid cases	No. of establishments successfully enumerated	Response rate
Overall	**1 221**	**1 011**	**965**	**95.5%**
Electrical and Mechanical Engineering	1 055	868	836	96.3%
Shipbuilding and Ship Repair	71	58	54	93.1%
Gas	80	72	67	93.1%
Aircraft Maintenance	15	13	8	61.5%

[4] *The remaining cases were regarded as invalid cases, including establishments which were suspended operation, engaged in irrelevant trade or had not employed any E&M staff and so on.*

III. SURVEY FINDINGS

A. Overview of the Electrical and Mechanical Services Industry

Number of Workers Employed

3.1 At the time of survey, there were around 117 thousands of employees serving in the E&M Services industry in Hong Kong, of which 76 602 employees and 3 642 trainees of E&M trade were present. The rest were employees of other disciplines (the non-E&M employees), such as human resources, finance, administration, information technology and so on, with a total of 36 695 employees.

3.2 Of the 76 602 employees, 66 594 (86.9%) engaged in the E&M Engineering sector, 2 000 (2.6%) in the Shipbuilding and Ship Repair sector, 2 512 (3.3%) in the Gas sector and 5 496 (7.2%) in the Aircraft Maintenance sector (*Table 3.1*).

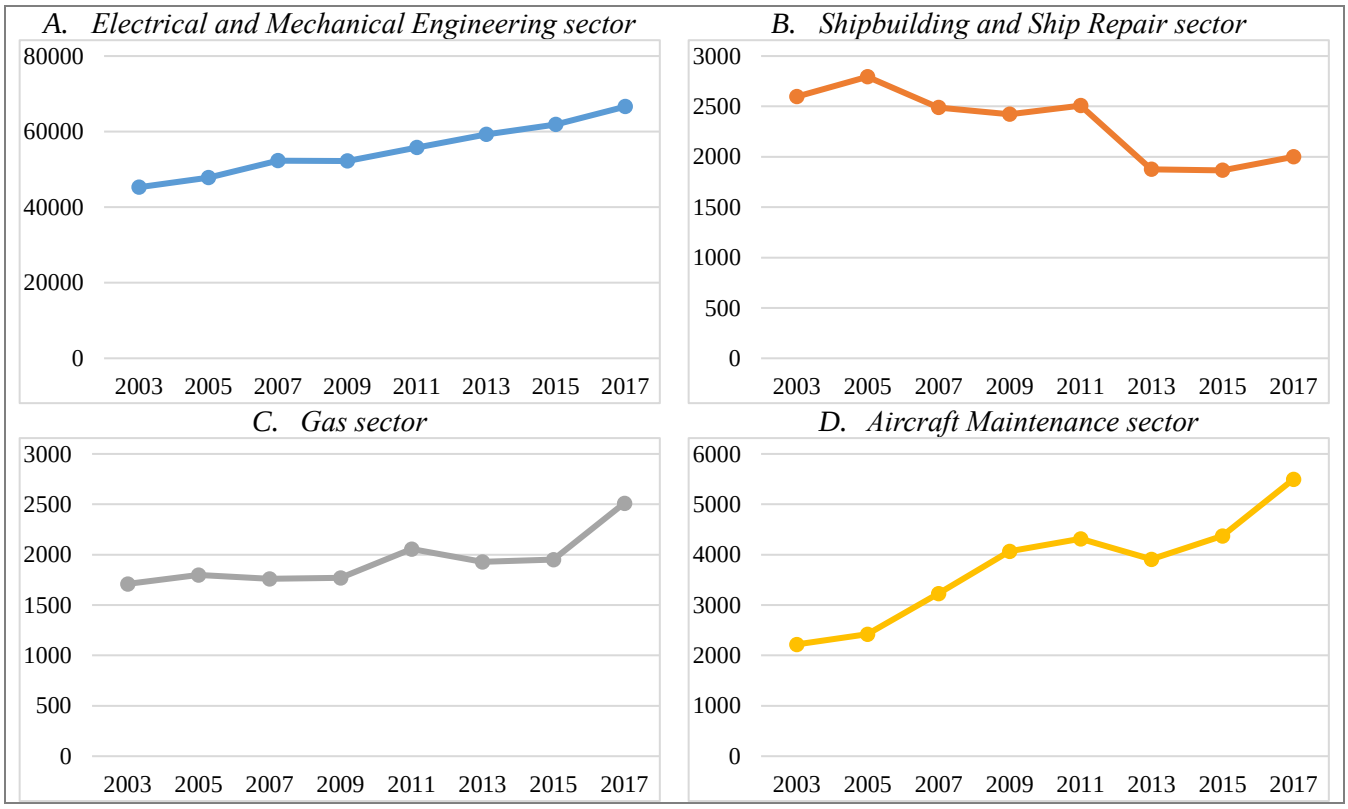
Table 3.1 Number of workers employed by sector in the E&M Services industry, 2017

Sector	E&M		Non-E&M employees	Total
	Employees	Trainees		
E&M Engineering	66 594 (86.9%)	2 942 (80.8%)	31 008 (84.5%)	100 544 (86.0%)
Shipbuilding and Ship Repair	2 000 (2.6%)	30 (0.8%)	836 (2.3%)	2 866 (2.5%)
Gas	2 512 (3.3%)	59 (1.6%)	1 293 (3.5%)	3 864 (3.3%)
Aircraft Maintenance	5 496 (7.2%)	611 (16.8%)	3 558 (9.7%)	9 665 (8.3%)
Overall	**76 602 (100%)**	**3 642 (100%)**	**36 695 (100%)**	**116 939 (100%)**

Manpower Change Over the Years

3.3 Overall speaking, the E&M employees engaged in the E&M Services industry indicated an upward trend since 2003 (*Figure 3.1*). The scenario of individual sector will be discussed in latter parts of the report.

Figure 3.1 Number of E&M employees of E&M Services industry, 2003 to 2017 by sector



Forecast of Manpower Growth

3.4 At the time of survey, the respondents were asked to make a forecast on the number of E&M employees of their respective establishments 12 months later. Overall speaking, the industry anticipated a 4% growth in the E&M employees after a year.

Table 3.2 Current and forecasted number of E&M employees in E&M Services industry by sector

Sector	E&M employees		Percentage increase (2018 vs 2017)
	Actual number in 2017	Forecasted number in 2018	
E&M Engineering	66 594	69 136	3.8%
Shipbuilding and Ship Repair	2 000	2 254	12.7%
Gas	2 512	2 574	2.5%
Aircraft Maintenance	5 496	5 993	9.0%
Overall	**76 602**	**79 957**	**4.4%**

E&M Employees Deployed to Work Outside Hong Kong

3.5 As indicated by the Survey, it was uncommon to deploy E&M employees to work outside Hong Kong nowadays, particularly for the Shipbuilding and Ship Repair sector and the Gas sector. Yet for the E&M Engineering sector, only 171 employees were deployed to work outside Hong Kong with a certain number at various levels while for Aircraft Maintenance sector, 29 employees were deployed to work outside Hong Kong and they were all working at the technician level *(Table 3.3)*.

A. Overview of the Electrical and Mechanical Services Industry (cont.)

Table 3.3 Number of E&M employees deployed to work outside Hong Kong in E&M Services industry by sector by level, 2017

Sector	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total
E&M Engineering	41 (91.1%)	60 (66.7%)	70 (98.6%)	171 (83.0%)
Shipbuilding and Ship Repair	4 (8.9%)	0 (0%)	0 (0%)	4 (1.9%)
Gas	0 (0%)	1 (1.1%)	1 (1.4%)	2 (1.0%)
Aircraft Maintenance	0 (0%)	29 (32.2%)	0 (0%)	29 (14.1%)
Overall	**45 (100%)**	**90 (100%)**	**71 (100%)**	**206 (100%)**

B. Electrical and Mechanical Engineering Sector

Employees

3.6 E&M Engineering sector comprised mainly of E&M contractors, engineering companies of electrical fitting with water plumbing, and companies of E&M services.

3.7 At the time of survey, a total of 66 594 E&M employees engaged in the E&M Engineering sector of which 56% were at tradesman/craftsman level, followed by 24% at technician level, 15% at professional/technologist level and 5% at semi-skilled/general worker. Please refer to *Table 3.4* for an overview of manpower situation of E&M Engineering sector.

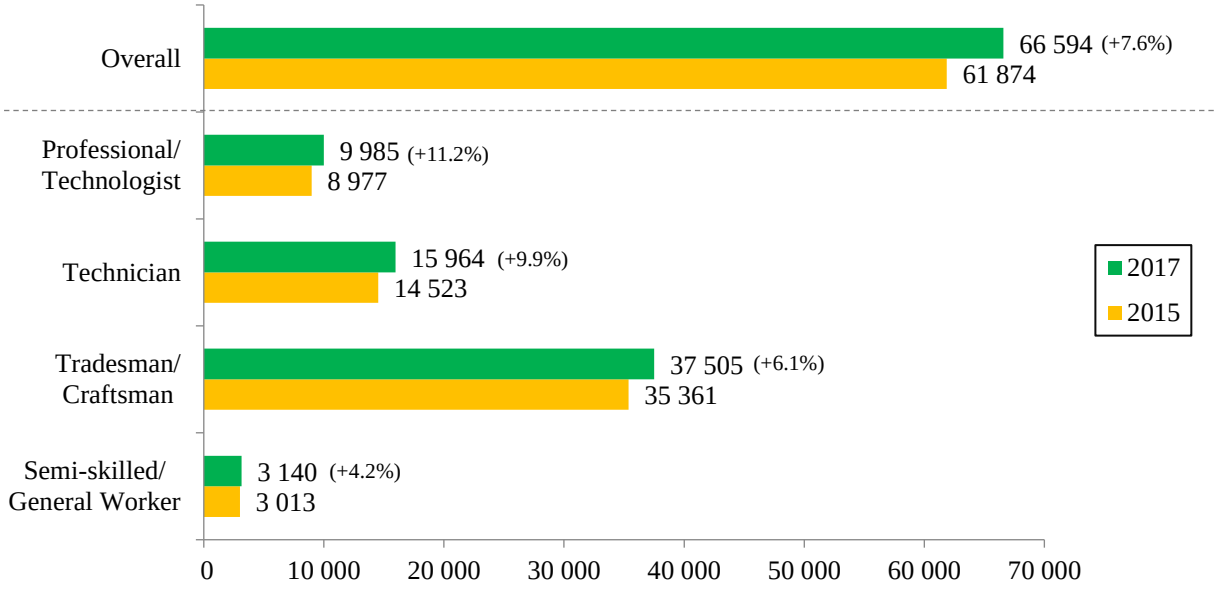
Table 3.4 Number of E&M employees, trainees and vacancies in the E&M Engineering sector by job level, 2017

Job level	E&M Engineering sector		
	E&M employees	E&M trainees	E&M vacancies
Professional/technologist	9 985 *(15.0%)*	407 *(13.8%)*	528 *(18.3%)*
Technician	15 964 *(24.0%)*	535 *(18.2%)*	643 *(22.2%)*
Tradesman/craftsman	37 505 *(56.3%)*	2 000 *(68.0%)*	1 506 *(52.1%)*
Semi-skilled/general worker	3 140 *(4.7%)*	N.A.	215 *(7.4%)*
Overall	**66 594** ***(100%)***	**2 942** ***(100%)***	**2 892** ***(100%)***

B. Electrical and Mechanical Engineering Sector (cont.)

3.8 As compared with 2015, a growth in the number of E&M employees for all levels was noted, giving an overall increment of 7.6%. In particular, manpower at professional/technologist and technician levels registered an over 10% growth in 2017 as compared with two years ago. The growth was mainly attributed to some sizeable and renowned companies of E&M services *(Branch 3)* and Government departments *(Branch 4)* as a result of increased number of engineering projects *(Figure 3.2)*.

Figure 3.2 Number of E&M employees in the E&M Engineering sector by job level, 2017



3.9 As reflected by the Survey, around 46.6% and 53.4% of manpower were devoted to contracting and servicing works respectively, representing 31 061 and 35 533 employees in terms of headcount.

Table 3.5 Estimated manpower for contracting and servicing work in the E&M Engineering sector, 2017

Job level	Number of E&M employees	Number of E&M employees (%) engaged in	
		Contracting	Servicing
Professional/technologist	9 985	5 384 (53.9%)	4 601 (46.1%)
Technician	15 964	6 516 (40.8%)	9 448 (59.2%)
Tradesman/craftsman	37 505	17 539 (46.8%)	19 966 (53.2%)
Semi-skilled/general worker	3 140	1 622 (51.7%)	1 518 (48.3%)
Overall	**66 594**	**31 061 (46.6%)**	**35 533 (53.4%)**

B. Electrical and Mechanical Engineering Sector (cont.)

Prominent Principal Jobs

3.10 For each job level, the principal jobs which accounted for a significant percentage of the E&M manpower in 2017 are listed in *Table 3.6*.

Table 3.6 Prominent Principal jobs by level in the E&M Engineering sector, 2017

Job Level	Prominent Principal Jobs	% of E&M employees accounted at respective level
Professional/ technologist	Electrical Engineer	78%
	Building Services Engineer	
	Engineering Manager	
	Refrigeration/ Air-conditioning/Ventilation Engineer	
	Mechanical Engineer	
Technician	Supervisor	65%
	Electrical Engineering Technician	
	Building Services Technician	
	Refrigeration/ Air-conditioning/Ventilation Technician	
	Mechanical Engineering Technician	
Tradesman/ craftsman	Electrician/ Electrical Fitter	59%
	Foreman/Chargehand	
	Building Services Mechanic	
	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System)	
	Lift Mechanic	

3.11 As compared with 2015, quite a significant increase in manpower was noted for the following principal jobs :

Table 3.7 Principal jobs with significant increase in manpower by level in the E&M Engineering sector, 2017

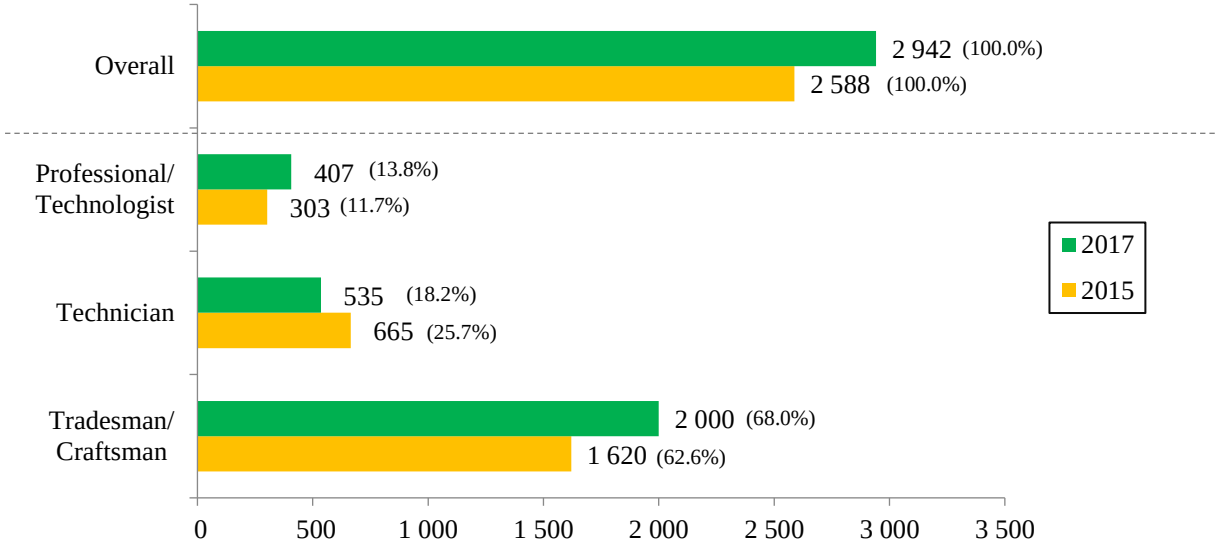
Job Level	Principal Jobs with significant increase in manpower
Professional/ technologist	Building Services Engineer
	Safety Officer
	Electrical Engineer
	Engineering Manager
	Plumbing and Drainage Engineer
Technician	Supervisor
	Electrical Engineering Technician
	Mechanical Engineering Technician
	Telecommunication Technician
	Assistant Safety Officer/Safety Supervisor
Tradesman/ craftsman	Building Services Mechanic
	Electrical Wireman
	Lift Mechanic & Escalator Mechanic

B. Electrical and Mechanical Engineering Sector (cont.)

Trainees

3.12 The employment of trainees, under a contract or mode of apprenticeship, was very common in the E&M Engineering sector. A total of 2 942 trainees was reported, which accounted for around 4% of the total of employees and trainees (69 086) of E&M Engineering sector. Comparing to 2015, more trainees were actually reported in 2017 at professional/technologist and tradesman/craftsman levels, but less at the technician level (*Figure 3.3*).

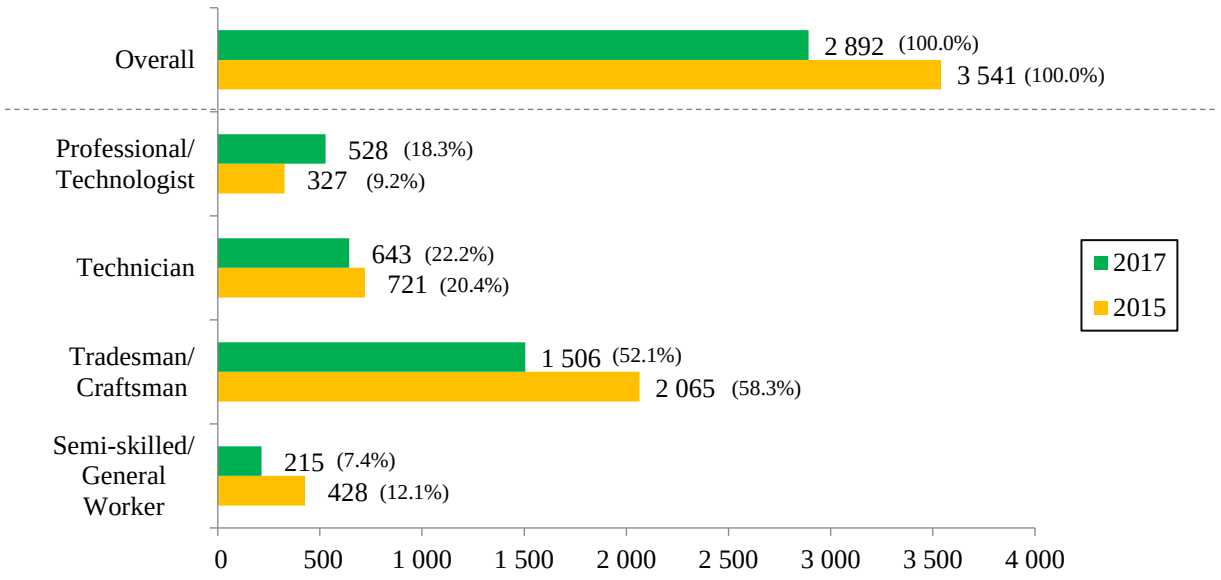
Figure 3.3 Number of E&M trainees in the E&M Engineering sector by job level, 2017



Vacancies

3.13 With the fact that more people entered the sector as employees or trainees, it was not surprised to note the decrease in the number of vacancies from 3 541 in 2015 to 2 892 in 2017. The decrease was noted for all levels except the professional/technologist level *(Figure 3.4)*. The vacancy rate ranged from 4% to nearly 7% for various levels (*Table 3.8*).

Figure 3.4 Number of E&M vacancies in the E&M Engineering sector by job level, 2017



B. Electrical and Mechanical Engineering Sector (cont.)

Table 3.8 Number and percentage of vacancies of employees in the E&M Engineering sector by job level, 2017 and 2015

Job level	2017		2015	
	Number of vacancies	% of vacancies over employees	Number of vacancies	% of vacancies over employees
Professional/technologist	528	5.3%	327	3.6%
Technician	643	4.0%	721	5.0%
Tradesman/craftsman	1 506	4.0%	2 065	5.8%
Semi-skilled/general worker	215	6.8%	428	14.2%
Overall	**2 892**	**4.3%**	**3 541**	**5.7%**

Turnover and Recruit of E&M Employees

3.14 Overall, a total of 4 323 E&M employees left their organisations within the 12 months before the survey, representing a 6.5% turnover rate. The turnover rate was 4.5%, 5.0%, 6.7% and 18.1% respectively for professionals/technologists, technicians, tradesmen/craftsmen and semi-skilled/general workers *(Table 3.9)*.

Table 3.9 Number and percentage of turnover in the E&M Engineering sector by job level, 2017

Job level	Number of E&M employees	Number of turnover	Turnover rate
Professional/technologist	9 985	446	4.5%
Technician	15 964	797	5.0%
Tradesman/craftsman	37 505	2 511	6.7%
Semi-skilled/general worker	3 140	569	18.1%
Overall	**66 594**	**4 323**	**6.5%**

3.15 Overall, a total of 4 663 experienced E&M employees were recruited by organisations within the 12 months before the survey, representing a 7.0% recruit rate. In general, the number of recruits was larger than the number of turnover, indicating that establishments not only filled up the turnover but also the vacancies *(Table 3.10)*

Table 3.10 Number of recruits and turnover in the E&M Engineering sector by job level, 2017

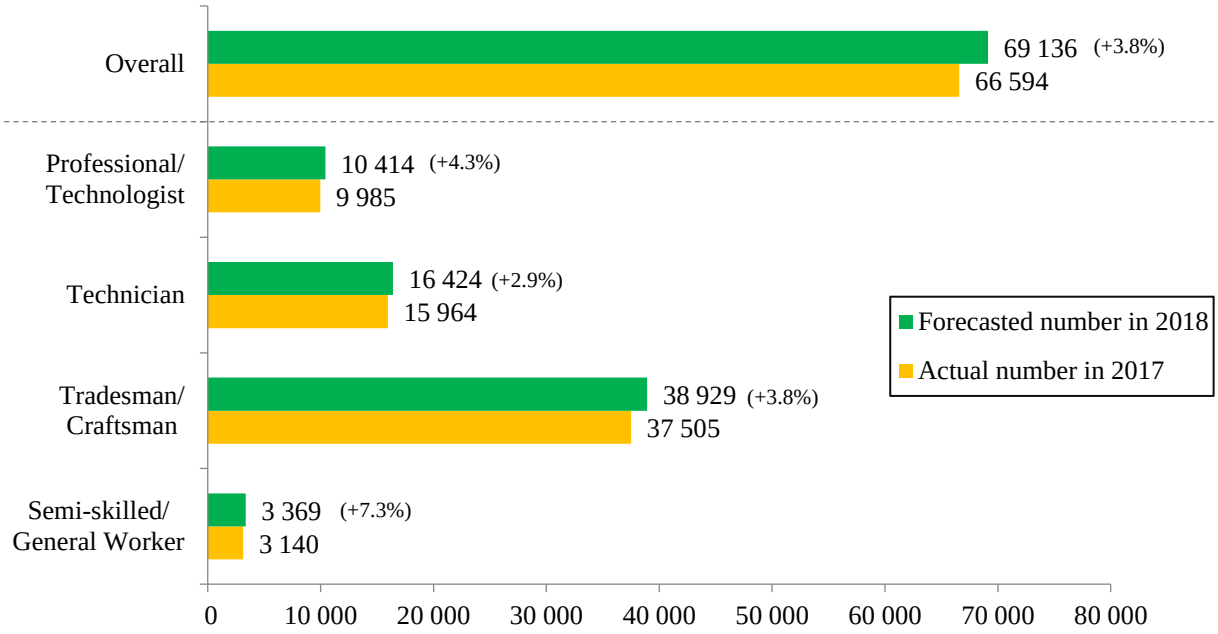
Job level	Number of recruits	Number of turnover	Difference
Professional/technologist	506	446	+60
Technician	997	797	+200
Tradesman/craftsman	2 539	2 511	+28
Semi-skilled/general worker	621	569	+52
Overall	**4 663**	**4 323**	**+340**

B. Electrical and Mechanical Engineering Sector (cont.)

Forecast of E&M Employees and Trainees

3.16 Looking at the E&M Engineering sector as a whole, a 3.8% growth in manpower was expected from employers after a year, from 66 594 E&M employees in 2017 to 69 136 in 2018. The growth was obviously high for semi-skilled/general worker (7.3%).

Figure 3.5 Current and forecasted number of E&M employees of E&M Engineering sector by job level



3.17 The number of trainees present in the establishments would be quite stable as employers anticipated a less than 1% growth in terms of number of trainees after one year.

Salary

3.18 Employers were requested to provide salary brackets for the employees. The salary distribution of E&M employees of various levels is listed in *Table 3.11*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.11 Salary distribution of E&M employees in the E&M Engineering sector by job level, 2017

Job level	E&M Engineering sector						
	<= $12,000	$12,001 to $15,000	$15,001 to $18,000	$18,001 to $25,000	$25,001 to $35,000	$35,001 to $45,000	> $45,000
Professional/technologist	0%	*	*	11%	34%	12%	43%
Technician	1%	2%	12%	41%	34%	8%	2%
Tradesman/craftsman	2%	11%	33%	44%	10%	*	0%
Semi-skilled/general worker	6%	42%	29%	23%	0%	0%	0%
Overall	**1%**	**8%**	**23%**	**37%**	**19%**	**4%**	**7%**

Notes :
*(1) * Less than 0.5%*
(2) A certain percentage of establishments did not provide the salary information. The above percentages were calculated on the basis of those which provided the information.

B. Electrical and Mechanical Engineering Sector (cont.)

3.19 Overall speaking, a shift to higher end of salary was noted for employees of E&M Engineering sector as compared with 2015. The salary trend of 2017 against 2015 for individual level was given in *Figures 3.6 to 3.10.*

Figure 3.6 Cumulative percentage of average monthly salary in the E&M Engineering sector, 2017 and 2015 – Overall

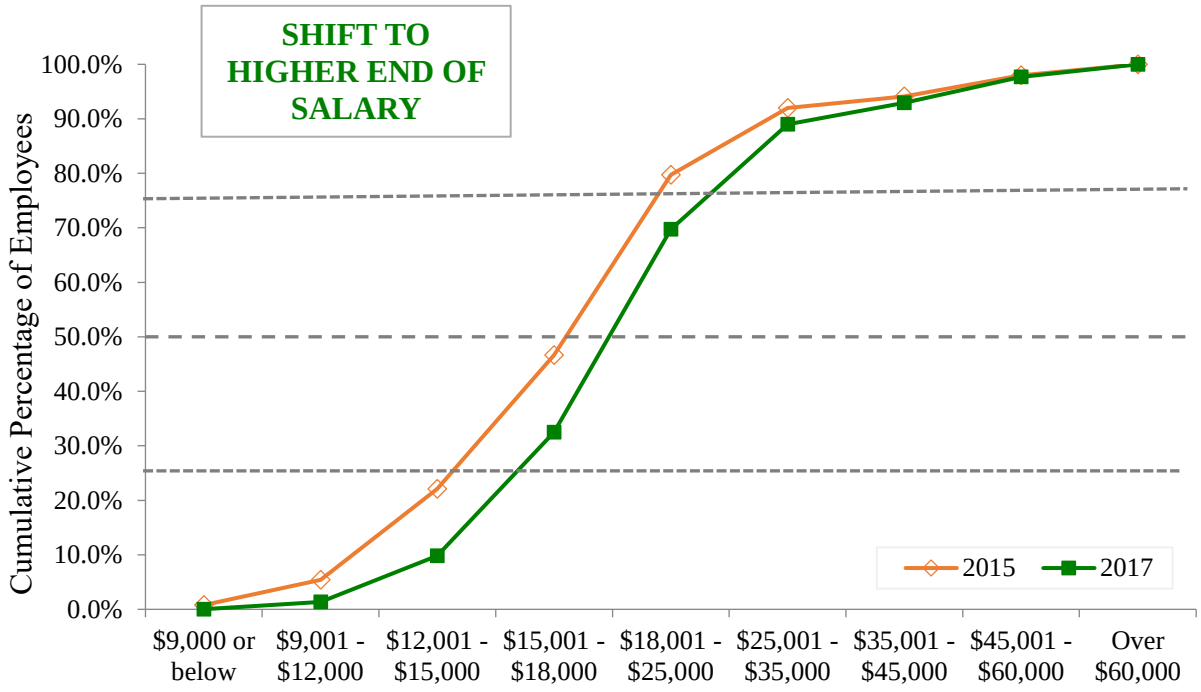
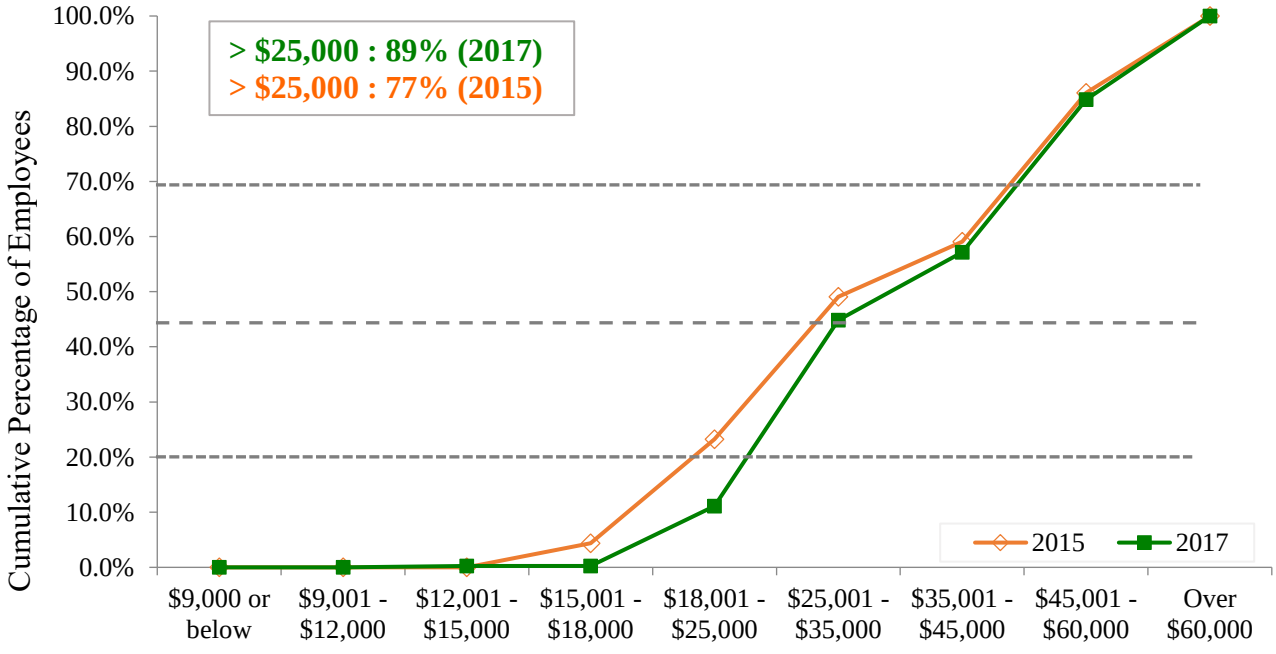


Figure 3.7 Cumulative percentage of average monthly salary in the E&M Engineering sector, 2017 and 2015 – Professional/Technologist



B. Electrical and Mechanical Engineering Sector (cont.)

Figure 3.8 Cumulative percentage of average monthly salary in the E&M Engineering sector, 2017 and 2015 – Technician

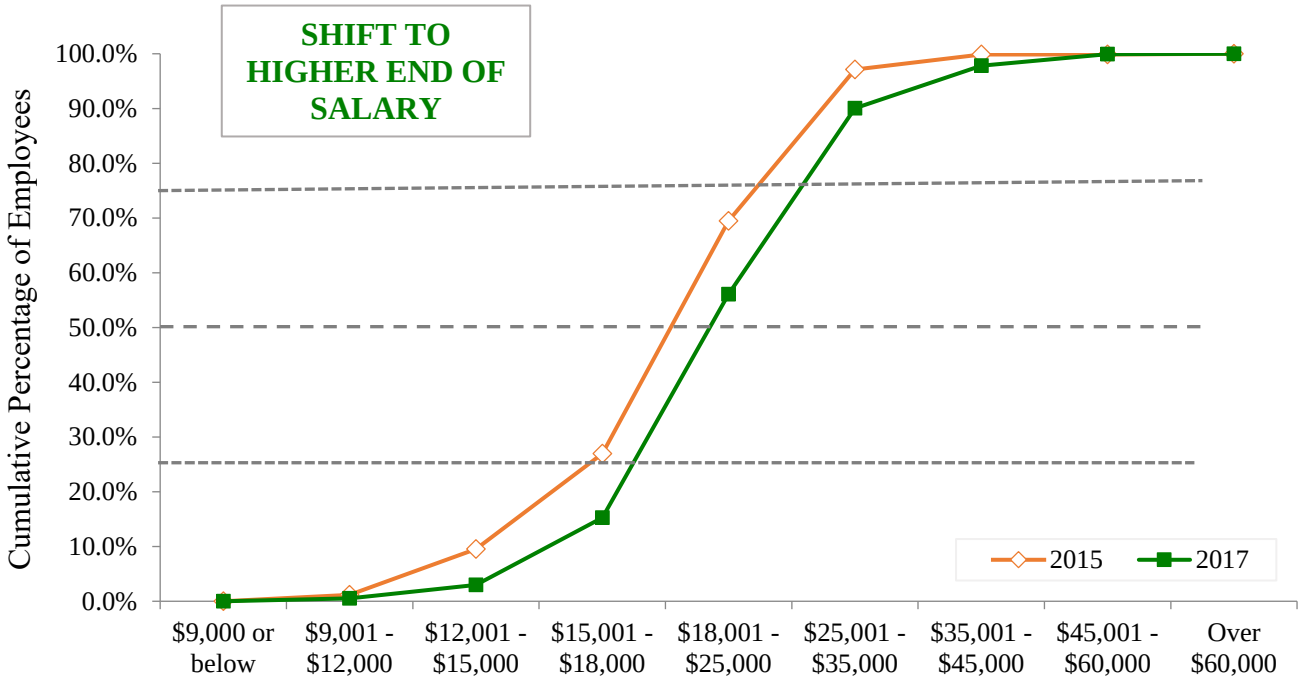
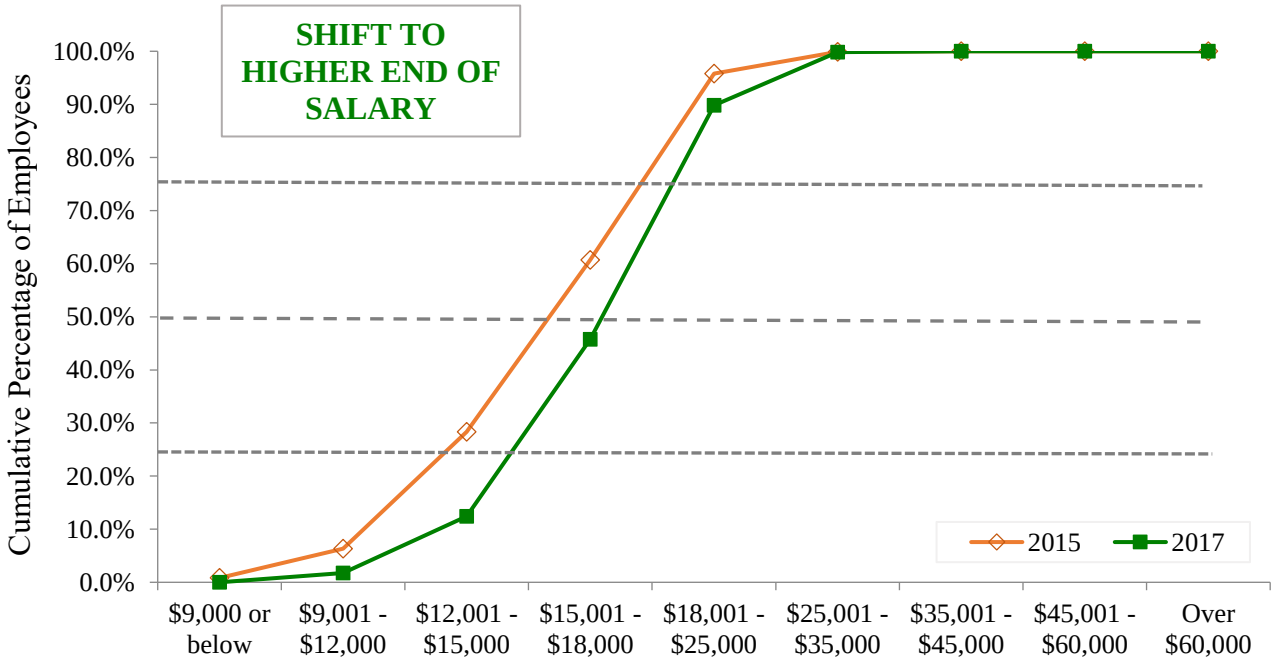
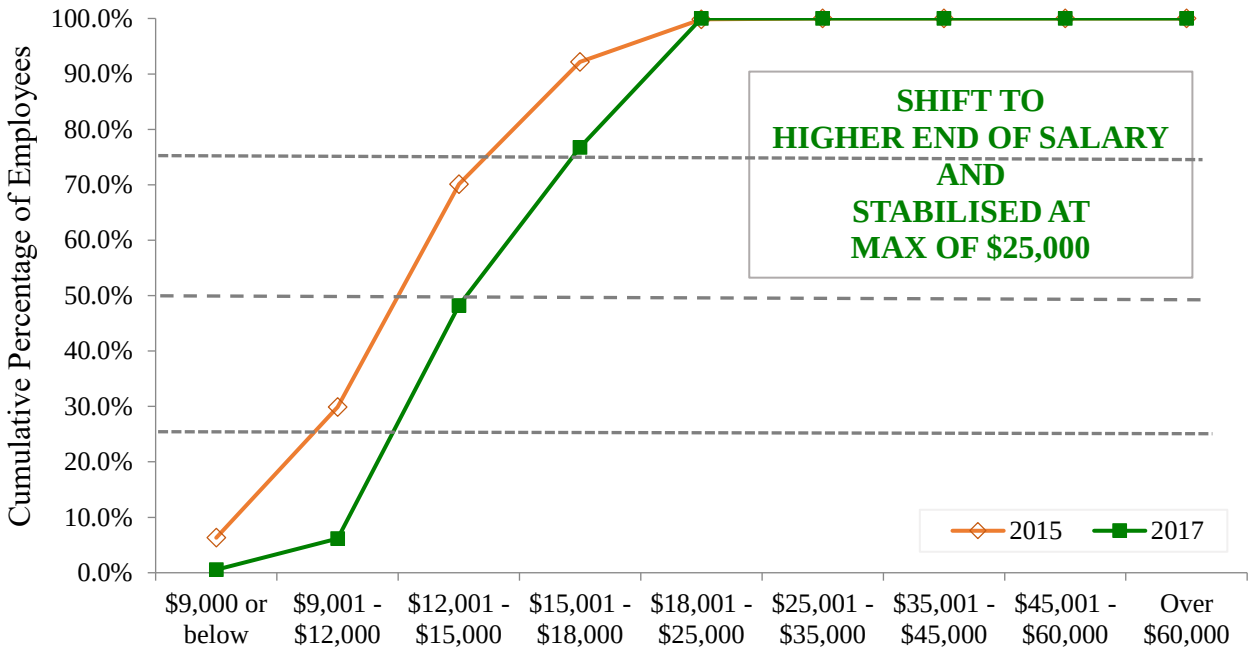


Figure 3.9 Cumulative percentage of average monthly salary in the E&M Engineering sector, 2017 and 2015 – Tradesman / Craftsman



B. Electrical and Mechanical Engineering Sector (cont.)

Figure 3.10 Cumulative percentage of average monthly salary in the E&M Engineering sector, 2017 and 2015 – Semi-skilled worker / General worker



3.20 The principal jobs with a relatively higher percentage of employees falling into the salary brackets of higher ends are listed in *Table 3.12 to 3.14*.

Table 3.12 Principal jobs at Professional/Technologist level with most employees in high salary brackets in the E&M Engineering sector, 2017

Job	% of employees with average monthly income > $35,000	Total no. of employees
Level 1 : Professional/Technologist level		
Engineering Manager	86.0%	1 610
Building Services Engineer	67.2%	1 643
Mechanical Engineer	60.7%	911
Safety Officer	59.5%	483
Overall for Level 1	***55.1%***	***9 985***

B. Electrical and Mechanical Engineering Sector (cont.)

Table 3.13 Principal jobs at Technician level with most employees in high salary brackets in the E&M Engineering sector, 2017

Job	% of employees with average monthly income > $25,000	Total no. of employees
Level 2 : Technician		
Electronics Technician	91.5%	833
Supervisor	65.3%	3 440
Electrical Engineering Technician	60.1%	2 432
Mechanical Engineering Technician	55.3%	1 206
Draughtsman	47.2%	639
Overall for Level 2	***43.9%***	***15 964***

Table 3.14 Principal jobs at Tradesman/Craftsman level with most employees in high salary brackets in the E&M Engineering sector, 2017

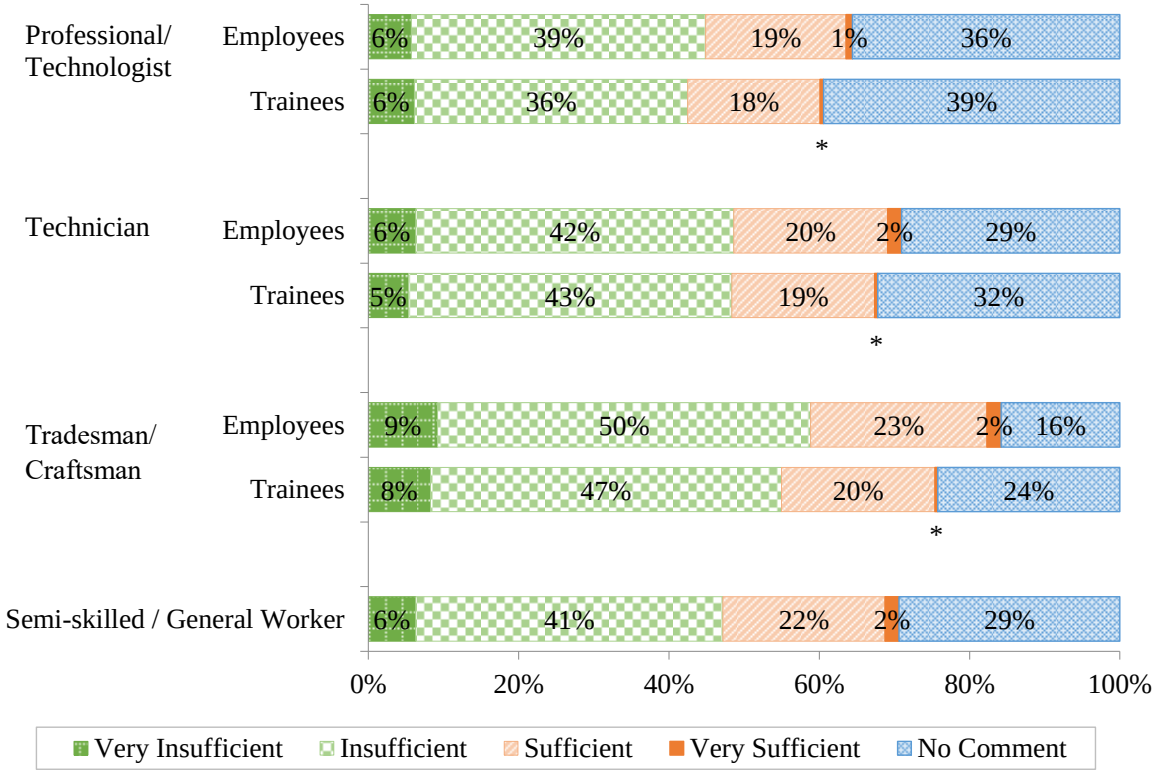
Job	% of employees with average monthly income > $18,000	Total no. of employees
Level 3 : Tradesman/Craftsman		
Cable Jointer (Power)	94.0%	500
Overhead Linesman	85.6%	139
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System)	84.3%	398
Foreman/Chargehand	82.8%	4 040
Carpenter	81.0%	106
Overall for Level 3	***54.2%***	***37 505***

Views on Manpower Supply

3.21 The views of respondents on the manpower supply in the past 12 months were also solicited. In general, apparently more establishments considered the manpower supply as being insufficient than sufficient.

B. Electrical and Mechanical Engineering Sector (cont.)

Figure 3.11 Views on manpower supply of different job level in the past 12 months in the E&M Engineering sector, 2017



3.22 Amongst the four job levels, a higher degree of manpower insufficiency was noted for employees at the tradesman/craftsman level, as nearly 60% of the respondents gave this remark. The manpower insufficiency at this level was echoed by an even higher percentage (nearly 74%) of respondents of E&M contractors with 100 employees or above.

3.23 One point was worth noting for the companies of E&M services with 100 employees or above, where manpower insufficiency across levels, including professional/technologist, technician and tradesman/craftsman, was noted from 60-70% of the employers.

C. Shipbuilding and Ship Repair Sector

Employees

3.24 At the time of survey, a total of 2 000 E&M employees engaged in the Shipbuilding and Ship Repair sector, of which over 56% (1 132) were employees at tradesman/craftsman level, followed by 26% at technician level, 12% at professional/technologist level and 5% at semi-skilled/general worker level. Please refer to *Table 3.15* for an overview of manpower situation of Shipbuilding and Ship Repair sector.

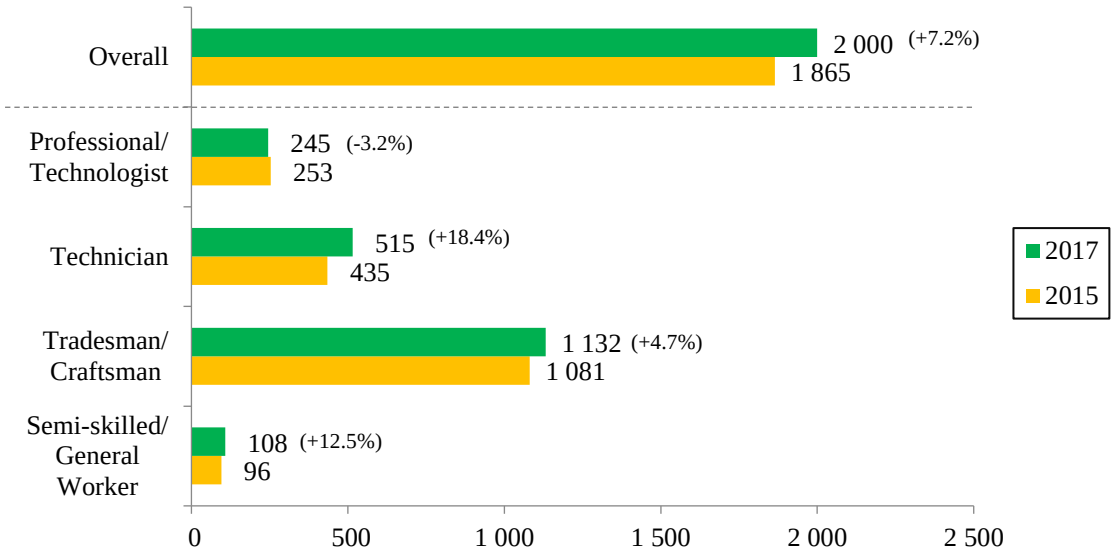
C. Shipbuilding and Ship Repair Sector (cont.)

Table 3.15 Number of E&M employees, trainees and vacancies in the Shipbuilding and Ship Repair sector by job level, 2017

Job level	Shipbuilding and Ship Repair sector		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional/technologist	245 *(12.3%)*	0 *(0%)*	8 *(3.1%)*
Technician	515 *(25.8%)*	11 *(36.7%)*	126 *(48.8%)*
Tradesman/craftsman	1 132 *(56.6%)*	19 *(63.3%)*	104 *(40.3%)*
Semi-skilled/general worker	108 *(5.4%)*	N.A.	20 *(7.8%)*
Overall	**2 000** ***(100%)***	**30** ***(100%)***	**258** ***(100%)***

3.25 As compared with 2015, the manpower at professional/technologist was close while the manpower at the lower levels increased, giving an overall growth of 7%. Manpower at technician level registered the largest growth of 18% (from 435 to 515). Bearing in mind that the ship business in Hong Kong was rather stable, one of the major reasons for the increase was due to the expansion of business of sizeable companies to include land engineering projects as well *(Figure 3.12)*.

Figure 3.12 Number of E&M employees in the Shipbuilding and Ship Repair sector by job level, 2017



3.26 For technician level, over 90% of the manpower were accounted by supervisor/foreman, mechanical engineering technician and electrical engineering technician. For tradesman/craftsman level on the other hand, over 55% of manpower were attributed to mechanical fitter, carpenter and painter.

C. Shipbuilding and Ship Repair Sector (cont.)

Trainees and vacancies

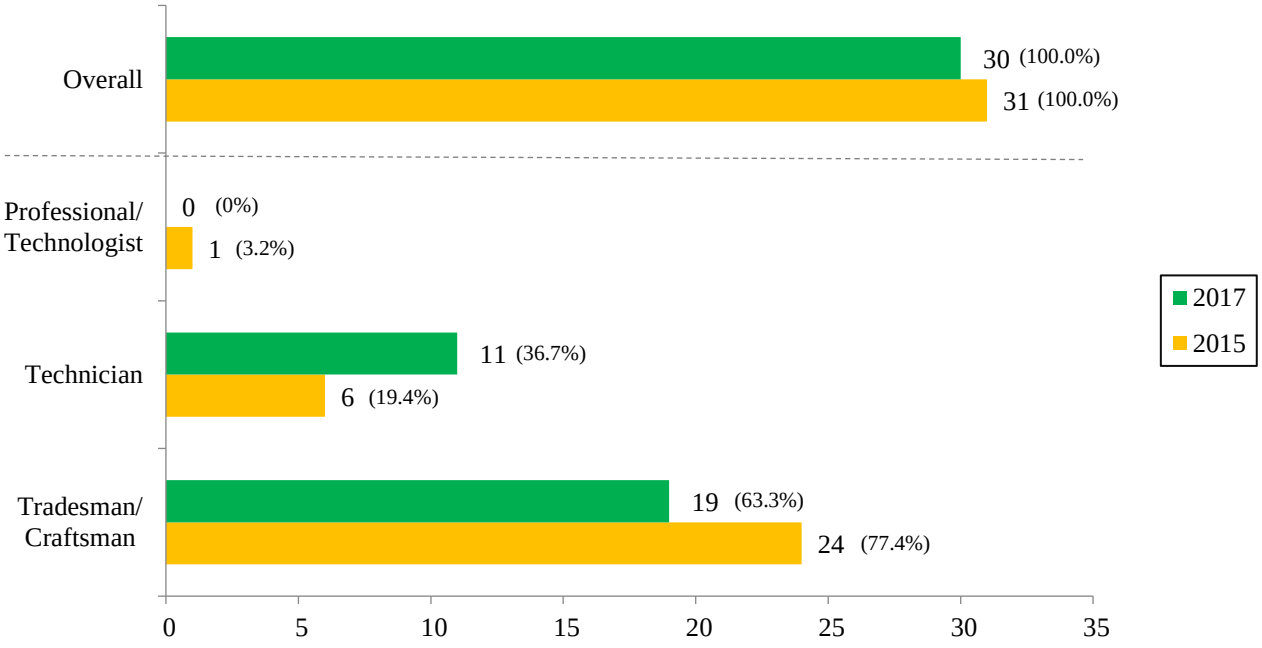
3.27 The reason mentioned in paragraph 3.25 also applied to the increase in the number of vacancies (from 121 in 2015 to 258 in 2017). The vacancy rate ranged widely from 3.3% (Professional/Technologist) to 24.5% (Technician).

Table 3.16 Number and percentage of vacancies of employees in the Shipbuilding and Ship Repair sector by job level, 2017 and 2015

Job level	2017		2015	
	Number of vacancies	% of vacancies over employees	Number of vacancies	% of vacancies over employees
Professional/technologist	8	3.3%	7	2.8%
Technician	126	24.5%	24	5.5%
Tradesman/craftsman	104	9.2%	89	8.2%
Semi-skilled/general worker	20	18.5%	1	1.0%
Overall	**258**	**12.9%**	**121**	**6.5%**

3.28 The number of trainees in 2017 were more or less the same as two years ago.

Figure 3.13 Number of E&M trainees in the Shipbuilding and Ship Repair sector by job level, 2017 and 2015



C. Shipbuilding and Ship Repair Sector (cont.)

Turnover and Recruit of E&M Employees

3.29 Overall, a total of 145 E&M employees left their organisations within the 12 months before the survey, representing a 7.3% turnover rate. The turnover rate was 2.0%, 6.0%, 7.7% and 20.4% respectively for professionals/technologists, technicians, tradesmen/craftsmen and semi-skilled/general workers *(Table 3.17)*.

Table 3.17 Number and percentage of turnover in the Shipbuilding and Ship Repair sector by job level, 2017

Job level	Number of E&M employees	Number of turnover	Turnover rate
Professional/technologist	245	5	2.0%
Technician	515	31	6.0%
Tradesman/craftsman	1 132	87	7.7%
Semi-skilled/general worker	108	22	20.4%
Overall	**2 000**	**145**	**7.3%**

3.30 Overall, a total of 150 experienced E&M employees were recruited by organisations within the 12 months before the survey, representing a 7.5% recruit rate. The number of recruits was larger than the number of turnover except for tradesmen/craftsmen, indicating that the turnover and some of the vacancies had been successfully filled up for these three levels *(Table 3.18)*.

Table 3.18 Number of recruit and turnover in the Shipbuilding and Ship Repair sector by job level, 2017

Job level	Number of recruits	Number of turnover	Difference
Professional/technologist	16	5	+11
Technician	47	31	+16
Tradesman/craftsman	63	87	-24
Semi-skilled/general worker	24	22	+2
Overall	**150**	**145**	**+5**

Forecast of E&M Employees

3.31 The forecasted number of E&M employees engaged in the Shipbuilding and Ship Repair sector a year after the Survey registered an almost 13% growth, from 2 000 E&M employees in 2017 to 2 254 in 2018. The growth was particularly high for technicians (24.5%) and semi-skilled/general workers (16.7%). Similar to the case of number of employees, the growth was mainly attributed to one particular sizeable company which engaged in land engineering projects in addition to its core business in the Shipbuilding and Ship Repair sector.

C. Shipbuilding and Ship Repair Sector (cont.)

Table 3.19 Current and forecasted number of E&M employees in the Shipbuilding and Ship Repair sector by job level, 2017

Job level	Current number of E&M employees	Forecasted number of E&M employees	Forecasted percentage change
Professional/technologist	245	253	3.3%
Technician	515	641	24.5%
Tradesman/craftsman	1 132	1 234	9.0%
Semi-skilled/general worker	108	126	16.7%
Overall	**2 000**	**2 254**	**12.7%**

Salary

3.32 The salary distribution of the E&M employees of Shipbuilding and Ship Repair sector of various levels is listed in *Table 3.20.* Salary ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.20 Salary distribution of E&M employees in the Shipbuilding & Ship Repair sector by job level, 2017

Job level	Shipbuilding & Ship Repair Sector						
	<= $12,000	$12,001 to $15,000	$15,001 to $18,000	$18,001 to $25,000	$25,001 to $35,000	$35,001 to $45,000	> $45,000
Professional/technologist	0%	0%	0%	23%	23%	15%	39%
Technician	*	10%	6%	50%	18%	*	17%
Tradesman/craftsman	8%	10%	12%	63%	7%	0%	0%
Semi-skilled/general worker	16%	49%	30%	5%	0%	0%	0%
Overall	**5%**	**11%**	**9%**	**49%**	**12%**	**3%**	**11%**

Notes:
*(1) * Less than 0.5%*
(2) A certain percentage of establishments did not provide the salary information. The above percentages were calculated on the basis of those who provided the information.

3.33 Overall speaking, an obvious shift to higher end of salary was noted for the Shipbuilding and Ship Repair sector as compared with 2015 (*Figure 3.14*). The salary trend of 2017 against 2015 for individual level was given in *Figures 3.15 to 3.18*.

C. Shipbuilding and Ship Repair Sector (cont.)

Figure 3.14 Cumulative percentage of average monthly salary in the Shipbuilding and Ship Repair sector, 2017 and 2015 – Overall

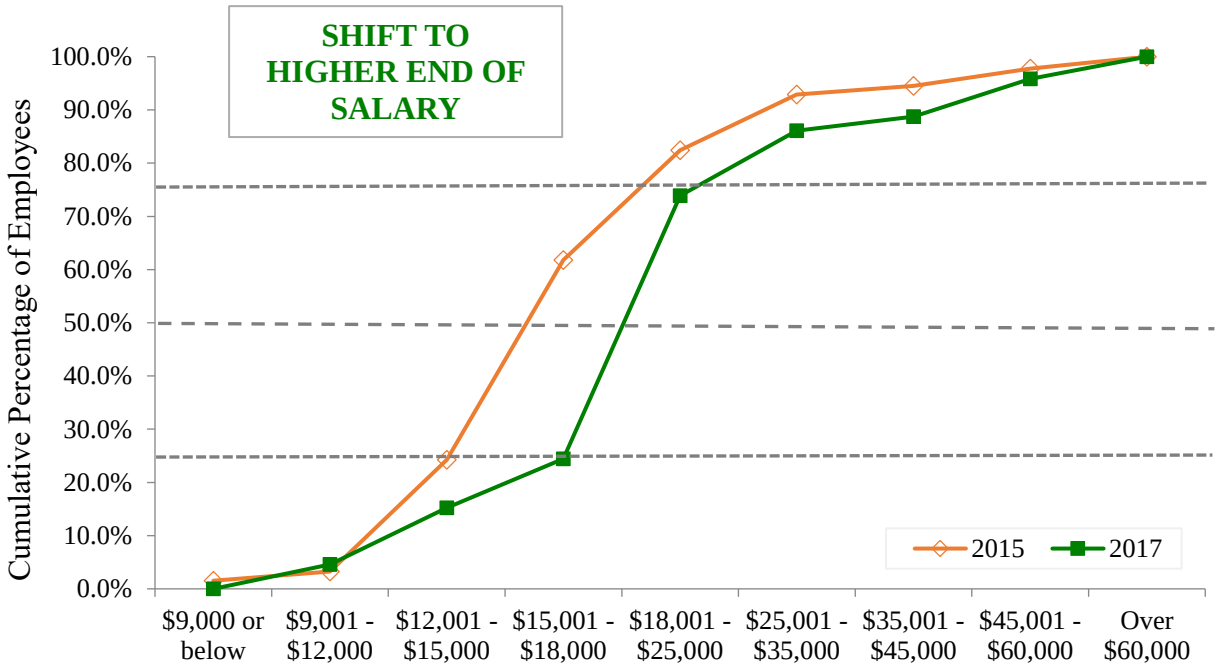
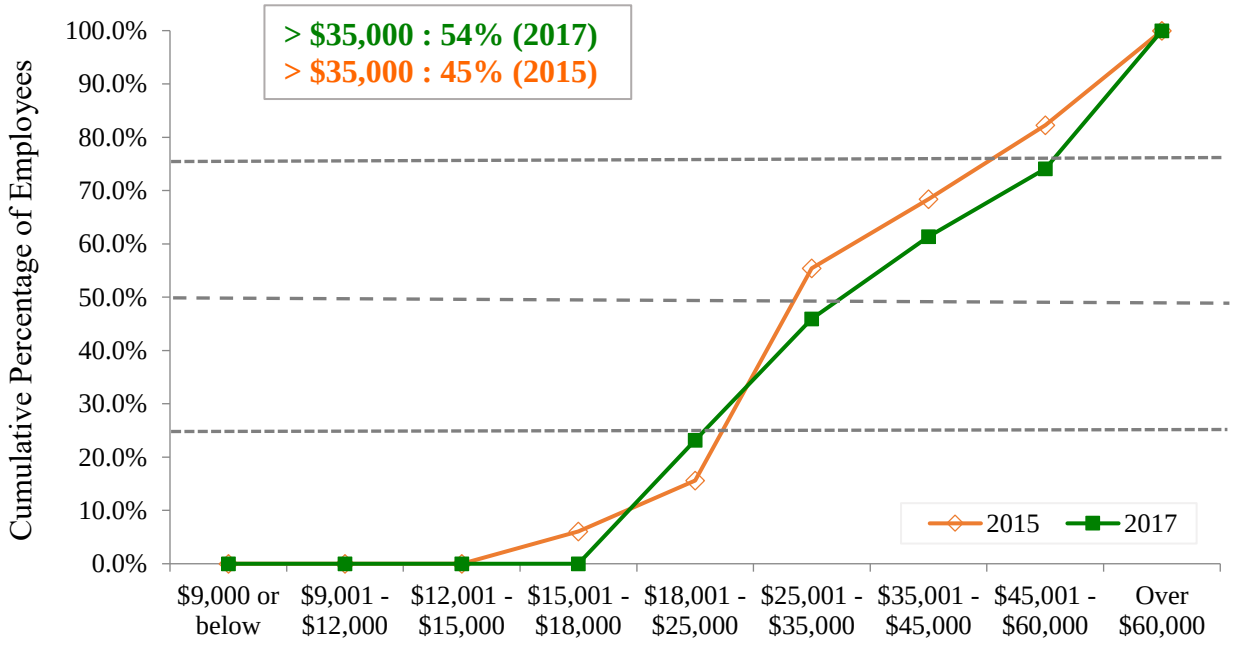


Figure 3.15 Cumulative percentage of average monthly salary in the Shipbuilding and Ship Repair sector, 2017 and 2015 – Professional / Technologist



C. Shipbuilding and Ship Repair Sector (cont.)

Figure 3.16 Cumulative percentage of average monthly salary in the Shipbuilding and Ship Repair sector, 2017 and 2015 – Technician

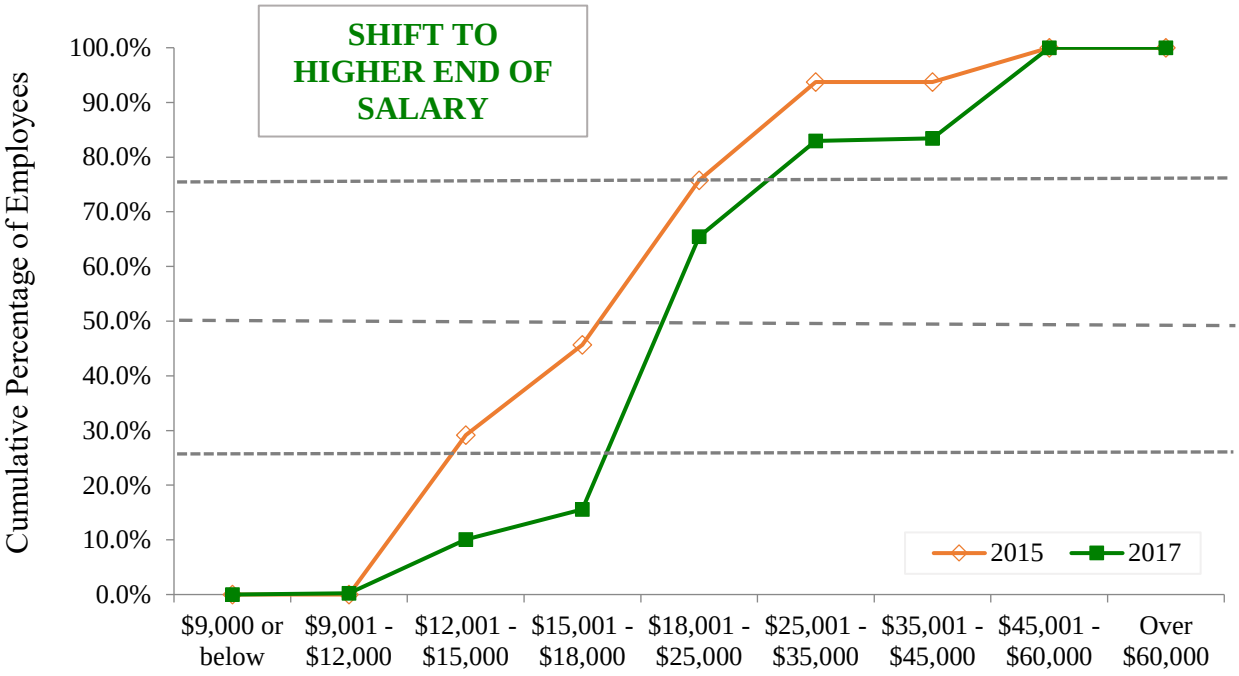
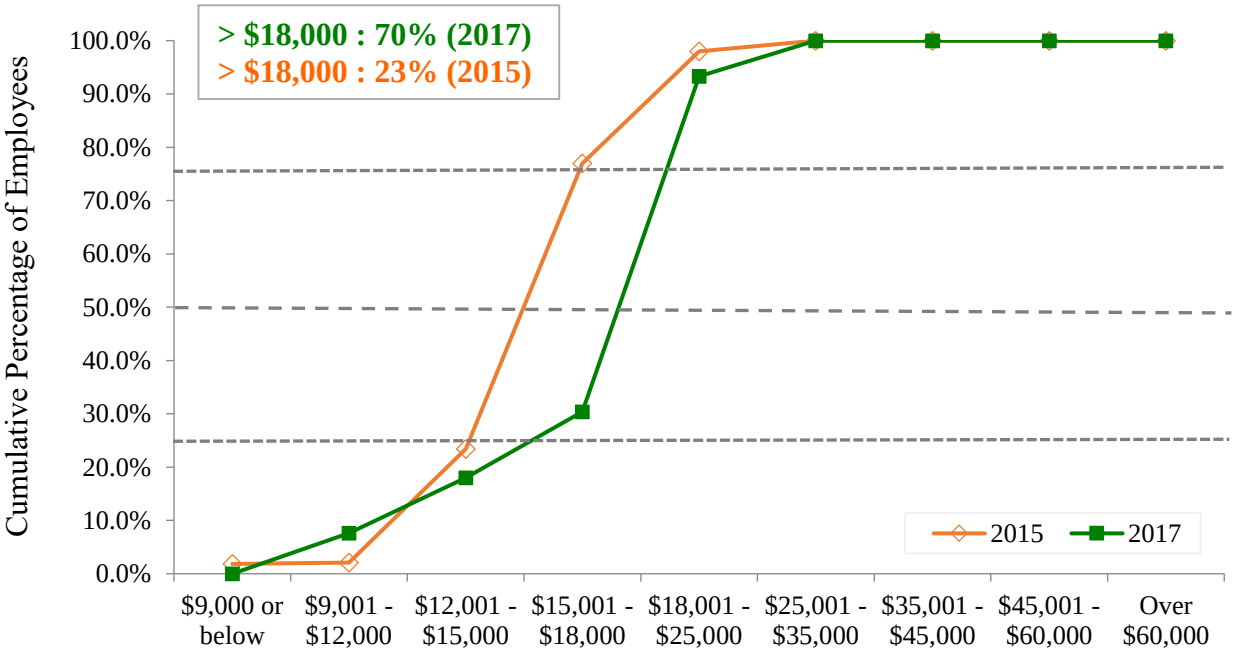
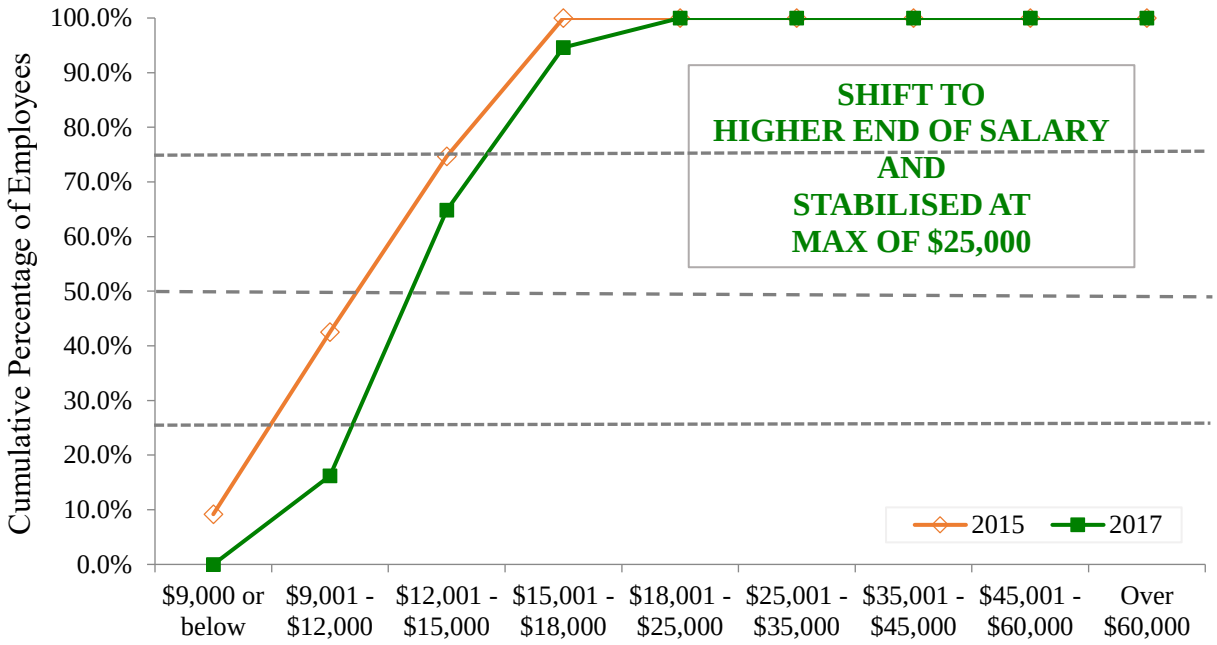


Figure 3.17 Cumulative percentage of average monthly salary in the Shipbuilding and Ship Repair sector, 2017 and 2015 – Tradesman / Craftsman



C. Shipbuilding and Ship Repair Sector (cont.)

Figure 3.18 Cumulative percentage of average monthly salary in the Shipbuilding and Ship Repair sector, 2017 and 2015 – Semi-skilled worker / General worker

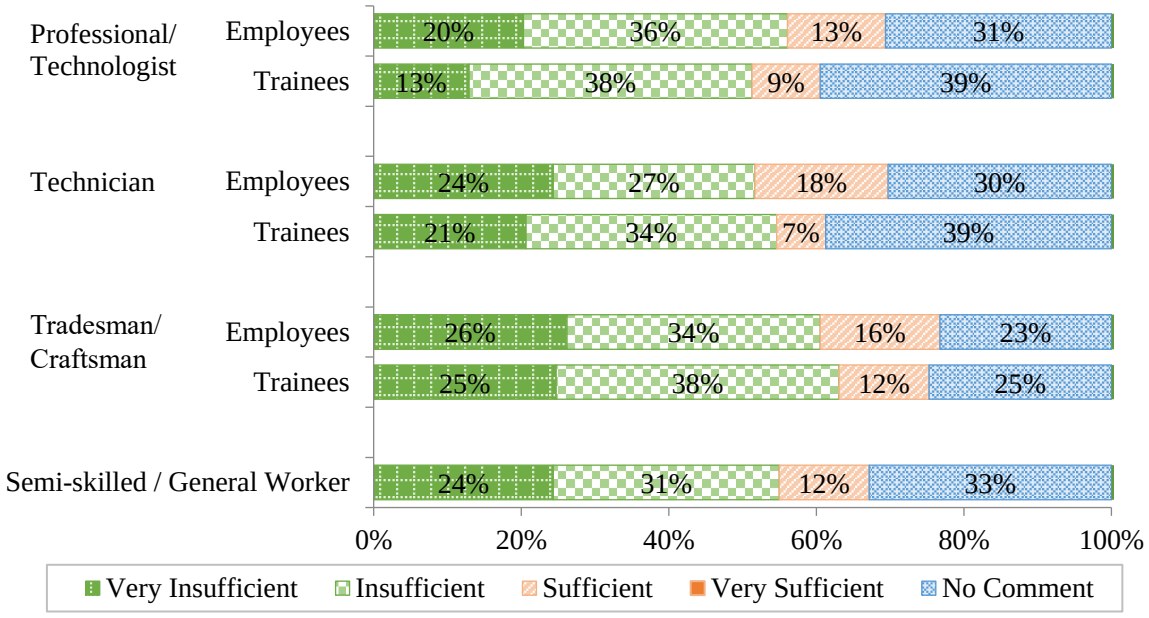


Views on Manpower Supply

3.34 The views of respondents on the manpower supply in the past 12 months were also solicited. In general, apparently more establishments considered the manpower supply as being insufficient than sufficient.

3.35 Amongst the four job levels, a higher degree of manpower insufficiency was noted for employees at the tradesman/craftsman level, as over 60% of the establishments gave this remark.

Figure 3.19 Views on manpower supply of different job levels in the past 12 months in the Shipbuilding and Ship Repair sector, 2017



D. Gas Sector

Employees

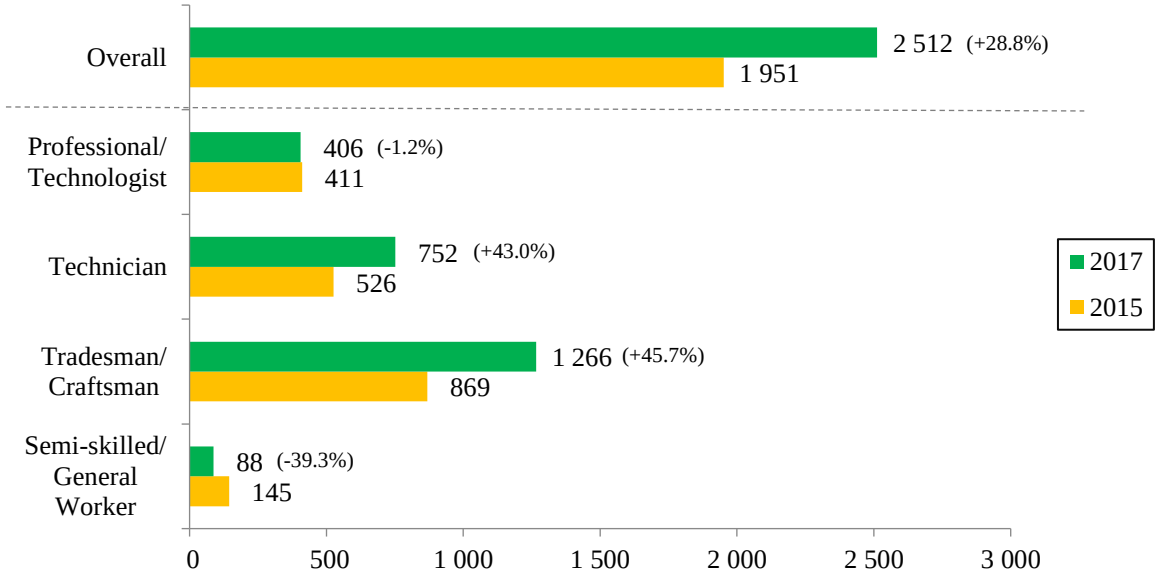
3.36 At the time of survey, a total of 2 512 E&M employees engaged in the Gas sector, of which over half employees were at tradesmen/craftsmen level, followed by 30% at technician level, 16% at professional/technologist level and 4% at semi-skilled/general worker level. Please refer to *Table 3.21* for an overview of manpower situation of Gas sector.

Table 3.21 Number of E&M employees, trainees and vacancies in the Gas sector by job level, 2017

Job level	Gas sector		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional/technologist	406 *(16.2%)*	10 *(16.9%)*	0 *(0%)*
Technician	752 *(29.9%)*	20 *(33.9%)*	9 *(14.5%)*
Tradesman/craftsman	1 266 *(50.4%)*	29 *(49.2%)*	40 *(64.5%)*
Semi-skilled/general worker	88 *(3.5%)*	N.A.	13 *(21.0%)*
Overall	**2 512** ***(100%)***	**59** ***(100%)***	**62** ***(100%)***

3.37 As compared with 2015, an overall increase of almost 30% was noted in the number of employees of Gas sector as 2 respondents claimed that their manpower had been underestimated in previous rounds of the survey. The manpower at professional/technologist level was more or less the same while there was a significant increase in manpower at both technician and tradesman/craftsman levels *(Figure 3.20)*.

Figure 3.20 Number of employees in the Gas sector by job level, 2017 and 2015



D. Gas Sector (cont.)

Prominent Principal jobs

3.38 For each job level, the principal jobs which accounted for a significant percentage of the E&M manpower in 2017 are listed in *Table 3.22*.

Table 3.22 Prominent Principal jobs in the Gas sector by level, 2017

Job Level	Job	% of E&M employees accounted at respective level
Professional/ technologist	Gas Engineer (Fuel Gas)	61.6%
Technician	Gas Engineering Technician	54.7%
Tradesman/ craftsman	Gas Utilisation Fitter (Domestic)	53.5%

3.39 As compared with 2015, quite an obvious increase in manpower was noted for the following principal jobs :

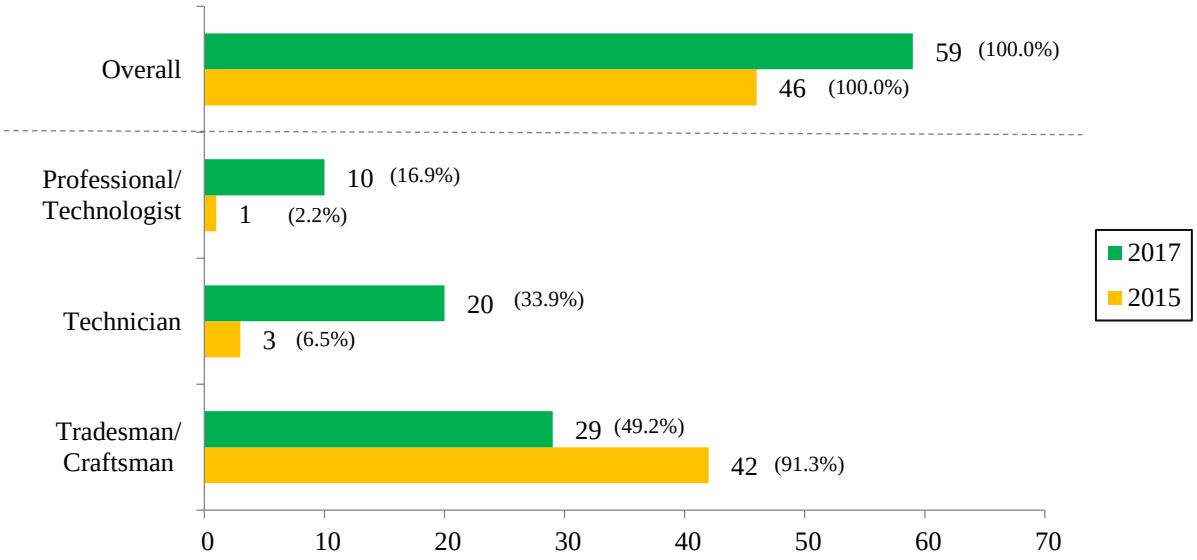
Table 3.23 Principal jobs with significant increase in manpower in the Gas sector by level, 2017

Job Level	Principal Jobs with significant increase in manpower
Technician	Gas Engineering Technician
Tradesman/ craftsman	Gas Utilisation Fitter (Domestic)
	Gas Distribution Fitter (Town Gas)

Trainees

3.40 Overall speaking, the number of trainees reported in 2017 was 59, which registered a slight increase over 2015 (46) *(Figure 3.21)*.

Figure 3.21 Number of trainees in the Gas sector by job level, 2017 and 2015

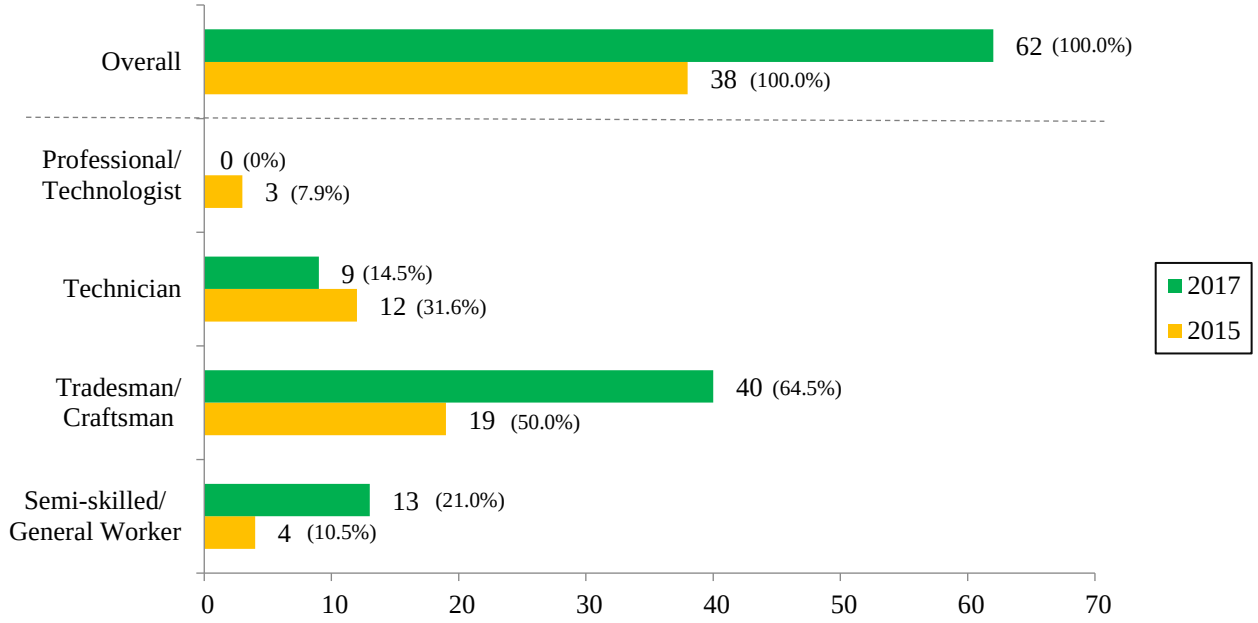


D. Gas Sector (cont.)

Vacancies

3.41 Overall speaking, the number of vacancies was increased from 38 in 2015 to 62 in 2017. The increase was particularly obvious at tradesman/craftsman level (*Figure 3.22*).

Figure 3.22 Number of vacancies in the Gas sector by job level, 2017 and 2015



Turnover and Recruit of E&M Employees

3.42 Overall, a total of 64 E&M employees left their organisations within the 12 months before the survey, representing a 2.5% turnover rate. The turnover rate was 1.5%, 3.1%, 2.3% and 6.8% respectively for professionals/technologists, technicians, tradesmen/craftsmen and semi-skilled/general workers (*Table 3.24*).

Table 3.24 Number and percentage of turnover in the Gas sector by job level, 2017

Job level	Number of E&M employees	Number of turnover	Turnover rate
Professional/technologist	406	6	1.5%
Technician	752	23	3.1%
Tradesman/craftsman	1 266	29	2.3%
Semi-skilled/general worker	88	6	6.8%
Overall	**2 512**	**64**	**2.5%**

3.43 Overall, a total of 46 experienced E&M employees were recruited by organisations within the 12 months before the survey, representing a 1.8% recruit rate. The recruit for professional/technologists and tradesmen/craftsmen could barely meet the turnover while the recruit for employees at the other levels had been fall short of the turnover (*Table 3.25*).

D. Gas Sector (cont.)

Table 3.25 Number of recruit and turnover by job level in the Gas sector, 2017

Job level	Number of recruit	Number of turnover	Difference
Professional/technologist	6	6	0
Technician	3	23	-20
Tradesman/craftsman	33	29	+4
Semi-skilled/general worker	4	6	-2
Overall	**46**	**64**	**-18**

Forecast of E&M Employees

3.44 Looking at the Gas sector as a whole, a slight growth of 2.5% in manpower was expected from employers after a year.

Table 3.26 Current and forecasted number of E&M employees by job level in the Gas sector, 2017

Job level	Current number of E&M employees	Forecasted number of E&M employees	Forecasted percentage change
Professional/technologist	406	406	0.0%
Technician	752	759	0.9%
Tradesman/craftsman	1 266	1 308	3.3%
Semi-skilled/general worker	88	101	14.8%
Overall	**2 512**	**2 574**	**2.5%**

Salary

3.45 The salary distribution of the E&M employees of Gas sector of various levels is listed in *Table 3.27*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.27 Salary distribution of E&M employees by job level in the Gas sector, 2017

Job level	Gas sector						
	<= $12,000	$12,001 to $15,000	$15,001 to $18,000	$18,001 to $25,000	$25,001 to $35,000	$35,001 to $45,000	> $45,000
Professional/technologist	0%	0%	1%	3%	10%	80%	6%
Technician	0%	1%	49%	23%	20%	7%	0%
Tradesman/craftsman	3%	39%	22%	32%	4%	0%	0%
Semi-skilled/general worker	13%	36%	31%	20%	0%	0%	0%
Overall	**2%**	**22%**	**27%**	**24%**	**9%**	**14%**	**1%**

Note: A certain percentage of establishments did not provide the salary information. The above percentages were calculated on the basis of those who provided the information.

3.46 Overall speaking, the salary of employees of Gas sector followed a similar pattern as 2015 and no obvious change was noted (*Figure 3.23*). The salary trend of 2017 against 2015 for individual level was given in *Figures 3.24 to 3.27*.

D. Gas Sector (cont.)

Figure 3.23 Cumulative percentage of average monthly salary in the Gas sector, 2017 and 2015 – Overall

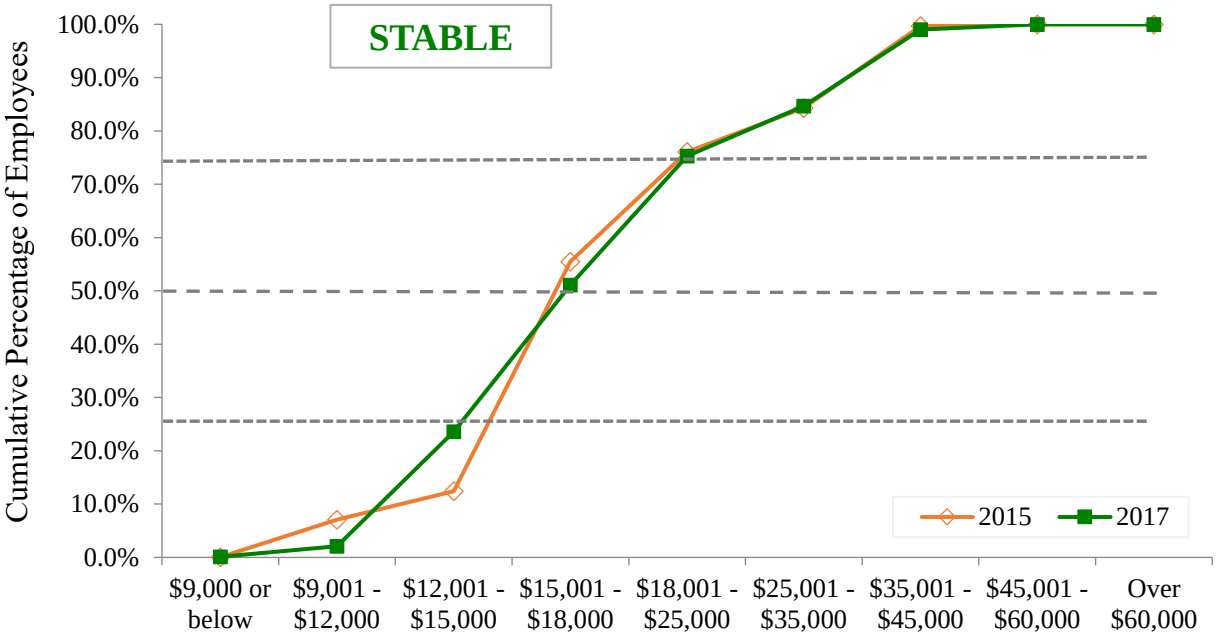
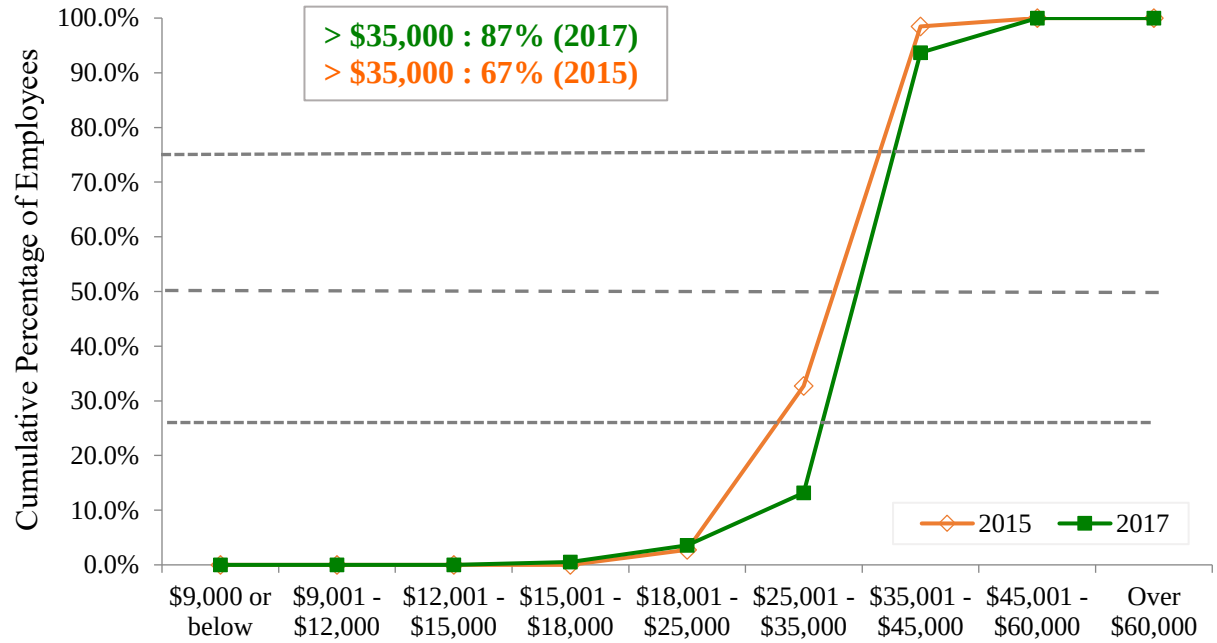


Figure 3.24 Cumulative percentage of average monthly salary in the Gas sector, 2017 and 2015 – Professional/Technologist



D. Gas Sector (cont.)

Figure 3.25 Cumulative percentage of average monthly salary in the Gas sector, 2017 and 2015 – Technician

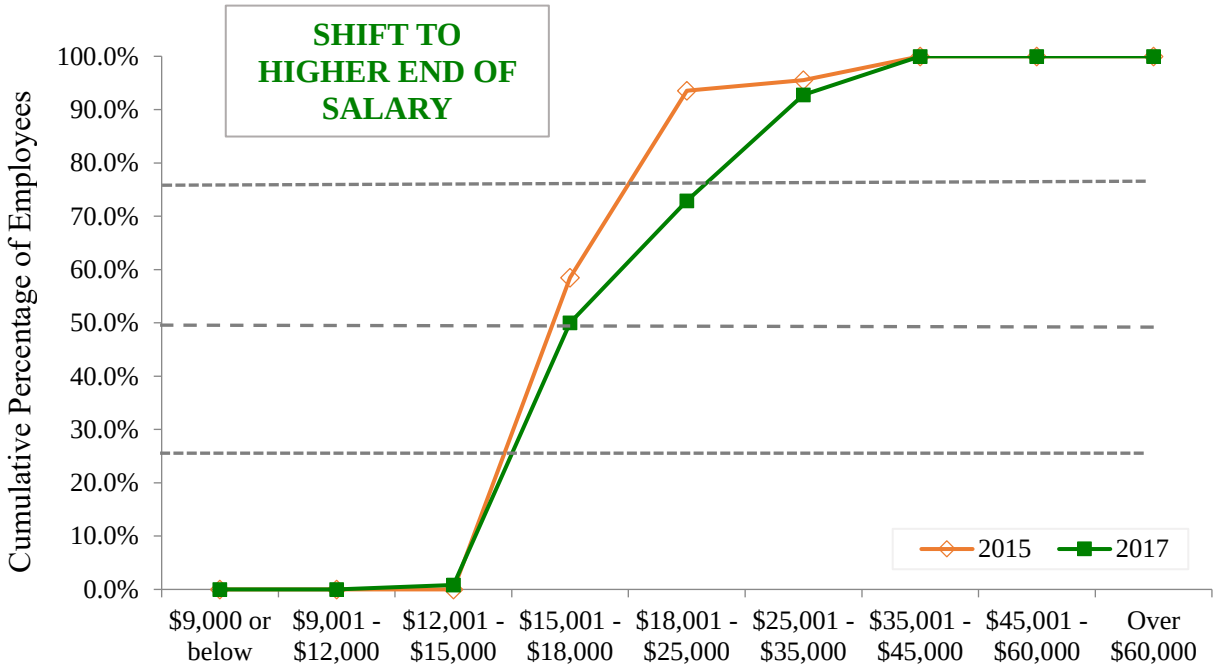
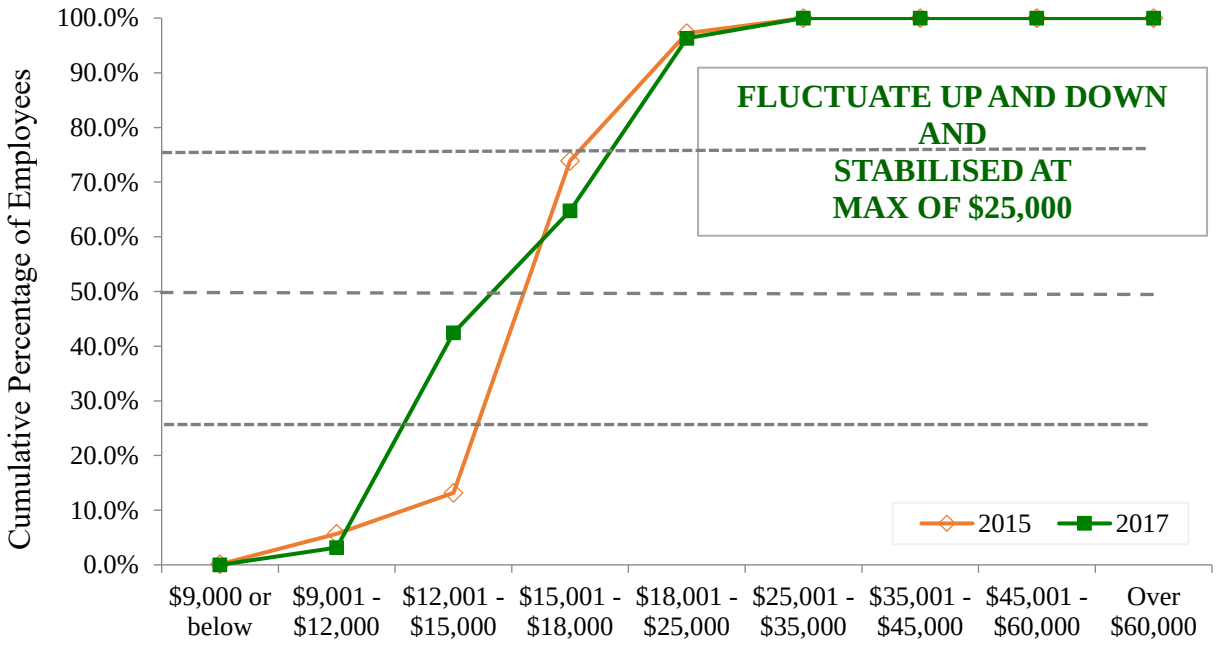
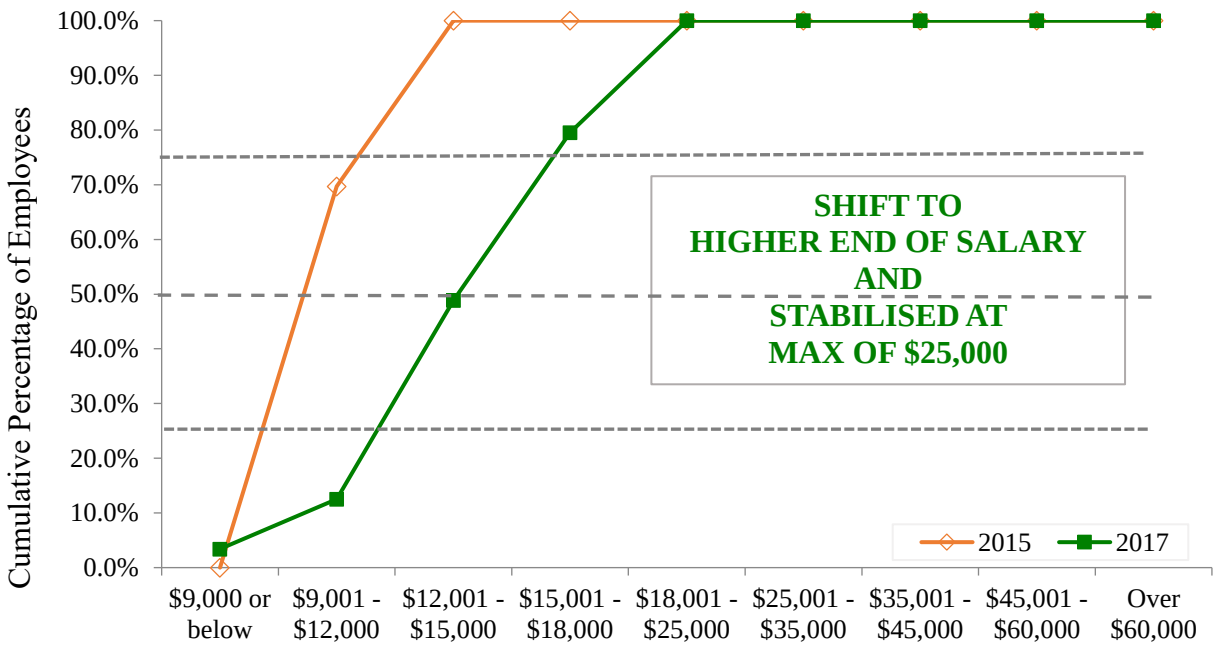


Figure 3.26 Cumulative percentage of average monthly salary in the Gas sector, 2017 and 2015 – Tradesman / Craftsman



D. Gas Sector (cont.)

Figure 3.27 Cumulative percentage of average monthly salary in the Gas sector, 2017 and 2015 – Semi-skilled worker / General worker

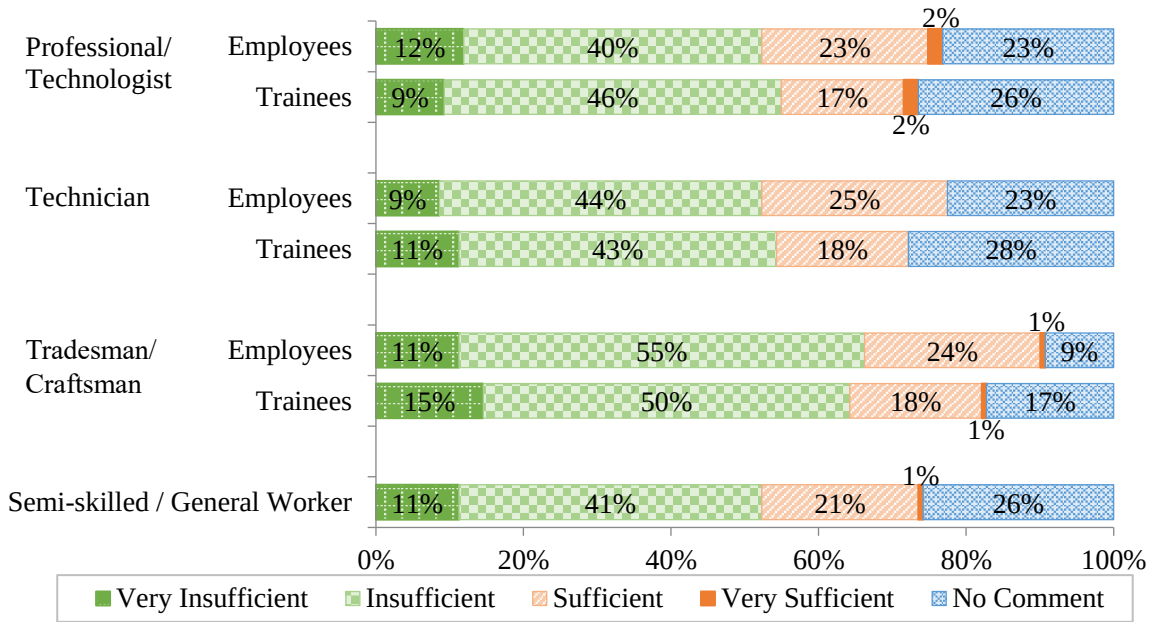


Views on Manpower Supply

3.47 The views of respondents on the manpower supply in the past 12 months were also solicited. In general, apparently more establishments considered the manpower supply as being insufficient than sufficient.

3.48 Amongst the four job levels, a higher degree of manpower insufficiency was noted for employees at the tradesman/craftsman level, as over 60% of the establishments gave this remark.

Figure 3.28 Views on manpower supply of different job levels in the past 12 months in the Gas sector, 2017



E. Aircraft Maintenance Sector

Employees and Trainees

3.49 At the time of survey, a total of 5 496 E&M employees engaged in the Aircraft Maintenance sector, of which over half of the employees were at tradesman/craftsman level, followed by 26% at technician level, 13% at professional/technologist level and 11% at semi-skilled/general worker level. Please refer to Table 3.28 for an overview of manpower situation of the Aircraft Maintenance sector.

Table 3.28 Number of E&M employees, trainees and vacancies in the Aircraft Maintenance sector by job level, 2017

Job level	Aircraft Maintenance sector		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional/technologist	685 *(12.5%)*	0 *(0%)*	37 *(7.2%)*
Technician	1 415 *(25.7%)*	23 *(3.8%)*	149 *(29.0%)*
Tradesman/craftsman	2 798 *(50.9%)*	588 *(96.2%)*	190 *(37.0%)*
Semi-skilled/general worker	598 *(10.9%)*	N.A.	138 *(26.8%)*
Overall	**5 496** ***(100%)***	**611** ***(100%)***	**514** ***(100%)***

3.50 The Aircraft Maintenance sector was singled out as a separate sector of E&M Services industry in this round of survey. In order to increase the representativeness of the results, the number of companies was increased from 6 in 2015 to 12 in 2017. As the base was rather small, caution should be exercised to interpret the figures. Also, due to the large difference in scope in 2017 as compared with 2015, comparison with past results would not be presented in the report.

Trainees

3.51 At the time of survey, there were a total of 611 E&M trainees engaged in the Aircraft Maintenance sector, accounting for 10.0% of the total number of employees and trainees (6 107) in the sector.

Vacancies

3.52 At the time of survey, there were a total of 514 vacancies of E&M employees in the Aircraft Maintenance sector, representing a 9.4% vacancy rate. The vacancy rate was 5.4%, 10.5%, 6.8% and 23.1% respectively for professionals/technologists, technicians, tradesmen/craftsmen and semi-skilled/general workers (*Table 3.29*).

E. Aircraft Maintenance Sector (cont.)

Table 3.29 Number and percentage of vacancies in the Aircraft Maintenance sector by job level, 2017

Job level	Number of vacancies	% of vacancies of employees
Professional/technologist	37	5.4%
Technician	149	10.5%
Tradesman/craftsman	190	6.8%
Semi-skilled/general worker	138	23.1%
Overall	**514**	**9.4%**

Turnover and Recruit of E&M Employees

3.53 Overall, a total of 316 E&M employees left their organisations within the 12 months before the survey, representing a 5.7% turnover rate. The turnover rate was 3.6%, 2.0%, 2.8% and 30.8% respectively for professionals/technologists, technicians, tradesmen/craftsmen and semi-skilled/general workers (*Table 3.30*).

Table 3.30 Number and percentage of turnover by job level in the Aircraft Maintenance sector, 2017

Job level	Number of E&M employees	Number of turnover	Turnover rate
Professional/technologist	685	25	3.6%
Technician	1 415	29	2.0%
Tradesman/craftsman	2 798	78	2.8%
Semi-skilled/general worker	598	184	30.8%
Overall	**5 496**	**316**	**5.7%**

3.54 Overall, a total of 450 experienced E&M employees were recruited by organisations within the 12 months before the survey, representing a 8.2% recruit rate. The recruit had been falling short of the turnover for professional/technologist and technician levels while for tradesman/craftsman and semi-skilled/general worker, it was believed that the recruits filled up the turnover as well as some of the vacancies.

Table 3.31 Number of recruit and turnover by job level in the Aircraft Maintenance sector, 2017

Job level	Number of recruit	Number of turnover	Difference
Professional/technologist	19	25	-6
Technician	24	29	-5
Tradesman/craftsman	133	78	+55
Semi-skilled/general worker	274	184	+90
Overall	**450**	**316**	**+134**

E. Aircraft Maintenance Sector (cont.)

Forecast of E&M Employees

3.55 Looking at the Aircraft Maintenance sector as a whole, a 9.0% growth in manpower after a year was expected from the employers, from 5 496 E&M employees in 2017 to 5 993 in 2018. The increase was particularly large for technicians and semi-skilled/general workers.

Table 3.32 Current and forecasted number of E&M employees by job level in the Aircraft Maintenance sector, 2017

Job level	Current number of E&M employees	Forecasted number of E&M employees	Forecasted percentage change
Professional/technologist	685	720	5.1%
Technician	1 415	1 561	10.3%
Tradesman/craftsman	2 798	2 976	6.4%
Semi-skilled/general worker	598	736	23.1%
Overall	**5 496**	**5 993**	**9.0%**

Salary

3.56 The salary distribution of the E&M employees of Aircraft Maintenance sector of various levels is listed in *Table 3.33*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.33 Salary distribution of E&M employees by job level in the Aircraft Maintenance sector, 2017

Job level	Aircraft Maintenance sector						
	<= $12,000	$12,001 to $15,000	$15,001 to $18,000	$18,001 to $25,000	$25,001 to $35,000	$35,001 to $45,000	> $45,000
Professional/technologist	0%	0%	0%	0%	2%	98%	0%
Technician	0%	0%	15%	85%	0%	0%	0%
Tradesman/craftsman	0%	4%	71%	25%	0%	0%	0%
Semi-skilled/general worker	72%	6%	22%	0%	0%	0%	0%
Overall	**9%**	**3%**	**43%**	**34%**	*	**11%**	**0%**

Notes:
*(1) * Less than 0.5%*
(2) A certain percentage of establishments did not provide the salary information. The above percentages were calculated on the basis of those who provided the information.

E. Aircraft Maintenance Sector (cont.)

3.57 The salary of employees at various levels is presented in *Figures 3.29 to 3.33.*

Figure 3.29 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector, 2017 and 2015 – Overall

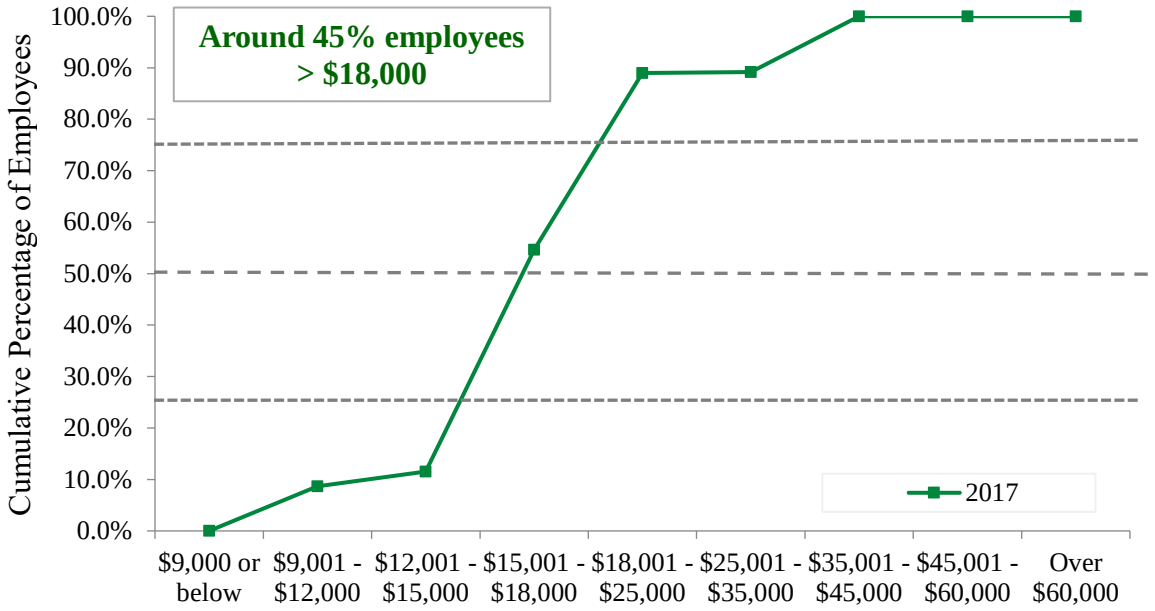
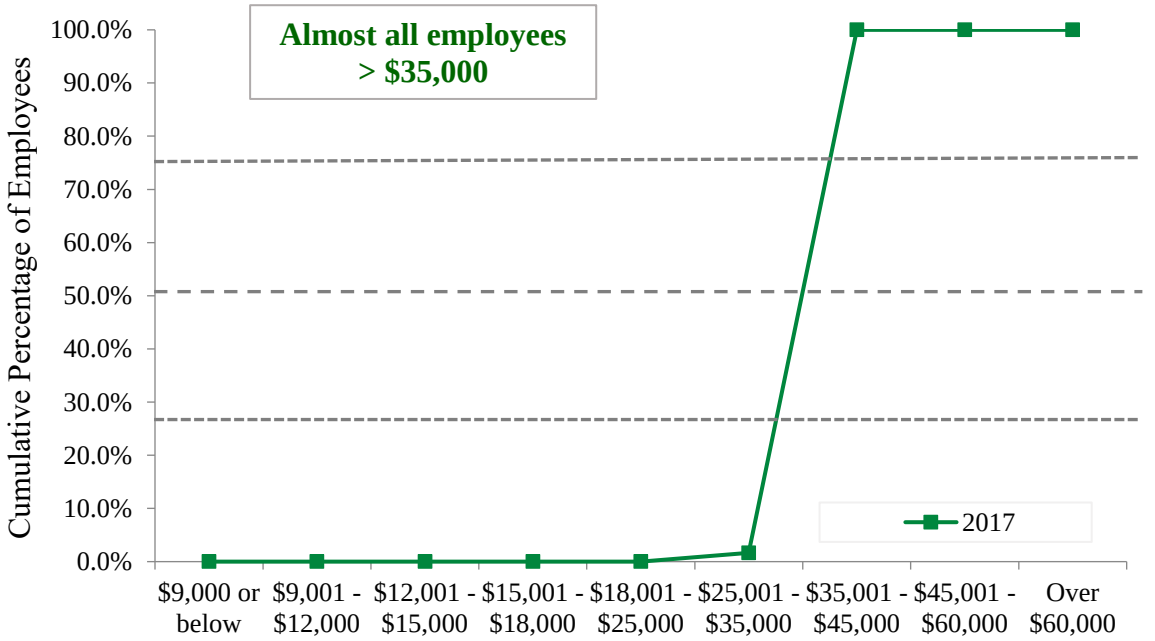


Figure 3.30 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector, 2017 and 2015 – Professional / Technologist



E. Aircraft Maintenance Sector (cont.)

Figure 3.31 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector, 2017 and 2015 – Technician

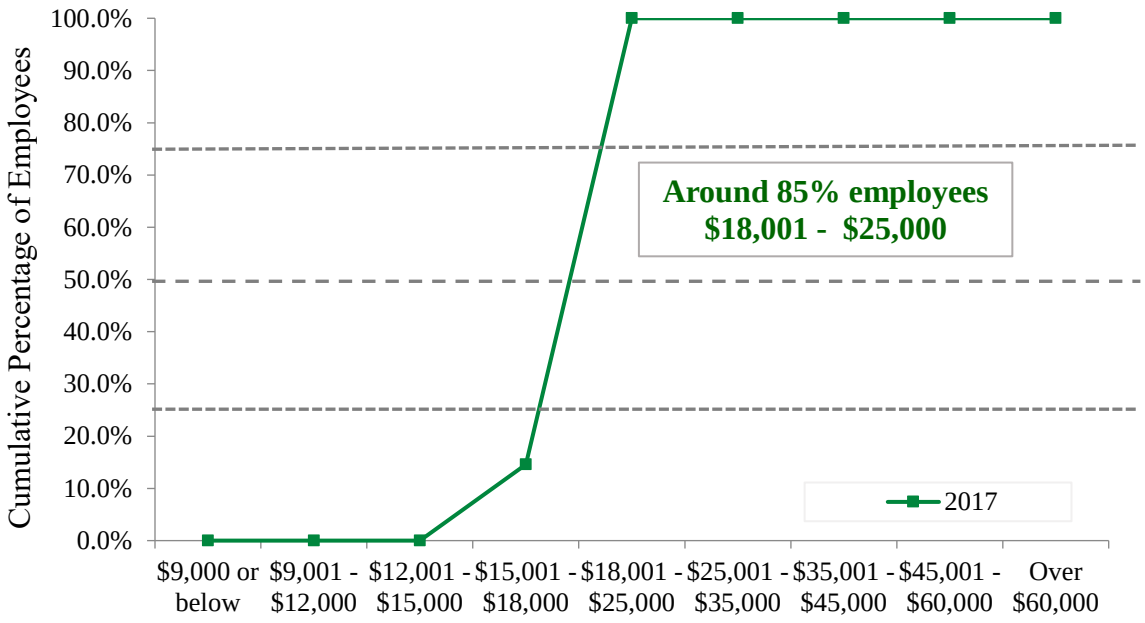
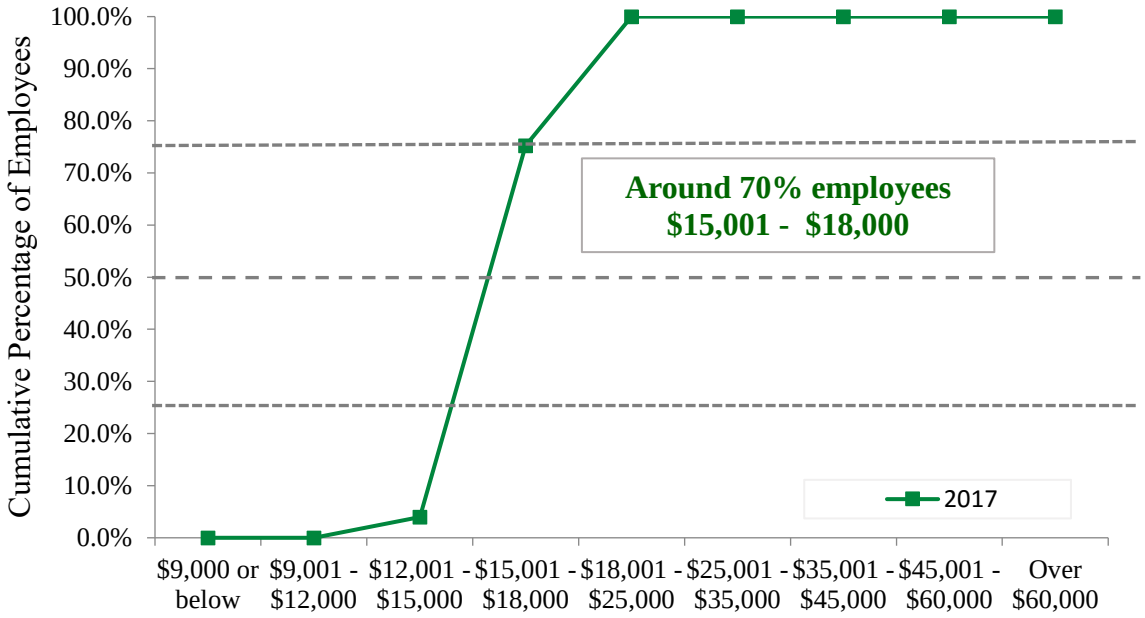
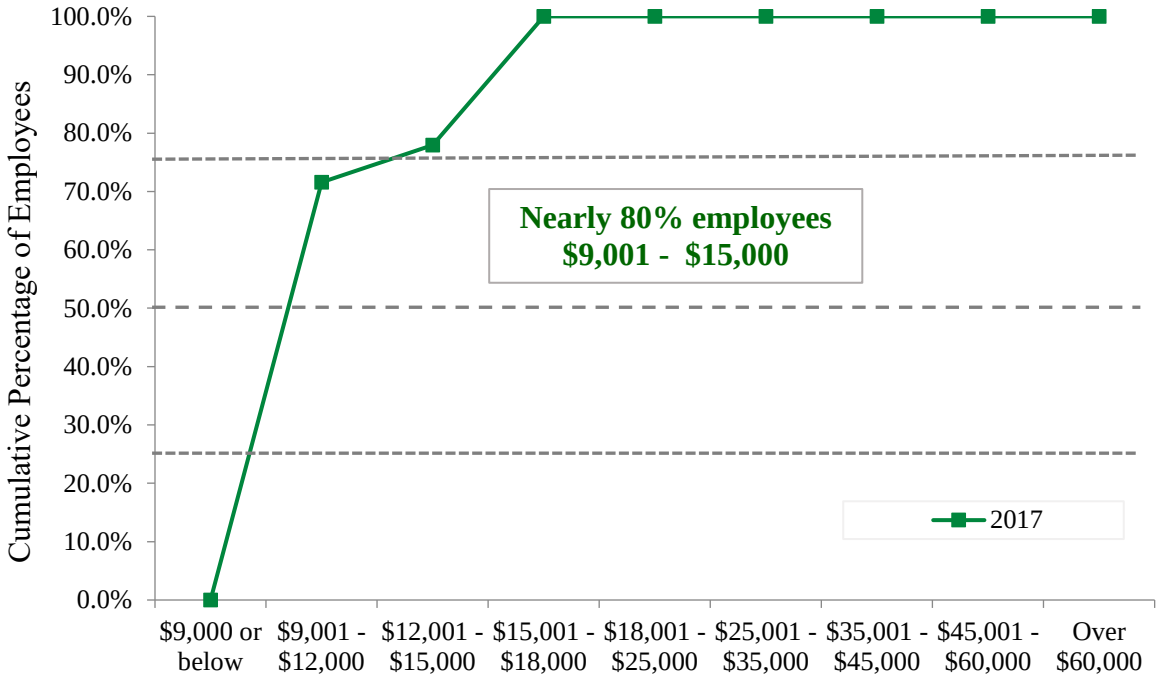


Figure 3.32 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector, 2017 and 2015 – Tradesman / Craftsman



E. Aircraft Maintenance Sector (cont.)

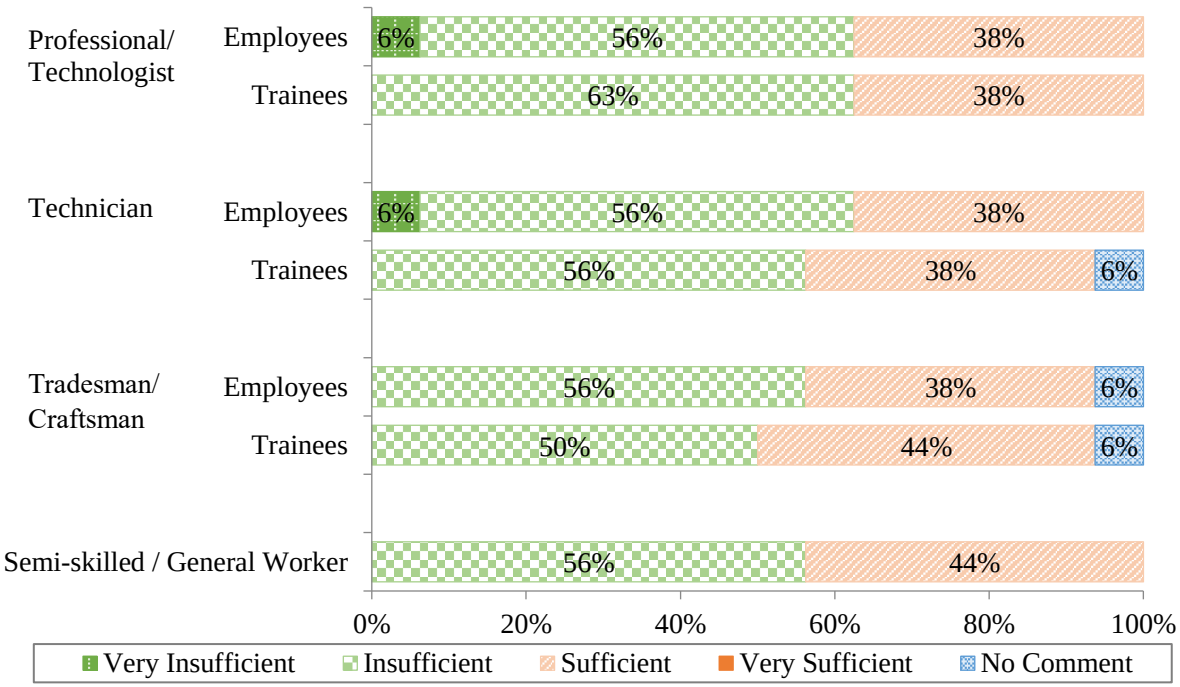
Figure 3.33 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector, 2017 and 2015 – Semi-worker / General worker



Views on Manpower Supply

3.58 The views of respondents on the manpower supply in the past 12 months were also solicited. In general, over half of the employers considered the manpower supply as being insufficient but there was still 4 to 5 companies concluding that the manpower was sufficient *(Figure 3.34)*.

Figure 3.34 Views on manpower supply of different job levels in the past 12 months in the Aircraft Maintenance sector, 2017



IV. OBSERVATIONS AND CONCLUSIONS

General

4.1 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 (E&M) Engineering sector, the Shipbuilding and Ship Repair sector, the Gas sector and the Aircraft Maintenance sector of the electrical and mechanical services industry at the time of the survey.

A. Electrical and Mechanical Engineering Sector

Manpower Changes

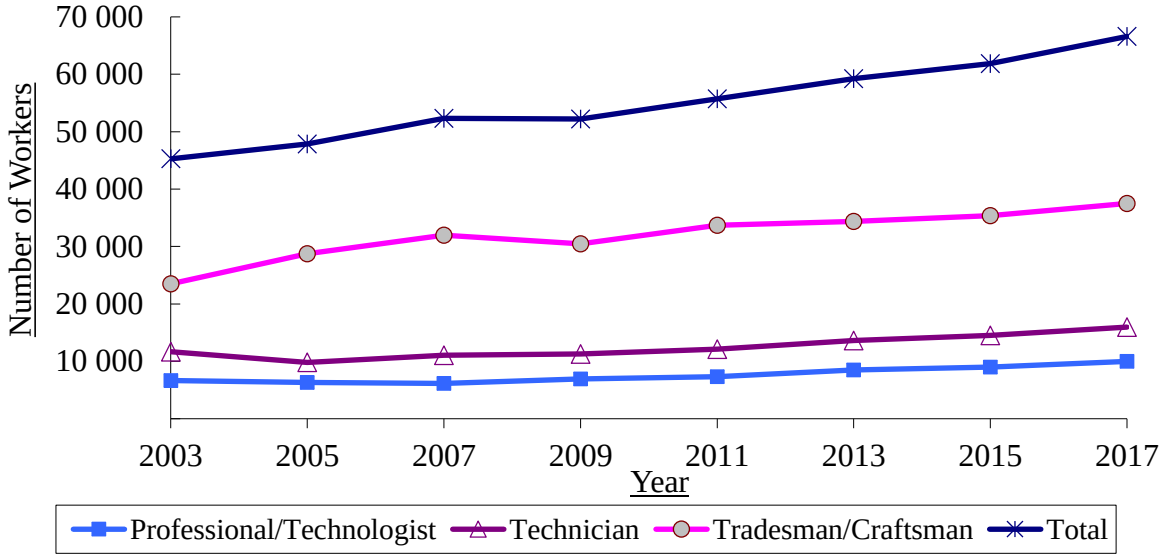
4.2 The manpower changes at professional/technologist, technician and tradesman/craftsman levels of the E&M Engineering sector from 2003 to 2017 are shown in *Table 4.1 and Figure 4.1*. The figures exclude the manpower for aircraft maintenance as it has been singled out to form a new sector starting from this round of survey.

Table 4.1 Manpower Changes of the Electrical and Mechanical Engineering sector between 2003 and 2017

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower[5]
2003	6 630	11 654	23 496	45 274
2005	6 297	9 807	28 739	47 849
2007	6 148	11 079	31 961	52 333
2009	6 930	11 279	30 486	52 192
2011	7 299	12 125	33 687	55 742
2013	8 509	13 641	34 371	59 249
2015	8 977	14 523	35 361	61 874
2017	9 985	15 964	37 505	66 594

[5] including semi-skilled/general workers

Figure 4.1 Manpower Changes of the Electrical and Mechanical Engineering sector between 2003 and 2017



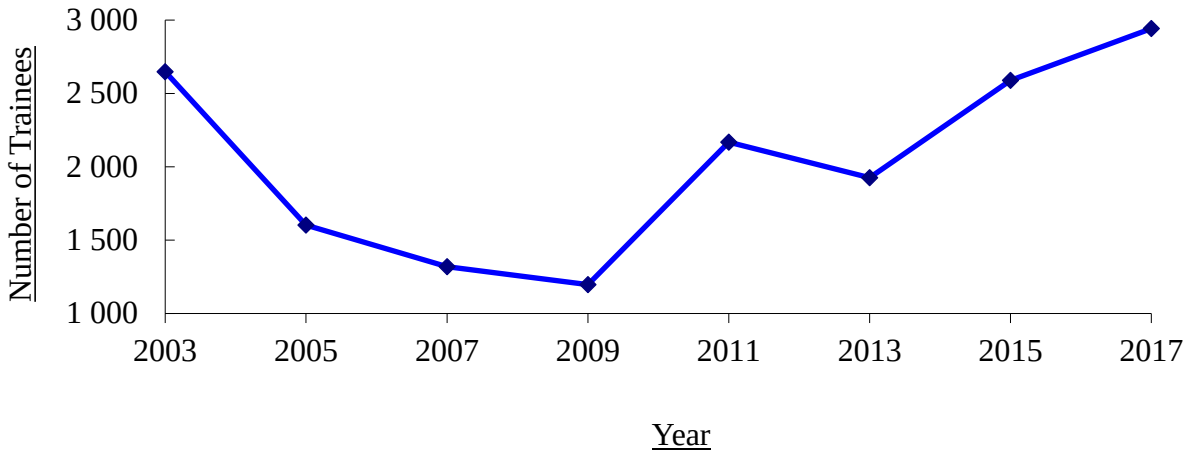
4.3 With the upturn of the economy starting from 2003 and the implementation of the 10 major infrastructural projects since 2007, the manpower of the E&M Engineering sector has been on a rising trend. The number of workers increased by 3.7% per annum during the past 2 years. The annual manpower increase in professional/technologist, technician, tradesman/craftsman and semi-skilled/general worker levels were 5.5%, 4.8%, 3% and 2.1% respectively.

4.4 From 2003 to 2009, the numbers of trainees in the E&M Engineering sector showed a persistent decline. With the commencement of the mega infrastructure projects in early 2010s, the number of trainees has rebounded (*Table 4.2 and Figure 4.2*), particularly in the tradesman/craftsman level.

Table 4.2 Number of Trainees in the E&M Engineering sector

Year of Survey	Number of Workers Employed	Number of Trainees	Percentage of Workers
2003	45 274	2 648	5.8%
2005	47 849	1 603	3.4%
2007	52 333	1 320	2.5%
2009	52 192	1 197	2.3%
2011	55 742	2 167	3.9%
2013	59 249	1 926	3.3%
2015	61 874	2 588	4.2%
2017	66 594	2 942	4.4%

Figure 4.2 Number of Trainees in the Electrical and Mechanical Engineering sector



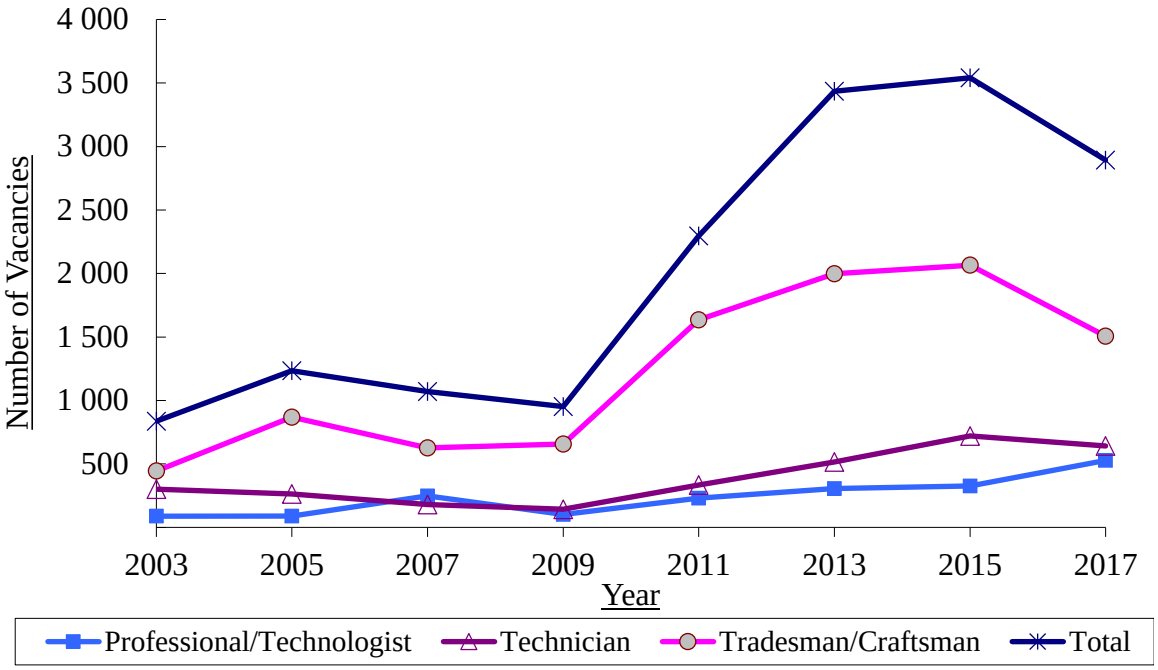
4.5 The number of vacancies in the E&M Engineering sector surged from 2009 to 2015 when the major infrastructural projects were at full steam. With the completion of some of these projects and the increasing supply of graduates and trainees during the past few years, the vacancy number finally dropped in this round of survey, as shown in *Table 4.3 and Figure 4.3*. Nevertheless, 15 out of 57 principal jobs still had vacancy rates of 5% or higher. Among them, 4 principal jobs, namely (i) Office Equipment Service Technician, (ii) Mechanical Fitter / Machinist, (iii) Escalator Mechanic, and (iv) Semi-skilled Worker, recorded vacancy rates of 10% or higher.

Table 4.3 Number of Vacancies in the Electrical and Mechanical Engineering sector from 2003 to 2017

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total No. of Vacancies[6]
2003	89	302	445	837
2005	91	264	869	1 235
2007	248	182	626	1 071
2009	102	144	656	953
2011	231	335	1 636	2 296
2013	308	517	1 999	3 436
2015	327	721	2 065	3 541
2017	528	643	1 506	2 892

[6] including semi-skilled/general workers

Figure 4.3 Number of Vacancies in the Electrical and Mechanical Engineering sector from 2003 to 2017



Business Outlook of the E&M Engineering Sector

4.6 Despite several rail projects have been completed during the past few years, the construction work of the Guangzhou-Shenzhen-Hong Kong Express Rail Link and the Shatin to Central Link are now in full swing till 2021. After that, the 7 new railway projects proposed in the Railway Development Strategy 2014 (listed below) will likely enter into the implementation stage.

(1) Tuen Mun South Extension
(2) Northern Link including Kwu Tung Station
(3) East Kowloon Line
(4) Tung Chung West Extension
(5) Hung Shui Kiu Station
(6) South Island Line (West)
(7) North Island Line

4.7 In addition to railway projects, there are other ongoing or newly started major infrastructural projects, such as the West Kowloon Cultural District Development, the Three-runway System Project (2016 to 2024) and the 10-year Hospital Development Plan (2017 to 2026), which will surely bring lots of contracting business to the E&M Engineering sector.

4.8 The Chief Executive announced in her 2017 Policy Address that the Government would allocate $3 billion to launch the 5-year "Operation Building Bright 2.0", staring from the second half of 2018 to subsidise owner-occupiers of aged residential or composite buildings for undertaking primary inspections of their buildings and repair works. Besides, the Government also plans to devote $2 billion to subsidise owners of old composite buildings to undertake fire safety enhancement measures. These new projects, together with the regular operations and maintenance works for buildings and railways, will sustain the servicing business of the E&M Engineering sector for years to come.

Projected Manpower and Training Requirements for the E&M Engineering Sector

4.9 For the 2017 manpower survey, with consideration of the factors similar to previous rounds, the Training Board decided to adopt the "Adaptive Filtering Method (AFM)" (Please refer to *Appendix 6* for more details.) for projecting the manpower of the E&M Engineering sector for year 2018 to 2021.

4.10 Based on the findings of the 2017 and previous rounds of manpower surveys, the Training Board decided to adopt the best fitted curved of AFM for the manpower projection at different job levels for 2018 to 2021 (*Figures 4.4 to 4.6*).

Figure 4.4 Manpower Projection of Professional/Technologist for the E&M Engineering sector

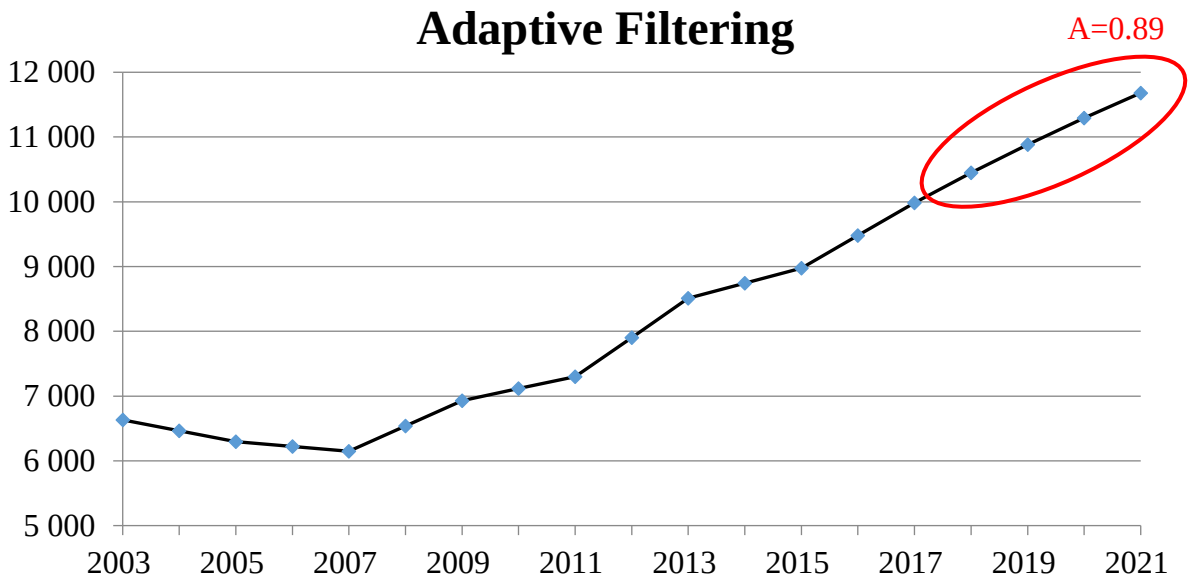


Figure 4.5 Manpower Projection of Technician for the E&M Engineering sector

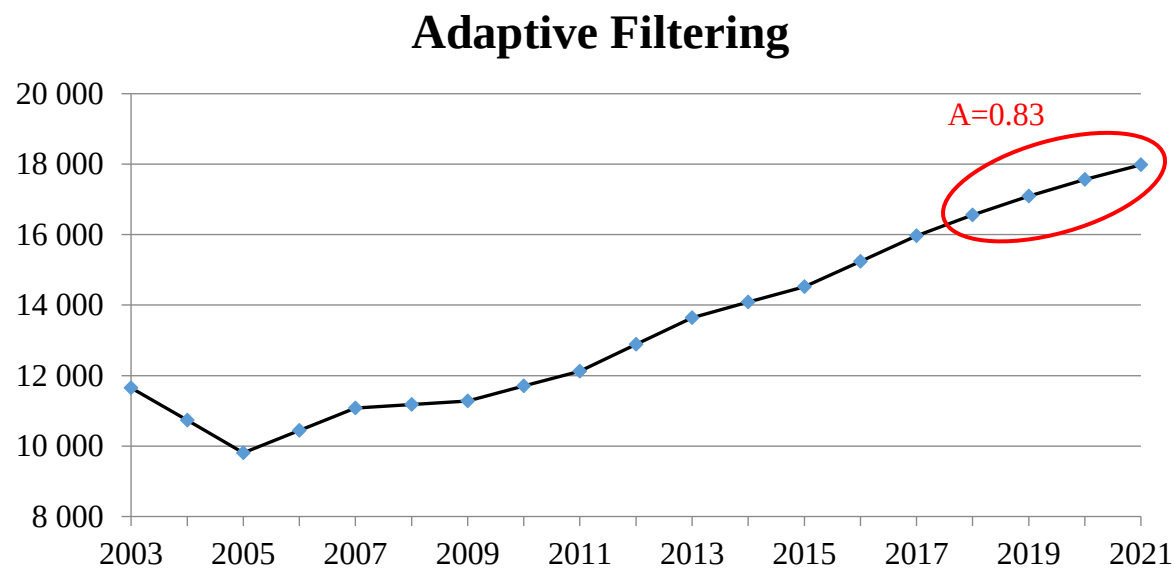
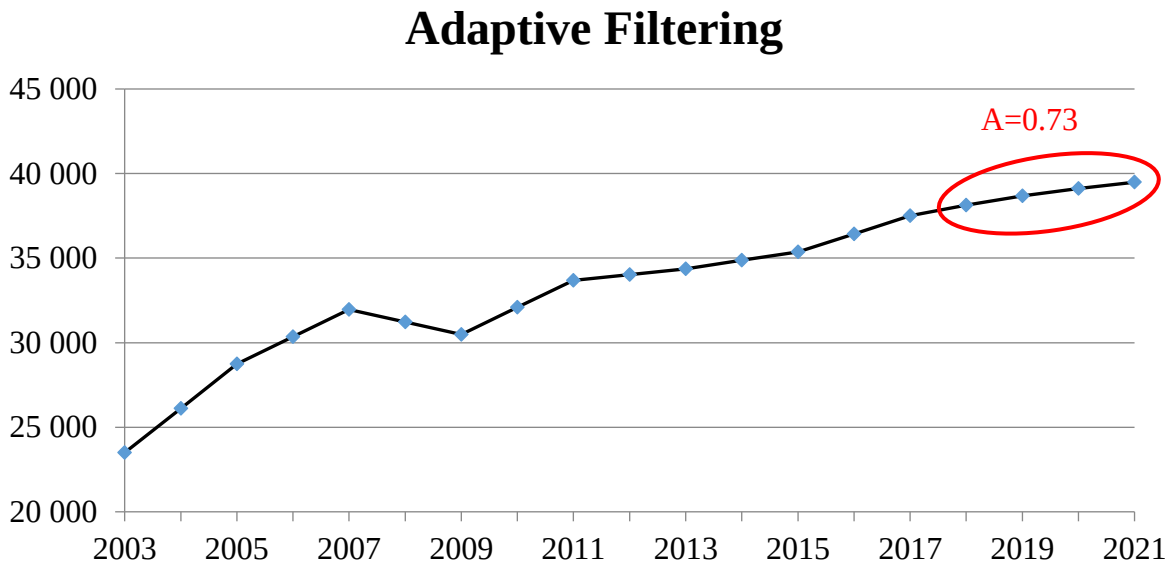


Figure 4.6 Manpower Projection of Tradesman/Craftsman for the E&M Engineering sector



4.11 The forecast manpower of professional/technologist, technician and tradesman/craftsman for 2018 to 2021 is shown in *Table 4.4*.

Table 4.4 Forecast Manpower of the E&M Engineering sector

Year	Professional (A = 0.89)	Technician (A = 0.83)	Tradesman/ Craftsman (A = 0.73)
2018	10 447	16 557	38 126
2019	10 885	17 091	38 676
2020	11 296	17 564	39 123
2021	11 681	17 982	39 486

4.12 The Training Board followed the practice of last round and adopted 3% as the annual wastage rate of professional/technologists as well as technicians and 4% for tradesmen/craftsmen.

4.13 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 2018 to 2021 for the E&M Engineering sector are calculated and shown in *Table 4.5*.

Table 4.5 Projected annual training requirements of E&M workers for the Electrical and Mechanical Engineering sector in the coming 4 years

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2018 - 2021
Professional/Technologist	9 985	749 (364)*
Technician	15 964	1 014 (705)*
Tradesman/Craftsman	37 505	2 035 (2 003)*

** Training Board's projected annual training requirements made in 2015, for 2016 – 2018. The estimates for aircraft maintenance have been deducted.*

B. Shipbuilding and Ship Repair Sector

Manpower Changes

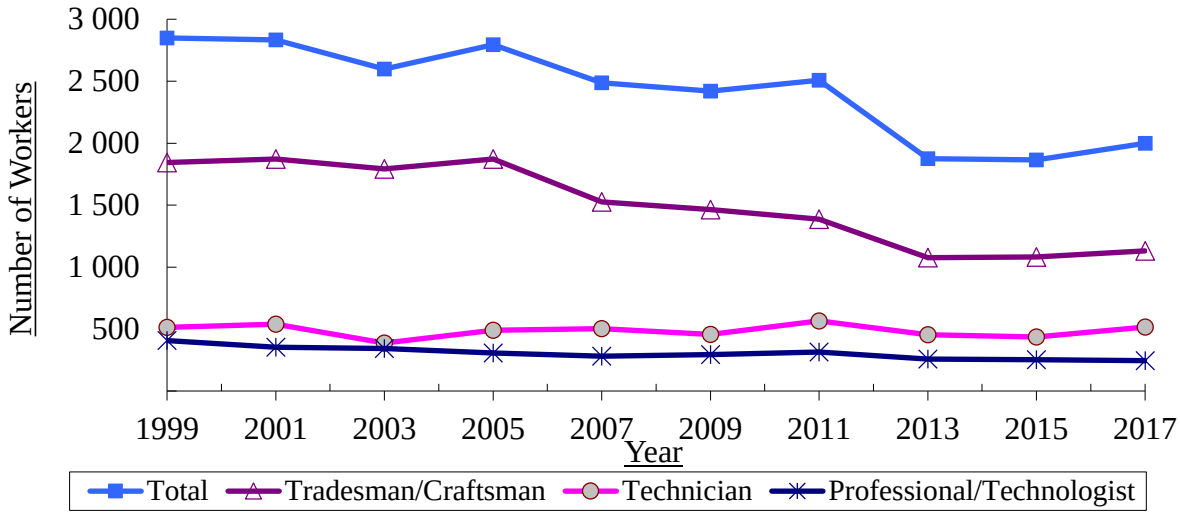
4.14 The manpower changes at professional/technologist, technician and tradesman/craftsman levels of the Shipbuilding and Ship Repair sector from 1999 to 2017 are shown in *Table 4.6 and Figure 4.7*.

Table 4.6 E&M Manpower Changes of the Shipbuilding and Ship Repair sector

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower[7]
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
2017	245	515	1 132	2 000

[7] including semi-skilled/general workers

Figure 4.7 Manpower Changes of the Shipbuilding and Ship Repair sector between 1999 and 2017



4.15 Employers continued to diversify their business to land engineering and a manpower growth of 3.6% per annum was recorded in this sector.

4.16 At the time of survey, the Shipbuilding and Ship Repair sector had the highest vacancy rate (12.9%) among the E&M Services industry. Among the 28 principal jobs of the sector, 16 had vacancy rates of 5% or higher. Ten principal jobs, namely (i) Electrical Engineering Technician, (ii) Electronics / Telecommunication Technician, (iii) Mechanical Engineering Technician, (iv) Assistant Safety Officer / Safety Supervisor, (v) Sheet Metal Worker, (vi) Electrician, (vii) Mechanical Fitter, (viii) Painter, (ix) Labourer and (x) Semi-skilled Worker recorded vacancy rates of 10% or higher.

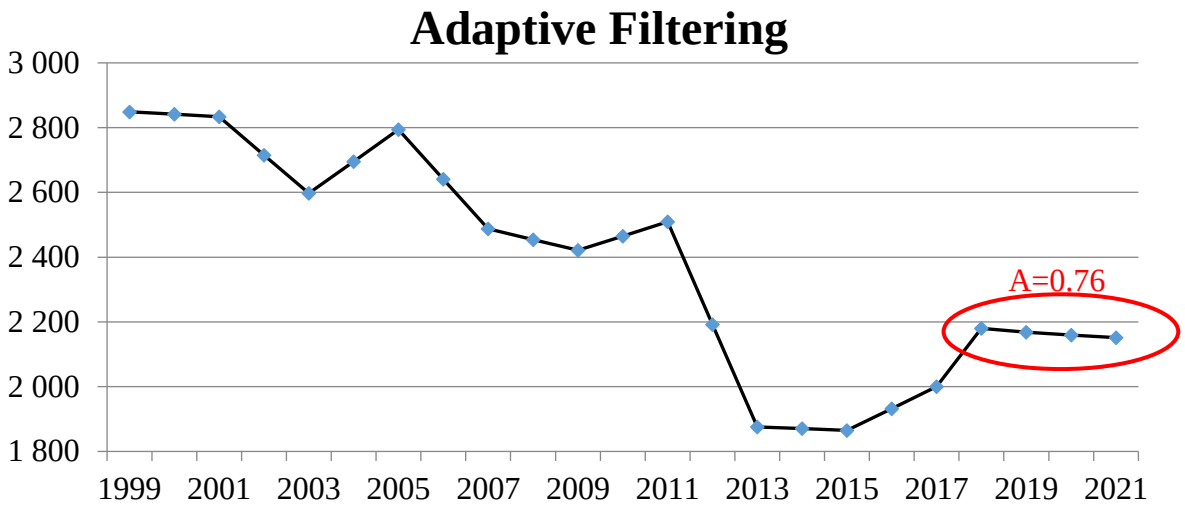
Business Outlook of the Shipbuilding and Ship Repair Sector

4.17 The Shipbuilding and Ship Repair sector continues to face fierce competition from Mainland competitors in ocean-going vessel repairing business. Whereas, the local craft repairing business, in particular the luxury and leisure boat market, remains stable and optimistic. A big challenge that the sector encounters is manpower shortage. The harsh working conditions of the Shipbuilding and Ship Repair sector are comparable to that of the construction industry but the latter offers higher salaries to workers. As long as the remuneration gap remains, the Shipbuilding and Ship Repair sector will have difficulties retaining its young workers.

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

4.18 Considering that the size of the workforce is relatively small, the Training Board applied AFM to the total manpower of the sector for manpower forecast. The result is shown in *Figure 4.8*.

Figure 4.8 Manpower Projection for the Shipbuilding and Ship Repair sector



4.19 The Training Board decided to adopt the best fitted curve (A=0.76) for manpower projection of the Shipbuilding and Ship Repair sector. The forecast total manpower of the sector for 2018 to 2021 are 2 180, 2 169, 2 159 and 2 151 respectively.

4.20 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 most of the aged workers have already retired in recent years, the wastage rate of the sector was still relatively high as many workers moved to the construction industry. Therefore, the Training Board decided to keep the wastage rate at 6% for the Shipbuilding and Ship Repair sector.

4.21 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 2018 to 2021 which are shown in *Table 4.7*.

Table 4.7 Projected annual training requirements of E&M workers for the Shipbuilding and Ship Repair sector in the coming 4 years

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2018 - 2021
Professional/Technologist	245	20 (14)*
Technician	515	42 (24)*
Tradesman/Craftsman	1 132	92 (61)*

** Training Board's projected annual training requirements made in 2015, for 2016 – 2018.*

C. Gas Sector

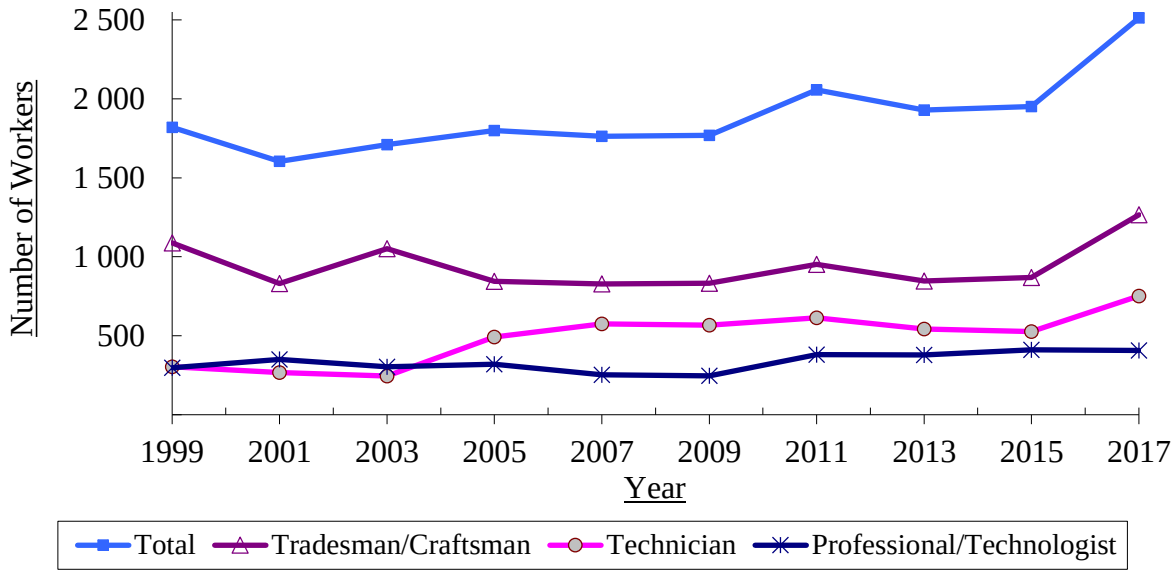
Manpower Changes

4.22 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 4.8 and Figure 4.9*.

Table 4.8 E&M Manpower Changes of the Gas sector

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower[8]
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
2017	406	752	1 266	2 512

Figure 4.9 E&M Manpower Changes of the Gas sector



4.23 The manpower of the Gas sector used to be very stable. A noticeable increase (+28.8% compared with 2 years ago) was found in this round of survey as 2 respondents claimed that their manpower had been underestimated in previous rounds of the survey.

4.24 At the time of survey, the number of vacancies in the Gas sector amounted to 2.5% of the workforce. Among the 19 principal jobs of the sector, 3 (Electrician / Electrical Fitter, Driver (LPG Cylinder Wagon), Labourer) had vacancy rates of 5% or higher.

[8] including semi-skilled/general workers

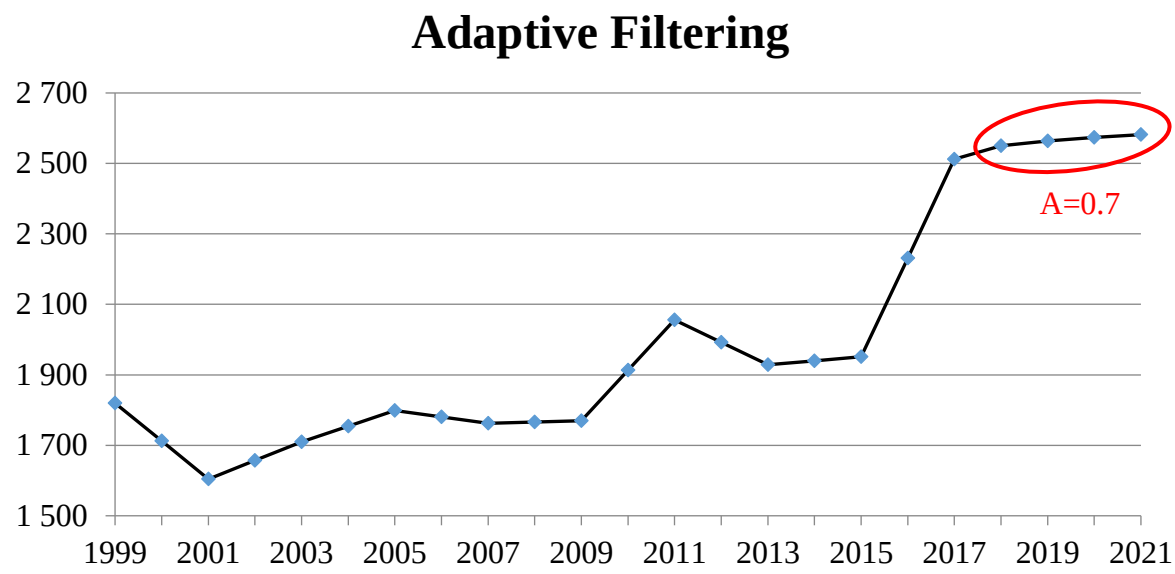
Business Outlook of the Gas Sector

4.25 The HKSAR Government is determined to increase the housing supply, with a target of 460,000 units for the coming 10 years, which is 80% more than the supply of the past 10 years. According to the figures published by the Transport and Housing Bureau and the Hong Kong Housing Authority, there will be some 97,000 new private flats completed in the next 3 to 4 years, and 94,500 public housing produced from 2016-17 to 2020-21. The increasing supply of housing, coupled with the present favourable economic conditions, will sustain the steady growth of the Gas sector.

Projected Manpower and Training Requirements for the Gas Sector

4.26 Considering that the size of the workforce is relatively small, the Training Board applied the AFM to the total manpower of the sector for manpower forecast. The result is shown in *Figure 4.10*.

Figure 4.10 Manpower Projection for the Gas sector



4.27 The Training Board decided to adopt the best fitted curve (A=0.7) for manpower projection of the Gas sector. The forecast total manpower of the sector for 2018 to 2021 are 2 550, 2 563, 2 574 and 2 582 respectively.

4.28 The Training Board decided to adopt 3% as the annual wastage rate of the Gas sector. The annual training requirements from 2018 to 2021 are calculated and shown in *Table 4.9*.

Table 4.9 Projected annual training requirements of E&M workers for the Gas sector in the coming 4 years

Job level	No. of Workers at the Time of Survey	Projected Average Annual Training Requirements for 2018 - 2021
Professional/Technologist	406	9 (11)*
Technician	752	19 (15)*
Tradesman/Craftsman	1 266	62 (26)*

** Training Board's projected annual training requirements made in 2015, for 2016 – 2018.*

D. Aircraft Maintenance Sector

Manpower Changes

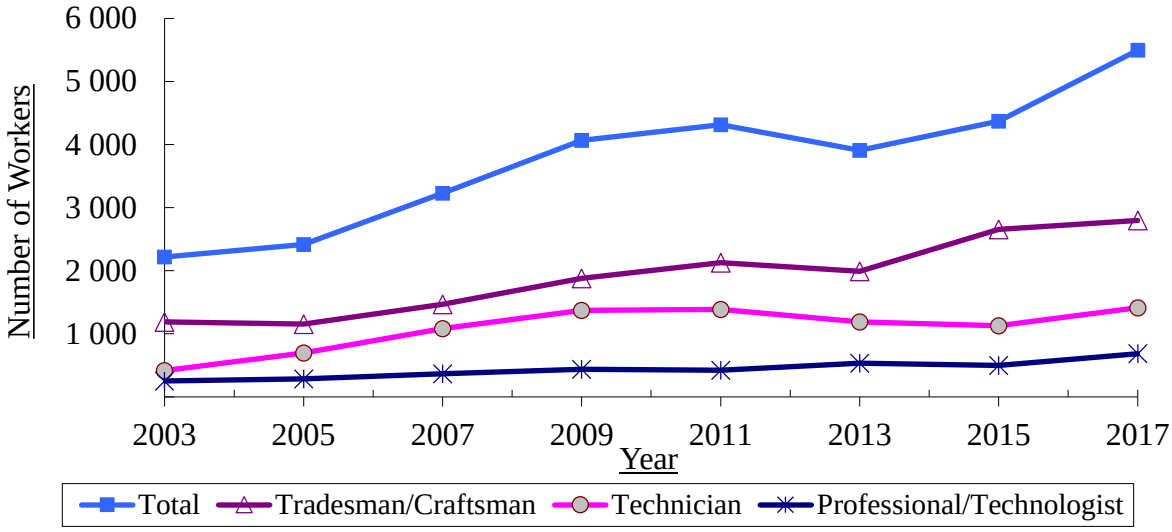
4.29 The manpower figures at professional/technologist, technician and tradesman/craftsman levels of the Aircraft Maintenance sector recorded from 2003 to 2017 are shown in *Table 4.10 and Figure 4.11*. It should be noted that in this round of survey, the number of companies covered has increased from 6 to 12.

Table 4.10 E&M Manpower Changes of the Aircraft Maintenance sector

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower[9]
2003	253	418	1 189	2 218
2005	287	699	1 155	2 419
2007	367	1 084	1 468	3 230
2009	439	1 370	1 878	4 068
2011	421	1 387	2 129	4 318
2013	533	1 187	1 991	3 910
2015	498	1 130	2 656	4 372
2017	685	1 415	2 798	5 496

[9] including semi-skilled/general workers

Figure 4.11 E&M Manpower Changes of the Aircraft Maintenance sector between 2003 and 2017



Business Outlook of the Aircraft Maintenance Sector

4.30 Being the world's busiest cargo gateway and one of the busiest passenger airports, the Hong Kong International Airport (HKIA) also serves as a major aircraft maintenance and engineering services centre in the region. The Government estimated that upon the completion of the Three-runway System by 2024, the direct employment in the airport area will double to some 123,000 jobs. Among them, maintenance positions like engineers and mechanics will continue to be difficult to fill. Wages will certainly rise as employers need to retain their well-trained technical workers at the remote airport site.

Projected Manpower and Training Requirements for the Aircraft Maintenance Sector

4.31 Because of the expanded scope in 2017, manpower projection by trend analysis (i.e. AFM) cannot be applied. Employers' one-year forecast is adopted. The projected manpower figures for 2018 at professional/technologist, technician and tradesman/craftsman levels are 720, 1 561 and 2 976 respectively.

4.32 The Training Board decided to adopt 3% as the annual wastage rate for professional/technologist and technician levels, and 4% for tradesman/craftsman level. The training requirements for 2018 are calculated and shown in *Table 4.11*.

Table 4.11 Projected training requirements of E&M workers in 2018, for the Aircraft Maintenance sector

Job level	No. of Workers at the Time of Survey	Projected Training Requirements for 2018
Professional/Technologist	685	56
Technician	1 415	188
Tradesman/Craftsman	2 798	290

V. RECOMMENDATIONS

5.1 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 4 sectors of the industry from 2018 to 2021 will be as follows:

(i) E&M Engineering sector: As most of the existing rail projects will be completed by 2021, some workers currently engaged in contracting works may shift to the servicing branches, i.e. operation and maintenance of buildings and railways, in the coming few years. Nevertheless, new buildings and other ongoing or new projects, such as the West Kowloon Cultural District Development, the 10-year Hospital Development Plan and Operation Building Bright 2.0, should be able to sustain the manpower in the contracting branches.

(ii) Shipbuilding and Ship Repair sector: Despite the uncertainty of the ocean-going vessel repairing business, the local craft repairing business remains optimistic. The manpower demand of welders, marine fitters, electricians, pipefitters / sprinkler installers, supervisors, machine fitters and marine engine mechanics will remain strong.

(iii) Gas sector: The 97,000 new private flats to be completed in the next 3 to 4 years, together with 94,500 public housing to be produced from 2016-17 to 2020-21, amount to about 75% of the total new flats (private + public) produced over the past 10 years. With the increasing housing supply, a positive manpower growth in the Gas sector is anticipated.

(iv) Aircraft maintenance sector: Employers of this sector have been suffering from labour shortage for years. With the aggressive expansion of some stakeholders and foreseeable new business opportunities brought by the Three-runway System, fierce competition for skilled workers will continue for years to come.

5.2 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 organised manpower training programmes at the scale recommended in paragraphs 4.13, 4.21, 4.28 and 4.32.

5.3 For manpower planning at the company level, employers can take *Table 5.1* 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 5.1 Annual Intake of Trainees by Job Level and by sector

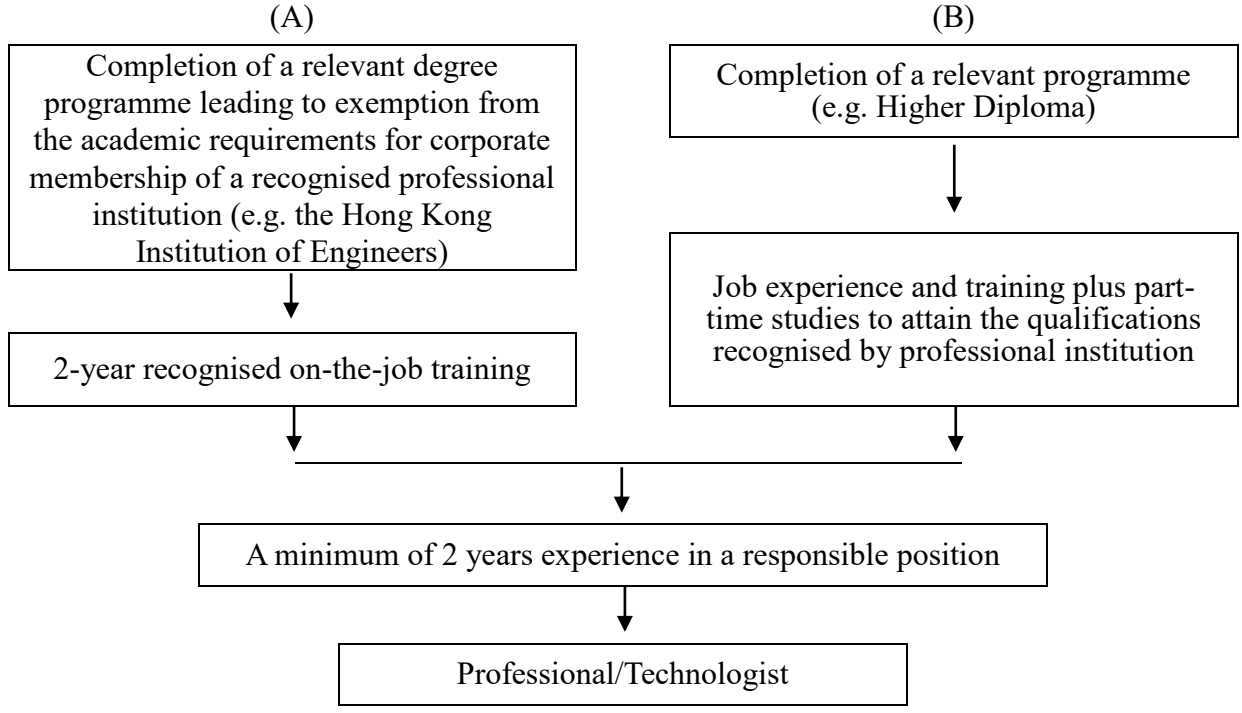
Sector	Professional/ Technologist	Technician	Tradesman/ Craftsman
E&M Engineering	7.5%	6.4%	5.4%
Shipbuilding and Ship Repair	8.2%	8.2%	8.1%
Gas	2.2%	2.5%	4.9%
Aircraft Maintenance	8.2%	13.3%	10.4%

A. Training of Professionals/Technologists

5.4 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.

5.5 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 5.1*.

Figure 5.1 Training of Professionals/Technologists



5.6 With reference to the figures in paragraphs 4.13, 4.21, 4.28 and 4.32, the projected average annual training requirements of principal jobs at professional/technologist level of the E&M Services industry, from 2018 to 2021, are about **830** persons.

5.7 *Table 5.2* 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 5.2 Estimated Local Supply of University Graduates from Full-time Degree Programmes in 2018 & 2019 for Major Disciplines of the E&M Services Industry

Institution[10]	Programme	Estimated No. of Local Graduates per Annum
CityU, HKU, PolyU, THEi	B Eng - Building Services Engineering	200
HKU, PolyU	B Eng - Electrical Engineering	150
HKU, HKUST, PolyU	B Eng - Mechanical Engineering	300
CUHK	B Eng - Mechanical & Automation Engineering	90
PolyU	B Eng – Air Transport Engineering	40
	B Eng – Transportation Systems Engineering	35
	Total	**815**

5.8 According to the figures of *Table 5.2*, 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. Anyway, 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, some of the training requirements will need to be filled up by internal promotion or graduates returned from overseas.

Engineering Graduate Training Scheme (EGTS)

5.9 To bring about more well-structured practical training opportunities for engineering graduates, the VTC, with the assistance of the Innovation and Technology Training Board, 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 (HKIE) for

[10] 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
THEi : Technological and Higher Education Institute of Hong Kong

corporate membership. Each graduate receiving training under the scheme is granted a subsidy through his employer as part of his salary. If required, basic workshop training of up to 8 weeks can be arranged in VTC's Pro-Act Training and Development Centres for those graduates who did not receive approved practical training during their study in the Degree programme. The Training Board strongly recommends the scheme to employers for training their engineering graduates.

New Technology Training Scheme (NTTS)

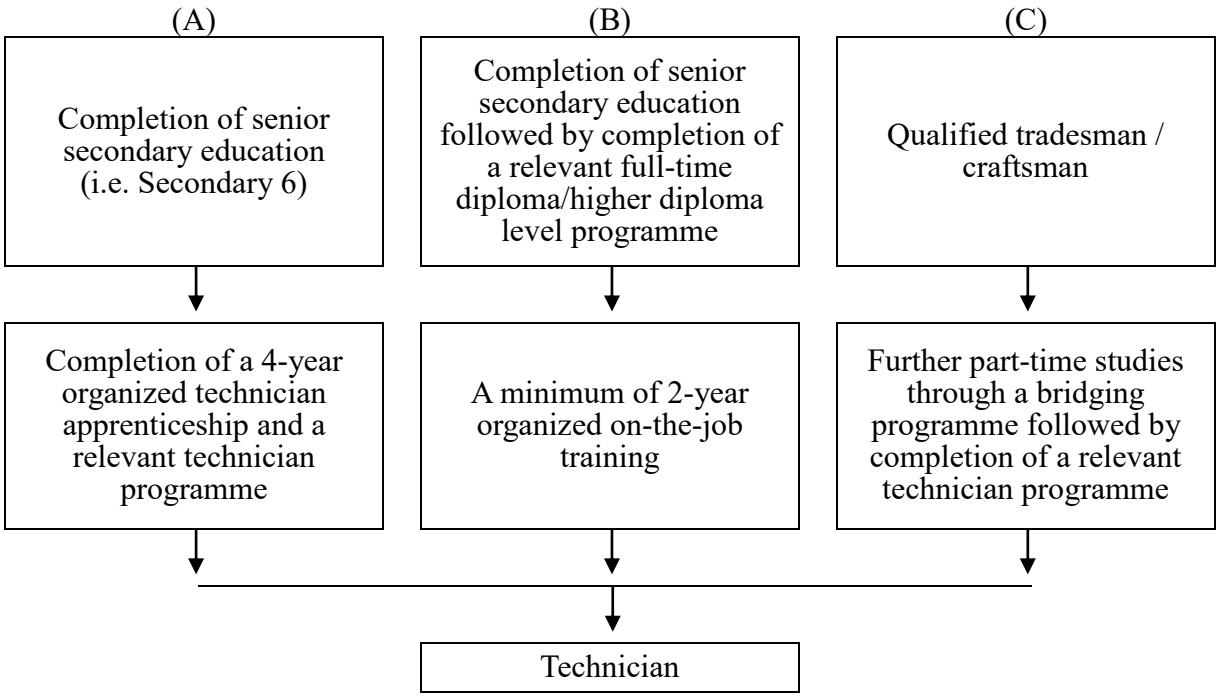
5.10 The New Technology Training Scheme provides financial assistance to local companies up to a maximum of 50% of the training cost for their employees to be trained in new technologies. The scheme covers various types of training mode including overseas training programmes or working attachments; and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

B. Training of Technicians

5.11 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.

5.12 The three normal routes for training technicians are listed in *Figure 5.2*.

Figure 5.2 Training of Technicians



5.13 The Hong Kong Polytechnic University and City University of Hong Kong offer full-time Higher Diploma (HD) / Associate Degree (ASc) technician level programmes in building services engineering and electrical engineering.

5.14 The Hong Kong Institute of Vocational Education (IVE) of the VTC 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.

5.15 The Youth College (YC) of the VTC offers Diploma of Vocational Education[11] (DVE) Programme in aircraft maintenance, building services engineering, electrical engineering and mechanical engineering. Graduates with DVE awards may take up technician trainee posts in the E&M Services industry. Employers are urged to employ these graduates as technician trainees, Higher Diploma apprentices (i.e. technician apprentices), or supervisor trainees because they have received proper basic training before joining the industry.

5.16 With reference to the figures in paragraphs 4.13, 4.21, 4.28 and 4.32, the projected average annual training requirements of principal jobs at technician level of the E&M Services industry, from 2018 to 2021, are about **1 260** persons.

5.17 The estimated supply of technicians from full-time programmes in 2018 and 2019 for key E&M trades is shown in *Table 5.3*. 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.

5.18 In addition to outputs from full-time HD and ASc programmes, every year there are more than 200 trainees joining the E&M Services industry as technician apprentices and studying the Higher Diploma programmes (electrical, mechanical, building services or aircraft maintenance engineering) in part-time-day mode.

5.19 The combined output from full-time and part-time-day mode technician level training programmes in 2018 and 2019 is about 1 035 + 200 = **1 235** per annum, which is

[11] previously called "Diploma in Vocational Education"

close to the projected annual training requirements (i.e. 1 260). Similar to the situation at professional/technologist level, not 100% of the graduates will join the E&M Services industry and some may be employed by organisations outside the scope of this manpower survey. Therefore, the supply should be considered as marginally meeting the demand.

Table 5.3 Estimated Local Supply of Technicians from Full-time Programmes in 2018 and 2019 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[12]:	
	- Building Services Engineering	50
	- Electrical Engineering	15
	Sub-total	65
IVE	Full-time HD programmes[13]:	
	- Aircraft Maintenance Engineering	90
	- Building Services Engineering	330
	- Electrical Engineering	260
	- Mechanical Engineering	175
	Sub-total	855
Youth College	Full-time DVE programmes[14]: (graduates with DVE award):	
	- Aircraft Maintenance	15
	- Building Services Engineering	30
	- Electrical Engineering	40
	- Mechanical Engineering	30
	Sub-total	115
	Grand Total	**1 035**

Engineering Training Subsidy Scheme (ETSS)

5.20 To further encourage continuing education, the HKSAR Government approved the implementation of a pilot scheme to provide tuition fee subsidy for three cohorts of students admitted from AY 2016/17 to designated professional (accredited at Qualifications Framework (QF) Level 3 to 5), self-financing part-time programmes offered by the VTC, covering programmes in the disciplines of construction and engineering. Successful

[12] It is assumed that about 60% of the Higher Diploma / Associate Degree graduates from Universities will articulate to Degree programmes. The numbers in Table 5.3 refer to those 40% graduates who enter employment.

[13] Students' drop-out rate, passing rate, further study rate and employment rate have been taken into consideration for the estimates. Table 5.3 shows the estimated number of graduates who will enter employment.

[14] The majority of graduates with the DVE award are S6 intakes. The numbers in Table 5.3 were estimated based on the completion and employment rates in AY 2015/16 and the admission numbers in AY 2017/18.

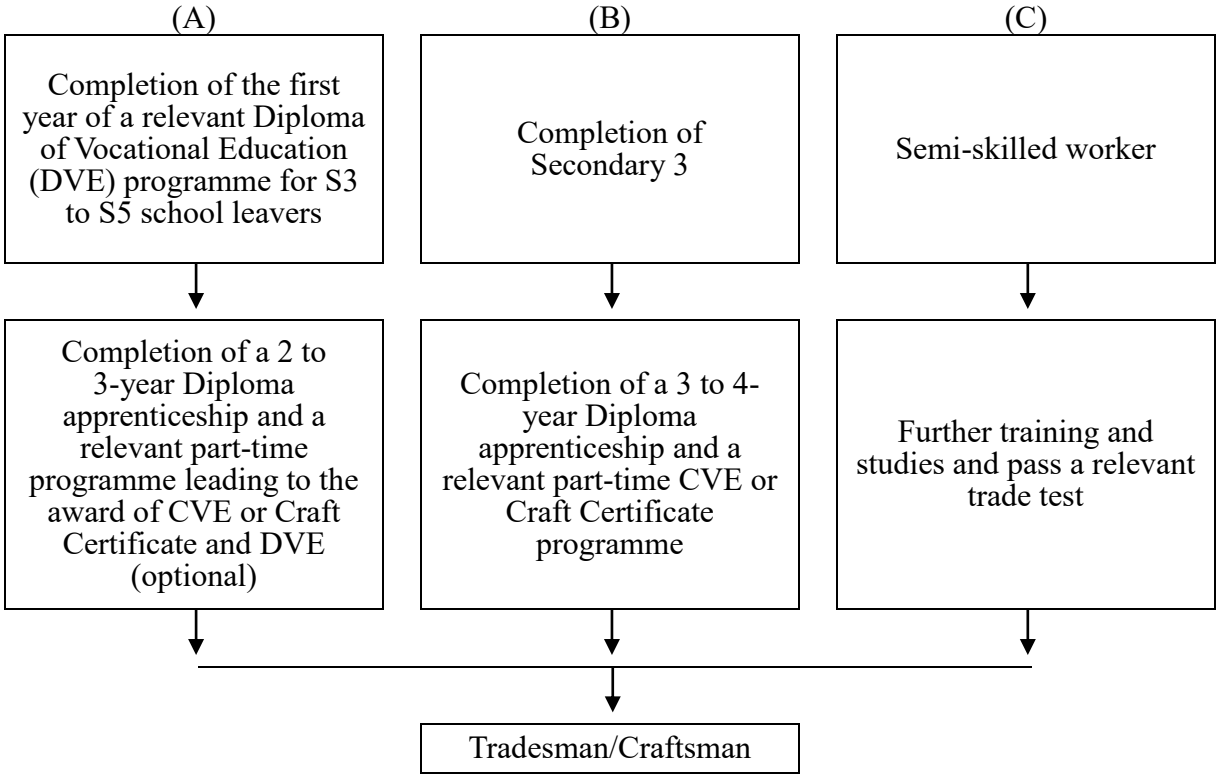
applicants will be refunded 60% of the tuition fees of eligible programmes, subject to a maximum of $45,000 per person. Under the E&M engineering sub-discipline, IVE's Higher Diploma programmes (part-time-evening mode) and several Professional Diploma programmes (offered by THEi or IVE) are covered by the scheme. The Training Board recommends the scheme to working adults who are planning to pursue higher qualifications to enhance their upward mobility.

C. Training of Tradesmen/Craftsmen

5.21 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.

5.22 The common routes for training tradesmen/craftsmen are shown in *Figure 5.3*.

Figure 5.3 Training of Tradesmen/Craftsmen



5.23 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.

5.24 Craftsman level training programmes in various trades of the E&M Services industry are mainly offered by the Youth College of the VTC for S3 to S5 school leavers. Apart from full-time DVE programmes (i.e. pre-employment training programme), part-time-day mode DVE and Certificate of Vocational Education (CVE)[15] programmes are offered for registered Diploma apprentices (i.e. craft apprentices). The Construction Industry Council (CIC) also offers two Basic Craft courses on E&M trades, namely electrical installation, plumbing and pipe-fitting.

5.25 With reference to the figures in paragraphs 4.13, 4.21, 4.28 and 4.32, the projected average annual training requirements of principal jobs at tradesman/craftsman level of the E&M Services industry, from 2018 to 2021, are about **2 480** persons.

5.26 *Table 5.4* show the estimated average annual supply of tradesman/craftsman trainees for key E&M trades from full-time training programmes offered by VTC in 2018 and 2019.

Table 5.4 Estimated Local Supply of Tradesman/Craftsman Trainees from Full-time DVE Programmes in 2018 and 2019 for Key E&M Trades of the E&M Services Industry

Institution	Programme	Estimated No. of Graduates Entering into Employment Per Annum[16]
Youth College	Full-time DVE Programme (S3 to S5 Intakes):	
	- Building Services Engineering (covering Air-conditioning & Refrigeration, Fire Services Engineering)	200
	- Electrical Engineering	165
	- Gas Services Engineering	40
	- Lift & Escalator Engineering	60
	- Mechanical Engineering	90
	- Welding Technology & Inspection	15
	Total	570

5.27 Graduates of the full-time programmes mentioned in paragraph 5.26 normally work as Diploma apprentices and continue to receive formal training by enrolling in part-time-day mode DVE or CVE programmes. There are some other youngsters who join the E&M Services industry as Diploma apprentices without studying in full-time DVE programme before (i.e. path B in Figure 5.3). Based on the average new intakes of the part-time-day DVE and CVE programmes in AY 2016/17 and AY 2017/18, the estimated supply of craftsman/ tradesman trainees (including paths (A) and path (B) in Figure 5.3) in 2018 and 2019 is listed in *Table 5.5*.

[15] previously called "Craft Certificate"

[16] The estimate was based on the placement figures of AY 2016/17.

Table 5.5 Estimated Number of Newly Registered Diploma Apprentices of E&M Trades Enrolled in PTD mode DVE or CVE Programmes for 2018 and 2019

Institution	Programmes	Estimated No. of New Intakes per Annum[17]
Youth College	DVE / CVE in Air-conditioning & Refrigeration	230
	DVE / CVE in Building Services Engineering	80
	DVE / CVE in Electrical Engineering	340
	CVE in Gas Services Engineering	35
	DVE / CVE in Lift and Escalator Engineering	250
	DVE / CVE in Mechanical Engineering	145
	DVE / CVE in Digital Electronics Technology	50
	CC in Plumbing and Pipefitting	80
	Total	**1 210**

5.28 Comparing the numbers in paragraph 5.25 and *Table 5.5*, it is found that the estimated number of newly-registered Diploma apprentices of E&M trades per annum, from 2018 to 2019, amounts to about 50% of the projected annual training requirements. The shortage will need to be filled up by qualified tradesmen/craftsmen who attained their qualifications through on-the-job training / skills upgrading training or passing relevant trade tests.

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

5.30 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)

5.31 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 AY 2013/14, 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,

[17] The projection is based on the enrolment figures of AY 2016/17 and AY 2017/18.

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-recognised companies as apprentices, students will received another $15,400 encouragement subsidy from CIC during the apprenticeship period. In AY 2014/15, the scheme extended to cover 2 more DVE programmes of S3 intakes (Gas Services Engineering, Digital Electronics Technology – Telecommunications and Surveillance Technology stream) and 4 DVE programmes of S6 intakes (Building Services Engineering, Electrical Engineering, Mechanical Engineering and Construction).

Earn & Learn Pilot Scheme (ELS)

5.32 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 Diploma apprentice can attain the DVE qualification, in addition to CVE within the apprenticeship period. Since the introduction of the scheme, the enrolment rate of the related DVE programmes has improved and the retention rate of apprentices has risen to nearly 90%. The increasing supply of trainees during the past few years has, to a certain extent, relieved the manpower shortage problem suffered by the E&M Services industry. Compared with 2 years ago, the number of vacancies at tradesman/craftsman level recorded a noticeable drop (from 2 335 to 1 840). Because of the effectiveness of the scheme, the Government decided to extend the pilot period to AY 2016/17 and AY 2017/18, benefiting 2 000 more trainees. The Training Board recommends that employers support the TSS and ELS schemes in order to attract more new bloods to join and retain in the E&M Services industry.

D. Training of Semi-skilled/General Workers

5.33 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 that more semi-skilled/general workers be trained up to help relieving the workload of tradesmen/craftsmen. This can be achieved by means of retraining programmes and short 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 that 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 FY 2013-14. Contractors of the lift and escalator branch have been the keen supporters of the scheme since its launch. In this round of survey, some 20% increase was observed in the number of lift mechanics and escalators mechanics which to a certain extent, can be attributed to the success of the CCTS.

5.34 In an increasingly competitive environment, it is imperative for employers to provide continuous on-the-job upgrading/updating training, and job enrichment to retain and raise the productivity of their semi-skilled/general workers. The Training Board recommends that 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 Plus of the Employees Retraining Board and the Advanced Construction Manpower Training Scheme (Pilot Scheme (Structured On-the-job) and Pilot Scheme (Skills Enhancement Courses)) of CIC are both good examples.

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

5.35 The Pro-Act(Electrical), Pro-Act(Gas), Pro-Act(Mechanical) and Pro-Act(Welding) Centres of the VTC 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 craftsman 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

5.36 The VTC 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 recognised 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.

5.37 The E&M Services Training Board is responsible for the development of trade test for electricians. The trade test certificate of electrician has been recognised by the Electrical and Mechanical Services Department (EMSD) of the HKSAR Government for the purpose of registration of Grade A and Grade R (Air-conditioning) electrical workers. With a view to providing better services to applicants, a web-based trade testing software system was launched in May 2017 which supports online applications and allows applicants to choose the test dates by themselves.

5.38 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.

5.39 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 recognised.

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

5.40 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.

5.41 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.

5.42 E&M contractors for construction works are urged to encourage their E&M workers to take the TT and ITT, in order to meet the CWRO requirements.

WorldSkills Competition

5.43 WorldSkills Competition (WSC) is the largest international skills competition organised by WorldSkills International (WSI) with an aim to promote excellence in skills, uplift professional skills standards, and to raise the awareness and status of vocational education and skills training across the world. To select outstanding competitors from different trades to represent Hong Kong to compete in the WorldSkills Competition, VTC together with CIC and the Clothing Industry Training Authority (CITA), organise the

WorldSkills Hong Kong Competition (WHKC) biennially. With a view to promoting vocational education and arousing public's awareness on skills training, large scale carnivals were held alongside with the competitions in 2014 and 2017, at the Kai Tak Cruise Terminal and the Hong Kong Convention and Exhibition Centre respectively. Skills try-out activities, seminars, career talks and masters' demonstration were showcased. The events attracted more than 20,000 participants each time, including students, parents, teachers, industry experts and overseas Vocational and Professional Education and Training (VPET) practitioners who shared the fun and experienced the power of skills.

5.44 Since 2014, the Training Board has been assisting the organization of 3 local competitions in E&M trades, namely Aircraft Maintenance, Electrical Installations and Refrigeration & Air Conditioning. The Training Board Chairman also joined the Hong Kong delegation to São Paulo, Brazil in 2015 and Abu Dhabi, United Arab Emirates in 2017 to show their support to the Hong Kong representatives. The Training Board recommends that employers continued to support the competitions by nominating their young, talent workers to the competitions.

Promotion of STEM Education

5.45 The promotion of STEM (Science, Technology, Engineering and Mathematics) education is a worldwide trend, aiming to equipping students to meet the changes and challenges in our society and around the world with rapid economic, scientific and technological developments. As mentioned in the Chief Executives' 2016 and 2017 Policy Address, the HKSAR Government would step up efforts to promote STEM and encourage students to pursue the study of these subjects. Being the largest VPET provider in Hong Kong, the VTC has set up 3 STEM Education Centres in its IVE and Youth College premises to support the government's policy. The Centres provide: (i) Mathematics and Science Corner to help students enhancing their proficiency in Mathematics and Science knowledge, (ii) Virtual Reality (VR) / Augmented Reality (AR) Learning Zone to engage students in an immersive simulated environment for virtual workplace experience, (iii) STEM Activity Workshop to demonstrate STEM related activities such as 3D printing and laser scanning to secondary school students, and (iv) Engineering and Technology Zone to showcase STEM projects/ products such as robotics, solar cars, bridge building.

5.46 The Training Board is delighted to know the services provided by the VTC STEM Education Centres. Employers are encouraged to share their experience with the Centres on technology-enhanced learning.

E. Summary of Major Conclusions and Recommendations

5.47 The Training Boards' major conclusions and recommendations for manpower training of the E&M Services industry for 2018 to 2021 are summarised below:

(a) Training of Professionals/Technologists:

(i) The annual supply of local university graduates from full-time degree programmes is slightly less than the projected annual training requirements. The shortage can be filled up by internal promotion or graduates returned from overseas.

(ii) The Engineering Graduate Training Scheme (EGTS) and New Technology Training Scheme (NTTS) are recommended to employers for their engineering graduates' practical training and staff training on new technologies. The EGTS is particularly beneficial to graduates from overseas universities as few of them have received approved practical training in their Degree programme. The scheme can arrange 8 weeks of basic workshop training in VTC's Pro-Act Training and Development Centres which are HKIE's approved training establishments.

(b) Training of Technicians:

(i) The annual supply of technicians from full-time and part-time-day programmes offered by CityU, PolyU, IVE and Youth College marginally meet the projected annual training requirements.

(ii) The Engineering Training Subsidy Scheme (ETSS) piloted from AY 2016/17 to AY 2018/19 are recommended to working adults who want to pursue higher qualifications by enrolling in VTC's designated professional part-time programmes.

(c) Training of Tradesmen/Craftsmen:

(i) The newly-registered Diploma apprentices per annum amounts to about 50% of the projected annual training requirements. The other 50% will need to be filled up by qualified tradesmen/craftsmen who attained their qualifications through on-the-job training/skills upgrading training or passing relevant trade test.

(ii) The findings of this round of survey revealed that compared with 2 years ago, there were noticeable increase in the number of tradesman/craftsman trainees and significant decrease in the number of vacancies. This, to a certain extent, can be attributed to the effectiveness of the Trainee Subsidy Scheme (TSS) and the Earn & Learn Pilot Scheme (ELS) in attracting and retaining new bloods. Employers are urged to support the schemes. It is also recommended that training providers increase their pre-employment training places and offer more skills upgrading programmes to enable semi-skilled

workers upgrade to qualified tradesmen/ craftsmen.

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

(i) As reflected from the findings of this and previous rounds of manpower survey, the supply of tradesman/craftsman for the E&M Services industry cannot rely on apprenticeship training alone. It is recommended that more semi-skilled / general workers be trained up who can later update to tradesman/craftsman.

(ii) Contractors of the lift & escalator branch have been actively participating in CIC's Contractor Cooperative Training Scheme (CCTS). Compared with 2 years ago, the number of lift/escalator mechanics reported by respondents increased for about 20%. The Training Board recommends CCTS to employers who want to fulfill their manpower need with the "First-hire-then-train" approach.

(e) Trade Tests

(i) Trade test is one of the routes that allow semi-skilled workers to migrate to qualified tradesman/craftsman. Employers should encourage their workers in electrical installations, lift and escalator engineering, if unregistered, to take VTC's trade tests.

(ii) E&M contractors for construction works should encourage their E&M workers to take CIC's trade tests or intermediate trade tests, in order to register and comply with the Construction Workers Registration Ordinance (CWRO).

(f) Promotion of VPET and STEM Education

(i) In order to attract more youngsters to study engineering-related programmes, there is a need to raise the awareness and status of vocational education and skills training across the society, The Training Board recommends that employers continue to support youth skills competitions, e.g. the WorldSkills Competition, by nominating their young, talent workers to join the competitions.

(ii) Close collaboration between VTC's STEM Education Centres and the industry is recommended, to promote STEM education and share experience on technology-enhanced learning.

I. 報告摘要

背景

1.1 本會為機電工程業展開人力調查，主要目的是蒐集最新的人力資料，以評估業界的人力及培訓需求。

1.2 本報告書載述 **2017 年 6 月至 8 月**機電工程業人力調查所得結果。

調查覆蓋範圍

1.3 調查覆蓋以下機電工程行業及門類。每一行業之下，再細分不同主要門類以及補充抽樣[1]。

機電工程行業
門類 1： 機電工程承造
門類 2： 水電工程
門類 3： 機電工程服務
門類 4： 補充抽樣 （機電工程行業）

船舶修建行業
門類 5： 船廠及艇廠
門類 6： 補充抽樣 （船舶修建行業）

氣體燃料行業
門類 7： 燃氣供應
門類 8： 燃氣系統安裝及保養
門類 9： 補充抽樣 （氣體燃料行業）

飛機維修工程行業
門類 10： 飛機維修

1.4 飛機維修工程在是次調查作為機電工程業中的一個獨立行業界別，但在以往的人力調查則歸入機電工程行業之下。為了在同等的基礎上比較各個行業界別歷年的人力數據，本報告所載 2015 年及之前機電工程行業的人力數字，並不包括受僱於飛機維修公司的人員。

[1] *「補充抽樣」 是指經營其他業務但聘有機電工程人員的大型機構，例如：物業管理公司、貿易公司、顧問公司、大學及政府的相關部門等。*

人力調查方法

數據蒐集

1.5 是次調查共選取 1 221 間機構，其中 1 069 間是以分層隨機抽樣方式選取，另有 152 間作為補充抽樣加入調查。

1.6 是次人力調查於 2017 年 6 月至 8 月期間蒐集數據。1 221 間樣本機構中，共有 965 間順利集得統計資料，另有 46 間不允提供資料，有效回應率為 95.5%[2]。本會考慮以下因素：(i) 各門類的回應率令人滿意；(ii) 公眾熟識和具規模的機構大多回應了調查；(iii) 從樣本機構調查所得的結果可運用統計學方法倍大；從而總結本報告書所載的調查結果足以反映本業的人力情況。

1.7 本會採用一套有系統的調查問卷，透過電話或面對面訪問向樣本機構蒐集資料。這些機構需填答調查問卷的兩個部分；第一部分是問卷的主要內容，按主要職務及職級填報人力資料（僱員人數、職位空缺、受訓者等），第二部分則填報其他相關的人力資料。

1.8 是次人力調查將機電工程業人手劃分為以下四個職級，以便分析人力資料：

(i) 專業人士／技師；
(ii) 技術員；
(iii) 技工；
(iv) 半技術工人／普通工人

1.9 本會於調查問卷的第一部分訂明業內各項主要職務，並詳述每項職務的工作說明。本會了解業界機構所採用的職務名稱未必與表列名稱盡同，但仍請填覆人士按照工作說明填報該項主要職務的人力資料。

1.10 在人力調查的各個階段，本會均採取嚴謹的質素保證措施，確保調查順利進行，並力求調查結果準確，包括為調查人員提供充足培訓、由 VTC 的專責職員詳細核對每一份問卷、用電腦程式複核所蒐集的數據等。

推算 2018 年至 2021 年人力

1.11 本會採用了「調節過濾法」推算機電工程業 2018 年至 2021 年的人力需求（詳見附錄 6）。「調節過濾法」應用統計學上的「最適切」數值概念，假設所有其他影響人力需求的因素維持不變，利用歷年的人力數據趨勢推算未來需求。同時，本會亦考慮僱主的預測以及業界人士對行業發展的專業意見，然後才推算出未來的人力需求數字。

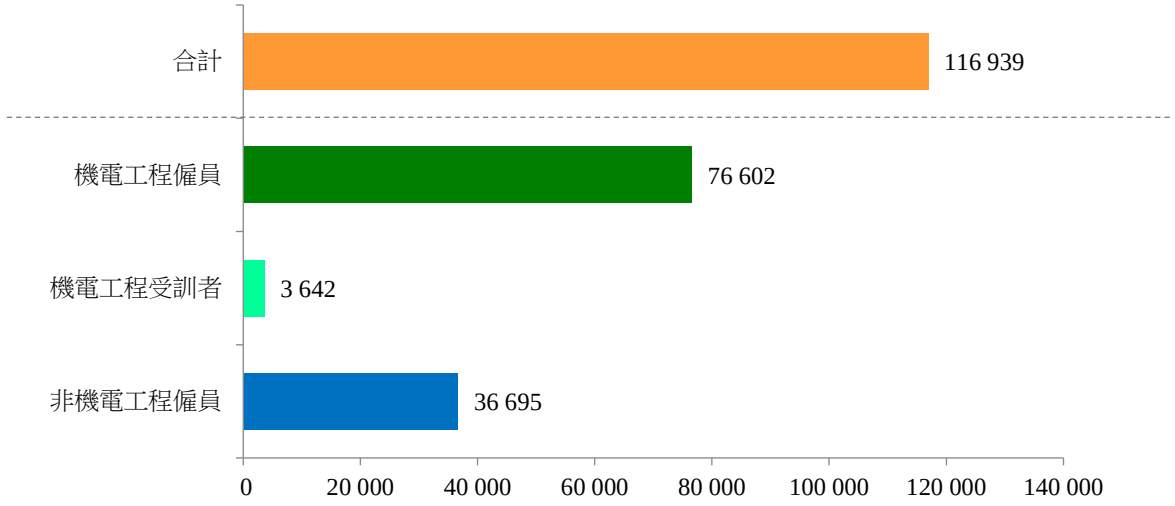
[2] *其餘的個案列作無效類別，包括機構已停止經營、經營其他業務、並無僱用機電工程人手等。*

調查結果摘要

A. 機電工程業

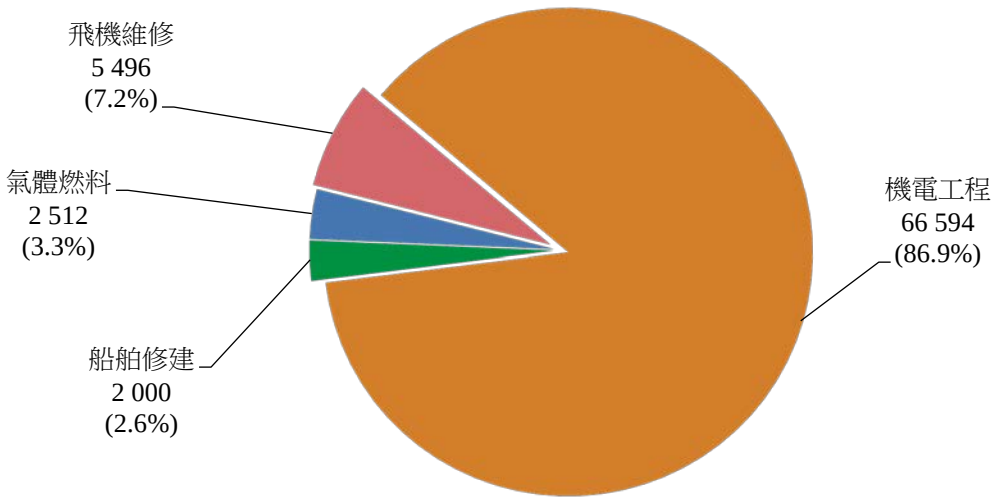
1.12. 香港機電工程業整體約有 11 萬 7 000 名僱員，當中有 76 602 名僱員及 3 642 名受訓者從事機電工程工作，其餘負責人力資源、財務、行政及資訊科技等其他職務（*圖 1.1*）。

圖 1.1 2017 年機電工程業僱員人數



1.13 在 76 602 名僱員中，66 594 (86.9%)人屬機電工程行業，2 000 人(2.6%)屬船舶修建行業，2 512 (3.3%)屬氣體燃料行業，5 496 人(7.2%)屬飛機維修工程行業（*圖 1.2*）。

圖 1.2 2017 年機電工程業僱員分布情況（按行業劃分）



1.14　整體而言，業內最高及最低技能等級（即專業人士／技師，以及半技術工人／普通工人）的僱員人數較少，中級僱員（技術員及技工）佔最多。下文概述個別行業的人力資料。

B. 機電工程行業

人力概況

1.15　機電工程行業主要涵蓋機電工程承建商、水電工程公司及機電工程服務公司。

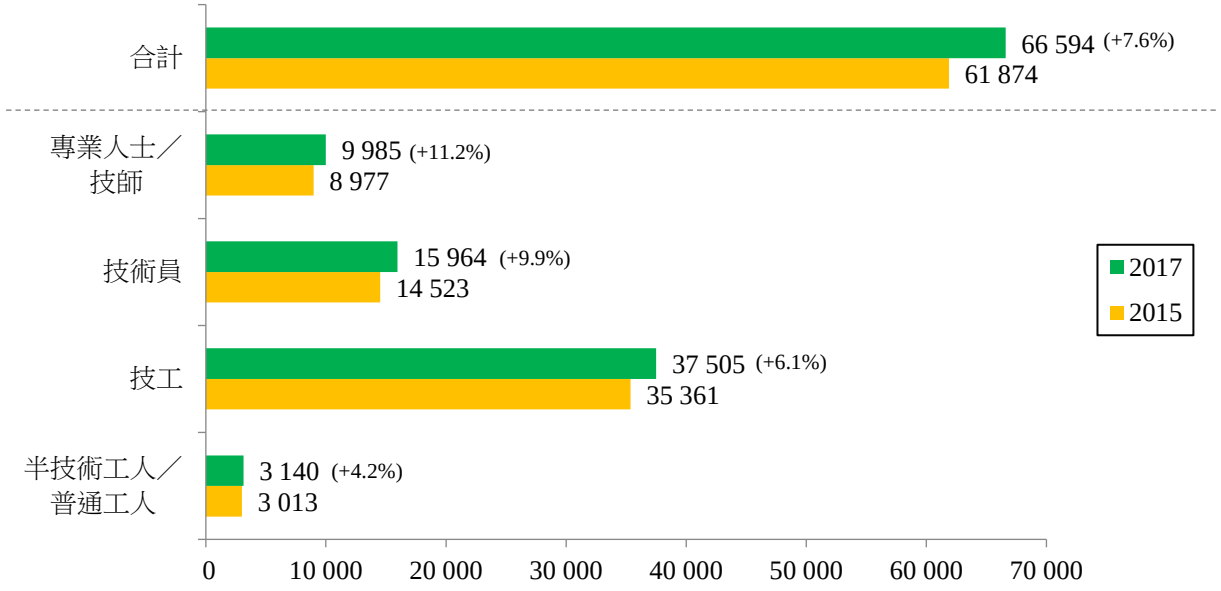
1.16　於調查期間，從事機電工程行業的機電工程僱員共有 66 594 人，當中 56%屬技工級，24%屬技術員級，15%屬專業人士／技師級，5%屬半技術工人／普通工人級。各技能等級的機電工程空缺數目共有 2 892 個，空缺率介乎 4%至近乎 7%之間不等（*表 1.1*）。

表 1.1　2017 年機電工程行業機電工程僱員、受訓者及空缺數目（按技能等級劃分）

技能等級	機電工程行業		
	機電工程僱員	機電工程受訓者	機電工程空缺
專業人士／技師	9 985 *(15.0%)*	407 *(13.8%)*	528 *(18.3%)*
技術員	15 964 *(24.0%)*	535 *(18.2%)*	643 *(22.2%)*
技工	37 505 *(56.3%)*	2 000 *(68.0%)*	1 506 *(52.1%)*
半技術工人／普通工人	3 140 *(4.7%)*	不適用	215 *(7.4%)*
合計	**66 594** ***(100%)***	**2 942** ***(100%)***	**2 892** ***(100%)***

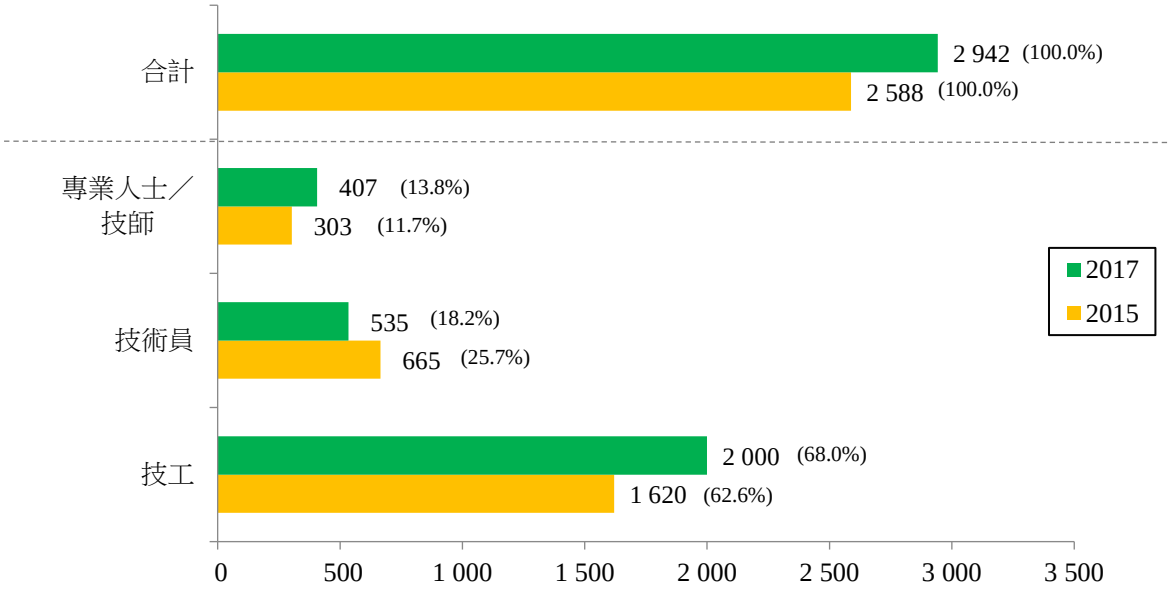
1.17　與 2015 年相比，各技能等級的機電工程僱員人數均錄得增長，整體升幅 7.6%，當中，2017 年專業人士／技師及技術員級的僱員人數相對兩年前顯著增加超過 10%，主要因為工程項目數量增加，帶動一些具規模的知名機電工程服務公司（*門類 3*）及政府部門（*門類 4*）增聘人手（*圖 1.3*）。

圖 1.3　2017 年機電工程行業機電工程僱員人數（按技能等級劃分）



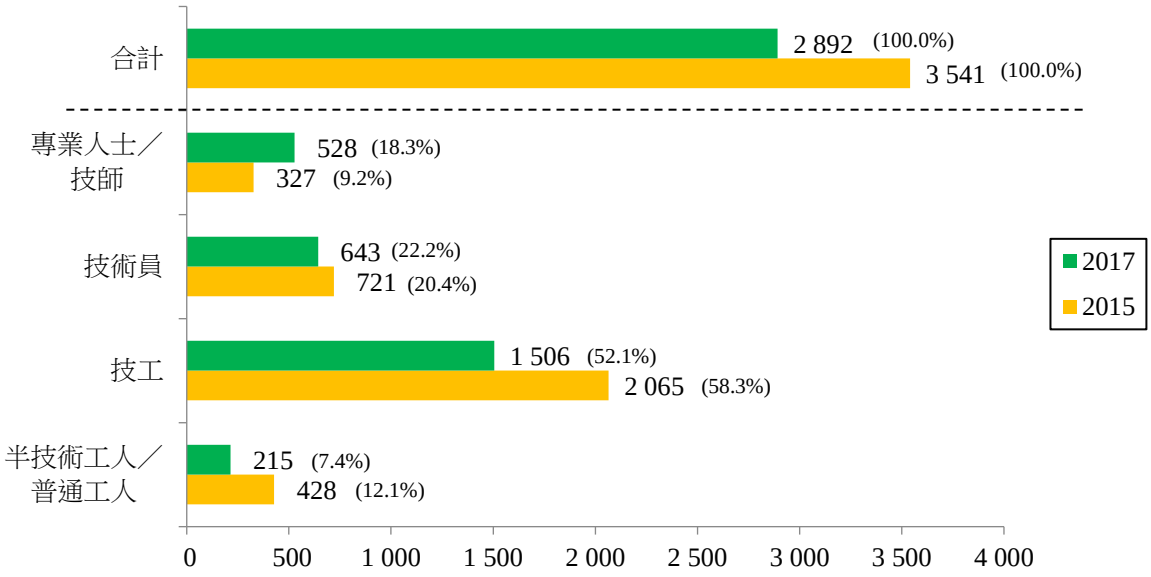
1.18　　機電工程行業以合約或學徒形式僱用受訓者的情況十分普遍。與 2015 年相比，2017 年專業人士／技師級和技工級的受訓者人數上升，技術員級的則有所減少（*圖 1.4*）。

圖 1.4　2017 年機電工程行業機電工程受訓者人數（按技能等級劃分）



1.19　　愈來愈多人成為機電工程行業僱員或受訓者，職位空缺數目由 2015 年的 3 541 個，降至 2017 年的 2 892 個，正好反映這個情況。除了專業人士／技師級，其餘技能等級的空缺數目均見回落（*圖 1.5*）。

圖 1.5　2017 年機電工程行業機電工程職位空缺數目（按技能等級劃分）



薪酬

1.20　　調查請僱主填覆僱員的薪酬組別。各技能等級機電工程僱員的薪酬分布情況載於*表 1.2*，適用於 10%或以上僱員的薪酬幅度以陰影標示，方便參考。

表 1.2　2017 年機電工程行業機電工程僱員的薪酬分布情況（按技能等級劃分）

技能等級	機電工程行業						
	<= $12,000	**$12,001 – $15,000**	**$15,001 – $18,000**	**$18,001 – $25,000**	**$25,001 – $35,000**	**$35,001 – $45,000**	**> $45,000**
專業人士／技師	0%	*	*	11%	34%	12%	43%
技術員	1%	2%	12%	41%	34%	8%	2%
技工	2%	11%	33%	44%	10%	*	0%
半技術工人／普通工人	6%	42%	29%	23%	0%	0%	0%
合計	**1%**	**8%**	**23%**	**37%**	**19%**	**4%**	**7%**

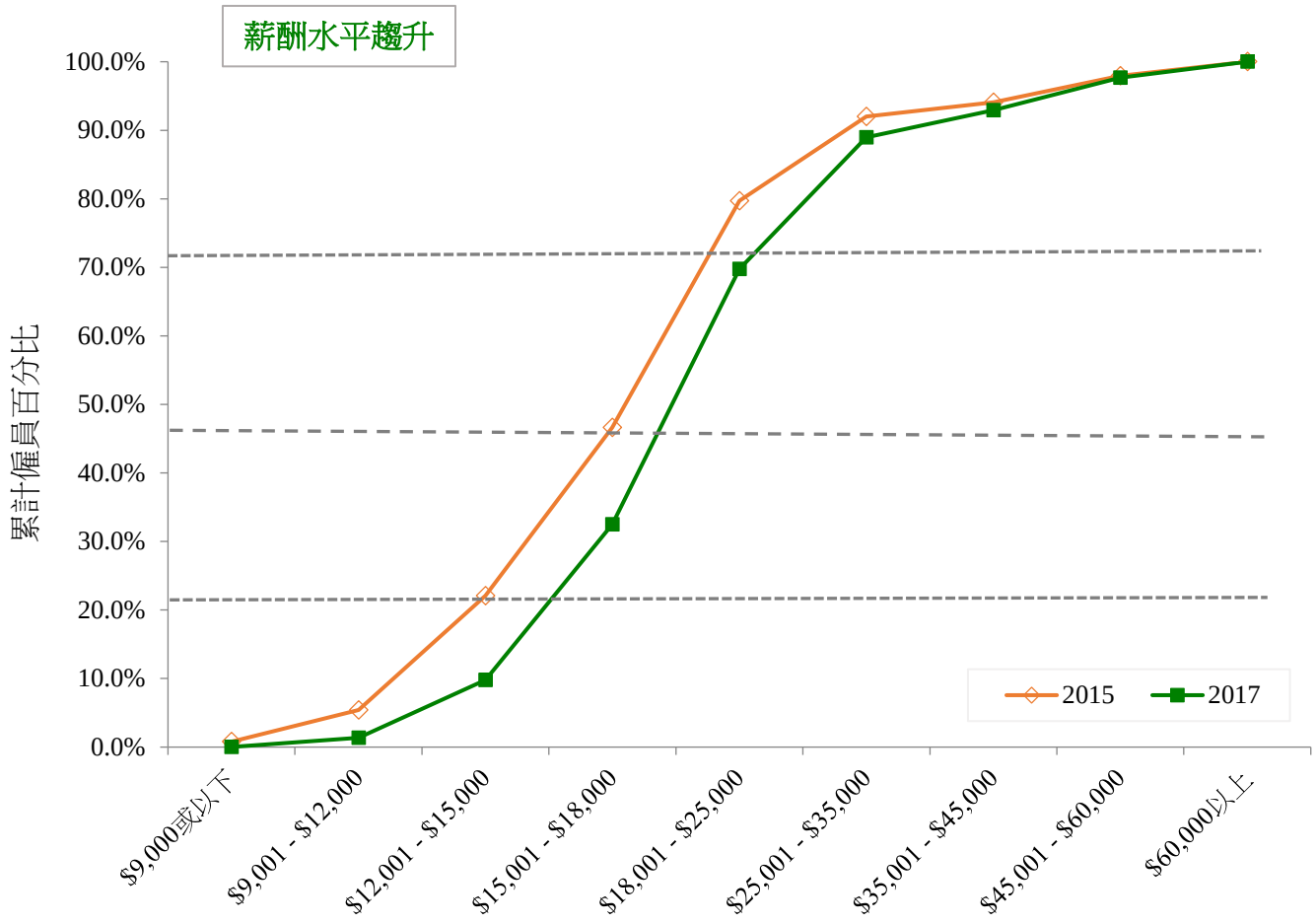
註：

*(1) *不足 0.5%。*

(2) 有若干百分比的機構並沒有提供薪酬資料。以上百分比按填覆機構所提供的資料計算所得。

1.21　　整體而言，與 2015 年相比，機電工程行業僱員的薪酬水平趨升（*圖 1.6*）。各技能等級 2017 年與 2015 年之薪酬趨勢載於*第 III 章 3.19 段*。

圖 1.6　2017 年與 2015 年機電工程行業平均月薪累計百分比—整體



推算人力訓練需求

1.22　儘管過去數年幾個鐵路項目陸續完成，其他正在進行或剛剛上馬的大型基建項目，如廣深港高速鐵路、沙田至中環線、發展西九文化區及「十年醫院發展計劃」等，將於未來數年持續推動承造門類業務發展。至於樓宇及鐵路的日常營運和修護工作，包括為期五年的「樓宇更新大行動 2.0」計劃，亦可支撐服務門類的人力需求。

1.23　根據是次及過往的人力調查數據，並考慮僱員年齡分布及調查期間的空缺數目，本會推算 2018 至 2021 年機電工程行業機電工程僱員每年的平均訓練需求，詳情見*表 1.3*。

表 1.3　推算機電工程行業未來四年機電工程僱員每年平均訓練需求

技能等級	調查期間僱員人數	推算 2018 至 2021 年 每年平均訓練需求
專業人士／技師	9 985	749
技術員	15 964	1 014
技工	37 505	2 035

C. 船舶修建行業

人力概況

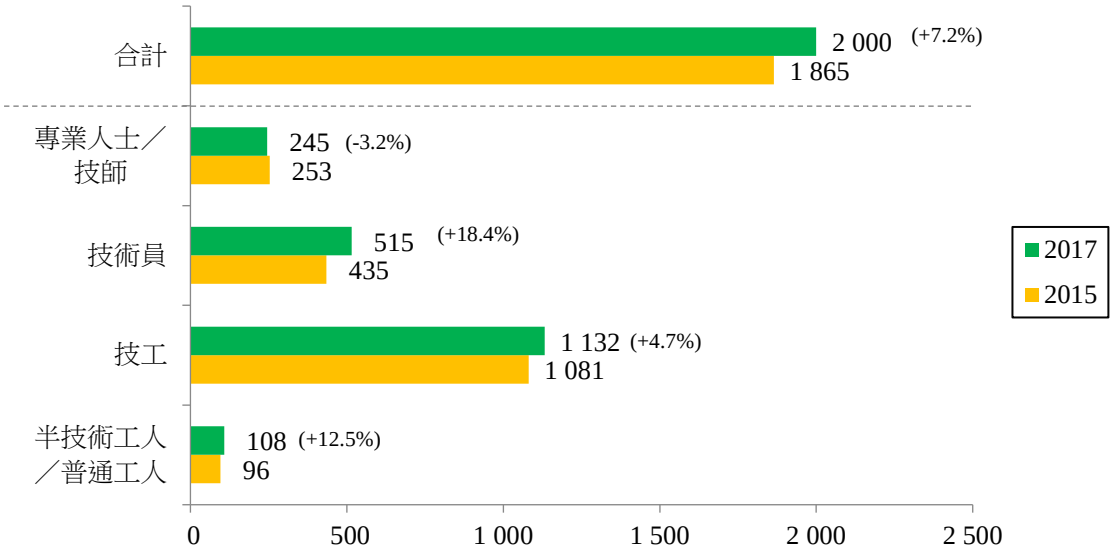
1.24　　於調查期間，從事船舶修建行業的機電工程僱員共有 2 000 人，當中逾 56%（1 132 人）屬技工級，26%屬技術員級，12%屬專業人士／技師級，5%屬半技術工人／普通工人級。船舶修建行業人力概況載於*表 1.4*。

表 1.4　2017 年船舶修建行業機電工程僱員、受訓者及空缺數目（按技能等級劃分）

技能等級	船舶修建行業		
	機電工程僱員	機電工程受訓者	機電工程空缺
專業人士／技師	245 *(12.3%)*	0 *(0%)*	8 *(3.1%)*
技術員	515 *(25.8%)*	11 *(36.7%)*	126 *(48.8%)*
技工	1 132 *(56.6%)*	19 *(63.3%)*	104 *(40.3%)*
半技術工人／普通工人	108 *(5.4%)*	不適用	20 *(7.8%)*
合計	**2 000** ***(100%)***	**30** ***(100%)***	**258** ***(100%)***

1.25　　與 2015 年相比，專業人士／技師級的僱員人數變化不大，技能等級較低的僱員人數則有所增加，使整體人力增長 7%。技術員級的僱員人數升幅最大，由 435 人增至 515 人，增幅達 18%。須留意的是，香港船舶業務頗為穩定，僱員人數增加，主因之一是具規模的公司擴張業務至岸上工程項目（*圖 1.7*）。基於相同原因，空缺數目由 2015 年 121 個，增至 2017 年 258 個。空缺率高低不一，由 3.3%（專業人士／技師）至 24.5%（技術員）不等。

圖 1.7　2017 年船舶修建行業機電工程僱員人數（按技能等級劃分）



薪酬

1.26　　船舶修建行業各技能等級機電工程僱員的薪酬分布情況載於*表 1.5*，並以陰影標示適用於 10%或以上僱員的薪酬幅度，以便參考。

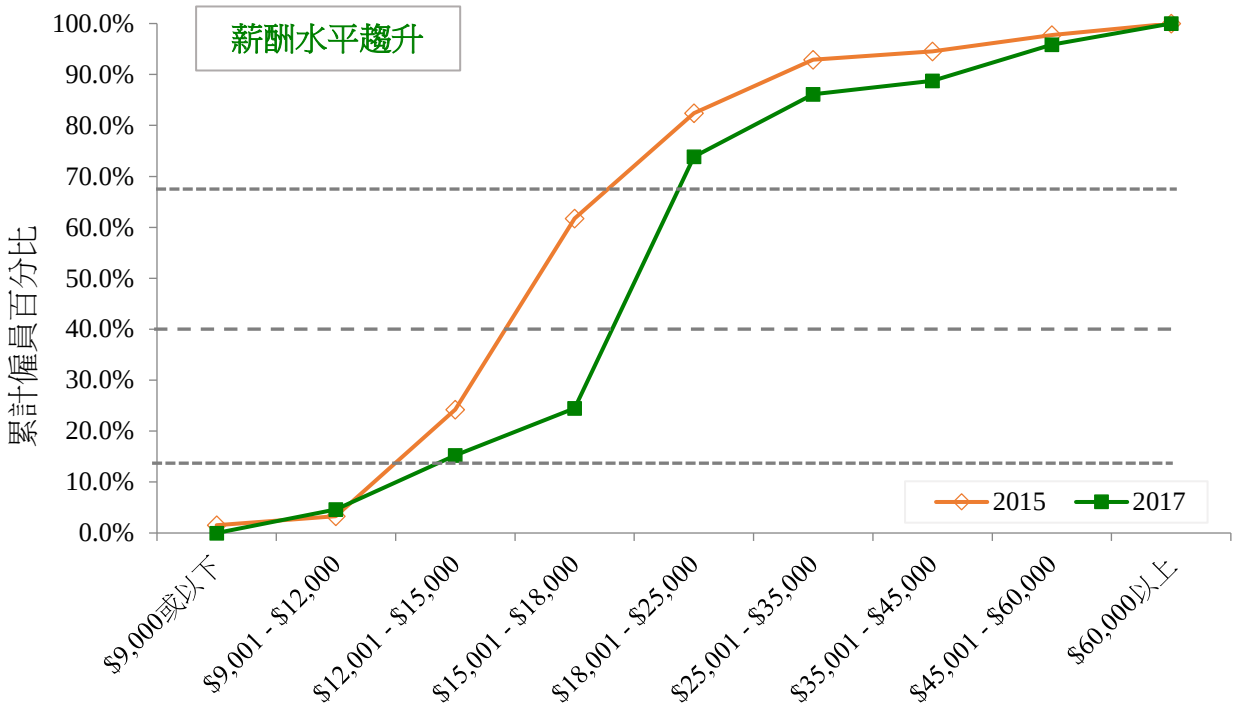
表 1.5　2017 年船舶修建行業機電工程僱員的薪酬分布情況（按技能等級劃分）

技能等級	船舶修建行業						
	<= $12,000	$12,001 – $15,000	$15,001 – $18,000	$18,001 – $25,000	$25,001 – $35,000	$35,001 – $45,000	> $45,000
專業人士／技師	0%	0%	0%	23%	23%	15%	39%
技術員	*	10%	6%	50%	18%	*	17%
技工	8%	10%	12%	63%	7%	0%	0%
半技術工人／普通工人	16%	49%	30%	5%	0%	0%	0%
合計	**5%**	**11%**	**9%**	**49%**	**12%**	**3%**	**11%**

註：
*(1) *不足 0.5%。*
(2) 有若干百分比的機構並沒有提供薪酬資料。以上百分比按填覆機構所提供的資料計算所得。

1.27　　與 2015 年相比，整體船舶修建行業的薪酬水平趨升（*圖 1.8*）。各技能等級 2017 年與 2015 年之薪酬趨勢載於*第 III 章 3.33 段*。

圖 1.8　2017 年與 2015 年船舶修建行業平均月薪累計百分比—整體



推算人力訓練需求

1.28 儘管本地船舶維修業務（特別是遊艇及遊樂船隻）維持樂觀，但船舶修建行業仍要繼續面對人力短缺這個重大挑戰。僱主需改善薪酬待遇，以吸引並挽留熟練人才。

1.29 根據是次及過往的人力調查數據，以及業內流失率，本會推算 2018 至 2021 年船舶修建行業機電工程僱員的每年平均訓練需求，詳情見*表 1.6*。

表 1.6 推算船舶修建行業未來四年機電工程僱員每年平均訓練需求

技能等級	調查期間僱員人數	推算 2018 至 2021 年 每年平均訓練需求
專業人士／技師	245	20
技術員	515	42
技工	1 132	92

D. 氣體燃料行業

人力概況

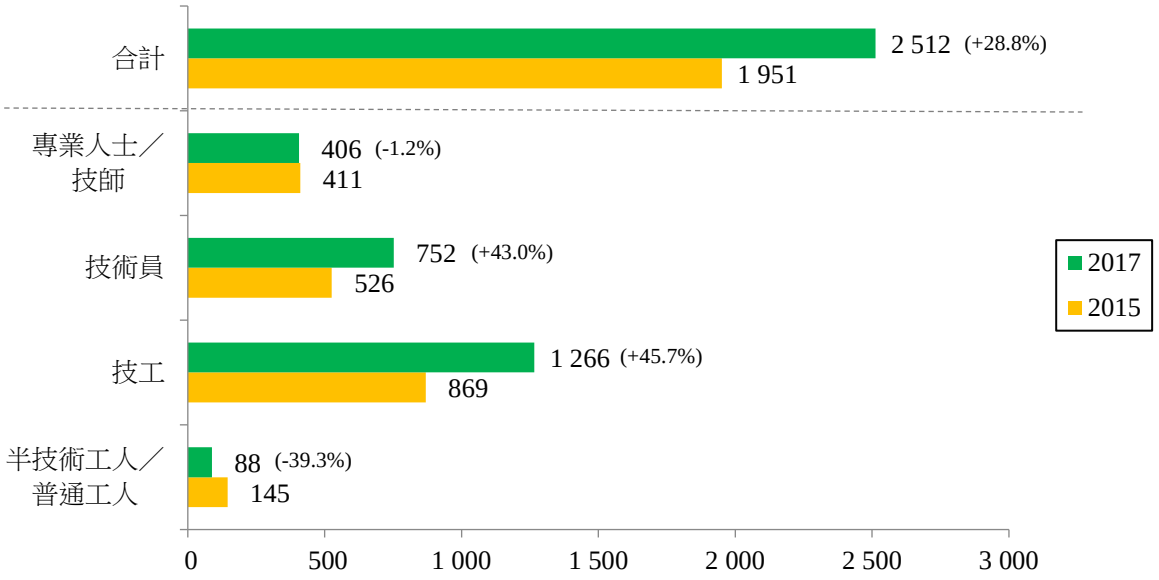
1.30 於調查期間，從事氣體燃料行業的機電工程僱員共有 2 512 人，當中超過一半屬技工級，30%屬技術員級，16%屬專業人士／技師級，4%屬半技術工人／普通工人級。氣體燃料行業人力概況載於*表 1.7*。

表 1.7 2017 年氣體燃料行業機電工程僱員、受訓者及空缺數目（按技能等級劃分）

技能等級	**氣體燃料行業**		
	機電工程僱員	**機電工程受訓者**	**機電工程空缺**
專業人士／技師	406 *(16.2%)*	10 *(16.9%)*	0 *(0%)*
技術員	752 *(29.9%)*	20 *(33.9%)*	9 *(14.5%)*
技工	1 266 *(50.4%)*	29 *(49.2%)*	40 *(64.5%)*
半技術工人／普通工人	88 *(3.5%)*	不適用	13 *(21.0%)*
合計	**2 512** ***(100%)***	**59** ***(100%)***	**62** ***(100%)***

1.31 與 2015 年相比，氣體燃料行業整體僱員人數大幅增加近 30%，原因是有兩間受訪公司表示過往調查低估了其僱員人數。專業人士／技師級的僱員人數相若，技術員及技工級的僱員人數則顯著上升（*圖 1.9*）。

圖 1.9　2017 年與 2015 年氣體燃料行業僱員人數（按技能等級劃分）



薪酬

1.32　　氣體燃料行業各技能等級機電工程僱員的薪酬分布情況載於*表 1.8*，並以陰影標示適用於 10%或以上僱員的薪酬幅度，以便參考。

表 1.8　2017 年氣體燃料行業機電工程僱員的薪酬分布情況（按技能等級劃分）

技能等級	氣體燃料行業						
	<= $12,000	$12,001 – $15,000	$15,001 – $18,000	$18,001 – $25,000	$25,001 – $35,000	$35,001 – $45,000	> $45,000
專業人士／技師	0%	0%	1%	3%	10%	80%	6%
技術員	0%	1%	49%	23%	20%	7%	0%
技工	3%	39%	22%	32%	4%	0%	0%
半技術工人／普通工人	13%	36%	31%	20%	0%	0%	0%
合計	**2%**	**22%**	**27%**	**24%**	**9%**	**14%**	**1%**

註：

(1) 有若干百分比的機構並沒有提供薪酬資料。以上百分比按填覆機構所提供的資料計算所得。

1.33　　與 2015 年相比，整體氣體燃料行業的薪酬分布模式與 2015 年相若，並無明顯變化。2017 年與 2015 年各技能等級之薪酬趨勢載於*第 III 章 3.46 段*。

推算人力訓練需求

1.34　　香港特區政府決意增加房屋供應，將刺激氣體燃料用量，本會預測氣體燃料行業未來數年對技術人員的需求會持續增長；推算 2018 至 2021 年氣體燃料行業機電工程僱員每年的平均訓練需求載於*表 1.9*。

表 1.9　推算氣體燃料行業未來四年機電工程僱員每年平均訓練需求

技能等級	調查期間僱員人數	推算 2018 至 2021 年 每年平均訓練需求
專業人士／技師	406	9
技術員	752	19
技工	1 266	62

E. 飛機維修工程行業

人力概況

1.35　　於調查期間，從事飛機維修工程行業的機電工程僱員共有 5 496 人，當中超過一半屬技工級，26%屬技術員級，13%屬專業人士／技師級，11%屬半技術工人／普通工人級。飛機維修工程行業人力概況載於*表 1.10*。

表 1.10　　2017 年飛機維修工程行業機電工程僱員、受訓者及空缺數目（按技能等級劃分）

技能等級	**飛機維修工程行業**		
	機電工程僱員	**機電工程受訓者**	**機電工程空缺**
專業人士／技師	685 *(12.5%)*	0 *(0%)*	37 *(7.2%)*
技術員	1 415 *(25.7%)*	23 *(3.8%)*	149 *(29.0%)*
技工	2 798 *(50.9%)*	588 *(96.2%)*	190 *(37.0%)*
半技術工人／普通工人	598 *(10.9%)*	不適用	138 *(26.8%)*
合計	**5 496** ***(100%)***	**611** ***(100%)***	**514** ***(100%)***

1.36　　是次調查將飛機維修工程行業歸類為機電工程業內一個獨立行業。為了提高調查結果的代表性，公司數目由 2015 年 6 間，增至 2017 年 12 間。由於供參照的基礎數字頗小，須謹慎分析調查數據。另因 2017 年與 2015 年的調查範圍差距頗大，故本報告不會比對過往調查的人力數字。

薪酬

1.37 飛機維修工程行業各技能等級機電工程僱員的薪酬分布情況載於*表 1.11*，並以陰影標示適用於 10%或以上僱員的薪酬幅度，以便參考。

表 1.11 2017 年飛機維修工程行業機電工程僱員的薪酬分布情況（按技能等級劃分）

技能等級	飛機維修工程行業						
	<= $12,000	**$12,001 – $15,000**	**$15,001 – $18,000**	**$18,001 – $25,000**	**$25,001 – $35,000**	**$35,001 – $45,000**	**> $45,000**
專業人士／技師	0%	0%	0%	0%	2%	98%	0%
技術員	0%	0%	15%	85%	0%	0%	0%
技工	0%	4%	71%	25%	0%	0%	0%
半技術工人／普通工人	72%	6%	22%	0%	0%	0%	0%
合計	**9%**	**3%**	**43%**	**34%**	*****	**11%**	**0%**

註：
*(1) *不足 0.5%。*
(2) 有若干百分比的機構並沒有提供薪酬資料。以上百分比按填覆機構所提供的資料計算所得。

1.38 各技能等級之薪酬趨勢載於*第 III 章 3.57 段*。

推算人力訓練需求

1.39 三跑道系統將於 2024 年前竣工，預料帶動機場區內直接受僱的人員倍增。飛機維修工程行業對熟練人手的需求持續殷切，工程師及技工等維修職務將繼續面對招聘困難。根據僱主對未來一年的預測，本會推算飛機維修工程行業 2018 年機電工程僱員的訓練需求，載於*表 1.12*。

表 1.12 推算飛機維修工程行業未來一年機電工程僱員的訓練需求

技能等級	調查期間僱員人數	推算 2018 年訓練需求
專業人士／技師	685	56
技術員	1 415	188
技工	2 798	290

主要結論及建議摘要

1.40 本會的主要結論及建議扼述如下：

(a) 專業人士／技師訓練：

(i) 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，略少於本會推算業界每年所需的訓練人手。差額可透過內部晉升或以海外回流畢業生填補。

(ii) 建議僱主善用「工科畢業生訓練計劃」及「新科技培訓計劃」，讓工程畢業生接受實務訓練及新科技培訓。「工科畢業生訓練計劃」對海外大學畢業生尤為實用，因為當中只有少數在修讀學位課程期間曾接受認可實務訓練。計劃可於 VTC 各卓越培訓發展中心安排八周基本工場訓練，這些中心是香港工程師學會認可的訓練機構。

(b) 技術員訓練：

(i) 城大、理大、IVE 及青年學院全日制及日間兼讀制技術員課程每年的畢業生人數，能勉強應付本會推算機電工程業每年所需訓練的人手。

(ii) 建議在職人士利用 2016/17 至 2018/19 學年試行的「工程專才進修資助計劃」，修讀 VTC 指定兼讀制專業課程，考取更高學歷。

(c) 技工訓練：

(i) 機電工程業每年新註冊文憑學徒的人數，僅能滿足本會推算業內每年所需訓練人手約 50%。業內現職僱員可透過在職培訓、技能提升訓練或通過相關技能測驗而成為合格技工，相信業界須循此途徑填補其餘短缺人手。

(ii) 是次調查結果顯示，與兩年前相比，見習技工人數顯著增加，空缺數目大幅減少。這個情況在某程度上可歸功於「機電業（建築）學員培訓津貼計劃」及「『職』學創前路先導計劃」能成功吸引及挽留新血。本會籲請僱主支持上述計劃，亦建議培訓機構增加職前培訓名額，同時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。

(d) 半技術工人／普通工人訓練：

(i) 近年人力調查報告結果反映，機電工程業的技工供應不能單靠學徒訓練。建議訓練更多半技術工人／普通工人，協助他們日後晉升為技工。

(ii) 升降機及自動梯門類承辦商自「承建商合作培訓計劃」推出以來一直鼎力支持。與兩年前相比，回覆機構報稱升降機及自動梯技工的人數增加約 20%。本會籲請僱主善用這項計劃，以「先聘用，後培訓」的模式滿足人力需求。

(e) 技能測試

(i) 技能測驗是讓半技術工人／普通工人成為合格技工的途徑之一。僱主應鼓勵未註冊的電力裝置、升降機及自動梯工程員工報考 VTC 的技能測驗。

(ii) 承造建築工程機電項目的承辦商應鼓勵機電工程工人參加 CIC 的技能測驗或中工測試，成為註冊人員並符合《建造業工人註冊條例》的規定。

(f) 推動 VPET 及 STEM 教育

(i) 為了吸引更多青少年修讀工程相關課程，有需要提升職業教育及技能訓練在社會上的認識和地位。本會籲請僱主繼續支持「世界技能大賽」等青年技能競賽，提名公司內的年輕人才參加比賽。

(ii) 建議 VTC 的 STEM 教育中心與業界緊密協作，攜手推動 STEM 教育，並分享科技增進學習的經驗。

II. 緒論

背景

2.1 機電工程業訓練委員會（本會）由職業訓練局（VTC）成立，職責之一是確定機電工程業的人力需求，並向局方提供建議，配合需求發展培訓設施。本會成員由各大行業商會、職工會、專業團體、教育培訓機構以及政府部門提名出任。本會成員組合及職權範圍分別載於*附錄 1* 及*附錄 3*。

2.2 本會依據職權範圍於 **2017 年 6 月至 8 月**進行機電工程業人力調查，蒐集最新人力資料，以評估業界的人力及培訓需求。報告書內載述人力調查所得結果。

人力調查目的

2.3 進行人力調查，目的在蒐集機電工程業的最新人力資料，尤其重於以下幾方面：

(a) 蒐集機電工程相關行業範疇內主要職務的最新人力資訊；
(b) 評估技術人力結構；
(c) 預測未來短期的培訓需求；以及
(d) 向局方提出發展培訓策略的建議，以配合需求。

調查覆蓋範圍

2.4 調查覆蓋以下機電工程行業及門類：

I. 機電工程行業

門類 1： 承造 (E&M) – 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 2：水電工程 – 電器裝設兼水管鋪設 (HSIC: 432102)。

門類 3: 服務 (E&M) – 提供下列機電工程服務的機構：

(i) 電力設備維修 (HSIC: 331400);
(ii) 鐵道運輸設備維修 (HSIC: 331500)
(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 4： 補充抽樣– 經營其他業務但聘有機電工程人員的機構：

(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等。

II. 船舶修建行業

門類 5： 船廠及艇廠 – 包括下列船廠及艇廠公司：

(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 6： 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. 氣體燃料行業

門類 7： 燃氣供應 – 燃氣製造及配送公司 (HSIC: 352000)。

門類 8：燃氣系統安裝及保養 – 燃氣供應系統裝設、安裝及保養公司 (HSIC: 432204)。

門類 9： 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。

IV. 飛機維修工程行業

門類 10： 飛機維修 – 飛機裝嵌及相關機械的製造：

(i) 飛行器裝嵌及相關機械的製造 (HSIC: 303000)，以及

(ii) 空中運輸設備維修 (HSIC: 331500)。

抽樣之設計

2.5 抽樣的設計與選取樣本是由香港特區政府統計處與 VTC 合作完成。為確保所選樣本具有代表性並利於進一步的行業／門類分析，共有 1 221 間公司獲邀參與調查，其中 1 069 間是由統計處在機構單位記錄庫[3]使用分層隨機抽樣的科學統計方法選取(包括三個機構層級：行業、門類、僱員數目)；其餘 152 間機構（補充抽樣）則是由本會建議加入，這些機構都是從事其他業務的大公司，亦聘用了機電工程員工，包括物業管理公司、貿易公司、顧問公司、大學及政府的相關部門。

[3] *統計處的機構單位記錄庫是一套電子資料庫，包含大約 400 000 間在港活躍從事業務的公司。記錄庫內的資料透過統計處不同調查及相關政府部門各項行政活動收集回應而得，每季更新。*

問卷設計

2.6 本會使用一套有系統的問卷收集數據。共設計了三套問卷，配合不同行業的主要職務情況：

(a) 機電工程行業與飛機維修行業（問卷 E）
(b) 船舶修建行業 （問卷 S）
(c) 氣體燃料行業 （問卷 G）

2.7 本報告書載有調查問卷、附註、主要職務說明的樣本，見*附錄 4*。

數據蒐集方法

2.8 調查工作開始前一星期，本會將整套調查文件（包括邀請信、調查問卷、附註、主要職務工作說明）郵寄予每間選定機構，並籲請機構負責人提供該機構在統計日期當天的人力情況資料。

2.9 機電工程行業的人力調查將業內人手劃分為以下四個職級，以便分析人力資料：

(i) 專業人士／技師；
(ii) 技術員；
(iii) 技工；
(iv) 半技術工人／普通工人

2.10 本會訂定業內的各項主要職務，列載於調查問卷第一部分，並詳述每項職務的工作說明。本會了解業界機構所採用的職務名稱未必與表列名稱盡同，但仍請填覆人士按照工作說明填報該項主要職務的人力資料。

2.11 調查期間，統計員致電或造訪個別機構，協助機構人員填覆問卷，又或收集填妥的問卷。

質素管理措施

2.12 本會採取各種措施以確保調查蒐集的數據質素，包括調查前的準備、為調查人員提供充足培訓、監察調查的進行情況，盡力提高回應率，核對填妥的問卷、重複輸入資料以求準確、驗證所蒐集的數據等。

(a) 調查前的準備

開始調查前，盡量向樣本機構取得聯絡電話。此外，同一業務集團的樣本機構歸入一組，方便調查工作。

(b) 為調查人員提供充足培訓

- VTC 舉辦行業簡介工作坊，讓調查人員掌握相關的行業知識。
- 為所有調查人員提供密集的簡介和培訓，確保他們明瞭調查目的、問卷內容和運作步驟。VTC 的代表擔任客席講員，解答疑問。

(c) 監察調查進行情況

- 調查工作由訓練充足並富經驗的統計員負責，期間調查主任嚴密監察調查進度及工作。每周兩次檢討，商討難題和解決方案，並檢視已填妥問卷的質素。
- VTC 人員一同造訪多間機構，確保調查工作進行得當。

(d) 提高調查回應率

我們採用多種方法提高調查的回應率，特別邀請本會委員及業界商會協助，呼籲屬下成員機構合作參與。

(e) 核對填妥問卷

- 每位統計員收回已填寫的問卷後，均由一組獨立富經驗的人員負責抽取樣本核對，查證是否已造訪有關機構。
- 所有填妥的問卷均會由 VTC 人員審閱。遇有疑問個案，會致電或造訪有關機構跟進。

(f) 重複輸入資料和驗證數據

我們採用一套重複輸入資料的系統，減少錯誤輸入的風險。此外，所輸入資料均需經過電腦驗證，發現疑問個案會安排實地驗證。

調查期及統計結果

2.13 是次人力調查於 2017 年 6 月至 8 月期間蒐集數據。1 221 間樣本機構中，共有 965 間順利集得統計資料，另有 46 間不允提供資料，有效回應率為 95.5%[4]。本會考慮以下因素：(i) 各門類的回應率令人滿意；(ii) 公眾熟識和具規模的機構大多回應了調查；(iii) 從樣本機構調查所得的結果可運用統計學方法倍大；從而總結本報告書所載的調查結果足以反映本業的人力情況。而在每一個行業／門類機構獲得的回應率亦能夠提供有意義的資料細分（見表 2.1）。

[4] *其餘的個案列作無效類別，包括機構已停止經營、經營其他業務、並無僱用機電工程人手等。*

表 2.1　各機構統計數目（按行業劃分）

行業	樣本機構數目	有效個案	集得統計資料機構數目	回應率
整體	**1 221**	**1 011**	**965**	**95.5%**
機電工程	1 055	868	836	96.3%
船舶修建	71	58	54	93.1%
氣體燃料	80	72	67	93.1%
飛機維修工程	15	13	8	61.5%

III. 調查結果

A. 機電工程業概況

僱員人數

3.1 於調查期間，香港機電工程業約有 11 萬 7 000 名僱員，當中有 76 602 名僱員及 3 642 名受訓者從事機電工程工作，其餘 36 695 名僱員負責人力資源、財務、行政及資訊科技等其他職務（歸類為非機電工程僱員）。

3.2 在 76 602 名僱員中，66 594 (86.9%)人屬機電工程行業，2 000 人(2.6%)屬船舶修建行業，2 512 (3.3%)屬氣體燃料行業，5 496 人(7.2%)屬飛機維修工程行業（*表 3.1*）。

表 3.1 2017 年機電工程業僱員人數（按行業劃分）

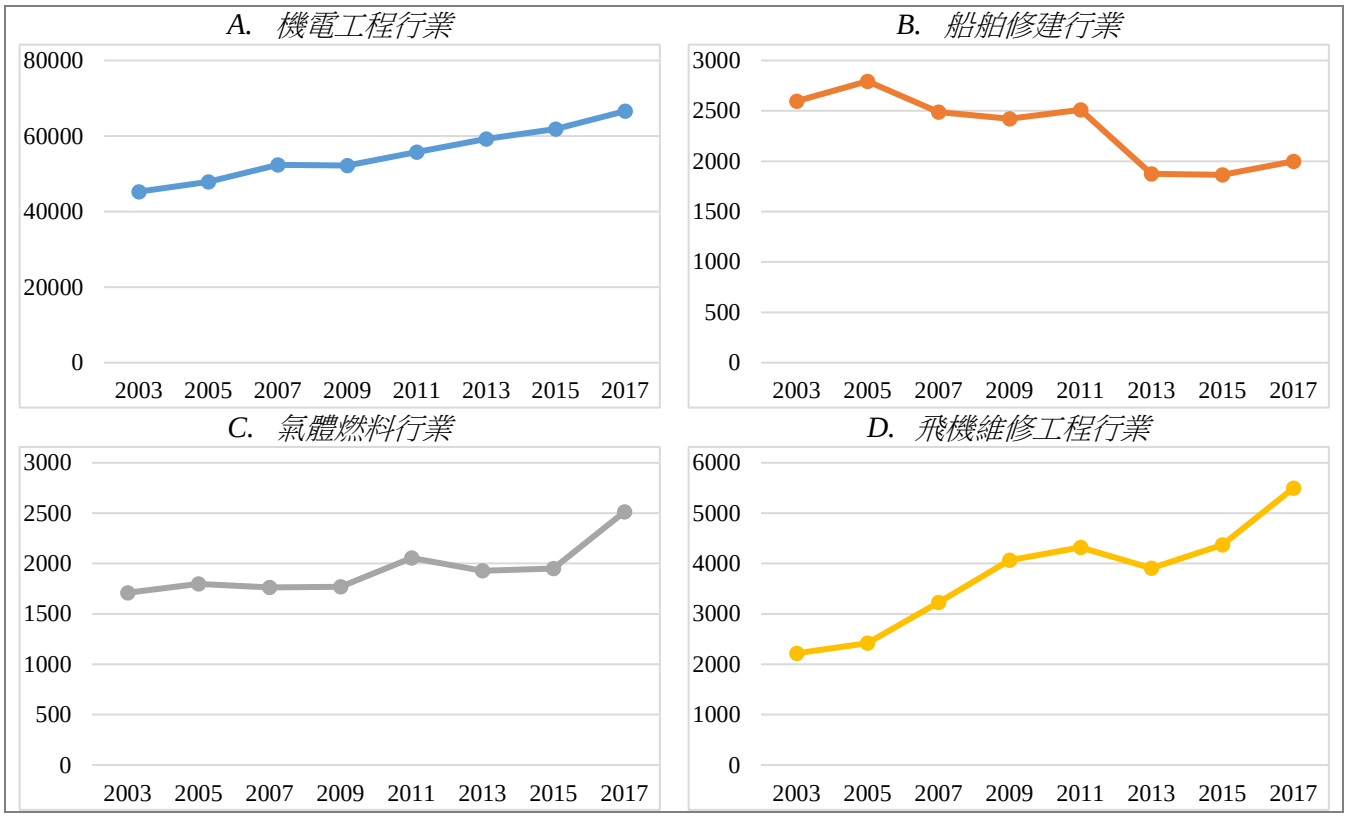
行業	機電工程		非機電工程僱員	總數
	僱員	受訓者		
機電工程	66 594 (86.9%)	2 942 (80.8%)	31 008 (84.5%)	100 544 (86.0%)
船舶修建	2 000 (2.6%)	30 (0.8%)	836 (2.3%)	2 866 (2.5%)
氣體燃料	2 512 (3.3%)	59 (1.6%)	1 293 (3.5%)	3 864 (3.3%)
飛機維修工程	5 496 (7.2%)	611 (16.8%)	3 558 (9.7%)	9 665 (8.3%)
合計	**76 602 (100%)**	**3 642 (100%)**	**36 695 (100%)**	**116 939 (100%)**

歷年人力變化

3.3 總括而言，從事機電工程業的機電工程僱員人數自 2003 年起有上升趨勢（*圖 3.1*）。個別行業的情況將於本報告後半部分論述。

A. 機電工程業概況（續）

圖3.1　2003 至2017 年機電工程業機電工程僱員人數（按行業劃分）



人力增長預測

3.4　　於調查期間，本會請填覆機構預計 12 個月後旗下機電工程僱員人數。整體而言，機電工程僱員人數一年後預料錄得 4%增長。

表3.2　機電工程業目前及預計機電工程僱員人數（按行業劃分）

行業	機電工程僱員		百分比增幅（2018 年與 2017 年相比）
	2017 年實際人數	預計 2018 年人數	
機電工程	66 594	69 136	3.8%
船舶修建	2 000	2 254	12.7%
氣體燃料	2 512	2 574	2.5%
飛機維修工程	5 496	5 993	9.0%
合計	**76 602**	**79 957**	**4.4%**

調派往香港境外工作的機電工程僱員

3.5　　調查顯示，現今調派機電工程僱員往香港境外工作的情況並不常見，船舶修建及氣體燃料行業更甚。至於機電工程行業，只有 171 名僱員被調派往香港境外工作，分布於各技能等級；飛機維修工程行業則有 29 名僱員派往香港境外工作，全部均屬技術員級（*表3.3*）。

A. 機電工程業概況（續）

表 3.3　2017 年被調派往香港境外工作的機電工程業機電工程僱員人數（按行業及技能等級劃分）

行業	專業人士／技師	技術員	技工	總數
機電工程	41 (91.1%)	60 (66.7%)	70 (98.6%)	171 (83.0%)
船舶修建	4 (8.9%)	0 (0%)	0 (0%)	4 (1.9%)
氣體燃料	0 (0%)	1 (1.1%)	1 (1.4%)	2 (1.0%)
飛機維修工程	0 (0%)	29 (32.2%)	0 (0%)	29 (14.1%)
合計	**45 (100%)**	**90 (100%)**	**71 (100%)**	**206 (100%)**

B. 機電工程行業

僱員

3.6　機電工程行業主要涵蓋機電工程承建商、水電工程公司及機電工程服務公司。

3.7　於調查期間，從事機電工程行業的機電工程僱員共有 66 594 人，當中 56%屬技工級，24%屬技術員級，15%屬專業人士／技師級，5%屬半技術工人／普通工人級。機電工程行業人力概況載於*表 3.4*。

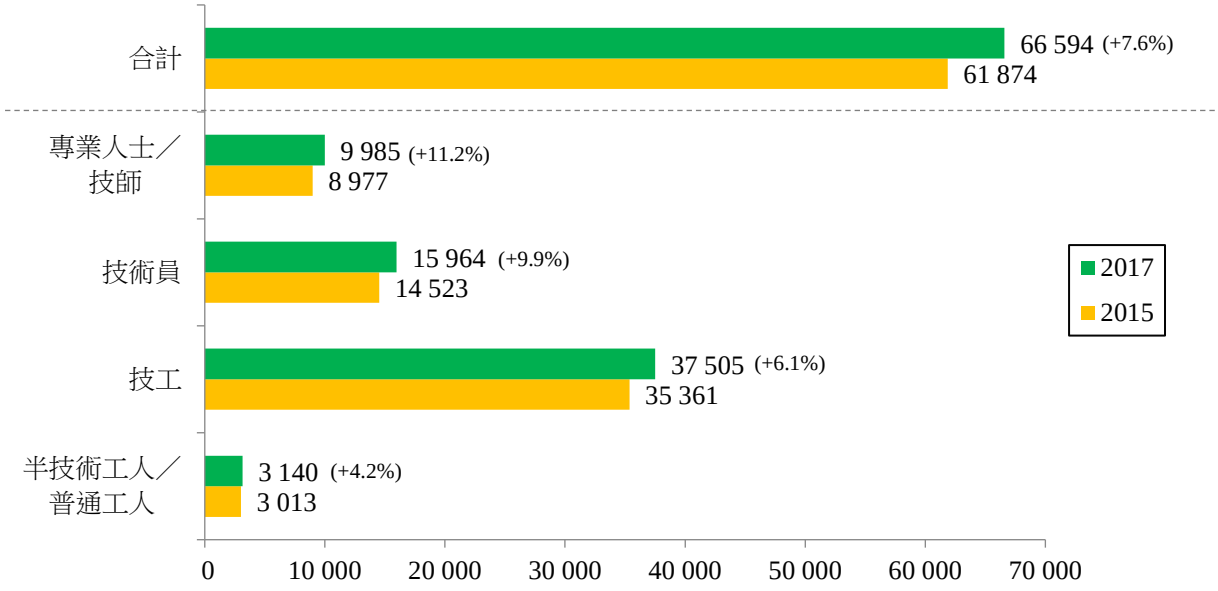
表 3.4　2017 年機電工程行業機電工程僱員、受訓者及空缺數目（按技能等級劃分）

技能等級	機電工程行業		
	機電工程僱員	機電工程受訓者	機電工程職位空缺
專業人士／技師	9 985 *(15.0%)*	407 *(13.8%)*	528 *(18.3%)*
技術員	15 964 *(24.0%)*	535 *(18.2%)*	643 *(22.2%)*
技工	37 505 *(56.3%)*	2 000 *(68.0%)*	1 506 *(52.1%)*
半技術工人／普通工人	3 140 *(4.7%)*	不適用	215 *(7.4%)*
合計	**66 594** ***(100%)***	**2 942** ***(100%)***	**2 892** ***(100%)***

B. 機電工程行業（續）

3.8 與 2015 年相比，各技能等級的機電工程僱員人數均錄得增長，整體升幅 7.6%，當中，2017 年專業人士／技師及技術員級的僱員人數相對兩年前顯著增加超過 10%，主要因為工程項目數量增加，帶動一些具規模的知名機電工程服務公司（*門類 3*）及政府部門（*門類 4*）增聘人手（*圖 3.2*）。

圖 3.2 2017 年機電工程行業機電工程僱員人數（按技能等級劃分）



3.9 調查反映，機電工程人力當中，有約 46.6%從事「承造」工作，其餘 53.4%從事「服務」工作，僱員人數分別為 31 061 及 35 533 人。

表 3.5 2017 年機電工程行業估計從事承造及服務工程的僱員人數

技能等級	機電工程僱員人數	從事以下工作之機電工程僱員人數(%)	
		承造	服務
專業人士／技師	9 985	5 384 (53.9%)	4 601 (46.1%)
技術員	15 964	6 516 (40.8%)	9 448 (59.2%)
技工	37 505	17 539 (46.8%)	19 966 (53.2%)
半技術工人／普通工人	3 140	1 622 (51.7%)	1 518 (48.3%)
合計	**66 594**	**31 061 (46.6%)**	**35 533 (53.4%)**

B. 機電工程行業（續）

僱員人數較多的主要職務

3.10 按技能等級劃分，2017 年佔機電工程僱員較高百分比的主要職務載於*表 3.6*。

表 3.6 2017 年機電工程行業僱員人數較多的主要職務（按技能等級劃分）

技能等級	僱員人數較多的主要職務	佔該技能等級機電工程僱員人數百分比
專業人士／技師	電機工程師	78%
	屋宇設備工程師	
	工程經理	
	冷凝／空氣調節／通風設備工程師	
	機械工程師	
技術員	監督	65%
	電機工程技術員	
	屋宇設備技術員	
	冷凝／空氣調節／通風設備技術員	
	機械工程技術員	
技工	電工／電氣打磨裝配工	59%
	管工／領工	
	屋宇設備技工	
	空調製冷設備技工（獨立系統）	
	升降機技工	

3.11 與 2015 年相比，下列主要職務錄得頗為顯著的人力增長：

表 3.7 2017 年機電工程行業錄得顯著人力增長的主要職務（按技能等級劃分）

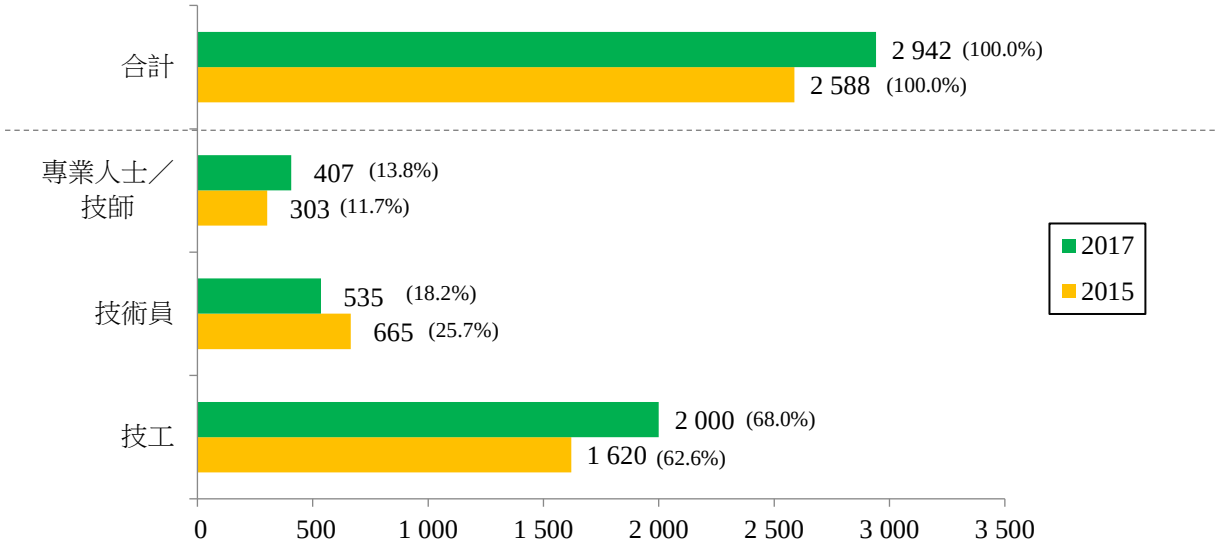
技能等級	錄得顯著人力增長的主要職務
專業人士／技師	屋宇設備工程師
	安全主任
	電機工程師
	工程經理
	水喉及渠務工程師
技術員	監督
	電機工程技術員
	機械工程技術員
	電訊技術員
	助理安全主任／安全督導員
技工	屋宇設備技工
	電氣佈線工
	升降機技工及自動梯技工

B. 機電工程行業（續）

受訓者

3.12　機電工程行業以合約或學徒形式僱用受訓者的情況十分普遍。調查顯示，受訓者共有 2 942 人，佔機電工程行業僱員及受訓者總數（69 086 人）約 4%。與 2015 年相比，2017 年專業人士／技師級和技工級的受訓者人數上升，技術員級的則有所減少（*圖 3.3*）。

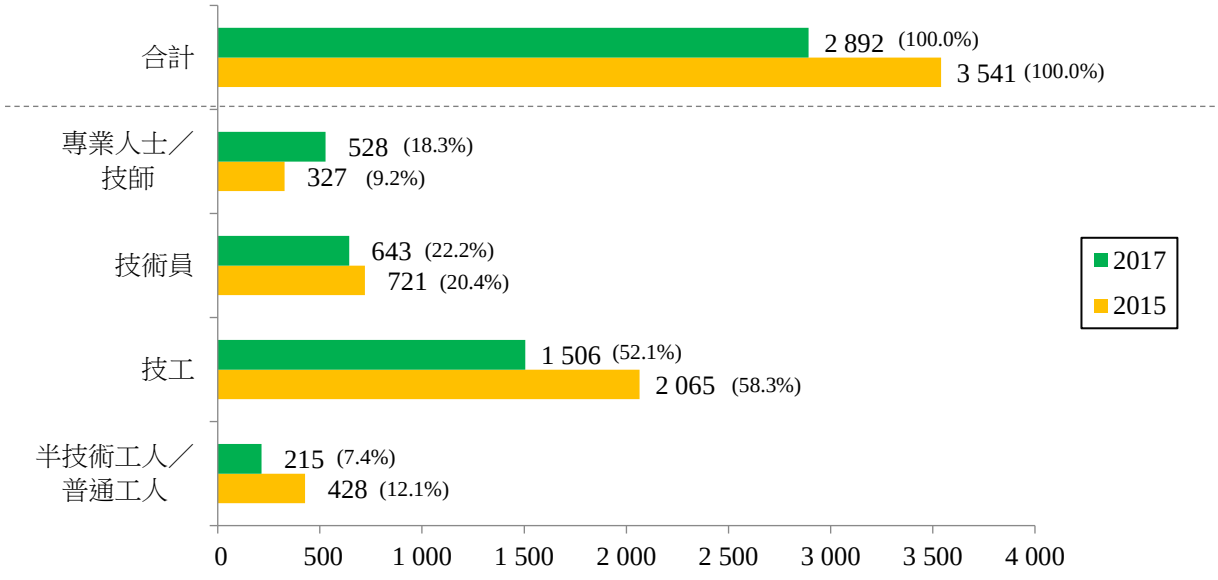
圖 3.3　2017 年機電工程行業機電工程受訓者人數（按技能等級劃分）



職位空缺

3.13　愈來愈多人成為機電工程行業僱員或受訓者，職位空缺數目由 2015 年的 3 541 個，降至 2017 年的 2 892 個，正好反映這個情況。除了專業人士／技師級，其餘技能等級的空缺數目均見回落（*圖 3.4*）。各技能等級的空缺率介乎 4%至近乎 7%之間不等（*表 3.8*）。

圖 3.4　2017 年機電工程行業機電工程職位空缺數目（按技能等級劃分）



B. 機電工程行業（續）

表 3.8　2017 年與 2015 年機電工程行業空缺數目及所佔僱員人數百分比（按技能等級劃分）

技能等級	2017 年		2015 年	
	空缺數目	空缺數目佔僱員人數百分比	空缺數目	空缺數目佔僱員人數百分比
專業人士／技師	528	5.3%	327	3.6%
技術員	643	4.0%	721	5.0%
技工	1 506	4.0%	2 065	5.8%
半技術工人／普通工人	215	6.8%	428	14.2%
合計	**2 892**	**4.3%**	**3 541**	**5.7%**

機電工程僱員之流動及招聘情況

3.14　在調查前 12 個月內，離職機電工程僱員共有 4 323 人，流動率為 6.5%。按技能等級劃分，專業人士／技師、技術員、技工、半技術工人／普通工人的流動率分別為 4.5%、5.0%、6.7%及 18.1%（*表 3.9*）。

表 3.9　2017 年機電工程行業離職人數及流動率（按技能等級劃分）

技能等級	機電工程僱員人數	離職人數	流動率
專業人士／技師	9 985	446	4.5%
技術員	15 964	797	5.0%
技工	37 505	2 511	6.7%
半技術工人／普通工人	3 140	569	18.1%
合計	**66 594**	**4 323**	**6.5%**

3.15　在調查前 12 個月內，填覆機構共招聘 4 663 名具經驗的機電工程僱員，招聘率為 7.0%。整體而言，招聘人數多於離職人數，反映機構除了補充離職人手，亦有填補職位空缺（*表 3.10*）。

表 3.10　2017 年機電工程行業招聘及離職人數（按技能等級劃分）

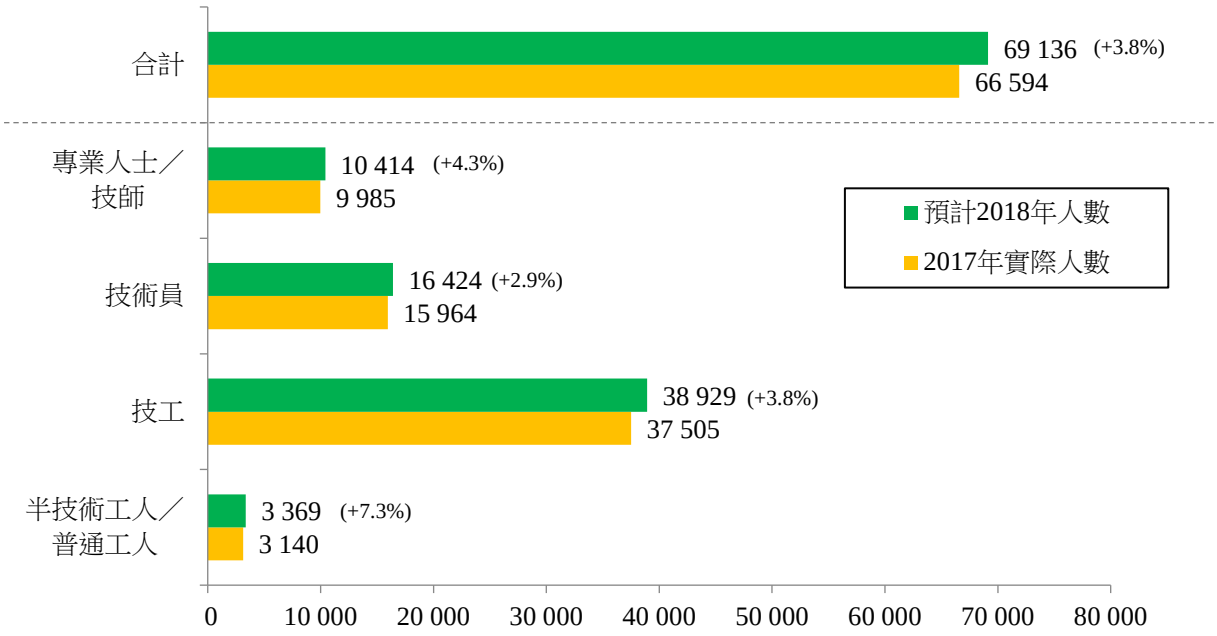
技能等級	招聘人數	離職人數	相差
專業人士／技師	506	446	+60
技術員	997	797	+200
技工	2 539	2 511	+28
半技術工人／普通工人	621	569	+52
合計	**4 663**	**4 323**	**+340**

B. 機電工程行業（續）

預計機電工程僱員及受訓者人數

3.16　　僱主預計機電工程行業一年後的整體僱員人數，會由 2017 年 66 594 人，增至 2018 年 69 136 人，增幅為 3.8%；當中，半技術工人／普通工人級的增長最為顯著(7.3%)。

圖 3.5　機電工程行業目前及預計機電工程僱員人數（按技能等級劃分）



3.17　　僱主預計一年後受訓者人數的增幅不足 1%，可見機構內的受訓者人數將頗為穩定。

薪酬

3.18　　調查請僱主填覆僱員的薪酬組別。各技能等級機電工程僱員的薪酬分布情況載於*表 3.11*，並以陰影標示適用於 10%或以上僱員的薪酬幅度，以便參考。

表 3.11　2017 年機電工程行業機電工程僱員的薪酬分布情況（按技能等級劃分）

技能等級	機電工程行業						
	<= $12,000	$12,001 – $15,000	$15,001 – $18,000	$18,001 – $25,000	$25,001 – $35,000	$35,001 – $45,000	> $45,000
專業人士／技師	0%	*	*	11%	34%	12%	43%
技術員	1%	2%	12%	41%	34%	8%	2%
技工	2%	11%	33%	44%	10%	*	0%
半技術工人／普通工人	6%	42%	29%	23%	0%	0%	0%
合計	**1%**	**8%**	**23%**	**37%**	**19%**	**4%**	**7%**

註：
*(1) *不足 0.5%。*
(2) 有若干百分比的機構並沒有提供薪酬資料。以上百分比按填覆機構所提供的資料計算所得。

B. 機電工程行業（續）

3.19　　整體而言，與 2015 年相比，機電工程行業僱員的薪酬水平趨升。各技能等級 2017 年與 2015 年之薪酬趨勢載於*圖 3.6 至圖 3.10*。

圖 3.6　2017 年與 2015 年機電工程行業平均月薪累計百分比—整體

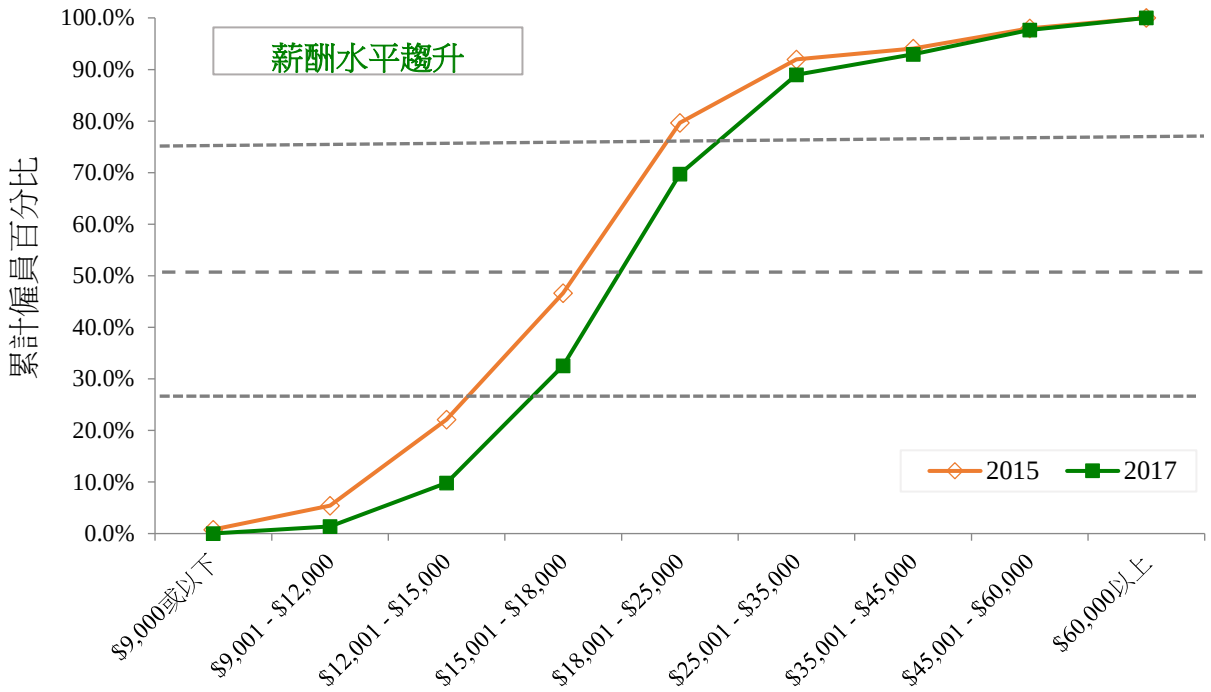
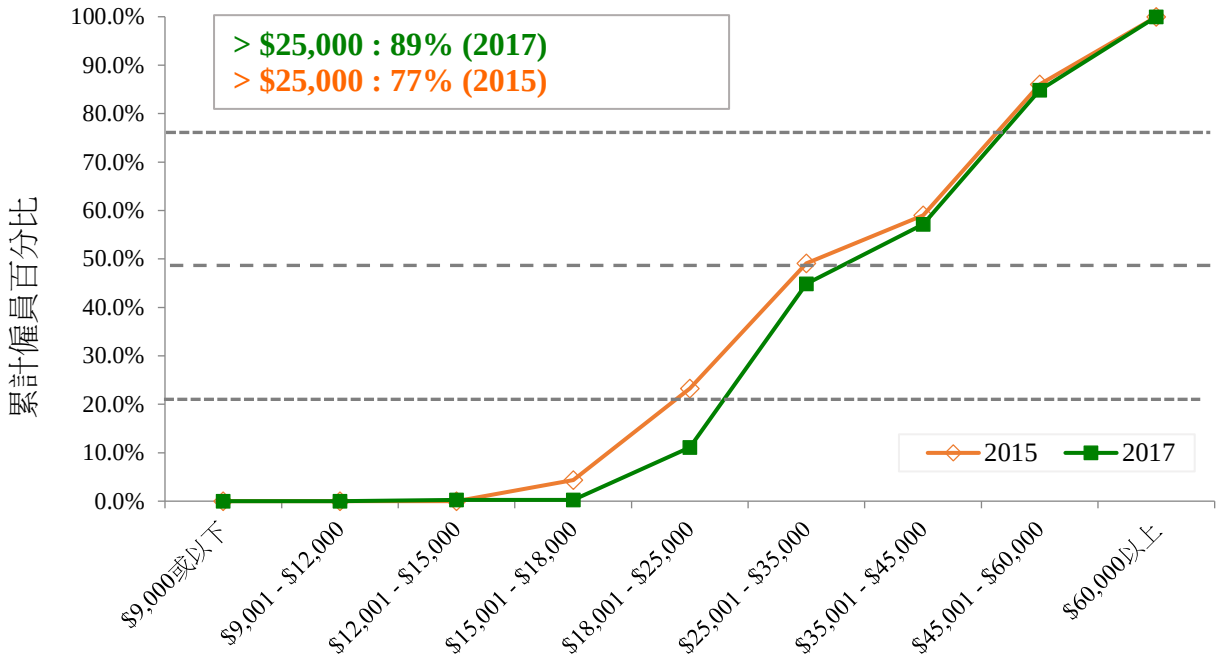


圖 3.7　2017 年與 2015 年機電工程行業平均月薪累計百分比—專業人士／技師



B. 機電工程行業（續）

圖3.8　2017 年與2015 年機電工程行業平均月薪累計百分比—技術員

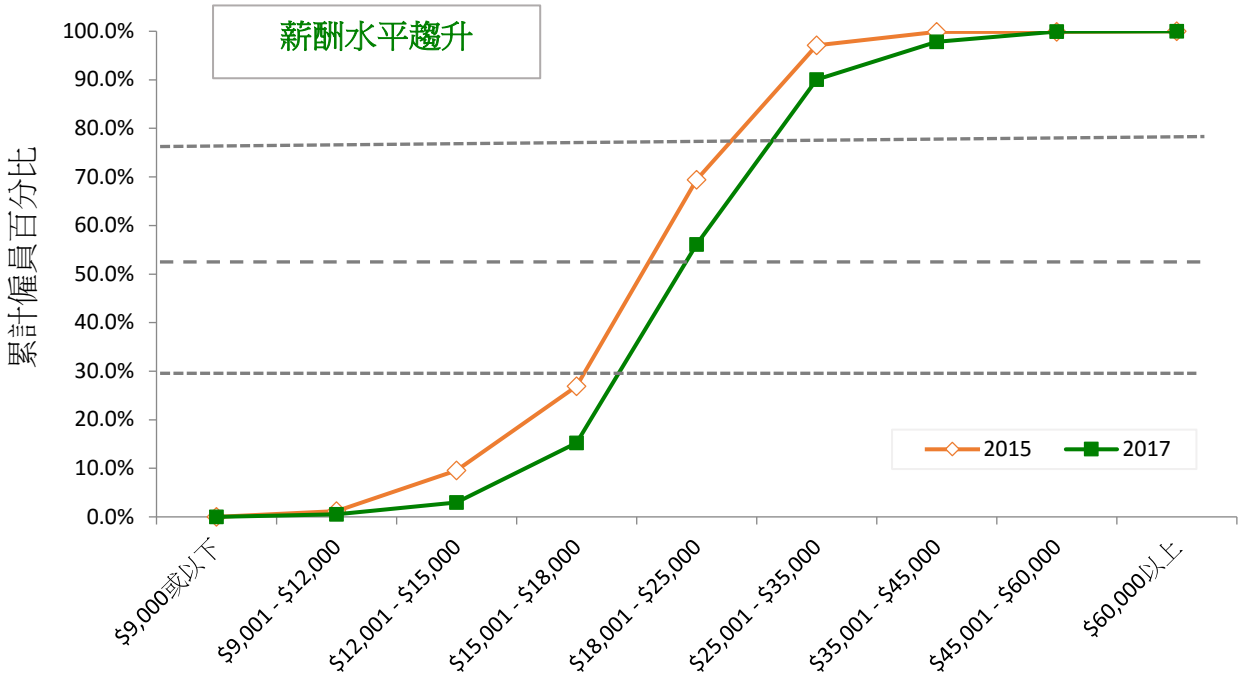
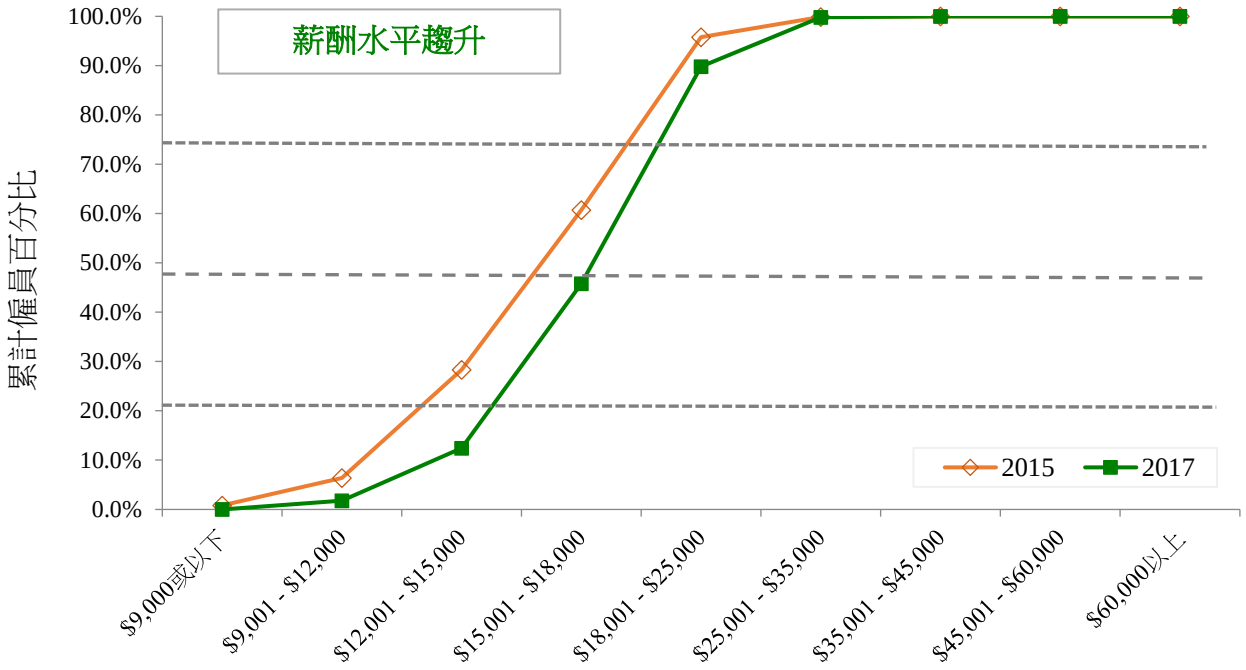
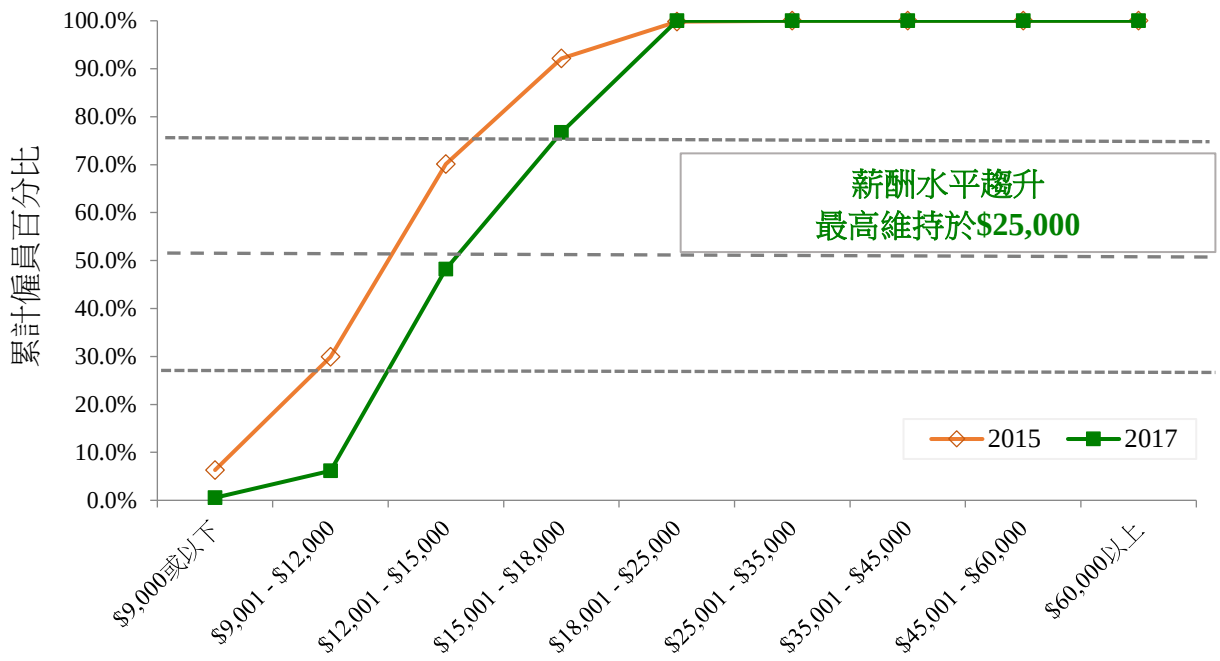


圖3.9　2017 年與2015 年機電工程行業平均月薪累計百分比—技工



B. 機電工程行業（續）

圖3.10　2017 年與 2015 年機電工程行業平均月薪累計百分比—半技術工人／普通工人



3.20　　有較多僱員屬較高薪酬組別的主要職務載於*表 3.12 至表 3.14*。

表3.12　2017 年機電工程行業有最多僱員落入高薪酬組別的主要職務（專業人士／技師級）

職務	平均月薪高於$35,000 的僱員百分比	僱員總數
級別 1：專業人士／技師級		
工程經理	86.0%	1 610
屋宇設備工程師	67.2%	1 643
機械工程師	60.7%	911
安全主任	59.5%	483
級別 1 合計	***55.1%***	***9 985***

B. 機電工程行業（續）

表 3.13　　2017 年機電工程行業有最多僱員落入高薪酬組別的主要職務（技術員級）

職務	平均月薪高於$25,000 的僱員百分比	僱員總數
級別 2：技術員		
電子技術員	91.5%	833
監督	65.3%	3 440
電機工程技術員	60.1%	2 432
機械工程技術員	55.3%	1 206
繪圖員	47.2%	639
級別 2 合計	***43.9%***	***15 964***

表 3.14　　2017 年機電工程行業有最多僱員落入高薪酬組別的主要職務（技工級）

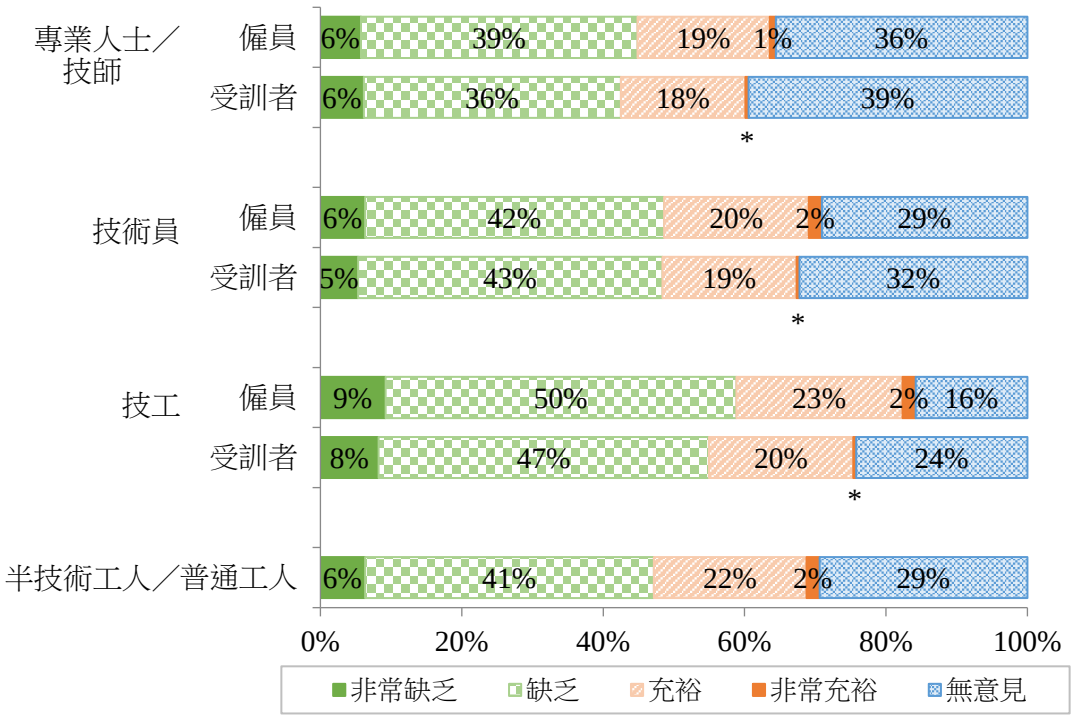
職務	平均月薪高於$18,000 的僱員百分比	僱員總數
級別 3：技工		
強電流電纜接駁工	94.0%	500
架空電線技工	85.6%	139
空調製冷設備技工（水系統）	84.3%	398
管工／領工	82.8%	4 040
木工	81.0%	106
級別 3 合計	***54.2%***	***37 505***

對人力供應情況的看法

3.21　　調查亦蒐集填覆機構對過去 12 個月人力供應情況的看法。普遍而言，顯然有較多機構認為人力供應不足。

B. 機電工程行業（續）

圖 3.11　2017 年僱主對機電工程行業過去 12 個月人力供應情況的看法（按技能等級劃分）



3.22　　近 60%填覆機構認為，在四個技能等級中，技工級僱員人力供應不足的情況較普遍。填覆機構當中，僱用 100 人或以上的機電工程承建商更有近 74%持相同意見，反映技工級人手緊絀。

3.23　　值得注意的是，聘有 100 人或以上的機電工程業公司當中，有 60-70%僱主認為各技能等級（包括專業人士／技師、技術員及技工級）均有人力供應不足的情況。

C. 船舶修建行業

僱員

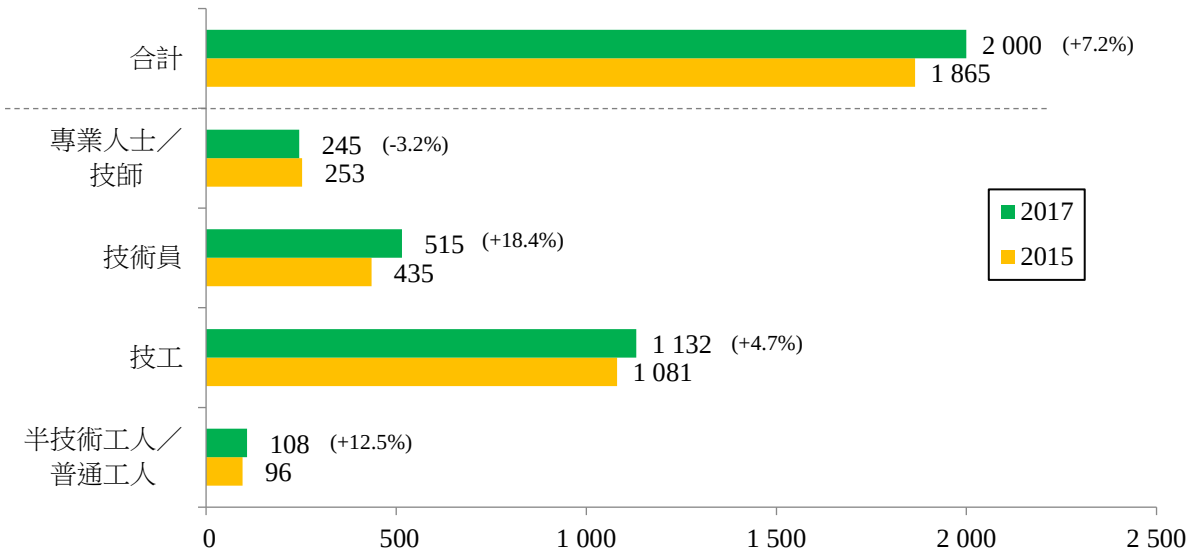
3.24　　於調查期間，從事船舶修建行業的機電工程僱員共有 2 000 人，當中逾 56%（1 132 人）屬技工級，26%屬技術員級，12%屬專業人士／技師級，5%屬半技術工人／普通工人級。船舶修建行業人力概況載於*表 3.15*。

表 3.15　2017 年船舶修建行業機電工程僱員、受訓者及空缺數目（按技能等級劃分）

技能等級	船舶修建行業		
	機電工程僱員	機電工程受訓者	機電工程職位空缺
專業人士／技師	245 *(12.3%)*	0 *(0%)*	8 *(3.1%)*
技術員	515 *(25.8%)*	11 *(36.7%)*	126 *(48.8%)*
技工	1 132 *(56.6%)*	19 *(63.3%)*	104 *(40.3%)*
半技術工人／普通工人	108 *(5.4%)*	不適用	20 *(7.8%)*
合計	**2 000** ***(100%)***	**30** ***(100%)***	**258** ***(100%)***

3.25　　與 2015 年相比，專業人士／技師級的僱員人數變化不大，技能等級較低的僱員人數則有所增加，使整體人力增長 7%。技術員級的僱員人數升幅最大，由 435 人增至 515 人，增幅達 18%。須留意的是，香港船舶業務頗為穩定，僱員人數增加，主因之一是具規模的公司擴張業務至岸上工程項目（*圖 3.12*）。

圖 3.12　2017 年船舶修建行業機電工程僱員人數（按技能等級劃分）



3.26　　技術員級當中，超過 90%僱員擔任監督／管工、機械工程技術員及電機工程技術員。至於技工級，逾 55%僱員擔任機械打磨裝配工、木工及髹漆工。

C. 船舶修建行業（續）

受訓者及職位空缺

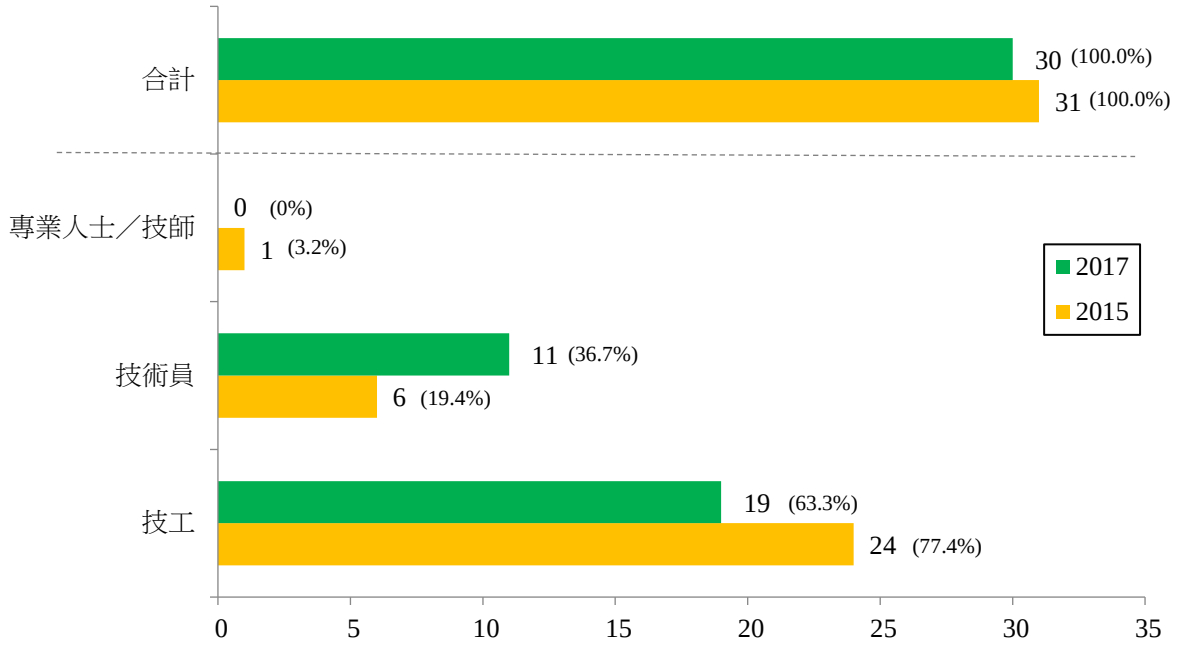
3.27　　基於第 3.25 段所述原因，空缺數目由 2015 年 121 個，增至 2017 年 258 個。空缺率高低不一，由 3.3%（專業人士／技師）至 24.5%（技術員）不等。

表 3.16　2017 年與 2015 年船舶修建行業職位空缺數目及所佔僱員人數百分比（按技能等級劃分）

技能等級	2017 年		2015 年	
	空缺數目	空缺數目佔僱員人數百分比	空缺數目	空缺數目佔僱員人數百分比
專業人士／技師	8	3.3%	7	2.8%
技術員	126	24.5%	24	5.5%
技工	104	9.2%	89	8.2%
半技術工人／普通工人	20	18.5%	1	1.0%
合計	**258**	**12.9%**	**121**	**6.5%**

3.28　　2017 年受訓者人數與兩年前相若。

圖 3.13　2017 年與 2015 年船舶修建行業機電工程受訓者人數（按技能等級劃分）



C. 船舶修建行業（續）

機電工程僱員之流動及招聘情況

3.29 在調查前 12 個月內，離職機電工程僱員共有 145 人，流動率為 7.3%。按技能等級劃分，專業人士／技師、技術員、技工、半技術工人／普通工人的流動率分別為 2.0%、6.0%、7.7%及 20.4%（*表 3.17*）。

表 3.17 2017 年船舶修建行業離職人數及流動率（按技能等級劃分）

技能等級	機電工程僱員人數	離職人數	流動率
專業人士／技師	245	5	2.0%
技術員	515	31	6.0%
技工	1 132	87	7.7%
半技術工人／普通工人	108	22	20.4%
合計	**2 000**	**145**	**7.3%**

3.30 在調查前 12 個月內，填覆機構共招聘 150 名具經驗的機電工程僱員，招聘率為 7.5%。除技工級以外，其餘三個技能等級的招聘人數均多於離職人數，反映機構成功填補離職人手及部分職位空缺（*表 3.18*）。

表 3.18 2017 年船舶修建行業招聘及離職人數（按技能等級劃分）

技能等級	招聘人數	離職人數	相差
專業人士／技師	16	5	+11
技術員	47	31	+16
技工	63	87	-24
半技術工人／普通工人	24	22	+2
合計	**150**	**145**	**+5**

預計機電工程僱員人數

3.31 僱主預計，船舶修建行業一年後的機電工程僱員人數，將由 2017 年 2 000 人增至 2018 年 2 254 人，增幅近 13%，技術員及半技術工人／普通工人級的增長尤為顯著，分別為 24.5%及 16.7%。預計僱員人數有所增長，主要因為一間具規模的公司除了船舶修建核心業務外，還擴張業務至岸上工程項目，這亦是調查錄得現職僱員人數增加的原因。

C. 船舶修建行業（續）

表 3.19　2017 年船舶修建行業目前及預計機電工程僱員人數（按技能等級劃分）

技能等級	目前機電工程僱員人數	預計機電工程僱員人數	預計百分比變化
專業人士／技師	245	253	3.3%
技術員	515	641	24.5%
技工	1 132	1 234	9.0%
半技術工人／普通工人	108	126	16.7%
合計	**2 000**	**2 254**	**12.7%**

薪酬

3.32　　船舶修建行業各技能等級機電工程僱員的薪酬分布情況載於*表 3.20*，並以陰影標示適用於 10%或以上僱員的薪酬幅度，以便參考。

表 3.20　2017 年船舶修建行業機電工程僱員的薪酬分布情況（按技能等級劃分）

技能等級	船舶修建行業						
	<= $12,000	**$12,001 – $15,000**	**$15,001 – $18,000**	**$18,001 – $25,000**	**$25,001 – $35,000**	**$35,001 – $45,000**	**> $45,000**
專業人士／技師	0%	0%	0%	23%	23%	15%	39%
技術員	*	10%	6%	50%	18%	*	17%
技工	8%	10%	12%	63%	7%	0%	0%
半技術工人／普通工人	16%	49%	30%	5%	0%	0%	0%
合計	**5%**	**11%**	**9%**	**49%**	**12%**	**3%**	**11%**

註：
*(1) *不足 0.5%。*
(2) 有若干百分比的機構並沒有提供薪酬資料。以上百分比按填覆機構所提供的資料計算所得。

3.33　　與 2015 年相比，整體船舶修建行業的薪酬水平趨升（*圖 3.14*）。各技能等級 2017 年與 2015 年之薪酬趨勢載於*圖 3.15 至圖 3.18*。

C. 船舶修建行業（續）

圖3.14　2017 年與 2015 年船舶修建行業平均月薪累計百分比—整體

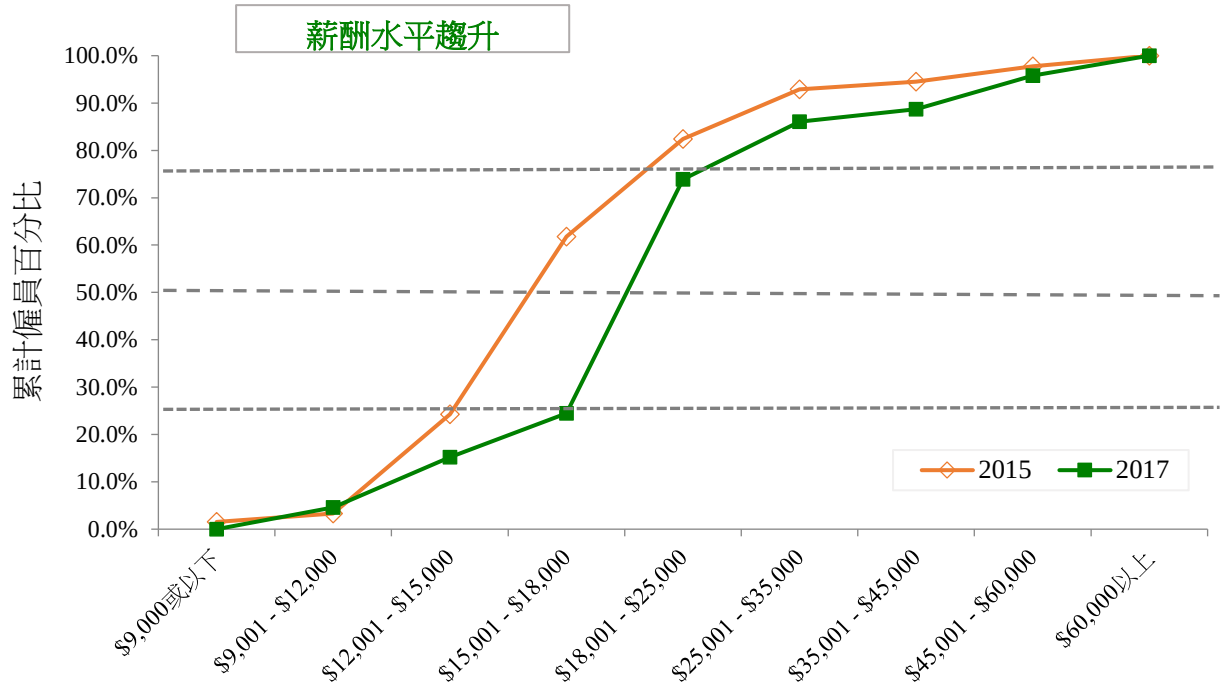
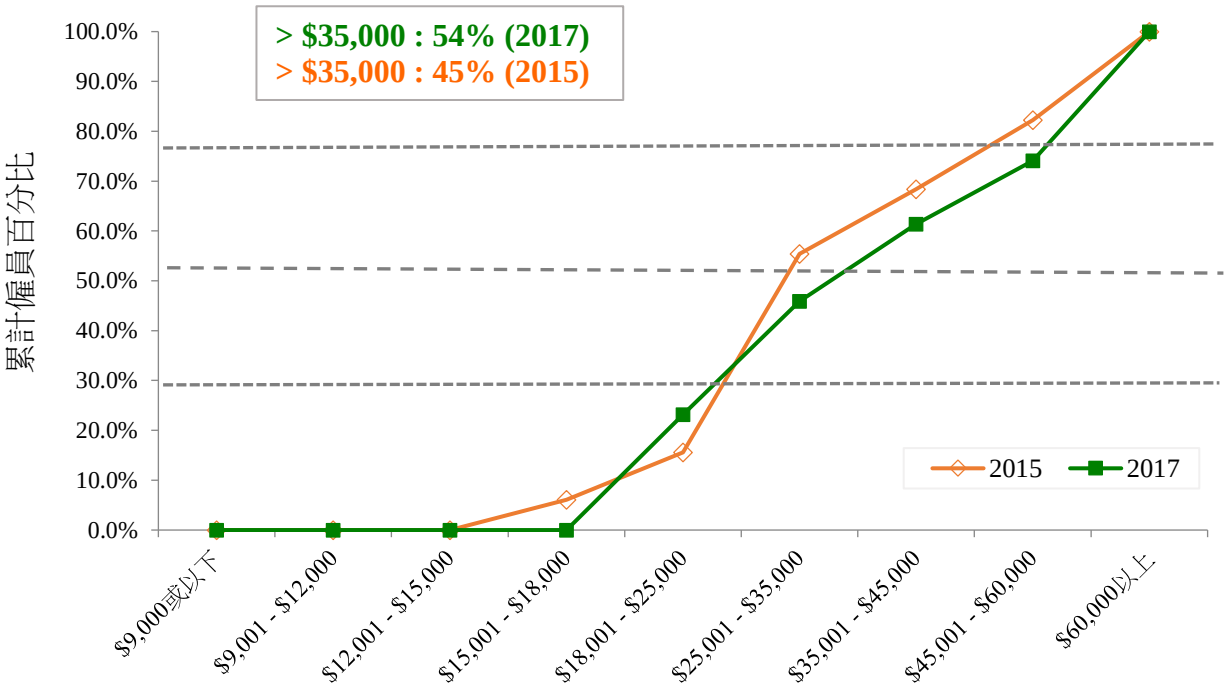


圖3.15　2017 年與 2015 年船舶修建行業平均月薪累計百分比—專業人士／技師



C. 船舶修建行業（續）

圖3.16　2017 年與 2015 年船舶修建行業平均月薪累計百分比—技術員

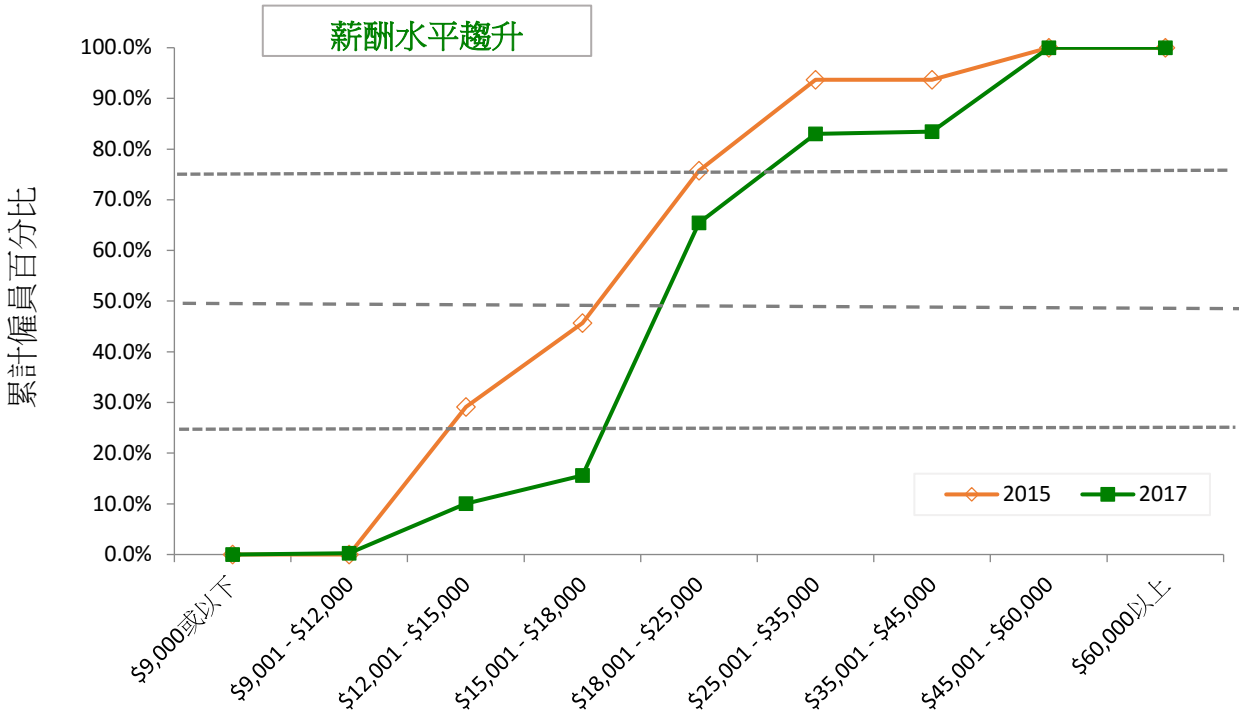
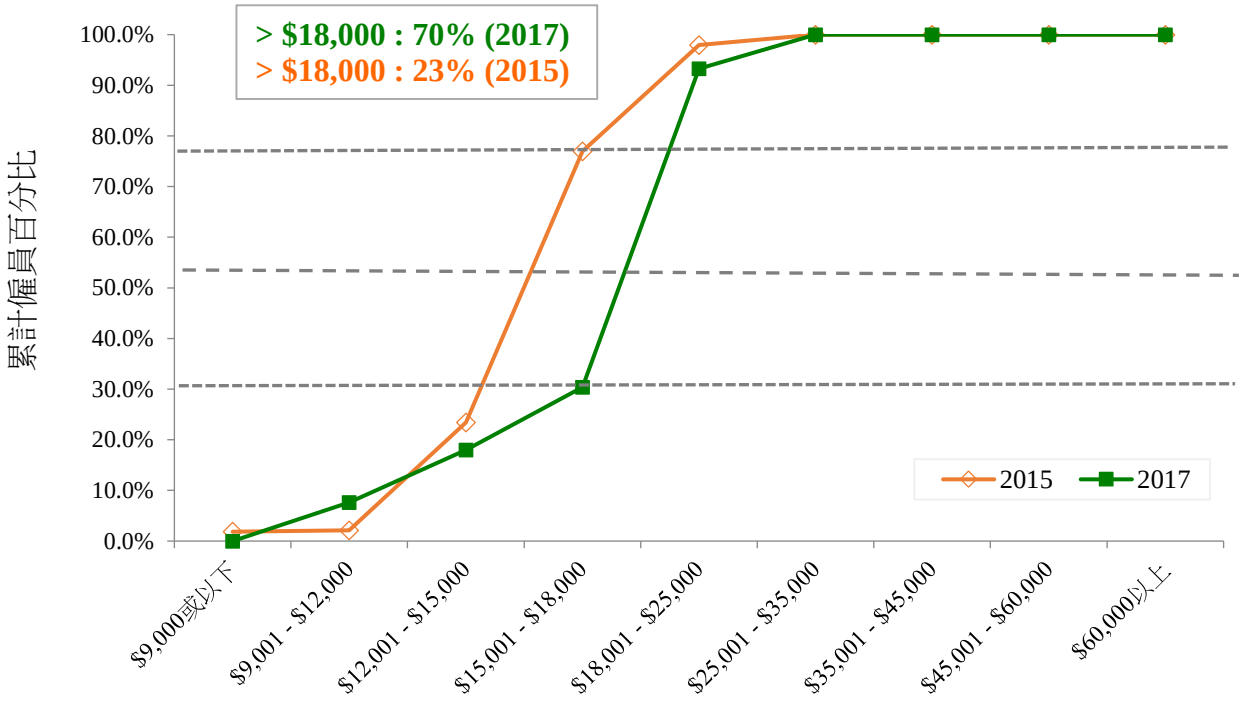
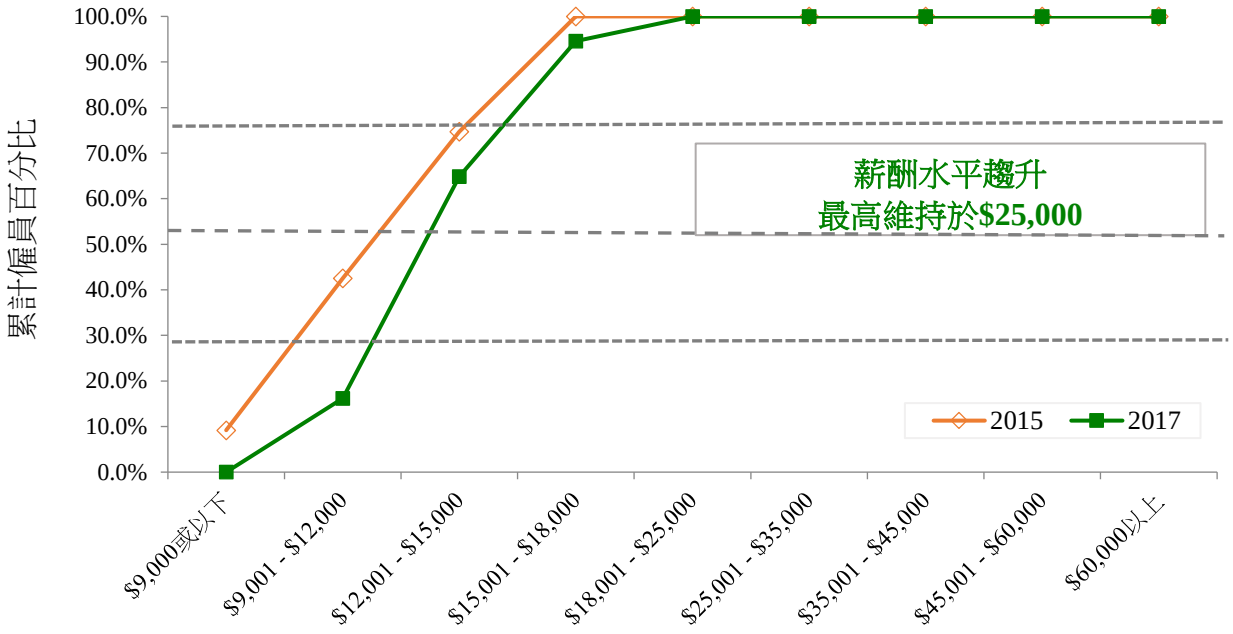


圖3.17　2017 年與 2015 年船舶修建行業平均月薪累計百分比—技工



C. 船舶修建行業（續）

圖 3.18　2017 年與 2015 年船舶修建行業平均月薪累計百分比—半技術工人／普通工人

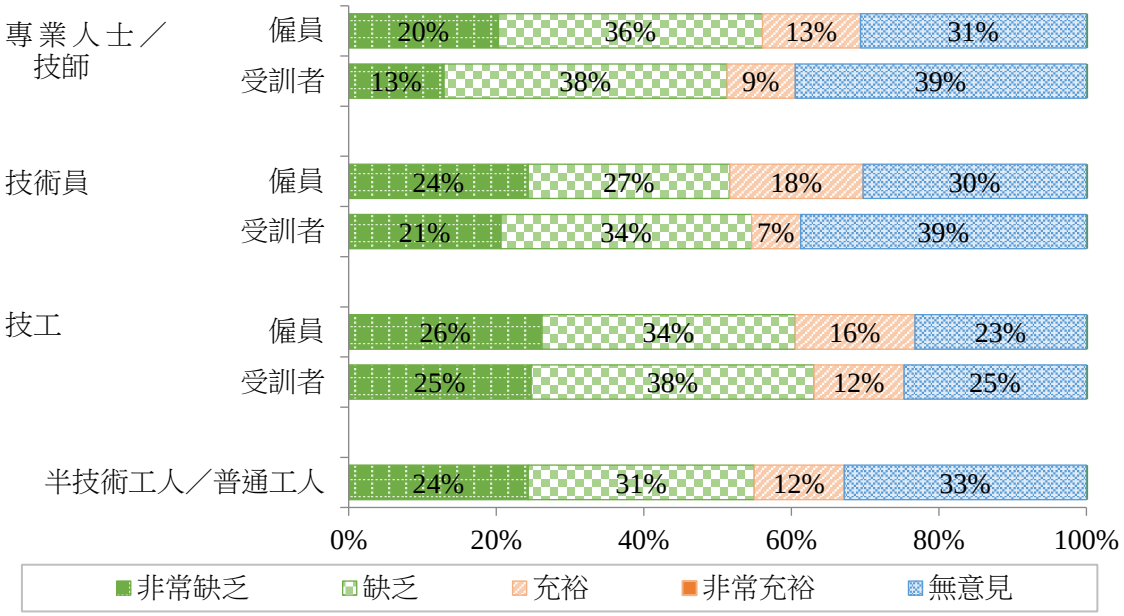


對人力供應情況的看法

3.34　　調查亦蒐集填覆機構對過去 12 個月人力供應情況的看法。普遍而言，顯然有較多機構認為人力供應不足。

3.35　　逾 60%填覆機構認為，在四個技能等級中，技工級僱員人力供應不足的情況較普遍。

圖 3.19　2017 年僱主對船舶修建行業過去 12 個月人力供應情況的看法（按技能等級劃分）



D. 氣體燃料行業

僱員

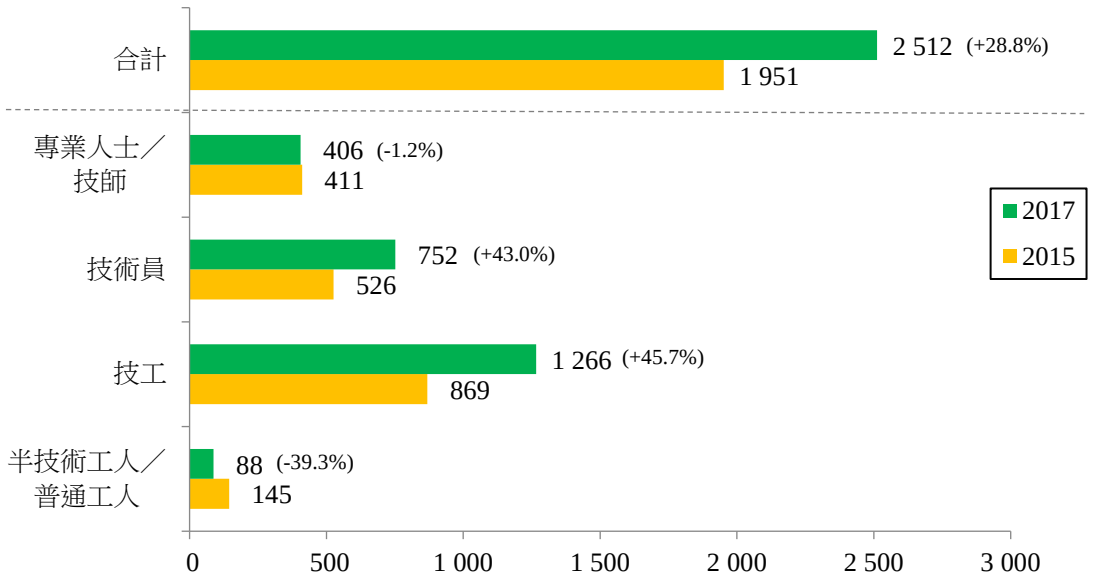
3.36　　於調查期間，從事氣體燃料行業的機電工程僱員共有 2 512 人，當中超過一半屬技工級，30%屬技術員級，16%屬專業人士／技師級，4%屬半技術工人／普通工人級。氣體燃料行業人力概況載於*表 3.21*。

表 3.21　2017 年氣體燃料行業機電工程僱員、受訓者及空缺數目（按技能等級劃分）

技能等級	氣體燃料行業		
	機電工程僱員	機電工程受訓者	機電工程職位空缺
專業人士／技師	406 *(16.2%)*	10 *(16.9%)*	0 *(0%)*
技術員	752 *(29.9%)*	20 *(33.9%)*	9 *(14.5%)*
技工	1 266 *(50.4%)*	29 *(49.2%)*	40 *(64.5%)*
半技術工人／普通工人	88 *(3.5%)*	不適用	13 *(21.0%)*
合計	**2 512** ***(100%)***	**59** ***(100%)***	**62** ***(100%)***

3.37　　與 2015 年相比，氣體燃料行業整體僱員人數大幅增加近 30%，原因是有兩間受訪公司表示過往調查低估了其僱員人數。專業人士／技師級的僱員人數相若，技術員及技工級的僱員人數則顯著上升（*圖 3.20*）。

圖 3.20　2017 年與 2015 年氣體燃料行業僱員人數（按技能等級劃分）



D. 氣體燃料行業（續）

僱員人數較多的主要職務

3.38　　按技能等級劃分，2017 年佔機電工程僱員人數較大百分比的主要職務載於*表 3.22*。

表 3.22　2017 年氣體燃料行業僱員人數較多的主要職務（按技能等級劃分）

技能等級	職務	佔該技能等級 機電工程僱員人數百分比
專業人士／技師	氣體工程師（氣體燃料）	61.6%
技術員	氣體燃料工程技術員	54.7%
技工	氣體燃料應用技工（住宅式）	53.5%

3.39　　與 2015 年相比，下列主要職務錄得頗為顯著的人力增長：

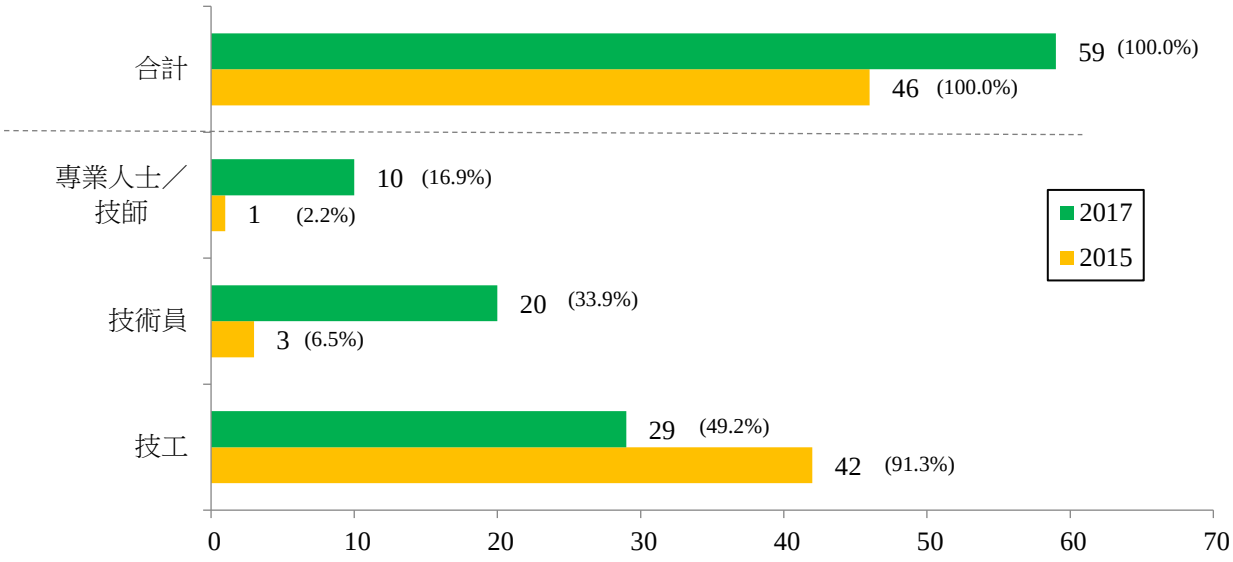
表 3.23　2017 年氣體燃料行業錄得顯著人力增長的主要職務（按技能等級劃分）

技能等級	錄得顯著人力增長的主要職務
技術員	氣體燃料工程技術員
技工	氣體燃料應用技工（住宅式）
	氣體燃料輸送技工（煤氣）

受訓者

3.40　　整體而言，2017 年有 59 名受訓者，較 2015 年 46 人略為增加（*圖 3.21*）。

圖 3.21　2017 年與 2015 年氣體燃料行業空缺數目（按技能等級劃分）

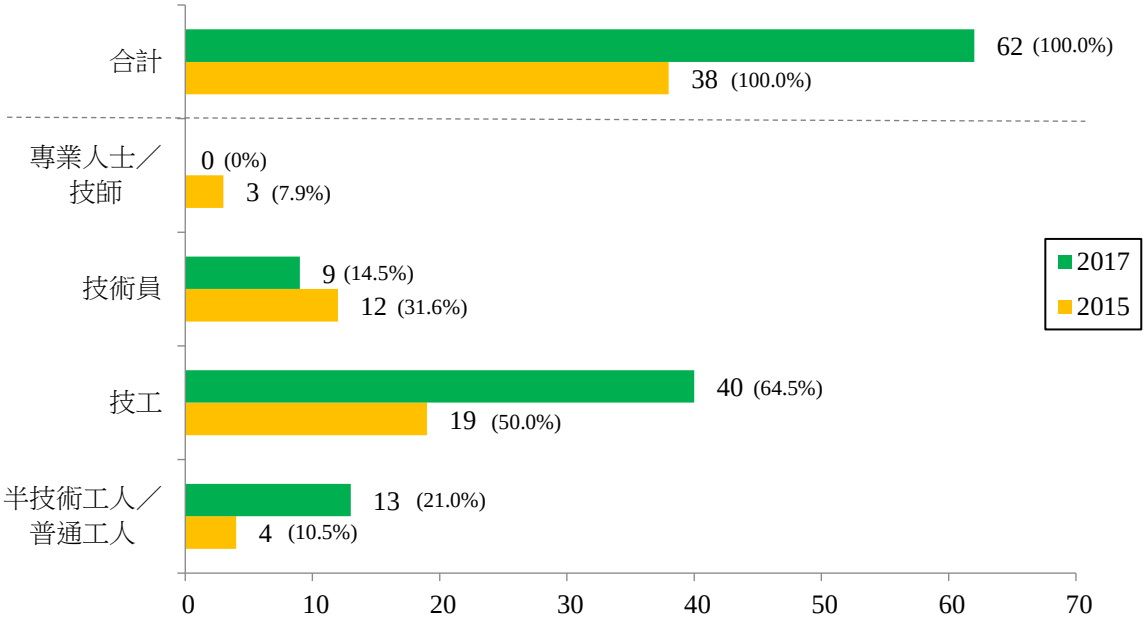


D. 氣體燃料行業（續）

職位空缺

3.41　　整體空缺數目由 2015 年 38 個，增至 2017 年 62 個，技工級的空缺數目增幅尤為顯著（*圖 3.22*）。

圖 3.22　2017 年與 2015 年氣體燃料行業空缺數目（按技能等級劃分）



機電工程僱員之流動及招聘情況

3.42　　在調查前 12 個月內，離職機電工程僱員共有 64 人，流動率為 2.5%。按技能等級劃分，專業人士／技師、技術員、技工、半技術工人／普通工人的流動率分別為 1.5%、3.1%、2.3%及 6.8%（*表 3.24*）。

表 3.24　2017 年氣體燃料行業離職人數及流動率（按技能等級劃分）

技能等級	機電工程僱員人數	離職人數	流動率
專業人士／技師	406	6	1.5%
技術員	752	23	3.1%
技工	1 266	29	2.3%
半技術工人／普通工人	88	6	6.8%
合計	**2 512**	**64**	**2.5%**

3.43　　在調查前 12 個月內，填覆機構共招聘 46 名具經驗的機電工程僱員，招聘率為 1.8%。新聘專業人士／技師和技工的人數僅能填補離職人手，而其他技能等級的新聘人員則不足以彌補離職人手（*表 3.25*）。

D. 氣體燃料行業（續）

表 3.25　2017 年氣體燃料行業招聘及離職人數（按技能等級劃分）

技能等級	招聘人數	離職人數	相差
專業人士／技師	6	6	0
技術員	3	23	-20
技工	33	29	+4
半技術工人／普通工人	4	6	-2
合計	**46**	**64**	**-18**

預計機電工程僱員人數

3.44　　按僱主預測，氣體燃料行業一年後的整體僱員人數將微增 2.5%。

表 3.26　2017 年氣體燃料行業目前及預計機電工程僱員人數（按技能等級劃分）

技能等級	目前機電工程僱員人數	預計機電工程僱員人數	預計百分比變化
專業人士／技師	406	406	0.0%
技術員	752	759	0.9%
技工	1 266	1 308	3.3%
半技術工人／普通工人	88	101	14.8%
合計	**2 512**	**2 574**	**2.5%**

薪酬

3.45　　氣體燃料行業各技能等級機電工程僱員的薪酬分布情況載於*表 3.27*，並以陰影標示適用於 10%或以上僱員的薪酬幅度，以便參考。

表 3.27　2017 年氣體燃料行業機電工程僱員的薪酬分布情況（按技能等級劃分）

技能等級	氣體燃料行業						
	<= $12,000	**$12,001 – $15,000**	**$15,001 – $18,000**	**$18,001 – $25,000**	**$25,001 – $35,000**	**$35,001 – $45,000**	**> $45,000**
專業人士／技師	0%	0%	1%	3%	10%	80%	6%
技術員	0%	1%	49%	23%	20%	7%	0%
技工	3%	39%	22%	32%	4%	0%	0%
半技術工人／普通工人	13%	36%	31%	20%	0%	0%	0%
合計	**2%**	**22%**	**27%**	**24%**	**9%**	**14%**	**1%**

註：有若干百分比的機構並沒有提供薪酬資料。以上百分比按填覆機構所提供的資料計算所得。

3.46　　與 2015 年相比，整體氣體燃料行業的薪酬分布模式與 2015 年相若，並無明顯變化（*圖 3.23*）。2017 年與 2015 年各技能等級之薪酬趨勢載於*圖 3.24 至圖 3.27*。

D. 氣體燃料行業（續）

圖 3.23　2017 年與 2015 年氣體燃料行業平均月薪累計百分比—整體

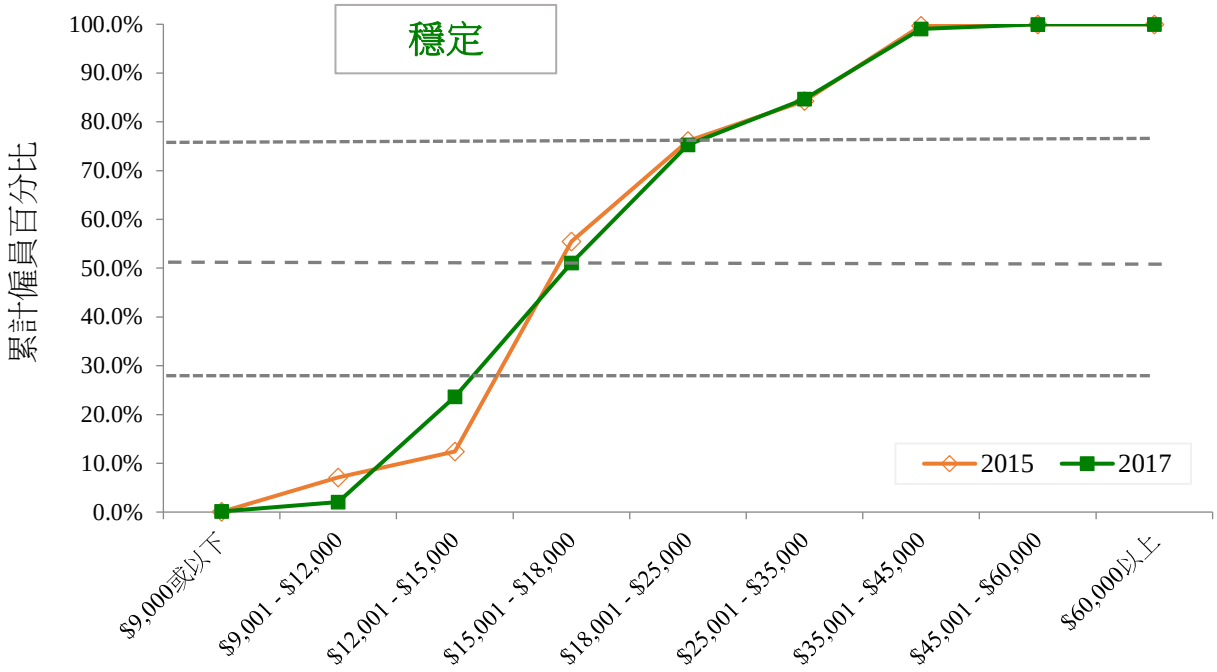
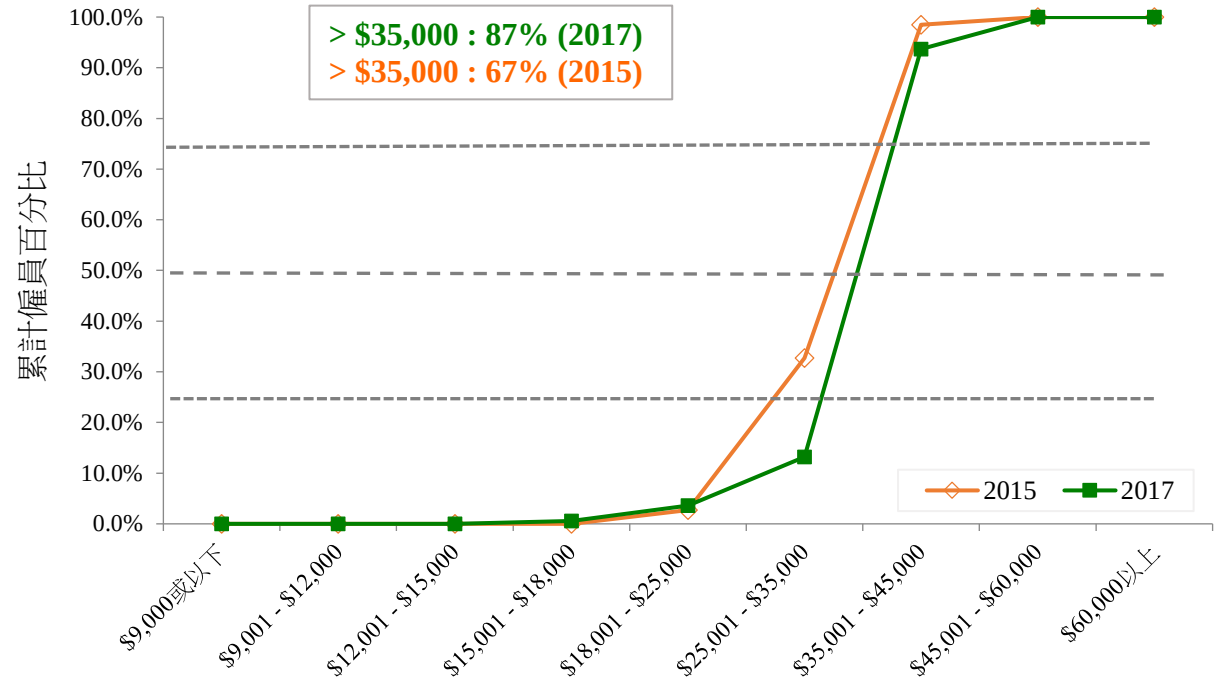


圖 3.24　2017 年與 2015 年氣體燃料行業平均月薪累計百分比—專業人士／技師



D. 氣體燃料行業（續）

圖3.25　2017 年與 2015 年氣體燃料行業平均月薪累計百分比—技術員

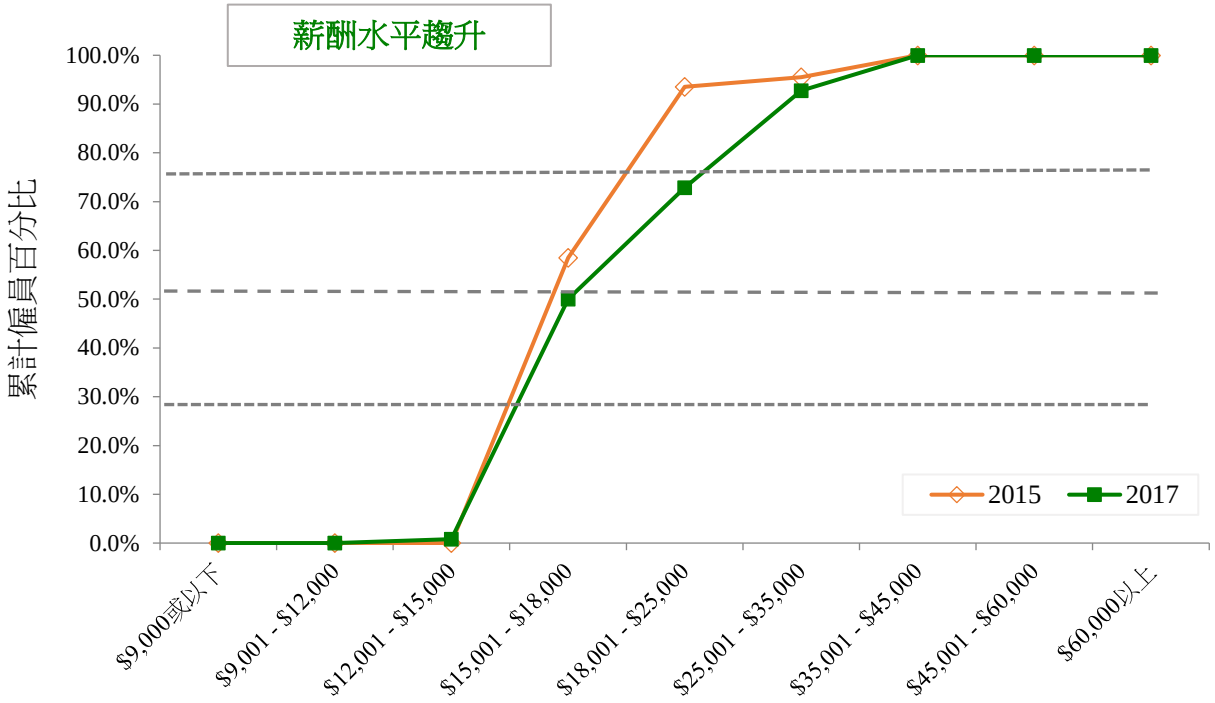
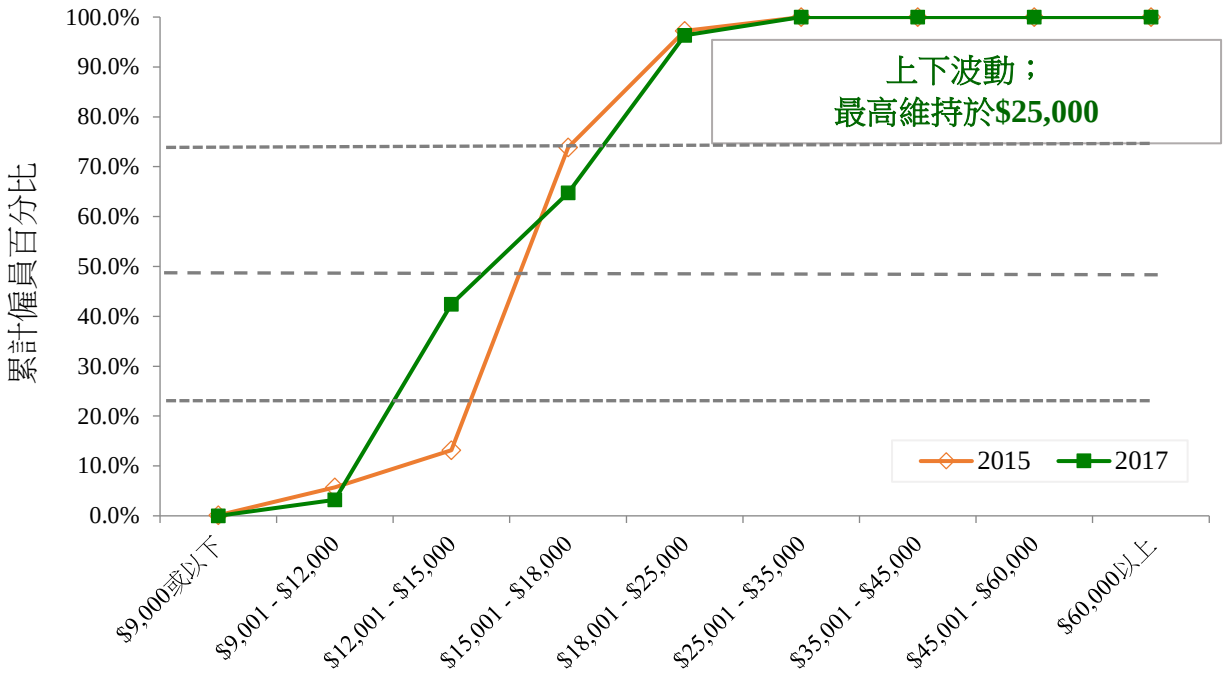
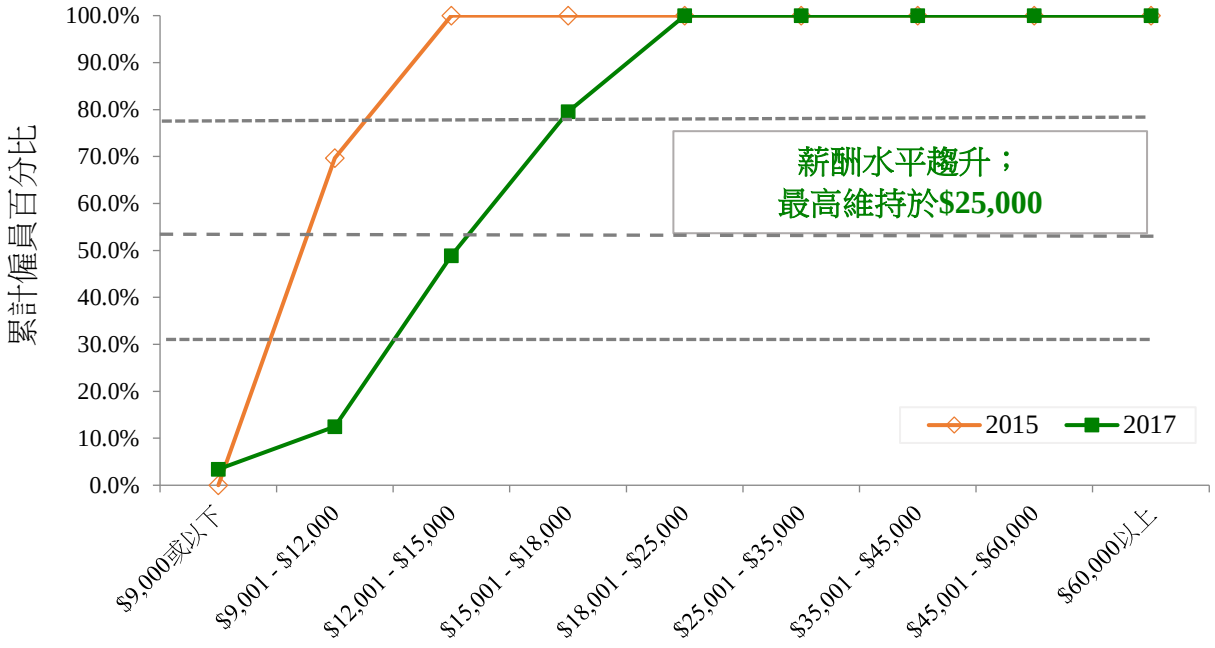


圖3.26　2017 年與 2015 年氣體燃料行業平均月薪累計百分比—技工



D. 氣體燃料行業（續）

圖3.27　2017 年與 2015 年氣體燃料行業平均月薪累計百分比—半技術工人／普通工人

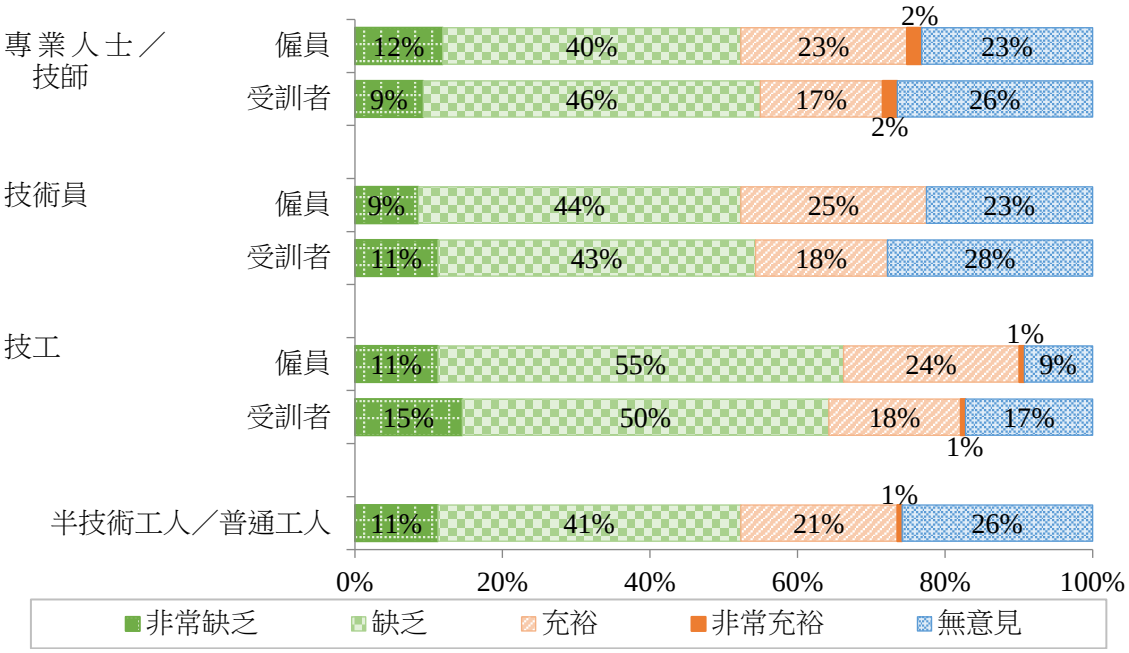


對人力供應情況的看法

3.47　　調查亦蒐集填覆機構對過去 12 個月人力供應情況的看法。普遍而言，顯然有較多機構認為人力供應不足。

3.48　　逾 60%填覆機構認為，在四個技能等級中，技工級人力不足的情況較普遍。

圖3.28　2017 年僱主對氣體燃料行業過去 12 個月人力供應情況的看法（按技能等級劃分）



E. 飛機維修工程行業

僱員及受訓者

3.49 於調查期間，從事飛機維修工程行業的機電工程僱員共有 5 496 人，當中超過一半屬技工級，26%屬技術員級，13%屬專業人士／技師級，11%屬半技術工人／普通工人級。飛機維修工程行業人力概況載於*表 3.28*。

表 3.28 2017 年飛機維修工程行業機電工程僱員、受訓者及空缺數目（按技能等級劃分）

技能等級	飛機維修工程行業		
	機電工程僱員	機電工程受訓者	機電工程職位空缺
專業人士／技師	685 *(12.5%)*	0 *(0%)*	37 *(7.2%)*
技術員	1 415 *(25.7%)*	23 *(3.8%)*	149 *(29.0%)*
技工	2 798 *(50.9%)*	588 *(96.2%)*	190 *(37.0%)*
半技術工人／普通工人	598 *(10.9%)*	不適用	138 *(26.8%)*
合計	**5 496** ***(100%)***	**611** ***(100%)***	**514** ***(100%)***

3.50 是次調查將飛機維修工程行業歸類為機電工程業內一個獨立門類。為了提高調查結果的代表性，公司數目由 2015 年 6 間，增至 2017 年 12 間。由於基數頗小，須謹慎分析數字。另因 2017 年與 2015 年的調查範圍差距大，故本報告不會列出兩者數字的比較。

受訓者

3.51 於調查期間，飛機維修工程行業共有 611 名機電工程受訓者，佔該行業僱員及受訓者總數（6 107 人）10.0%。

職位空缺

3.52 於調查期間，飛機維修工程行業共有 514 個機電工程職位空缺，空缺率為 9.4%。專業人士／技師、技術員、技工、半技術工人／普通工人的空缺率分別為 5.4%、10.5%、6.8%及 23.1%（*表 3.29*）。

E. 飛機維修工程行業（續）

表 3.29　2017 年飛機維修工程行業空缺數目及所佔僱員人數百分比（按技能等級劃分）

技能等級	空缺數目	空缺數目 佔僱員人數百分比
專業人士／技師	37	5.4%
技術員	149	10.5%
技工	190	6.8%
半技術工人／普通工人	138	23.1%
合計	**514**	**9.4%**

機電工程僱員之流動及招聘情況

3.53　在調查前 12 個月內，離職機電工程僱員共有 316 人，流動率為 5.7%。按技能等級劃分，專業人士／技師、技術員、技工、半技術工人／普通工人的流動率分別為 3.6%、2.0%、2.8%及 30.8%（*表 3.30*）。

表 3.30　2017 年飛機維修工程行業離職人數及流動率（按技能等級劃分）

技能等級	機電工程 僱員人數	離職人數	流動率
專業人士／技師	685	25	3.6%
技術員	1 415	29	2.0%
技工	2 798	78	2.8%
半技術工人／普通工人	598	184	30.8%
合計	**5 496**	**316**	**5.7%**

3.54　在調查前 12 個月內，填覆機構共招聘 450 名具經驗的機電工程僱員，招聘率為 8.2%。新聘專業人士／技師及技術員級的人數不足以彌補離職人手，但本會相信，新聘技工及半技術工人／普通工人的人數除了填補離職人手，亦填補了部分職位空缺。

表 3.31　2017 年飛機維修工程行業招聘及離職人數（按技能等級劃分）

技能等級	招聘人數	離職人數	相差
專業人士／技師	19	25	-6
技術員	24	29	-5
技工	133	78	+55
半技術工人／普通工人	274	184	+90
合計	**450**	**316**	**+134**

E. 飛機維修工程行業（續）

預計機電工程僱員人數

3.55　　僱主預計，飛機維修工程行業一年後的整體機電工程僱員人數，會由 2017 年 5 496 人增至 2018 年 5 993 人，增幅 9.0%，技術員及半技術工人／普通工人級的增長尤為顯著。

表 3.32　2017 年飛機維修工程行業目前及預計機電工程僱員人數（按技能等級劃分）

技能等級	目前機電工程僱員人數	預計機電工程僱員人數	預計百分比變化
專業人士／技師	685	720	5.1%
技術員	1 415	1 561	10.3%
技工	2 798	2 976	6.4%
半技術工人／普通工人	598	736	23.1%
合計	**5 496**	**5 993**	**9.0%**

薪酬

3.56　　飛機維修工程行業各技能等級機電工程僱員的薪酬分布情況載於*表 3.33*，並以陰影標示適用於 10%或以上僱員的薪酬幅度，以便參考。

表 3.33　2017 年飛機維修工程行業機電工程僱員的薪酬分布情況（按技能等級劃分）

技能等級	飛機維修工程行業						
	<= $12,000	**$12,001 – $15,000**	**$15,001 – $18,000**	**$18,001 – $25,000**	**$25,001 – $35,000**	**$35,001 – $45,000**	**> $45,000**
專業人士／技師	0%	0%	0%	0%	2%	98%	0%
技術員	0%	0%	15%	85%	0%	0%	0%
技工	0%	4%	71%	25%	0%	0%	0%
半技術工人／普通工人	72%	6%	22%	0%	0%	0%	0%
合計	**9%**	**3%**	**43%**	**34%**	*****	**11%**	**0%**

註：

*(1) *不足 0.5%。*

(2) 有若干百分比的機構並沒有提供薪酬資料。以上百分比按填覆機構所提供的資料計算所得。

E. 飛機維修工程行業（續）

3.57 各技能等級之薪酬趨勢載於*圖3.29 至圖3.33*。

圖3.29 2017 年與 2015 年飛機維修工程行業平均月薪累計百分比—整體

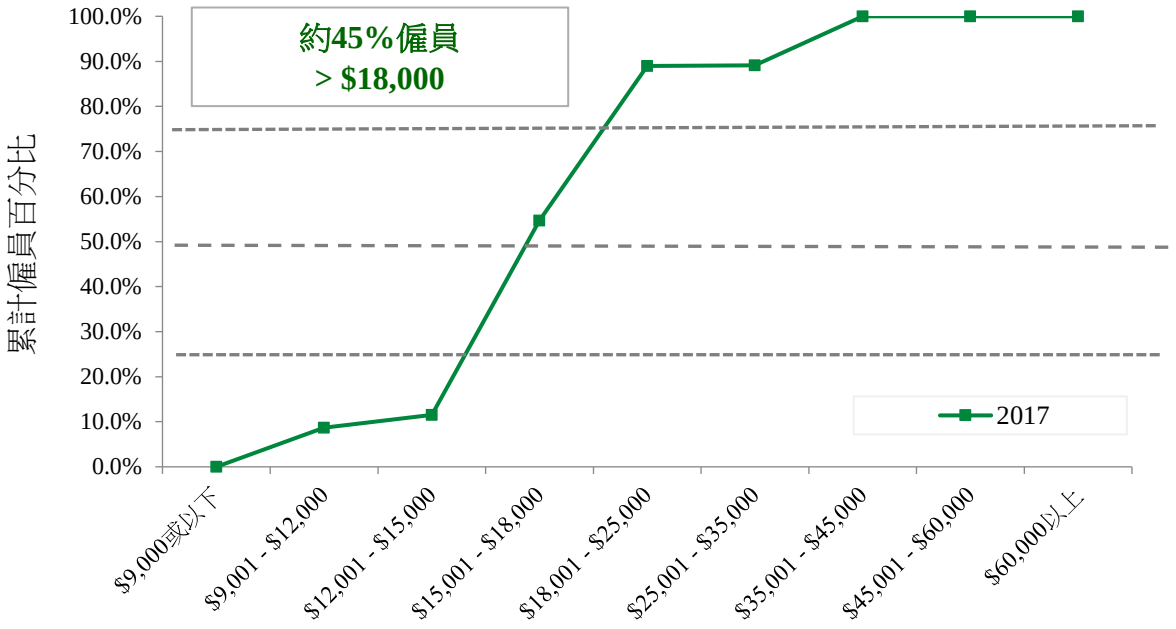
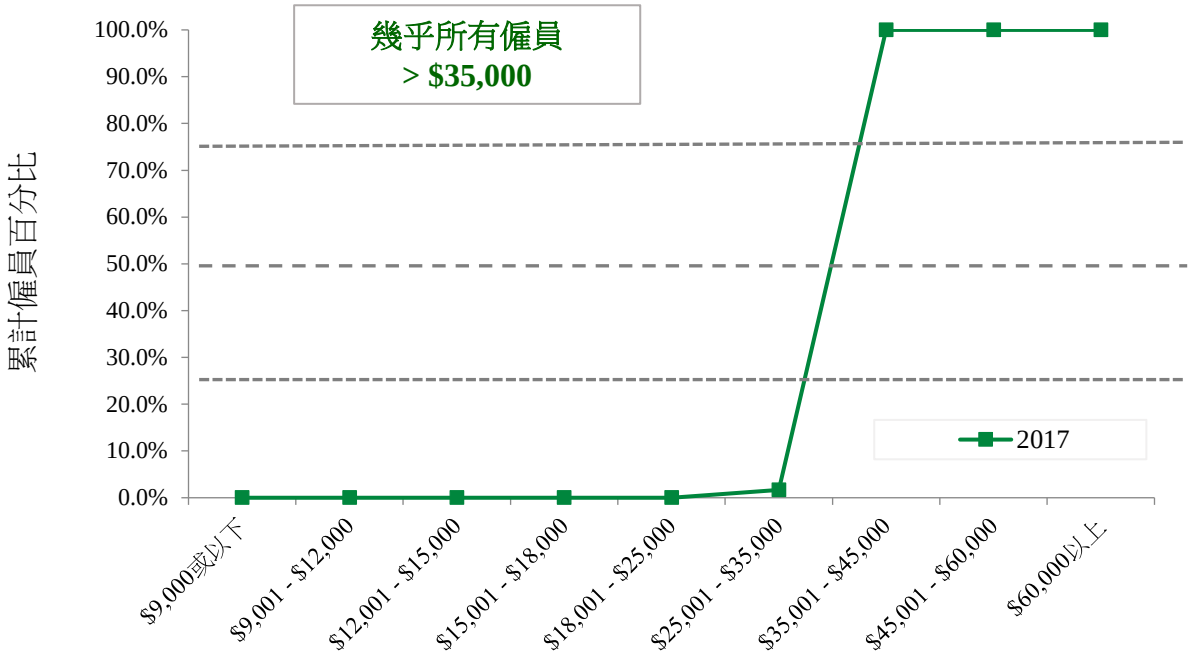


圖3.30 2017 年與 2015 年飛機維修工程行業平均月薪累計百分比—專業人士／技師



E. 飛機維修工程行業（續）

圖3.31　2017 年與 2015 年飛機維修工程行業平均月薪累計百分比—技術員

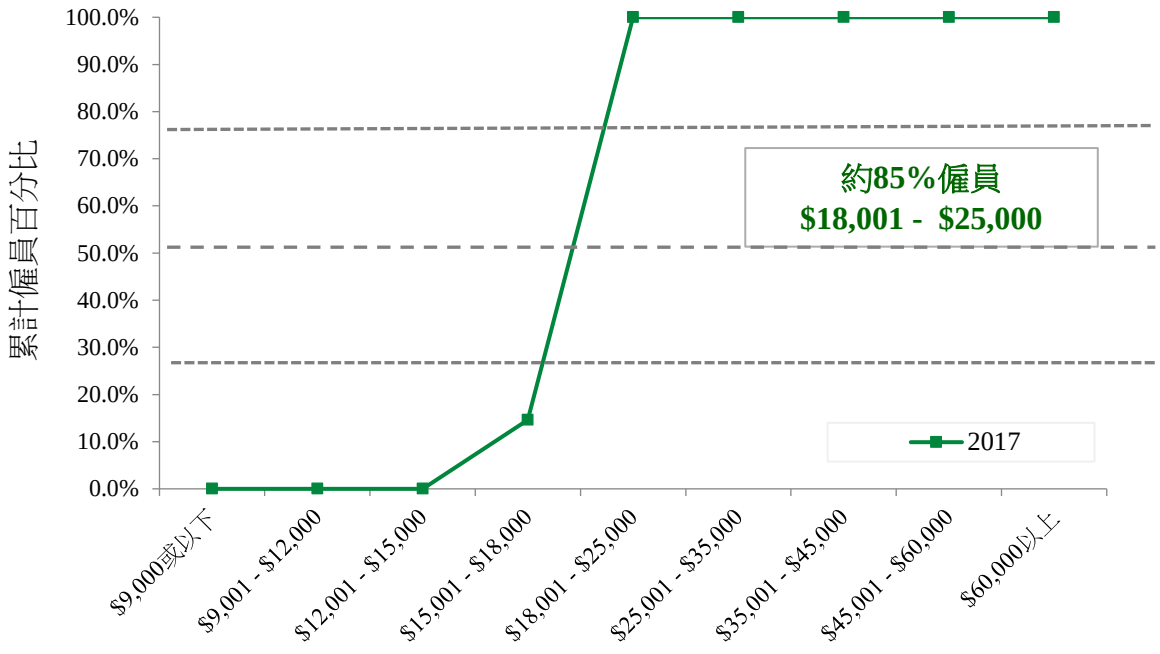
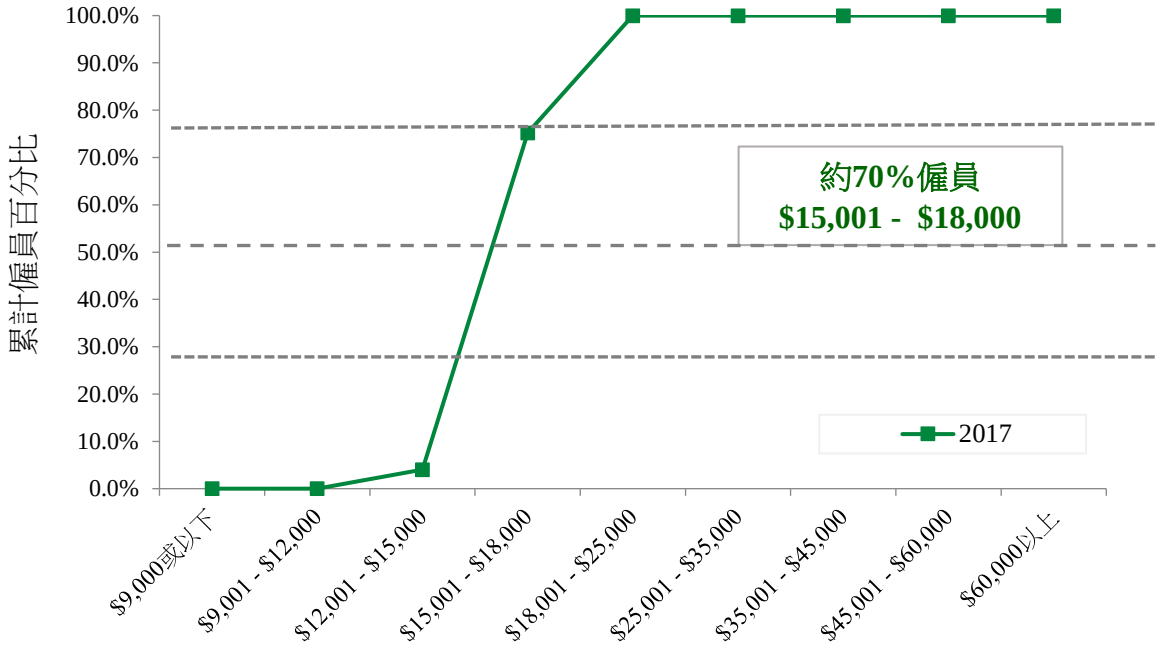
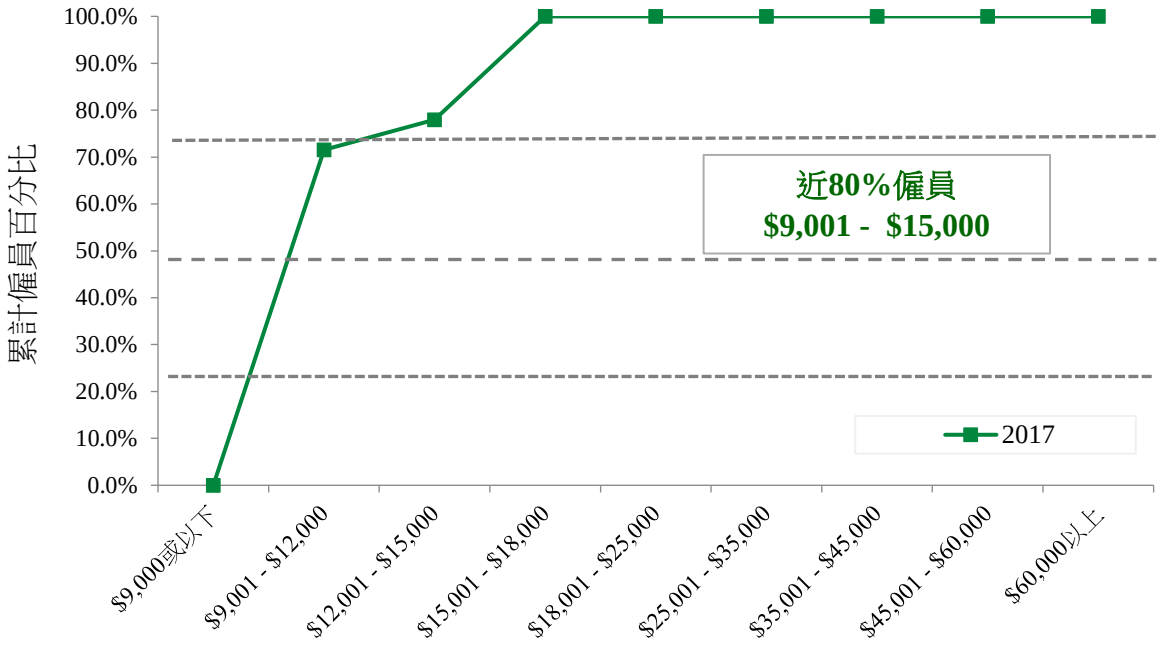


圖3.32　2017 年與 2015 年飛機維修工程行業平均月薪累計百分比—技工



E. 飛機維修工程行業（續）

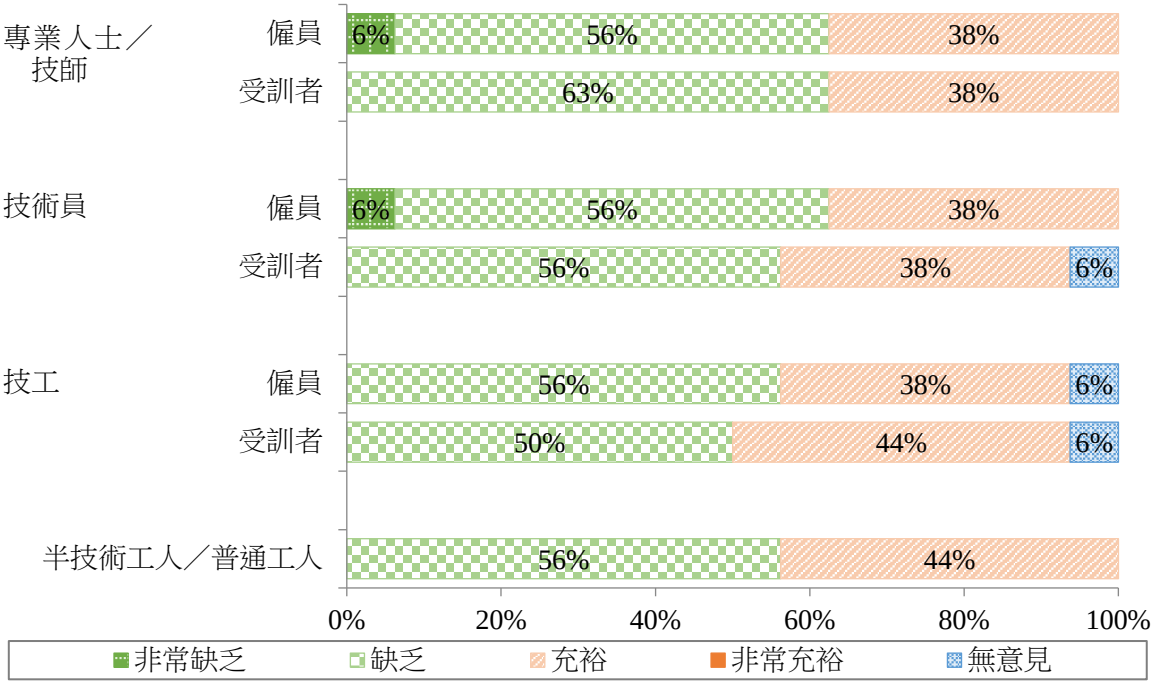
圖3.33　2017 年與 2015 年飛機維修工程行業平均月薪累計百分比—半技術工人／普通工人



對人力供應情況的看法

3.58　　調查亦蒐集填覆機構對過去 12 個月人力供應情況的看法。普遍而言，超過一半僱主認為人力供應不足，但也有四至五間公司認為人力供應充足（*圖3.34*）。

圖3.34　2017 年僱主對飛機維修工程行業過去12 個月人力供應情況的看法(按技能等級劃分)



IV. 觀察所得與結論

概況

4.1 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、氣體燃料以及飛機維修工程各大行業的就業情況。

A. 機電工程行業

人力變化

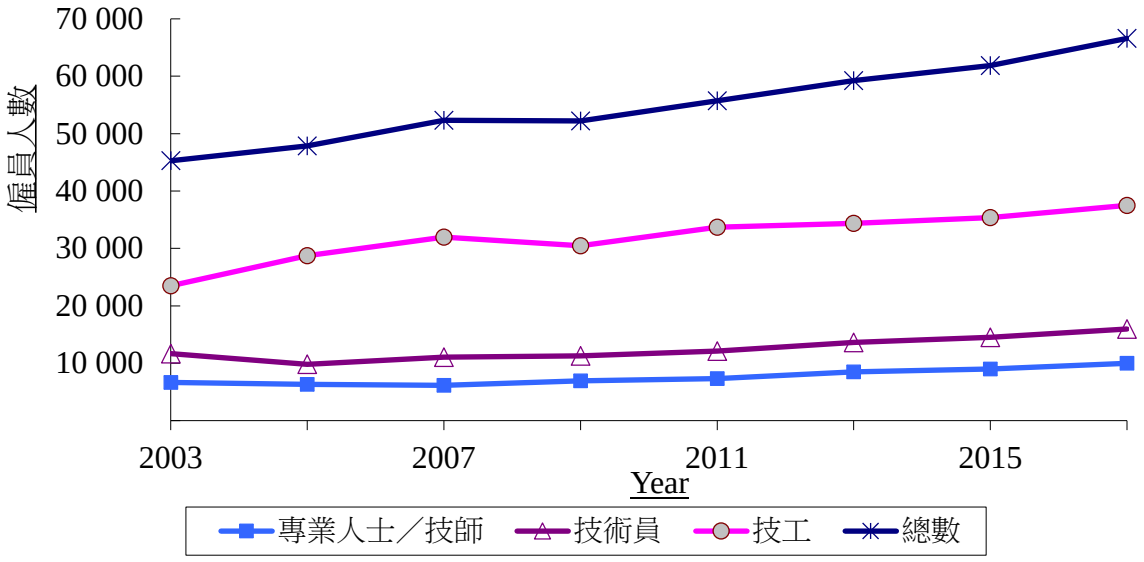
4.2 2003 至 2017 年間，機電工程行業各技能等級（專業人士／技師、技術員及技工）的人力變化，見*表 4.1 及圖 4.1*。自本次調查開始，飛機維修工程歸類為一個獨立行業，因此，飛機維修相關人力並無納入下表之內。

表 4.1 2003 至 2017 年機電工程行業人力變化

調查年份	專業人士／技師	技術員	技工	總人力[5]
2003	6 630	11 654	23 496	45 274
2005	6 297	9 807	28 739	47 849
2007	6 148	11 079	31 961	52 333
2009	6 930	11 279	30 486	52 192
2011	7 299	12 125	33 687	55 742
2013	8 509	13 641	34 371	59 249
2015	8 977	14 523	35 361	61 874
2017	9 985	15 964	37 505	66 594

[5]包括半技術工人／普通工人。

圖 4.1　2003 至 2017 年機電工程行業人力變化



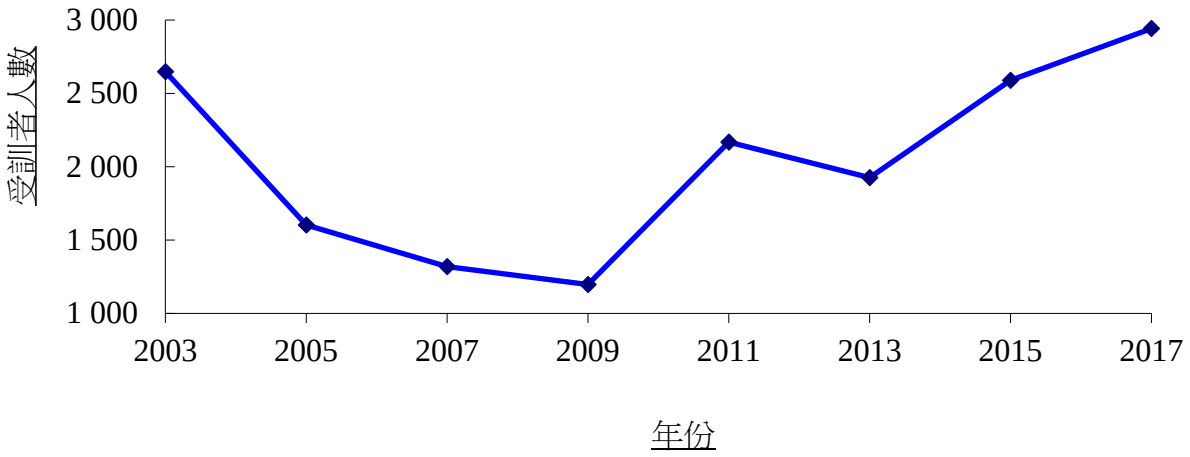
4.3　　隨著香港經濟於 2003 年起轉趨蓬勃，加上 2007 年開始十大基建項目陸續上馬，機電工程行業僱員人數呈現升勢。過去兩年，僱員人數平均每年增加 3.7%。其中，專業人士／技師、技術員、技工、半技術工人／普通工人的僱員人數，每年分別增長 5.5%、4.8%、3%及 2.1%。

4.4　　2003 年至 2009 年的人力調查顯示，機電工程行業的受訓者人數持續下跌。直至 2010 年代初大型基建項目開始動工，業內受訓者的人數回升，當中以「技工級」的回升幅度尤為顯著（見*表 4.2 及圖 4.2*）。

表 4.2　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
2003	45 274	2 648	5.8%
2005	47 849	1 603	3.4%
2007	52 333	1 320	2.5%
2009	52 192	1 197	2.3%
2011	55 742	2 167	3.9%
2013	59 249	1 926	3.3%
2015	61 874	2 588	4.2%
2017	66 594	2 942	4.4%

圖4.2　　機電工程行業受訓者人數



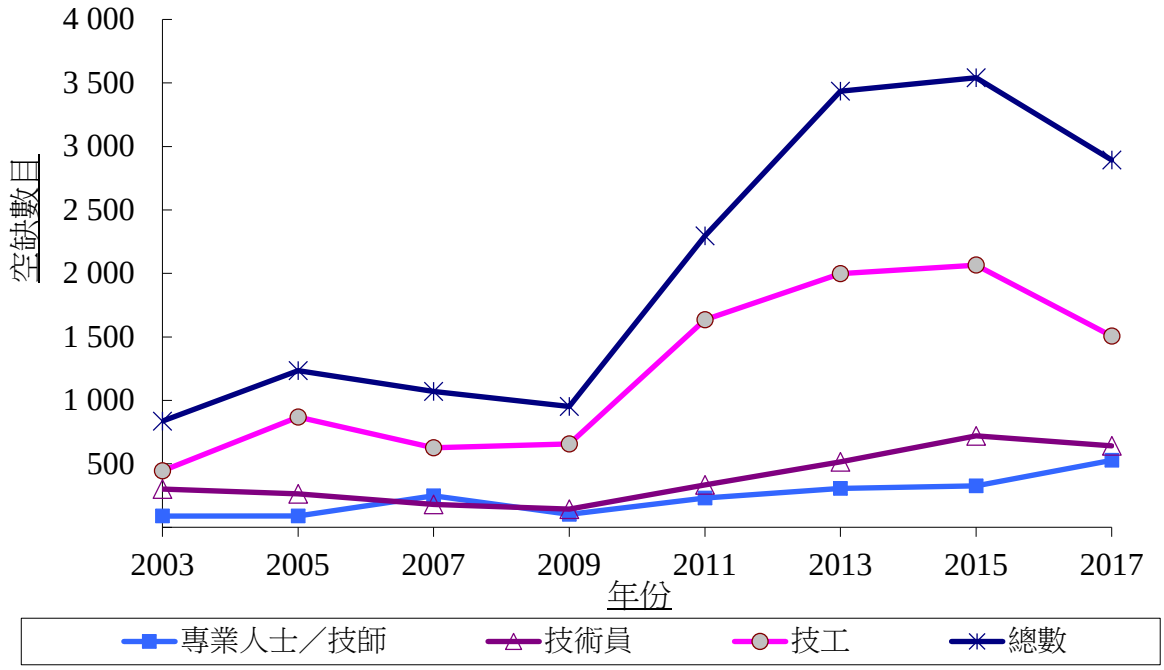
4.5　　如*表 4.3 及圖 4.3* 所示，受到多項大型基建項目全速施工所帶動，2009 至 2015 年間機電工程行業的職位空缺數目持續上升。隨著部分工程在過去數年相繼落成，加上畢業生及受訓者供應增加，是次調查終於錄得空缺額回落。然而，在 57 個主要職務中，仍有 15 個的空缺率達 5%或以上。其中四個主要職務的空缺率更達 10%或以上，包括：(i)辦公室設備維修技術員；(ii)機械打磨裝配工／機床工；(iii)自動梯技工；以及(iv)半技術工。

表 4.3　2003 至 2017 年機電工程行業空缺數目

調查年份	專業人士／技師	技術員	技工	空缺總額[6]
2003	89	302	445	837
2005	91	264	869	1 235
2007	248	182	626	1 071
2009	102	144	656	953
2011	231	335	1 636	2 296
2013	308	517	1 999	3 436
2015	327	721	2 065	3 541
2017	528	643	1 506	2 892

[6]包括半技術工人／普通工人。

圖 4.3　2003 至 2017 年機電工程行業空缺數目



機電工程行業的業務展望

4.6　　雖然過去數年多個鐵路項目已陸續完成，廣深港高速鐵路和沙田至中環線兩項工程目前正全速進行，直至 2021 年才竣工。其後，「鐵路發展策略 2014」擬議的七個項目或會開始動工，包括：

(1) 屯門南延線
(2) 北環線及古洞站
(3) 東九龍線
(4) 東涌西延線
(5) 洪水橋站
(6) 南港島線 (西段)
(7) 北港島線

4.7　　鐵路項目以外，尚有其他在建或新開展的工程，例如西九文化區發展、三跑道系統工程(2016 至 2024 年)、 十年醫院發展計劃 (2017 至 2026 年)等，相信定能為機電工程行業帶來大量承造工程業務。

4.8 行政長官在 2017 年《施政報告》內提出，政府將動用 30 億元，於 2018 年下半年推行「樓宇更新大行動 2.0」，資助私人住用或商住高齡樓宇的業主進行所需的檢驗及修葺。此外，政府亦打算撥款 20 億元，資助舊式商住樓宇的業主改善防火設施。樓宇及鐵路系統的日常營運和保養，加上這兩個新計劃帶來的額外需求，料會帶動未來幾年社會對機電工程服務的需求。

機電工程行業的人力訓練需求推算

4.9 在 2017 年人力調查中，由於過去調查時曾考慮的各項相關因素並無改變，因此本會決定再次採用「調節過濾法」[Adaptive Filtering Method, AFM]作為主要工具，以推算機電工程行業 2018 至 2021 年的人力需求。有關 AFM 的詳情請參考*附錄 6*。

4.10 本會根據 2017 年及以往人力調查結果，選定適用於各技能等級的最適切 AFM 推算數值（見*圖 4.4 至圖 4.6*）。

圖 4.4 機電工程行業人力推算 —專業人士／技師

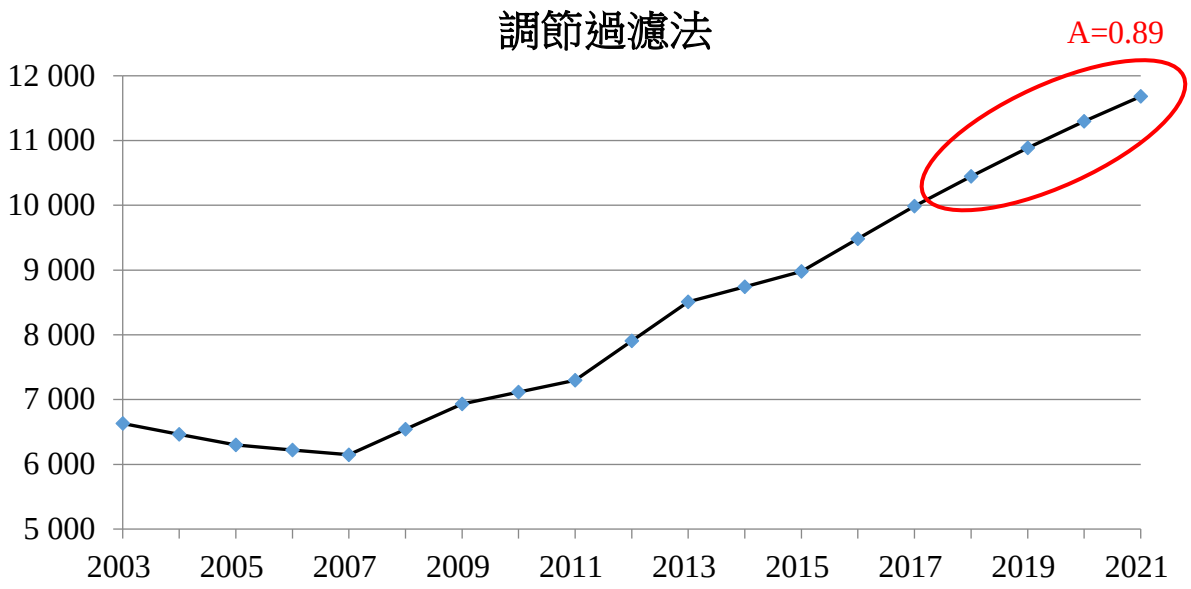


圖 4.5 機電工程行業人力推算 —技術員

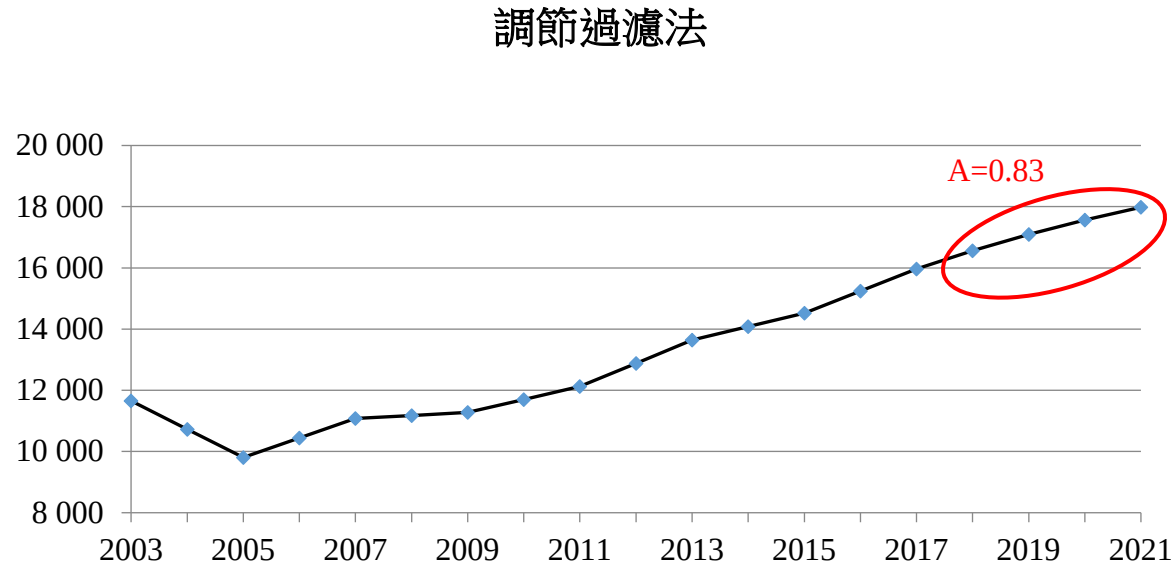
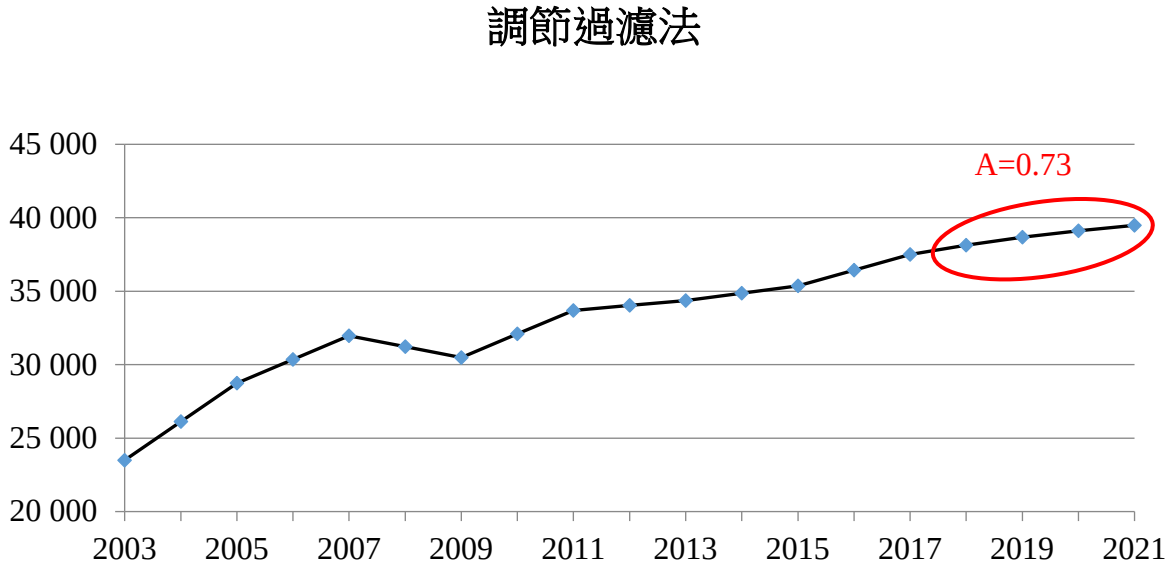


圖 4.6 機電工程行業人力推算 —技工



4.11 按 AFM 推算，2018 至 2021 年專業人士／技師、技術員和技工等級的預測人力載於*表 4.4*。

表 4.4 機電工程行業人力預測

年份	專業人士 (A = 0.89)	技術員 (A = 0.83)	技工 (A = 0.73)
2018	10 447	16 557	38 126
2019	10 885	17 091	38 676
2020	11 296	17 564	39 123
2021	11 681	17 982	39 486

4.12 參考上次調查，本會繼續將專業人士／技師及技術員的每年流失率定為 3%，而技工的流失率則定為 4%。

4.13 鑑於上述因素，機電工程行業於 2018 至 2021 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 4.5*。

表 4.5 推算機電工程行業未來四年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 2018 至 2021 年平均每年需要訓練的人手
專業人士／技師	9 985	749 (364)*
技術員	15 964	1 014 (705)*
技工	37 505	2 035 (2 003)*

**括號內的數字為本會於 2015 年時對本業 2016 至 2018 年每年訓練需求的推算數字，已剔除飛機維修工程的推算人力。*

B. 船舶修建行業

人力變化

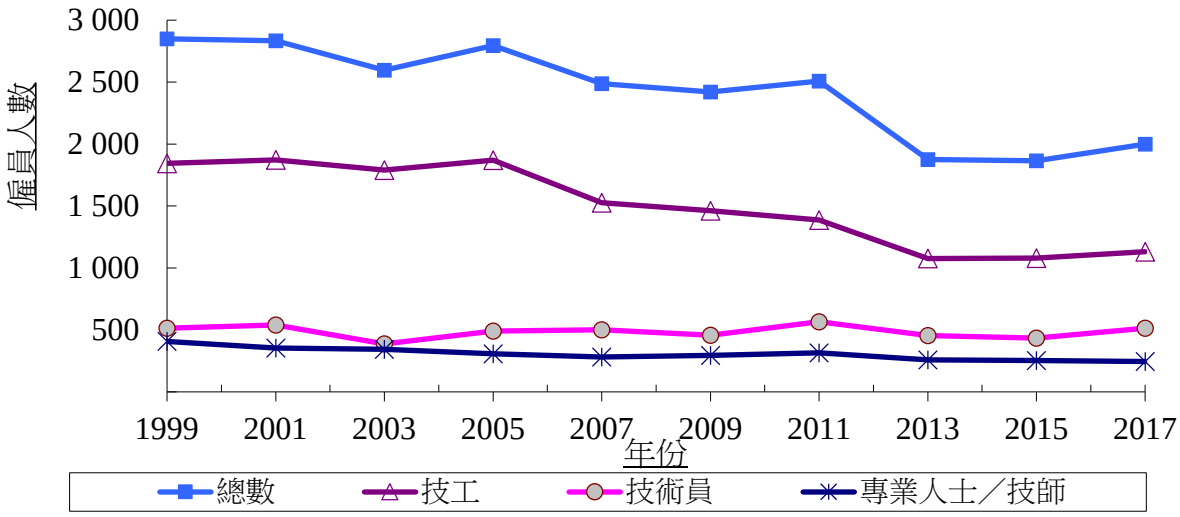
4.14 1999 至 2017 年間，船舶修建行業各技能等級（專業人士／技師、技術員及技工）的人力變化，*見表 4.6 及圖 4.7*。

表 4.6 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[7]
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
2017	245	515	1 132	2 000

[7]包括半技術工人／普通工人。

圖 4.7　船舶修建行業的人力變化（1999 至 2017 年）



4.15　　船舶修建行業僱主繼續將業務擴展至岸上工程項目，業內人力錄得每年 3.6% 的增幅。

4.16　　調查期間，船舶修建行業的空缺率達 12.9%，冠絕整個機電工程業。在 28 個主要職務中，有 16 個的空缺率達 5%或以上。其中十個主要職務的空缺率達 10%或以上，包括：(i) 電機工程技術員；(ii) 電子／電訊技術員；(iii) 機械工程技術員；(iv) 助理安全主任／安全督導員；(v) 薄片金屬構造工；(vi) 電工；(vii) 機械打磨裝配工；(viii)髹漆工；(ix)雜工；以及(x)半技術工 。

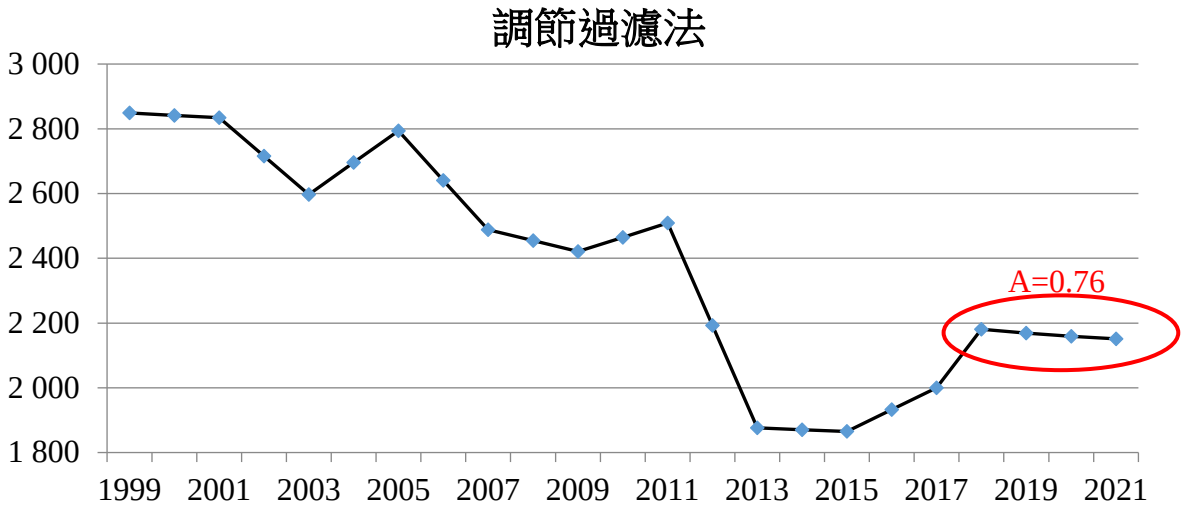
船舶修建行業的業務展望

4.17　　在遠洋輪船維修業務方面，船舶修建行業仍然面對中國內地競爭對手的強大威脅。至於本地船舶維修業務則保持平穩及樂觀，尤其是遊艇及遊樂船隻維修業務。人手短缺是行業面對的一大隱憂。船舶修建行業的工作相當辛勞，情況與建造業相若，但薪酬待遇不及建造業高。假若與其他行業的薪酬差距維持不變，相信船舶修建行業難以挽留年輕僱員。

船舶修建行業的人力訓練需求推算

4.18　　鑑於船舶修建行業的僱員人數相對較少，本會決定採用 AFM 推算業界的總人力需求，有關結果見*圖 4.8*。

圖 4.8　船舶修建行業人力推算



4.19　本會決定採用 A=0.76 為船舶修建行業人力推算最合適的曲線。預測 2018 至 2021 年船舶修建行業的總人力分別為 2 180、2 169、2 159 及 2 151 名僱員。

4.20　本會自 2001 年起將船舶修建行業的每年流失率定為 6%，以反映業內人手老化的問題。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%。

4.21　綜合上述因素，本會推算 2018 至 2021 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 4.7*。

表 4.7　推算船舶修建行業未來四年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2018至2021年平均每年需要訓練的人手
專業人士／技師	245	20 (14)*
技術員	515	42 (24)*
技工	1 132	92 (61)*

** 括號內的數字為本會於2015 年時對本業2016 至2018 年每年訓練需求的推算數字。*

C. 氣體燃料行業

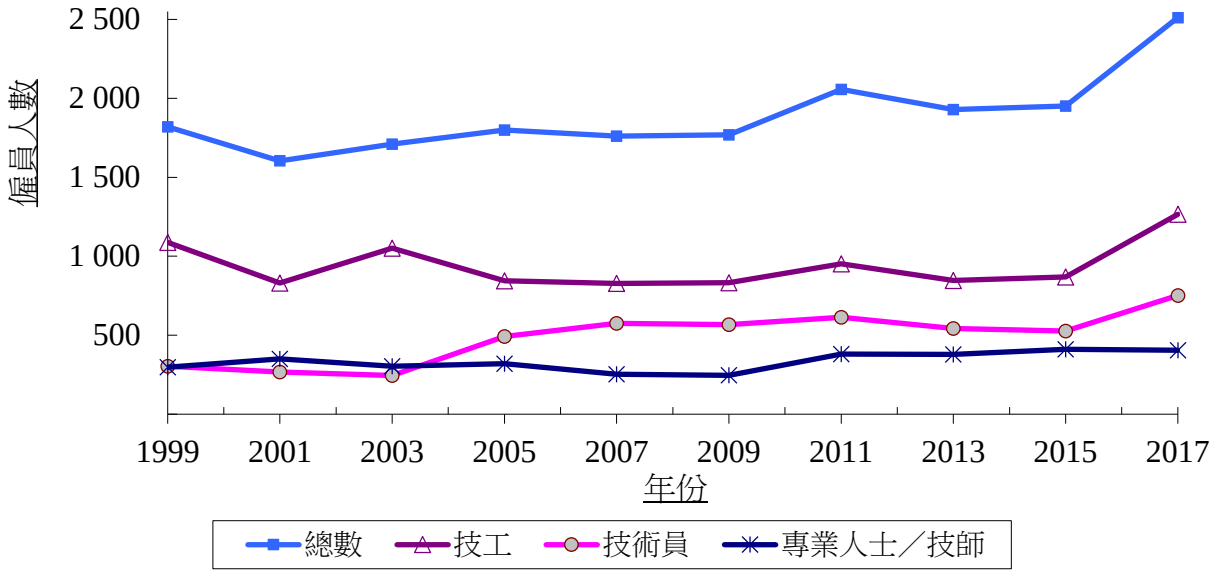
人力變化

4.22　　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 4.8 及圖 4.9*。

表 4.8 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[8]
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
2017	406	752	1 266	2 512

圖 4.9 氣體燃料行業機電人力的變化



4.23　　氣體燃料行業的整體人力一直保持穩定，但是次調查錄得顯著升幅（比兩年前增加 28.8%），原因是有兩間受訪公司表示過往調查低估了其僱員人數。

4.24　　調查期間，氣體燃料行業的空缺數目佔整體人力的 2.5%，在 19 個主要職務中，有三個的空缺率達 5%或以上， 包括電工／電氣打磨裝配工、司機（石油氣瓶車）和雜工。

[8]包括半技術工人／普通工人。

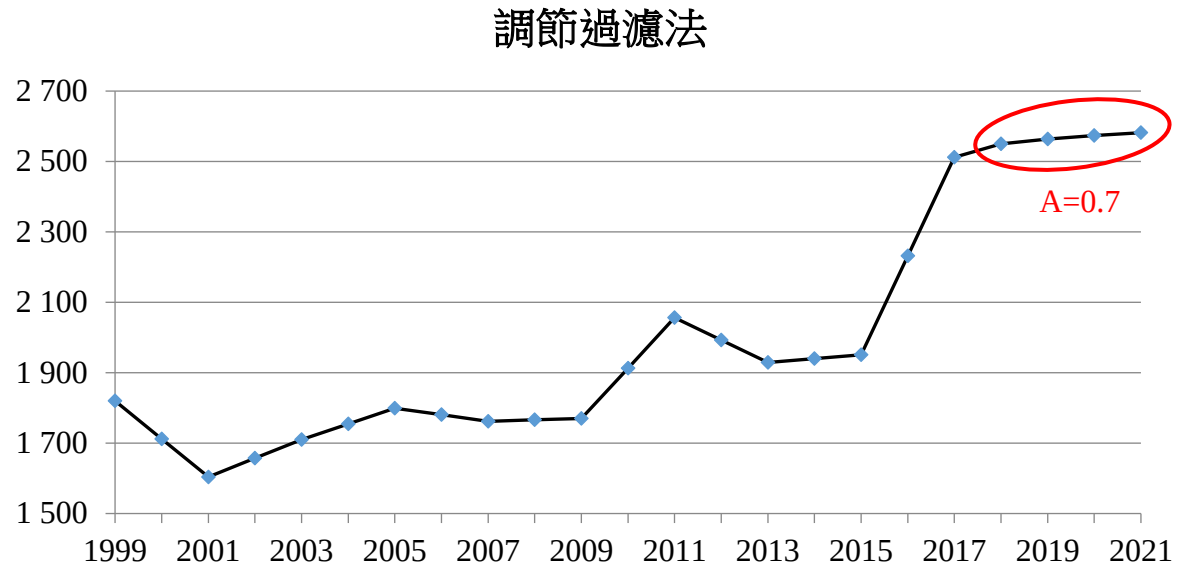
氣體燃料行業的業務展望

4.25 香港政府決心增加房屋供應，未來十年的目標建屋量達 460,000 個單位， 較過去十年增加超過八成。根據運輸及房屋局以及香港房屋委員會公布的數字，未來三至四年新落成私人樓宇單位估計約有 97,000 個；而 2016-17 至 2020-21 年度公屋落成量會有 94,500 個。房屋供應持續增加，加上目前有利的經濟環境，預料氣體燃料行業未來會保持穩定增長。

氣體燃料行業的人力訓練需求推算

4.26 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 4.10*。

圖 4.10 氣體燃料行業人力推算



4.27 本會決定採用 A=0.7 為氣體燃料行業人力推算最合適的曲線。預測 2018 至 2021 年氣體燃料行業的總人力分別為 2 550、2 563、2 574 及 2 582 名僱員。

4.28 本會決定將氣體燃料行業的每年流失率定為 3%，並推算 2018 至 2021 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 4.9*。

表 4.9 推算氣體燃料行業未來四年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2018至2021年平均每年需要訓練的人手
專業人士／技師	406	9 (11)*
技術員	752	19 (15)*
技工	1 266	62 (26)*

**括號內的數字為本會於 2015 年時對本業 2016 至 2018 年每年訓練需求的推算數字。*

D. 飛機維修工程行業

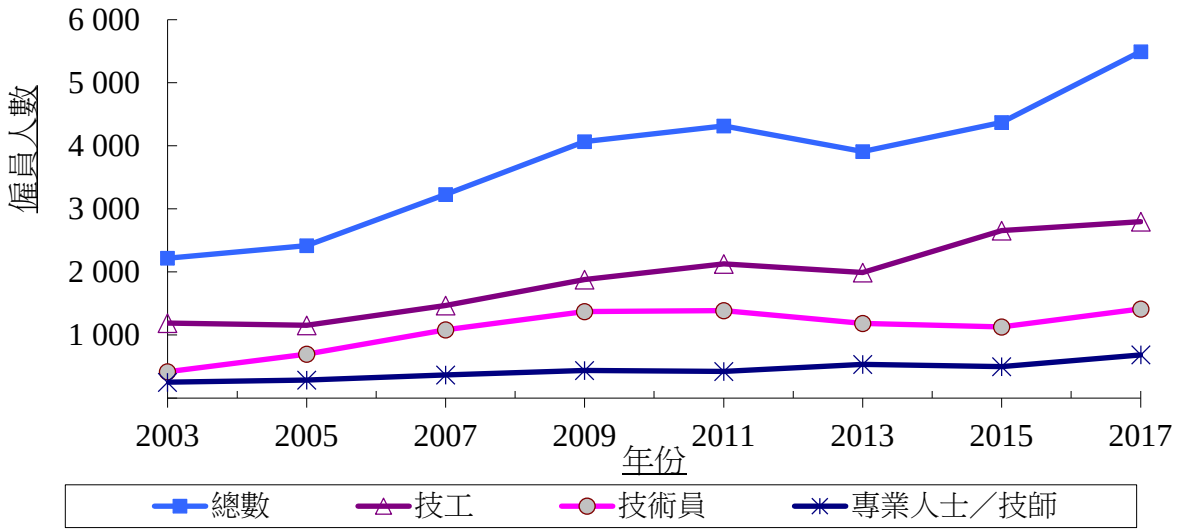
人力變化

4.29　　2003 至 2017 年間，飛機維修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 4.10 及圖 4.11*。讀者請留意，是次調查的受訪機構由 6 間增至 12 間。

表 4.10　飛機維修工程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[9]
2003	253	418	1 189	2 218
2005	287	699	1 155	2 419
2007	367	1 084	1 468	3 230
2009	439	1 370	1 878	4 068
2011	421	1 387	2 129	4 318
2013	533	1 187	1 991	3 910
2015	498	1 130	2 656	4 372
2017	685	1 415	2 798	5 496

圖 4.11　2003 至 2017 年飛機維修工程行業的人力變化



飛機維修工程行業的業務展望

4.30　　香港國際機場不單是全球最繁忙的貨運基地，以及其中一個繁盛的客運樞紐，更是區內主要的飛機維修及工程服務中心。政府估計，2024 年三跑道系統建成後，機場區域的直接職位會倍增至 123,000 個；當中，工程師及機械工等維修崗位會繼續出現人手短缺。要吸引技術人才到位處偏遠的機場工作，僱主勢要提高薪酬。

[9]包括半技術工人／普通工人。

飛機維修工程行業的人力訓練需求推算

4.31 由於飛機維修工程自 2017 年調查起才歸類為一個獨立行業，因此，以過往人力變化趨勢為基礎的推算方法（即 AFM）並不適用，本會決定參考僱主對未來一年人力的預測。據僱主估計，2018 年專業人士／技師、技術員和技工等級的人力，分別有 720、 1 561 及 2 976 人。

4.32 本會亦決定將專業人士／技師及技術員的每年流失率定為 3%，而技工的流失率則定為 4%。按推算，2018 年飛機維修工程行業所需訓練的機電僱員數目載於*表 4.11*。

表 4.11 推算飛機維修工程行業未來一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2018年需要訓練的人手
專業人士／技師	685	56
技術員	1 415	188
技工	2 798	290

V. 建議

5.1 考慮到本地經濟狀況，以及機電工程業的業務性質，本會預計 2018 至 2021 年業內四大業務界別對曾接受適當訓練技術人員的需求如下：

(i) 機電工程行業：現時大部分鐵路項目將於 2021 年完工，一些目前從事承造工程的工人未來數年或會轉為從事服務門類，包括樓宇及鐵路的營運和修護工作。然而，新建樓宇及其他正在進行或將會上馬的項目，如發展西九文化區、「十年醫院發展計劃」及「樓宇更新大行動 2.0」，應能繼續支撐承造門類的人力需求。

(ii) 船舶修建行業：儘管遠洋輪船維修業務前景不明朗，本地船隻維修業務維持樂觀。焊接工、輪機裝配工、電工、喉管裝配技工／灑水器安裝工、監督、機械裝配工及輪機工程技工的人力需求依然強勁。

(iii) 氣體燃料行業：未來三至四年新落成的私人住宅單位將有 97 000 個，2016-17 至 2020-21 年亦供應 94 500 個公共房屋單位，數量約是過去十年私人住宅及公共房屋新建單位總數的 75%。由於住宅單位供應漸多，氣體燃料行業的人力料錄得正面增長。

(iv) 飛機維修工程行業：業內僱主多年來一直面對人手短缺的問題。部分持份者積極擴展業務，加上預期三跑道系統帶來的新商機，未來幾年激烈競逐熟練人手的情勢將會持續。

5.2 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 4.13、4.21、4.28 及 4.32 各段所列數字，推出有系統的人力訓練方案。

5.3 *表 5.1* 列載每年需培訓的專業人士／技師、技術員及技工級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 5.1 每年需培訓人數佔現有人手的百分比（按技能等級及行業劃分）

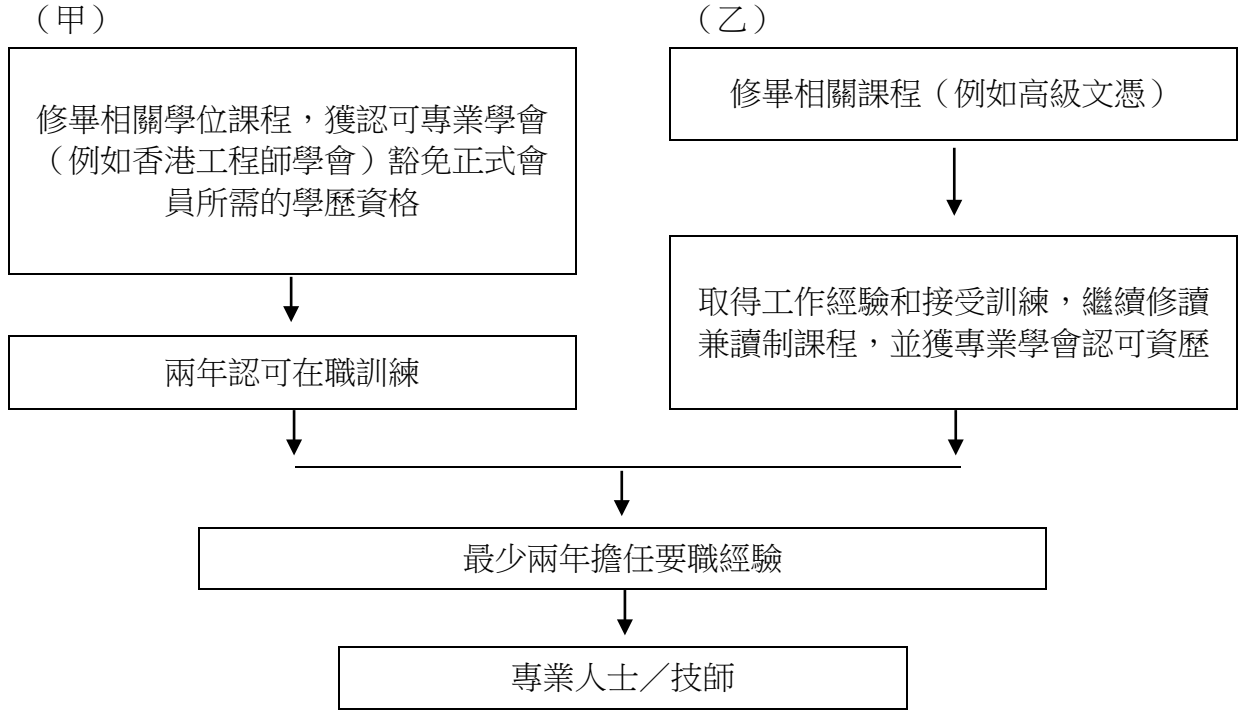
行業	專業人士／技師	技術員	技工
機電工程	7.5%	6.4%	5.4%
船舶修建	8.2%	8.2%	8.1%
氣體燃料	2.2%	2.5%	4.9%
飛機維修工程	8.2%	13.3%	10.4%

A. 專業人士／技師訓練

5.4 專業人士／技師須具備相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。

5.5 專業人士／技師在改進管理及創新技術方面擔當重要角色。本會建議採用*圖 5.1* 的訓練途徑。

圖 5.1　專業人士／技師訓練



5.6　　參考第 4.13、4.21、4.28 及 4.32 各段的數字後，推算 2018 至 2021 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 **830** 人。

5.7　　*表 5.2* 列出預計本地大學機電工程主要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課程的畢業生擔任。

表 5.2　推算 2018 至 2019 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[10]	課程	預計每年本地畢業生人數
城大、港大、理大、THEi	工學士（屋宇裝備工程學）	200
港大、理大	工學士（電機工程學）	150
港大、科大、理大	工學士（機械工程學）	300
中大	工學士（機械與自動化工程學）	90
理大	工學士（民航工程學）	40
	工學士（運輸系統工程學）	35
	總數	**815**

5.8　　據 *表 5.2* 數字顯示，本地大學全日制學位課程每年的畢業生人數，與機電工

[10] 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。
THEi：香港高等教育科技學院。

程業每年的推算人力訓練需求大致相符。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，部分訓練需求須以內部晉升或由海外回流畢業生填補。

工科畢業生訓練計劃

5.9 職業訓練局[VTC]在創新及科技訓練委員會的協助下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 個月並符合成為香港工程師學會正式會員要求的實務訓練。受訓的畢業生可經由僱主獲得薪金津貼。如有需要，在修讀學位課程期間沒有接受認可實務訓練的畢業生，可於 VTC 轄下卓越培訓發展中心接受長達八周的基本工場訓練。本會籲請僱主善用此項計劃訓練工科畢業生。

新科技培訓計劃

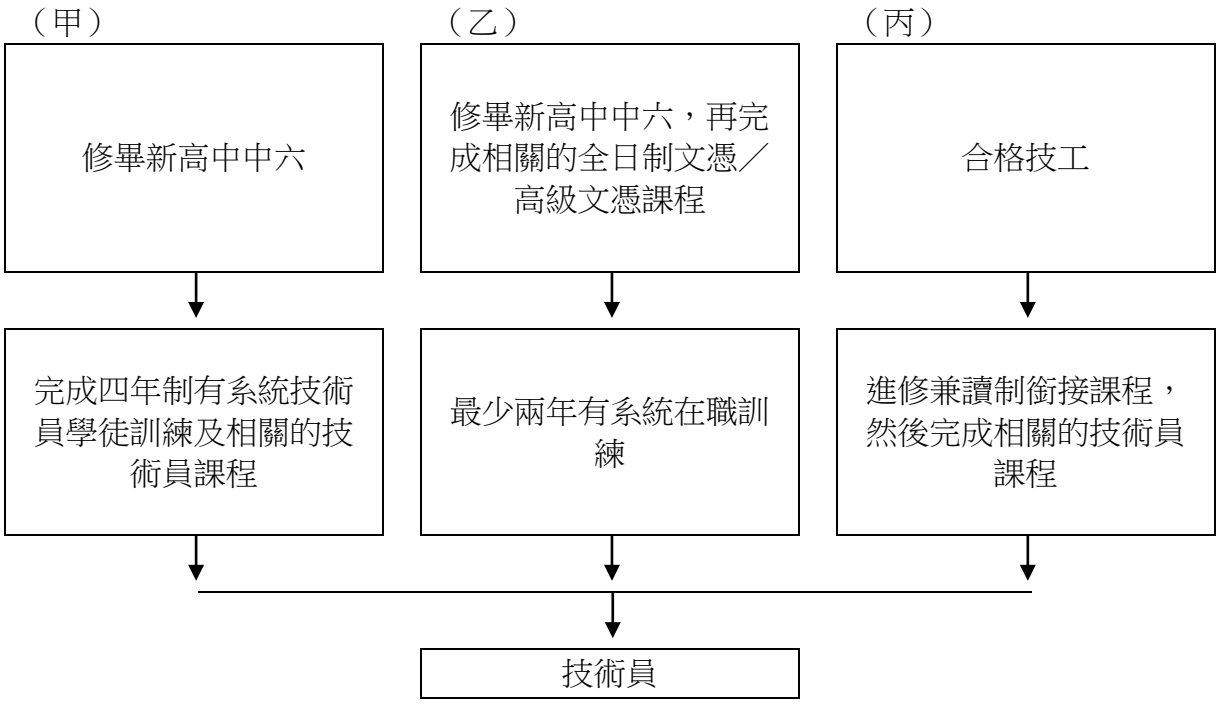
5.10 新科技培訓計劃向本地僱主提供資助，最高可達訓練開支的 50%，讓僱員學習新科技。合資格申請資助的訓練方式包括：海外訓練或在職實習，以及為個別公司特設的本地課程／在職實習。本會籲請僱主善用這項計劃讓僱員接受新科技培訓。

B. 技術員訓練

5.11 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。

5.12 訓練技術員的三大途徑見*圖 5.2*。

圖 5.2 技術員訓練



5.13 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。

5.14 VTC 轄下香港專業教育學院[IVE]開辦技術員程度的飛機維修工程、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。

5.15 此外，VTC 的青年學院亦開辦飛機維修、屋宇裝備工程、電機工程及機械工程職專文憑 [11] [DVE]課程。持有職專文憑的畢業生，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、高級文憑學徒（即技術員學徒）或見習監督。

5.16 參考第 4.13、4.21、4.28 及 4.32 各段的數字後，推算 2018 至 2021 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 **1 260** 人。

5.17 估計 2018 至 2019 年間投身機電工程主要行業擔當技術員的全日制課程畢業生人數見*表 5.3*。由於氣體燃料工程市場規模細小，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；不過，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。

5.18 除了全日制高級文憑及副學士課程畢業生，每年逾 200 名受訓者以見習技術員身份投身機電工程業，修讀日間兼讀制高級文憑課程（電機、機械、屋宇裝備或飛機維修工程）。

5.19 2018 至 2019 年間全日制及日間兼讀制技術員級訓練課程每年畢業生總數約為 1 035 + 200 = **1 235** 人，與推算的每年人力訓練需求（即 1 260 人）相符。然而，與專業人士／技師級的情況相近，上述畢業生未必全部選擇投身機電工程業，有些可能加入並非本人力調查所涵蓋的機構，因此本會認為人力供應只能勉強符合需求。

[11] 前稱「中專教育文憑」。

表 5.3　　推算 2018 至 2019 年間本地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 [12]：	
	- 屋宇裝備工程學	50
	- 電機工程學	15
	小計	65
IVE	全日制高級文憑課程 [13]：	
	- 飛機維修工程	90
	- 屋宇裝備工程	330
	- 電機工程	260
	- 機械工程	175
	小計	855
青年學院	全日制職專文憑課程 [14]（持職專文憑學歷的畢業生）：	
	- 飛機維修	15
	- 屋宇裝備工程	30
	- 電機工程	40
	- 機械工程	30
	小計	115
	總計	**1 035**

工程專才進修資助計劃

5.20　　為進一步鼓勵持續進修，香港特別行政區政府批准撥款推行為期三屆的試行計劃，由 2016/17 學年起，向就讀 VTC 指定兼讀制專業自資課程（課程須獲評為資歷架構[QF]第三至第五級）的學生提供學費資助，涵蓋建築及工程學科。獲批資助的申請人可獲退還合資格課程 60%的學費，上限為每人 45,000 元。多個 IVE 機電工程高級文憑課程（夜間兼讀制）及多個專業文憑課程（由 THEi 或 IVE 開辦）均獲納入這項資助計劃內。本會鼓勵在職人士透過計劃考取更高學歷，爭取向上流動。

C. 技工訓練

5.21　　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，成為合格技工。

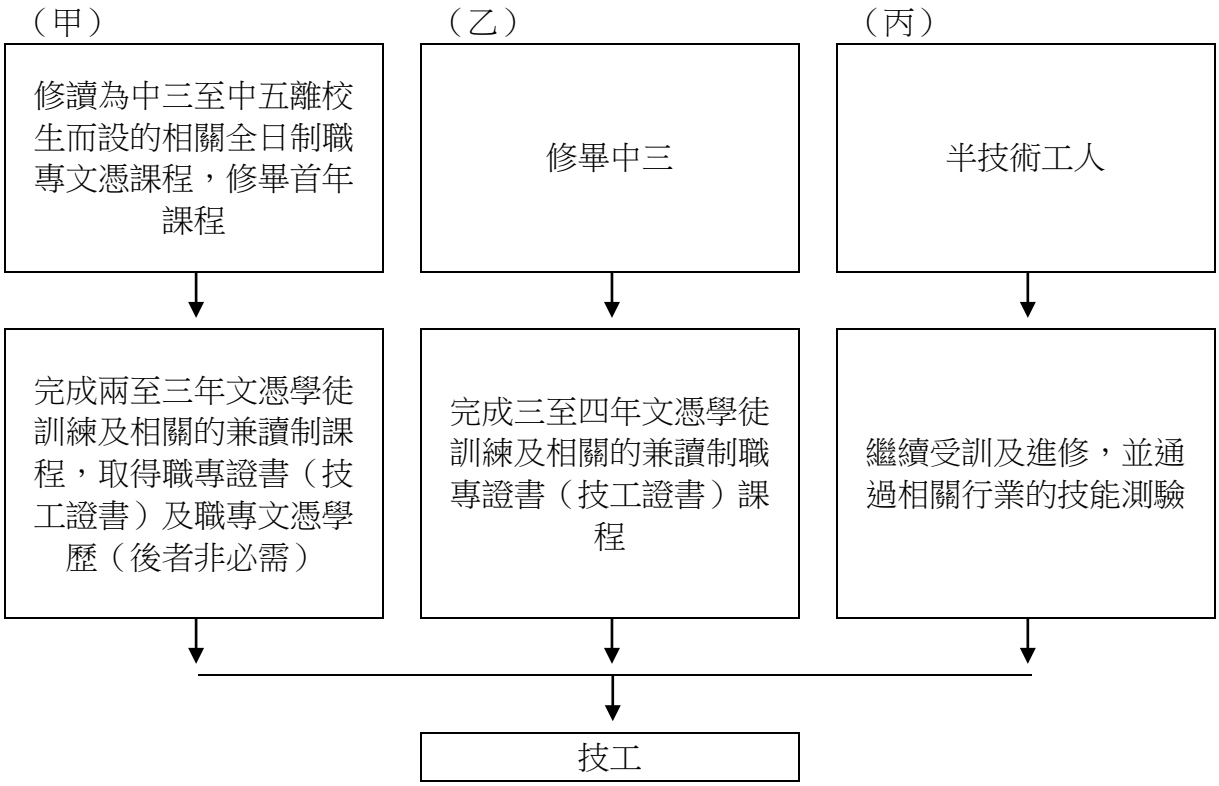
[12] 表5.3所列的數字假設60%大學高級文憑／副學士課程畢業生升讀學位課程，其餘40%選擇就業。

[13] 推算時已考慮學生的退學率、及格率、升學率及就業率。表5.3顯示預計投身社會工作的畢業生人數。

[14] 大部分持職專文憑學歷的畢業生已完成中六。表5.3所列的數字是根據2015/16學年的修畢課程比率和就業率，以及2017/18學年的收生人數推算所得。

5.22 訓練技工的一般途徑見*圖 5.3*。

圖 5.3 技工訓練



5.23 本會建議採用訓練途徑（甲），因為訓練期較短，而且受聘者已接受若干基本訓練，在學徒訓練之初，即可擔任工作。

5.24 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[15]課程，供註冊文憑學徒（即技工學徒）修讀。此外，建造業議會[CIC]開設了兩項與機電工程相關的基本工藝課程，包括電器裝置及水喉潔具兩科。

5.25 參考第 4.13、4.21、4.28 及 4.32 各段的數字後，推算 2018 至 2021 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 **2 480** 人。

5.26 按推算，2018 至 2019 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每年平均人數見*表 5.4*。

[15] 前稱「技工證書」。

表 5.4　推算 2018 至 2019 年間擔當見習技工的全日制本地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[16]
青年學院	全日制職專文憑課程（中三至中五生）：	
	- 屋宇裝備工程（涵蓋空調製冷、消防裝備工程）	200
	- 電機工程	165
	- 氣體燃料工程	40
	- 升降機及自動梯工程	60
	- 機械工程	90
	- 焊接科技及檢定	15
	總數	570

5.27　第 5.26 段提及的全日制課程畢業生通常受聘為文憑學徒，並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課程（即圖 5.3 所示的訓練途徑（乙）），直接投身機電工程業成為文憑學徒。根據 2016/17 至 2017/18 學年日間兼讀制職專文憑及職專證書課程的平均新收生人數，推算 2018 至 2019 年間的見習技工（包括圖 5.3 所示的訓練途徑（甲）及途徑（乙））總人數見*表 5.5*。

表 5.5　推算 2018 至 2019 年間修讀日間兼讀制職專文憑／職專證書課程的新註冊機電工程文憑學徒人數

院校	課程	預計每年新生人數[17]
青年學院	職專文憑／職專證書（空調製冷）	230
	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）	340
	職專證書（氣體燃料工程）	35
	職專文憑／職專證書（升降機及自動梯工程）	250
	職專文憑／職專證書（機械工程）	145
	職專文憑（數碼電子科技）	50
	水喉全科技工證書	80
	總數	**1 210**

5.28　本會比較第 5.25 段及*表 5.5* 的數字，發現 2018 至 2019 年間每年新註冊機電工程文憑學徒的估計人數，僅能滿足推算每年所需訓練人手約 50%。業內現職僱員可透過在職培訓、技能提升訓練或通過相關技能測驗而成為合格技工，相信業界須循此途徑填補短缺的人手。

5.29　為培訓足夠合格技工支援機電工程業長遠發展，本會建議培訓機構增加機電

[16] 數字根據2016/17學年的畢業生就業數字推算所得。

[17] 數字根據2016/17及2017/18學年的收生人數推算所得。

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，幫助他們晉升為合格技工。

5.30 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，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

5.31 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、數碼電子科技－通訊及智能監控科技分流），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

5.32 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。計劃提供專業教育培訓，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，文憑學徒在受訓期間，除了能取得職專證書，也可考取職專文憑資格。自計劃推出以來，相關職專文憑課程的入學率有所改善，留讀率亦上升至近 90%。過去數年受訓者人數持續增加，在某個程度上紓緩了機電工程業人力短缺的問題。與兩年前比較，技工級職位空缺數目顯著減少，由 2 335 個減至 1 840 個。計劃見成效，政府決定將先導計劃延至 2016/17 及 2017/18 學年，惠及多 2 000 名學徒。本會籲請僱主支持機電業（建築）學員培訓津貼計劃及「職」學創前路先導計劃，吸引更多新血入行並留在機電工程業發展。

D. 半技術工人／普通工人訓練

5.33 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。升降機及自動梯門類承辦商自計劃推出以來一直鼎力支持。是次調查結果顯示，升降機及自動梯技工人數增加約 20%，某程度上可歸功於「承建商合作培訓計劃」奏效。

5.34 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。僱員再培訓局的新技能提升計劃，以及 CIC 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」），均是推動這方面工作的好例子。

VTC 轄下卓越培訓發展中心

5.35 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；以及

(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

5.36 VTC 自 1989 年起，推行屬自願參與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) 協助未受過正規訓練的人士取得認可資格；

(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。

5.37 本會負責推行電工技能測驗。電工技能測驗證書已獲香港特區政府機電工程署認可，分別作為 A 級及 R 級（空氣調節）兩類電工註冊之用。為了向申請人提供更優質的服務，2017 年 5 月推出了網絡版技能測驗軟件系統，讓申請人透過網上登記，自行選擇測試日期。

5.38 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。

5.39 僱主應鼓勵旗下電工、升降機及自動梯工人參加技能測驗，以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

5.40 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」的熟練工人修讀，協助他們於三年臨時期限屆滿前取得註冊資格。

5.41 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（又稱「中工測試」）。目前，有關技能測驗及中工測試由 CIC 負責，不過 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。

5.42 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，以符合《建造業工人註冊條例》的規定。

世界技能大賽

5.43 世界技能大賽是最大型的國際技能比賽，由世界技能組織舉辦，旨在推廣卓越技能，提升專業技能水平，同時加深全球對專業教育及技能訓練的意識和地位。為了選拔出色選手代表香港出戰世界技能大賽，VTC 與 CIC 和製衣業訓練局每兩年舉辦一次「香港青年技能大賽」。2014 年及 2017 年的比賽分別在啟德郵輪碼頭及香港會議展覽中心舉行，同場亦舉辦大型嘉年華，設有技能體驗活動、研討會、職業講座及大師示範等節目，藉此推動職業教育，提高公眾對技能訓練的認識。兩屆活動各吸引逾 20 000 人參與，當中包括師生、家長、行業專家及海外職業專才教育[VPET]業界人士，一同參加各項有趣活動並體驗技能的力量。

5.44 自 2014 年起，本會一直協辦三項本地機電工程行業賽事，包括飛機維修、電氣安裝及空調製冷。本會主席亦分別於 2015 及 2017 年隨香港代表團前往巴西聖保羅及阿聯酋阿布扎比，支持香港代表隊出戰世界技能大賽。本會籲請僱主繼續給予支持，提名公司內的年輕人才參加比賽。

推動 STEM 教育

5.45 推動 STEM（科學[Science]、科技[Technology]、工程[Engineering]及數學[Mathematics]）教育是環球趨勢，目的在裝備學生應對社會及全球日新月異的經濟、科學及科技發展所帶來的轉變和挑戰。行政長官於 2016 及 2017 年的《施政報告》宣布，香港政府會積極推動 STEM 教育，鼓勵學生修讀這些科目。VTC 作為香港最具規模的職業專才教育機構，響應政府政策，已於轄下 IVE 及青年學院校園內設立三間 STEM 教育中心，分別由四個主區組成：(i)數理學習坊，協助學生提升數理知識；(ii)虛擬實境[VR]／擴增實境[AR]學習區，讓學生置身於模擬工作環境，親身體驗不同職場的工作；(iii) STEM 活動工作坊，為中學生舉辦 3D 打印及激光掃描等 STEM 相關的示範活動；以及(iv)工程科技區，展示機械人、太陽能汽車及築橋設計等 STEM 項目／產品。

5.46 本會欣悉 VTC STEM 教育中心提供上述服務，並鼓勵僱主與這些教育中心分享以科技增進學習成效的經驗。

E. 主要結論及建議摘要

5.47 本會對 2018 至 2021 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：

(i) 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，略少於本會推算業界每年所需的訓練人手。差額可透過內部晉升或以海外回流畢業生填補。

(ii) 建議僱主善用「工科畢業生訓練計劃」及「新科技培訓計劃」，讓工程畢業生接受實務訓練及新科技培訓。「工科畢業生訓練計劃」對海外大學畢業生尤為實用，因為當中只有少數在修讀學位課程期間曾接受認可實務訓練。計劃可於 VTC 各卓越培訓發展中心安排八周基本工場訓練，這些中心屬於香港工程師學會認可的訓練機構。

(b) 技術員訓練：

(i) 城大、理大、IVE 及青年學院全日制及日間兼讀制技術員課程每年的畢業生人數，能勉強應付本會推算機電工程業每年所需訓練的人手。

(ii) 建議在職人士利用 2016/17 至 2018/19 學年試行的「工程專才進修資助計劃」，修讀 VTC 指定兼讀制專業課程，考取更高學歷。

(c) 技工訓練：

(i) 機電工程業每年新註冊文憑學徒的人數，僅能滿足本會推算業內每年所需訓練人手約 50%。其餘須由透過在職培訓、技能提升訓練或通過相關技能測驗而成為合格技工的從業員填補。

(ii) 是次調查結果顯示，與兩年前相比，見習技工人數顯著增加，空缺數目大幅減少。這個情況在某程度上可歸功於「機電業（建築）學員培訓津貼計劃」及「『職』學創前路先導計劃」能成功吸引及挽留新血。本會籲請僱主支持上述計劃，亦建議培訓機構增加職前培訓名額，同時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。

(d) 半技術工人／普通工人訓練：

(i) 近年人力調查報告結果反映，機電工程業的技工供應不能單靠學徒訓練。建議訓練更多半技術工人／普通工人，協助他們日後晉升為技工。

(ii) 升降機及自動梯門類承辦商自「承建商合作培訓計劃」推出以來一直鼎力支持。與兩年前相比，回覆機構報稱升降機及自動梯技工的人數增加約 20%。本會籲請僱主善用這項計劃，以「先聘用，後培訓」的模式滿足人力需求。

(e) 技能測驗

(i) 技能測驗是讓半技術工人／普通工人成為合格技工的途徑之一。僱主應鼓勵未註冊的電力裝置、升降機及自動梯工程員工報考 VTC 的技能測驗。

(ii) 承造建築工程機電項目的承辦商應鼓勵機電工程工人參加 CIC 的技能測驗或中工測試，成為註冊人員並符合《建造業工人註冊條例》的規定。

(f) 推動 VPET 及 STEM 教育

(i) 為了吸引更多青少年修讀工程相關課程，有需要提升職業教育及技能訓練在社會上的認識和地位。本會籲請僱主繼續支持「世界技能大賽」等青年技能競賽，提名公司內的年輕人才參加比賽。

(ii) 建議 VTC 的 STEM 教育中心與業界緊密協作，攜手推動 STEM 教育，並分享科技增進學習的經驗。

Electrical and Mechanical Services Training Board

Membership

(As at 1st December 2017)

Chairman

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

Members

Ir CHAN Hing-keung	(nominated by an Electric Railway Company)
Ir CHAN Wai-ping, Frankie	(nominated by the Hong Kong Electrical and Mechanical Contractors' Association Limited)
Mr CHAN Yun-fu	(nominated by the Hong Kong and Kowloon Electrical Engineering and Appliances Trade Workers Union)
Ir CHUNG Chi-ming	(nominated by an Electrical and Mechanical Engineering Consulting Company)
Ir Dr CHUNG Wai-nang	(nominated by an Aircraft Engineering Company)
Dr HUI Chun-man	(nominated by a Local University)
Ir KWAN Chung-ming	(nominated by an Electricity Supply Company)
Mr LAI Kam-to	(nominated by the Hong Kong and China Gas Company Limited)
Mr LAI Wah-hing	(nominated by the Lift and Escalator Contractors Association)
Ir LAU Lee-nin, David	(nominated by the Hong Kong Plumbing and Sanitary Ware Trade Association Ltd.)
Mr LAU Siu-hung, Anthony	(nominated by the Hong Kong and Kowloon Electric Trade Association)
Mr LEE Yiu-chung, Calvin	(nominated by a Local Craft Repairing Company)
Mr David Grant MURPHY	(nominated by an Ocean-going Vessel Repairing Company)
Ir TING Tsan-kau, Chris	(nominated by a Professional Body of the Building Services Operation and Maintenance Sector)

Ir WAI Yip-kin	(nominated by the Hong Kong Electrical Contractors' Association)
Ir WU Chi-fai	(nominated by the Hong Kong Air Conditioning & Refrigeration Association Limited)
Ir YEUNG Kwong-tung, Tony	(nominated by the Hong Kong Institution of Engineers)
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.)
Ir CHAN Ka-chung	(representing the Director of Electrical and Mechanical Services)
Mr LI Wai-kei	(representing of the Commissioner for Labour)
Ir Dr LIU Sai-lok, Eric	(representing 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

(二零一七年十二月一日)

主席 ：

莊堅烈先生, BBS, MH	(獨立人士)

委員 ：

陳慶強工程師	(一間電氣化鐵路公司提名)
陳偉平工程師	(香港機電工程商協會提名)
陳潤富先生	(港九電器工程電業器材職工會提名)
鍾志明工程師	(一間機電工程顧問公司提名)
鍾偉能博士、工程師	(一間飛機工程公司提名)
許俊民博士	(一間本地大學提名)
關仲明工程師	(一間電力司提名)
黎錦圖先生	(香港中華煤氣有限公司提名)
黎華興先生	(電梯業協會提名)
劉利年工程師	(香港水喉潔具商會有限公司提名)
劉少雄先生	(港九電業總會提名)
李耀忠先生	(一間本地船隻維修公司提名)
Mr David Grant MURPHY	(一間遠洋輪船維修公司提名)
丁燦球工程師	(一間屋宇設備運行及裝修專業團體提名)
韋業堅工程師	(香港電器工程商會有限公司提名)
胡志輝工程師	(香港空調及冷凍商會有限公司提名)
楊廣通工程師	(香港工程師學會提名)
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)
陳嘉聰工程師	(機電工程署署長代表)
李偉基先生	(勞工處處長代表)
廖世樂博士、工程師	(職業訓練局執行幹事代表)

秘書

馮明港先生	(職業訓練局)

Electrical and Mechanical Services Training Board

Membership of Working Party on Manpower Survey

(As at 1st December 2017)

Convener

Mr CHONG Kin-lit, Paul, BBS, MH

Members

Ir CHAN Hing-keung

Ir CHAN Wai-ping, Frankie

Ir Dr CHUNG Wai-nang

Mr LAI Kam-to

Ir LAU Lee-nin, David

Mr LEE Yiu-chung, Calvin

Mr David Grant MURPHY

Ir TING Tsan-kau, Chris

Ir WU Chi-fai

Mr YIU Chow-leung

Mr WAN Siu-chung

Ir WU Wai-ming

Secretary

Mr FUNG Ming-kong, Steve

機電工程業訓練委員會
人力調查工作小組委員名單

(二零一七年十二月一日)

召集人 ：

莊堅烈先生, BBS, MH

委員 ：

陳慶強工程師

陳偉平工程師

鍾偉能博士、工程師

黎錦圖先生

劉利年工程師

李耀忠先生

Mr David Grant MURPHY

丁燦球工程師

胡志輝工程師

姚秋樑先生

溫兆聰先生

胡惠明工程師

秘書

馮明港先生

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 Council) the development of vocational and professional education and training (VPET) facilities to meet the assessed manpower demand.

4. To advise the Council on the strategic development and quality assurance of its programmes in the relevant disciplines.

5. To prescribe job specifications for the principal jobs in the industry defining the skills and knowledge and advise on relevant training programme specifying the time a trainee needs to spend on each skill element.

6. 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.

7. To advise on the conduct of skill competitions in key trades in the industry for the promotion of VPET as well as participation in international competitions.

8. To liaise with relevant bodies, including employers, employers' associations, trade unions, professional institutions, training and educational institutions and government departments, on matters pertaining to the development and promotion of VPET in the industry.

9. To organise seminars/conferences/symposia on VPET for the industry.

10. To advise on the publicity relating to the activities of the Training Board and relevant VPET programmes of the Council.

11. 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.

12. 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. 就發展業內職業專才教育及訓練設施應付人力需求，向職業訓練局（下稱「局方」）提供意見。
4. 就相關學科的課程發展策略及質素保證，向局方提出建議。
5. 擬訂本業主要職務的工作範圍，界定所需的技能及知識，審議訓練方案，包括訂定每種技能所需的訓練期。
6. 對技術評估、技能測驗及認證制度提供意見，以確定從業員、學徒及見習員的技能水平。
7. 就本業主要行業舉辦技能比賽提供意見，以推廣職業專才教育和派員參加國際賽事。
8. 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，共商本業職業專才教育的發展與推廣事宜。
9. 為本業舉辦有關職業專才教育的研討會和會議。
10. 就訓練委員會工作和相關職業專才教育課程之推廣宣傳，向局方提供意見。
11. 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。
12. 根據《職業訓練局條例》第 7 條，負責局方所委派的其他工作。

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 2017 MANPOWER SURVEY OF THE ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機 電 工 程 業 2017 年 人 力 調 查

The 2017 Manpower Survey of the Electrical and Mechanical Services (E&M) Industry aims at collecting manpower information of the industry concerned for formulating recommendations on future manpower training. Please kindly provide the information of your establishment as at **23rd May 2017** by answering the questionnaire. Thank you.
機電工程業2017年人力調查旨在蒐集業內人力情況的最新資料，並按此為未來人力訓練制訂適當建議。懇請貴機構根據**2017年 5月23日**的人力情況填寫此問卷。多謝合作。

Establishment Information
機構資料

TYPE OF SERVICE: _____
服 務 性 質

(For official use)
Industry Code _____

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

Details of Contact Person
聯絡人資料

NAME OF PERSON TO CONTACT: _____
聯 絡 人 姓 名

POSITION: _____
職 位

TEL. NO.: _____ - _____
電 話

FAX NO.: _____
圖 文 傳 真

E-MAIL: _____
電 郵

E

Survey Reference Date: 23 May 2017
統計日期：2017年5月23日

Part I – Manpower Information
第一部份 – 人力情況

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

(A) Principal Jobs 主要職務

1. 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。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	**(A)** Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	**(B)** Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	**(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
101	Building Services Engineer 屋宇設備工程師						
102	Electrical Engineer 電機工程師						
103	Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師						
104	Mechanical Engineer 機械工程師						
105	Plumbing and Drainage Engineer 水喉及渠務工程師						
106	Lift/Escalator Engineer 升降機／自動梯工程師						
107	Fire Services Engineer 消防設備工程師						
108	Electronics Engineer 電子工程師						
109	Control and Instrumentation Engineer 控制及儀器工程師						
110	Engineering Manager 工程經理						
111	Safety Officer 安全主任						
112	Aircraft Maintenance Engineer 飛機維修工程師						

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。

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

2. 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完成工作。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	(B) Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	(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
201	Supervisor 監督						
202	Building Services Technician 屋宇設備技術員						
203	Draughtsman 繪圖員						
204	Electrical Engineering Technician 電機工程技術員						
205	Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員						
206	Mechanical Engineering Technician 機械工程技術員						
207	Lift/Escalator Technician 升降機／自動梯技術員						
208	Fire Services Technician 消防設備技術員						
209	Electrical Instrument and Meter Technician 電工儀器技術員						
210	Electronics Technician 電子技術員						
211	Telecommunication Technician 電訊技術員						
212	Office Equipment Service Technician 辦公室設備維修技術員						
213	Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員						
214	Aircraft Maintenance Technician 飛機維修技術員						
215	Rolling Stock Technician 鐵道車輛技術員						
216	Railway Signalling Technician 鐵路訊號技術員						

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。

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

3. 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。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	(B) Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	(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
301	Foreman/Chargehand 管工／領工						
302	Building Services Mechanic 屋宇設備技工						
303	Electrician/Electrical Fitter 電工／電氣打磨裝配工						
304	Control Panel Assembler 控制板裝配工						
305	Electrical Wireman 電氣佈線工						
306	Refrigeration/Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)						
307	Refrigeration/Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)						
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						
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						
310	Refrigeration/Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)						
311	Plumber and Pipe Fitter 喉管工						
312	Mechanical Fitter/Machinist 機械打磨裝配工／機床工						
313	Lift Mechanic 升降機技工						
314	Escalator Mechanic 自動梯技工						
315	Fire Services Electrical Fitter 消防電氣裝配工						
316	Fire Services Mechanical Fitter 消防機械裝配工						
317	Cable Jointer (Power) 強電流電纜接駁工						
318	Overhead Linesman 架空電線技工						

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。

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

3. Tradesman/Craftsman (con't) 技工 (續)

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	(B) Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	(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
319	Electrical Appliances Service Mechanic 電器用具服務技工						
320	Welder 焊接工						
321	Carpenter 木工						
322	Painter 髹漆工						
323	AV and RF Mechanic 影音及射頻技工						
324	Building Security System Mechanic 屋宇防盜系統技工						
325	Communication System Mechanic 電訊系統裝配工						
329	Aircraft Maintenance Mechanic 飛機維修技工						
330	Rolling Stock Tradesman 鐵道車輛技工						
331	Railway Signalling Tradesman 鐵路訊號技工						

4. 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。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	(B) Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	(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
401	Labourer 雜工						
402	Semi-skilled Worker 半技術工						

(B) Number of non-E&M related staff (incl. Trainees#)
從事非機電工程相關的工作人員人數（包括受訓者#） 000

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。

Part II － Manpower Flow
第二部份 － 人力動向

1. Number of new graduates recruited between 1st May and the Survey reference date by job levels (excluding trainees):
貴機構在2017年5月1日至統計日期間，各技能等級共招聘的新畢業生人數（不包括受訓者）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工		(d) Semi-skilled / General Worker 半技術／普通工人	

2. Number of employees, including those who had retired, left your organisation in the past 12 months by job levels (excluding trainees):
貴機構過去12個月內各技能等級離職的僱員人數（包括年屆退休而離職的僱員，但不包括受訓者）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工		(d) Semi-skilled / General Worker 半技術／普通工人	

3. Number of employees recruited from E&M services industry by your organisation in the past 12 months by job levels (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各技能等級的僱員人數（不包括新畢業生、從其他行業轉任者或受訓者）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工		(d) Semi-skilled / General Worker 半技術／普通工人	

4. 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 by job levels:
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個月的各技能等級的僱員人數：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工			

5. No. of Hong Kong E&M workers (on Macau payroll) employed in Macau by the subsidiary/associated companies of your organization at the Survey reference date by job levels:
在統計日期間，受僱於貴機構在澳門的附屬公司之各技能等級的香港機電工程僱員人數（由澳門公司發放薪金）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工			

6. What has been the situation of manpower supply of different job levels for the industry in the past 12 months? (Please tick as appropriate.)
過去12個月內，行業各技能等級僱員的人力供應情況如何？ (請在適當方格內填上 ✓ 號。)

	Very Insufficient 非常缺乏	Insufficient 缺乏	Sufficient 充裕	Very Sufficient 非常充裕	No Comment 無意見
(a) Professional / Technologist 專業人士／技師	☐	☐	☐	☐	☐
Trainees of Professional / Technologist 專業人士／技師的受訓者	☐	☐	☐	☐	☐
(b) Technician 技術員	☐	☐	☐	☐	☐
Trainees of Technician 技術員的受訓者	☐	☐	☐	☐	☐
(c) Tradesman / Craftsman 技工	☐	☐	☐	☐	☐
Trainees of Tradesman / Craftsman 技工的受訓者	☐	☐	☐	☐	☐
(d) Semi-skilled / General Worker 半技術／普通工人	☐	☐	☐	☐	☐

7. 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:
請填寫貴機構各技能等級的僱員，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：

	Contracting* 承造*	Servicing* 維修服務*
(a) Professional / Technologist 專業人士／技師	%	%
(b) Technician 技術員	%	%
(c) Tradesman / Craftsman 技工	%	%
(d) Semi-skilled / General Worker 半技術／普通工人	%	%

* "Contracting" involves works of design, planning, installation, testing and commissioning of various electrical and mechanical equipment and systems. "Servicing" involves works of maintaining and repairing of electrical and mechanical equipment and systems, including the provision of energy supply and public utilities services in this manpower survey.
* 「承造」指設計、規劃、安裝、測試及投運試驗各種機電設備和系統的工作。「維修服務」指保養和修理機電設備和系統的工作。在本人力調查中亦包括提供能源及公用事業服務等。

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

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 2017 MANPOWER SURVEY OF THE ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機 電 工 程 業 2017 年 人 力 調 查

The 2017 Manpower Survey of the Electrical and Mechanical Services (E&M) Industry aims at collecting manpower information of the industry concerned for formulating recommendations on future manpower training. Please kindly provide the information of your establishment as at **23rd May 2017** by answering the questionnaire. Thank you.

機電工程業2017年人力調查旨在蒐集業內人力情況的最新資料，並按此為未來人力訓練制訂適當建議。懇請貴機構根據**2017年 5月23日**的人力情況填寫此問卷。多謝合作。

Establishment Information
機構資料

TYPE OF SERVICE: _____
服 務 性 質

(For official use)
Industry Code _____

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

Details of Contact Person
聯絡人資料

NAME OF PERSON TO CONTACT: _____
聯 絡 人 姓 名

POSITION: _____
職 位

TEL. NO.: _____ - _____
電 話

FAX NO.: _____
圖 文 傳 真

E-MAIL: _____
電 郵

S

Survey Reference Date: 23 May 2017
統計日期：2017年5月23日

Part I － Manpower Information
第一部份 － 人力情況

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

(A) Principal Jobs 主要職務

1. 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。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	**(A)** Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	**(B)** Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	**(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
151	Electrical Engineer 電機工程師						
152	Marine Engineer 輪機工程師						
153	Mechanical Engineer 機械工程師						
154	Ship Designer/Naval Architect 船舶設計師／造船工程師						
155	Ship Repairs Manager/Superintendent 船舶修理主管或船舶修理監督						
156	Safety Officer 安全主任						

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。

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

2. 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完成工作。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	**(A)** Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	**(B)** Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	**(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
251	Draughtsman 繪圖員						
252	Electrical Engineering Technician 電機工程技術員						
253	Electronics/Telecommunication Technician 電子／通訊技術員						
254	Estimator 估計員						
255	Mechanical Engineering Technician 機械工程技術員						
256	Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員						
257	Supervisor/Foreman 監督／管工						

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。

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

3. 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。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	(B) Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	(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
351	Air-conditioning Mechanic/Sheet Metal Worker 空氣調節技工／薄片金屬構造工						
352	Carpenter 木工						
353	Crane Driver 起重機操作工						
354	Electrician 電工						
355	Mechanical Fitter 機械打磨裝配工						
356	GRP - Worker 玻璃纖維工						
357	Machinist 機床工						
358	Marine Pipeworker 船舶喉管工						
359	Painter 髹漆工						
360	Rigger 索具工／喊吔工						
361	Ship Classification Qualified Welder 船級協會認可焊接工						
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)						
363	Welder 焊接工						

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。

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

4. 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。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	**(A)** Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	**(B)** Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	**(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
451	Labourer 雜工						
452	Semi-skilled Worker 半技術工						

(B) Number of non-E&M related staff (incl. Trainees#)
從事非機電工程相關的工作人員人數（包括受訓者#） 000

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。

Part II － Manpower Flow
第二部份 － 人力動向

1. Number of new graduates recruited between 1st May and the Survey reference date by job levels (excluding trainees):
貴機構在2017年5月1日至統計日期間，各技能等級共招聘的新畢業生人數（不包括受訓者）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工		(d) Semi-skilled / General Worker 半技術／普通工人	

2. Number of employees, including those who had retired, left your organisation in the past 12 months by job levels (excluding trainees):
貴機構過去12個月內各技能等級離職的僱員人數（包括年屆退休而離職的僱員，但不包括受訓者）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工		(d) Semi-skilled / General Worker 半技術／普通工人	

3. Number of employees recruited from E&M services industry by your organisation in the past 12 months by job levels (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各技能等級的僱員人數（不包括新畢業生、從其他行業轉任者或受訓者）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工		(d) Semi-skilled / General Worker 半技術／普通工人	

4. 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 by job levels:
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個月的各技能等級的僱員人數：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工			

5. No. of Hong Kong E&M workers (on Macau payroll) employed in Macau by the subsidiary/associated companies of your organization at the Survey reference date by job levels:
在統計日期間，受僱於貴機構在澳門的附屬公司之各技能等級的香港機電工程僱員人數（由澳門公司發放薪金）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工			

6. What has been the situation of manpower supply of different job levels for the industry in the past 12 months? (Please tick as appropriate.)
過去12個月內，行業各技能等級僱員的人力供應情況如何？ (請在適當方格內填上 ✓ 號。)

	Very Insufficient 非常缺乏	Insufficient 缺乏	Sufficient 充裕	Very Sufficient 非常充裕	No Comment 無意見
(a) Professional / Technologist 專業人士／技師	☐	☐	☐	☐	☐
Trainees of Professional / Technologist 專業人士／技師的受訓者	☐	☐	☐	☐	☐
(b) Technician 技術員	☐	☐	☐	☐	☐
Trainees of Technician 技術員的受訓者	☐	☐	☐	☐	☐
(c) Tradesman / Craftsman 技工	☐	☐	☐	☐	☐
Trainees of Tradesman / Craftsman 技工的受訓者	☐	☐	☐	☐	☐
(d) Semi-skilled / General Worker 半技術／普通工人	☐	☐	☐	☐	☐

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

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 2017 MANPOWER SURVEY OF THE ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機 電 工 程 業 2017 年 人 力 調 查

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機電工程業2017年人力調查旨在蒐集業內人力情況的最新資料，並按此為未來人力訓練制訂適當建議。懇請貴機構根據**2017年 5月23日**的人力情況填寫此問卷。多謝合作。

Establishment Information
機構資料

TYPE OF SERVICE: _____
服 務 性 質

(For official use)
Industry Code _____

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

Details of Contact Person
聯絡人資料

NAME OF PERSON TO CONTACT: _____
聯 絡 人 姓 名

POSITION: _____
職 位

TEL. NO.: _____ - _____
電 話

FAX NO.: _____
圖 文 傳 真

E-MAIL: _____
電 郵

G

Survey Reference Date: 23 May 2017
統計日期：2017年5月23日

Part I － Manpower Information
第一部份 － 人力情況

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

(A) Principal Jobs 主要職務

1. 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。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	**(A)** Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	**(B)** Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	**(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
171	Electrical Engineer 電機工程師						
172	Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）						
173	Mechanical Engineer 機械工程師						
174	Safety Officer 安全主任						

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。

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

2. 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完成工作。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	(B) Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	(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
271	Electrical Engineering Technician 電機工程技術員						
272	Gas Engineering Technician 氣體燃料工程技術員						
273	Mechanical Engineering Technician 機械工程技術員						
274	Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員						
275	Supervisor/Chargehand 監督／管工						

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。

Please complete columns 'A' to 'G' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job. Please insert a zero (0) for any column not applicable to your establishment.
請根據列表中的主要職務，並參考附錄B有關各種職務的工作說明來填寫表內各欄 'A' 至 'G'。並在不適用的欄內填零（0）。

3. 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。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	(B) Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	(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
371	Electrician/Electrical Fitter 電工／電氣打磨裝配工						
372	Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）						
373	Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）						
374	Gas Utilisation Fitter (Domestic) 氣體燃料應用技工（住宅式）						
375	Gas Utilisation Fitter (Non-domestic) 氣體燃料應用技工（非住宅式）						
376	Mechanical Fitter 機械打磨裝配工						
377	Welder 焊接工						

4. 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。

Please refer to Appendix A for column explanations. 請參考附錄A內各欄的說明。

Job Code 職位編號	(A) Principal Jobs 主要職務 (See Appendix B) (參閱附錄B)	(B) Average Monthly Income Range (Please enter the appropriate code below) 每月平均收入幅度 (請填上下列適當編號) Code 編號: 1 $9,000 or below 或以下; 2 $9,001 - $12,000; 3 $12,001 - $15,000; 4 $15,001 - $18,000; 5 $18,001 - $25,000; 6 $25,001 - $35,000; 7 $35,001 - $45,000; 8 $45,001 - $60,000; 9 Over $60,000 以上	(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
	Driver (LPG Cylinder Wagon) 司機（石油氣瓶車）						
471	Labourer 雜工						
472	Semi-skilled Worker 半技術工						
473							

(B) Number of non-E&M related staff (incl. Trainees#)
從事非機電工程相關的工作人員人數（包括受訓者#） 000

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。

Part II － Manpower Flow
第二部份 － 人力動向

1. Number of new graduates recruited between 1st May and the Survey reference date by job levels (excluding trainees):
貴機構在2017年5月1日至統計日期間，各技能等級共招聘的新畢業生人數（不包括受訓者）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工		(d) Semi-skilled / General Worker 半技術／普通工人	

2. Number of employees, including those who had retired, left your organisation in the past 12 months by job levels (excluding trainees):
貴機構過去12個月內各技能等級離職的僱員人數（包括年屆退休而離職的僱員，但不包括受訓者）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工		(d) Semi-skilled / General Worker 半技術／普通工人	

3. Number of employees recruited from E&M services industry by your organisation in the past 12 months by job levels (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各技能等級的僱員人數（不包括新畢業生、從其他行業轉任者或受訓者）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工		(d) Semi-skilled / General Worker 半技術／普通工人	

4. 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 by job levels:
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個月的各技能等級的僱員人數：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工			

5. No. of Hong Kong E&M workers (on Macau payroll) employed in Macau by the subsidiary/associated companies of your organization at the Survey reference date by job levels:
在統計日期間，受僱於貴機構在澳門的附屬公司之各技能等級的香港機電工程僱員人數（由澳門公司發放薪金）：

(a) Professional / Technologist 專業人士／技師		(b) Technician 技術員	
(c) Tradesman / Craftsman 技工			

6. What has been the situation of manpower supply of different job levels for the industry in the past 12 months? (Please tick as appropriate.)
過去12個月內，行業各技能等級僱員的人力供應情況如何？ (請在適當方格內填上 ✓ 號。)

	Very Insufficient 非常缺乏	Insufficient 缺乏	Sufficient 充裕	Very Sufficient 非常充裕	No Comment 無意見
(a) Professional / Technologist 專業人士／技師	☐	☐	☐	☐	☐
Trainees of Professional / Technologist 專業人士／技師的受訓者	☐	☐	☐	☐	☐
(b) Technician 技術員	☐	☐	☐	☐	☐
Trainees of Technician 技術員的受訓者	☐	☐	☐	☐	☐
(c) Tradesman / Craftsman 技工	☐	☐	☐	☐	☐
Trainees of Tradesman / Craftsman 技工的受訓者	☐	☐	☐	☐	☐
(d) Semi-skilled / General Worker 半技術／普通工人	☐	☐	☐	☐	☐

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

The 2017 Manpower Survey of the
Electrical and Mechanical Services Industry
機電工程業 2017 年人力調查

Explanatory Notes
附　註

1. Principal Jobs - Column 'A'
主要職務——'A' 欄

(a) Please go through column 'A' and mark those principal jobs applicable to your establishment. For detailed job descriptions for principal jobs, please refer to Appendix B.
請瀏覽 'A' 欄，選取適用於 貴機構的主要職務。有關詳細的工作說明，請參閱 附錄 B。

(b) Please add in column 'A' titles of any technical jobs not mentioned in the job descriptions (Appendix B); briefly describe them and indicate their skill levels.
如 貴機構另有技術性主要職務未載於工作說明（附錄 B），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）。

2. 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 during the past 12 months (1.6.2016 - 31.5.2017) for each principal 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' 欄填入每個主要職務僱員 過去十二個月（指二〇一六年六月一日至二〇一七年五月三十一日期間）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。

3. 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 principal 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主要職務的員工總數。此總數不包括受訓者人數。

4. 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 of 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）。

5. 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。

6. 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。

7. 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。

THE 2017 MANPOWER SURVEY OF THE
ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機電工程業 2017 年人力調查

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	Principal Jobs 主要職務	Job Description 工作說明
1. 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。
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。

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
1. PROFESSIONAL/TECHNOLOGIST (Continued)　專業人士／技師（續）		
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。
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	Principal Jobs 主要職務	Job Description 工作說明
2. 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。
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。

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
2. TECHNICIAN (Continued)	**技術員（續）**	
210	Electronics Technician 電子技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, construction, installation, operation, maintenance and repair of electronic devices and equipment other than telecommunication systems. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、建造、安裝、操作、保養及修理電子裝置及設備（電訊系統除外）。
211	Telecommunication Technician 電訊技術員	Performs technical tasks, either independently or under the direction of a qualified engineer, contributory to design, development, installation, operation, maintenance and repair of telecommunication systems and equipment. 單獨或在有資歷工程師的指導下，擔任技術性工作，從事設計、發展、安裝、操作、保養及修理電訊系統及設備。
212	Office Equipment Service Technician 辦公室設備維修技術員	Checks, tests, installs, maintains and services, repairs and overhauls general office equipment including electronic business equipment and copying machines, in both workshops and customers' premises. 在工場或顧客事務所查驗、測試、安裝、保養及檢修、修理及大修各項常用辦公室裝置，包括電子商業設備及各類複印機器。
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。
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。

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
3. TRADESMAN/CRAFTSMAN	**技工**	
301	Foreman/Chargehand 管工／領工	Organises and directs groups or teams of craftsmen or other workers. 組織及督導若干組或若干隊技工或其他工人。
302	Building Services Mechanic 屋宇設備技工	Installs, operates, maintains and repairs various types of building services systems and equipment. 安裝、操作、保養和維修各類屋宇裝置及設備。
303	Electrician/ Electrical Fitter 電工／ 電氣打磨裝配工	Installs, tests, maintains and repairs electrical installations including electrical wiring in accordance with regulations and specifications; fits, assembles, erects, installs, maintains and repairs electrical plant and equipment other than refrigeration/air-conditioning/ventilation electrical control, low voltage switchboards and control panels. 依據規例及規格安裝、測試、保養和維修電力裝置，包括敷電線；裝配、組合、設置、安裝、保養及修理各類電氣裝置及設備（控制板及空調製冷設備電力控制除外）。
304	Control Panel Assembler 控制板裝配工	Fits, assembles, installs and repairs low voltage switchboards and control panels, for electrical plants and equipment. 裝配、組合、安裝及修理用於電氣裝置及設備的低電壓電線制箱及控制板。
305	Electrical Wireman 電氣佈線工	Installs and lays wiring for electrical systems and equipment. 安裝和敷設用於電氣裝置及設備的電線。
306	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	Fits, assembles, installs, commissions, maintains and repairs electrical control for: (a) air-conditioning systems including refrigerating, air-handling and ventilation equipment; (b) cold stores, ice-making and other refrigerating equipment; (c) air-conditioning and ventilation equipment forming part of fire services systems. 裝配、組合、安裝、試動、保養和修理用於下列設備的電力控制： (甲) 空調系統，包括冷凝、空氣處理及通風設備； (乙) 冷藏庫、製冰及其他冷凝設備； (丙) 與消防系統有關連的空調系統及通風設備等。
307	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	Fits, assembles, installs, commissions, maintains and repairs: (a) unitary air-conditioning systems including refrigerating, air-handling and ventilation equipment; (b) unitary cold stores, ice-making and other refrigerating equipment. 裝配、組合、安裝、試動、保養和修理： (甲) 獨立安裝的空調系統和通風設備； (乙) 獨立安裝的冷藏庫、製冰及其他冷凝設備。
308	Refrigeration/ Air-conditioning/ Ventilation Mechanic(Air System)/ Sheet Metal Worker 空調製冷設備技工(送風系統)／薄片金屬構造工	Fabricates, installs and repairs sheet metal assemblies and products (including ventilation ducting, dampers, fire resistant board and fittings). 製造、裝置及修理薄片金屬組合及製品(包括通風槽、風閘、防火板及有關裝置)。
309	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	Prepares, fits, fixes and repairs thermal insulations of air-conditioning and refrigeration plants. 準備、裝配、設置和修理空氣調節及冷凝裝置的保溫設備。

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
3. TRADESMAN/CRAFTSMAN (Continued)　技工（續）		
310	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	Fits, assembles, installs, commissions, maintains and repairs water systems for air-conditioning systems (including air-handling and water condensing equipment). 裝配、組合、安裝、試動、保養和修理用於空調系統(包括空氣處理及水冷凝設備)的水系統。
311	Plumber and Pipe Fitter 喉管工	Assembles, installs and maintains pipes, fittings and fixtures for conveying gases and liquids other than refrigeration, air-conditioning, ventilation and fire services piping. 組合、安裝及保養用以供應氣體和液體的喉管及裝置（消防及空調製冷設備喉管除外）。
312	Mechanical Fitter/ Machinist 機械打磨裝配工／ 機床工	Fits, assembles, erects, installs, repairs and services mechanical plant and equipment; sets up and operates machine tools to make products to specified tolerances and surface finishes. 打磨、裝配、裝置、安裝、修理及檢修機械設備；裝設及操作機械工具，製作產品以符合規定的公差及表面公度。
313	Lift Mechanic 升降機技工	Installs, adjusts, services, maintains and repairs various types of lifts. 安裝、校正、檢修、保養及修理各類升降機設備。
314	Escalator Mechanic 自動梯技工	Installs, adjusts, services, maintains and repairs various types of escalators. 安裝、校正、檢修、保養及修理各類自動梯設備。
315	Fire Services Electrical Fitter 消防電氣裝配工	Installs, tests, maintains, repairs and inspects automatic fire alarm (AFA) and manual fire alarm systems, and electrical/electronic parts of fire services systems. 安裝、測試、保養、修理及查驗自動及手動火警警報系統及消防系統電氣和電子設備。
316	Fire Services Mechanical Fitter 消防機械裝配工	Installs, tests, maintains, repairs and inspects fire services piping systems and mechanical parts of fire services systems. 安裝、測試、保養、修理及查驗消防設備喉管及消防系統機械設備。
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）。

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
3. TRADESMAN/CRAFTSMAN (Continued)　技工（續）		
320	Welder 焊接工	Joins, cuts and deposits metals by means of an electric arc or a gas flame or by other welding or brazing processes. Holds the BS EN 287-1 qualification or a welder's license (skilled or semi-skilled workers) issued by CIC. 使用電弧、氣體火焰、黃銅焊接或其他焊接法，以接合、割切及附合金屬。持有 BS EN 287-1 資格或建造業議會發出的焊接工註冊證(大工或中工)。
321	Carpenter 木工	Cuts out, assembles, erects and repairs structural and other woodwork. 鋸切、裝配、架設及修理木架及其他木材結構。
322	Painter 髹漆工	Prepares surfaces, selects, mixes and applies paint. 擔任物品表面的打灰與磨滑、選油、混色及塗漆等工作。
323	AV and RF Mechanic 影音及射頻技工	Installs, maintains and repairs television receivers, consumer video equipment and community antenna systems. 安裝、保養及修理電視機、影音設備及公用天線系統。
324	Building Security System Mechanic 屋宇防盜系統技工	Installs, maintains and repairs building security systems including building doorphone systems, CCTV systems, public address systems and security alarm systems and access control system. 安裝、保養及修理各類屋宇防盜系統包括訪客對講機系統、閉路電視系統、擴音系統及防盜警報系統及進出控制系統。
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	Principal Jobs 主要職務	Job Description 工作說明
4. 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。

THE 2017 MANPOWER SURVEY OF THE
ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機電工程業2017年人力調查

JOB DESCRIPTIONS FOR THE PRINCIPAL JOBS
IN THE SHIPBUILDING AND SHIP REPAIR SECTOR
船舶修建行業主要職務工作說明

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
1. 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。
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。

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
1. PROFESSIONAL/TECHNOLOGIST (Continued) 專業人士／技師（續）		
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。
2. 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。
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	Principal Jobs 主要職務	Job Description 工作說明
3. TRADESMAN/CRAFTSMAN 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／嘅吔工	Responsible for the rigging of ship's derricks, masts, lifeboat davits, staging and other rope work. 負責船上吊杆、船桅、救生艇吊架、架板及其他的索具裝配工作。
361	Ship Classification Qualified Welder 船級協會認可焊接工	Being certified by the ship classification societies as qualified welder to perform welding jobs 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. Holds the BS EN 287-1 qualification or a welder's license (skilled or semi-skilled workers) issued by CIC. 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。持有BS EN 287-1資格或建造業議會發出的焊接工註冊證(大工或中工)。

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
4. 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。

THE 2017 MANPOWER SURVEY OF THE
ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機電工程業2017年人力調查

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	Principal Jobs 主要職務	Job Description 工作說明
1. 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。
2. 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。

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
2. TECHNICIAN (Continued)　技術員（續）		
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。
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。
3. 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。
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。

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
3. TRADESMAN/CRAFTSMAN (Continued)　技工（續）		
377	Welder 焊接工	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. Holds the BS EN 287-1 qualification or a welder's license (skilled or semi-skilled workers) issued by CIC. 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。持有BS EN 287-1資格或建造業議會發出的焊接工註冊證(大工或中工)。
4. 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, including assisting the driver in the delivery of LPG cylinder. 擔任有關氣體燃料行業的一般雜務工作，包括協助司機運送石油氣瓶。
473	Semi-skilled Worker 半技術工	Assists skilled tradesmen in the industry. 協助業內的技工工作。

Appendix 5(A)
附錄 5(A)

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 May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年5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	1 643	74	104	66	1 742
Electrical Engineer 電機工程師	2 581	137	154	121	2 698
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	1 059	44	50	41	1 095
Mechanical Engineer 機械工程師	911	59	67	49	958
Plumbing and Drainage Engineer 水喉及渠務工程師	230	15	1	14	231
Lift/Escalator Engineer 升降機／自動梯工程師	295	36	23	40	304
Fire Services Engineer 消防設備工程師	480	10	40	9	519
Electronics Engineer 電子工程師	564	14	28	12	592
Control and Instrumentation Engineer 控制及儀器工程師	92	2	5	2	97
Engineering Manager 工程經理	1 610	5	23	29	1 632
Safety Officer 安全主任	483	11	33	11	509
Aircraft Maintenance Engineer 飛機維修工程師	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	Forecasted No. of Trainees by May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	34	-	-	-	34
Sub-total 小計	**9 985**	**407**	**528**	**394**	**10 414**
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	3 440	6	119	5	3 547
Building Services Technician 屋宇設備技術員	1 803	59	49	51	1 661
Draughtsman 繪圖員	639	8	17	9	656
Electrical Engineering Technician 電機工程技術員	2 432	185	70	154	2 544
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	1 563	67	57	137	1 602
Mechanical Engineering Technician 機械工程技術員	1 206	131	115	93	1 356
Lift/Escalator Technician 升降機／自動梯技術員	797	3	57	4	831
Fire Services Technician 消防設備技術員	827	22	31	18	858
Electrical Instrument and Meter Technician 電工儀器技術員	175	-	4	-	179
Electronics Technician 電子技術員	833	2	29	1	861
Telecommunication Technician 電訊技術員	711	40	70	49	768
Office Equipment Service Technician 辦公室設備維修技術員	54	12	6	12	60

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 May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年5月時的僱員人數
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	242	-	8	-	248
Rolling Stock Technician 鐵道車輛技術員	870	-	3	-	873
Railway Signalling Technician 鐵道訊號技術員	372	-	8	-	380
Sub-total 小計	**15 964**	**535**	**643**	**533**	**16 424**
TRADESMAN/craftsman LEVEL 技工級					
Foreman/Chargehand 管工／領工	4 040	122	168	117	4 146
Building Services Mechanic 屋宇設備技工	4 012	96	128	124	4 166
Electrician/Electrical Fitter 電工／電氣打磨裝配工	8 867	463	343	443	9 208
Control Panel Assembler 控制板裝配工	76	3	3	3	79
Electrical Wireman 電氣佈線工	1 816	107	85	147	1 960
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	1 712	265	95	256	1 819
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	3 217	100	27	115	3 250
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	789	20	12	30	732

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 May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 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	117	-	-	6	123
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	398	11	14	17	418
Plumber and Pipe Fitter 喉管工	977	1	45	1	1 046
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	1 871	398	217	335	2 149
Lift Mechanic 升降機技工	2 018	138	99	128	2 062
Escalator Mechanic 自動梯技工	1 283	141	196	171	1 424
Fire Services Electrical Fitter 消防電氣裝配工	1 083	33	22	32	1 104
Fire Services Mechanical Fitter 消防機械裝配工	965	19	17	19	942
Cable Jointer (Power) 強電流電纜接駁技工	500	26	1	24	501
Overhead Linesman 架空電線技工	139	14	6	10	145
Electrical Appliances Service Mechanic 電器用具維修技工	988	2	8	4	995
Welder 焊接工	217	-	1	-	217
Carpenter 木工	106	-	-	-	106
Painter 髹漆工	84	-	3	-	87
AV and RF Mechanic 影音及射頻技工	71	2	2	2	73

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 May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
Building Security System Mechanic 屋宇防盜系統技工	63	12	2	10	65
Communication System Mechanic 電訊系統裝配工	1 496	27	7	48	1 507
Rolling Stock Tradesman 鐵道車輛技工	596	-	5	-	601
Railway Signalling Tradesman 鐵道訊號技工	4	-	-	-	4
Sub-total 小計	**37 505**	**2 000**	**1 506**	**2 042**	**38 929**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人					
Labourer 雜工	1 765	-	77	-	1 848
Semi-skilled Worker 半技術工人	1 375	-	138	-	1 521
Sub-total 小計	3 140	-	**215**	-	**3 369**
GRAND TOTAL 總　計	**66 594**	**2 942**	**2 892**	**2 969**	**69 136**

Appendix 5(B)
附錄 5(B)

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 May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年5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	227	6	15	12	231
Electrical Engineer 電機工程師	663	28	51	28	688
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	633	2	28	5	641
Mechanical Engineer 機械工程師	104	8	4	8	99
Plumbing and Drainage Engineer 水喉及渠務工程師	10	2	1	2	11
Fire Services Engineer 消防設備工程師	397	-	38	-	434
Electronics Engineer 電子工程師	200	-	1	-	201
Control and Instrumentation Engineer 控制及儀器工程師	20	-	-	-	20
Engineering Manager 工程經理	406	3	3	25	408
Safety Officer 安全主任	200	-	10	-	206

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 May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年5月時的僱員人數
Sub-total 小計	**2 860**	**49**	**151**	**80**	**2 939**
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	980	2	6	2	980
Building Services Technician 屋宇設備技術員	213	4	2	4	215
Draughtsman 繪圖員	195	-	2	1	198
Electrical Engineering Technician 電機工程技術員	599	8	16	8	615
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	962	38	23	107	975
Mechanical Engineering Technician 機械工程技術員	51	-	1	-	52
Fire Services Technician 消防設備技術員	709	20	22	16	731
Electrical Instrument and Meter Technician	68	-	-	-	68
Electronics Technician 電子技術員	190	-	1	-	191
Telecommunication Technician 電訊技術員	455	4	21	14	463
Office Equipment Service Technician 辦公室設備維修技術員	6	12	6	12	12
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	90	-	-	-	90
Sub-total 小計	**4 518**	**88**	**100**	**164**	**4 590**

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 May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年5月時的僱員人數
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	939	-	-	-	879
Building Services Mechanic 屋宇設備技工	1 081	-	-	40	1 087
Electrician/Electrical Fitter 電工／電氣打磨裝配工	4 462	159	112	189	4 569
Control Panel Assembler 控制板裝配工	36	-	-	-	36
Electrical Wireman 電氣佈線工	1 437	101	77	141	1 573
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	1 185	82	15	136	1 212
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	2 384	46	6	66	2 396
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	589	20	12	30	607
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫) ／保溫技工	116	-	-	6	122
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	296	11	10	17	312
Plumber and Pipe Fitter 喉管工	20	-	-	-	20

Job Title 職 稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間空缺數目	Forecasted No. of Trainees by May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年5月時的僱員人數
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	20	-	-	-	20
Fire Services Electrical Fitter 消防電氣裝配工	1 064	30	20	30	1 083
Fire Services Mechanical Fitter 消防機械裝配工	949	19	15	19	924
Cable Jointer (Power) 強電流電纜接駁技工	200	-	-	-	200
Electrical Appliances Service Mechanic 電器用具服務技工	80	-	-	-	80
Welder 焊接工	70	-	-	-	69
Carpenter 木工	84	-	-	-	84
Painter 髹漆工	3	-	-	-	3
AV and RF Mechanic 影音及射頻技工	44	2	2	2	46
Building Security System Mechanic 屋宇防盜系統技工	2	2	2	2	4
Communication System Mechanic 電訊系統裝配工	1 387	-	3	8	1 394
Sub-total 小計	**16 448**	**472**	**274**	**686**	**16 720**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL　半技術工人／普通工人					
Labourer 雜工	886	-	30	-	914
Semi-skilled Worker 半技術工人	658	-	67	-	721
Sub-total 小計	**1 544**	**-**	**97**	**-**	**1 635**
GRAND TOTAL 總　計	**25 370**	**609**	**622**	**930**	**25 884**

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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 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	17	-	2	-	19
Electrical Engineer 電機工程師	27	-	4	-	31
Plumbing and Drainage Engineer 水喉及渠務工程師	60	2	-	1	60
Fire Services Engineer 消防設備工程師	3	-	-	-	3
Engineering Manager 工程經理	15	-	-	-	15
Safety Officer 安全主任	7	-	-	-	7
Sub-total 小計	**129**	**2**	**6**	**1**	**135**
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	53	-	1	-	54
Building Services Technician 屋宇設備技術員	29	-	-	-	29
Draughtsman 繪圖員	36	1	1	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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
Electrical Engineering Technician 電機工程技術員	55	3	4	6	59
Refrigeration/ Air-conditioning/ Ventilation Technician 冷氣／空氣調節／通風設備技術員	10	-	-	-	10
Mechanical Engineering Technician 機械工程技術員	8	-	1	-	9
Electrical Instrument and Meter Technician 電工儀器技術員	5	-	-	-	5
Assistant Safety Officer/ Safety Supervisor 助理安仕主任／安全督導員	3	-	-	-	3
Sub-total 小計	**199**	**4**	**7**	**7**	**206**
TRADESMAN/ CRAFTSMAN LEVEL　技工級					
Foreman/Chargehand 管工／領工	153	-	1	-	154
Building Services Mechanic 屋宇設備技工	546	12	4	12	546
Electrician/Electrical Fitter 電工／電氣打磨裝配工	1 178	9	27	9	1 179
Electrical Wireman 電氣佈線工	135	4	2	3	137
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	29	-	-	-	29
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	77	4	-	4	77

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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 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)	26	-	-	-	26
Plumber and Pipe Fitter 喉管工	645	1	29	1	699
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	2	-	2	-	2
Electrical Appliances Service Mechanic 電器用具維修技工	17	-	-	-	17
Painter 髹漆工	4	-	-	-	4
Communication System Mechanic 電訊系統裝配工	4	-	-	-	4
Sub-total 小計	**2 816**	**30**	**65**	**29**	**2 874**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL　半技術工人／普通工人					
Labourer 雜工	61	-	4	-	61
Semi-skilled Worker 半技術工人	51	-	1	-	64
Sub-total 小計	**112**	**-**	**5**	**-**	**125**
GRAND TOTAL 總　計	**3 256**	**36**	**83**	**37**	**3 340**

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

BRANCH II: 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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 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	721	40	39	27	766
Electrical Engineer 電機工程師	1 299	87	54	73	1 356
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	307	39	10	33	323
Mechanical Engineer 機械工程師	434	36	23	28	448
Plumbing and Drainage Engineer 水喉及渠務工程師	110	9	-	9	110
Lift/Escalator Engineer 升降機／自動梯工程師	292	36	23	40	301
Fire Services Engineer 消防設備工程師	67	10	1	9	68
Electronics Engineer 電子工程師	175	2	3	2	178
Control and Instrumentation Engineer 控制及儀器工程師	69	2	5	2	74
Engineering Manager 工程經理	865	-	14	-	879

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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
Safety Officer 安全主任	162	1	7	1	166
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	34	-	-	-	34
Sub-total 小計	**4 535**	**262**	**179**	**224**	**4 703**
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	1 623	3	42	2	1 666
Building Services Technician 屋宇設備技術員	778	35	21	27	808
Draughtsman 繪圖員	182	7	9	7	191
Electrical Engineering Technician 電機工程技術員	1 137	123	27	78	1 207
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	360	27	16	26	377
Mechanical Engineering Technician 機械工程技術員	573	85	85	50	694
Lift/Escalator Technician 升降機／自動梯技術	789	3	57	4	823
Fire Services Technician 消防設備技術員	98	2	9	2	107
Electrical Instrument and Meter Technician 電工儀器技術員	53	-	3	-	56
Electronics Technician 電子技術員	142	1	5	1	147
Telecommunication Technician 電訊技術員	33	-	-	-	33

Job Title 職 稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間空缺數目	Forecasted No. of Trainees by May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
Office Equipment Service Technician 辦公室設備維修技術員	48	-	-	-	48
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全督導員	86	-	-	-	86
Rolling Stock Technician 鐵道車輛技術員	870	-	3	-	873
Railway Signalling Technician 鐵路訊號技術員	367	-	8	-	375
Sub-total 小計	**7 139**	**286**	**285**	**197**	**7 491**
TRADESMAN/ CRAFTSMAN LEVEL 技工級					
Foreman/Chargehand 管工／領工	861	-	9	-	870
Building Services Mechanic 屋宇設備技工	1 372	37	11	26	1 394
Electrician/Electrical Fitter 電工／電氣打磨裝配工	2 458	145	51	64	2 543
Control Panel Assembler 控制板裝配工	20	-	-	-	20
Electrical Wireman 電氣佈線工	207	-	2	-	209
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	200	100	3	-	203
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	635	46	7	41	642
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	175	-	-	-	100

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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 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)	48	-	3	-	51
Plumber and Pipe Fitter 喉管工	275	-	15	-	289
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	983	146	23	79	1 073
Lift Mechanic 升降機技工	2 001	132	95	122	2 041
Escalator Mechanic 自動梯技工	1 283	141	196	171	1 424
Fire Services Electrical Fitter 消防電氣裝配工	4	3	2	2	6
Fire Services Mechanical Fitter 消防機械裝配工	6	-	2	-	8
Cable Jointer (Power) 強電流電纜接駁技工	278	26	1	24	279
Overhead Linesman 架空電線技工	119	14	6	10	125
Electrical Appliances Service Mechanic 電器用具服務技工	883	2	8	4	890
Welder 焊接工	104	-	1	-	105
Carpenter 木工	1	-	-	-	1
Painter 髹漆工	10	-	-	-	10
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	61	10	-	8	61
Communication System Mechanic 電訊系統裝配工	57	1	3	1	60
Rolling Stock Tradesman 鐵道車輛技工	596	-	5	-	601

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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
Railway Signalling Tradesman 鐵路訊號技工	4	-	-	-	4
Sub-total 小計	**12 659**	**803**	**443**	**552**	**13 027**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人					
Labourer 雜工	229	-	3	-	327
Semi-skilled Worker 半技術工人	313	-	56	-	369
Sub-total 小計	**612**	**-**	**59**	**-**	**696**
GRAND TOTAL 總 計	**24 945**	**1 351**	**966**	**973**	**25 917**

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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 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	678	28	48	27	726
Electrical Engineer 電機工程師	592	22	45	20	623
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	119	3	12	3	131
Mechanical Engineer 機械工程師	373	15	40	13	411
Plumbing and Drainage Engineer 水喉及渠務工程師	50	2	-	2	50
Lift/Escalator Engineer 升降機／自動梯工程師	3	-	-	-	3
Fire Services Engineer 消防設備工程師	13	-	1	-	14
Electronics Engineer 電子工程師	189	12	24	10	213
Control and Instrumentation Engineer 控制及儀器工程師	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	Forecasted No. of Trainees by May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
Engineering Manager 工程經理	324	2	6	4	330
Safety Officer 安全主任	114	10	16	10	130
Aircraft Maintenance Engineer 飛機維修工程師	3	-	-	-	3
Sub-total 小計	**2 461**	**94**	**192**	**89**	**2 637**
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	784	1	70	1	847
Building Services Technician 屋宇設備技術員	783	20	26	20	609
Draughtsman 繪圖員	226	-	5	-	230
Electrical Engineering Technician 電機工程技術員	641	51	23	62	663
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	231	2	18	4	240
Mechanical Engineering Technician 機械工程技術員	574	46	28	43	601
Lift/Escalator Technician 升降機／自動梯技術	8	-	-	-	8
Fire Services Technician 消防設備技術員	20	-	-	-	20
Electrical Instrument and Meter Technician 電工儀器技術員	49	-	1	-	50
Electronics Technician 電子技術員	501	1	23	-	523
Telecommunication Technician 電訊技術員	223	36	49	35	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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	63	-	8	-	69
Railway Signalling Technician 鐵路訊號技術員	5	-	-	-	5
Sub-total 小計	**4 108**	**157**	**251**	**165**	**4 137**
TRADESMAN/ craftsman LEVEL 技工級					
Foreman/Chargehand 管工／領工	2 087	122	158	117	2 243
Building Services Mechanic 屋宇設備技工	1 013	47	113	46	1 139
Electrician/Electrical Fitter 電工／電氣打磨裝配工	769	150	153	181	917
Control Panel Assembler 控制板裝配工	20	3	3	3	23
Electrical Wireman 電氣佈線工	37	2	4	3	41
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	298	83	77	120	375
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	121	4	14	4	135
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	25	-	-	-	25
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	1	-	-	-	1

Job Title 職 稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間空缺數目	Forecasted No. of Trainees by May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 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)	28	-	1	-	29
Plumber and Pipe Fitter 喉管工	37	-	1	-	38
Mechanical Fitter/Machinist 機械打磨裝配工／機床工	866	252	192	256	1 054
Lift Mechanic 升降機技工	17	6	4	6	21
Fire Services Electrical Fitter 消防電氣裝配工	15	-	-	-	15
Fire Services Mechanical Fitter 消防機械裝配工	10	-	-	-	10
Cable Jointer (Power) 強電流電纜接駁工	22	-	-	-	22
Overhead Linesman 架空電線技工	20	-	-	-	20
Electrical Appliances Service Mechanic 電器用具服務技工	8	-	-	-	8
Welder 焊接工	43	-	-	-	43
Carpenter 木工	21	-	-	-	21
Painter 髹漆工	67	-	3	-	70
AV and RF Mechanic 影音及射頻技工	9	-	-	-	9
Communication System Mechanic 電訊系統裝配工	48	26	1	39	49
Sub-total 小計	**5 582**	**695**	**724**	**775**	**6 308**

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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL　半技術工人／普通工人					
Labourer 雜工	519	-	40	-	546
Semi-skilled Worker 半技術工人	353	-	14	-	367
Sub-total 小計	**872**	**-**	**54**	**-**	**913**
GRAND TOTAL 總　計	**13 023**	**946**	**1 221**	**1 029**	**13 995**

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 服 務 門 類 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	2 860	76%	2 174	24%	686
Branch 2 : Electrical Fitting with Water Plumbing Branch 門類 II : 水電工程	129	71%	92	29%	37
Branch 3 : Servicing (E & M) Branch 門類 III : 服務	4 535	40%	1 814	60%	2 721
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣	2 461	53%	1 304	47%	1 157
Sub-total 小計	**9 985**	**54%**	**5 384**	**46%**	**4 601**
TECHNICIAN LEVEL 技術員級					
Branch 1: Contracting (E&M) 門類 I : 承造	4 518	66%	2 982	34%	1 536
Branch 2 : Electrical Fitting with Water Plumbing Branch 門類 II : 水電工程	199	71%	141	29%	58
Branch 3 : Servicing (E & M) Branch 門類 III : 服務	7 139	32%	2 284	68%	4 855
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣	4 108	27%	1 109	73%	2 999
Sub-total 小計	**15 964**	**41%**	**6 516**	**59%**	**9 448**

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	16 448	68%	11 185	32%	5 263
Branch 2 : Electrical Fitting with Water Plumbing Branch 門類 II : 水電工程	2 816	56%	1 577	44%	1 239
Branch 3 : Servicing (E & M) Branch 門類 III : 服務	12 659	32%	4 051	68%	8 608
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣	5 582	13%	726	87%	4 856
Sub-total 小計	**37 505**	**47%**	**17 539**	**53%**	**19 966**
SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人					
Branch 1: Contracting (E&M) 門類 I : 承造	1 544	71%	1 096	29%	448
Branch 2 : Electrical Fitting with Water Plumbing Branch 門類 II : 水電工程	112	61%	68	39%	44
Branch 3 : Servicing (E & M) Branch 門類 III : 服務	612	35%	214	65%	398
Branch 4 : Supplementary Samples 門類 IV : 補充抽樣	872	28%	244	72%	628
Sub-total 小計	**3 140**	**52%**	**1 622**	**48%**	**1 518**
GRAND TOTAL 總 計	**66 594**	**47%**	**31 061**	**53%**	**35 533**

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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Electrical Engineer 電機工程師	12	-	1	-	13
Marine Engineer 輪機工程師	59	-	3	-	62
Mechanical Engineer 機械工程師	45	-	2	-	47
Ship Designer/Naval Architect 船舶設計師／造船工程師	58	-	-	-	58
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	58	-	1	-	59
Safety Officer 安全主任	13	-	1	-	14
Sub-total 小計	**245**	**-**	**8**	**-**	**253**
TECHNICIAN LEVEL 技術員級					
Draughtsman 繪圖員	4	-	-	-	4
Electrical Engineering Technician 電機工程技術員	65	-	41	-	106
Electronics/ Telecommunication Technician 電子／通訊技術員	22	-	19	-	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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
Estimator 估計員	10	1	-	1	10
Mechanical Engineering Technician 機械工程技術員	168	2	52	2	220
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全督導員	9	-	1	-	10
Supervisor/Foreman 監督／管工	237	8	13	8	250
Sub-total 小計	**515**	**11**	**126**	**11**	**641**
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	49	-	6	-	55
Carpenter 木工	167	-	7	-	174
Crane Driver 起重機操作工	33	-	-	-	33
Electrician 電工	79	5	22	5	101
Mechanical Fitter 機械打磨裝配工	332	8	44	8	376
GRP-Worker 玻璃纖維工	56	-	-	-	56
Machinist 機床工	17	-	1	-	18
Marine Pipeworker 船舶喉管工	52	2	3	2	55
Painter 髹漆工	143	-	17	-	158
Rigger 索具工（喊吔工）	61	-	2	-	63
Ship Classification Qualified Welder 船級協會認可焊接工	36	-	-	-	36

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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工（鍋爐工、造船鋼板工、捻縫工／鐵工）	36	4	1	4	37
Welder 焊接技工	71	-	1	-	72
Sub-total 小計	**1 132**	**19**	**104**	**19**	**1 234**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人					
Labourer 雜工	92	-	16	-	106
Semi-skilled Worker 半技術工人	16	-	4	-	20
Sub-total 小計	**108**	**-**	**20**	**-**	**126**
GRAND TOTAL 總　計	**2 000**	**30**	**258**	**30**	**2 254**

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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Electrical Engineer 電機工程師	20	4	-	4	20
Gas Engineer (Fuel Gas) 氣體工程師(氣體燃料)	250	3	-	3	250
Mechanical Engineer 機械工程師	107	3	-	3	107
Safety Officer 安全主任	29	-	-	-	29
Sub-total 小計	**406**	**10**	-	10	**406**
TECHNICIAN LEVEL 技術員級					
Electrical Engineering Technician 電機工程技術員	33	-	1	-	34
Gas Engineering Technician 氣體燃料工程技術員	411	13	7	23	416
Mechanical Engineering Technician 機械工程技術員	61	2	-	2	61
Assistant Safety Officer/Safety 助理安全主任／安全督導員	20	-	-	-	20
Supervisor/Chargehand 監督／管工	227	5	1	5	228
Sub-total 小計	**752**	**20**	**9**	**30**	**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 May 2018 估計 2018 年 5 月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年 5 月時的僱員人數
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Electrician/Electrical Fitter 電工／電氣打磨裝配工	54	11	26	11	80
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	54	-	-	-	54
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	352	2	-	1	354
Gas Utilisation Fitter (Domestic) 氣體燃料應用技工（住宅式）	677	14	13	26	690
Gas Utilisation Fitter (Non-domestic) 氣體燃料應用技工（非住宅式）	113	1	1	1	114
Mechanical Fitter 機械打磨裝配工	6	1	-	1	6
Welder 焊接工	10	-	-	-	10
Sub-total 小計	**1 266**	**29**	**40**	**40**	**1 308**
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）	21	-	3	-	24
Labourer 雜工	52	-	10	-	62
Semi-skilled Worker 半技術工	15	-	-	-	15
Sub-total 小計	**88**	**-**	**13**	**-**	**101**
GRAND TOTAL 總　計	**2 512**	**59**	**62**	**80**	**2 574**

THE AIRCRAFT MAINTENANCE SECTOR
飛 機 維 修 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 May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年5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	-	-	-	1
Engineering Manager 工程經理	8	-	1	-	8
Safety Officer 安全主任	7	-	-	-	7
Aircraft Maintenance Engineer 飛機維修工程師	669	-	36	-	704
Sub-total 小計	**685**	**-**	**37**	**-**	**720**
TECHNICIAN LEVEL 技術員級					
Supervisor 監督	667	-	65	-	732
Building Services Technician 屋宇設備技術員	4	-	-	-	4
Assistant Safety Officer/Safety Supervisor 助理安全主任/安全督導員	6	-	-	-	6
Aircraft Maintenance Technician 飛機維修技術員	738	23	84	23	819
Sub-total 小計	**1 415**	**23**	**149**	**23**	**1 561**

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 May 2018 估計2018年5月時的受訓者人數	Forecasted No. of Employees by May 2018 估計 2018 年5月時的僱員人數
TRADESMAN/CRAFTSMAN LEVEL 技工級					
Sheet Metal Worker 薄片金屬構造工	126	-	-	-	126
Carpenter 木工	4	-	-	-	4
Aircraft Maintenance Mechanic 飛機維修技工	2 668	588	190	588	2 846
Sub-total 小計	**2 798**	**588**	**190**	**588**	**2 976**
SEMI-SKILLED WORKER/GENERAL WORKER 半技術工人／普通工人					
Labourer 雜工	514	-	138	-	652
Semi-skilled Worker 半技術工人	84	-	-	-	84
Sub-total 小計	**598**	**-**	**138**	**-**	**736**
GRAND TOTAL 總 計	**5 496**	**611**	**514**	**611**	**5 993**

THE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR
機電工程行業

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

Job Title 職稱	$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	-	-	-	-	4%	25%	11%	34%	14%	11%
Electrical Engineer 電機工程師	-	-	1%	-	14%	25%	4%	32%	10%	14%
Refrigeration/ Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	-	-	-	-	7%	62%	14%	1%	1%	15%
Mechanical Engineer 機械工程師	-	-	-	-	5%	26%	3%	20%	26%	20%
Plumbing and Drainage Engineer 水喉及渠務工程師	-	-	-	-	4%	83%	8%	3%	-	1%
Lift/Escalator Engineer 升降機／自動梯工程師	-	-	-	-	-	47%	15%	7%	-	30%
Fire Services Engineer 消防設備工程師	-	-	-	-	22%	59%	17%	-	1%	*
Electronics Engineer 電子工程師	-	-	-	-	35%	10%	16%	13%	20%	6%
Control and Instrumentation Engineer控制及儀器工程師	-	-	-	-	24%	23%	2%	33%	18%	-
Engineering Manager 工程經理	-	-	-	-	3%	10%	11%	41%	27%	8%
Safety Officer 安全主任	-	-	-	*	6%	28%	42%	8%	-	17%
Aircraft Maintenance Engineer 飛機維修工程師	-	-	-	-	-	-	-	100%	-	-
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	-	-	-	-	-	-	-	-	-	100%
Sub-total 小計	**-**	**-**	*****	*****	**10%**	**30%**	**11%**	**24%**	**13%**	**12%**

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
TECHNICIAN LEVEL 技術員級										
Supervisor 監督	-	1%	*	4%	26%	53%	4%	*	*	12%
Building Services Technician 屋宇設備技術員	-	-	1%	26%	44%	15%	7%	4%	-	2%
Draughtsman 繪圖員	-	*	11%	12%	15%	23%	-	12%	-	27%
Electrical Engineering Technician 電機工程技術員	-	2%	2%	9%	26%	41%	14%	2%	-	5%
Refrigeration/ Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	-	1%	1%	15%	42%	14%	15%	-	-	14%
Mechanical Engineering Technician 機械工程技術員	-	-	2%	14%	24%	29%	13%	7%	-	11%
Lift/Escalator Technician 升降機／自動梯技術員	-	-	-	14%	71%	7%	1%	-	-	7%
Fire Services Technician 消防設備技術員	-	-	3%	17%	44%	1%	7%	-	-	29%
Electrical Instrument and Meter Technician 電工儀器技術員	-	-	10%	7%	38%	29%	2%	13%	-	1%
Electronics Technician 電子技術員	-	-	-	7%	1%	79%	5%	-	-	8%
Telecommunication Technician 電訊技術員	-	-	11%	15%	29%	42%	-	-	-	3%
Office Equipment Service Technician 辦公室設備維修技術員	-	-	100%	-	-	-	-	-	-	-
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全監督	-	-	4%	23%	40%	6%	2%	-	-	26%
Rolling Stock Technician 鐵道車輛技術員	-	-	-	-	100%	-	-	-	-	-
Railway Signalling Technician 鐵路訊號技術員	-	-	1%	-	98%	1%	-	-	-	-
Sub-total 小計	**-**	*****	**2%**	**11%**	**37%**	**31%**	**7%**	**2%**	*****	**9%**

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
TRADESMAN/CRAFTSMAN LEVEL 技工級										
Foreman/Chargehand 管工／領工	-	-	1%	14%	53%	20%	*	-	-	11%
Building Services Mechanic 屋宇設備技工	-	8%	15%	41%	21%	2%	-	-	-	13%
Electrician/Electrical Fitter 電工／電氣打磨裝配工	-	1%	8%	19%	44%	13%	*	-	-	16%
Control Panel Assembler 控制板裝配工	-	-	26%	13%	49%	-	-	-	-	12%
Electrical Wireman 電氣佈線工	-	2%	18%	12%	35%	7%	1%	-	-	25%
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工 (電力控制)	-	-	5%	22%	60%	2%	-	-	-	11%
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary Control) 空調製冷設備技工 (獨立系統)	-	1%	14%	38%	31%	2%	-	-	-	14%
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	-	-	8%	26%	50%	3%	-	-	-	13%
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/Thermal 空調製冷設備技工(保溫)/保溫技工	-	-	10%	63%	-	1%	-	-	-	26%
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工 (水系統)	-	-	-	14%	73%	2%	1%	-	-	11%
Plumber and Pipe Fitter 喉管工	-	-	7%	15%	45%	14%	-	-	-	19%
Mechanical Fitter/ Machinist 機械打磨裝配工／ 機床工	-	-	18%	7%	45%	13%	-	-	-	17%
Lift Mechanic 升降機技工	-	-	1%	55%	21%	-	-	-	-	23%
Escalator Mechanic 自動梯技工	-	-	-	21%	57%	-	-	-	-	22%

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
Fire Services Electrical Fitter 消防電氣裝配工	-	-	6%	26%	41%	-	-	-	-	27%
Fire Services Mechanical Fitter 消防機械裝配工	-	4%	1%	50%	15%	-	-	-	-	31%
Cable Jointer (Power) 強電流電纜接駁技工	-	-	2%	4%	35%	58%	-	-	-	*
Overhead Linesman 架空電線技工	-	-	-	14%	86%	-	-	-	-	-
Electrical Appliances Service Mechanic 電器用具服務技工	-	-	23%	36%	13%	6%	-	-	-	22%
Welder 焊接工	-	1%	10%	8%	41%	21%	-	-	-	19%
Carpenter 木工	-	-	16%	2%	1%	75%	-	-	-	6%
Painter 髹漆工	-	5%	10%	69%	-	7%	-	-	-	10%
AV and RF Mechanic 影音及射頻技工	-	-	31%	69%	-	-	-	-	-	-
Building Security System Mechanic 屋宇防盜系統技工	-	3%	-	97%	-	-	-	-	-	-
Communication System Mechanic 電訊系統裝配工	-	6%	19%	59%	2%	-	-	-	-	14%
Rolling Stock Tradesman 鐵道車輛技工	-	-	-	100%	-	-	-	-	-	-
Railway Signalling Tradesman 鐵路訊號技工	-	-	100%	-	-	-	-	-	-	-
Sub-total 小計	**-**	**1%**	**9%**	**28%**	**37%**	**8%**	*****	**-**	**-**	**16%**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人										
Labourer 雜工	1%	6%	32%	17%	20%	-	-	-	-	24%
Semi-skilled Worker 半技術工人	*	3%	37%	31%	18%	-	-	-	-	11%
Sub-total 小計	*****	**5%**	**34%**	**23%**	**19%**	**-**	**-**	**-**	**-**	**18%**
GRAND TOTAL 總計	*****	**1%**	**7%**	**20%**	**32%**	**17%**	**3%**	**4%**	**2%**	**14%**

* Less than 0.5%
小過0.5%

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	-	-	-	-	17%	42%	8%	25%	-	8%
Marine Engineer 輪機工程師	-	-	-	-	-	15%	2%	-	69%	14%
Mechanical Engineer 機械工程師	-	-	-	-	9%	27%	40%	18%	-	7%
Ship Designer/ Naval Architect 船舶設計師／ 造船工程師	-	-	-	-	67%	3%	-	2%	26%	2%
Ship Repairs Manager/ Superintendent 船舶修理主管／ 船舶修理監督	-	-	-	-	7%	33%	17%	28%	2%	14%
Safety Officer 安全主任	-	-	-	-	15%	23%	31%	-	-	31%
Sub-total 小計	**-**	**-**	**-**	**-**	**21%**	**20%**	**14%**	**11%**	**23%**	**10%**
TECHNICIAN LEVEL 技術員級										
Draughtsman 繪圖員	-	-	-	50%	-	-	-	-	-	50%
Electrical Engineering Technician 電機工程技術員	-	-	5%	-	57%	11%	-	23%	-	5%
Electronics/ Telecommunication Technician 電子／通訊技術員	-	-	9%	5%	45%	27%	-	14%	-	-
Estimator 估計員	-	-	-	10%	50%	40%	-	-	-	-
Mechanical Engineering Technician 機械工程技術員	-	-	4%	10%	42%	1%	-	30%	-	13%
Assistant Safety Officer/ Safety Supervisor 助理安全主任／ 安全監督	-	-	-	11%	22%	33%	-	-	-	33%

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	-	*	13%	1%	35%	22%	1%	-	-	29%
Sub-total 小計	**-**	*****	**8%**	**4%**	**40%**	**14%**	*****	**13%**	**-**	**19%**
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	-	-	-	6%	22%	-	-	-	-	71%
Carpenter 木工	-	-	-	2%	40%	-	-	-	-	59%
Crane Driver 起重機操作工	-	-	-	3%	58%	21%	-	-	-	18%
Electrician 電工	-	-	3%	4%	54%	-	-	-	-	39%
Mechanical Fitter 機械打磨裝配工	-	9%	8%	2%	48%	-	-	-	-	33%
GRP-Worker 玻璃纖維工	-	-	39%	54%	4%	-	-	-	-	4%
Machinist 機床工	-	-	-	12%	35%	-	-	-	-	53%
Marine Pipeworker 船舶喉管工	-	-	-	10%	13%	-	-	-	-	77%
Painter 髹漆工	-	-	13%	1%	29%	4%	-	-	-	52%
Rigger 索具工（喊吔工）	-	-	-	5%	30%	-	-	-	-	66%
Ship Classification Qualified Welder 船級協會認可焊接工	-	-	-	-	17%	78%	-	-	-	6%
Steel Worker (Boiler Maker/Steel Plater/ Blacksmith) 鋼鐵工（鍋爐工、造船鋼板工、捻縫工／鐵工）	-	-	-	6%	36%	6%	-	-	-	53%
Welder 焊接工	-	28%	-	30%	25%	1%	-	-	-	15%
Sub-total 小計	**-**	**4%**	**6%**	**7%**	**36%**	**4%**	**-**	**-**	**-**	**42%**
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人										
Labourer 雜工	-	13%	39%	7%	4%	-	-	-	-	37%
Semi-skilled Worker 半技術工人	-	-	-	100%	-	-	-	-	-	-
Sub-total 小計	**-**	**11%**	**33%**	**20%**	**4%**	**-**	**-**	**-**	**-**	**31%**
GRAND TOTAL 總計	**-**	**3%**	**7%**	**6%**	**34%**	**8%**	**2%**	**5%**	**3%**	**32%**

* Less than 0.5%
小過0.5%

Appendix 5(L)
附錄 5(L)

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	-	-	-	-	-	5%	50%	30%	-	15%
Gas Engineer (Fuel Gas) 氣體工程師(氣體燃料)	-	-	-	-	3%	8%	83%	2%	-	4%
Mechanical Engineer 機械工程師	-	-	-	1%	-	3%	70%	-	-	26%
Safety Officer 安全主任	-	-	-	3%	14%	34%	-	45%	-	3%
Sub-total 小計	**-**	**-**	**-**	*****	**3%**	**9%**	**72%**	**6%**	**-**	**10%**
TECHNICIAN LEVEL 技術員級										
Electrical Engineering Technician 電機工程技術員	-	-	-	27%	64%	-	-	-	-	9%
Gas Engineering Technician 氣體燃料工程技術員	-	-	1%	80%	13%	2%	1%	-	-	1%
Mechanical Engineering Technician 機械工程技術員	-	-	-	5%	95%	-	-	-	-	-
Assistant Safety Officer Safety Supervisor 助理安全主任／安全監督	-	-	-	-	45%	30%	-	-	-	25%
Supervisor/Chargehand 監督／管工	-	-	-	7%	11%	57%	21%	-	-	4%
Sub-total 小計	**-**	**-**	**1%**	**48%**	**22%**	**19%**	**7%**	**-**	**-**	**3%**
TRADESMAN/CRAFTSMAN LEVEL 技工級										
Electrician/ Electrical Fitter 電工／電氣打磨裝配工	-	69%	9%	6%	7%	-	-	-	-	9%
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	-	-	50%	46%	-	-	-	-	-	4%
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工(煤氣）	-	-	4%	52%	44%	-	-	-	-	-

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 Utilisation Fitter (Domestic) 氣體燃料應用技工（住宅式）	-	-	59%	8%	27%	5%	-	-	-	2%
Gas Utilisation Fitter (Non-domestic) 氣體燃料應用技工（非住宅式）	-	2%	33%	2%	39%	4%	-	-	-	21%
Mechanical Fitter 機械打磨裝配工	-	-	17%	83%	-	-	-	-	-	-
Welder 焊接工	-	-	-	-	-	100%	-	-	-	-
Sub-total 小計	**-**	**3%**	**38%**	**22%**	**30%**	**4%**	**-**	**-**	**-**	**3%**
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）	-	29%	5%	67%	-	-	-	-	-	-
Labourer 雜工	-	4%	60%	17%	19%	-	-	-	-	-
Semi-skilled Worker 半技術工人	20%	-	-	27%	53%	-	-	-	-	-
Sub-total 小計	**3%**	**9%**	**36%**	**31%**	**20%**	**-**	**-**	**-**	**-**	**-**
GRAND TOTAL 總計	*****	**2%**	**21%**	**26%**	**23%**	**9%**	**14%**	**1%**	**-**	**4%**

* Less than 0.5%
小過0.5%

THE AIRCRAFT MAINTENANCE SECTOR
飛機維修工程行業

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

Job Title 職稱	$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	-	-	-	-	-	100%	-	-	-	-
Engineering Manager 工程經理	-	-	-	-	-	38%	-	-	-	63%
Safety Officer 安全主任	-	-	-	-	-	71%	-	-	-	29%
Aircraft Maintenance Engineer 飛機維修工程師	-	-	-	-	-	-	80%	-	-	20%
Sub-total 小計	**-**	**-**	**-**	**-**	**-**	**1%**	**78%**	**-**	**-**	**21%**
TECHNICIAN LEVEL 技術員級										
Supervisor 監督	-	-	-	-	99%	-	-	-	-	1%
Building Services Technician 屋宇設備技術員	-	-	-	100%	-	-	-	-	-	-
Assistant Safety Officer/ Safety Supervisor 助理安全主任／安全監督	-	-	-	-	17%	-	-	-	-	83%
Aircraft Maintenance Technician 飛機維修技術員	-	-	-	24%	54%	-	-	-	-	22%
Sub-total 小計	**-**	**-**	**-**	**13%**	**75%**	**-**	**-**	**-**	**-**	**12%**
TRADESMAN/CRAFTSMAN LEVEL 技工級										
Sheet Metal Worker 薄片金屬構造工	-	-	-	100%	-	-	-	-	-	-
Carpenter 木工	-	-	-	100%	-	-	-	-	-	-
Aircraft Maintenance Mechanic 飛機維修技工	-	-	4%	63%	24%	-	-	-	-	10%
Sub-total 小計	**-**	**-**	**4%**	**65%**	**23%**	**-**	**-**	**-**	**-**	**9%**

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
SEMI-SKILLED WORKER/GENERAL WORKER LEVEL 半技術工人／普通工人										
Labourer 雜工	-	83%	7%	10%	-	-	-	-	-	-
Semi-skilled Worker 半技術工人	-	-	2%	98%	-	-	-	-	-	-
Sub-total 小計	**-**	**72%**	**6%**	**22%**	**-**	**-**	**-**	**-**	**-**	**-**
GRAND TOTAL 總計	**-**	**8%**	**3%**	**39%**	**31%**	*****	**10%**	**-**	**-**	**10%**

* Less than 0.5%
小過0.5%

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	No Comment 無意見
A. Electrical and Mechanical Engineering Sector 機電工程業					
Professional / Technologist 專業人士 / 技師	6% (12%)	39% (34%)	18% (38%)	1% (1%)	36% (17%)
Trainees of Professional / Technologist 專業人士 / 技師的受訓者	6% (9%)	37% (26%)	17% (31%)	- -	40% (34%)
Technician 技術員	6% (11%)	42% (47%)	20% (28%)	2% -	29% (14%)
Trainees of Technician 技術員的受訓者	5% (8%)	43% (37%)	19% (27%)	- -	32% (28%)
Tradesman / Craftsman 技工	9% (13%)	50% (48%)	23% (24%)	2% (1%)	16% (15%)
Trainees of Tradesman / Craftsman 技工的受訓者	8% (13%)	47% (38%)	20% (26%)	- (1%)	24% (22%)
Semi-skilled Worker / General Worker 半技術／普通工人	6% (4%)	41% (39%)	21% (29%)	2% -	29% (28%)
B. Shipbuilding and Ship Repair Sector 船舶修建工程行業					
Professional / Technologist 專業人士 / 技師	20% (29%)	35% (50%)	13% (14%)	- -	32% (7%)
Trainees of Professional / Technologist 專業人士 / 技師的受訓者	12% (21%)	38% (43%)	9% (14%)	- -	40% (21%)
Technician 技術員	25% (21%)	27% (36%)	17% (36%)	- -	32% (7%)
Trainees of Technician 技術員的受訓者	21% (14%)	34% (29%)	6% (21%)	- -	39% (36%)
Tradesman / Craftsman 技工	25% (43%)	35% (29%)	17% (7%)	- -	23% (21%)

Job level 技能等級	Very Insufficient 非常缺乏	Insufficient 缺乏	Sufficient 充裕	Very Sufficient 非常充裕	No Comment 無意見
Trainees of Tradesman / Craftsman 技工的受訓者	26% (7%)	39% (36%)	12% (14%)	- -	24% (43%)
Semi-skilled Worker / General Worker 半技術／普通工人	25% (7%)	30% (43%)	12% (7%)	- -	32% (43%)
C. Gas Sector 氣體燃料行業					
Professional / Technologist 專業人士 / 技師	12% (14%)	42% -	22% (43%)	2% -	22% (43%)
Trainees of Professional / Technologist 專業人士 / 技師的受訓者	9% (14%)	48% -	16% (29%)	2% -	25% (57%)
Technician 技術員	8% (14%)	44% (29%)	24% (43%)	- -	23% (14%)
Trainees of Technician 技術員的受訓者	11% (14%)	44% (14%)	19% -	- -	26% (71%)
Tradesman / Craftsman 技工	10% (29%)	58% -	23% (43%)	1% -	8% (29%)
Trainees of Tradesman / Craftsman 技工的受訓者	14% (29%)	52% -	18% (14%)	1% -	15% (57%)
Semi-skilled Worker / General Worker 半技術／普通工人	11% (14%)	42% (14%)	22% (14%)	1% -	24% (57%)
D. Aircraft Maintenance Sector 飛機維修工程行業					
Professional / Technologist 專業人士 / 技師	- (10%)	- (90%)	100% -	- -	- -
Trainees of Professional / Technologist 專業人士 / 技師的受訓者	- -	- (100%)	100% -	- -	- -
Technician 技術員	- (10%)	- (90%)	100% -	- -	- -
Trainees of Technician 技術員的受訓者	- -	- (90%)	100% (10%)	- -	20% -
Tradesman / Craftsman 技工	- -	- (90%)	100% (10%)	- -	20% -
Trainees of Tradesman / Craftsman 技工的受訓者	- -	- (80%)	100% (20%)	- -	20% -

Job level 技能等級	Very Insufficient 非常缺乏	Insufficient 缺乏	Sufficient 充裕	Very Sufficient 非常充裕	No Comment 無意見
Semi-skilled Worker / General Worker	-	-	100%	-	-
半技術／普通工人	-	(90%)	(10%)	-	-

N.B. 註

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	169	15	-
Electrical Engineer 電機工程師	283	4	2
Refrigeration/Air-conditioning/ Ventilation Engineer 冷凝／空氣調節／通風設備工程師	48	-	-
Mechanical Engineer 機械工程師	74	5	-
Plumbing and Drainage Engineer 水喉及渠務工程師	11	-	-
Lift/Escalator Engineer 升降機／自動梯工程師	3	-	-
Fire Services Engineer 消防設備工程師	10	-	-
Electronics Engineer 電子工程師	2	-	-
Control and Instrumentation Engineer 控制及儀器工程師	4	-	-
Engineering Manager 工程經理	103	-	-
Safety Officer 安全主任	176	-	-
Sub-total 小計	**883**	**24**	**2**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間空缺數目
TECHNICIAN LEVEL 技術員級			
Supervisor 監督	220	-	-
Building Services Technician 屋宇設備技術員	125	1	-
Draughtsman 繪圖員	97	-	-
Electrical Engineering Technician 電機工程技術員	186	-	-
Refrigeration/Air-conditioning/ Ventilation Technician 冷凝／空氣調節／通風設備技術員	106	2	-
Mechanical Engineering Technician 機械工程技術員	106	9	-
Lift/Escalator Technician 升降機／自動梯技術員	39	-	-
Fire Services Technician 消防設備技術員	60	-	-
Electrical Instrument and Meter Technician 電工儀器技術員	11	-	-
Electronics Technician 電子技術員	16	-	-
Telecommunication Technician 電訊技術員	6	-	-
Assistant Safety Officer/ Safety Supervisor 助理安全主任/安全督導員	122	-	-
Sub-total 小計	**1 094**	**12**	**-**

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	2 292	-	-
Control Panel Assembler 控制板裝配工	242	-	-
Electrical Wireman 電氣佈線工	718	1	-
Refrigeration/Air-conditioning/ Ventilation Mechanic (Master) 空調製冷設備技工(全科)	1 004	16	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	318	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	89	-	-
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	271	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Thermal Insulation)/ Thermal Insulation Craftsman 空調製冷設備技工(保溫)/ 保溫技工	33	-	-
Refrigeration/ Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	65	1	-
Drain and Pipe Layer (Master) 地渠及喉管工(全科)	11	-	-
Drainlayer 地渠工	29	-	-
Plumber 水喉工	648	-	1
Pipelayer 敷喉管工	40	-	-

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies at Date of Survey 調查期間空缺數目
TRADESMAN/CRAFTSMAN LEVEL (Continued) 技工級 (續)			
Mechanical Fitter 機械打磨裝配工	341	-	-
Lift and Escalator Mechanic (Master) 升降機及自動梯技工(全科)	263	-	-
Lift Mechanic 升降機技工	143	-	-
Escalator Mechanic 自動梯技工	19	-	-
Fire Service Mechanic (Master) 消防設備技工(全科)	364	-	-
Fire Services Electrical Fitter 消防電氣裝配工	74	-	-
Fire Services Mechanical Fitter 消防機械裝配工	234	-	-
Fire Service Portable Equipment Fitter 手提消防設備裝配工	2	-	-
Cable Jointer (Power) 強電流電纜接駁技工	25	-	-
Cable Jointer (Low Voltage) 強電流電纜接駁技工（低壓）	24	-	-
Overhead Linesman 架空電線技工	47	-	-
Electrical Appliances Service Mechanic 電器用具維修技工	402	-	-
General Welder 普通焊接工	686	-	2
Electronic Equipment Mechanic (Construction Work) (Master) 電子設備技工(建造工作) (全科)	11	-	-
Building Security System Mechanic 屋宇防盜系統技工	14	-	-
Communication System Mechanic 電訊系統裝配工	28	-	-
Gas Installer 氣體裝置技工	37	-	-
Sub-total 小計	**8 474**	**18**	**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	2 076	-	-
Semi-skilled Worker 半技術工人	526	-	-
Sub-total 小計	**2 602**	**-**	**-**
GRAND TOTAL 總　計	**13 053**	**54**	**5**

Adaptive Filtering Method for Manpower Projection

Introduction

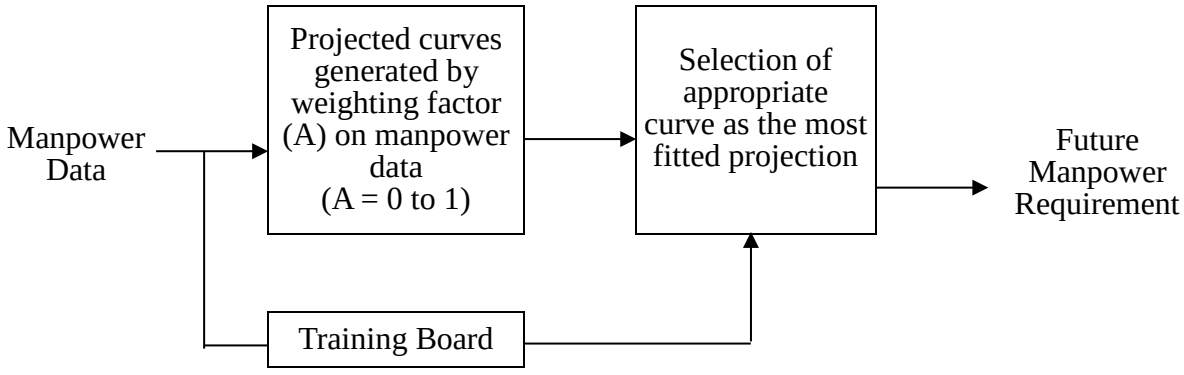
Primitive methods for forecasting, often used when insufficient historical data are available, have severe limitations. However, when a moderate history of data is available, the forecast can be refined to lead to a better forecasting of data.

Adaptive Filtering

2. The 'Adaptive Filtering Method' (AFM) is a forecasting method which rested on the principle of "Weighted Exponential Smoothing". In this 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.

3. Finally the forecast may also be optimised to suit decisions by training boards based on factors such as market trends, technological development, social-economical factors, future expectations and so on. The method is illustrated in *Figure 1 below*.

Figure 1 Adaptive Filtering Method



採用調節過濾法

推算人力情況

簡介

當歷史數據不足而又需要預測人力情況時，往往會採用粗略的估算方法。這類預測方法大有局限；而當掌握到一定的歷史數據，就可以把預測優化，達至更理想的預測結果。

調節過濾法

2. 「調節過濾法」使用「加權指數平滑法」的原則預測人力情況。將過往的人力數據加權，較近期的數據加權比重較高，亦即倚重較近期的數據而作人力預測。同時，亦可以透過調整加權因子 "A" 來調較這些近期數據所佔的比重。 "A" 的數值愈高，新近的數據所佔比重愈大。

3. 不同行業的訓練委員會可以根據市場趨勢、科技發展、社會經濟因素、行業未來展望等，調整推斷，以預測最符合實際的人力情況。見 *下圖 1*：

圖 1　　調節過濾法