Electrical and Mechanical Services Training Board
機電工程業訓練委員會

Electrical and Mechanical Services Industry Manpower Survey Report
機電工程業 • 人力調查報告書

2021

2021 Manpower Survey Report

Electrical and Mechanical Services Industry

2021 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

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Published in March 2022

2022 年 3 月出版

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ACKNOWLEDGEMENT

The Electrical and Mechanical Services Training Board (the Training Board) wishes to thank all the respondents of establishments for completing and returning the questionnaires.

The Training Board is also grateful to all the parties for providing information on programmes and graduate statistics, in particular the University Grants Committee (UGC), the Institute of Vocational Education (IVE) and Youth College (YC) of VTC.

DEFINITION OF TERMS

Average salary/income	"Average salary/income" refers to the monthly salary/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.
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.
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 and taking up non-E&M related positions, emigrating, for other reasons, out of the total number of E&M employees.
Vacancy rate	"Vacancy rate" is defined as the percentage of vacancies out of the total number of E&M employees

I. EXECUTIVE SUMMARY

Background

1.1 The Electrical and Mechanical Services Training Board (the Training Board) conducted a manpower survey for the Electrical and Mechanical (E&M) Services industry from June to August 2021, with the reference date of 1 June 2021. This report presents the survey findings of the latest manpower situation of the industry and proposes recommendations in response to the manpower demand and training needs to the different stakeholders of the industry, including employers, employees and training providers, by making reference to the business outlook.

Survey Coverage

1.2 The Survey covered the following sectors and branches of the E&M Services industry. Each sector is 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
Branch 4: Supplementary Samples (E&M Engineering Sector)

Gas Sector
Branch 5: Gas Supply
Branch 6: Gas Fitting, Installation and Maintenance
Branch 7: Supplementary Samples (Gas Sector)

Aircraft Maintenance Sector
Branch 8: 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 the Government, and so on.*

Survey Methodology

Data collection

1.3 A total of 1,280 establishments was selected for the survey, with 1,148 establishments selected based on the stratified random sampling method and 132 establishments selected as supplementary samples.

1.4 The data collection was carried out between June and August 2021. Among the 1,280 sampled establishments, 853 were successfully enumerated and 13 refused, giving an effective response rate of 98.5%.[2] Taking into account (i) the satisfactory response rate of individual branches, (ii) the fact that the majority of prominent and sizeable establishments had responded to the survey and (iii) the grossing-up of sample results based 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.

1.5 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 information.

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

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

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

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

1.8 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.

New data collected

1.9 The Manpower Survey for the E&M Services industry is reviewed by the Training Board from time to time. In order to collect more information about the industry, new data were collected in this survey; hence, they could not be compared with that of the last round survey. The new data collected in this survey are shown as below:

(i) employers' views on business volume in the next 12 months;
(ii) employers preferred employees to have and employees achieved education level;
(iii) employers preferred full-time employees to have and employees have accumulated years of experience;
(iv) difficulties encountered in the recruitment of full-time employees in past 12 months;
(v) the training and staff development budget in the next 12 months; and
(vi) the future training areas for full-time employees in order to meet the emerging trend of the industry.

Data Projection for 2022-2025

1.10 For the E&M Services industry, the manpower requirements of E&M workers were projected for 2022-2025 using "Adaptive Filtering Method (AFM)" (please refer to Appendix 6 for more details). The AFM was 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 considered when deciding on the final projected manpower requirements.

Summary of Survey Findings

A. Overview of the Electrical and Mechanical Services Industry

Number of Employees and Vacancies

1.11 Overall, around 76,240 employees served in the E&M Services industry as of 1 June 2021, of which 68,766 (90.2%) employees were engaged in the E&M Engineering sector, 2,657 (3.5%) of employees in the Gas sector, and 4,817 (6.3%) of employees in the Aircraft Maintenance sector *(Figure 1.1)*. Among these, 15.1%, 24.4%, 55.9% and 4.6% were employed respectively at the professional/technologist, technician, tradesman/craftsman, and semi-skilled/general worker levels, which are presented in *Table 1.1*.

Figure 1.1 Distribution of E&M employees by Sector in 2021

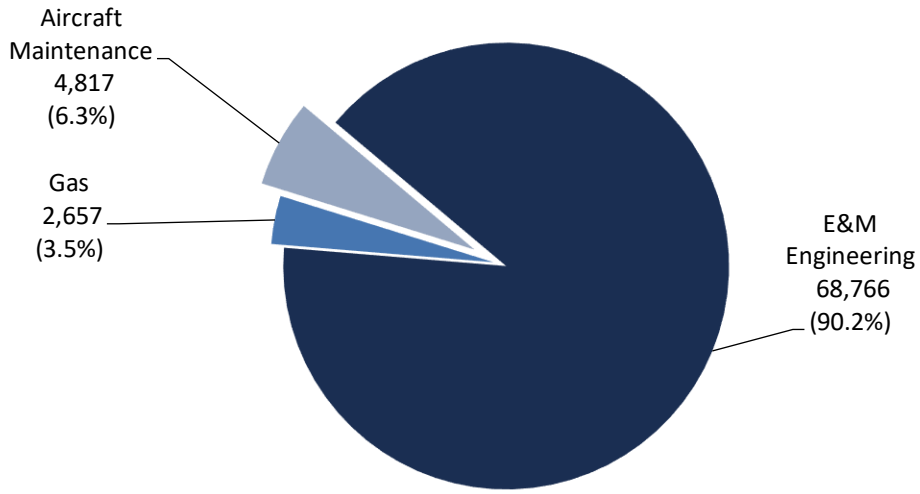


Table 1.1 Number of Employees by Sector and Job Level (as of 1 June 2021)

Sector	Job level				Total	% of total no. of employees
	Professional / Technologist	Technician	Tradesman/ craftsman	Semi-skilled / General worker		
E&M Engineering	10,432	16,656	38,758	2,920	68,766	**90.2%**
Gas	581	829	1,175	72	2,657	**3.5%**
Aircraft Maintenance	505	1,143	2,663	506	4,817	**6.3%**
Total	**11,518**	**18,628**	**42,596**	**3,498**	**76,240**	**100%**
% of total no. of employees	**15.1%**	**24.4%**	**55.9%**	**4.6%**	**100%**	

1.12 Generally speaking, the technician and tradesman/craftsmanlevels comprised the majority of manpower of the sector.

1.13 At the time of the survey, there were a total of 2,800 vacancies in the E&M Services industry, representing a vacancy rate[3] of 3.5%. Most of the vacancies were found in the E&M Engineering sector (2,309) and were concentrated on the tradesman/craftsman level (1,298) as shown in *Table 1.2*.

Table 1.2 Number of Vacancies by Sector and Job level (as of 1 June 2021)

Sector	No. of vacancies (vacancy rate %)				
	Professional/ Technologist	Technician	Tradesman/ Craftsman	Semi-skilled/ General worker	Total
E&M Engineering	450 (4.1%)	520 (3%)	1,298 (3.2%)	41 (1.4%)	2,309 (3.2%)
Gas	14 (2.4%)	18 (2.1%)	23 (1.9%)	3 (4%)	58 (2.1%)
Aircraft Maintenance	0 (0%)	73 (6%)	300 (10.1%)	60 (10.6%)	433 (8.2%)
Total	**464 (3.9%)**	**611 (3.2%)**	**1,621 (3.7%)**	**104 (2.9%)**	**2,800 (3.5%)**

Employers' Views on Business Environment in the Next 12 Months

1.14 At the time of the survey, the respondents were asked to make a forecast on business volume in the next 12 months. Overall speaking, both the E&M Engineering and Gas sectors expected that the business environment in the next 12 months would be stable, while the Aircraft Maintenance sector expected that the business environment would become worse after a year. Please refer to *Table 1.3* for employers' views on business volume in the next 12 months by sector.

Table 1.3 Employers' Views on Business Volume in the Next 12 Months by sector

Sector	Percentage distribution of companies			
	Better	Stable	Worsen	Uncertain
E&M Engineering	0.6%	70.2%	11.3%	17.9%
Gas	0.5%	72.3%	8.0%	19.1%
Aircraft Maintenance	11.8%	23.5%	52.9%	11.8%

[3] *Vacancy rate = No. of vacancies / No. of posts (No. of employees + No. of vacancies)*

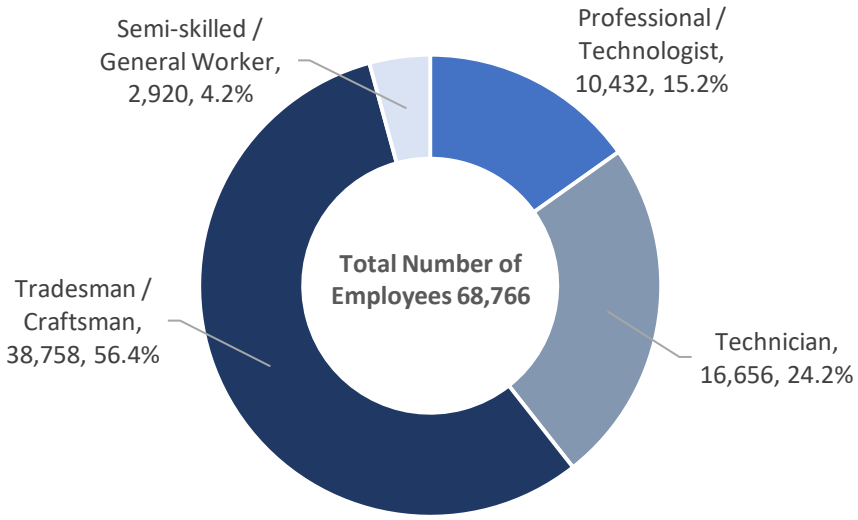
B. Electrical and Mechanical Engineering Sector

Manpower

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

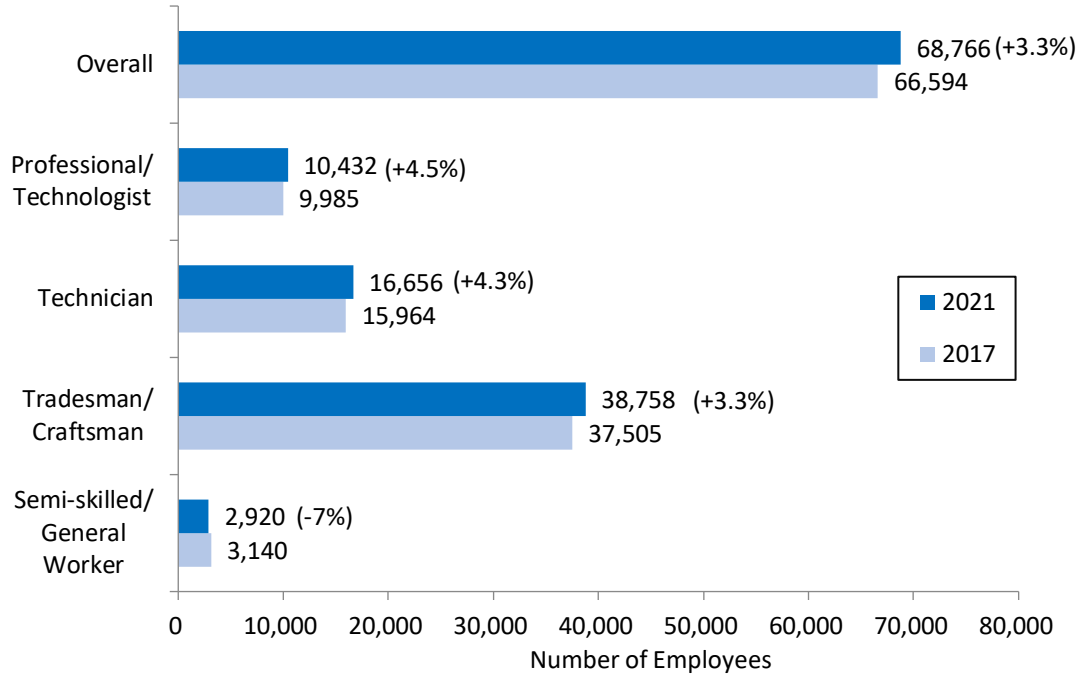
1.16 At the time of the survey, a total of 68,766 E&M employees engaged in the E&M Engineering sector, of which 56.4% of employees were at the tradesman/craftsman level, followed by 24.2% of employees at the technician level, 15.2% of employees at the professional/technologist level, and 4.2% of employees at the semi-skilled/general worker level. *Figure 1.2*. shows the distribution of E&M employees engaged in the E&M Engineering sector in 2021.

Figure 1.2 Distribution of E&M employees engaged in the E&M Engineering sector in 2021



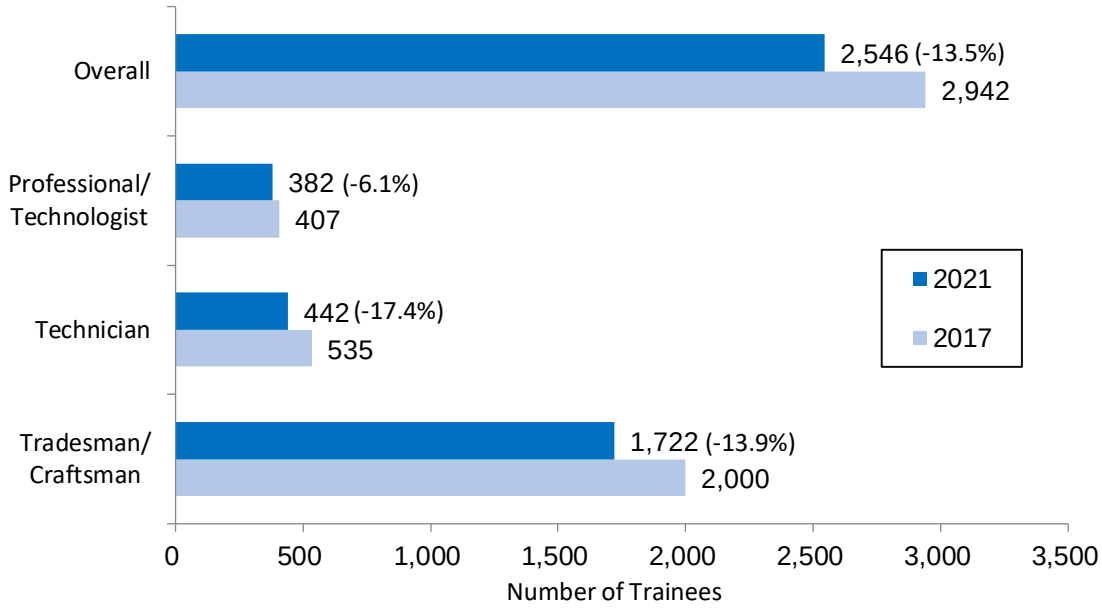
1.17 As compared to 2017, a growth in the number of E&M employees was noted, giving an overall increment of 3.3%. In particular, manpower at the professional/technologist, technician and tradesman/craftsman levels registered respectively a growth of 4.5%, 4.3% and 3.3% in 2021 as compared to four years ago, while the manpower at the semi-skilled/general worker level decreased 7% as compared with 2017 (*Figure 1.3)*.

Figure 1.3 Number of E&M employees in the E&M Engineering sector by job level in 2021



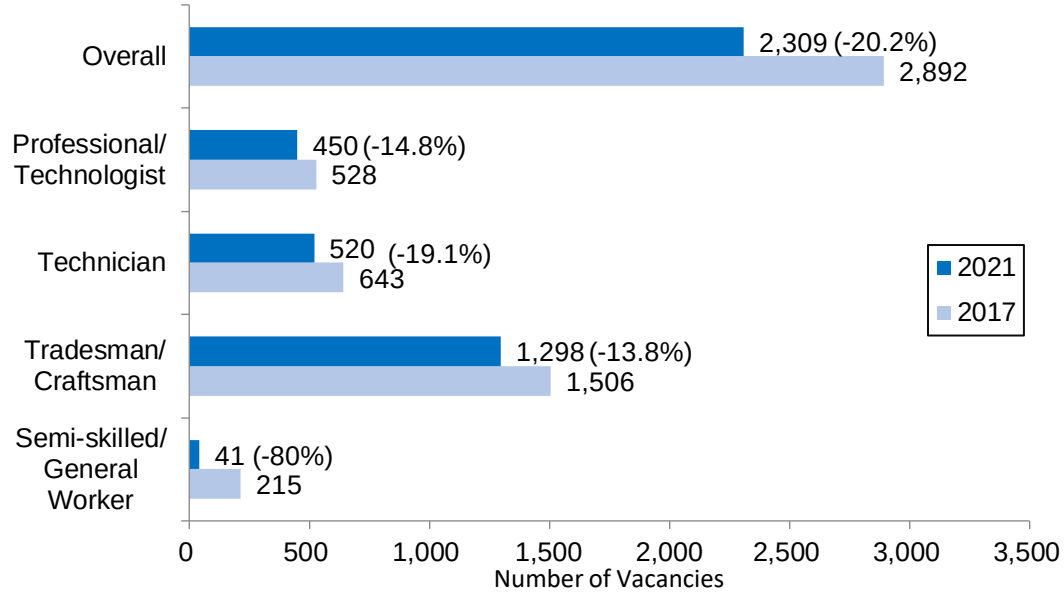
1.18 The employment of trainees, under a contract or mode of apprenticeship, was very common in the E&M Engineering sector. Fewer trainees at all levels were reported in 2021 than four years ago *(Figure 1.4)*.

Figure 1.4 Number of E&M trainees in the E&M Engineering sector by job level in 2021 and 2017



1.19 The survey revealed that the number of trainees and vacancies decreased respectively 13.5% and 20.2% as compared with 2017. The decrease was noted for all levels *(Figure 1.5)*.

Figure 1.5 Number of E&M vacancies in the E&M Engineering sector by job level in 2021 and 2017



Salary

1.20 The salary distribution of E&M employees at various levels is listed in *Table 1.4*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

Table 1.4 Salary distribution of E&M employees in the E&M Engineering sector by job level in 2017

Job level	E&M Engineering Sector						
	<= $15,000	$15,001 - $18,000	$18,001 - $25,000	$25,001 - $35,000	$35,001 - $45,000	$45,001 - $60,000	> $60,000
Professional/ Technologist	0%	0%	0.7%	33.7%	24.0%	25.5%	16.2%
Technician	0.5%	3.8%	43.5%	36.4%	14.7%	*	0%
Tradesman/ Craftsman	2.6%	23.5%	59.3%	14.5%	*	0%	0%
Semi-skilled/ General worker	50.9%	38.1%	10.8%	*	0%	0%	0%
Overall	3.6%	15.7%	44.4%	22.2%	7.3%	4.3%	2.5%

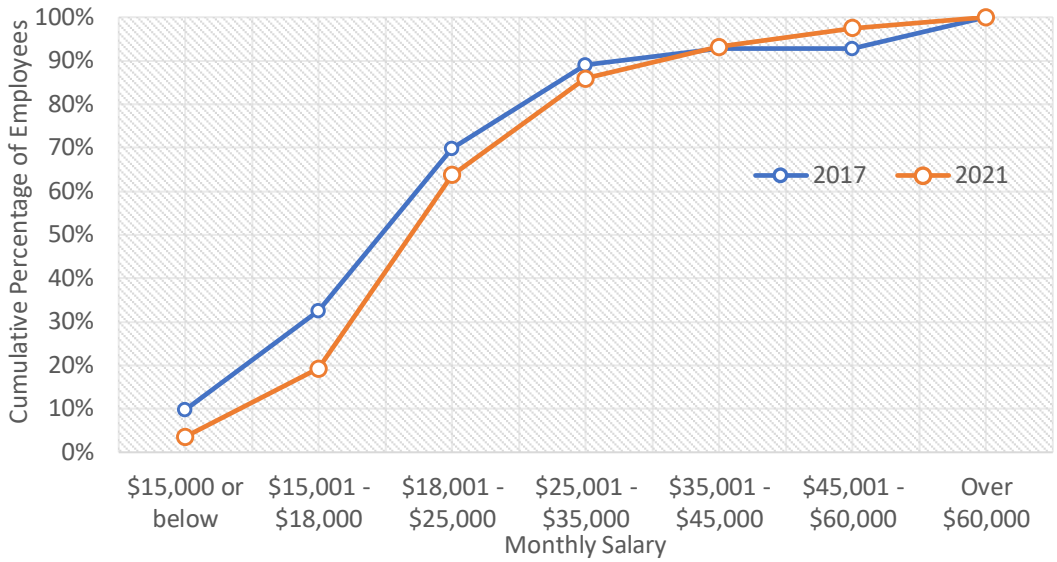
Notes :

*(1) * Less than 0.5%*

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

1.21 Overall speaking, a shift to the higher end of salary was noted for employees of the E&M Engineering sector as compared to 2017 *(Figure 1.6)*.

Figure 1.6 Cumulative percentage of average monthly salary in the E&M Engineering sector in 2021 and 2017 – Overall



Prominent Principal Jobs

1.22 The prominent principal jobs of the E&M Engineering sector with most employees are shown in *Table 1.5* below.

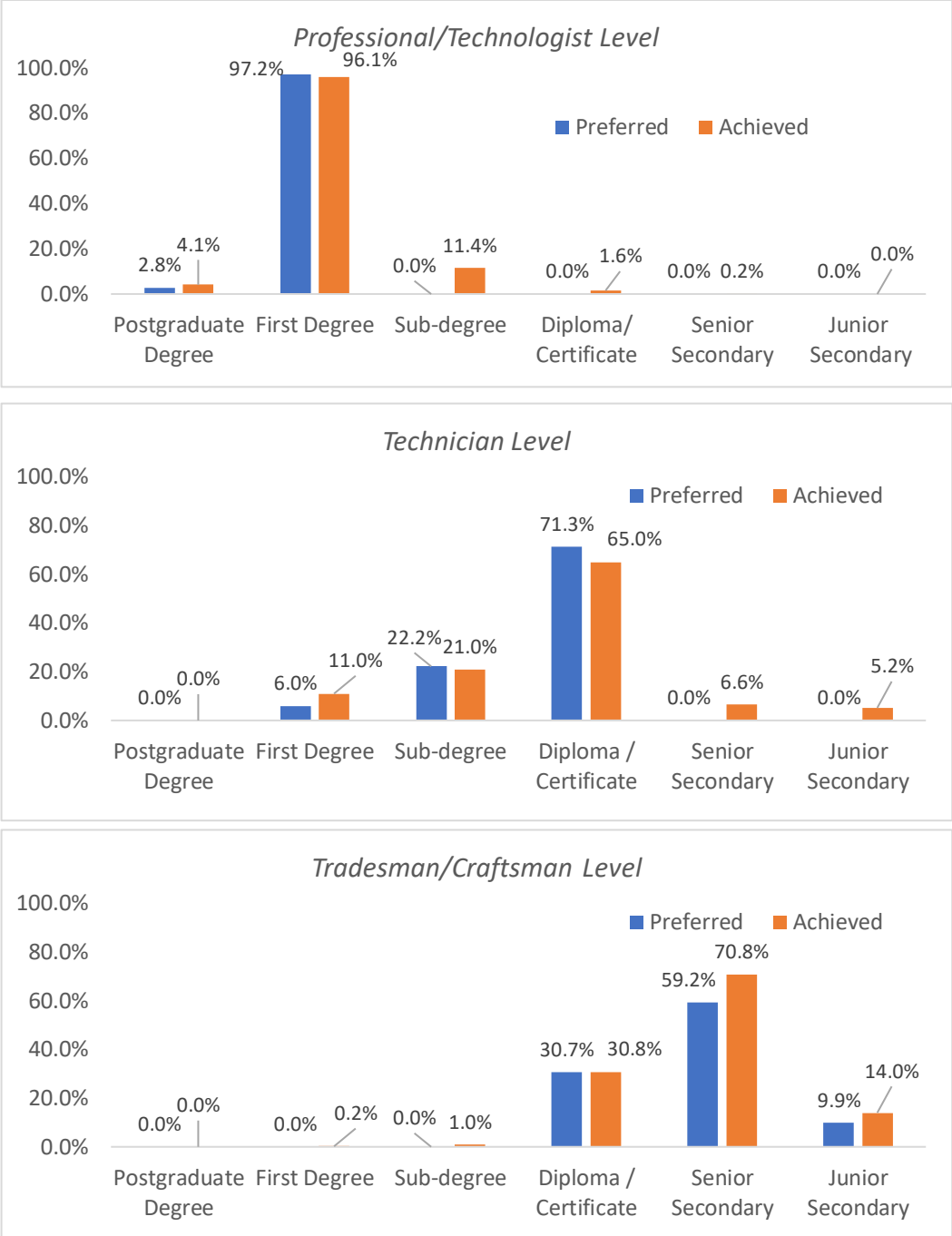
Table 1.5 Prominent Principal jobs by level in the E&M Engineering sector in 2021

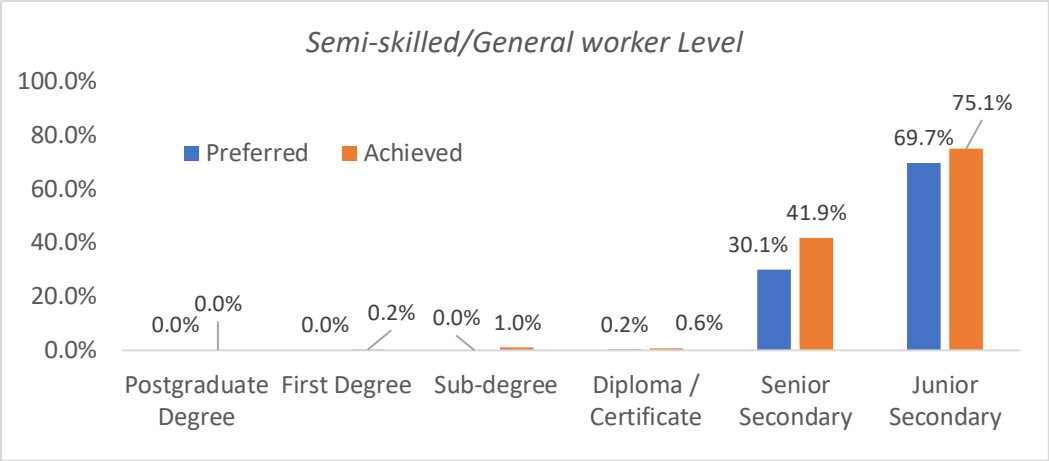
Job Level	Prominent Principal Jobs	% of E&M employees accounted at respective level
Professional/ Technologist	Electrical Engineer	78.5
	Building Services Engineer	
	Engineering Manager	
	Refrigeration / Air-conditioning/ Ventilation Engineer	
	Mechanical Engineer	
Technician	Supervisor	66.1
	Electrical Engineering Technician	
	Building Services Technician	
	Refrigeration / Air-conditioning/ Ventilation Technician	
	Mechanical Engineering Technician	
Tradesman/ Craftsman	Electrician / Electrical Fitter	59.8
	Foreman / Chargehand	
	Building Services Mechanic	
	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System)	
	Lift Mechanic	

Preferred and Achieved Education Level

1.23 Employers of the E&M Engineering sector were asked to indicate the preferred education level for their staff members, and a higher level of education was generally preferred for staff at the higher job level. A first degree or above was preferred for professionals/technologists, while a diploma/certificate was preferred for technicians; senior secondary and junior secondary were preferred respectively for tradesmen/craftsmen and semi-skilled/general workers. The distribution is shown in *Figure 1.7*.

Figure 1.7 Preferred and Achieved Level of Education for Full-time Employees by Job Level

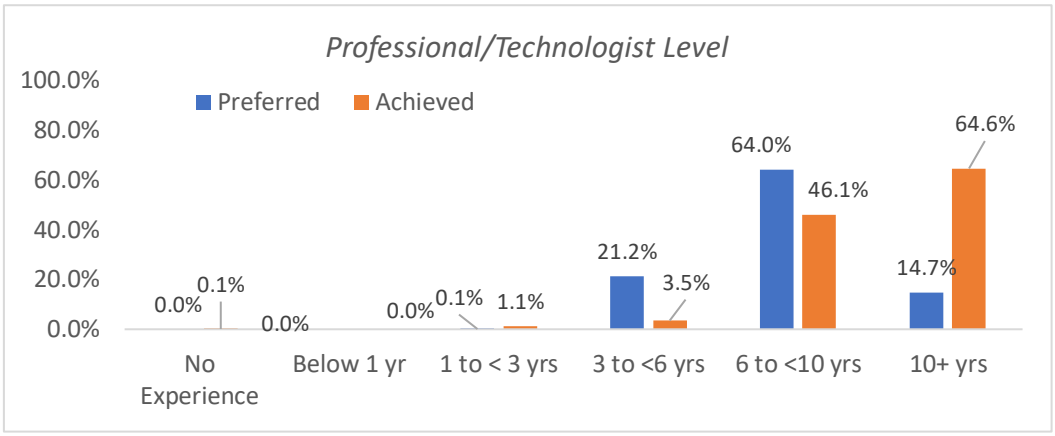


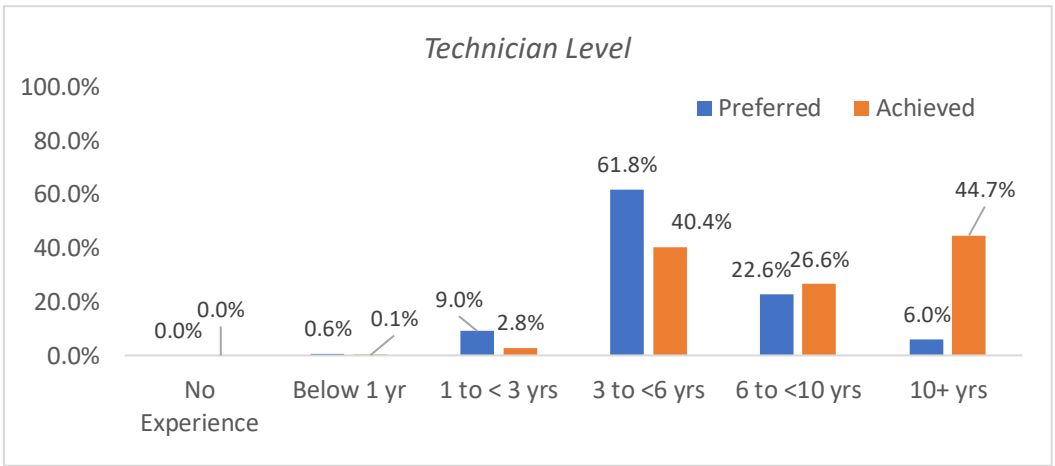


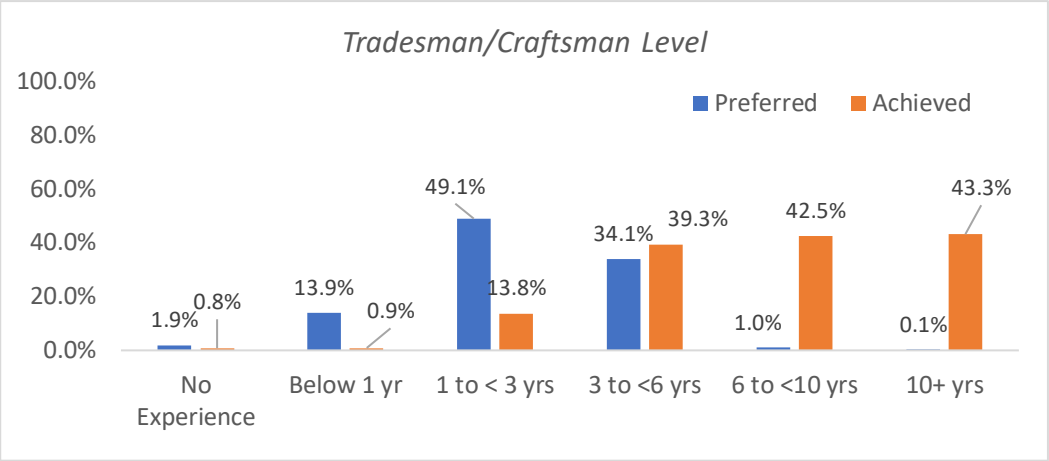
Preferred and Accumulated Years of Experience

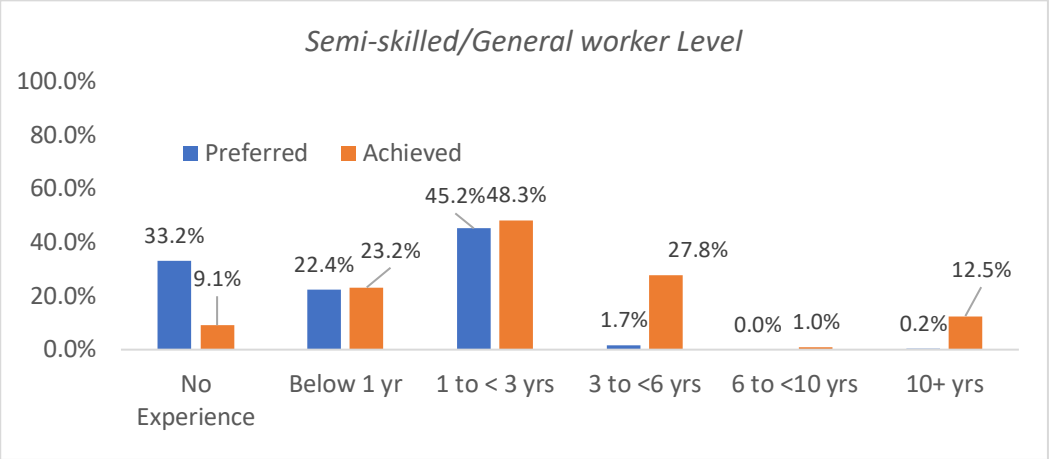
1.24 Employers in the E&M engineering sector reported that staff members' actual work experience exceeded their expectations. Among employees at the professional/technologist level and technician level, 64.0% and 61.8% preferred to have 6 - 10 years and 3 - 6 years of work experience respectively, while 49.1% and 45.2% of employees at the tradesman/craftsman level and semi-skilled/general worker level preferred to have 1 - 3 years of experience. The distribution is shown in *Figure 1.8*.

Figure 1.8 Preferred and Accumulated Years of Work Experience for Full-time Employees by Job Level









Turnover

1.25 A total of 4,349 employees in the E&M Engineering sector left their companies in the past 12 months, giving an overall turnover rate of 6.1%. Employees at the professional/technologist level registered the highest turnover rate of 7.2%. For details, please refer to *Table 1.6*.

Table 1.6 Employees Left their Companies in the Past 12 Months and Turnover Rate by Job Level

Job level	Number of Employees Left	Turnover Rate*
Professional/technologist	787	7.2%
Technician	942	5.5%
Tradesman/ craftsman	2,409	6.0%
Semi-skilled/general worker	211	7.1%
Total	**4,349**	**6.1%**

*Note: * Turnover rate = no. of employees left in the past 12 months / (no. of employees + no. of vacancies)*

Major Areas of Training Required

1.26 The majority of employers preferred their professionals and technologists to be trained in project management. However, employees at the technician level preferred to be trained in regulations and specific safety topics (e.g. safety awareness, construction site safety). The five most important training areas for employees at the tradesman/craftsman level were all related to safety topics. The prominent areas of training required for employees by job level are shown in *Table 1.7*.

Table 1.7 Top Five Areas of Training Required for Employees

Professional / Technologist	Technician	Tradesman / Craftsman
Project Management (54.3%)	Safety Awareness (45.4%)	Safety Awareness (72.2%)
Risk and Crisis Management (43.0%)	Safety ordinances Cap. 59 FIUO and Cap. 509 OSHO (35.1%)	Construction Site Safety for Workers (39.3%)
Relevant Trade's Ordinances and Regulations (34.1%)	Relevant Trade's Ordinances and Regulations (30.9%)	Use of Personal Protective Equipment (38.6%)
Construction Contract's Terms and Conditions (29.7%)	Construction Site Safety for Workers (29.1%)	Safety/Risk Management (24.5%)
Safety Awareness (22.1%)	Project Management (27.9%)	Safety Audit/Assessment (21.5%)

C. Gas Sector

Manpower

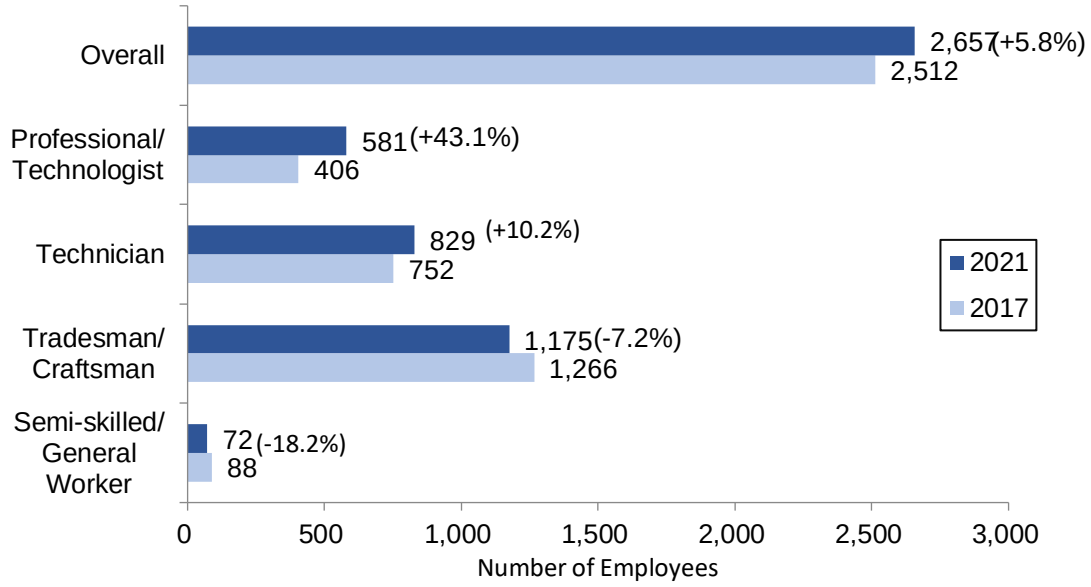
1.27 At the time of the survey, a total of 2,657 E&M employees engaged in the Gas sector, of which 44.2% of employees were at the tradesmen/craftsmen level, followed by 31.2% of employees at the technician level, 21.9% of employees at the professional/technologist level, and 2.7% of employees at the semi-skilled/general worker level. Please refer to *Table 1.8* for an overview of the manpower situation of the Gas sector.

Table 1.8 Number of E&M employees, trainees and vacancies in the Gas sector by job level in 2021

Job level	Gas sector		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional/technologist	581 *(21.9%)*	7 *(22.6%)*	14 *(24.1%)*
Technician	829 *(31.2%)*	11 *(35.5%)*	18 *(31%)*
Tradesman/craftsman	1,175 *(44.2%)*	13 *(41.9%)*	23 *(39.7%)*
Semi-skilled/general worker	72 *(2.7%)*	N.A.	3 *(5.2%)*
Overall	**2,657** ***(100%)***	**31** ***(100%)***	**58** ***(100%)***

1.28 As compared to 2017, an overall increase of almost 5.8% of employees in the Gas sector was noted. A rise in manpower was recorded at the professional/technologist and technician levels, while a decrease was recorded at both the tradesman/craftsman and semi-skilled/general worker levels *(Figure 1.9)*.

Figure 1.9 Number of employees in the Gas sector by job level in 2021 and 2017



Salary

1.29 The salary distribution of E&M employees in the Gas sector at various levels is listed in *Table 1.9*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

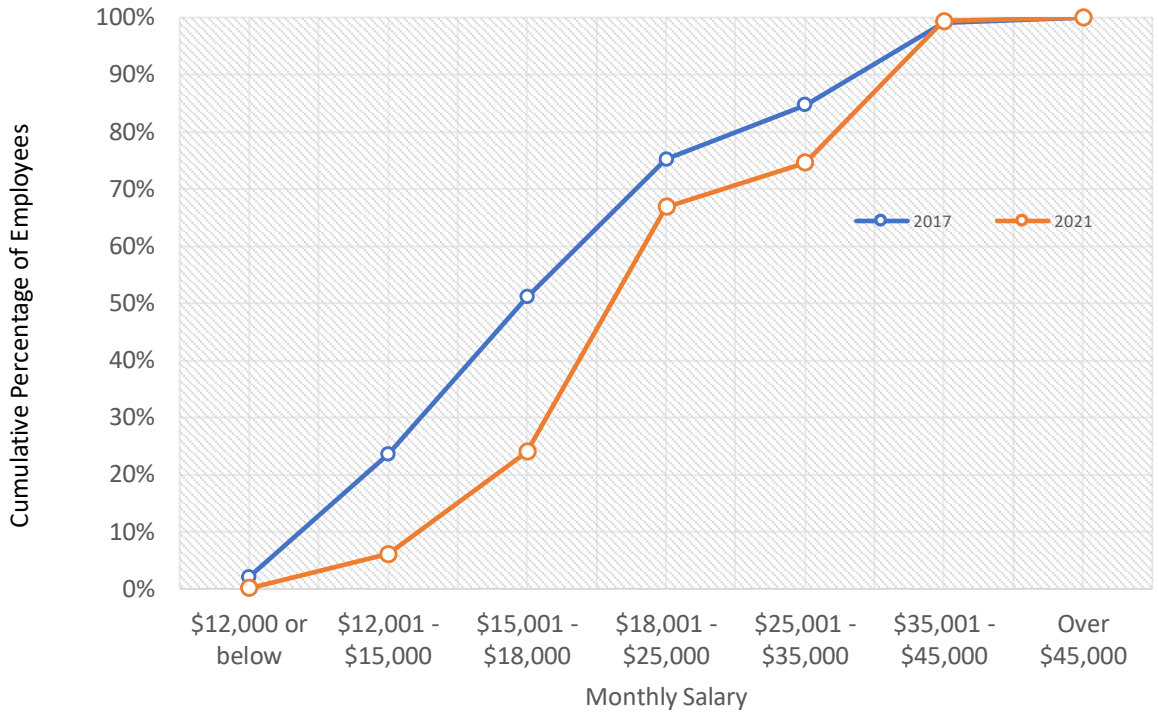
Table 1.9 Salary distribution of E&M employees in the Gas sector by job level in 2021

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%	0%	0%	3.9%	93.1%	3%
Technician	0%	0%	0.7%	67.5%	17.3%	14.5%	0%
Tradesman/craftsman	0%	11.8%	36%	49%	3.2%	0%	0%
Semi-skilled/general worker	3%	30.3%	62.1%	4.5%	0%	0%	0%
Overall	**0.1%**	**6%**	**17.9%**	**42.9%**	**7.7%**	**24.8%**	**0.7%**

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

1.30 Overall speaking, a shift to higher end of salary was noted for employees of the Gas sector as compared to 2017 *(Figure 1.10)*.

Figure 1.10 Cumulative percentage of average monthly salary in the Gas sector in 2021 and 2017 – Overall



Prominent Principal Jobs

1.31 The prominent principal jobs of the Gas sector with the majority of employees are shown in *Table 1.10* below.

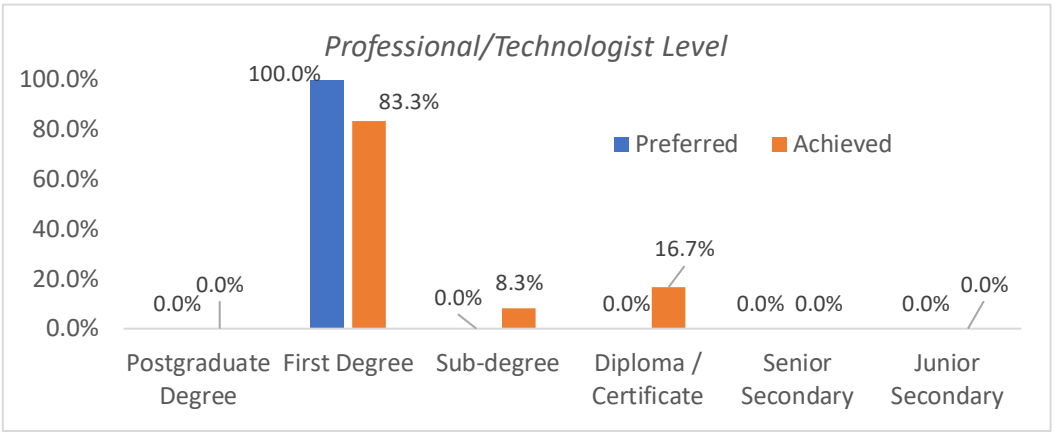
Table 1.10 Prominent Principal jobs in the Gas sector by level in 2021

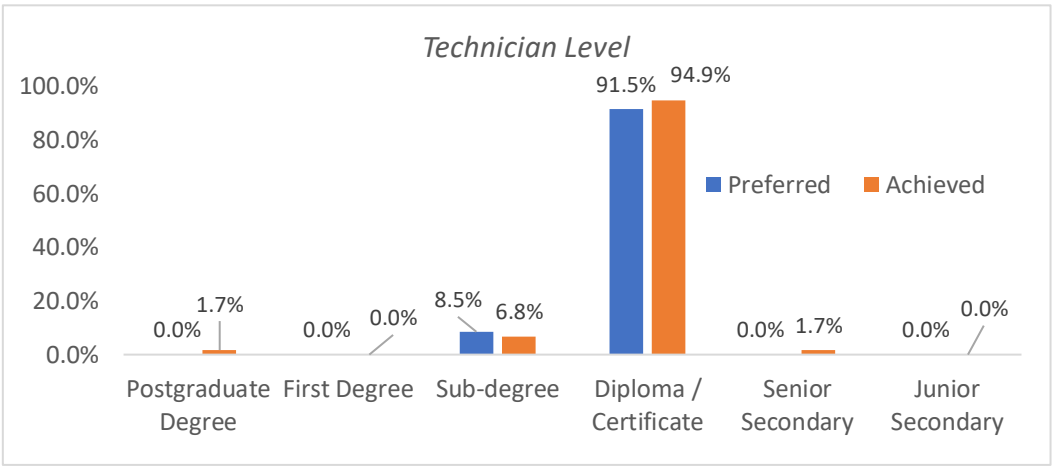
Job Level	Job	% of E&M employees accounted at respective level
Professional / Technologist	Mechanical Engineer	62.0
Technician	Mechanical Engineering Technician	46.9
Tradesman / Craftsman	Gas Utilisation Fitter (Domestic)	42.3

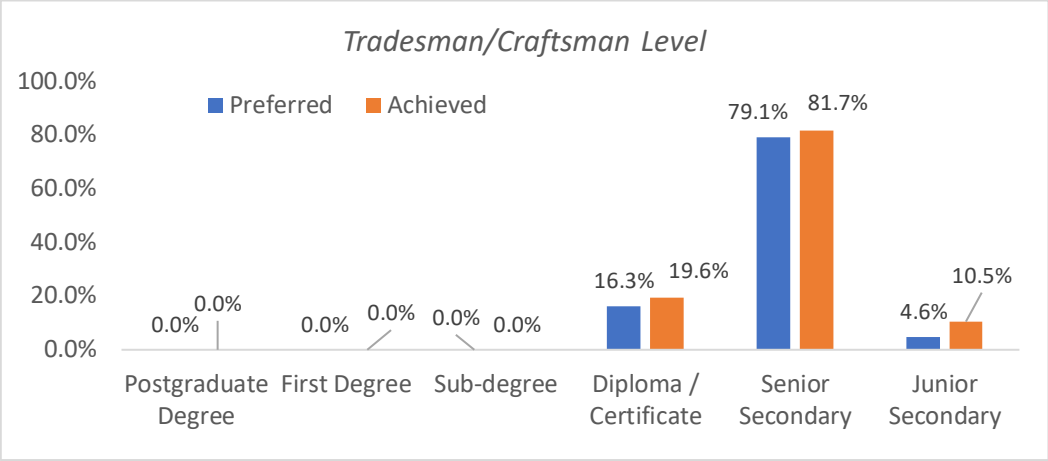
Preferred and Achieved Education Level

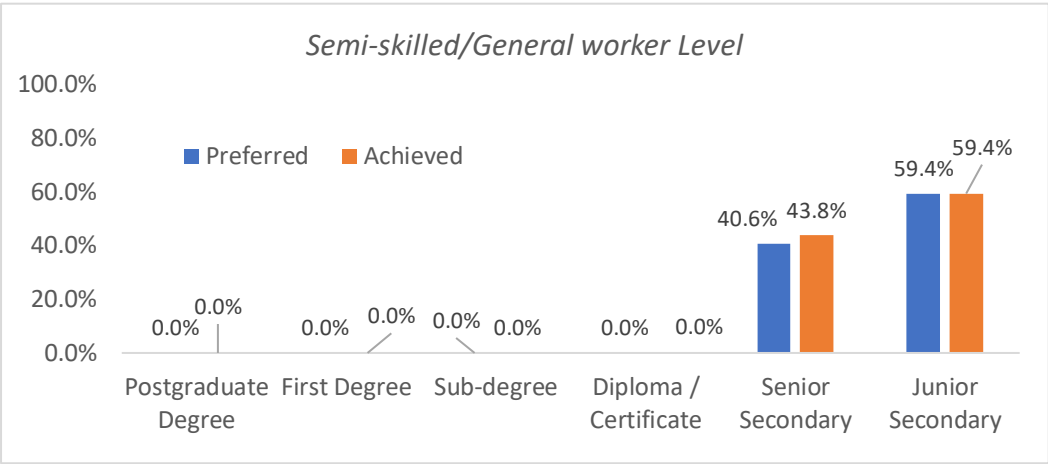
1.32 In the Gas sector, employers were asked to indicate the preferred educational level for their employees, and higher education levels were typically preferred among employees at higher positions. A first degree or above was preferred for professionals/technologists, and a diploma/certificate was preferred for technicians. On the other hand, senior secondary and junior secondary were preferred respectively for tradesmen/craftsmen and semi-skilled/general workers. The distribution is shown in *Figure 1.11*.

Figure 1.11 Preferred and Achieved Level of Education for Full-time Employees in the Gas Sector by Job Level





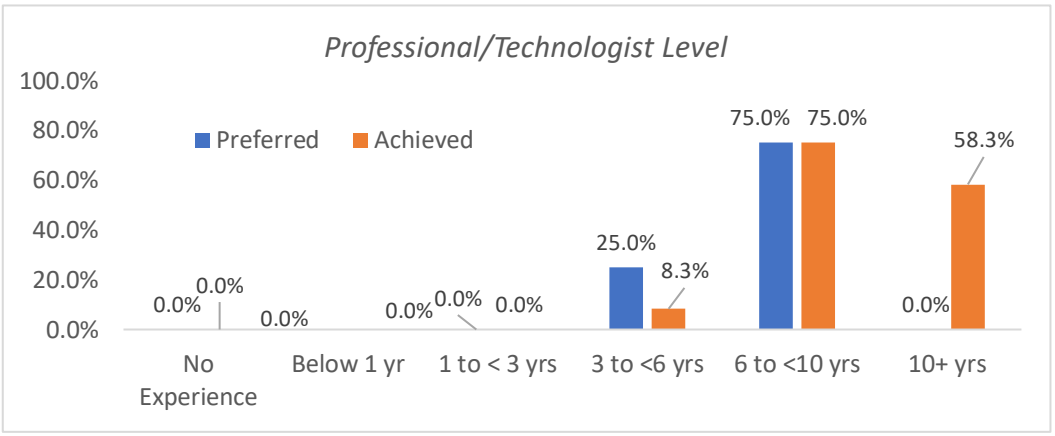


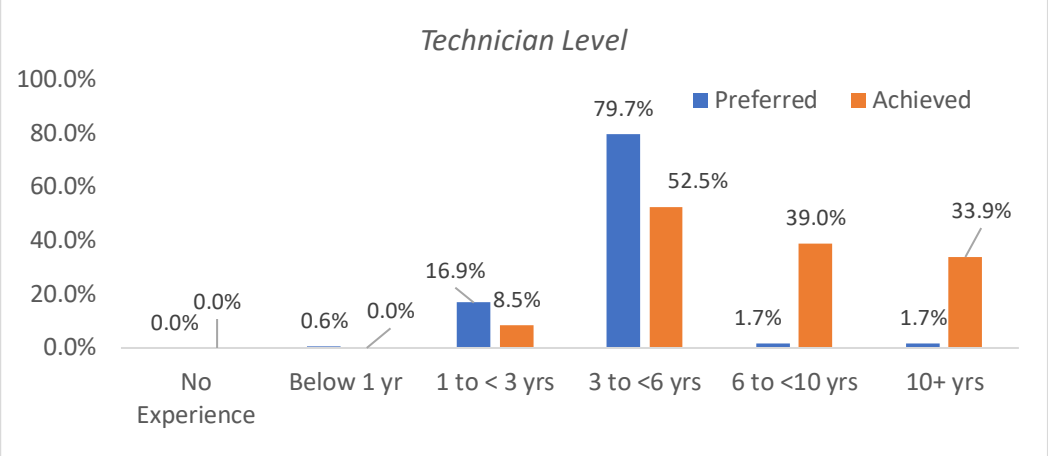


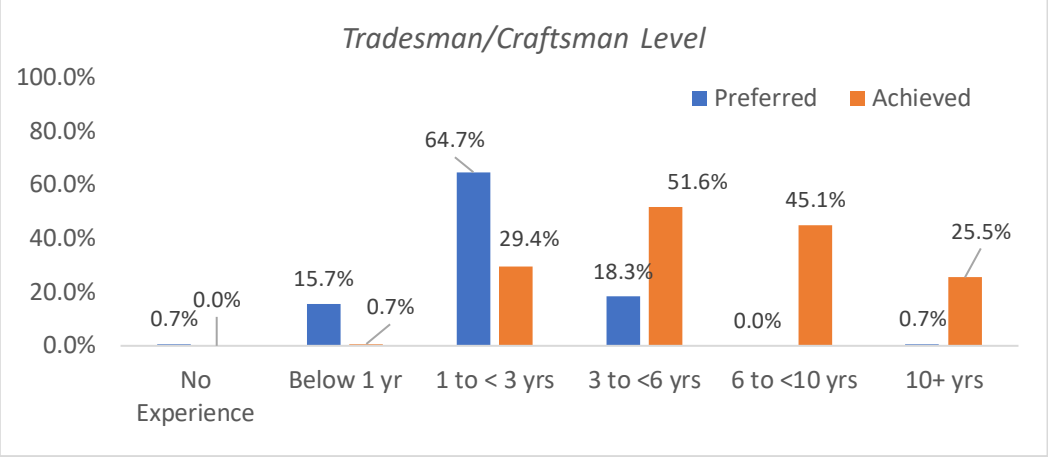
Preferred and Accumulated Years of Experience

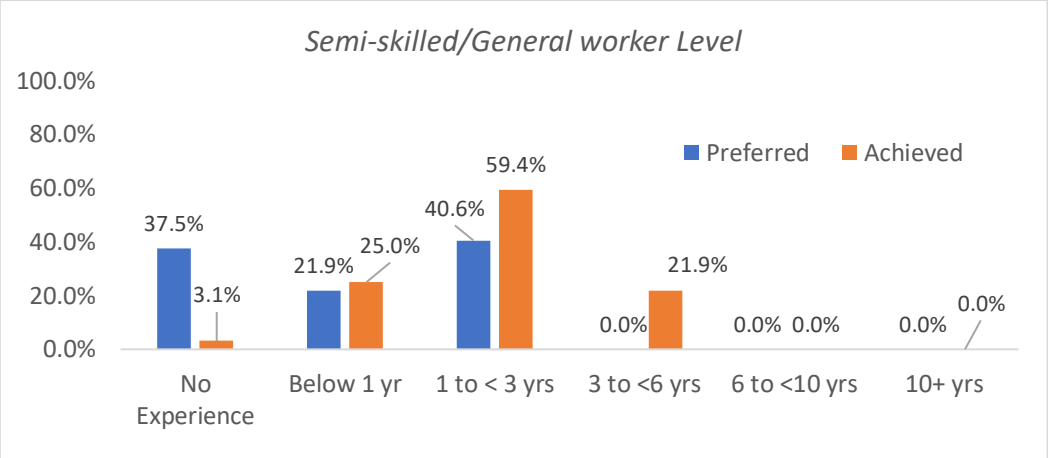
1.33 The majority of employers in the Gas sector reported that the actual work experience of their staff exceeded their expectations. 75.0% and 79.7% of employees at the professional/technologist level and technician level were preferred respectively to have 6-10 years and 3-6 years of work experience, while 64.7% and 40.6% of employees at tradesman/craftsman level and semi-skilled/general worker level were preferred to have 1-3 years of work experience. The distribution is shown in *Figure 1.12*.

Figure 1.12 Preferred and Accumulated Years of Experience for Full-time Employees by Job Level









Turnover

1.34 A total of 145 employees in the Gas sector left their companies in the past 12 months, giving an overall turnover rate of 5.3%; most of them were at the technician level. Employees at the professional/technologist level registered the highest turnover rate of 7.2%. For details, please refer to *Table 1.11*.

Table 1.11 Employees Left their Companies in the Past 12 Months and Turnover Rate by Job Level

Job level	Number of Employees Left	Turnover Rate*
Professional / Technologist	43	7.2%
Technician	57	6.7%
Tradesman / Craftsman	40	3.3%
Semi-skilled/ General worker	5	6.7%
Total	**145**	**5.3%**

Note: Turnover rate = no. of employees left in the past 12 months / (no. of employees + no. of vacancies)*

Major Areas of Training Required

1.35 Most employers preferred their professionals and technologists to have training in project management related areas. However, employees at the technician level were expected to receive training in operation-related areas as well as safety-related topics (e.g. safety awareness, safety/risk management). The five most important training areas for employees at the tradesman/craftsman level were all related to safety topics. The prominent areas of training required for employees by job level are shown in *Table 1.12*.

Table 1.12 Top Five Areas of Training Required for Employees

Professional / Technologist	Technician	Tradesman / Craftsman
Project Management (43.8%)	Basic Gas Engineering (50.8%)	Safety Awareness (59.9%)
Risk and Crisis Management (37.5%)	Safety Awareness (44.4%)	Construction Site Safety for Workers (39.5%)
Construction Contract's Terms and Conditions (31.3%)	Safety/Risk Management (20.6%)	Safety ordinances Cap. 59 FIUO and Cap. 509 OSHO (22.9%)
IT Application for Gas Engineering (25.0%)	IT Application for Gas Engineering (19.0%)	Safety/Risk Management (21.0%)
Basic Gas Engineering (25.0%)	Relevant Trade's Ordinances and Regulations (19.0%)	Use of Personal Protective Equipment (20.4%)

D. Aircraft Maintenance Sector

Manpower

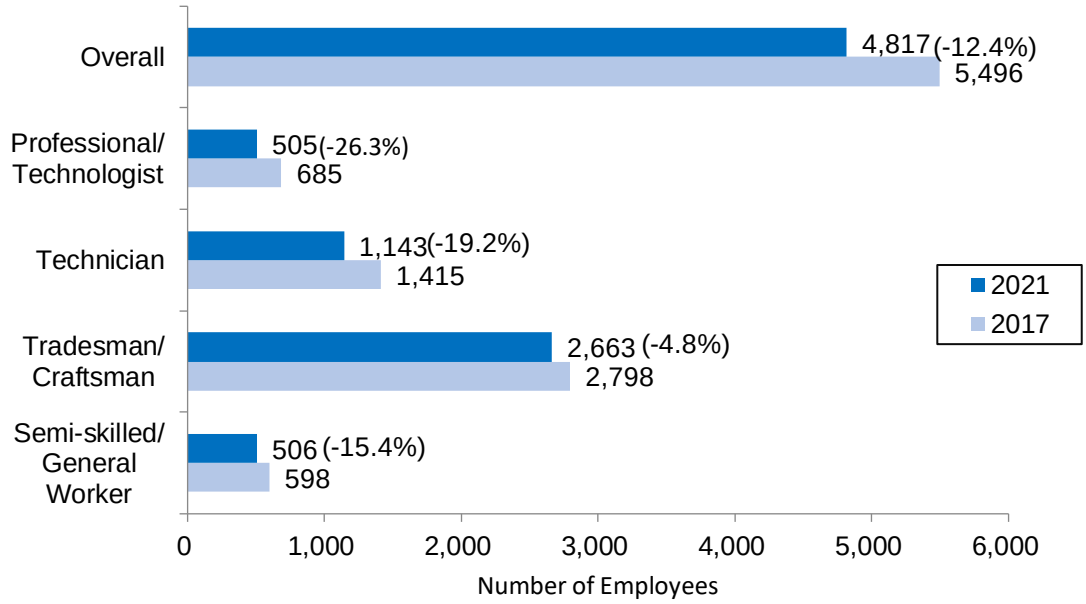
1.36 There were 4,817 E&M employees employed in the Aircraft Maintenance sector at the time of the survey, of whom over half were tradesman/craftsmen, followed by 23.7% of employees at the technician level, and 10.5% of employees at both the professional/technologist and semi-skilled/general worker level. Please refer to *Table 1.13* for an overview of manpower situation of the Aircraft Maintenance Sector.

Table 1.13 Number of E&M employees, trainees and vacancies in the Aircraft Maintenance sector by job level in 2021

Job level	Aircraft Maintenance Sector		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional/technologist	505 *(10.5%)*	0 *(0%)*	0 *(0%)*
Technician	1,143 *(23.7%)*	0 *(0%)*	73 *(16.9%)*
Tradesman/craftsman	2,663 *(55.3%)*	468 *(100%)*	300 *(69.3%)*
Semi-skilled/general worker	506 *(10.5%)*	N.A.	60 *(13.98%)*
Overall	**4,817 *(100%)***	**486 *(100%)***	**433 *(100%)***

1.37 As compared to 2017, an overall decrease of 12.4% employees in the Aircraft Maintenance sector was noted. There was a decrease in manpower for all levels, and the professional/technologist level recorded a significant decrease of 26.3% *(Figure 1.13)*.

Figure 1.13 Number of employees in the Aircraft Maintenance sector by job level in 2021 and 2017



Salary

1.38 The salary distribution of the E&M employees in the Aircraft Maintenance sector of various levels is listed in *Table 1.14*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

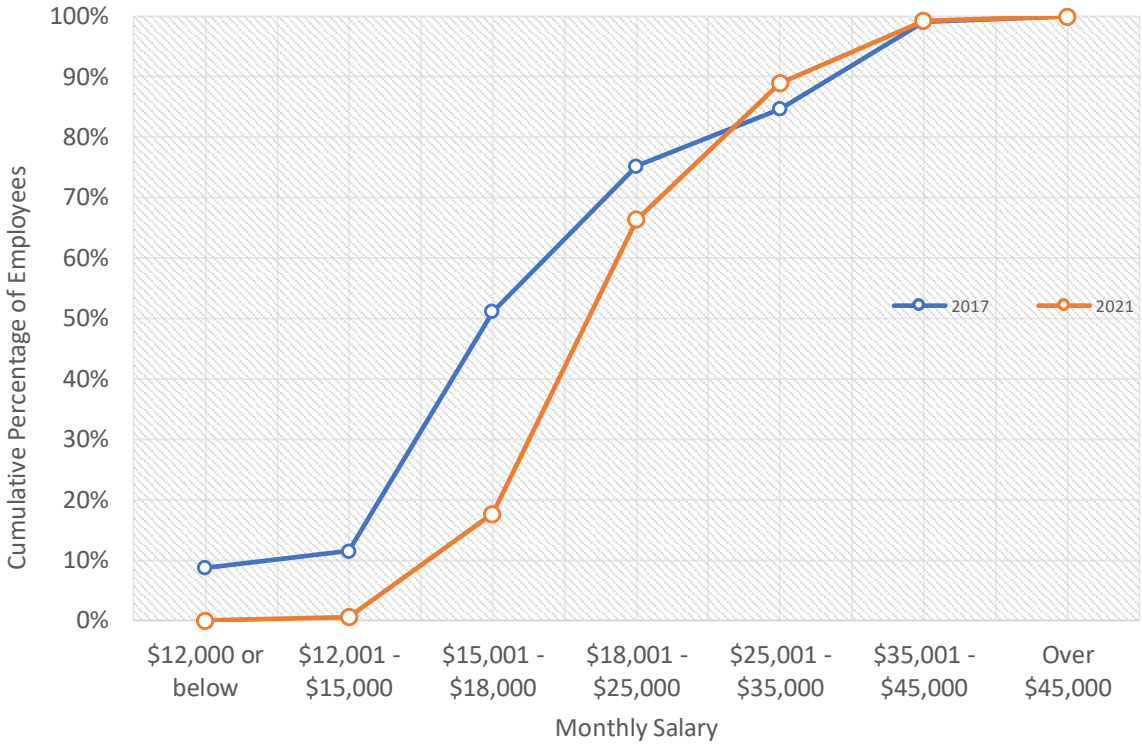
Table 1.14 Salary distribution of E&M employees in the Aircraft Maintenance sector by job level in 2021

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%	0.4%	99%	0.6%
Technician	0%	0%	3.9%	0.6%	95.5%	0%	0%
Tradesman/Craftsman	0%	4%	11.3%	88.6%	0.1%	0%	0%
Semi-skilled/General worker	0%	5.9%	94.1%	0%	0%	0%	0%
Overall	**0%**	**0.6%**	**17.1%**	**49.3%**	**22.6%**	**10.3%**	**0.1%**

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

1.39 Overall speaking, a shift to overall of salary was noted for employees of Aircraft Maintenance sector as compared to 2017 *(Figure 1.14)*.

Figure 1.14 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector in 2021 and 2017 – Overall



Prominent Principal Jobs

1.40 The prominent principal jobs of the Aircraft Maintenance sector with most employees are shown in *Table 1.15* below.

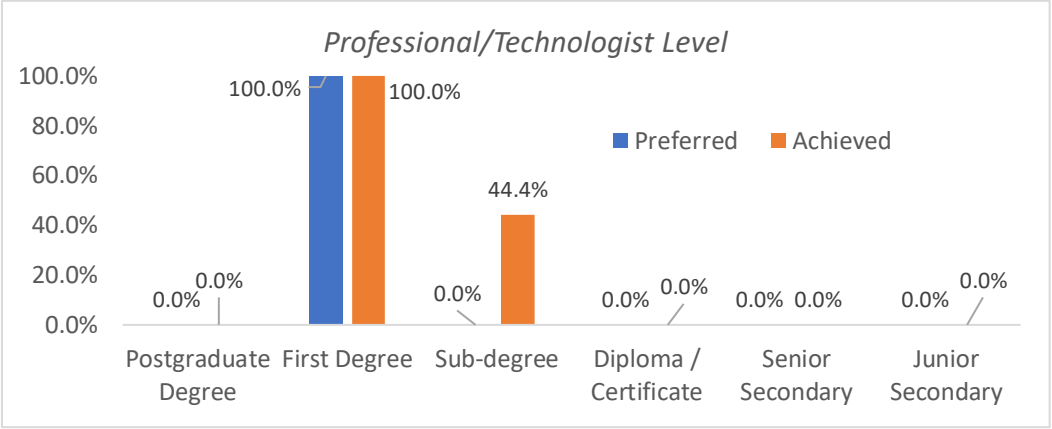
Table 1.15 Prominent Principal jobs in the Aircraft Maintenance sector by level in 2021

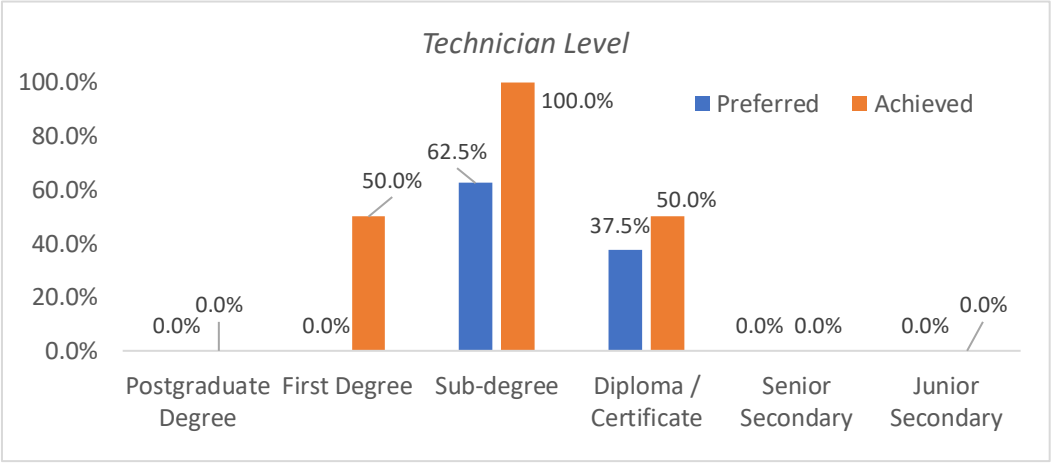
Job Level	Job	% of E&M employees accounted at respective level
Professional/Technologist	Aircraft Maintenance Engineer	**94.6**
Technician	Supervisor	**50.3**
	Aircraft Maintenance Technician	**47.5**
Tradesman/Craftsman	Aircraft Maintenance Mechanic	**93.3**

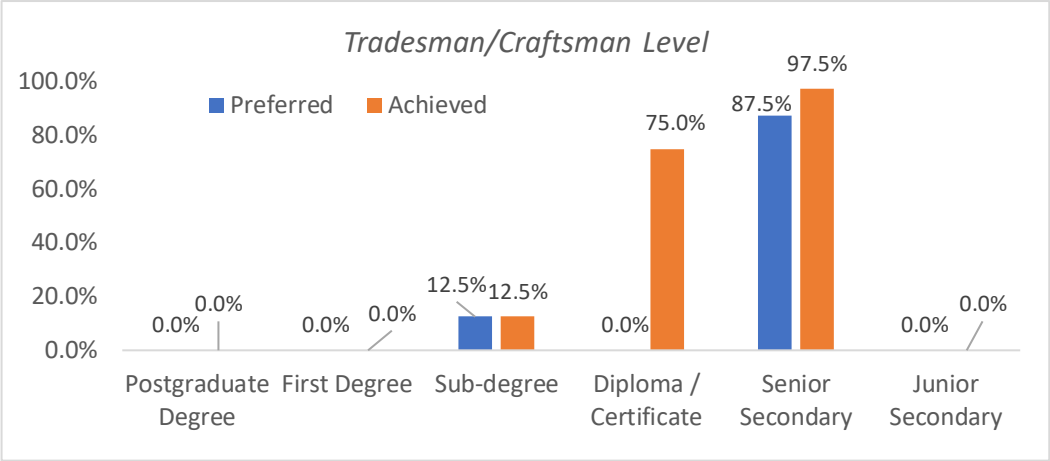
Preferred and Achieved Education Level

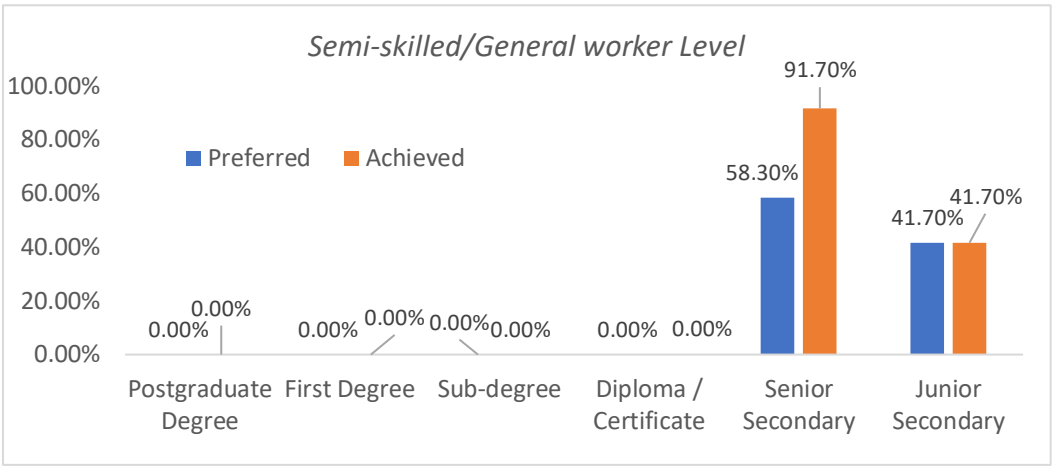
1.41 The survey revealed that 100% of Aircraft Maintenance employers preferred employees to have a first degree, while 62.5% preferred technicians to have a sub-degree. Conversely, 87.5% of employers prefer workers at the tradesman/craftsman level to have a senior secondary education. The distribution is shown in *Figure 1.15*.

Figure 1.15 Preferred and Achieved Level of Education for Full-time Employees by Job Level





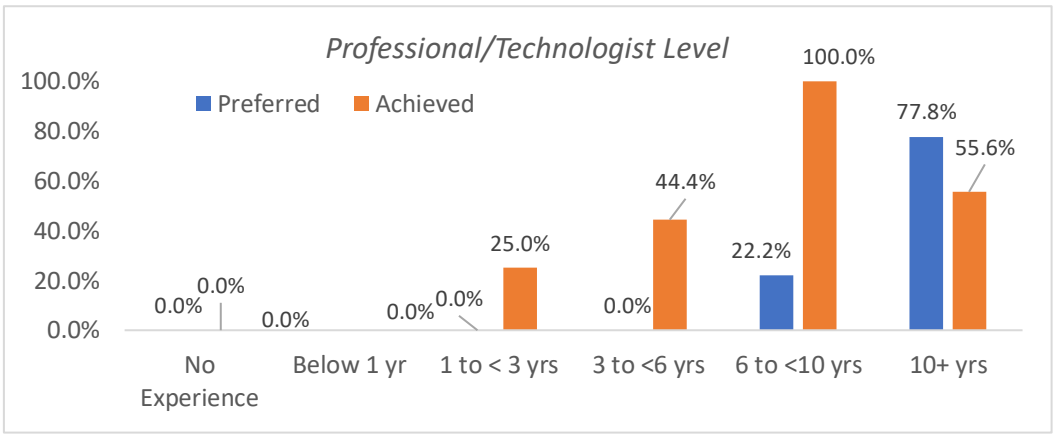


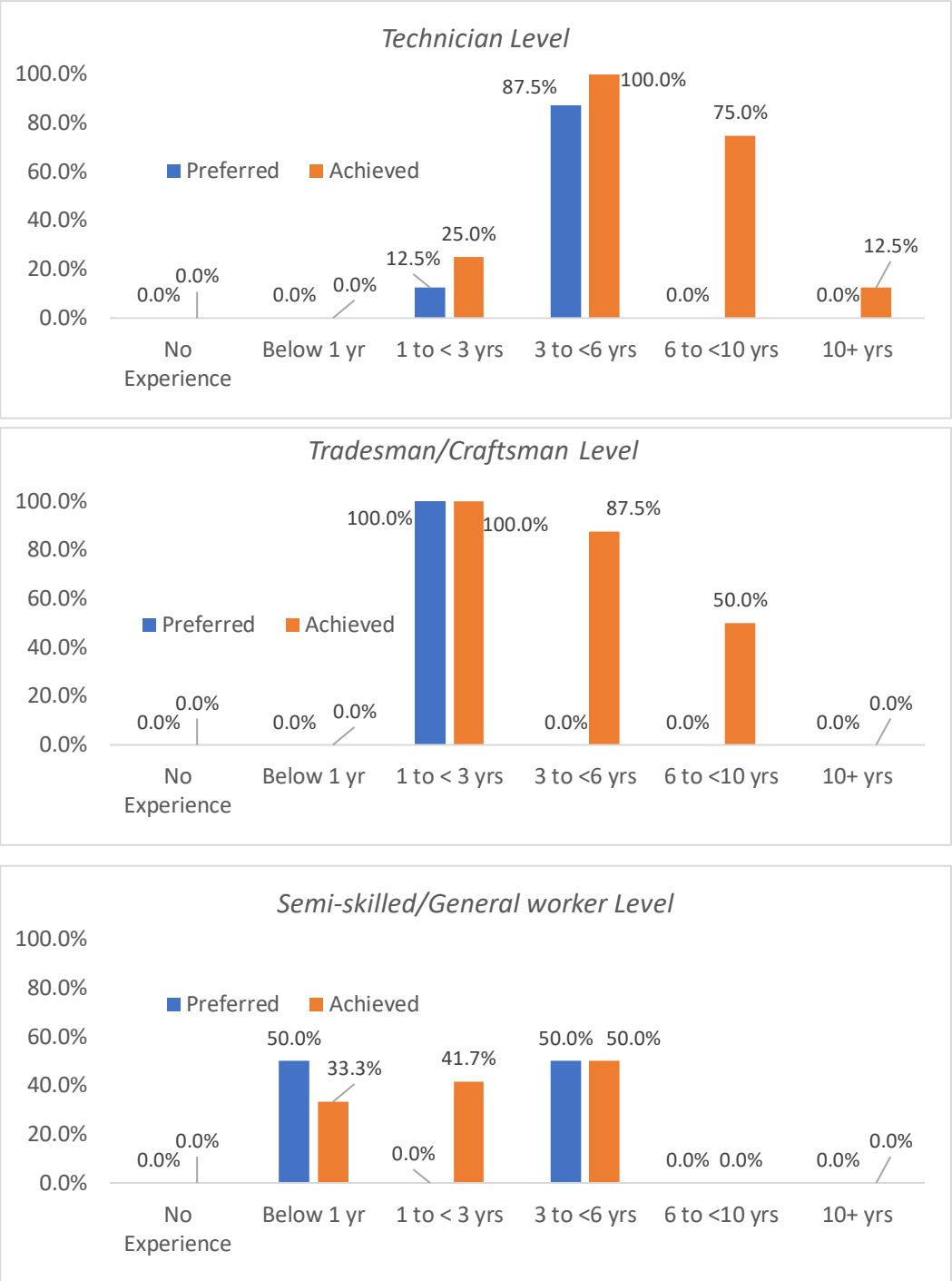


Preferred and Accumulated Years of Experience

1.42 The majority of employers of the Aircraft Maintenance sector reported that the actual work experience of staff members exceeded their preferences. At the professional/technologist level, 77.8% of employers preferred their employees to have 6 - 10 years of work experience, while at the technician and tradesman/craftsman levels, employers preferred their employees to have respectively 3 - 6 years (87.5%) and 1 - 3 years (100.0%) of work experience. The distribution is shown in *Figure 1.16*.

Figure 1.16 Preferred and Accumulated Years of Experience for Full-time Employees by Job Level





Turnover

1.43 A total of 230 employees in the Aircraft Maintenance sector left their companies in the past 12 months, giving an overall turnover rate of 4.4%. Employees at the professional/technologist level registered the highest turnover rate of 9.9%. For details, please refer to *Table 1.16*.

Table 1.16 Employees Left their Companies in the Past 12 Months and Turnover Rate by Job Level

Job level	Number of Employees Left	Turnover Rate*
Professional/technologist	50	9.9%
Technician	80	6.6%
Tradesman/ craftsman	90	3.0%
Semi-skilled/ general worker	10	1.8%
Total	**230**	**4.4%**

*Note: * Turnover rate = no. of employees left in the past 12 months / (no. of employees + no. of vacancies)*

Major Areas of Training Required

1.44 A majority of employees at the professional/technologist level were preferred to receive training in project management-related areas. On the other hand, technicians were preferred to have training in regulations related areas. The five most important training areas for employees at the tradesman/craftsman level were all related to safety topics. The prominent areas of training required for employees by job level are shown in *Table 1.17*.

Table 1.17 Prominent Areas of Training Required for Employees

Professional / Technologist	Technician	Tradesman / Craftsman
Project Management (45.5%)	Safety ordinances Cap. 59 FIUO and Cap. 509 OSHO (80.0%)	Safety Awareness (88.9%)
Construction Contract's Terms and Conditions (36.4%)	Relevant Trade's Ordinances and Regulations (30.0%)	Safety Audit/Assessment (66.7%)
Risk and Crisis Management (27.3%)	Engineering-related ISO Standards (30.0%)	Safety/Risk Management (66.7%)
Digital Skill in Using Engineering Related Software and Apps (18.2%)	Instructing and Coaching Skills (30.0%)	Use of Personal Protective Equipment (33.3%)
	Computer-based Technology for Training (20.0%)	Construction Site Safety for Workers (22.2%)

Major Conclusions and Recommendations

Summary of Major Conclusions and Recommendations

1.45 The Training Boards' major conclusions and recommendations for manpower training of the E&M Services industry for 2022 to 2025 are summarised below:

(a) E&M Engineering personnel:

(i) They should acquire new knowledge of construction technologies and practical skills such as Building Information Modeling (BIM), Design for Manufacture and Assembly (DfMA), Multi-trade Integrated MEP (MiMEP), and Modular Integrated Construction (MiC) to enhance their competitiveness.

(ii) They should equip with knowledge of the Internet of Things and other smart technologies to meet the new industry needs.

(b) Training of Professionals/Technologists:

(i) The annual supply of local university graduates from full-time degree programmes meets the projected additional annual training requirements.

(ii) The Reindustrialization and Technology Training Programme (RTTS) and the Engineering Graduate Training Scheme (EGTS) 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 programmes.

(c) Training of Technicians:

(i) The annual supply of technicians from full-time and part-time-day programmes offered by City University of Hong Kong, The Hong Kong Polytechnic University, and Hong Kong Institute of Vocational Education and Youth College of VTC marginally meets the projected additional annual manpower requirements.

(ii) The Vplus Engineering under the Vplus Subsidy Scheme is recommended to working adults who are planning to pursue higher qualifications to enhance their upward mobility.

(d) Training of Tradesmen/Craftsmen:

(i) The annual supply of apprentices only fullfills one-third of the projected annual additional manpower requirements. The remaining manpower 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.

(ii) It is recommended that employers should support the Earn and Learn Scheme to attract more new entrants to join and retain in the E&M Services industry.

(iii) It is recommended that employers should support the Pilot Incentive Scheme to Employers (PISE) whereby the skills of apprentices could be cultivated, applied and assessed in authentic workplaces.

(iv) It is also recommended that training providers should increase their pre-employment training places and offer more skills upgrading programmes to enable semi-skilled workers to upgrade to qualified tradesmen/craftsmen.

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

(i) As reflected from the findings of this and previous rounds of manpower surveys, the supply of tradesmen/craftsmen for the E&M Services industry cannot rely on apprenticeship training alone. It is recommended that more semi-skilled/general workers to be trained up to address the manpower shortage.

(f) Trade Tests

(i) Trade test is one of the routes that allow semi-skilled workers to migrate to qualified tradesmen/craftsmen. Employers should encourage their non-registered workers in electrical installations and lift and escalator engineering to take the VTC's or Construction Industry Council’s (CIC) trade tests.

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

(g) Promotion of VPET and STEM Education

(i) 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 employers to continue support for the WorldSkills Competition by nominating their young and talented workers to join the competitions.

(ii) Close collaboration between the 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 (the Training Board) of the Vocational Training Council (VTC) 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 Starting from 2017, the manpower survey for the E&M services industry is conducted every four years, followed by two periodic manpower updates through focus group and desk research to better reflect the changing trends of the technical manpower situation. The employees and manpower in the report refer to those who are expected to apply the industrial knowledge and technical skills required to complete the work assigned.

2.3 Manpower data with respect to the survey reference date of 1 June 2021 was collected from June to August 2021. This report presents the survey findings and analysis of the latest manpower situation of the E&M services industry and proposes recommendations on manpower development to the different stakeholders of the industry, including employers, employees and training providers.

Survey Objective

2.4 The objective of the survey is to collect the latest manpower information of the Electrical and Mechanical Services industry. Specifically, the survey aims to:

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

Survey Coverage

2.5 The Survey covered the following sectors and branches of the E&M 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 E&M 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. Gas Sector

Branch 5: Gas Supply – Gas manufacturing and distribution companies (HSIC: 352000).

Branch6: Gas Fitting, Installation and Maintenance – Gas fitting, installation and maintenance companies (HSIC: 432204).

Branch 7: Supplementary Samples – Trading companies of gas equipment having associated servicing workshops, and relevant divisions of government departments and educational institutions.

III. Aircraft Maintenance Sector

Branch 8: 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

2.6 The survey adopted the stratified random sampling method for selecting companies to participate in the survey. To ensure the selection of a representative sample and to facilitate subgroup analysis, a total of 1,280 out of 10,986 establishments in the E&M Services industry were invited for the survey. Among the 1,280 establishments, 1,148 were selected by C&SD from the Central Register of Establishments (CRE)[4] 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 132 companies (supplementary sample) were 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 the Government.

[4] *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 quarterly through feedback from various surveys of the department and administrative returns from relevant government departments.*

Questionnaire Design

2.7 Survey data were collected by a structured questionnaire. Two separate questionnaires were designed to cater for the principal jobs applicable to the respective sectors:

(a) Questionnaire for the Electrical and Mechanical Engineering Sector and Aircraft Maintenance Sector (Questionnaire E); and
(b) Questionnaire for the Gas Sector(Questionnaire G).

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

Data Collection Method

2.9 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 the survey.

2.10 In respect of manpower information, four 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.

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

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

Quality Control Measures

2.13 Various measures were taken to ensure 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.

Prior fieldwork preparation

(a) 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 that belonged to the same business organisations were grouped to facilitate the fieldwork execution.

Thorough training of fieldwork staff

(b) VTC organised an industry briefing workshop to familiarise the fieldwork staff with industry-related knowledge.

(c) 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.

(d) Representatives of VTC had participated as guest speakers in the briefing session to answer and clarify queries.

Monitoring of the fieldwork execution

(e) 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.

(f) Joint field visits to a number of establishments were made by the staff of VTC to ensure that fieldwork was properly conducted.

Measures to increase the response rate

(g) Several 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.

Checking of the completed questionnaires

(h) Completed questionnaires returned by each enumerator were subject to sample check by an independent team of experienced checkers to verify if field visits had been made.

(i) All the completed questionnaires had undergone vetting process by the staff of VTC to clarify uncertainity cases. These cases were followed up by telephone and field verification with the parties concerned.

Double data entry and validation of the collected data

(j) 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 uncertainity cases were followed up through field verification.

New data collected in the survey

2.14 The questionnaires of the Manpower Survey for the E&M Services Industry are reviewed by the Training Board from time to time in order to collect data to reflect the current situation. New data were collected in this survey; hence, they could not be compared with that of the last round survey. The new data collected in this survey are shown as below:

(i) employers' views on business volume in the next 12 months;
(ii) employment of Hong Kong E&M workers in Greater Bay Area;
(iii) employers preferred employees to have and employees achieved education level;
(iv) employers preferred full-time employees to have and employees have accumulated Years of experience;
(v) difficulties encountered in the recruitment of full-time employees in past 12 months; and
(vii) the training and staff development budget in the next 12 months; and
(viii) the future training areas for full-time employees to meet the emerging trend of the industry.

Fieldwork Period and Enumeration Results

2.15 The data collection was carried out between June and August 2021. Among the 866 valid sampled establishments, 853 were successfully enumerated and 13 refused, giving an effective response rate of 98.5%.[5] Taking into account (i) the satisfactory response rate of individual branches, (ii) the fact that the majority of prominent and sizeable establishments had responded to the survey, and (iii) the grossing-up of sample results based 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 an individual sector/branch was also adequate to produce a meaningful breakdown by sector *(Table 2.1)*.

Table 2.1 Number of establishments successfully enumerated by sector

Sector	(a) No. of valid cases*	(b) No. of establishments successfully enumerated	(b)/(a) Effective Response rate
Overall	**866**	**853**	**98.5%**
Electrical and Mechanical Engineering	793	782	96.9%
Gas	64	62	100%
Aircraft Maintenance	9	9	100%

*Note: * Invalid cases were referred as those establishments which had been ceased operation, closed, and so on.*

[5] *The remaining cases were regarded as invalid cases, including establishments that 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 the survey, a total of 76,240 employees and 3,045 trainees were engaged in the E&M Services industry in Hong Kong.

3.2 Of the 76,240 employees, 68,766 (90.2%) were employed in the E&M Engineering sector, 2,657 (3.5%) in the Gas sector, and 4,817 (6.3%) in the Aircraft Maintenance sector (*Table 3.1*).

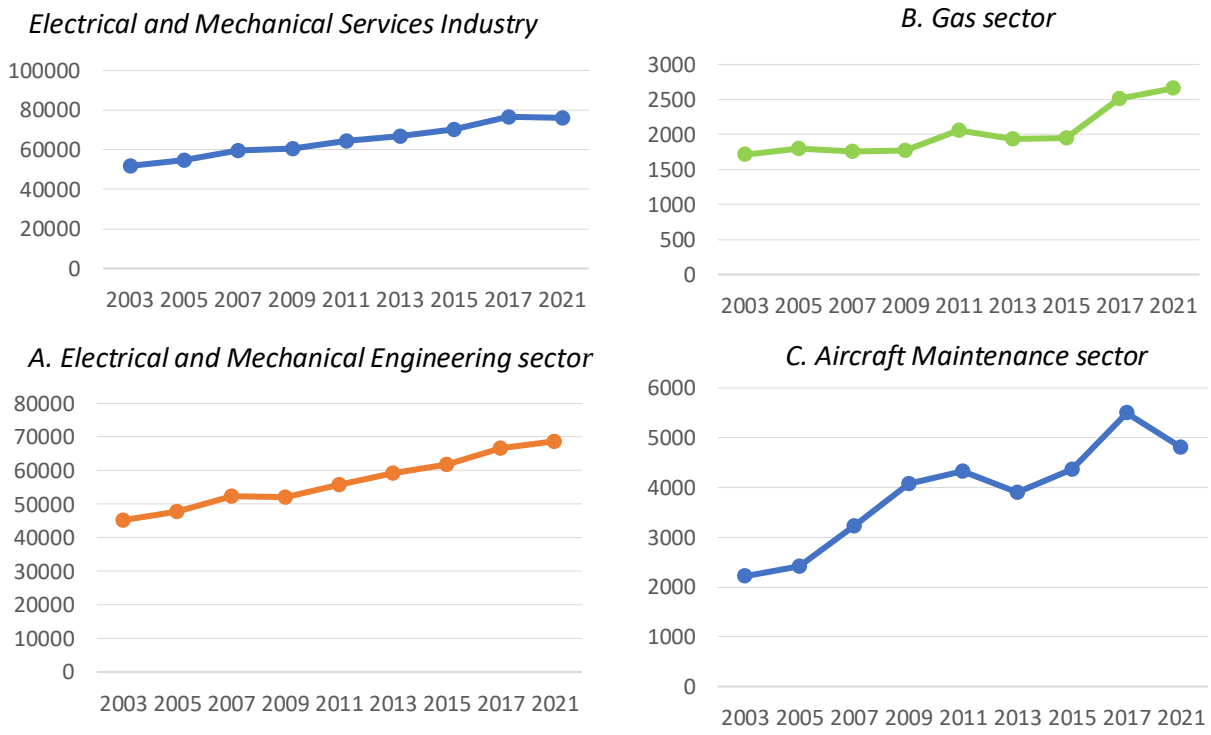
Table 3.1 Number of workers employed by sector in the E&M Services industry in 2021

Sector	E&M	
	Employees	Trainees
E&M Engineering	68,766 (90.2%)	2,546 (83.6%)
Gas	2,657 (3.5%)	31 (1%)
Aircraft Maintenance	4,817 (6.3%)	468 (15.4%)
Overall	**76,240 (100%)**	**3,045 (100%)**

Manpower Change Over the Years

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

Figure 3.1 Number of E&M employees in the E&M Services industry from 2003 to 2021 and by sector



Employers' Views on Business Environment in the Next 12 Months

3.4 The E&M Engineering and Gas sectors predicted that the business environment would be stable in the next 12 months, while the Aircraft Maintenance sector expected that the business environment would get worse after a year due to the decrease in flights during the COVID-19 pandemic. Please refer to *Table 3.2* for employers' views on business volume in the next 12 months by sector.

Table 3.2 Employers' Views on Business Volume in the Next 12 Months by sector

Sector	Percentage distribution of companies			
	Better	Stable	Worsen	Uncertain
E&M Engineering	0.6%	70.2%	11.3%	17.9%
Gas	0.5%	72.3%	8.0%	19.1%
Aircraft Maintenance	11.8%	23.5%	52.5%	11.8%

B. Electrical and Mechanical Engineering Sector

Employees

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

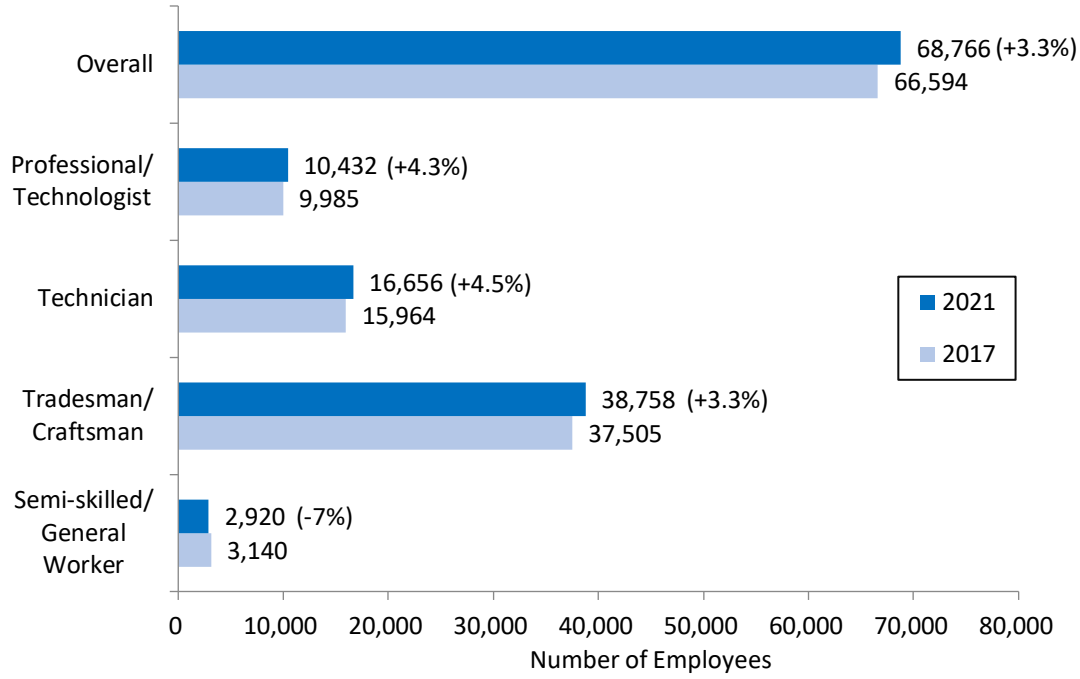
3.6 There were 68,766 E&M employees working in the E&M Engineering sector at the time of the survey, of whom 56.4% were tradesmen/craftsmen, followed by 24.2% of technicians, 15.2% of professionals/technologists, and 4.2% of semi-skilled/general workers. Please refer to *Table 3.3* for an overview of the manpower situation of the E&M Engineering sector.

Table 3.3 Number of E&M employees, trainees and vacancies in the E&M Engineering sector by job level in 2021

Job level	E&M Engineering sector		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional / Technologist	10,432 *(15.2%)*	382 *(15.0%)*	450 *(19.5%)*
Technician	16,656 *(24.2%)*	442 *(17.4%)*	520 *(22.5%)*
Tradesman / Craftsman	38,758 *(56.4%)*	1,722 *(67.6%)*	1,298 *(56.2%)*
Semi-skilled / General worker	2,920 *(4.2%)*	N.A.	41 *(1.8%)*
Overall	**68,766** ***(100%)***	**2,546** ***(100%)***	**2,309** ***(100%)***

3.7 The total number of E&M employees increased 3.3% from 2017 to 2021, and manpower at the professional/technologist and technician levels both increased by 4.5% and 4.3% respectively. At the semi-skilled/general worker level, however, manpower decreased by 7% as compared with 2017. Please refer to *Figure 3.2* for details.

Figure 3.2 Number of E&M employees in the E&M Engineering sector by job level in 2021



3.8 As reflected by the survey, 32,868 (47.8%) and 35,898 (52.2%) of manpower were devoted respectively to contracting and servicing works. Details are shown in *Table 3.4*.

Table 3.4 Estimated manpower for contracting and servicing work in the E&M Engineering sector in 2021

Job level	Number of E&M employees	Number of E&M employees (%) engaged in	
		Contracting	Servicing
Professional / Technologist	10,432	5,147 (49.3%)	5,285 (50.7%)
Technician	16,656	6,983 (41.9%)	9,673 (58.1%)
Tradesman / Craftsman	38,758	19,390 (50.0%)	19,368 (50.0%)
Semi-skilled / General worker	2,920	1,347 (46.1%)	1,572 (53.9%)
Overall	**68,766**	**32,868 (47.8%)**	**35,898 (52.2%)**

Prominent Principal Jobs

3.9 For each job level, the principal jobs which accounted for the significant percentages of the manpower in the E&M Engineering sector in 2021 are listed in *Table 3.5*.

Table 3.5 Prominent Principal jobs by level in the E&M Engineering sector in 2021

Job Level	Prominent Principal Jobs	% of E&M employees accounted at respective level
Professional/ Technologist	Electrical Engineer	78.5
	Building Services Engineer	
	Engineering Manager	
	Refrigeration / Air-conditioning/Ventilation Engineer	
	Mechanical Engineer	
Technician	Supervisor	66.1
	Electrical Engineering Technician	
	Building Services Technician	
	Refrigeration / Air-conditioning/Ventilation Technician	
	Mechanical Engineering Technician	
Tradesman/ Craftsman	Electrician / Electrical Fitter	59.8
	Foreman / Chargehand	
	Building Services Mechanic	
	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Unitary System)	
	Lift Mechanic	

3.10 As compared to 2021, quite a significant increase in manpower was noted for the following principal jobs (*Table 3.6*).

Table 3.6 Principal jobs with significant increase in manpower by level in the E&M Engineering sector in 2021

Job Level	Principal Jobs with significant increase in manpower	No. of employees in 2021	No. of employees in 2017	Increased in number (2021 vs. 2017)	% increased (2021 vs. 2017)
Professional/ Technologist	Lift/Escalator Engineer	326	295	31	10.5
Technician	Lift/Escalator Technician	992	797	195	24.5
	Supervisor	3,767	3,440	327	9.5
Tradesman / Craftsman	Electrical Wireman	2,561	1,816	745	41.0
	Refrigeration/ Air-conditioning/ Ventilation Mechanic (Air System)/ Sheet Metal Worker	1,008	789	219	27.8
	Overhead Linesman	176	139	37	26.6
	AV and RF Mechanic	86	71	15	21.1
	Escalator Mechanic	1,522	1,283	239	18.6
	Lift Mechanic	2,286	2,018	268	13.3

3.11 In contrast, a significant decrease in manpower was noted for the following principal jobs (*Table 3.7*).

Table 3.7 Principal jobs with significant decrease in manpower by level in the E&M Engineering sector in 2021

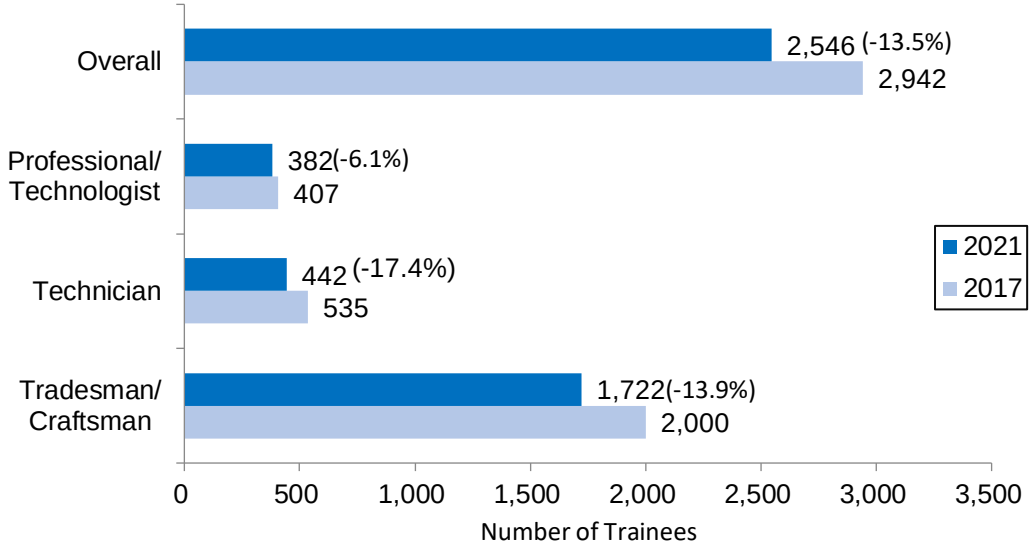
Job code	Principal Jobs	No. of employees in 2021	No. of employees in 2017	Decreased in number (2021 vs. 2017)	% decreased (2021 vs. 2017)
Professional/ Technologist	Control and Instrumentation Engineer	68	92	-24	-26.1
Technician	Office Equipment Service Technician	27	54	-27	-50.0
	Draughtsman	532	639	-107	-16.7
Tradesman / Craftsman	Building Security System Mechanic	13	63	-50	-79.4
	Control Panel Assembler	40	76	-36	-47.4
	Mechanical Fitter/ Machinist	1,489	1,871	-382	-20.4
	Welder	173	217	-44	-20.3
	Electrical Appliances Service Mechanic	855	988	-133	-13.5
Semi-skilled / General worker	Semi-skilled Worker	1,235	1,375	-140	-10.2

Trainees

3.12 The employment of trainees, under a contract or mode of apprenticeship, was quite common in the E&M engineering sector. A total of 2,546 trainees was reported, which accounted for around 3.6% of the total of employees[6] (71,312) in the E&M Engineering sector. Compared to 2017, a decrease of 13.5% in trainees was reported in 2021 (*Figure 3.3*).

[6] *Total of employees = Employees + Trainees*

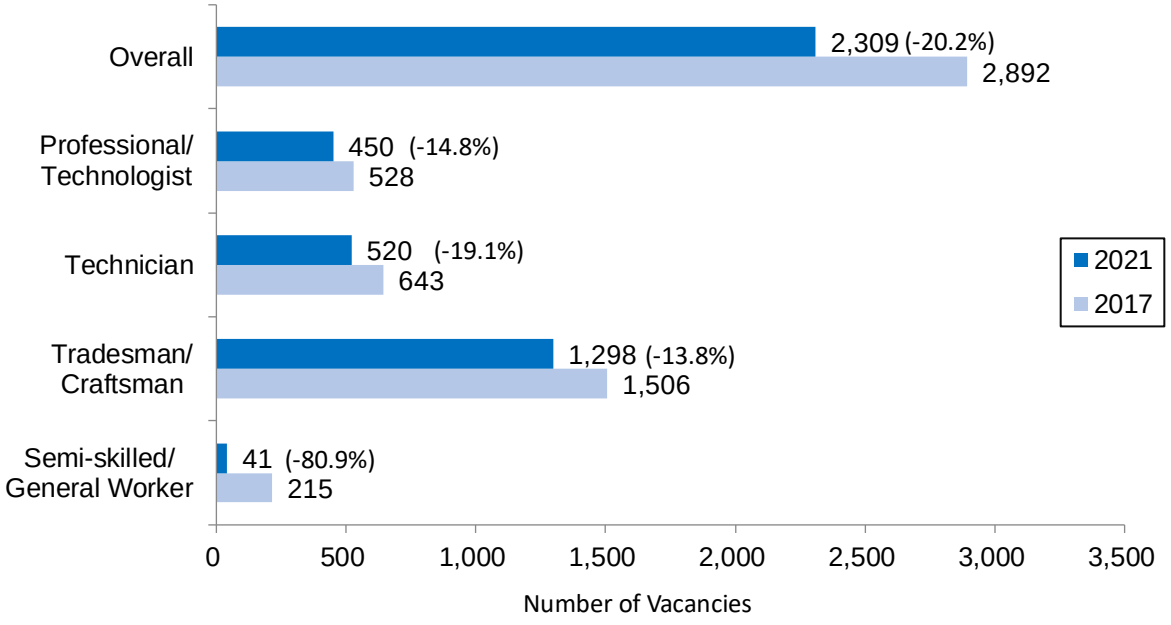
Figure 3.3 Number of E&M trainees in the E&M Engineering sector by job level in 2021



Vacancies

3.13 It was noted that the number of vacancies decreased from 2,892 in 2017 to 2,309 in 2021 for all levels *(Figure 3.4)*. The vacancy rate[7] for various levels is shown in *Figure 3.4 and Table 3.8*.

Figure 3.4 Number of E&M vacancies in the E&M Engineering sector by job level in 2021



[7] *Vacancy rate = no. of vacancies / (no. of FT employees + no. of vacancies)*

Table 3.8 Number of vacancies and vacancy rates in the E&M Engineering sector by job level in 2021 and 2017

Job Level	2021		2017	
	Number of vacancies	Vacancy rates	Number of vacancies	Vacancy rates
Professional / Technologist	450	4.1%	528	5.0%
Technician	520	3.0%	643	3.9%
Tradesman / Craftsman	1,298	3.2%	1,506	3.9%
Semi-skilled / General worker	41	1.4%	215	6.4%
Overall	**2,309**	**3.2%**	**2,892**	**4.2%**

Turnover and Recruit of E&M Employees

3.14 Overall, a total of 4,349 E&M employees left their organisations within the 12 months before the survey, representing an overall turnover rate of 6.1%. The turnover rate for professionals/technologists, technicians, tradesmen/craftsmen, and semi-skilled/general workers was respectively 7.2%, 5.5%, 6%, and 7.1% *(Table 3.9)*.

Table 3.9 Number and percentage of turnover in the E&M Engineering sector by job level in 2021

Job level	Number of posts (employees + vacancies)	Number of full-time employees left	Turnover rate
Professional / Technologist	10,882	787	7.2%
Technician	17,176	942	5.5%
Tradesman / Craftsman	40,056	2,409	6.0%
Semi-skilled / General worker	2,961	211	7.1%
Overall	**71,075**	**4,349**	**6.1%**

3.15 A total of 4,931 E&M employees were recruited by organisations within the 12 months before the survey, representing a recruit rate of 6.9%, of which 4,399 employees had experience in the E&M engineering work. In general, the number of recruits was larger than the number of turnovers, 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 in 2021

Job level	Number of recruits	Number of turnover	Difference
Professional / Technologist	769	787	-18
Technician	1,104	942	+162
Tradesman / Craftsman	2,728	2,409	+319
Semi-skilled / General worker	330	211	+119
Overall	**4,931**	**4,349**	**+582**

Salary

3.16 Employers were requested to provide salary brackets for the employees. The survey revealed that the average monthly income of semi-skills/general workers was less than $15,000, which covered the income range of the majority of 50.9% of employees at that level. It was found that the average monthly income for tradesmen/craftsmen (59.3%) and technicians (43.5%) was $18,001 - $25,000, while the average salary for professionals/technologists was $25,001 - $35,000. The salary distribution of E&M employees in the E&M Engineering sector of various levels is listed in *Table 3.11,* and *s*alary ranges with at least 10% of employees are highlighted for ease of reference. The salary trend of 2021 against 2017 for the individual level is given in *Figures 3.5 to 3.9.*

Table 3.11 Salary distribution of E&M employees in the E&M Engineering sector by job level in 2021

Job level	E&M Engineering Sector						
	<= $15,000	$15,001 - $18,000	$18,001 - $25,000	$25,001 - $35,000	$35,001 - $45,000	$45,001 - $60,000	> $60,000
Professional /Technologist	0%	0%	0.7%	33.7%	24.0%	25.5%	16.2%
Technician	0.5%	3.8%	43.5%	36.4%	14.7%	*	0%
Tradesman / Craftsman	2.6%	23.5%	59.3%	14.5%	*	0.0%	0%
Semi-skilled / General worker	50.9%	38.1%	10.8%	*	0%	0%	0%
Overall	3.6%	15.7%	44.4%	22.2%	7.3%	4.3%	2.5%

Notes:

*(1) * Less than 0.5%*

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

Figure 3.5 Cumulative percentage of average monthly salary in the E&M Engineering sector in 2021 and 2017 – Overall

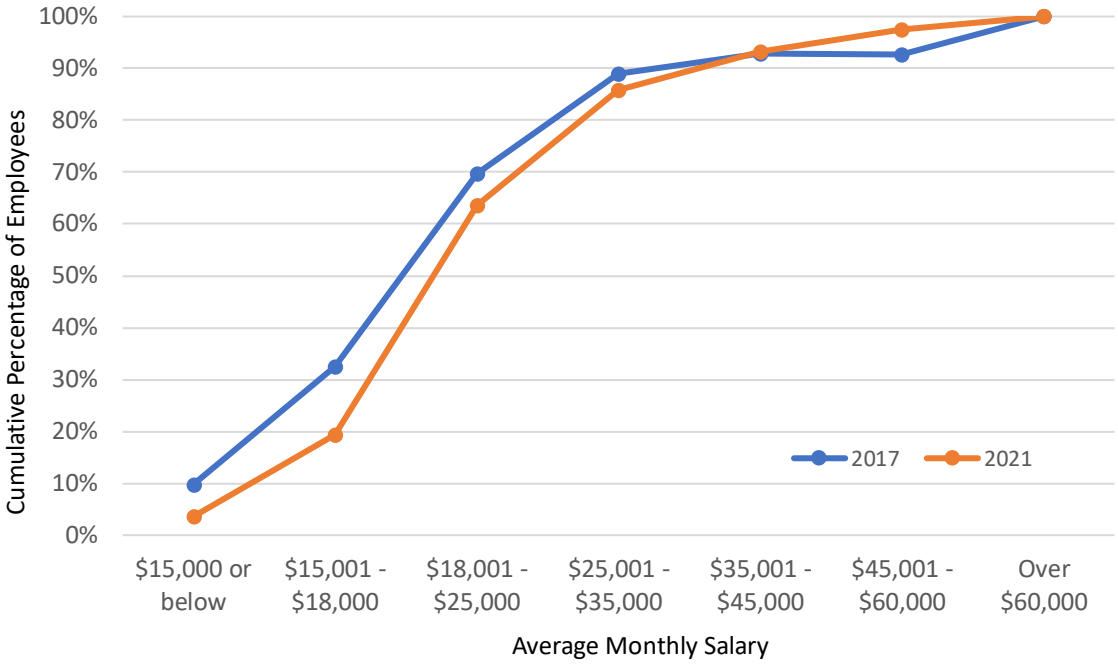


Figure 3.6 Cumulative percentage of average monthly salary in the E&M Engineering sector in 2021and 2017 – Professional / Technologist

Figure 3.7 Cumulative percentage of average monthly salary in the E&M Engineering sector in 2021 and 2017 – Technician

Figure 3.8 Cumulative percentage of average monthly salary in the E&M Engineering sector in 2021 and 2017 – Tradesman / Craftsman

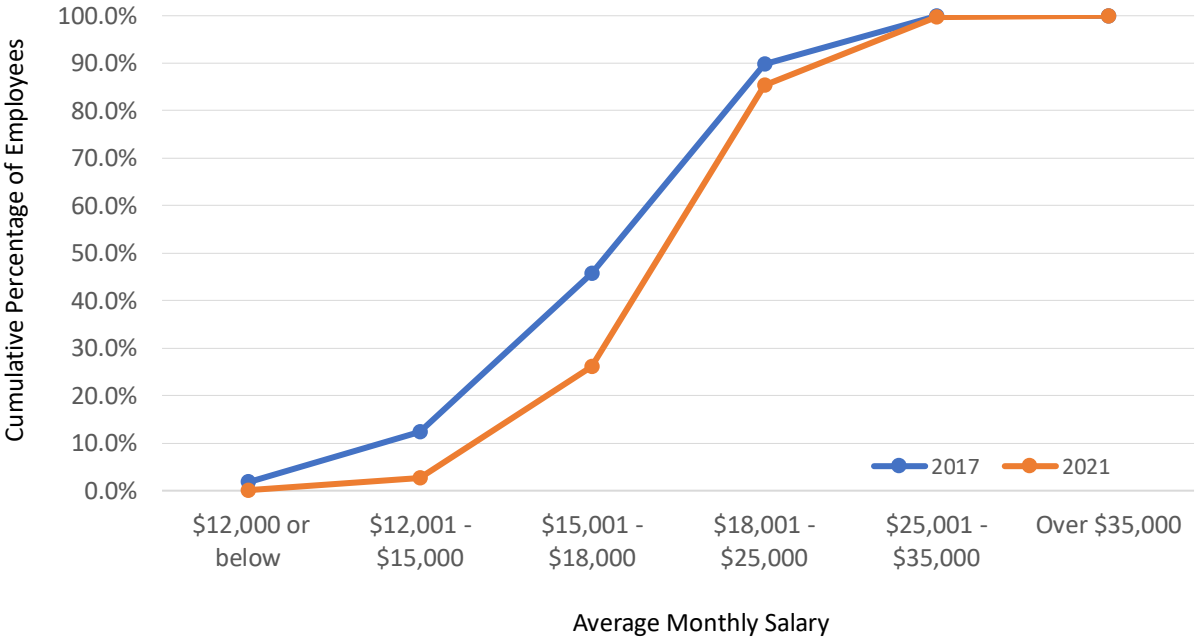
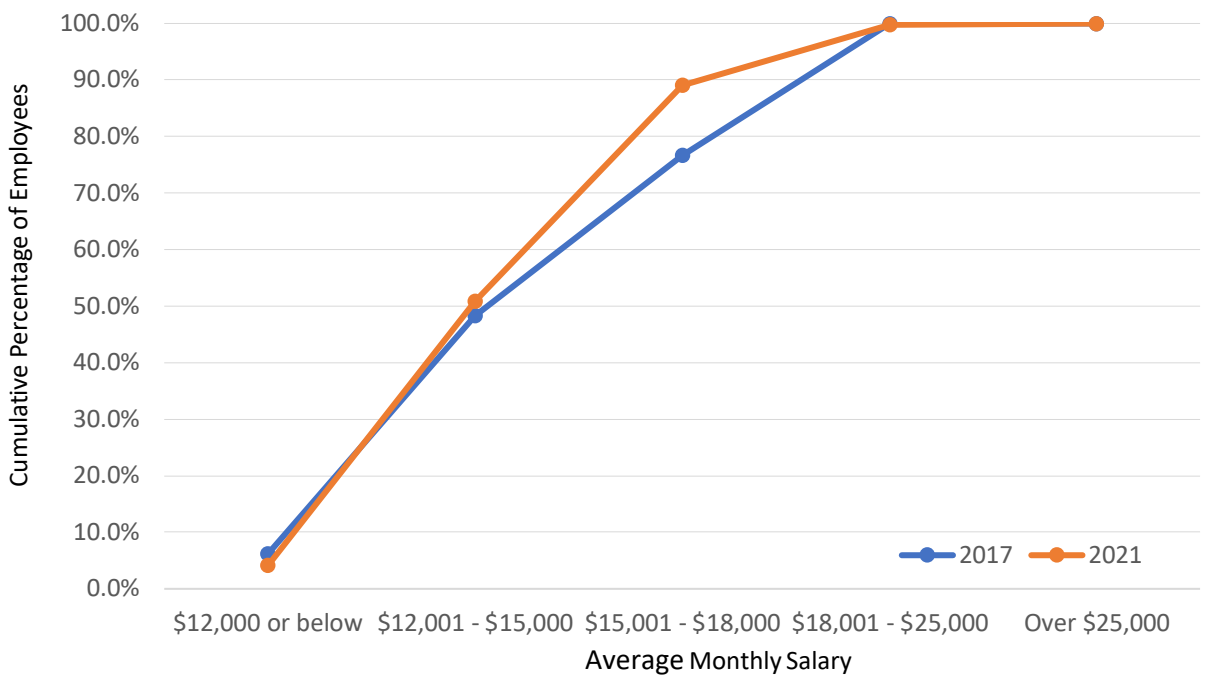


Figure 3.9 Cumulative percentage of average monthly salary in the E&M Engineering sector in 2021 and 2017 – Semi-skilled / General worker



3.17 The principal jobs with a relatively higher percentage of employees falling into the salary brackets of higher ends are listed in *Tables 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 in 2021

Principal Job	% of employees with average monthly income > $45,000	Total no. of employees
Level 1 : Professional / Technologist		
Building Services Engineering	52.8%	887
Electrical Engineering	44.2%	1,177
Mechanical Engineer	54.8%	533
Electronics Engineer	40.0%	207
Control and Instrumentation Engineer	61.8%	42
Engineering Manager	73.0%	1,281
Overall for Level 1	**62.5%**	**10,432**

Table 3.13 Principal jobs at Technician level with most employees in high salary brackets in the E&M Engineering sector in 2021

Principal Job	% of employees with average monthly income > $25,000	Total no. of employees
Level 2 : Technician		
Supervisor	73.0%	2,749
Draughtsman	65.6%	349
Electrical Engineering Technician	54.3%	1,397
Mechanical Engineering Technician	63.9%	815
Lift/Escalator Technician	66.3%	658
Fire Services Technician	62.0%	499
Electronics Technician	83.2%	740
Telecommunication Technician	70.1%	465
Overall for Level 2	**45.8%**	**16,656**

Table 3.14 Principal jobs at Tradesman/Craftsman level with most employees in high salary brackets in the E&M Engineering sector in 2021

Principal Job	% of employees with average monthly income > $18,000	Total no. of employees
Level 3 : Tradesman / Craftsman		
Refrigeration/Air-conditioning/Ventilation Mechanic (Unitary System)	85.1%	2,825
Refrigeration/Air-conditioning/Ventilation Mechanic (Air System) / Sheet Metal Worker	88.1%	888
Plumber and Pipe Fitter	85.8%	796
Fire Services Electrical Fitter	86.7%	961
Fire Services Mechanical Fitter	94.9%	923
Cable Jointer (Power)	88.1%	406
Electrical Appliances Service Mechanic	98.2%	840
Overall for Level 3	**68.3%**	**38,758**

Preferred and Achieved Education Level

3.18 Around 97.2% of employers in the E&M Engineering sector preferred professionals/technologists to possess a university degree, while 71.3% of employers expected technicians to possess diploma/certificate qualifications. On the other hand, 59.2% and 30.7% of employers preferred their employees at the tradesman/craftsman level to possess senior secondary and diploma/certificate qualifications respectively. The distribution is shown in *Table 3.15*, and the ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.15 Preferred and Achieved Level of Education for Full-time Employees by Job Level

Job level	Preferred Education Level					
	Postgraduate Degree	First Degree	Sub-degree (e.g. Higher Diploma)	Diploma/ Certificate	Senior secondary	Junior secondary
Professional / Technologist						
- Preferred	2.8%	97.2%	0.0%	0.0%	0.0%	0.0%
- Achieved	4.1%	96.1%	11.4%	1.6%	0.2%	0.0%
Technician						
- Preferred	0.0%	6.6%	22.2%	71.3%	0.0%	0.0%
- Achieved	0.0%	11.0%	21.0%	65.0%	6.6%	5.2%
Tradesman / Craftsman						
- Preferred	0.0%	0.0%	0.0%	30.7%	59.2%	9.9%
- Achieved	0.0%	0.2%	1.0%	30.8%	70.8%	14.0%
Semi-skilled / General worker						
- Preferred	0.0%	0.0%	0.0%	0.2%	30.1%	69.7%
- Achieved	0.0%	0.0%	0.0%	0.6%	41.9%	75.1%

Preferred and Accumulated Years of Experience

3.19 Employers in the E&M Engineering sector preferred professionals/technologists with 6 - 10 years of experience, but 64.6% of their professionals/technologists had more than ten years of work experience. In total, 61.8% of employers preferred technicians to have 3 - 6 years of work experience, whereas 49.1% preferred tradesmen/craftsmen to have 1 - 3 years of work experience. The distribution is shown in *Table 3.16*, and the ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.16 Preferred and Accumulated Years of Experience for Full-time Employees by Job Level

Job level	Preferred and Accumulated Years of Experience					
	No experience	Below 1 year	1 - < 3 years	3 - < 6 years	6 - < 10 years	10 years+
Professional / Technologist						
- Preferred	0.0%	0.0%	0.1%	21.2%	64.0%	14.7%
- Achieved	0.1%	0.2%	1.1%	6.5%	46.1%	64.6%
Technician						
- Preferred	0.0%	0.6%	9.0%	61.8%	22.6%	6.0%
- Achieved	0.0%	0.1%	2.8%	40.4%	26.6%	44.7%
Tradesman / Craftsman						
- Preferred	1.9%	13.9%	49.1%	34.1%	1.0%	0.1%
- Achieved	0.8%	0.9%	13.8%	39.3%	42.5%	43.3%
Semi-skilled / General worker						
- Preferred	33.2%	22.4%	42.5%	1.7%	0.0%	0.2%
- Achieved	9.1%	23.2%	48.3%	27.8%	1.0%	12.5%

Recruitment Difficulties

3.20 In the past 12 months, only a small number of companies in the E&M Engineering sector conducted recruitment exercises (*Table 3.17*). Among them, 38.0%, 34.6%, and 46% of employers reported that they encountered difficulties in recruiting professionals/technologists, technicians, and tradesmen/craftsmen respectively. The major difficulty encountered was "candidates lacked of the relevant experience". Details are shown in *Table 3.18*.

Table 3.17 Percentage distribution of whether recruitment was taken place in the past 12 months

	Job level		
	Professional / Technologist	Technician	Tradesman / Craftsman
No recruitment was taken place	98.4%	97.8%	92.7%
Recruitment was taken place	1.6%	2.2%	7.3%
Total no. of companies	**10,776**	**10,776**	**10,776**

Table 3.18 Percentage distribution of whether encountered difficulties in recruitment in the past 12 months

	Job level		
	Professional / Technologist	**Technician**	**Tradesman / Craftsman**
Did not encounter difficulties in recruitment	**62.0%**	**65.4%**	**54.1%**
Encountered difficulties in recruitment	**38.0%**	**34.6%**	**45.9%**
Lack of candidates with relevant experience	24.7%	27.8%	29.4%
Unsatisfactory terms of employment	7.6%	9.0%	6.0%
Unsatisfactory working environment	2.5%	1.3%	2.6%
Limited career prospects	7.6%	0.9%	3.3%
Insufficient trained/qualified manpower in the related disciplines	3.8%	2.6%	9.8%
Competition for manpower from the Mainland/Macao/other cities	0.0%	0.0%	0.1%
Alternative offers in the market	10.8%	5.6%	12.2%
Others	0.0%	0.0%	0.0%
No. of companies with recruitment of employees at respective job level	**158**	**234**	**756**

Note:

(1) Percentages of difficulties in recruitment are calculated based on companies having recruitment of the employees at the respective job level

(2) The percentages for each job level may not add up to 100% as the respondents are allowed to select more than one difficulty.

Training and Development Budget in the Next 12 Months

3.21 Companies in the E&M Engineering sector with larger employment size were more likely to have a training and development budget plan in the next 12 months. Most of them would use 1% - 2% of annual payroll on training and development (*Table 3.19*) and would keep the same budget as last year (*Table 3.20*).

Table 3.19 Training and Staff Development Budget in the Next 12 Months as Proportion of Annual Payroll

	Employment size			
	1-9	**10-49**	**50-99**	**100 & over**
<1%	0.3%	3.1%	2.2%	4.3%
1% - 2%	0.4%	4.9%	13.1%	15.7%
> 2%	0.3%	0.6%	0%	1.4%
Not yet estimate/No plan for training	99.1%	91.4%	84.6%	78.6%

Table 3.20 Training and Staff Development Budget in the Next 12 Months as Compared with Last Year

	Employment size			
	1-9	**10-49**	**50-99**	**100 & over**
Increase	2.4%	4.3%	9.5%	6.7%
Decrease	0%	11.8%	0%	0%
Remain unchanged/No training arranged	97.6%	83.9%	90.5%	93.3%

Major Training Areas

3.22 Most of the employers preferred their professionals/technologists to have training in project management-related areas. Employees at the technician level, however, preferred to be trained on regulations and some specific safety topics (e.g. safety awareness, construction site safety). The five most important training areas for employees at the tradesman/craftsman level were related to safety topics. The prominent areas of training required for employees by job level are shown in *Table 3.21*.

Table 3.21 Top Five Areas of Training Required for Employees

Professional / Technologist	**Technician**	**Tradesman / Craftsman**
Project Management (54.3%)	Safety Awareness (45.4%)	Safety Awareness (72.2%)
Risk and Crisis Management (43.0%)	Safety ordinances Cap. 59 FIUO and Cap. 509 OSHO (35.1%)	Construction Site Safety for Workers (39.3%)
Relevant Trade's Ordinances and Regulations (34.1%)	Relevant Trade's Ordinances and Regulations (30.9%)	Use of Personal Protective Equipment (38.6%)
Construction Contract's Terms and Conditions (29.7%)	Construction Site Safety for Workers (29.1%)	Safety/Risk Management (24.5%)
Safety Awareness (22.1%)	Project Management (27.9%)	Safety Audit/Assessment (21.5%)

C. Gas Sector

Employees

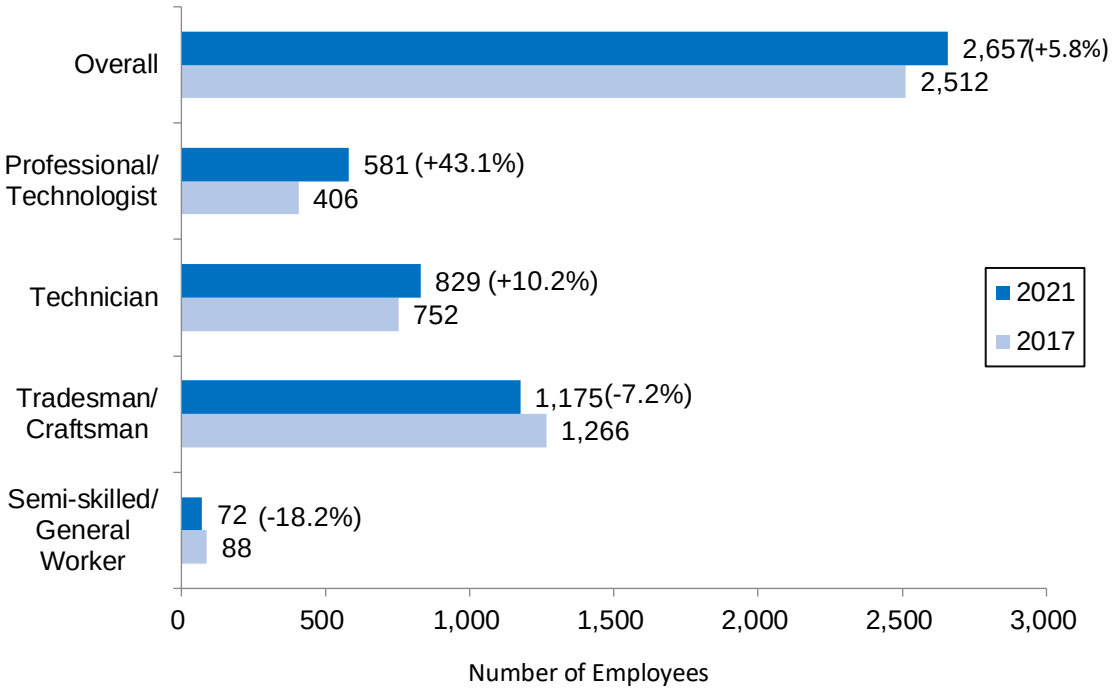
3.23 There were 2,657 employees engaged in E&M in the Gas sector at the time of the survey. Of those, 44.2% were tradesmen/craftsmen, followed by 31.2% at the technician level, 21.9% at the professional/technologist level, and 2.7% at the semi-skilled/general worker level. Please refer to *Table 3.22* for an overview of the manpower situation of the Gas sector.

Table 3.22 Number of E&M employees, trainees and vacancies in the Gas sector by job level in 2021

Job level	Gas sector		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional / Technologist	581 *(21.9%)*	7 *(22.6%)*	14 *(24.1%)*
Technician	829 *(31.2%)*	11 *(35.5%)*	18 *(31.0%)*
Tradesman / Craftsman	1,175 *(44.2%)*	13 *(41.9%)*	23 *(39.7%)*
Semi-skilled / General worker	72 *(2.7%)*	N.A.	3 *(5.2%)*
Overall	**2,657** ***(100%)***	**31** ***(100%)***	**58** ***(100%)***

3.24 As compared to 2017, the total number of employees in the Gas sector increased 5.8%. There was a significant increase of 43.1% and 10.2% in manpower at the professional/technologist level and technician level respectively, while the manpower at the tradesman/craftsman and semi-skilled/general worker levels decreased respectively 7.2% and 18.2% *(Figure 3.10)*.

Figure 3.10 Number of employees in the Gas sector by job level in 2021 and 2017



Prominent Principal Jobs

3.25 For each job level, the principal jobs which accounted for a significant percentage of the E&M manpower in 2021 are listed in *Table 3.23*.

Table 3.23 Prominent Principal jobs in the Gas sector by level in 2021

Job Level	Job	% of E&M employees accounted at respective level
Professional / Technologist	Mechanical Engineer	62.0
Technician	Mechanical Engineering Technician	46.9
Tradesman / Craftsman	Gas Utilisation Fitter (Domestic)	42.3

3.28 As compared to 2017, quite an obvious increase in manpower was noted for the following principal jobs *(Table 3.24*).

Table 3.24 Principal jobs with significant increase in manpower in the Gas sector by level in 2021

Job level	Principal Jobs	No. of employees in 2021	No. of employees in 2017	Increased in number (2021 vs. 2017)	% increased (2021 vs. 2017)
Professional / Technologist	Mechanical Engineer	360	107	253	236.4
Technician	Mechanical Engineering Technician	389	61	328	537.7
Tradesman/ Craftsman	Gas Utilisation Fitter (Non-domestic)	266	113	153	135.4

3.26 As compared to 2017, quite an obvious decrease in manpower was noted for the following principal jobs (*Table 3.25*).

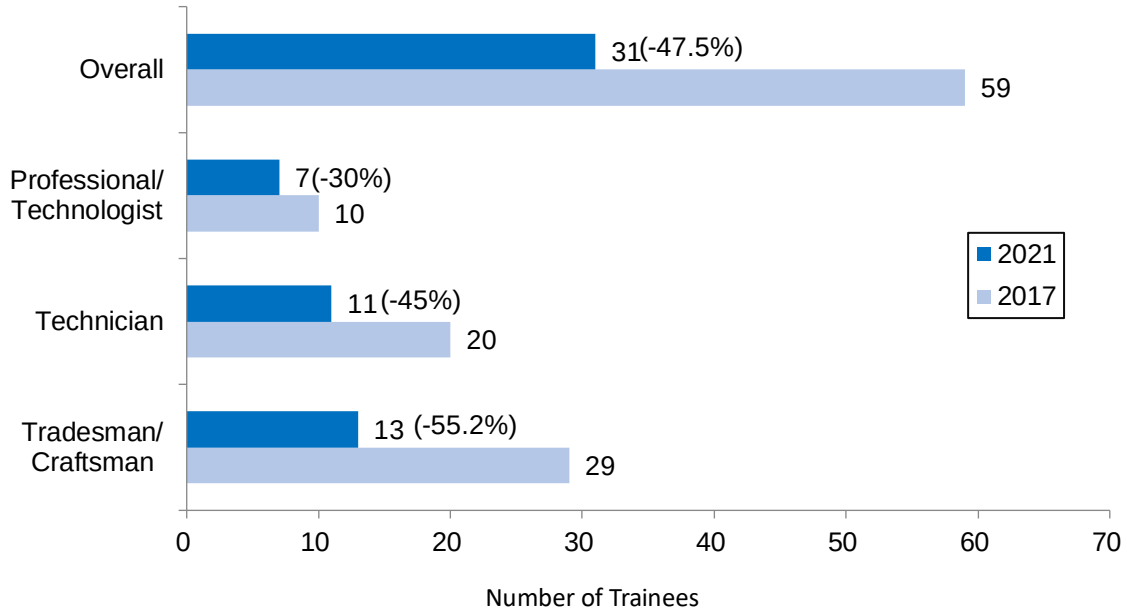
Table 3.25 Principal jobs with significant decrease in manpower in the Gas sector by level in 2021

Job level	Principal Jobs	No. of employees in 2021	No. of employees in 2017	Decreased in number (2021 vs. 2017)	% decreased (2021 vs. 2017)
Professional / Technologist	Gas Engineer (Fuel Gas)	166	250	-84	-33.6
Technician	Gas Engineering Technician	245	411	-166	-40.4
	Supervisor/ Chargehand	139	227	-88	-38.8
Tradesman / Craftsman	Gas Utilisation Fitter (Domestic)	497	677	-180	-26.6
	Gas Distribution Fitter (Town Gas)	281	352	-71	-20.2

Trainees

3.27 Overall speaking, the number of trainees reported in 2021 was 31, which registered a significant decrease over 2017 *(Figure 3.11)*.

Figure 3.11 Number of trainees in the Gas sector by job level in 2021 and 2017



Vacancies

3.28 In general, the number of vacancies in the Gas sector decreased from 62 in 2017 to 58 in 2021. The decrease was particularly obvious at the semi-skilled /general worker level. However, there was an increase in vacancies at the professional/technologist, technician, and tradesman/craftsman levels (*Figure 3.12*). The vacancy rate[8] for various levels is shown in *Table 3.26*.

[8] *Vacancy rate = no. of vacancies / (no. of FT employees + no. of vacancies)*

Figure 3.12 Number of vacancies in the Gas sector by job level in 2021 and 2017

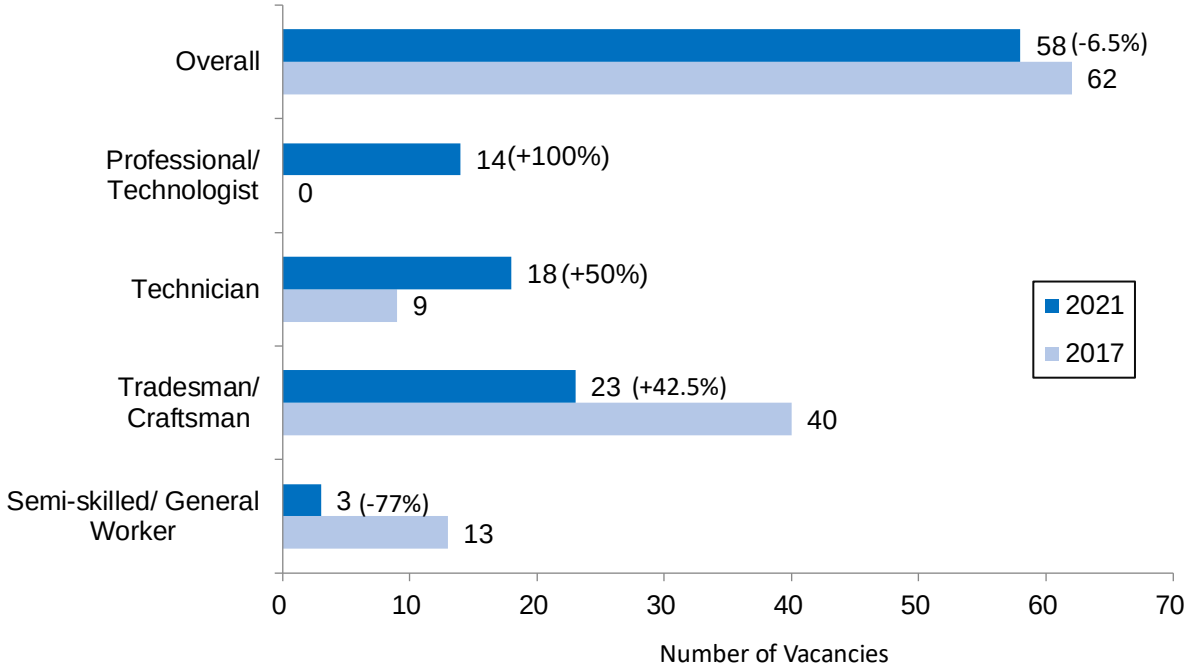


Table 3.26 Number of vacancies and vacancy rates in the Gas sector by job level in 2021 and 2017

Job level	2021		2017	
	Number of vacancies	vacancy rates	Number of vacancies	vacancy rates
Professional / Technologist	14	2.3%	0	0%
Technician	18	2.1%	9	1.2%
Tradesman / Craftsman	23	1.9%	40	3.1%
Semi-skilled / General worker	3	4%	13	12.9%
Overall	**58**	**2.1%**	**62**	**2.4%**

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 an overall turnover rate of 5.3%. The turnover rate for professionals/technologists, technicians, tradesmen/craftsmen, and semi-skilled/general workers was respectively 7.2%, 6.7%, 3.3%, and 6.7% (*Table 3.27*).

Table 3.27 Number and percentage of turnover in the Gas sector by job level in 2021

Job level	Number of post (employees + vacancies)	Number of full-time employees left	Turnover rate
Professional / Technologist	595	43	7.2%
Technician	847	57	6.7%
Tradesman / Craftsman	1,198	40	3.3%
Semi-skilled / General Worker	75	5	6.7%
Overall	**2,715**	**145**	**5.3%**

3.30 In contrast, a total of 150 E&M employees were recruited by organisations within the 12 months before the survey, of which 131 employees had experience in the electrical and mechanical engineering work, representing an overall recruit rate of 4.8% (*Table 3.28*).

Table 3.28 Number of recruit and turnover by job level in the Gas sector in 2021

Job level	Number of recruit	Number of turnover	Difference
Professional / Technologist	46	43	+3
Technician	55	57	-2
Tradesman / Craftsman	46	40	+6
Semi-skilled / General worker	3	5	-2
Overall	**150**	**145**	**-5**

Salary

3.31 The average monthly income of semi-skills/general workers was in the range of $15,001-$18,000, which covered the income range of the majority 50.9% of employees at that level. The average monthly income centralised to $18,001-$25,000 for tradesmen/craftsmen (49.0%) and technicians (67.5%). Employees at the professional/technologist level were in the salary range of $35,001-$45,000, which accounted for 93.1% of employees. The salary distribution of the E&M employees of the Gas sector of various levels is listed in *Table 3.29 and Figures 3.13 to 3.17*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.29 Salary distribution of E&M employees in the Gas sector by job level in 2021

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%	0%	0%	3.9%	93.1%	3%
Technician	0%	0%	0.7%	67.5%	17.3%	14.5%	0%
Tradesman / Craftsman	0%	11.8%	36%	49%	3.2%	0%	0%
Semi-skilled / General worker	3%	30.3%	62.1%	4.5%	0%	0%	0%
Overall	**0.1%**	**6%**	**17.9%**	**42.9%**	**7.7%**	**24.8%**	**0.7%**

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

Figure 3.13 Cumulative percentage of average monthly salary in the Gas sector in 2021 and 2017 – Overall

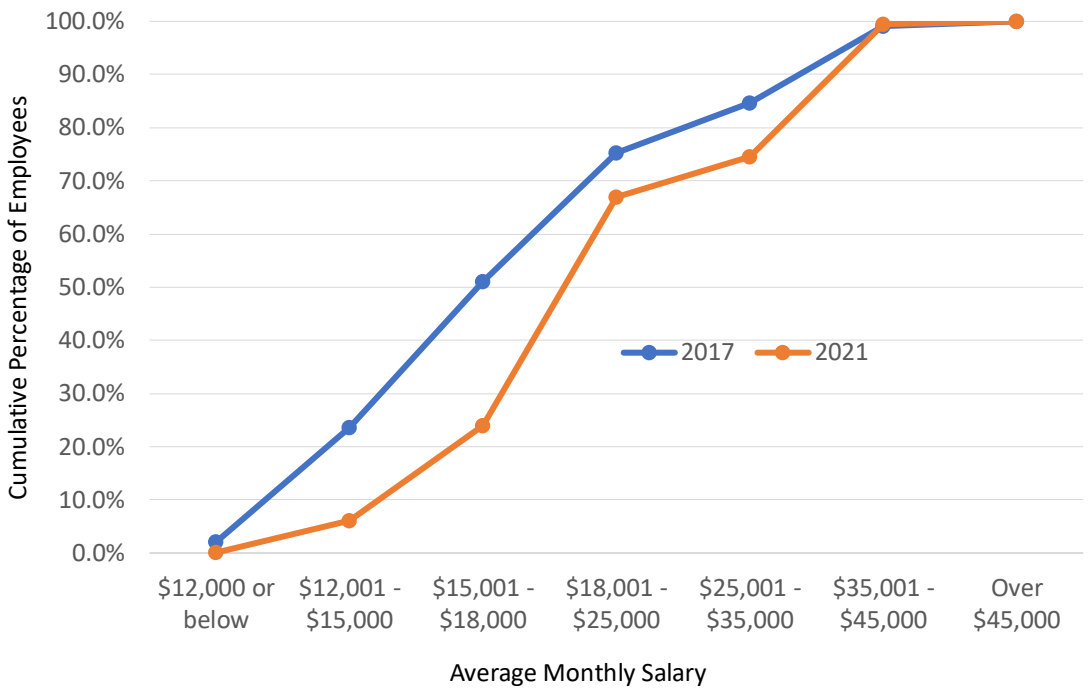


Figure 3.14 Cumulative percentage of average monthly salary in the Gas sector in 2021 and 2017 – Professional/Technologist

Figure 3.15 Cumulative percentage of average monthly salary in the Gas sector in 2021 and 2017 – Technician

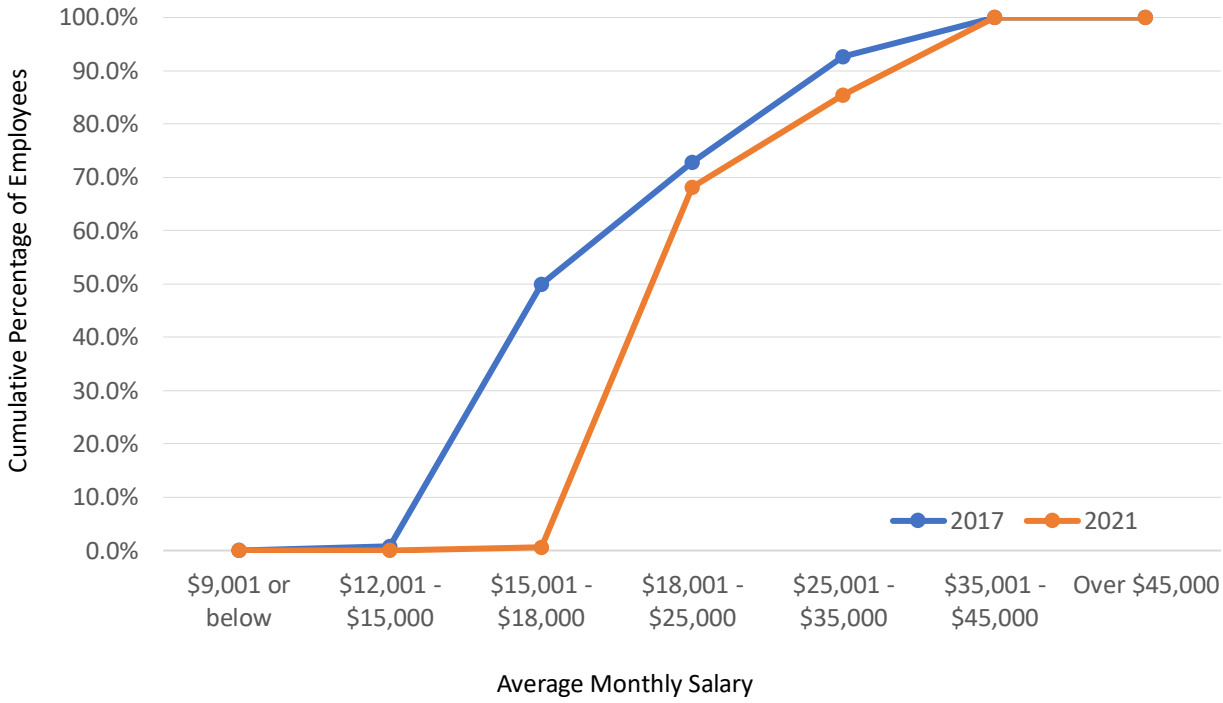


Figure 3.16 Cumulative percentage of average monthly salary in the Gas sector in 2021 and 2017 – Tradesman / Craftsman

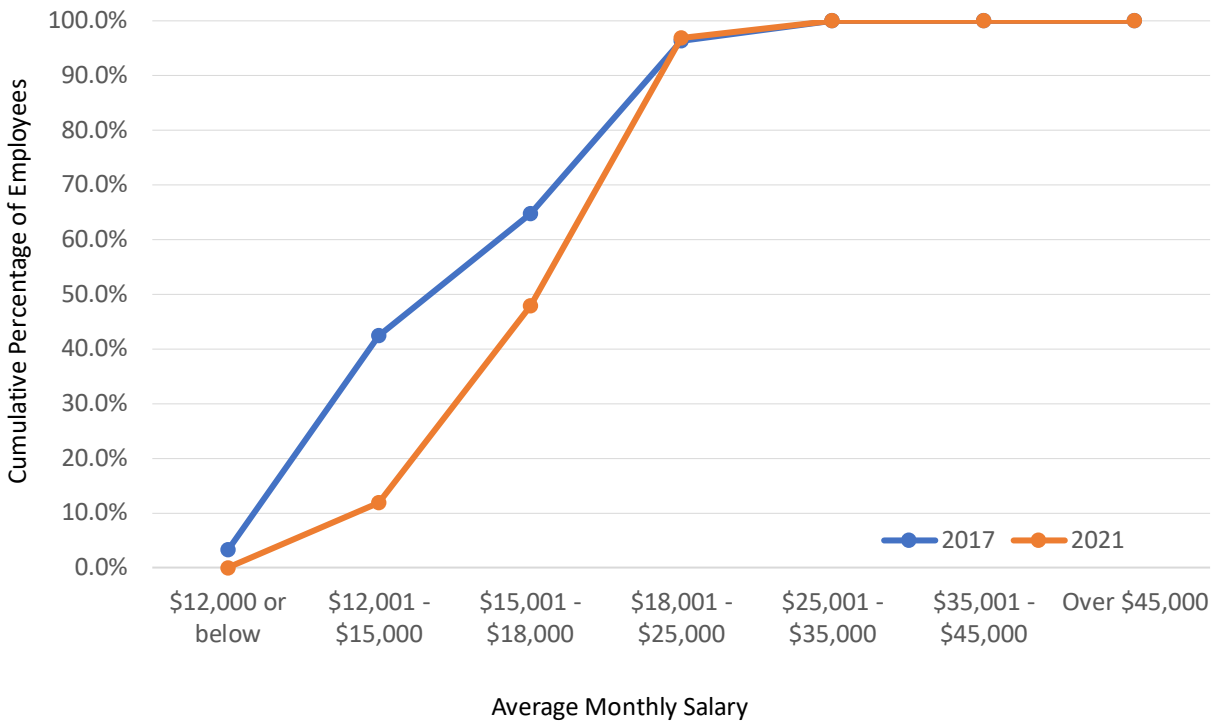
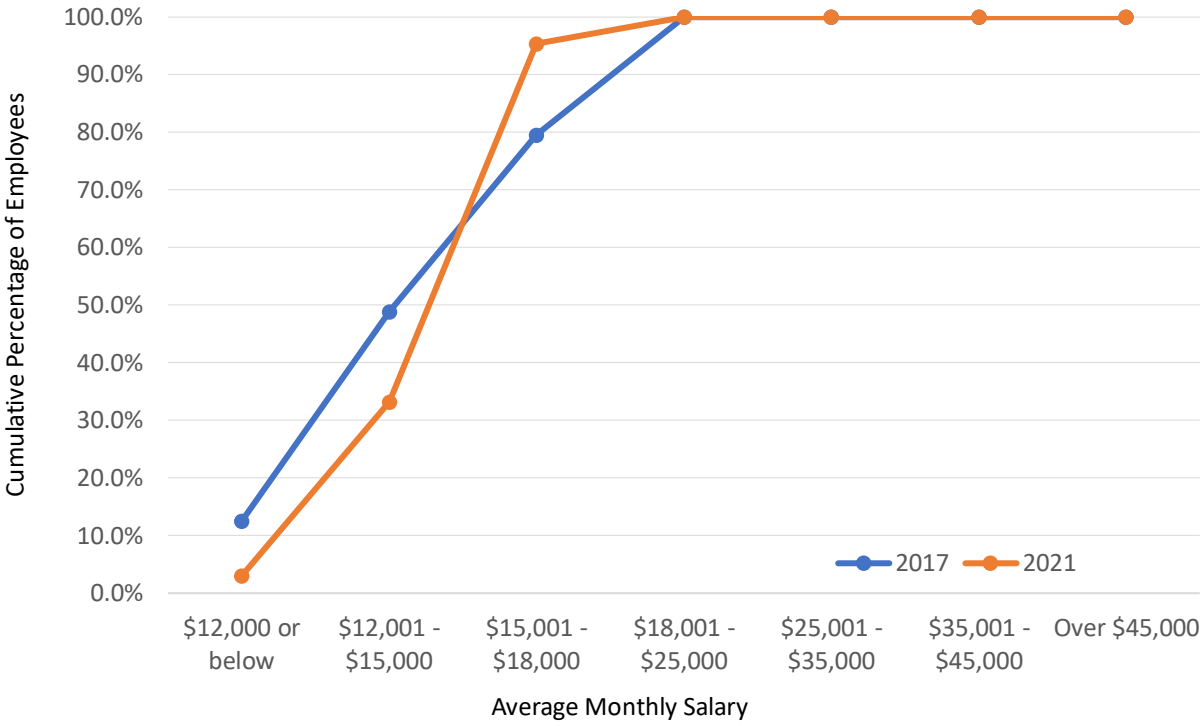


Figure 3.17 Cumulative percentage of average monthly salary in the Gas sector in 2021 and 2017 – Semi-skilled / General worker



3.32 The principal jobs with a relatively higher percentage of employees falling into the salary brackets of higher ends are listed in *Tables 3.30 to 3.32*.

Table 3.30 Principal jobs at Professional/Technologist level with most employees in high salary brackets in the Gas sector in 2021

Job	% of employees with average monthly income > $35,000	Total no. of employees
Level 1 : Professional / Technologist level		
Electrical Engineer	96.8%	30
Gas Engineer (Fuel Gas)	88.7%	147
Mechanical Engineer	100%	360
Safety Officer	83.3%	20
Overall for Level 1	**95.9%**	**581**

Table 3.31 Principal jobs at Technician level with most employees in high salary brackets in the Gas sector in 2021

Job	% of employees with average monthly income > $25,000	Total no. of employees
Level 2 : Technician		
Electrical Engineering Technician	59.5%	22
Gas Engineering Technician	43.6%	107
Assistant Safety Officer/Safety Supervisor	89.5%	17
Supervisor/Chargehand	88.8%	123
Overall for Level 2	**32.4%**	**829**

Table 3.32 Principal jobs at Tradesman/Craftsman level with most employees in high salary brackets in the Gas sector in 2021

Job	% of employees with average monthly income > $18,000	Total no. of employees
Level 3 : Tradesman / Craftsman		
Electrician/Electrical Fitter	100.0%	54
Gas Distribution Fitter (LPG)	43.9%	22
Gas Distribution Fitter (Town Gas)	54.5%	153
Gas Utilisation Fitter (Domestic)	54.4%	270
Gas Utilisation Fitter (Non-domestic)	33.1%	88
Mechanical Fitter	85.7%	6
Welder	100.0%	19
Overall for Level 3	**52.2%**	**1,175**

Preferred and Achieved Education Level

3.33 Employers in the Gas sector preferred professionals/technologists to have a university degree, and 83.3% of professionals/technologists had the degree. Although 91.5% of employers expected technicians to possess diploma/certificate qualifications, 94.9% of employers reported that their technicians possessed the respective qualifications. On the other hand, 79.1% of employers preferred employees at the tradesman/craftsman level to possess senior secondary qualifications, and 81.7% of employers employed tradesmen/craftsmen who achieved the respective qualifications. The distribution is shown in *Table 3.33*, and the ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.33 Preferred and Achieved Level of Education for Full-time Employees by Job Level

Job level	Preferred Education Level					
	Postgraduate Degree	First Degree	Sub-degree (e.g. Higher Diploma)	Diploma/ Certificate	Senior secondary	Junior secondary
Professional/Technologist						
- Preferred	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
- Achieved	0.0%	83.3%	8.3%	16.7%	0.0%	0.0%
Technician						
- Preferred	0.0%	0.0%	8.5%	91.5%	0.0%	0.0%
- Achieved	1.7%	0.0%	6.8%	94.9%	1.7%	0.0%
Tradesman/Craftsman						
- Preferred	0.0%	0.0%	0.0%	16.3%	79.1%	4.6%
- Achieved	0.0%	0.0%	0.0%	19.6%	81.7%	10.5%
Semi-skilled/General worker						
- Preferred	0.0%	0.0%	0.0%	0.0%	40.6%	59.4%
- Achieved	0.0%	0.0%	0.0%	0.0%	43.8%	59.4%

Preferred and Accumulated Years of Experience

3.34 Around 75.0% of employers of the Gas sector preferred employees at the professional/technologist level to have 6 - 10 years of work experience, while all professionals/technologists met the employers' preference. In contrast, 79.7% of employers preferred employees with 3 - 6 years of work experience at the technician level, and 64.7% of employers preferred employees with 1 - 3 years of work experience at the tradesman/craftsman level. The distribution is shown in *Table 3.34*, and the ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.34 Preferred and Accumulated Years of Experience for Full-time Employees by Job Level

Job level	Preferred and Accumulated Years of Experience					
	No experience	Below 1 year	1 - < 3 years	3 - < 6 years	6 - < 10 years	10 years+
Professional/Technologist						
- Preferred	0.0%	0.0%	0.0%	25.0%	75.0%	0.0%
- Achieved	0.0%	0.0%	0.0%	8.3%	75.0%	58.3%
Technician						
- Preferred	0.0%	0.0%	16.9%	79.7%	1.7%	1.7%
- Achieved	0.0%	0.0%	8.5%	52.5%	39.0%	33.9%
Tradesman/ Craftsman						
- Preferred	0.7%	15.7%	64.7%	18.3%	0.0%	0.7%
- Achieved	0.0%	0.7%	29.4%	51.6%	45.1%	25.5%
Semi-skilled/General worker						
- Preferred	37.5%	21.9%	40.6%	0.0%	0.0%	0.0%
- Achieved	3.1%	25.0%	59.4%	21.9%	0.0%	0.0%

Recruitment Difficulties

3.35 Only a small number of companies in the Gas sector conducted recruitment exercises in the past 12 months. Among them, 85.7% of employers reported that they encountered difficulties in recruiting employees at the technician level. The major difficulties encountered were "candidates lacked the relevant experience", "unsatisfactory terms of employment" and "alternative offers in the market". Details are shown in *Tables 3.35 and 3.36*.

Figure 3.35 Percentage distribution of whether recruitment was taken place in the past 12 months

	Job level		
	Professional / Technologist	**Technician**	**Tradesman / Craftsman**
No recruitment was taken place	97.3%	96.3%	92.6%
Recruitment was taken place	2.7%	3.7%	7.4%
Total no. of companies	188	188	188

Figure 3.36 Percentage distribution of difficulties encountered in recruitment in the Past 12 Months

	Job level		
	Professional / Technologist	**Technician**	**Tradesman / Craftsman**
Did not encounter difficulties in recruitment	**60.0%**	**14.3%**	**57.1%**
Encountered difficulties in recruitment	**40.0%**	**85.7%**	**42.9%**
Lack of candidates with relevant experience	40.0%	57.1%	21.4%
Unsatisfactory terms of employment	20.0%	57.1%	35.7%
Unsatisfactory working environment	0.0%	14.3%	21.4%
Limited career prospects	20.0%	14.3%	14.3%
Insufficient trained/qualified manpower in the related disciplines	20.0%	28.6%	14.3%
Competition for manpower from the Mainland/Macao/other cities	20.0%	0.0%	7.1%
Alternative offers in the market	20.0%	42.9%	14.3%
Others	0.0%	0.0%	0.0%
No. of companies with recruitment of employees at respective job level	**5**	**7**	**14**

Notes:

(1) Percentages of difficulties in recruitment are calculated based on companies having recruitment of the employees at the respective job level

(2) The percentages for each job level may not add up to 100% as the respondents are allowed to select more than one difficulty.

Training and Development Budget in the Next 12 Months

3.36 Companies in the Gas sector with larger employment size were more likely to have a training and development budget plan in the next 12 months. Most of them would use more than 2% of their annual payroll on training and development *(Table 3.37)* and would keep the same budget as last year *(Table 3.38)*.

Table 3.37 Training and Staff Development Budget in the Next 12 Months as Proportion of Annual Payroll

	Employment size[#]			
	1-9	**10-49**	**50-99**	**100 & over**
<1%	0.7%	3.8%	100%	0%
1% - 2%	0.7%	0%	0%	0%
> 2%	1.3%	15.4%	0%	33.3%
Not yet estimate/No plan for training	97.4%	80.8%	0%	66.7%

Note: [#] Readers should interpret with caution as the number of companies is small

Table 3.38 Training and Staff Development Budget in the Next 12 Months as Compared with Last Year

	Employment size[#]			
	1-9	**10-49**	**50-99**	**100 & over**
Increase	25.0%	0%	0%	0%
Decrease	0%	0%	0%	0%
Remain unchanged/No training arranged	75.0%	100%	100%	100%

Note: [#] Readers should interpret with caution as the number of companies is small

Major Training Areas

3.37 Most of the employers preferred professionals/technologists to have training in project management related areas, while employees at the technician and tradesman/craftsman levels were preferred to have training on operation-related and safety topics. The top five areas of training required for employees by job level are shown in *Table 3.39*.

Table 3.39 Top Five Areas of Training Required for Employees

Professional / Technologist	Technician	Tradesman / Craftsman
Project Management (43.8%)	Basic Gas Engineering (50.8%)	Safety Awareness (59.9%)
Risk and Crisis Management (37.5%)	Safety Awareness (44.4%)	Construction Site Safety for Workers (39.5%)
Construction Contract's Terms and Conditions (31.3%)	Safety/Risk Management (20.6%)	Safety ordinances Cap. 59 FIUO and Cap. 509 OSHO (22.9%)
IT Application for Gas Engineering (25.0%)	IT Application for Gas Engineering (19.0%)	Safety/Risk Management (21.0%)
Basic Gas Engineering (25.0%)	Relevant Trade's Ordinances and Regulations (19.0%)	Use of Personal Protective Equipment (20.4%)

D. Aircraft Maintenance Sector

Employees

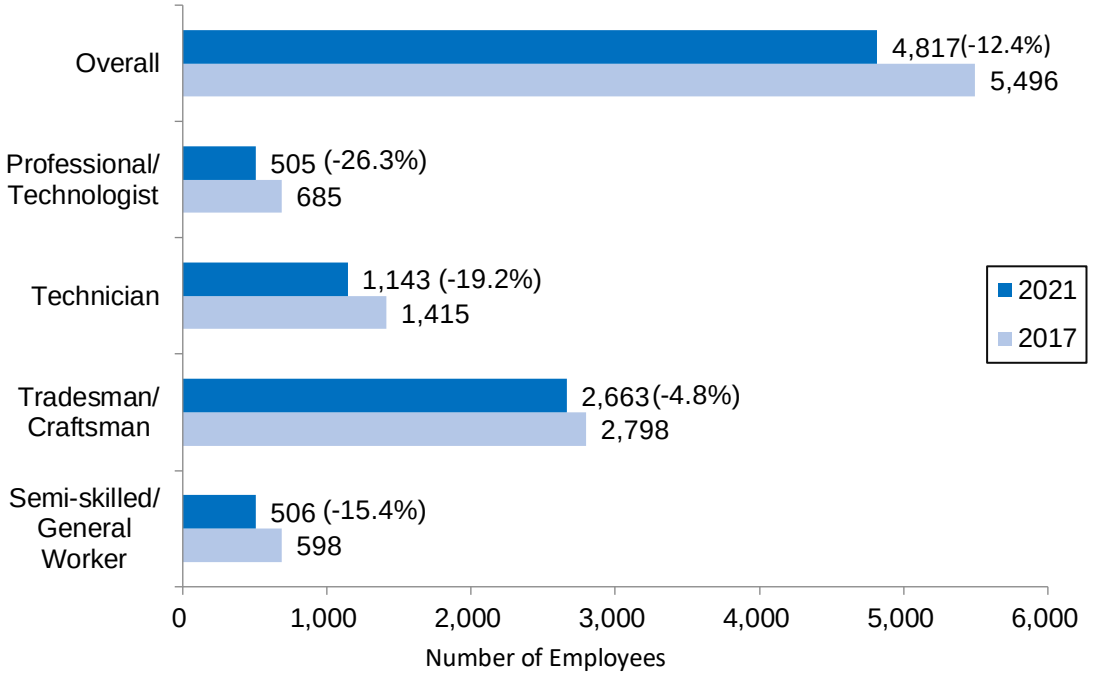
3.38 There were 4,817 employees employed in the Aircraft Maintenance sector at the time of the survey, with over half at the tradesman/craftsman level, 23.7% at the technician level, 10.5% at the professional/technologist level, and 10.5% at the semi-skilled/general worker level. Please refer to *Table 3.40* for an overview of the manpower situation of the Aircraft Maintenance sector.

Table 3.40 Number of E&M employees, trainees and vacancies in the Aircraft Maintenance sector by job level in 2021

Job level	Aircraft Maintenance sector		
	E&M employees	**E&M trainees**	**E&M vacancies**
Professional / Technologist	505 *(10.5%)*	0 *(0%)*	0 *(0%)*
Technician	1,143 *(23.7%)*	0 *(0%)*	73 *(16.9%)*
Tradesman / Craftsman	2,663 *(55.3%)*	468 *(100%)*	300 *(69.3%)*
Semi-skilled / General worker	506 *(10.5%)*	N.A.	60 *(13.9%)*
Overall	**4,817** ***(100%)***	**468** ***(100%)***	**433** ***(100%)***

3.39 As compared to 2017, the total number of employees in the Aircraft Maintenance sector decreased by 12.4%. There was a significant decrease of 26.3% and 19.2% in manpower at the professional/technologist level and technician level respectively, while the manpower at the tradesman/craftsman and semi-skilled/general worker levels decreased respectively 4.8% and 15.4% *(Figure 3.18)*.

Figure 3.18 Number of employees in the Aircraft Maintenance sector by job level in 2021 and 2017



Prominent Principal jobs

3.40 For each job level, the principal jobs which accounted for a significant percentage of the E&M manpower in 2021 are listed in *Table 3.41*.

Table 3.41 Prominent Principal jobs in the Aircraft Maintenance sector by level in 2021

Job Level	Job	% of E&M employees accounted at respective level
Professional/Technologist	Aircraft Maintenance Engineer	**94.6**
Technician	Supervisor	**50.3**
	Aircraft Maintenance Technician	**47.5**
Tradesman/Craftsman	Aircraft Maintenance Mechanic	**93.3**

3.41 As compared to 2017, quite an obvious increase in manpower was noted for the following principal jobs (*Table 3.42*).

Table 3.42 Principal jobs with significant increase in manpower in the Aircraft Maintenance sector by level in 2021

Job code	Principal Jobs	No. of employees in 2021	No. of employees in 2017	Increased in number (2021 vs. 2017)	% increased (2021 vs. 2017)
Professional/ Technologist	Building Services Engineer	11	1	10	1000.0
	Safety Officer	12	7	5	71.4
Technician	Assistant Safety Officer/Safety Supervisor	15	6	9	150.0

3.42 As compared to 2017, a significant decrease in manpower was noted for the following principal jobs (*Table 3.43*).

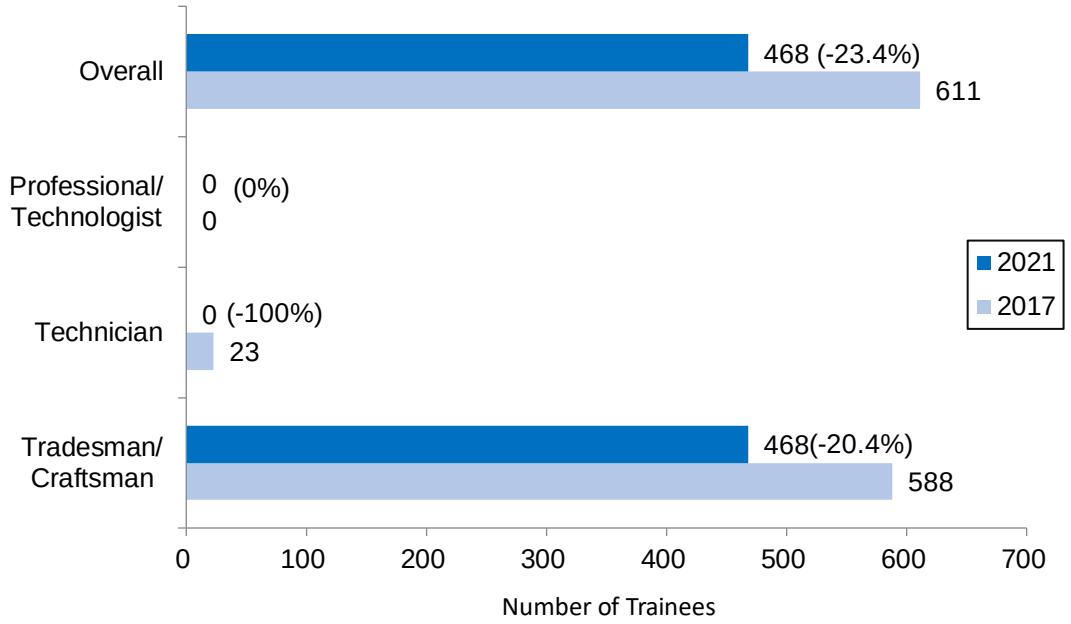
Table 3.43 Principal jobs with significant decrease in manpower in the Aircraft Maintenance sector by level in 2021

Job code	Principal Jobs	No. of employees in 2021	No. of employees in 2017	Decreased in number (2021 vs. 2017)	% decreased (2021 vs. 2017)
Professional/ Technologist	Aircraft Maintenance Engineer	478	669	-191	-28.6
Technician	Aircraft Maintenance Technician	543	738	-195	-26.4
Tradesman/ Craftsman	Aircraft Maintenance Mechanic	2485	2668	-183	-6.9

Trainees

3.43 Overall speaking, the number of trainees reported in 2021 was 468, which registered a significant decrease of 23.4% over 2017 *(Figure 3.19)*.

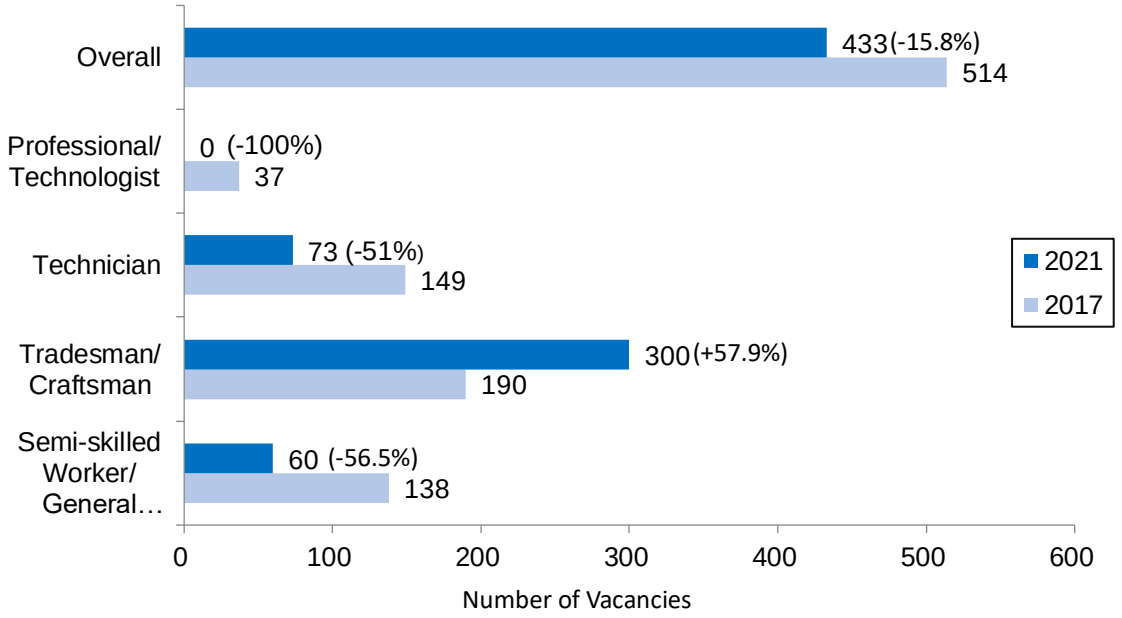
Figure 3.19 Number of trainees in the Aircraft Maintenance sector by job level in 2021 and 2017



Vacancies

3.44 General speaking, the number of vacancies in the Aircraft Maintenance sector decreased from 514 in 2017 to 433 in 2021. The decrease was particularly obvious at the professional/technologist, technician, and semi-skilled /general worker levels. On the other hand, an increase in vacancies was noted at the tradesman/craftsman level (*Figure 3.20*). The vacancy rate[9] for various levels is shown in *Table 3.44*.

Figure 3.20 Number of vacancies in the Aircraft Maintenance sector by job level in 2021 and 2017



[9] *Vacancy rate = no. of vacancies / (no. of FT employees + no. of vacancies)*

Table 3.44 Number of vacancies and vacancy rates in the Aircraft Maintenance sector by job level in 2021 and 2017

Job level	2021		2017	
	Number of vacancies	vacancy rates	Number of vacancies	vacancy rates
Professional / Technologist	0	0%	37	5.4%
Technician	73	6%	149	10.5%
Tradesman / Craftsman	300	10.1%	190	6.8%
Semi-skilled / General worker	60	10.6%	138	23.1%
Overall	**433**	**8.2%**	**514**	**9.4%**

Turnover and Recruit of E&M Employees

3.45 Overall, a total of 230 E&M employees left their organisations within the 12 months before the survey, representing an overall turnover rate of 4.4%. The turnover rate for professionals/technologists, technicians, tradesmen/craftsmen, and semi-skilled/general workers was respectively 9.9%, 6.6%, 3.0%, and 1.8% (*Table 3.45*).

Table 3.45 Number and percentage of turnover by job level in the Aircraft Maintenance sector in 2021

Job level	Number of posts (employees + vacancies)	Number of full-time employees left	Turnover rate
Professional / Technologist	505	50	9.9%
Technician	1,216	80	6.6%
Tradesman / Craftsman	2,963	90	3.0%
Semi-skilled / General Worker	566	10	1.8%
Overall	**5,250**	**230**	**4.4%**

3.46 Overall, a total of 75 experienced E&M employees were recruited by organisations within the 12 months before the survey, representing a recruit rate of 1.4%. The recruit fell short of the turnover for all levels (*Table 3.46*).

Table 3.46 Number of recruit and turnover by job level in the Aircraft Maintenance sector in 2021

Job level	Number of recruit	Number of turnover	Difference
Professional / Technologist	7	50	-43
Technician	19	80	-61
Tradesman / Craftsman	46	90	-44
Semi-skilled / General worker	3	10	-7
Overall	**75**	**230**	**-155**

Salary

3.47 In the semi-skills/general worker level, the average monthly salary ranged from $15,001 to $18,000, which covered the income range for the majority (94%) of employees at that level, while 88.7% of tradesmen/craftsmen and 95.5% of technicians received the average monthly income in the range of $18,001 - $25,000 and $25,001 - $35,000 respectively. Most employees at the professional/technologist level were in the salary range of $35,001 - $45,000. The salary distribution of the E&M employees of the Aircraft Maintenance sector of various levels is listed in *Table 3.47*. Salary ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.47 Salary distribution of E&M employees by job level in the Aircraft Maintenance sector in 2021

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%	0.4%	99.0%	0.6%
Technician	0%	0%	3.9%	0.6%	95.5%	0%	0%
Tradesman/Craftsman	0%	4%	11.3%	88.6%	0.1%	0%	0%
Semi-skilled/General worker	0%	5.9%	94.1%	0%	0%	0%	0%
Overall	**0%**	**0.6%**	**17.1%**	**49.3%**	**22.6%**	**10.3%**	**0.1%**

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

3.48 The salary of employees at various levels is presented in *Figures 3.21 to 3.25.*

Figure 3.21 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector in 2021 and 2017 – Overall

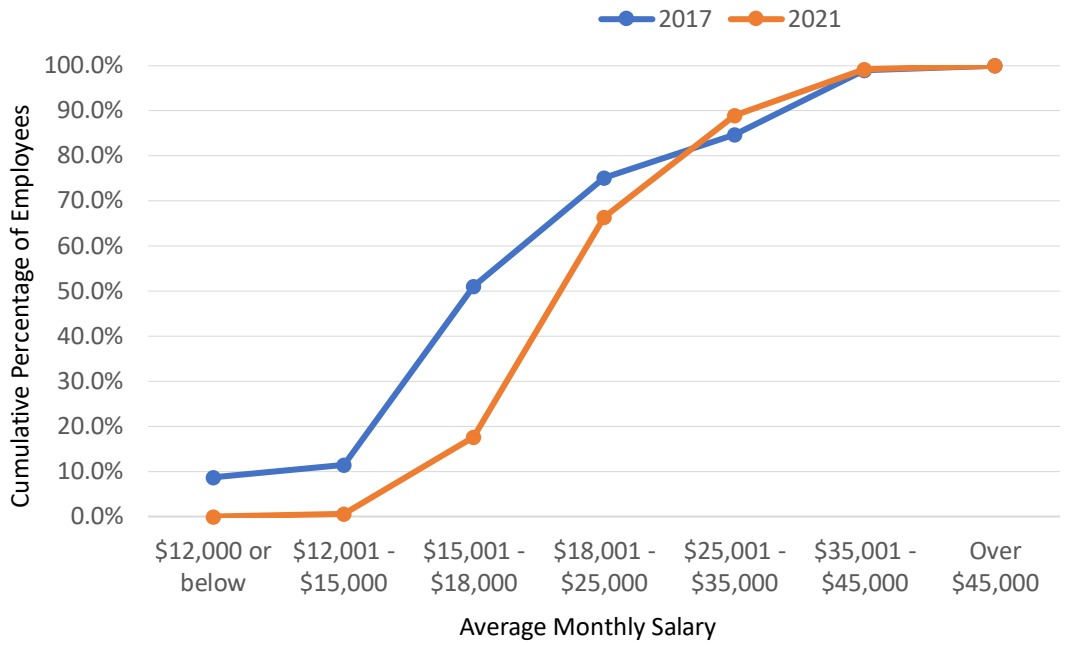


Figure 3.22 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector in 2021 and 2017 – Professional / Technologist

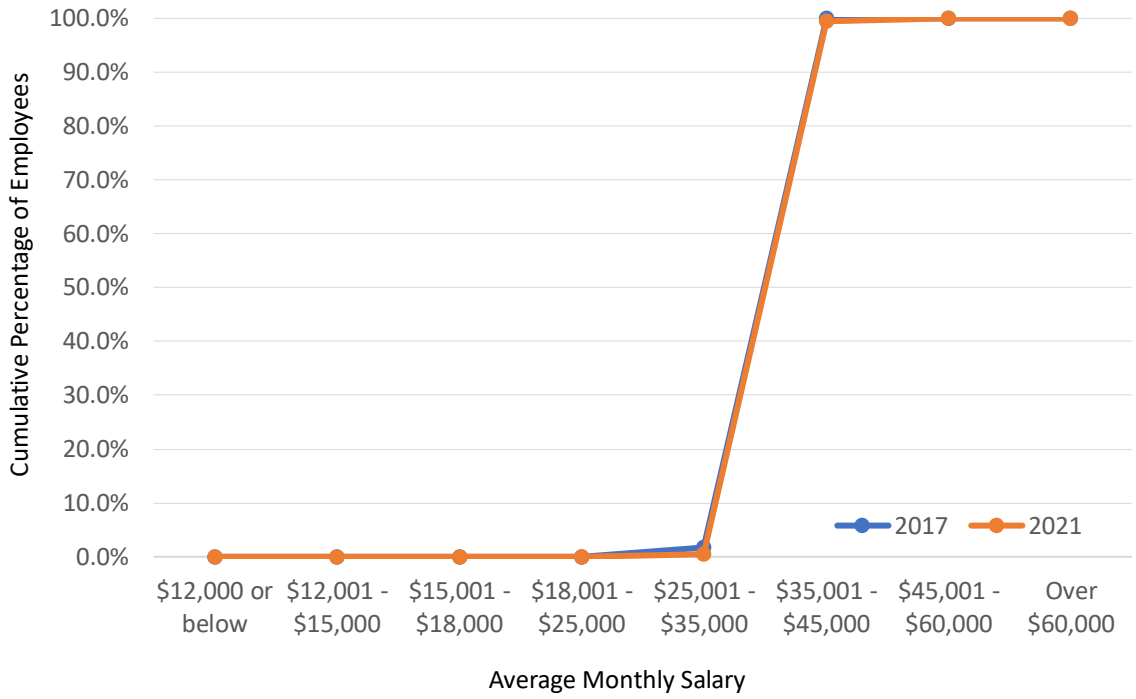


Figure 3.23 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector in 2021 and 2017 – Technician

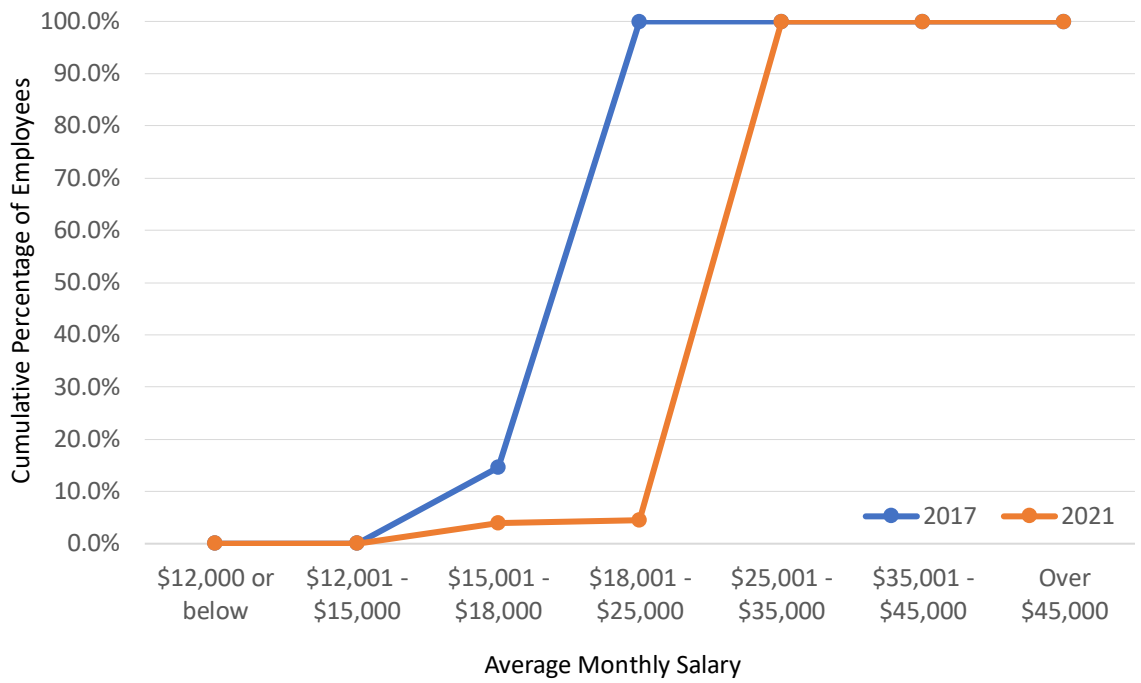


Figure 3.24 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector in 2021 and 2017 – Tradesman / Craftsman

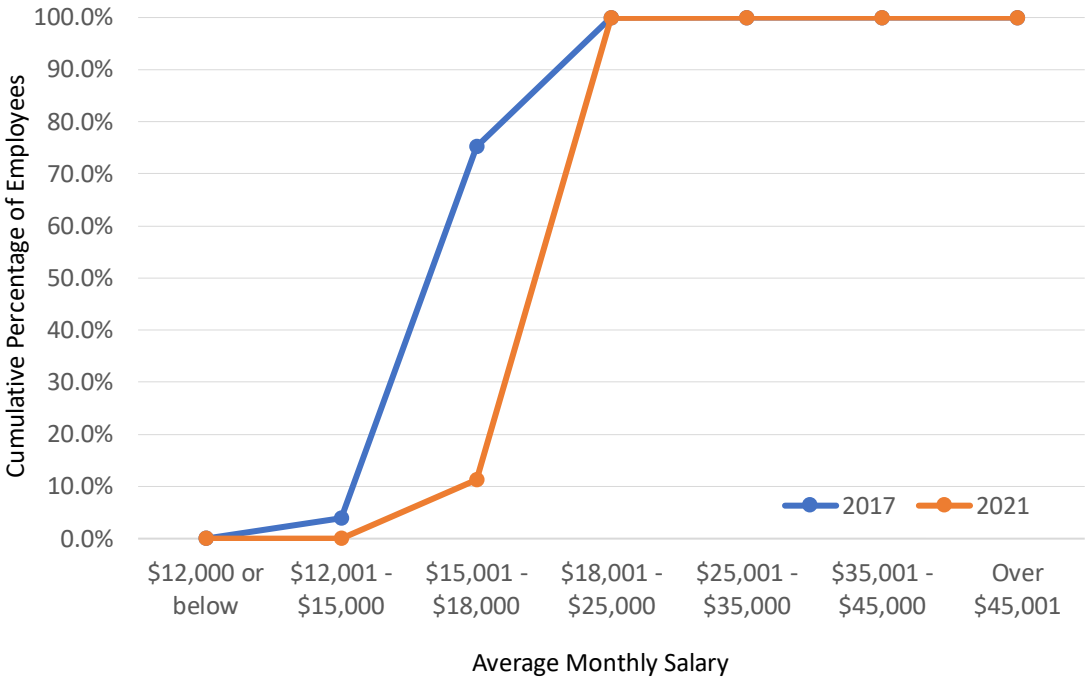


Figure 3.25 Cumulative percentage of average monthly salary in the Aircraft Maintenance sector in 2021 and 2017 – Semi-skilled / General worker

3.49 The principal jobs with a relatively higher percentage of employees falling into the salary brackets of higher ends are listed in *Tables 3.48 to 3.50*.

Table 3.48 Principal jobs at Professional/Technologist level with most employees in high salary brackets in the Aircraft Maintenance sector in 2021

***Principal* Job**	**% of employees with average monthly income > $35,000**	**Total no. of employees**
Level 1 : Professional / Technologist level		
Building Services Engineer	100.0%	11
Engineering Manager	75.0%	4
Safety Officer	91.7%	12
Aircraft Maintenance Engineer	100%	478
Overall for Level 1	**99.6%**	**505**

Table 3.49 Principal jobs at Technician level with most employees in high salary brackets in the Aircraft Maintenance sector in 2021

Principal Job	% of employees with average monthly income > $25,000	Total no. of employees
Level 2 : Technician		
Supervisor	99.0%	575
Building Services Technician	100.0%	10
Assistant Safety Officer/Safety Supervisor	100.0%	15
Aircraft Maintenance Technician	91.5%	543
Overall for Level 2	**94.5%**	**1,143**

Table 3.50 Principal jobs at Tradesman/Craftsman level with most employees in high salary brackets in the Aircraft Maintenance sector in 2021

Principal Job	% of employees with average monthly income > $18,000	Total no. of employees
Level 3 : Tradesman / Craftsman		
Refrigeration/Air-conditioning/Ventilation Mechanic (Air System)/Sheet Metal Worker	84.4%	128
Carpenter	80.0%	5
Painter	100.0%	45
Aircraft Maintenance Mechanic	88.8%	2,485
Overall for Level 3	**88.8%**	**2,663**

Preferred and Achieved Education Level

3.50 All employers in the Aircraft Maintenance sector preferred professionals/technologists to possess a university degree, and all employees at the professional/technologists level met the employers' preference. Meanwhile, 62.5% and 87.5% of employers expected employees at the technician and tradesman/craftsman levels to have sub-degree and senior secondary qualifications, respectively. The distribution is shown in *Table 3.51*, and the ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.51 Preferred and Achieved Level of Education for Full-time Employees by Job Level

Job level	Preferred Education Level					
	Postgraduate Degree	First Degree	Sub-degree (e.g. Higher Diploma)	Diploma/ Certificate	Senior secondary	Junior secondary
Professional / Technologist						
- Preferred	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
- Achieved	33.3%	100.0%	44.4%	0.0%	0.0%	0.0%
Technician						
- Preferred	0.0%	0.0%	62.5%	37.5%	0.0%	0.0%
- Achieved	0.0%	50.0%	100.0%	50.0%	0.0%	0.0%
Tradesman / Craftsman						
- Preferred	0.0%	0.0%	12.5%	0.0%	87.5%	0.0%
- Achieved	0.0%	0.0%	12.5%	75.0%	87.5%	0.0%
Semi-skilled / General worker						
- Preferred	0.0%	0.0%	0.0%	0.0%	58.3%	41.7%
- Achieved	0.0%	0.0%	0.0%	0.0%	91.7%	41.7%

Preferred and Accumulated Years of Experience

3.51 Although 77.8% of employers in the Air Maintenance sector preferred their employees at the professional/technologist level to have 6 - 10 years of work experience, all professionals/technologists met the preference. Around 87.5% of employers preferred employees at the technician level to have 3 - 6 years of work experience, while all employees at the tradesman/craftsman level were preferred to have 1 - 3 years of work experience. The distribution is shown in *Table 3.32*, and the ranges with at least 10% of employees are highlighted for ease of reference.

Table 3.52 Preferred and Accumulated Years of Experience for Full-time Employees by Job Level

Job level	Preferred and Accumulated Years of Experience					
	No experience	Below 1 year	1 - < 3 years	3 - < 6 years	6 - < 10 years	10 years+
Professional/Technologist						
- Preferred	0.0%	0.0%	0.0%	22.2%	77.8%	0.0%
- Achieved	0.0%	0.0%	0.0%	44.4%	100.0%	55.6%
Technician						
- Preferred	0.0%	0.0%	12.5%	87.5%	0.0%	0.0%
- Achieved	0.0%	0.0%	25.0%	100.0%	75.0%	12.5%
Tradesman/ Craftsman						
- Preferred	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
- Achieved	0.0%	0.0%	100.0%	87.5%	50.0%	0.0%
Semi-skilled/General worker						
- Preferred	0.0%	50.0%	0.0%	50.0%	0.0%	0.0%
- Achieved	0.0%	33.3%	41.7%	50.0%	0.0%	0.0%

Recruitment Difficulties

3.52 A small number of companies in the Aircraft Maintenance sector conducted recruitment exercises in the past 12 months. Among them, all reported that they encountered difficulties in recruiting employees at the professional/technologist level. The major difficulties encountered were "unsatisfactory terms of employment" and "unsatisfactory working environment". Details are shown in *Tables 3.53 and 3.54*.

Table 3.53 Percentage distribution of whether recruitment was taken place in the past 12 months

	Job level		
	Professional / Technologist	Technician	Tradesman / Craftsman
No recruitment was taken place	88.2%	70.6%	76.5%
Recruitment was taken place	11.8%	29.4%	23.5%
Total no. of companies	**18**		

Table 3.54 Percentage distribution of whether encountered difficulties in recruitment in the past 12 months

	Job level		
	Professional / Technologist	**Technician**	**Tradesman / Craftsman**
Did not encounter difficulties in recruitment	**0.0%**	**80.0%**	**75.0%**
Encountered difficulties in recruitment	**100.0%**	**20.0%**	**25.0%**
Lack of candidates with relevant experience	0.0%	0.0%	25.0%
Unsatisfactory terms of employment	100.0%	20.0%	0.0%
Unsatisfactory working environment	50.0%	20.0%	0.0%
Limited career prospects	0.0%	0.0%	0.0%
Insufficient trained/qualified manpower in the related disciplines	0.0%	0.0%	0.0%
Competition for manpower from the Mainland/Macao/other cities	0.0%	0.0%	0.0%
Alternative offers in the market	0.0%	0.0%	25.0%
Others	0.0%	0.0%	0.0%
No. of companies with recruitment of employees at respective job level	**2**	**5**	**4**

Notes:
(1) Percentages of difficulties in recruitment are calculated based on companies having recruitment of the employees at the respective job level
(2) The percentages for each job level may not add up to 100% as the respondents are allowed to select more than one difficulty

Training and Development Budget in the Next 12 Months

3.53 Companies in the Aircraft Maintenance sector with larger employment size were more likely to have a training and development budget plan. Most of them would use less than 1% of their annual payroll on training and development *(Table 3.55)* and would keep the same budget as last year, only 20% of them indicated that the budget would be reduced *(Table 3.56)*.

Table 3.55 Training and Staff Development Budget in the Next 12 Months as Proportion of Annual Payroll

	Employment size[#]			
	1-9	**10-49**	**50-99**	**100 & over**
<1%	0%	0%	0%	71.4%
1% - 2%	0%	0%	0%	0%
> 2%	0%	0%	0%	0%
Not yet estimate/No plan for training	100%	100%	100%	28.6%

Note: [#] Readers should interpret with caution as the number of companies is small

Table 3.56 Training and Staff Development Budget in the Next 12 Months as Compared with Last Year

	Employment size[#]			
	1-9	**10-49**	**50-99**	**100 & over**
Increase	NA	NA	NA	0%
Decrease				20.0%
Remain unchanged/No training arranged				80.0%

Note: [#] Readers should interpret with caution as the number of companies is small

Major Training Areas

3.54 Most of the employees at the professional/technologist level were preferred to have training in project management-related areas. On the other hand, employees at the technician level and tradesman/craftsman level were preferred to have training on regulations and safety areas, respectively. The top five areas of training required for employees by job level are shown in *Table 3.57*.

Table 3.57 Top Five Areas of Training Required for Employees

Professional / Technologist	**Technician**	**Tradesman/Craftsman**
Project Management (45.5%)	Safety ordinances Cap. 59 FIUO and Cap. 509 OSHO (80.0%)	Safety Awareness (88.9%)
Construction Contract's Terms and Conditions (36.4%)	Relevant Trade's Ordinances and Regulations (30.0%)	Safety Audit/Assessment (66.7%)
Risk and Crisis Management (27.3%)	Engineering-related ISO Standards (30.0%)	Safety/Risk Management (66.7%)
Digital Skill in Using Engineering Related Software and Apps (18.2%)	Instructing and Coaching Skills (30.0%)	Use of Personal Protective Equipment (33.3%)
	Computer-based Technology for Training (20.0%)	Construction Site Safety for Workers (22.2%)

IV. OBSERVATIONS AND CONCLUSIONS

A. 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 Gas sector, and the Aircraft Maintenance sector of the E&M Services industry at the time of the survey.

B. Electrical and Mechanical Engineering Sector

Manpower Changes

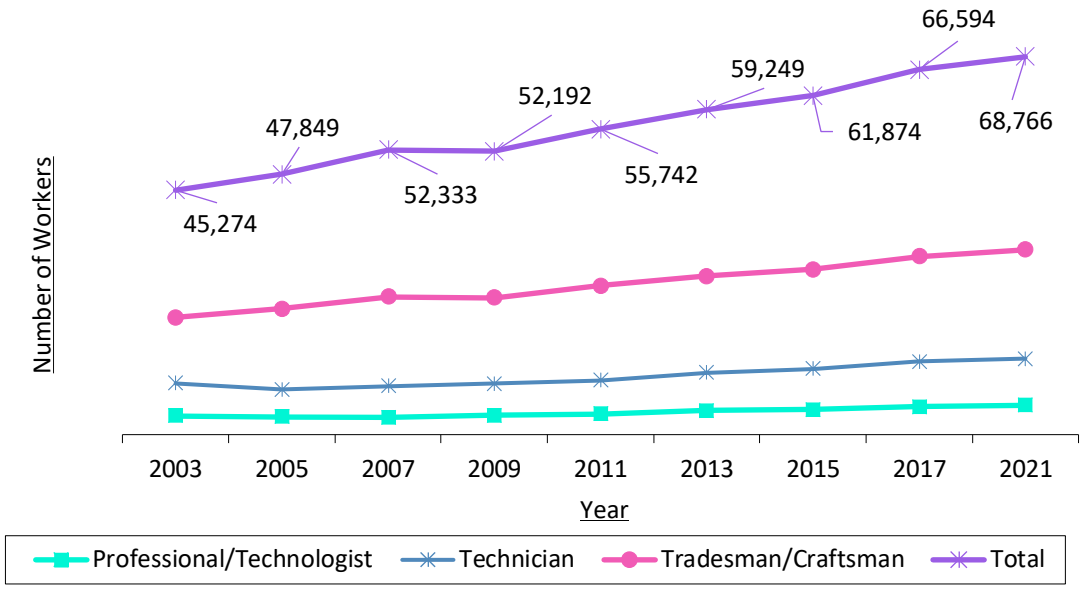
4.2 The manpower changes at professional/technologist, technician, and tradesman/craftsman levels of the E&M Engineering sector from 2003 to 2021 are shown in *Table 4.1 and Figure 4.1*.

Table 4.1 Manpower Changes of the Electrical and Mechanical Engineering sector between 2003 and 2021

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower[10]
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
2021	10,432	16,656	38,758	68,766

[10] *including semi-skilled/general workers*

Figure 4.1 Manpower Changes of the Electrical and Mechanical Engineering sector between 2003 and 2021



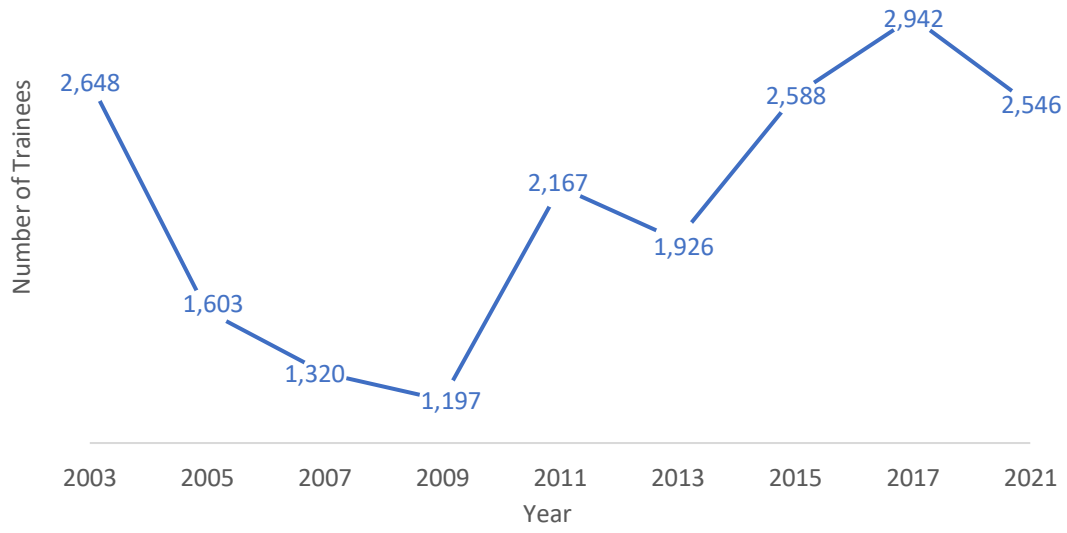
4.3 The manpower of the E&M Engineering sector has been on a rising trend since 2009 due to the increase of mega infrastructural projects, such as the Shatin to Central Railway Link, the Hong Kong-Zhuhai-Macao Bridge, the Expansion of Hong Kong International Airport into a Three-Runway System and the Tuen Mun-Chek Lap Kok Tunnel, and the residential and non-residential buildings in Hong Kong. The number of workers increased by 3.3% during the past four years. The manpower increase at professional/technologist, technician, and tradesman/craftsman levels were respectively 4.5%, 4.3% and 3.3%. On the other hand, the manpower at the semi-skilled/general worker level decreased 7% as compared with 2017.

4.4 The number of trainees has rebounded since the early 2010s as a result of the commencement of many infrastructure projects; however, starting from 2019 onwards, the number of trainees has dropped again (*Table 4.2 and Figure 4.2*).

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%
2021	68,766	2,546	3.7%

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



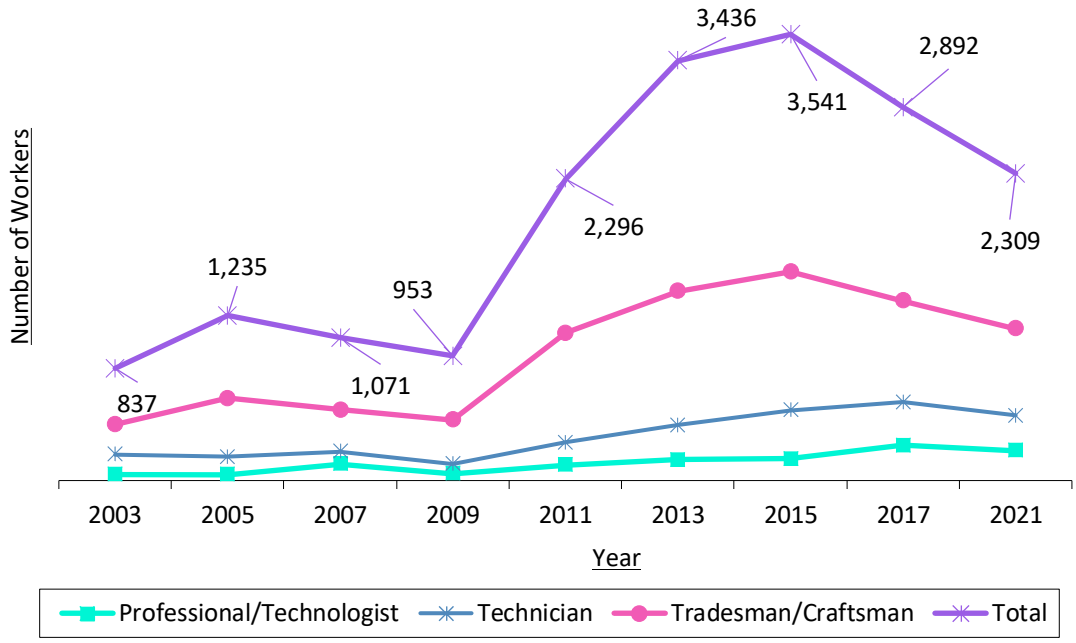
4.5 The number of vacancies in the E&M Engineering sector surged from 2009 to 2015 when the major infrastructural projects were at full steam. Table 4.3 and Figure 4.3 show that the vacancy number has decreased since 2017 as a result of the completion of some projects, a decrease in the total construction expenditure[11] of E&M work for public and private sectors, an increase in the supply of graduates and trainees in the past few years, and the impact of the COVID-19 pandemic in 2019. Notwithstanding, 10 out of 62 principal jobs still had vacancy rates of 5% or higher.

[11] *Figures provided by Construction Industry Council show that the total construction expenditures of E&M work for public and private sectors in 2017-18 and 2020-21 were respectively $54.4 billion and $42.9 billion.*

Table 4.3 Number of Vacancies in the Electrical and Mechanical Engineering sector from 2003 to 2021

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total No. of Vacancies[12]
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
2021	450	520	1,298	2,309

Figure 4.3 Number of Vacancies in the Electrical and Mechanical Engineering sector from 2003 to 2021



Business Outlook of the E&M Engineering Sector

Short and Medium-term

4.6 With the implementation of major construction projects coming on stream, there will be an increase in manpower demand in the E&M Engineering sector, in particular the following projects that have been constructed in full strength from Q3 of 2021:

[12] *including semi-skilled/general workers*

(i) the development of Kai Tak projects Area (2021-2024);
(ii) the development of Hospital Authority Supporting Services Centre (2021-2024);
(iii) the development of University of Hong Kong High West Site (2021-2024);
(iv) the development of Chai Wan Government Complex and Vehicle Depot (2021-2025) ;
(v) the development of Chinese Medicine Hospital (2021-26) ;
(vi) the development of Government Chinese Medicines Testing Institute (2021-2026);
(vii) the redevelopment of Western Police Married Quarters (2021-2028);
(viii) the development of Kwun Tong Government Composite (2022-2025); and
(ix) the construction of District Court at Caroline Hill Road (2022-25).

4.7 The railway industry has been vital to the development of manpower for E&M Engineering and construction companies over the years. Despite several rail projects completed over the past few years, new projects will begin in the coming years, including:

(i) the Tung Chung West Extension (2023-2029);
(ii) the Tuen Mun South Extension (2023-2030);
(ii) the Northern Link including Kwu Tung Station (2023-2034); and
(iii) the Hung Shui Kiu Station (2024-2030).

4.8 The Government has allocated over $19 billion in total to subsidise owners of aged buildings to maintain and repair their properties. However, it is expected that with the rapid ageing of buildings, the number of private buildings aged 50 years or above would surge from 3,900 to 8,600 in the coming decade. The ongoing property maintenance and repair works will sustain the servicing business of the E&M Engineering sector for years to come.

4.9 With reference to the Transport and Housing Bureau, the projected private housing supply in the primary market in 2023-2025 will be 94,000 units and the public housing supply in 2022/23 to 2025/26 will be 77,700 units. The increasing supply of housing will sustain the steady growth of the E&M Engineering sector.

Long-term

4.10 Apart from the current urban renewal, the Government will step up the urban renewal for Yau Ma Tei and commence district planning studies on the old districts of Tsuen Wan and Sham Shui Po. The urban renewal projects will undoubtedly bring forth a more significant number of new opportunities for the E&M Engineering sector.

4.11 The Chief Executive announced in her 2021 Policy Address that the northern part of Hong Kong would be developed into a metropolitan area. Together with the reclaimed land of Kau Yi Chau Artificial Islands under the Lantau Tomorrow Vision; these two projects would create more residential, commercial, and industrial buildings in future and will bring many business opportunities for the E&M Engineering sector.

4.12 In addition to the rail projects that will support the business growth of the E&M Engineering and construction sectors, with the formation of the concept of "Twin Cities, Three Circles" to boost the economy in the north of the city and facilitate close collaboration between the Hong Kong and Shenzhen, a new rail link will be built connecting Hung Shui Kiu in Yuen Long to Qianhai in Shenzhen. The HKSAR Government proposed to:

(i) extend the Northern Link northwards to connect to the new Huanggang Port in Shenzhen via the Hong Kong-Shenzhen Innovation and Technology Park (HSITP) in the Lok Ma Chau Loop;

(ii) build a new station between Lo Wu station and Sheung Shui station on the East Rail line;

(iii) extend eastward from Kwu Tung to connect with the areas of Lo Wu, Man Kam To and Heung Yuen Wai, and further southwards to Fanling, via Ta Kwu Ling and Queen's Hill;

(iv) explore the provision of co-location arrangement at the boundary control point on the Shenzhen side; and

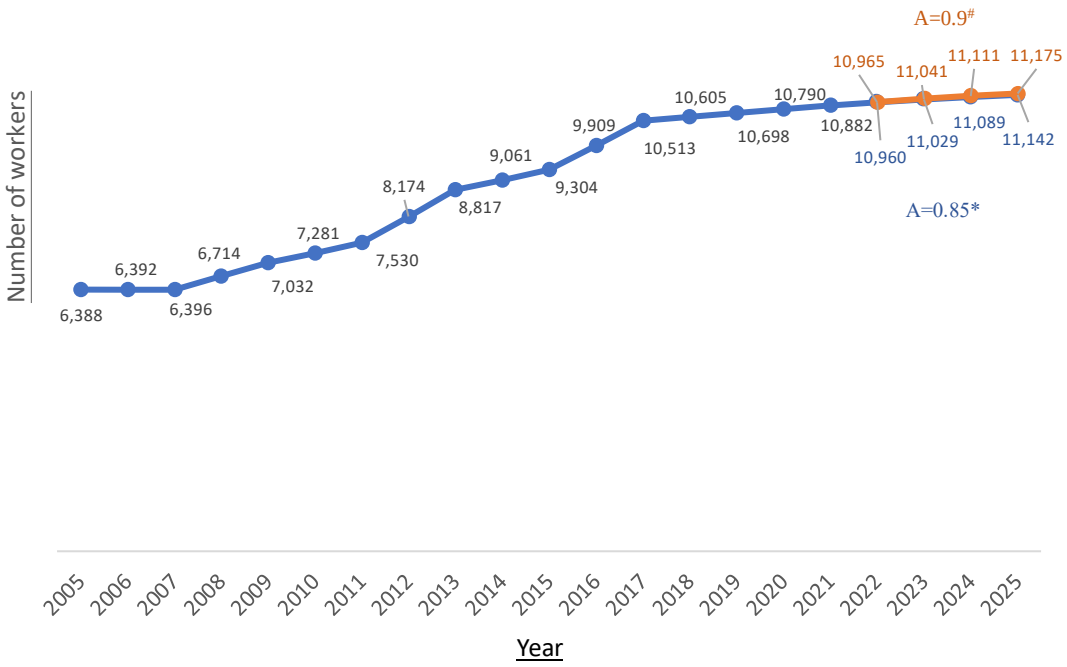
(v) construct an automated people mover system from Tsim Bei Tsui to Pak Nai to promote the development of the area and Lau Fau Shan.

Projected Manpower for the E&M Engineering Sector

4.13 In projecting the manpower of the E&M Engineering sector for years 2022 to 2025, the Training Board adopts the Adaptive Filtering Method (AFM) (*Please refer to Appendix 6 for details*), taking into consideration similar factors as previous rounds of manpower survey.

4.14 Based on the findings of the 2021 and previous rounds of manpower surveys, the business outlook of the sector, the impact of the COVID-19 pandemic, the total construction expenditure of E&M work for public and private sectors in E&M work forecasted by Construction Industry Council (CIC)[13], the Training Board decided to slightly adjust the weight factor (A)[14] from the best-fitted curve of the AFM for the manpower projection at different job levels for 2022 to 2025. The results are shown in *Figures 4.4 to 4.6*.

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

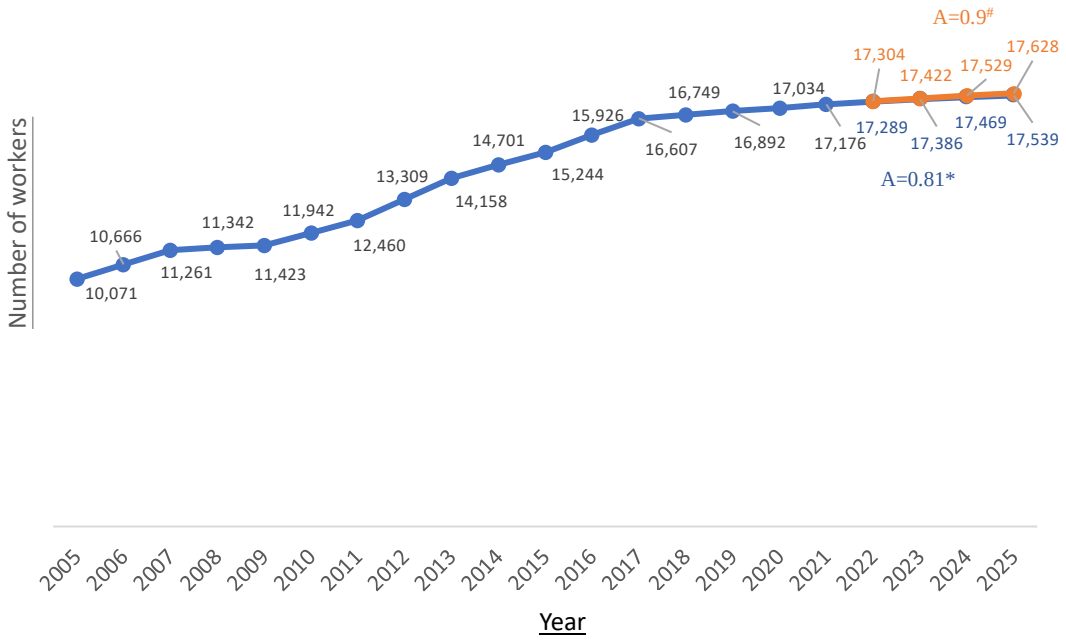


** The AFM best-fitted curve*
 # The AFM curve adopted by the Training Board

[13] *The CIC forecasted that the total construction expenditure of E&M works for public and private sectors would be increased from some $43 billion in 2020-21 to $58 billion in 2024-25.*

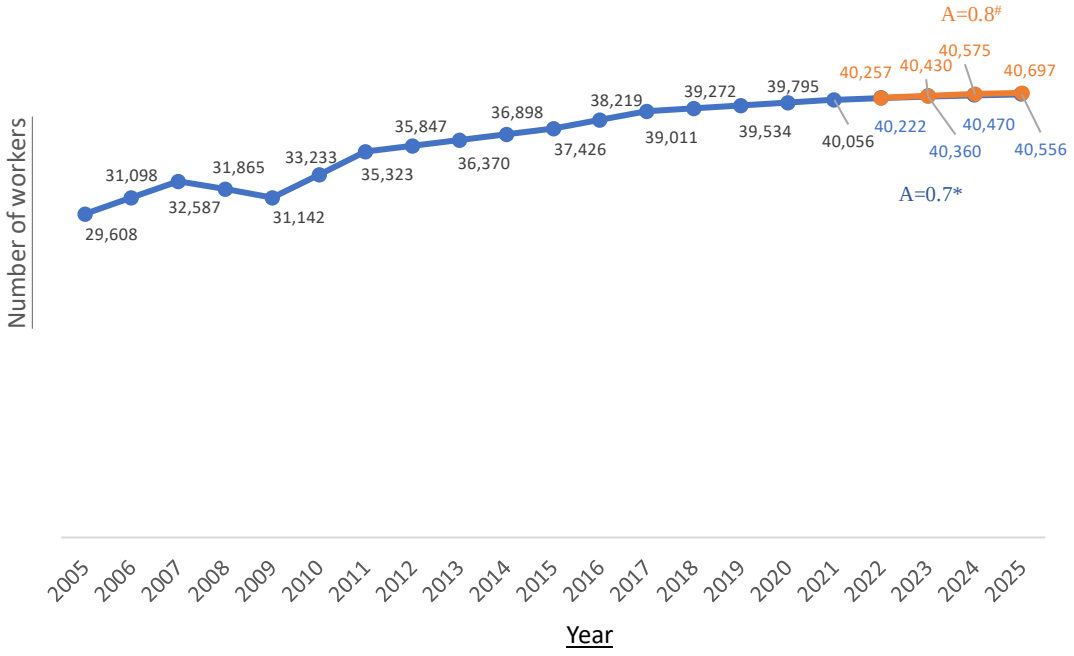
[14] *The degree of emphasis on the more recent survey data can however be varied by adjusting the weighting factor (A) from 0 to 1, the higher value of 'A', the heavier the weightings of more recent data are.*

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



** The AFM best-fitted curve*
 # The AFM curve adopted by the Training Board

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



** The AFM best-fitted curve*
 # The AFM curve adopted by the Training Board

4.14 The projected manpower of professional/technologist, technician, and tradesman/craftsman for 2022 to 2025 is shown in *Table 4.4*.

Table 4.4 Projected Manpower of the E&M Engineering sector

Year	Professional/ Technologist (A = 0.9)	Technician (A = 0.9)	Tradesman/ Craftsman (A = 0.8)
2022	10,965	17,304	40,257
2023	11,041	17,422	40,430
2024	11,111	17,529	40,575
2025	11,175	17,628	40,697

4.15 The Training Board followed the practice of previous rounds and adopted 3% as the annual wastage rate of professionals/technologists and technicians. Given the increasingly ageing population of the tradesmen/craftsmen [15], in particular plumbers, pipelayers and drainlayers, the Training Board slightly adjusted the annual wastage rate from 4% of the previous round survey to 4.5%.

4.16 Based on the above manpower projection and the wastage of each level, the estimated additional annual manpower requirement for professional/technologist, technician and tradesman /craftsman are respectively 404, 635 and 1,977. The detailed calculations are shown in *Tables 4.5, 4.6 and 4.7.*

Table 4.5 Estimated Additional Annual Manpower Requirement at Professional / Technologist Level

		Estimated Additional Annual Manpower Requirement			
Projected Manpower in 2025: E1	Annual Growth Rate $(E1/E^*)^{1/4}-1$	Annual Wastage W (%)	Growth G= (E1-E)/4	Replacement for Wastage R= (E1+E)/2xW	Total G+R
11,175	0.67%	3.0	**73**	**331**	**404**

** E is Total Manpower in 2021 (Employees + Vacancies) = 10,882*

[15] *Based on the survey from CIC in November 2021, 30.7% plumbers/pipelayers reached the age of 60 or above, while 23.6% of electrical tradesmen/craftsmen were the age of 60 or above.*

Table 4.6 Estimated Additional Annual Manpower Requirement at Technician Level

		Estimated Additional Annual Manpower Requirement			
Projected Manpower in 2025: E1	Annual Growth Rate $(E1/E^*)^{1/4}$-1	Annual Wastage W (%)	Growth G= (E1-E)/4	Replacement for Wastage R= (E1+E)/2xW	Total G+R
17,628	0.65%	3.0	**113**	**522**	**635**

** E is Total Manpower in 2021 (Employees + Vacancies) = 17,176*

Table 4.7 Estimated Additional Annual Manpower Requirement at Tradesman / Craftsman Level

		Estimated Additional Annual Manpower Requirement			
Projected Manpower in 2025: E1	Annual Growth Rate $(E1/E^*)^{1/4}$-1	Annual Wastage W (%)	Growth G= (E1-E)/4	Replacement for Wastage R= (E1+E)/2xW	Total G+R
40,697	0.40%	4.5	**160**	**1,817**	**1,977**

** E is Total Manpower in 2021 (Employees + Vacancies) = 40,056*

C. Gas Sector

Manpower Changes

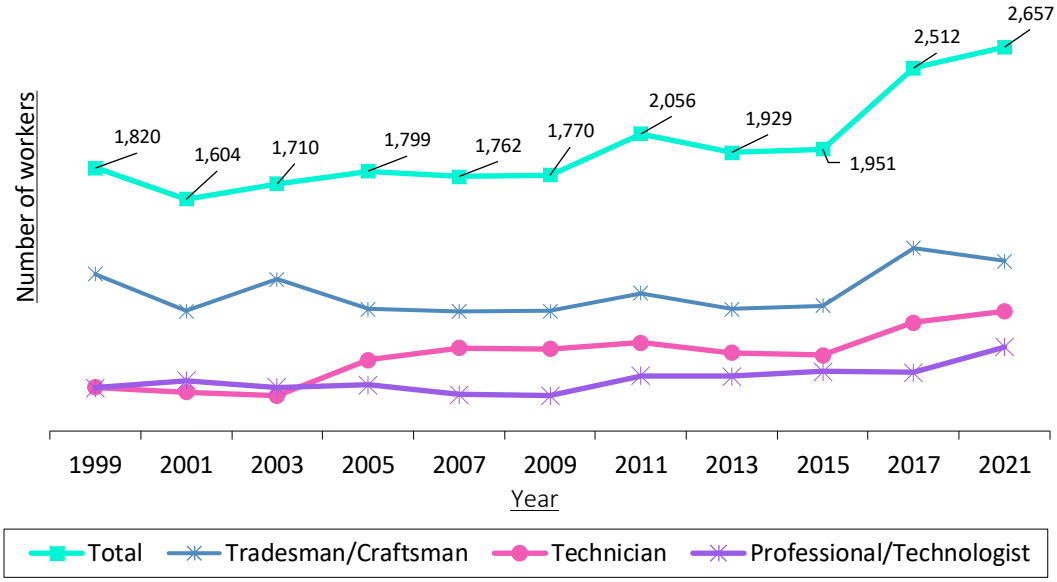
4.17 The manpower changes at the three job levels of the Gas sector from the first survey in 1999 to this round are shown in *Table 4.8 and Figure 4.7*.

Table 4.8 E&M Manpower Changes of the Gas sector

Year of Survey	**Professional/ Technologist**	**Technician**	**Tradesman/ Craftsman**	**Total Manpower[16]**
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
2021	581	829	1,175	2,657

[16] *including semi-skilled/general workers*

Figure 4.7 E&M Manpower Changes of the Gas sector



4.18 The manpower of the Gas sector used to be very stable. A noticeable increase (+5.8% compared with four years ago) was found in this round of survey.

4.19 At the time of the survey, the number of vacancies in the Gas sector amounted to 2.2% of the workforce. Among the principal jobs of the sector, the prominent vacancies were respectively Mechanical Engineer, Gas Engineering Technician, and Gas Distribution Fitter (Town Gas) and Gas Utilisation Fitter (Domestic) at professional/technologist, technician, and tradesman/craftsman levels.

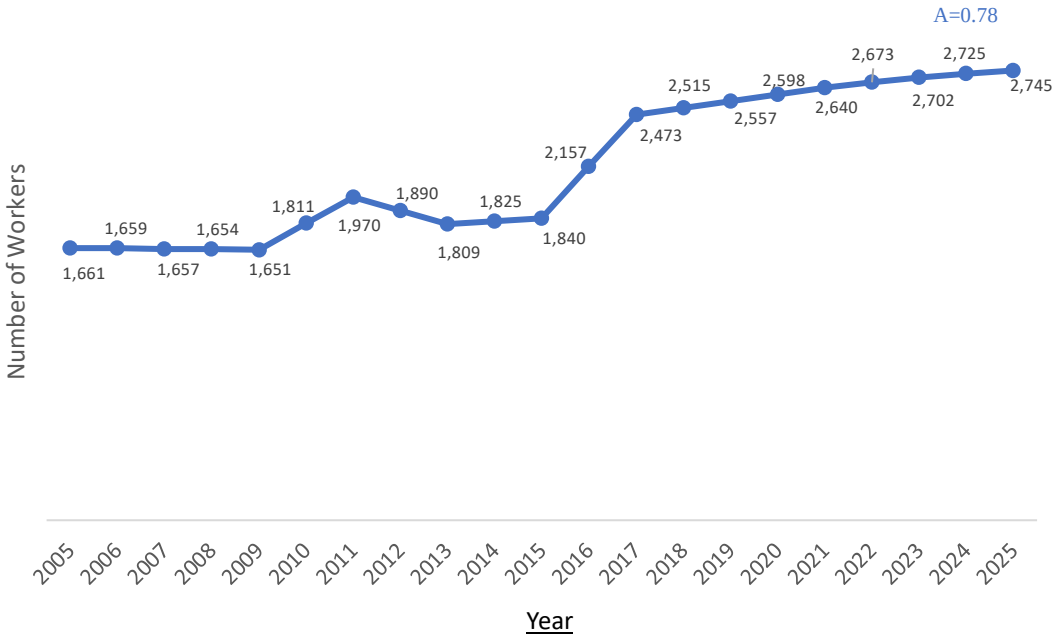
Business Outlook of the Gas Sector

4.20 According to the latest annual progress report of the Long-Term Housing Strategy, the HKSAR Government projected that the total housing supply target for the 10-year period from 2022-23 to 2031-32 would be 430,000 units. The increasing supply of housing, coupled with the present favourable economic conditions, will sustain the steady growth of the Gas sector.

Projected Manpower Requirements for the Gas Sector

4.21 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 projection. The result is shown in *Figure 4.8*.

Figure 4.8 Manpower Projection for the Gas sector



4.22 The Training Board decided to adopt the best-fitted curve (A=0.78) for manpower projection of the Gas sector. The total manpower projection of the sector for 2022 to 2025 are respectively 2,673, 2,702, 2,725 and 2,745.

4.23 Based on the above manpower projection and the annual wastage[17] of each level, the estimated additional annual manpower requirement for professional/technologist, technician and tradesman/craftsman are 24, 34 and 49 respectively. The detailed calculations are shown in *Table 4.9, 4.10 and 4.11*.

Table 4.9 Estimated Additional Annual Manpower Requirement at Professional / Technologist Level

		Estimated Additional Annual Manpower Requirement			
Projected Manpower in 2025: E1	Annual Growth Rate $(E1/E^*)^{1/4}-1$	Annual Wastage W (%)	Growth G= (E1-E)/4	Replacement for Wastage R= (E1+E)/2xW	Total G+R
619	0.98%	3.0	**6**	**18**	**24**

** E is Total Manpower in 2021 (Employees + Vacancies) = 595*

[17] *The Training Board followed the practice of previous rounds and adopted 3% as the annual wastage rate of professional/technologists, technicians, and tradesmen/craftsmen.*

Table 4.10 Estimated Additional Annual Manpower Requirement at Technician Level

		Estimated Additional Annual Manpower Requirement			
Projected Manpower in 2025: E1	Annual Growth Rate $(E1/E^*)^{1/4}$-1	Annual Wastage W (%)	Growth G= (E1-E)/4	Replacement for Wastage R= (E1+E)/2xW	Total G+R
881	0.98%	3.0	**8**	**26**	**34**

** E is Total Manpower in 2021 (Employees + Vacancies) = 847*

Table 4.11 Estimated Additional Annual Manpower Requirement at Tradesman / Craftsman Level

		Estimated Additional Annual Manpower Requirement			
Projected Manpower in 2025: E1	Annual Growth Rate $(E1/E^*)^{1/4}$-1	Annual Wastage W (%)	Growth G= (E1-E)/4	Replacement for Wastage R= (E1+E)/2xW	Total G+R
1,246	0.98%	3.0	**12**	**37**	**49**

** E is Total Manpower in 2021 (Employees + Vacancies) =1,198*

D. Aircraft Maintenance Sector

Manpower Changes

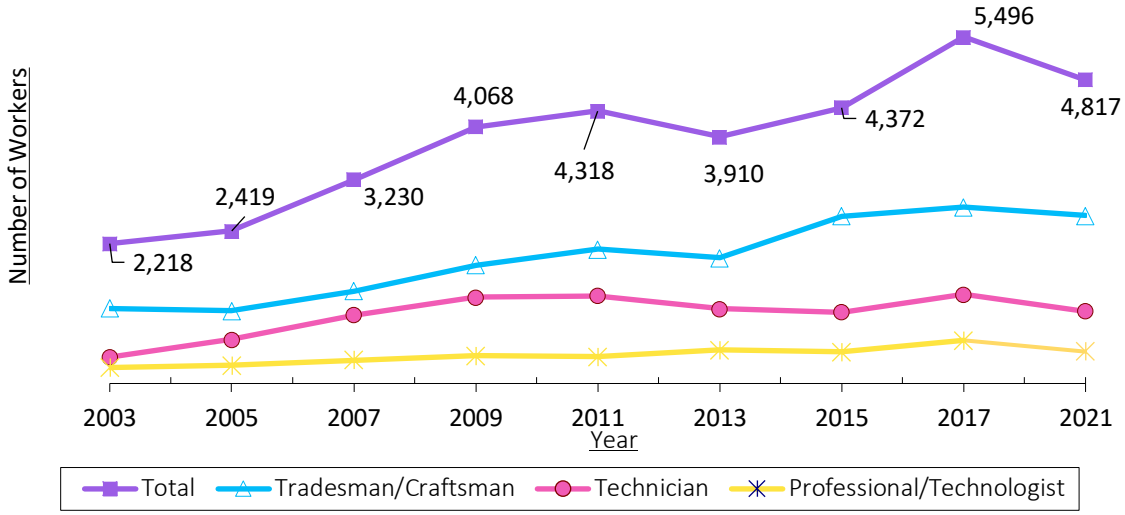
4.24 The manpower figures at professional/technologist, technician, and tradesman/craftsman levels of the Aircraft Maintenance sector recorded from 2003 to 2021 are shown in *Table 4.12 and Figure 4.9*.

Table 4.12 E&M Manpower Changes of the Aircraft Maintenance sector

Year of Survey	Professional/ Technologist	Technician	Tradesman/ Craftsman	Total Manpower[18]
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
2021	505	1,143	2,663	4,817

[18] *including semi-skilled/general workers*

Figure 4.9 E&M Manpower Changes of the Aircraft Maintenance sector between 2003 and 2021



Business Outlook of the Aircraft Maintenance Sector

4.25 The COVID-19 pandemic has had a significant impact on the aviation industry due to the travel restrictions, border measures and reduction in demand among travellers. As a result, massively reduced revenues for airlines and forced many airlines to lay off employees; the aircraft maintenance sector was not immune.

4.26 Notwithstanding, since many people around the world have not travelled overseas for leisure, business, or school for a long period, it is expected that there will be a huge demand for aviation services once the pandemic is over.

4.27 In addition, the third runway of the Hong Kong Airport will be put into operation in the second half of 2022. Thereafter the Centre Runway will be closed for reconfiguration, conducted in parallel with other works of the third runway project, with the target of completing the construction of the third runway in 2024 as planned. It is expected that the three runways will be able to handle the targeted annual passenger and cargo volume of around 120 million and 10 million tons respectively. The third runway will bring more business opportunities to the aircraft maintenance sector as well as its manpower demand.

4.28 The recovery of the aviation industry and aircraft maintenance sector is also dependent on the progression of the pandemic, and the Training Board believes a positive business outlook for the sector in the years ahead.

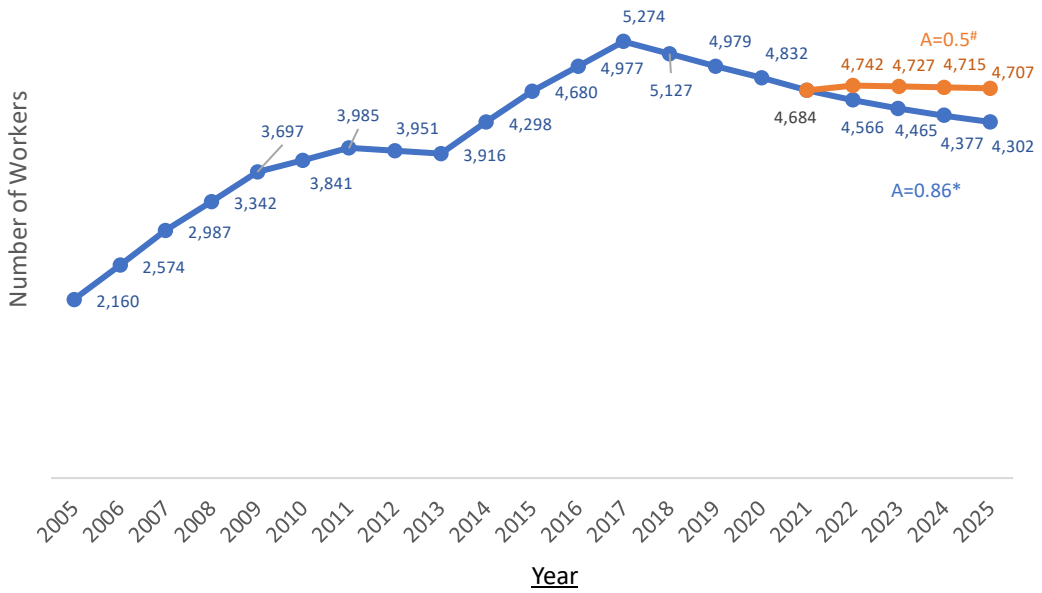
Projected Manpower Requirements for the Aircraft Maintenance Sector

4.29 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 projection.

4.30 The revenues of the aviation industry and aircraft maintenance sector have been impacted by the COVID-19 pandemic since early 2020. According to the figures provided by the Civil Aviation Department of the HKSAR Government, the total number of aircraft landing and take-off the Hong Kong International Airport dramatically dropped from 33,226 in January 2020 to 11,046 in June 2021 and the total number of arrival and departure passengers dropped from 5,701,788 in January 2020 to 83,280 in June 2021.

4.31 With a view of the once-in-a-century COVID-19 pandemic, the Training Board decided to adopt a middle weight factor[19] (A=0.5) instead of the best-fitted curve (A=0.86) to project the manpower for 2022 to 2025. The projected total manpower of the sector for 2022 to 2025 respectively are 4,742, 4,727, 4,715 and 4,707. The result is shown in *Figure 4.10*.

Figure 4.10 Manpower Projection for the Aircraft Maintenance sector



** The AFM best-fitted curve*
 # The AFM curve adopted by the Training Board

[19] *The degree of emphasis on the more recent survey data can however be varied by adjusting the weighting factor (A) from 0 to 1, The higher value of 'A', the heavier the weightings of more recent data are.*

4.32 Based on the above manpower projection and the annual wastage[20] of each level, the estimated additional annual manpower requirement for professional/technologist, technician and tradesman/craftsman are 15, 35 and 114 respectively. The detailed calculations are shown in *Table 4.13, 4.14 and 4.15*.

Table 4.13 Estimated Additional Annual Manpower Requirement) at Professional / Technologist Level

		Estimated Additional Annual Manpower Requirement			
Projected Manpower in 2025: E1	Annual Growth Rate $(E1/E^*)^{1/4}-1$	Annual Wastage W (%)	Growth G= (E1-E)/4	Replacement for Wastage R= (E1+E)/2xW	Total G+R
507	0.12%	3.2	**1**	**16**	**17**

** E is Total Manpower in 2021 (Employees + Vacancies) = 505*

Table 4.14 Estimated Additional Annual Manpower Requirement at Technician Level

		Estimated Additional Annual Manpower Requirement			
Projected Manpower in 2025: E1	Annual Growth Rate $(E1/E^*)^{1/4}-1$	Wastage W (%)	Growth G= (E1-E)/4	Replacement for Wastage R= (E1+E)/2xW	Total G+R
1,222	0.12%	3.2	**2**	**39**	**41**

** E is Total Manpower in 2021 (Employees + Vacancies) = 1,216*

Table 4.15 Estimated Additional Annual Manpower Requirement at Tradesman / Craftsman Level

		Estimated Additional Annual Manpower Requirement			
Projected Manpower in 2025: E1	Annual Growth Rate $(E1/E^*)^{1/4}-1$	Wastage W (%)	Growth G= (E1-E)/4	Replacement for Wastage R= (E1+E)/2xW	Total G+R
2,978	0.13%	3.2	4	**94**	**98**

** E is Total Manpower in 2021 (Employees + Vacancies) =2,963*

[20] *The Training Board followed the practice of previous rounds and adopted 3.2% as the annual wastage rate of professional/technologists as well as technicians and 4% for tradesmen/craftsmen.*

V. RECOMMENDATIONS

5.1 Taking into account the employers' views on the business environment in the next 12 months as well as the nature of the Electrical and Mechanical (E&M) services industry, the Training Board anticipates the demand for technically trained personnel for the following three sectors from 2022 to 2025:

(i) E&M Engineering sector: As most of the rail projects will commence or be completed in the coming years as well as the increasing number of new building units, these should be able to sustain the manpower in the sector.

(ii) Gas sector: Based on the latest housing supply projection conducted by the Long Term Housing Strategy, the supply of first-hand private residential flats for the coming three to four years is about 92,000 units, while some 105,300 public residential units will be completed in 2021-22 to 2025-26. With the increasing housing supply, a positive manpower growth in the Gas sector is anticipated.

(iii) Aircraft Maintenance sector: The Aviation industry including the Aircraft Maintenance sector have been suffering from the impact of the COVID-19 pandemic. In the aftermath of the pandemic, it is expected that the industry and the sector will be rebounded with new opportunities brought by the Three-runway System and the high demand for aviation services.

5.2 Investing in manpower training is a long-term strategy. A university graduate must receive at least 2 years of recognized on-the-job training before being eligible to become a professional/technologist, while technicians and tradesmen/craftsmen typically spend two to four years in training. The E&M Services industry has the very stringent quality and safety requirements, so properly trained manpower is especially vital. To ensure an adequate supply of skilled manpower, the industry should implement the manpower training programmes to cope with the annual manpower requirement recommended in paragraphs 4.16, 4.23 and 4.32.

5.3 For manpower planning at the company level, employers can take *Table 5.1* as a reference which expresses the percentage of additional annual manpower requirement in professional/technologist, technician, and tradesman/craftsman levels, in terms of the existing manpower of these job levels.

Table 5.1 Additional Annual Manpower by Job Level and by sector

Sector	Professional/ Technologist	Technician	Tradesman/ Craftsman
E&M Engineering	3.7%	3.7%	4.9%
Gas	4.0%	4.0%	3.9%
Aircraft Maintenance	3.4%	3.4%	3.3%

Training of E&M Engineering personnel

New Construction Technologies

5.4 The Government and the Construction Industry Council (CIC) were keen on pushing new construction technologies and practices like Building Information Modeling (BIM), Design for Manufacture and Assembly (DfMA), Multi-trade Integrated MEP (MiMEP), and Modular Integrated Construction (MiC). As more planning works are required for the adoption of new construction technologies and practices, E&M engineering personnel, in particular, professionals/technologies and technicians should equip with these technology skills to enhance their competitiveness.

Smart City and Internet of Things

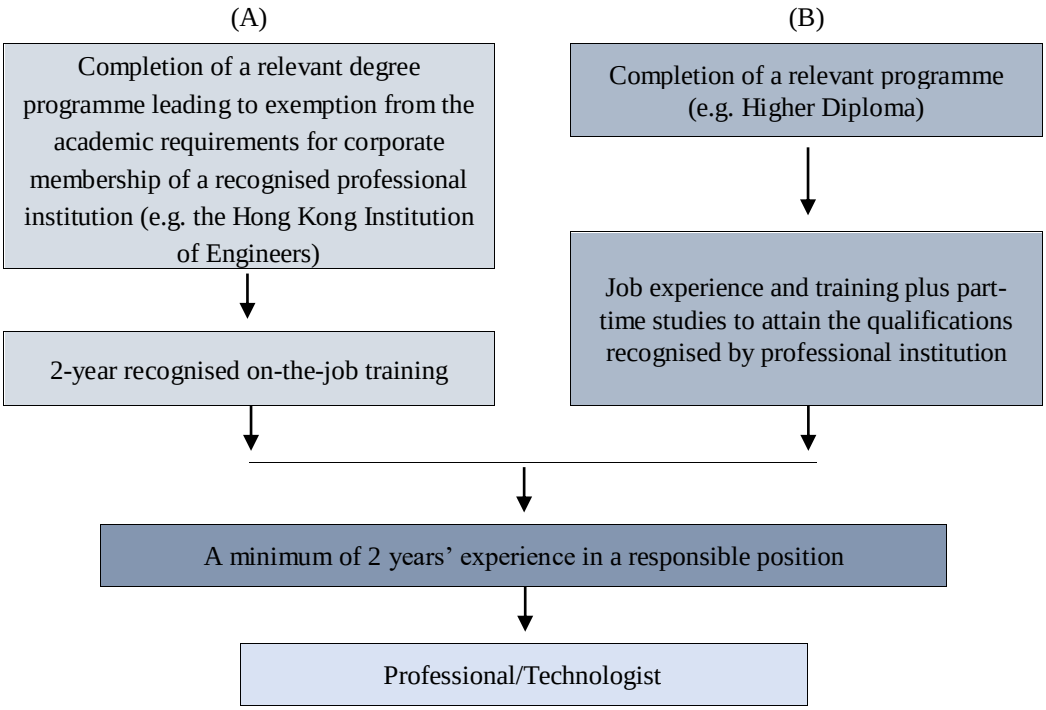
5.5 The use of the Internet of Things and other smart technologies have become more and more popular in E&M engineering systems. Relevant training elements should be included in E&M engineering-related pre-employment training programmes.

Training of Professionals/Technologists

5.6 A professional/technologist is an individual who meets the qualification and experience requirements for membership in a professional institution. He/she should be capable of analysing and solving a wide range of technical problems. Also, he/she ought to be capable of developing and applying engineering principles, demonstrating original thought and judgement, keeping abreast of technology, applying the latest techniques, and supervising/developing subordinates.

5.7 The role of a professional/ technologist in improving management and technology is vital. The Training Board recommends that professionals/technologists should be trained as shown in *Figure 5.1*.

Figure 5.1 Training of Professionals/Technologists



5.8 With reference to the figures in paragraphs 4.16, 4.23 and 4.32, the projected average additional annual manpower requirements at the professional/technologist level of the E&M Services industry, from 2022 to 2025, are about **445** persons.

5.9 The *Table 5.2* lists the estimated number of graduates per annum from full-time programmes of local universities in major E&M disciplines.

Table 5.2 Estimated Local Supply of University Graduates from Full-time Degree Programmes in 2022 for Major Disciplines of the E&M Services Industry

Institution[21]	Programme	Estimated No. of Local Graduates per Annum
PolyU, THEi	B Eng - Building Services Engineering	175
HKU, PolyU	B Eng - Electrical Engineering	155
CityU, PolyU, HKUST	B Eng - Mechanical Engineering	290
CUHK	B Eng - Mechanical & Automation Engineering	65
THEi	B Eng - Aircraft Engineering	18
PolyU	B Eng - Air Transport Engineering	45
PolyU	B Eng - Aviation Engineering	35
	Total	**783**

5.10 Taking into account of the construction industry, property management sector, and shipbuilding and ship sector who do not fall into the scope of this manpower survey but employ a significant number of graduates from E&M engineering programmes, the annual supply of local university graduates from full-time degree programmes meets the projected additional annual manpower demand of the E&M Services industry.

Engineering Graduate Training Scheme (EGTS)

5.11 With the assistance of the Innovation and Technology Training Board, the VTC is operating a scheme to provide engineering graduates with 18 months of practical training of a standard acceptable to the Hong Kong Institution of Engineers (HKIE) for corporate membership. Each graduate receiving training under the scheme is granted a subsidy through his employer as part of his salary. The Training Board strongly recommends the scheme to employers for training their engineering graduates.

[21] *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

Reindustrialisation and Technology Training Programme (RTTS)

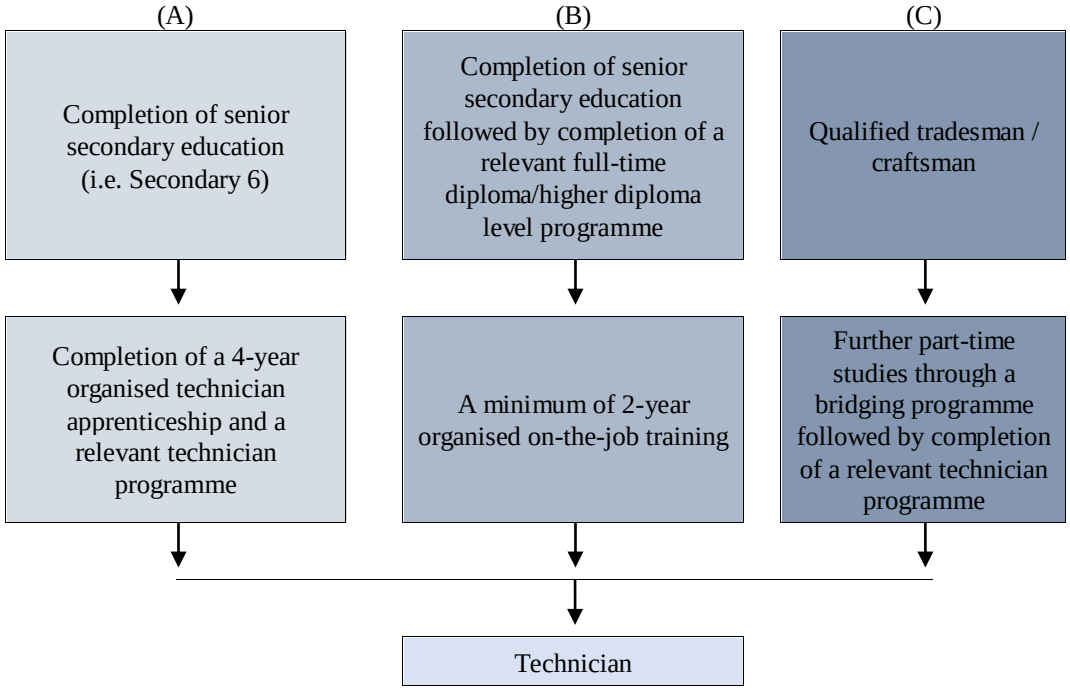
5.12 The Reindustrialisation and Technology Training Programme (RTTS) has been launched since August 2018 with aims to subsidise local enterprises on a 2:1(Government: Enterprise) matching basis to train their staff in advanced technologies, especially those related to "Industry 4.0". The maximum funding support is $500,000 for each enterprise in each financial year. The Training Board recommends the scheme to employers for training their staff in new technologies.

Training of Technicians

5.13 A technician falls somewhere in between the professional/technologist and the tradesman/craftsman. With his/her education, training, and practical experience, he/she can utilise proven techniques and procedures to accomplish technical tasks, normally under the supervision of an expert.

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

Figure 5.2 Training of Technicians



5.15 Regarding the technician level training, the Hong Kong Polytechnic University offers the full-time Higher Diploma (HD) in Building Services Engineering and Electrical Engineering programmes, while the City University of Hong Kong offers the Associate of Science (ASc) in Building Services Engineering programme.

5.16 The Hong Kong Institute of Vocational Education (IVE) of VTC offers full-time and part-time Higher Diploma technician level programmes for pre-employment and in-service training in building services engineering, electrical engineering, mechanical engineering and aircraft maintenance engineering.

5.17 The Youth College (YC) of VTC offers Diploma of Vocational Education[22] (DVE) Programmes in aircraft maintenance, building services engineering, electrical engineering and mechanical engineering. Graduates with DVE-Earn and Learn Scheme awards may take up technician trainee posts in the E&M Services industry. Since these graduates have received proper pre-employment training, employers are encouraged to employ them as technician trainees, Higher Diploma apprentices (i.e. technician apprentices), or supervisor trainees.

5.18 With reference to the figures in paragraphs 4.16, 4.23 and 4.32, the projected average additional annual manpower requirements at the technician level of the E&M Services industry, from 2022 to 2025, are about **710** persons.

5.19 The estimated supply of technicians from full-time programmes in 2022 for key E&M trades is shown in *Table 5.3*. In view of the 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. Graduates from electrical or mechanical engineering technician programmes.

5.20 In addition to outputs from full-time HD and ASc programmes, some 200 trainees join the E&M Services industry as technician apprentices and studying the HD programmes (electrical, mechanical, building services or aircraft maintenance engineering) in part-time-day mode every year.

5.21 The combined output from full-time and part-time-day mode technician level training programmes in 2022 is about 670+200 = **870**, which marginally meets the projected additional annual manpower requirement (i.e. 710). Similar to the situation at the 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.

[22] *Starting from AY 2021/22, the "Diploma of Vocational Education" programmes in part-timed day mode have been renamed as "Diploma of Vocational Education - Earn and Learn Scheme" programmes.*

Table 5.3 Estimated Local Supply of Technicians from Full-time Programmes in 2022 for Major Disciplines of the E&M Services Industry

Institution	Programme	Estimated No. of Graduates Enter Employment per Annum
CityU, PolyU	Full-time HD /ASc programmes[23]:	
	- Building Services Engineering	30
	- Electrical Engineering	20
	Sub-total	50
IVE	Full-time HD programmes[24]:	
	- Aircraft Maintenance Engineering	45
	- Building Services Engineering	200
	- Electrical Engineering	220
	- Mechanical Engineering	75
	Sub-total	540
Youth College	Full-time DVE programmes[25]: (graduates with DVE award):	
	- Aircraft Maintenance	5
	- Building Services Engineering	20
	- Electrical Engineering	40
	- Mechanical Engineering	15
	Sub-total	80
	Grand Total	**670**

Vplus Engineering

5.22 The Vplus Engineering is part of the Vplus Subsidy Scheme, which is supported by the HKSAR Government for the promotion of lifelong learning. To encourage working adults to pursue higher qualifications geared towards upward mobility while promoting professionalism in the disciplines of construction and engineering, Vplus Engineering will subsidise students pursuing the designated VTC professional part-time programme. Successful applicants will be refunded 60% of the tuition fees of eligible programmes, subject to a maximum of $45,000 per person. The Training Board recommends Vplus Engineering to work adults who are planning to pursue higher qualifications to enhance their upward mobility.

[23] *It is assumed that about 60% of Associate Degree graduates will articulate to Degree programmes. The numbers in Table 5.3 refer to that 40% of graduates who enter employment.*

[24] *The number is based on the employment headcount of Academic Year (AY) 2020/21.*

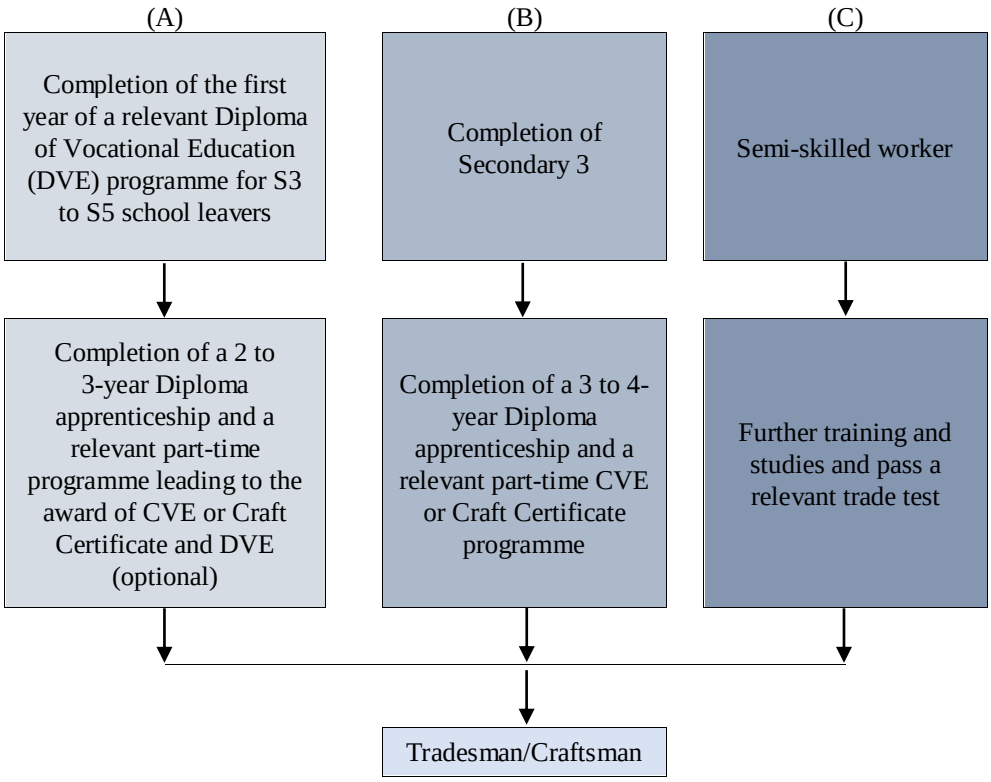
[25] *The majority of graduates with the DVE award are S6 intakes. The number is based on the employment headcount of AY 2020/21.*

Training of Tradesmen/Craftsmen

5.23 A tradesman/craftsman is a skilled worker in a particular occupation, trade or craft. He/she will be expected to apply a variety of skills to his work with minimal supervision. To adapt to new technologies, he/she needs both practical skills and related theoretical knowledge. The Training Board recommends that young persons join the apprenticeship scheme which ensures that they will receive the necessary practical training and technical education to become qualified tradesmen/ craftsmen.

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

Figure 5.3 Training of Tradesmen/Craftsmen



5.25 The Training Board recommends route (A) because the training period is shorter and the apprentices who have already undergone basic training will be productive right from the start of their apprenticeship.

5.26 Craftsman level training programmes in various trades of the E&M Services industry are mainly offered by the Youth College of VTC for S3 to S5 school leavers. Apart from full-time DVE-ELS programmes (i.e. pre-employment training programme), part-time-day mode DVE-ELS and Certificate of Vocational Education (CVE)[26] programmes are offered for registered Diploma apprentices (i.e. craft apprentices). The CIC also offers Certificate in Construction (Electrical Installation) and Certificate in Construction (Plumbing) programmes.

5.27 With reference to the figures in paragraphs 4.16, 4.23 and 4.32, the projected average annual additional manpower requirements at the tradesman/craftsman level of the E&M Services industry, from 2022 to 2025, are about **2,124** persons. *Table 5.4* shows the estimated average annual supply of tradesman/craftsman trainees for the key E&M sectors from full-time training programmes offered by VTC in 2021.

Table 5.4 Estimated Local Supply of Tradesman/Craftsman Trainees from Full-time DVE Programmes in 2021 for Key E&M Trades of the E&M Services Industry

Institution	Programme	Estimated No. of Graduates Entering into Employment Per Annum[27]
Youth College	Full-time DVE Programme (S3 to S5 Intakes):	
	- Building Services Engineering *(covering Air-conditioning & Refrigeration, Fire Services Engineering)*	200
	- Electrical Engineering	130
	- Gas Services Engineering	20
	- Lift & Escalator Engineering	50
	- Mechanical Engineering	50
	- Welding Technology & Inspection	20
	Total	**470**

5.28 Graduates of the full-time programmes mentioned in paragraph 5.27 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 a full-time DVE programme before (i.e. path B in Figure 5.3). Based on the new intakes of the part-time-day DVE and CVE programmes in AY 2021/22, the estimated supply of tradesman/craftsman (including paths (A) and path (B) in Figure 5.3) in 2021 is listed in *Table 5.5*.

[26] *Previously called "Craft Certificate"*

[27] *The number is based on the intake figures of AY 2021/22, and students' drop-out rate and passing rate have been taken into account.*

Table 5.5 Estimated Number of Newly Registered Diploma Apprentices of E&M Trades Enrolled in PTD mode DVE or CVE Programmes for 2021

Institution	Programmes	Estimated No. of New Intakes per Annum[28]
Youth College	DVE / CVE in Air-conditioning & Refrigeration	130
	DVE / CVE in Building Services Engineering	75
	DVE / CVE in Electrical Engineering	110
	CVE in Gas Services Engineering	20
	DVE / CVE in Lift and Escalator Engineering	180
	DVE / CVE in Mechanical Engineering	100
	DVE / CVE in Aircraft Maintenance	0
	Certificate in Plumbing and Pipefitting	30
	Total	**645**

5.29 Comparing the numbers in paragraph 5.27 and Table 5.5, it is found that the estimated number of newly-registered Diploma apprentices of E&M trades per annum amounts to about one-third of the projected additional annual manpower 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.

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

5.31 With the number of options available to youngsters today, employers should continue to promote the image and prospects of the E&M Services industry to attract more secondary school leavers joining the industry.

VTC Earn & Learn Scheme (ELS)

5.32 Since the 2014-2015 academic year, the Government has implemented the Training and Support Scheme on a pilot basis through the VTC under the name of "VTC Earn and Learn Scheme (ELS)". Trainees receive apprenticeship training and be disbursed a guaranteed level of salary and incentive allowance under the Scheme's "Earn and Learn" model. Upon completion of apprenticeship training, trainees may attain a range of Qualifications Framework-recognised qualifications.

[28] *The number is based on the estimated enrolment figures of AY 2021/22.*

5.33 The ELS integrates structured classroom learning with on-the-job training, providing young people with a clear career progression pathway and preparing them to join those trades and industries with great manpower demand. The ELS was piloted in 2014 and regularised in FY 2019-20. Under the ELS, in addition to a guaranteed salary, the apprentice will receive $72,000 allowance from the Government and $30,800 from the participating 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 showcase the involvement of industry sectors and respective industries, the grouping of industry of Earn and Learn (E&L) participation was revamped. For trades of Electrical & Mechanical (E&M) and Construction, it is now affiliated to the industry sector of Engineering and Technology. The Training Board recommends that employers support the ELS scheme to attract more new entrants to join and retain in the E&M Services industry.

Pilot Incentive Scheme to Employers (PISE)

5.34 To further enhance the effectiveness of the ELS, VTC has launched the Pilot Incentive Scheme to Employers (PISE) with the support of the Government. The Scheme offers incentives for employers who provide trainees with workplace learning and assessment under the ELS, through which trainees can hone their knowledge and professional skills to meet the specific needs and new opportunities of the industries. Employers who participate in the PISE will provide structured workplace learning and assessment for trainees. The assessment is developed by making reference to industry and international standards, allowing employers to better understand trainees' competencies and provide them with feedback to enhance their performance, creating a win-win situation for both trainees and employers. To encourage employers to take part in the scheme, participating employers will be entitled to receive around $3,000 per month with an upper limit of $36,000 per trainee. The Training Board recommends that employers support the PISE whereby the skills of apprentices could be cultivated, applied and assessed in authentic workplaces.

Training of Semi-skilled/General Workers

5.35 In general, semi-skilled/general workers are required to perform repetitive tasks that require only a limited set of skills, with a short training period. Since the tradesman/craftsman workforce is in shortage, the Training Board recommends that more semi-skilled/general workers be trained to help relieve the tradesmen/craftsmen workload. This can be achieved by means of retraining programmes and short programmes. As a result of the relatively unpleasant working environment and more demanding knowledge and skills, not many people would consider retraining in the E&M Services industry. The Training Board recommends offering more attractive incentive/subsidising schemes to boost the enrolment of the retraining programmes.

5.36 Employers must update their on-the-job training and job enrichment programs to retain and increase the productivity of semi-skilled/general workers in today's competitive environment. The Training Board recommends that more resources be devoted to upgrading the training of semi-skilled/general 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, the Advanced Construction Manpower Training Scheme - Pilot Scheme (Structured On-the-job) and the Intermediate Tradesman Collaborative Training Scheme of CIC are both good examples.

Pro-Act Training and Development Centres of VTC

5.37 The Pro-Act (Electrical), Pro-Act (Gas), Pro-Act (Mechanical) and Pro-Act (Welding) Centres of 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; and

(d) trade testing for skill assessment of in-service workers.

Trade Testing for Electricians, Lift and Escalator Workers

5.38 The VTC has been operating a voluntary trade testing and certification system since 1989. The objectives of the trade testing are:

(a) to help the 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 purposes with the agreement of relevant authorities, and

(e) to facilitate the establishment of a skill hierarchy for the career advancement of skilled workers.

5.39 The Training Board is responsible for the development of trade tests for electricians. The trade test certificate of the electrician has been recognised by the Electrical and Mechanical Services Department (EMSD) of the HKSAR Government for the purpose of registration of Grade A electrical workers. The Training Board reviews the trade tests from time to time to ensure they meet the industrial standards. The syllabus of the trade test for electricians was revised in early 2022 to cope with the latest development in technology and the new Code of Practice for the Electricity (Wiring) Regulations.

5.40 To support workers' registration under the Lifts and Escalators Ordinance (Cap. 618), the Training Board have launched two new trade tests for lift mechanics and escalator mechanics respectively since December 2012.

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

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

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

5.43 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 the 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.

5.44 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.

Promotion of STEM Education

5.45 The promotion of STEM (Science, Technology, Engineering and Mathematics) education is a worldwide trend, aiming to equip students to meet the changes and challenges in our society and around the world with rapid economic, scientific and technological developments. Being the largest VPET provider in Hong Kong, the VTC has set up three 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 enhance 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.

WorldSkills Competition

5.46 WorldSkills Competition is the largest international skills competition organised by WorldSkills International with an aim to promote excellence in skills, uplift professional skills standards, and 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 biennially.

5.47 Since 2014, the Training Board has been assisting the organisation of three local competitions in the 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, the United Arab Emirates in 2017 to show their support to the Hong Kong representatives. The Training Board recommends employers continue support for the competitions by nominating their young, talented workers to the competitions. To introduce skills and WorldSkills Competition to secondary school students, VTC, CIC, and CITA will jointly organise the Hong Kong Junior Skills Competition in 2022.

5.48 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.

Summary of Major Conclusions and Recommendations

5.49 The Training Boards' major conclusions and recommendations for manpower training of the E&M Services industry for 2022 to 2025 are summarised below:

(a) E&M Engineering personnel:

(i) They should acquire new knowledge on construction technologies and practical skills such as Building Information Modeling (BIM), Design for Manufacture, Multi-trade Integrated MEP (MiMEP), and Assembly (DfMA) and Modular Integrated Construction (MiC) to enhance their competitiveness.

(ii) They should equip with knowledge of Internet of Things and other smart technologies to meet the new industry needs.

(b) Training of Professionals/Technologists:

(i) The annual supply of local university graduates from full-time degree programmes meets the projected annual additional training requirements.

(ii) The Engineering Graduate Training Scheme (EGTS) and Reindustrialization and Technology Training Programme (RTTS) 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 programmes.

(c) 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 202inally meet the projected annual additional manpower requirements.

(ii) The Vplus Engineering under the Vplus Subsidy Scheme is recommended to working adults who are planning to pursue higher qualifications to enhance their upward mobility.

(d) Training of Tradesmen/Craftsmen:

(i) The annual supply of apprentices only fullfills one-third of the projected annual additional manpower requirements. The remaining manpower 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.

(ii) It is recommended that employers should support the ELS scheme to attract more new entrants to join and retain in the E&M Services industry.

(iii) It is recommended that employers should support the Pilot Incentive Scheme to Employers (PISE) whereby the skills of apprentices could be cultivated, applied and assessed in authentic workplaces.

(iv) It is also recommended that training providers should increase their pre-employment training places and offer more skills upgrading programmes to enable semi-skilled workers to upgrade to qualified tradesmen/craftsmen.

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

(ii) As reflected from the findings of this and previous rounds of manpower survey, the supply of tradesmen/craftsmen for the E&M Services industry cannot rely on apprenticeship training alone. It is recommended that more semi-skilled/general workers to be trained up to address the manpower shortage.

(f) Trade Tests

(i) Trade test is one of the routes that allow semi-skilled workers to migrate to qualified tradesmen/craftsmen. Employers should encourage their non-registered workers in electrical installations and lift and escalator engineering to take VTC's or CIC'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 to register and comply with the Construction Workers Registration Ordinance.

(g) Promotion of VPET and STEM Education

(i) 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 employers continue support for the WorldSkills Competition by nominating their young, talented 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.

Electrical and Mechanical Services Training Board

Membership

(As at 1st February 2022)

Chairman

Mr Peter LAM Oi-ki

Members

Ir AU Tat-kay

Ir Antonio CHAN Chi-ming

Ir Keith CHAN Kwok-wah

Ir Frankie CHAN Wai-ping

Mr Louis CHANG

Ir CHENG Wai-lung

Ms CHENG Pui-man

Ms CHUI Sze-wai

Ir CHUNG Chi-ming

Mr KO Tung-ping

Mr Samson LAM Yuk-ching

Ir David LAU Lee-nin

Mr LAU Wai-kei
(up to 3 September 2021)

Ir LAI Chi-fai

Mr LEE Kim-hung

Ir Eddie LEUNG Wing-pui

Mr MOW Tai-hing

Mr Brian NG Hang-wai

Ir Dr Roger NG Tsz-ho

Mr WONG Chun-nang, Johnny
(up to 18 October 2021)

Ir WONG Ming-kwong

Secretary

Mr Leslie LEUNG Kim-hang, Leslie (Vocational Training Council)

Electrical and Mechanical Services Training Board

Membership of Working Party on Manpower Survey

(As at 1st February 2022)

Convenor

Mr Peter LAM Oi-ki

Members

Ir Antonio CHAN Chi-ming

Ir Keith CHAN Kwok-wah

Mr CHAN Siu-keung

Ir Frankie CHAN Wai-ping

Ir CHUNG Chi-ming

Mr Samson LAM Yuk-ching

Ir Edmund LAU Kai-chung

Ir David LAU Lee-nin

Ir LEUNG Man-fai

Mr Brian NG Hang-wai

Dr Alan TANG Shung-tse

Secretary

Mr Leslie LEUNG Kim-hang

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.

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 2021 MANPOWER SURVEY OF THE ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機 電 工 程 業 2 0 2 1 年 人 力 調 查

The 2021 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 **1st June 2021** by answering the questionnaire. Thank you.
機電工程業2021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**2021年6月1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

* *The information provided will be used for the purpose of this and subsequent manpower surveys.*
所提供資料將用作是次及日後人力調查之用。

E

Survey Reference Date : 1st June 2021
統計日期 : 2021 年6月1日

Part I － Manpower Information
第一部份 － 人力情況

Please complete columns 'B' to 'E' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job.
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 'B' 至 'E' 。

Principal Jobs (Full-time employees) 主要職務 (全職僱員)

Job Code 職位編號	(A) Principal Job 主要職務 (See Appendix B) （參閱附錄 B）	(B) No. of **Employees** as at Survey Reference Date (Excl. trainees#) 在統計日期的**僱員**人數（受訓者#除外）	(C) No. of **Trainees#** as at Survey Reference Date 在統計日期的**受訓者#**人數	(D) No. of **Vacancies** as at Survey Reference Date 在統計日期的**空缺額**	(E) Average Monthly Remuneration Package of **Employees** (Excl. trainees#) **僱員**之每月平均薪酬（受訓者#除外） Code 編號: 1 $12,000 or below 或以下; 2 $12,001 - $15,000; 3 $15,001 - $18,000; 4 $18,001 - $25,000; 5 $25,001 - $35,000; 6 $35,001 - $45,000; 7 $45,001 - $60,000; 8 $60,001 or above 或以上
		Please enter a zero '0' in the box if no employee/ trainees/ vacancy. 如沒有僱員／受訓者／空缺，請在方格內 填入 '0'。			
e.g. 例子	**Job Title A (3 employees, 1 Trainee and 2 vacancies) 職位甲(3名僱員, 1名受訓者及2個空缺)**	**3**	**1**	**2**	**6**
	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。				
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				

"Trainees" refer to those employees undergoing any form of training, and includes trainees and apprentices under a contract of apprenticeship.
「受訓者」指正在接受各種形式訓練的僱員，包括受訓者及根據學徒合約受聘的學徒。

Job Code 職位編號	(A) Principal Job 主要職務 (See Appendix B) （參閱附錄 B）	(B) No. of **Employees** as at Survey Reference Date (Excl. trainees#) 在統計日期的**僱員**人數（受訓者#除外）	(C) No. of **Trainees**# as at Survey Reference Date 在統計日期的**受訓者**#人數	(D) No. of **Vacancies** as at Survey Reference Date 在統計日期的**空缺額**	(E) Average Monthly Remuneration Package of **Employees** (Excl. trainees #) **僱員**之每月平均薪酬（受訓者# 除外） Code 編號 1 $12,000 or below 或以下 2 $12,001 - $15,000 3 $15,001 - $18,000 4 $18,001 - $25,000 5 $25,001 - $35,000 6 $35,001 - $45,000 7 $45,001 - $60,000 8 $60,001 or above 或以上
		Please enter a zero '0' in the box if no employee/ trainees/ vacancy. 如沒有僱員／受訓者／空缺，請在方格內 填入 '0'。			
e.g: 例子:	**Job Title A (3 employees, 1 Trainee and 2 vacancies) 職位甲(3名僱員, 1名受訓者及2個空缺)**	**3**	**1**	**2**	**6**
	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。				
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				

"Trainees" refer to those employees undergoing any form of training, and includes trainees and apprentices under a contract of apprenticeship.
「受訓者」指正在接受各種形式訓練的僱員，包括受訓者及根據學徒合約受聘的學徒。

Job Code 職位編號	(A) Principal Job 主要職務 (See Appendix B) （參閱附錄 B）	(B) No. of **Employees** as at Survey Reference Date (Excl. trainees#) 在統計日期的**僱員**人數（受訓者#除外）	(C) No. of **Trainees**# as at Survey Reference Date 在統計日期的**受訓者**#人數	(D) No. of **Vacancies** as at Survey Reference Date 在統計日期的**空缺額**	(E) Average Monthly Remuneration Package of **Employees** (Excl. trainees#) **僱員**之每月平均薪酬（受訓者#除外） Code 編號 1 $12,000 or below 或以下 2 $12,001 - $15,000 3 $15,001 - $18,000 4 $18,001 - $25,000 5 $25,001 - $35,000 6 $35,001 - $45,000 7 $45,001 - $60,000 8 $60,001 or above 或以上
		Please enter a zero '0' in the box if no employee/ trainees/ vacancy. 如沒有僱員／受訓者／空缺，請在方格內 填入 '0'。			
e.g: 例子:	**Job Title A (3 employees, 1 Trainee and 2 vacancies) 職位甲(3名僱員, 1名受訓者及2個空缺)**	**3**	**1**	**2**	**6**
	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。				
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				
319	Electrical Appliances Service Mechanic 電器用具服務技工				
320	Welder 焊接工				

"Trainees" refer to those employees undergoing any form of training, and includes trainees and apprentices under a contract of apprenticeship.
「受訓者」指正在接受各種形式訓練的僱員，包括受訓者及根據學徒合約受聘的學徒。

Job Code 職位編號	(A) Principal Job 主要職務 (See Appendix B) （參閱附錄 B）	(B) No. of **Employees** as at Survey Reference Date (Excl. trainees#) 在統計日期的**僱員**人數（受訓者#除外）	(C) No. of **Trainees**# as at Survey Reference Date 在統計日期的**受訓者**#人數	(D) No. of **Vacancies** as at Survey Reference Date 在統計日期的**空缺額**	(E) Average Monthly Remuneration Package of **Employees** (Excl. trainees#) **僱員**之每月平均薪酬（受訓者#除外） Code 編號 1 $12,000 or below 或以下 2 $12,001 - $15,000 3 $15,001 - $18,000 4 $18,001 - $25,000 5 $25,001 - $35,000 6 $35,001 - $45,000 7 $45,001 - $60,000 8 $60,001 or above 或以上
		Please enter a zero '0' in the box if no employee/ trainees/ vacancy. 如沒有僱員／受訓者／空缺，請在方格內 填入 '0'。			
e.g. 例子	**Job Title A (3 employees, 1 Trainee and 2 vacancies) 職位甲(3名僱員, 1名受訓者及2個空缺)**	**3**	**1**	**2**	**6**
	Tradesman/Craftsman (Continued) 技 工（續）				
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				
	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。				
401	Labourer 普通工人				
402	Semi-skilled Worker 半技術工				
	OTHER RELATED STAFF 其他相關員工				

"Trainees" refer to those employees undergoing any form of training, and includes trainees and apprentices under a contract of apprenticeship.
「受訓者」指正在接受各種形式訓練的僱員，包括受訓者及根據學徒合約受聘的學徒。

Part II
第二部份

Business Environment
行業概況

1. Please indicate your views on the expected change in business volume of your establishment **in the next 12 months** (Please tick in the box as appropriate) and indicate the reasons leading to the **better or worse.**
請指出　貴機構在**未來十二個月**業務額的變化 (請在適當的格內填上"✓"號)及引起**較佳或較差**的原因。

☐ Better 較佳 (Please state reasons) (請說明原因) _____
☐ Stable 穩定
☐ Worsen 較差 (Please state reasons) (請說明原因) _____
☐ Uncertain 不肯定

New Recruitment
新聘僱員

2. Number of full-time employees **newly recruited** in the past 12 months.
過去十二個月內 ，貴機構**新招聘**的全職僱員人數。

	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工	Semi-skilled/ General Worker 半技術工人／普通工人
(a) Total new recruits 新招聘總人數				
(b) Number of new recruits **with** the experience in electrical and mechanical engineering or aircraft maintenance 新招聘僱員中，**具**機電工程或飛機維修工程的相關經驗				
(c) Number of new recruits who are **graduates of 2020 and 2021** from electrical and mechanical engineering or aircraft maintenance programmes 新招聘僱員中，相關機電工程或飛機維修工程之課程於**2020及2021的畢業生**人數				

3. No. of **Hong Kong E&M workers** employed by **your organisation and its subsidiaries** in the Greater Bay Area (except Hong Kong) at the Survey Reference Date :
在統計日期， 貴機構在大灣區（香港 除外）的公司及其附屬公司之**香港機電工程僱員**人數 :

(a) Professional/ Technologist 專業人士／技師 ☐
(b) Technician 技術員 ☐
(c) Tradesman/ Craftsman 技工 ☐

Employees Leaving the Establishment
僱員離職

4. Number of full-time employees left in the past 12 months:
過去十二個月內離職的全職僱員人數：

(a) Professional/ Technologist 專業人士／技師	☐	(b) Technician 技術員	☐
(c) Tradesman/ Craftsman 技工	☐	(d) Semi-skilled/ General Worker 半技術工人／普通工人	☐

Preferred and Achieved Education level
宜有及已獲得的教育程度

5. Please provide the information on education level of **full-time employees**
請提供 貴機構內各職級的**全職僱員**有關教育程度的資料。

(See Appendix A) （參閱附錄 A）	(i) **Preferred** for employees (should tick **one only** for each job level) 僱員**宜有**的教育程度 （每職級**只可選擇一個**）				(ii) **Already achieved** by employees (can tick **more than one** for each job level) 僱員**已達到**的教育程度 （每職級**可選擇一個或以上**）			
	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工	Semi-skilled/ General Worker 半技術工人／普通工人	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工	Semi-skilled/ General Worker 半技術工人／普通工人
(i) Postgraduate Degree 研究生學位	☐	☐	☐	☐	☐	☐	☐	☐
(ii) First Degree 學士學位	☐	☐	☐	☐	☐	☐	☐	☐
(iii) Sub-degree (e.g. Higher Diploma) 副學位（例如高級文憑）	☐	☐	☐	☐	☐	☐	☐	☐
(iv) Diploma/Certificate 文憑／證書	☐	☐	☐	☐	☐	☐	☐	☐
(v) Senior Secondary (e.g. Secondary 4 – 6/7) 高中（例如中四至中六/七）	☐	☐	☐	☐	☐	☐	☐	☐
(vi) Junior Secondary 初中	☐	☐	☐	☐	☐	☐	☐	☐
No such level of staff 沒有相關職級員工	☐	☐	☐	☐	☐	☐	☐	☐

Preferred and Accumulated Years of Experience
宜有及已獲得的相關年資

6. Please provide the information on years of experience of **full-time employees**
請提供 貴機構內各職級的**全職僱員**有關相關年資的資料。

	(i) **Preferred** for employees (should tick **one only** for each job level) 僱員**宜有**的年資（每職級**只可選擇一個**）				(ii) **Accumulated** by employees (tick **more than one** for each job level) 僱員**已累積**的年資（每職級**可選擇一個或以上**）			
	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工	Semi-skilled/ General Worker 半技術工人／普通工人	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工	Semi-skilled/ General Worker 半技術工人／普通工人
(i) 10 years or more 十年或以上	☐	☐	☐	☐	☐	☐	☐	☐
(ii) 6 years to less than 10 years 六年至十年以下	☐	☐	☐	☐	☐	☐	☐	☐
(iii) 3 years to less than 6 years 三年至六年以下	☐	☐	☐	☐	☐	☐	☐	☐
(iv) 1 year to less than 3 years 一年至三年以下	☐	☐	☐	☐	☐	☐	☐	☐
(v) Less than 1 year 一年以下	☐	☐	☐	☐	☐	☐	☐	☐
(vi) No experience 無經驗	☐	☐	☐	☐	☐	☐	☐	☐

No such level of staff 沒有相關職級員工	☐	☐	☐	☐	☐	☐	☐	☐

Major Difficulties Encountered in Recruitment
主要招聘困難

7. Please indicate the difficulties encountered in recruitment of full-time employees of your establishment **in past 12 months**.
請指出　貴機構在**過去十二個月**招聘全職僱員時所遇到的困難。

Reasons 原因	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工
(a) No recruitment was taken place 沒有招聘	☐	☐	☐
(b) Recruitment was taken place and the difficulties encountered were: (You may tick "✓" one or more options.) 有招聘，所遇到的困難是：（可剔"✓"選多於一項。）			
(i) Lack of candidates with relevant experience 缺乏具相關經驗求職者	☐	☐	☐
(ii) Unsatisfactory terms of employment 聘用條件不理想	☐	☐	☐
(iii) Unsatisfactory working environment 工作環境不理想	☐	☐	☐
(iv) Limited career prospects 晉升機會有限	☐	☐	☐
(v) Insufficient trained/qualified manpower in the related disciplines 缺乏具相關訓練／資歷的人力資源	☐	☐	☐
(vi) Competition for manpower from the Mainland/Macao/other cities 源自內地／澳門／其他城市之人手競爭	☐	☐	☐
(vii) Alternative offers in the market 市場上有其他選擇	☐	☐	☐
(viii) Others (please specify) 其他（請說明）_____	☐	☐	☐
(ix) Did not encounter difficulties 沒有遇上困難	☐	☐	☐

Training
培訓

8. The training and staff development budget of your establishment **in the next 12 months**:
貴機構於**未來十二個月**的訓練及員工發展經費預算：

(a) It will be in a proportion to the annual payroll of:
將會佔全年薪酬開支總額的：

- ☐ < 1%
- ☐ 1% - 2%
- ☐ > 2%
- ☐ Not yet estimate the training budget 尚未估算培訓預算 → **Please go to question 9 請跳至第9題**
- ☐ No concrete planning for training 未有確實的培訓計劃 → **Please go to question 9 請跳至第9題**

(b) When compared with last year, it will:
與過去一年比較將會：

- ☐ Increase 增加
- ☐ Decrease 減少
- ☐ Remain unchanged 維持不變
- ☐ No training arranged in last year 過去一年沒有安排培訓

9. Please indicate the future training areas for full-time employees in order to meet the emerging trend of the industry. (You may wish to tick "✓" more than 1 training area for each job level)
請指出 貴機構的全職僱員未來需要加強培訓的範疇，以配合行業的新興趨勢。（每職級可剔"✓"選多個培訓範疇）

Training Area 培訓範疇	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工
A. Technologies 科技			
(i) BIM for Underground Utilities, Applications and Drafting 適用於地下公用設施，應用和製圖的建築信息模擬	☐	☐	☐
(ii) Digital Skill in Using Engineering Related Software and Apps 與工程相關的軟件及應用的數碼技能	☐	☐	☐
(iii) Trenchless Pipe Laying Technology 無坑挖掘管道鋪設的技能	☐	☐	☐
(iv) IT Application for Gas Engineering 氣體工程的資訊科技應用	☐	☐	☐
B. Operations Related 營運相關			
(i) Basic Gas Engineering 氣體工程的基礎	☐	☐	☐
(ii) Pipe and Cable Detection 管道和電纜的檢測	☐	☐	☐
(iii) Knowledge of Pipe Engineering Materials, such as Polyethylene and Steel Pipes 對管道工程材料（例如:聚乙烯和鋼管）的了解	☐	☐	☐
(iv) Basic Theory of Pressure Regulating Installation 調壓裝置的基本原理	☐	☐	☐
C. Project Management Related 項目管理相關			
(i) Project Management 項目管理	☐	☐	☐
(ii) Construction Contract's Terms and Conditions 施工合同的條款細則	☐	☐	☐
(iii) Risk and Crisis Management 風險及危機管理	☐	☐	☐
D. Regulations 法規			
(i) Relevant Trade's Ordinances and Regulations 與行業相關的法規	☐	☐	☐
(ii) Engineering-related ISO Standards 與工程相關的ISO標準	☐	☐	☐
(iii) Safety ordinances Cap. 59 FIUO and Cap. 509 OSHO 職業安全及健康條例	☐	☐	☐
E. Safety 安全			
(i) Safety Awareness 安全意識	☐	☐	☐
(ii) Safety Audit/Assessment 安全審核/評估	☐	☐	☐
(iii) Safety/Risk Management 安全/風險的管理	☐	☐	☐
(iv) Use of Personal Protective Equipment 個人防護裝備的使用	☐	☐	☐
(v) Construction Site Safety for Workers 工人在工地的安全	☐	☐	☐

Training Area 培訓範疇	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工
F. Training Method 培訓方法			
(i) Instructing and Coaching Skills 指導及輔導的技能	☐	☐	☐
(ii) Online Training Methodology 線上培訓的方法	☐	☐	☐
(iii) Computer-based Technology for Training 電腦培訓的技術	☐	☐	☐
G. Soft Skills 軟性技巧			
(i) English Writing, Reading and Reporting 英語寫作，閱讀和報告	☐	☐	☐
(ii) Communication Skills with Stakeholders Both Internal and External 與內外持份者的溝通技巧	☐	☐	☐
(iii) Time Management Skills 時間管理的技巧	☐	☐	☐
(iv) Design Thinking Skills 設計思維的技巧	☐	☐	☐
(v) Team Building Skills 建立團體精神的技巧	☐	☐	☐

No such level of staff 沒有相關職級員工	☐	☐	☐

(NOT applicable for Aircraft Maintenance Sector)
(不適用於飛機維修工程業)

Proportion of Contracting and Servicing
承造與維修服務的比例

10. For each job level, please indicate the relative percentage of manpower engaging in "Contracting" and "Servicing" work of the **electrical and mechanical engineering** in your company:
請填寫 貴機構各技能等級的僱員，在從事**機電工程**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*	No such level of staff 沒有相關職級員工
(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。

For employees engaged in both contracting and servicing at the same time, their principal assignment of duties should be used for demarcation.
若員工同時參與承造及維修服務的工作，應以其主要受派工作類別作界分。

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 2021 MANPOWER SURVEY OF THE ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機 電 工 程 業 2 0 2 1 年 人 力 調 查

The 2021 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 **1st June 2021** by answering the questionnaire. Thank you.
機電工程業2021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**2021年6月1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

* *The information provided will be used for the purpose of this and subsequent manpower surveys.*
所提供資料將用作是次及日後人力調查之用。

G

Survey Reference Date : 1st June 2021
統計日期 : 2021 年6月1日

Part I － Manpower Information
第一部份 － 人力情況

Please complete columns 'B' to 'E' of the questionnaire according to the list of principal jobs by referring to Appendix B for job description of individual job.
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 'B' 至 'E' 。

Principal Jobs (Full-time employees) 主要職務 (全職僱員)

Job Code 職位編號	(A) Principal Job 主要職務 (See Appendix B) （參閱附錄 B）	(B) No. of **Employees** as at Survey Reference Date (Excl. trainees#) 在統計日期的**僱員**人數（受訓者#除外）	(C) No. of **Trainees#** as at Survey Reference Date 在統計日期的**受訓者#**人數	(D) No. of **Vacancies** as at Survey Reference Date 在統計日期的**空缺額**	(E) Average Monthly Remuneration Package of **Employees** (Excl. trainees#) **僱員**之每月平均薪酬（受訓者#除外） Code 編號 1 $12,000 or below 或以下 2 $12,001 - $15,000 3 $15,001 - $18,000 4 $18,001 - $25,000 5 $25,001 - $35,000 6 $35,001 - $45,000 7 $45,001 - $60,000 8 $60,001 or above 或以上
		Please enter a zero '0' in the box if no employee/ trainees/ vacancy. 如沒有僱員／受訓者／空缺，請在方格內 填入 '0'。			
e.g. 例子	**Job Title A (3 employees, 1 Trainee and 2 vacancies) 職位甲(3名僱員, 1名受訓者及2個空缺)**	**3**	**1**	**2**	**6**
	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。				
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				
	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。				
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				

"Trainees" refer to those employees undergoing any form of training, and includes trainees and apprentices under a contract of apprenticeship.
「受訓者」指正在接受各種形式訓練的僱員，包括受訓者及根據學徒合約受聘的學徒。

Job Code 職位編號	(A) Principal Job 主要職務 (See Appendix B) （參閱附錄 B）	(B) No. of **Employees** as at Survey Reference Date (Excl. trainees#) 在統計日期的**僱員**人數（受訓者#除外）	(C) No. of **Trainees**# as at Survey Reference Date 在統計日期的**受訓者**#人數	(D) No. of **Vacancies** as at Survey Reference Date 在統計日期的**空缺額**	(E) Average Monthly Remuneration Package of **Employees** (Excl. trainees#) **僱員**之每月平均薪酬（受訓者#除外） Code 編號 1 $12,000 or below 或以下 2 $12,001 - $15,000 3 $15,001 - $18,000 4 $18,001 - $25,000 5 $25,001 - $35,000 6 $35,001 - $45,000 7 $45,001 - $60,000 8 $60,001 or above 或以上
		Please enter a zero '0' in the box if no employee/ trainees/ vacancy. 如沒有僱員／受訓者／空缺，請在方格內 填入 '0'。			
e.g: 例子:	**Job Title A (3 employees, 1 Trainee and 2 vacancies) 職位甲(3名僱員, 1名受訓者及2個空缺)**	**3**	**1**	**2**	**6**
	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。				
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				
	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。				
471	Driver (LPG Cylinder Wagon) 司機（石油氣瓶車）				
472	Labourer 普通工人				
473	Semi-skilled Worker 半技術工				
	OTHER RELATED STAFF 其他相關員工				

"Trainees" refer to those employees undergoing any form of training, and includes trainees and apprentices under a contract of apprenticeship.
「受訓者」指正在接受各種形式訓練的僱員，包括受訓者及根據學徒合約受聘的學徒。

Part II
第二部份

Business Environment
行業概況

1. Please indicate your views on the expected change in business volume of your establishment **in the next 12 months** (Please tick in the box as appropriate) and indicate the reasons leading to the **better or worse.**
請指出　貴機構在**未來十二個月**業務額的變化 (請在適當的格內填上"✓"號)及引起**較佳或較差**的原因。

☐ Better 較佳 (Please state reasons) (請說明原因) _____
☐ Stable 穩定
☐ Worsen 較差 (Please state reasons) (請說明原因) _____
☐ Uncertain 不肯定

New Recruitment
新聘僱員

2. Number of full-time employees **newly recruited** in the past 12 months.
過去十二個月內 ，貴機構**新招聘**的全職僱員人數。

	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工	Semi-skilled/ General Worker 半技術工人／普通工人
(a) Total new recruits 新招聘總人數				
(b) Number of new recruits **with** the experience in electrical and mechanical engineering or aircraft maintenance 新招聘僱員中，**具**機電工程或飛機維修工程的相關經驗				
(c) Number of new recruits who are **graduates of 2020 and 2021** from electrical and mechanical engineering or aircraft maintenance programmes 新招聘僱員中，相關機電工程或飛機維修工程之課程於**2020及2021的畢業生**人數				

3. No. of **Hong Kong E&M workers** employed by **your organisation and its subsidiaries** in the Greater Bay Area (except Hong Kong) at the Survey Reference Date :
在統計日期， 貴機構在大灣區（香港 除外）的公司及其附屬公司之**香港機電工程僱員**人數 :

(a) Professional/ Technologist 專業人士／技師 ☐
(b) Technician 技術員 ☐
(c) Tradesman/ Craftsman 技工 ☐

Employees Leaving the Establishment
僱員離職

4. Number of full-time employees left in the past 12 months:
過去十二個月內離職的全職僱員人數：

(a) Professional/ Technologist 專業人士／技師	☐	(b) Technician 技術員	☐
(c) Tradesman/ Craftsman 技工	☐	(d) Semi-skilled/ General Worker 半技術工人／普通工人	☐

Preferred and Achieved Education level
宜有及已獲得的教育程度

5. Please provide the information on education level of **full-time employees**
請提供 貴機構內各職級的**全職僱員**有關教育程度的資料。

(See Appendix A) （參閱附錄 A）	(i) **Preferred** for employees (should tick **one only** for each job level) 僱員**宜有**的教育程度 （每職級**只可選擇一個**）				(ii) **Already achieved** by employees (can tick **more than one** for each job level) 僱員**已達到**的教育程度 （每職級**可選擇一個或以上**）			
	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工	Semi-skilled/ General Worker 半技術工人／普通工人	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工	Semi-skilled/ General Worker 半技術工人／普通工人
(i) Postgraduate Degree 研究生學位	☐	☐	☐	☐	☐	☐	☐	☐
(ii) First Degree 學士學位	☐	☐	☐	☐	☐	☐	☐	☐
(iii) Sub-degree (e.g. Higher Diploma) 副學位（例如高級文憑）	☐	☐	☐	☐	☐	☐	☐	☐
(iv) Diploma/Certificate 文憑／證書	☐	☐	☐	☐	☐	☐	☐	☐
(v) Senior Secondary (e.g. Secondary 4 – 6/7) 高中（例如中四至中六/七）	☐	☐	☐	☐	☐	☐	☐	☐
(vi) Junior Secondary 初中	☐	☐	☐	☐	☐	☐	☐	☐
No such level of staff 沒有相關職級員工	☐	☐	☐	☐	☐	☐	☐	☐

Preferred and Accumulated Years of Experience
宜有及已獲得的相關年資

6. Please provide the information on years of experience of **full-time employees**
請提供 貴機構內各職級的**全職僱員**有關相關年資的資料。

	(i) **Preferred** for employees (should tick **one only** for each job level) 僱員**宜有**的年資（每職級**只可選擇一個**）				(ii) **Accumulated** by employees (tick **more than one** for each job level) 僱員**已累積**的年資（每職級**可選擇一個或以上**）			
	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工	Semi-skilled/ General Worker 半技術工人／普通工人	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工	Semi-skilled/ General Worker 半技術工人／普通工人
(i) 10 years or more 十年或以上	☐	☐	☐	☐	☐	☐	☐	☐
(ii) 6 years to less than 10 years 六年至十年以下	☐	☐	☐	☐	☐	☐	☐	☐
(iii) 3 years to less than 6 years 三年至六年以下	☐	☐	☐	☐	☐	☐	☐	☐
(iv) 1 year to less than 3 years 一年至三年以下	☐	☐	☐	☐	☐	☐	☐	☐
(v) Less than 1 year 一年以下	☐	☐	☐	☐	☐	☐	☐	☐
(vi) No experience 無經驗	☐	☐	☐	☐	☐	☐	☐	☐
No such level of staff 沒有相關職級員工	☐	☐	☐	☐	☐	☐	☐	☐

Major Difficulties Encountered in Recruitment
主要招聘困難

7. Please indicate the difficulties encountered in recruitment of full-time employees of your establishment **in past 12 months**.
請指出　貴機構在**過去十二個月**招聘全職僱員時所遇到的困難。

Reasons 原因	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工
(a) No recruitment was taken place 沒有招聘	☐	☐	☐
(b) Recruitment was taken place and the difficulties encountered were: (You may tick "✓" one or more options.) 有招聘，所遇到的困難是：（可剔"✓"選多於一項。）			
(i) Lack of candidates with relevant experience 缺乏具相關經驗求職者	☐	☐	☐
(ii) Unsatisfactory terms of employment 聘用條件不理想	☐	☐	☐
(iii) Unsatisfactory working environment 工作環境不理想	☐	☐	☐
(iv) Limited career prospects 晉升機會有限	☐	☐	☐
(v) Insufficient trained/qualified manpower in the related disciplines 缺乏具相關訓練／資歷的人力資源	☐	☐	☐
(vi) Competition for manpower from the Mainland/Macao/other cities 源自內地／澳門／其他城市之人手競爭	☐	☐	☐
(vii) Alternative offers in the market 市場上有其他選擇	☐	☐	☐
(viii) Others (please specify) 其他（請說明）_____	☐	☐	☐
(ix) Did not encounter difficulties 沒有遇上困難	☐	☐	☐

Training
培訓

8. The training and staff development budget of your establishment **in the next 12 months**:
貴機構於**未來十二個月**的訓練及員工發展經費預算：

(a) It will be in a proportion to the annual payroll of:
將會佔全年薪酬開支總額的：

- ☐ < 1%
- ☐ 1% - 2%
- ☐ > 2%
- ☐ Not yet estimate the training budget 尚未估算培訓預算 → **Please go to question 9 請跳至第9題**
- ☐ No concrete planning for training 未有確實的培訓計劃 → **Please go to question 9 請跳至第9題**

(b) When compared with last year, it will:
與過去一年比較將會：

- ☐ Increase 增加
- ☐ Decrease 減少
- ☐ Remain unchanged 維持不變
- ☐ No training arranged in last year 過去一年沒有安排培訓

9. Please indicate the future training areas for full-time employees in order to meet the emerging trend of the industry. (You may wish to tick "✓" more than 1 training area for each job level)
請指出 貴機構的全職僱員未來需要加強培訓的範疇，以配合行業的新興趨勢。（每職級可剔"✓"選多個培訓範疇）

Training Area 培訓範疇	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工
A. Technologies 科技			
(i) BIM for Underground Utilities, Applications and Drafting 適用於地下公用設施，應用和製圖的建築信息模擬	☐	☐	☐
(ii) Digital Skill in Using Engineering Related Software and Apps 與工程相關的軟件及應用的數碼技能	☐	☐	☐
(iii) Trenchless Pipe Laying Technology 無坑挖掘管道鋪設的技能	☐	☐	☐
(iv) IT Application for Gas Engineering 氣體工程的資訊科技應用	☐	☐	☐
B. Operations Related 營運相關			
(i) Basic Gas Engineering 氣體工程的基礎	☐	☐	☐
(ii) Pipe and Cable Detection 管道和電纜的檢測	☐	☐	☐
(iii) Knowledge of Pipe Engineering Materials, such as Polyethylene and Steel Pipes 對管道工程材料（例如:聚乙烯和鋼管）的了解	☐	☐	☐
(iv) Basic Theory of Pressure Regulating Installation 調壓裝置的基本原理	☐	☐	☐
C. Project Management Related 項目管理相關			
(i) Project Management 項目管理	☐	☐	☐
(ii) Construction Contract's Terms and Conditions 施工合同的條款細則	☐	☐	☐
(iii) Risk and Crisis Management 風險及危機管理	☐	☐	☐
D. Regulations 法規			
(i) Relevant Trade's Ordinances and Regulations 與行業相關的法規	☐	☐	☐
(ii) Engineering-related ISO Standards 與工程相關的ISO標準	☐	☐	☐
(iii) Safety ordinances Cap. 59 FIUO and Cap. 509 OSHO 職業安全及健康條例	☐	☐	☐
E. Safety 安全			
(i) Safety Awareness 安全意識	☐	☐	☐
(ii) Safety Audit/Assessment 安全審核/評估	☐	☐	☐
(iii) Safety/Risk Management 安全/風險的管理	☐	☐	☐
(iv) Use of Personal Protective Equipment 個人防護裝備的使用	☐	☐	☐
(v) Construction Site Safety for Workers 工人在工地的安全	☐	☐	☐

Training Area 培訓範疇	Professional/ Technologist 專業人士／技師	Technician 技術員	Tradesman/ Craftsman 技工
F. Training Method 培訓方法			
(i) Instructing and Coaching Skills 指導及輔導的技能	☐	☐	☐
(ii) Online Training Methodology 線上培訓的方法	☐	☐	☐
(iii) Computer-based Technology for Training 電腦培訓的技術	☐	☐	☐
G. Soft Skills 軟性技巧			
(i) English Writing, Reading and Reporting 英語寫作，閱讀和報告	☐	☐	☐
(ii) Communication Skills with Stakeholders Both Internal and External 與內外持份者的溝通技巧	☐	☐	☐
(iii) Time Management Skills 時間管理的技巧	☐	☐	☐
(iv) Design Thinking Skills 設計思維的技巧	☐	☐	☐
(v) Team Building Skills 建立團體精神的技巧	☐	☐	☐

No such level of staff 沒有相關職級員工	☐	☐	☐

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

2021 Manpower Survey of the Electrical and Mechanical Services Industry
機電工程業 2021 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 note that some of the job titles may not be the same as those used in your establishment. Please classify an employee according to his/her major duty and supply the required information if the jobs have similar or related functions.
   調查表內部分職稱可能有別於 貴機構所採用。請根據僱員的主要職責分類。若員工職責與表內某職務的職責相近，可視作相同職務，請提供所需資料。

   (c) In the event where an employee's duties in your establishment are split between two or more job titles, please use the job title that best describes his/her principal responsibility.
   如 貴機構有員工身兼多項職責，請選用最能反映其主要職責的職稱。

   (d) Please add in column 'A' titles of any principal jobs not mentioned in job descriptions (Appendix B); briefly describe them in respect of the appropriate job categories.
   如 貴機構另有機電工程的主要職務未載於工作說明（附錄 B），請一併填入 'A' 欄內，並簡述其所屬的職務類別及等級。

2. Number of Full Time Employees as at Survey Reference Date (Excl. trainees) - Column 'B'
在統計日期的全職僱員人數（受訓者 除外）——— 'B' 欄

   For each principal job, please fill in the total number of full time employees (excluding trainees/apprentices) as at survey reference date.
   "Full Time Employees" refer to those working full-time (i.e. at least 4 weeks a month, and not less than 18 hours in each week) under the payroll of the establishment. These include proprietors and partners working full-time for the establishment. These definitions also apply to 'full-time employee(s)' appearing in other parts of the questionnaire.
   請填寫 貴機構於統計日期僱用的每個主要職務的全職僱員總數（實習生／見習員除外）。
   「全職僱員」指在 貴機構內全職工作（即每月最少四週、每週不少於十八小時）的受薪人員，其中包括在機構內全職工作的東主及合夥人。調查表內所出現的「全職僱員」等詞，定義亦同。

3. Number of Trainees as at Survey Reference Date – Column 'C'
在統計日期的受訓者人數———'C'欄

   Please fill in the total number of employees undergoing any form of training. This includes trainees and apprentices under a contract of apprenticeship.
   請填寫正在接受各種形式訓練的僱員總數，包括實習生及根據見習員合約受聘的學徒。

4. Number of Full Time Vacancies as at Survey Reference Date - Column 'D'
在統計日期的空缺額 ——— 'D' 欄

Please fill in the number of full time vacancies as at Survey Reference Date. 'Vacancies' refer to those unfilled, immediately available job openings for which the establishment is actively trying to recruit personnel as at survey reference date.
請填上在統計日期每一主要職務的全職空缺額。「空缺額」是指該職位於統計參考日期仍懸空，須立刻填補，而現正積極招聘人員填補。

5. Average Monthly Income of Full Time Employees (Excl. trainees) - Column 'E'
全職僱員之每月平均薪酬（受訓者 除外）——— 'E' 欄

Please enter the code of average monthly income during the past 12 months for each principal job of full time employee(s). This should include basic salary, overtime pay, cost of living allowance, meal allowance, housing allowance, travel allowance, commission and bonus. If you have more than one employee doing the same job, please enter the average range.
請在 'E' 欄填入每個主要職務的全職僱員過去 12 個月每月平均薪酬的編號。這包括底薪、逾時工作津貼、生活津貼、膳食津貼、房屋津貼、旅行津貼、佣金及花紅。如 貴機構有多於一名僱員擔任同一主要職務，則請取平均收入。

6. No. of Hong Kong E&M workers employed by your organisation and its subsidiaries in The Greater Bay Area (except Hong Kong) as at Survey Reference Date :
在統計日期，貴機構在大灣區（香港 除外）的公司及其附屬公司之香港機電工程僱員人數

Greater Bay Area (except Hong Kong) comprises:
大灣區（香港 除外）包括 :

Special Administrative Region of Macao, and the nine municipalities of Guangzhou, Shenzhen, Zhuhai, Foshan, Huizhou, Dongguan, Zhongshan, Jiangmen and Zhaoqing in Guangdong Province.
澳門特別行政區，及廣東省廣州、深圳、珠海、佛山、惠州、東莞、中山、江門、肇慶九市。

7. Preferred and Achieved Education Level of Full Time Employees
全職僱員宜有及已獲得的教育程度

Definition of Education Level:
教育程度的定義：

- "Postgraduate Degree" refers to higher degrees (e.g. master degrees) offered by local or non-local education institutions, or equivalent.
「研究生學位」是指本地或非本地教育機構提供的高等學位（如碩士學位），或同等教育程度。

- "First Degree" refers to First degrees offered by local or non-local education institutions, or equivalent.
「學士學位」是指本地或非本地教育機構提供的學士學位，或同等教育程度。

- "Sub-degree" refers to Associate Degrees, Higher Diplomas, Professional Diplomas, Higher Certificates, Endorsement Certificates, Associateship or equivalent programmes offered by local or non-local education institutions.
「副學位」 是指本地或非本地教育機構提供的副學士、高級文憑、專業文憑、高級證書、增修證書、院士銜或同等課程。

- "Diploma/Certificate" refers to technical and vocational education programmes including Diploma/Certificate courses, Diploma of Foundation Studies, Diploma of Vocational Education and programmes at the craft level, or equivalent.
「文憑／證書」是指技術及職業教育課程之文憑／證書、基礎課程文憑、職專文憑及技工程度的課程，或同等教育程度。

- "Senior Secondary" refers to Secondary 4-6/7, covering the education programmes in relation to the Hong Kong Certificate of Education Examination (HKCEE), the Hong Kong Diploma of Secondary Education (HKDSE) Examination, Diploma Yi Jin, or equivalent.

「高中」是指中四至中六/七，包括與香港中學會考、香港中學文憑考試、毅進文憑等相關的教育課程）或同等教育程度。

- "Junior Secondary" refers to Secondary 3 or below, or equivalent.
  「初中」是指中三或以下，或同等教育程度。

Appendix 4(C)
附錄 4(C)
(E&M-E)

THE 2021 MANPOWER SURVEY OF THE
ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機電工程業 2021 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	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.

Code 編號	Principal Jobs 主要職務	Job Description 工作說明
	升降機／自動梯 工程師	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。
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 普通工人	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 2021 MANPOWER SURVEY OF THE
ELECTRICAL AND MECHANICAL SERVICES INDUSTRY
機電工程業2021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 普通工人	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。

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 as 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	1,682	87	101
Electrical Engineer 電機工程師	2,664	119	137
Refrigeration/Air-conditioning/Ventilation Engineer 冷凝／空氣調節／通風設備工程師	1,123	47	31
Mechanical Engineer 機械工程師	973	53	68
Plumbing and Drainage Engineer 水喉及渠務工程師	240	10	5
Lift/Escalator Engineer 升降機／自動梯工程師	326	34	20
Fire Services Engineer 消防設備工程師	514	11	2
Electronics Engineer 電子工程師	519	8	37
Control and Instrumentation Engineer 控制及儀器工程師	68	-	5
Engineering Manager 工程經理	1,755	4	27
Safety Officer 安全主任	525	9	16
Aircraft Maintenance Engineer 飛機維修工程師	9	-	1
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	34	-	-
Sub-total 小計	**10,432**	**382**	**450**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TECHNICIAN LEVEL　技術員級			
Supervisor 監督	3,767	8	115
Building Services Technician 屋宇設備技術員	1,817	60	58
Draughtsman 繪圖員	532	4	7
Electrical Engineering Technician 電機工程技術員	2,573	159	84
Refrigeration/Air-conditioning/Ventilation Technician 冷凝／空氣調節／通風設備技術員	1,583	70	38
Mechanical Engineering Technician 機械工程技術員	1,275	106	69
Lift/Escalator Technician 升降機／自動梯技術員	992	6	56
Fire Services Technician 消防設備技術員	805	13	9
Electrical Instrument and Meter Technician 電工儀器技術員	173	1	6
Electronics Technician 電子技術員	890	0	34
Telecommunication Technician 電訊技術員	663	14	9
Office Equipment Service Technician 辦公室設備維修技術員	27	1	-
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	285	-	10
Aircraft Maintenance Technician 飛機維修技術員	1	-	-
Rolling Stock Technician 鐵道車輛技術員	883	-	10
Railway Signalling Technician 鐵路訊號技術員	390	-	15
Sub-total 小計	**16,656**	**442**	**520**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TRADESMAN/craftsman Level　技工級			
Foreman/Chargehand 管工／領工	3,845	115	165
Building Services Mechanic 屋宇設備技工	4,198	119	181
Electrician/Electrical Fitter 電工／電氣打磨裝配工	9,255	413	254
Control Panel Assembler 控制板裝配工	40	-	-
Electrical Wireman 電氣佈線工	2,561	109	7
Refrigeration/Air-conditioning/Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	1,679	98	139
Refrigeration/Air-conditioning/Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	3,321	104	108
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	1,008	18	28
Refrigeration/Air-conditioning/Ventilation Mechanic (Thermal Insulation)/Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	132	4	2
Refrigeration/Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	355	5	-
Plumber and Pipe Fitter 喉管工	927	0	19
Mechanical Fitter/Machinist 機械打磨裝配工／ 機床工	1,489	295	93
Lift Mechanic 升降機技工	2,286	153	105
Escalator Mechanic 自動梯技工	1,522	187	55
Fire Services Electrical Fitter 消防電氣裝配工	1,109	39	92
Fire Services Mechanical Fitter 消防機械裝配工	973	22	17
Cable Jointer (Power) 強電流電纜接駁工	461	18	-
Overhead Linesman 架空電線技工	176	12	6

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
Electrical Appliances Service Mechanic 電器用具服務技工	855	-	1
Welder 焊接工	173	-	9
Carpenter 木工	104	-	-
Painter 髹漆工	99	-	-
AV and RF Mechanic 影音及射頻技工	86	1	-
Building Security System Mechanic 屋宇防盜系統技工	13	10	-
Communication System Mechanic 電訊系統裝配工	1,451	-	5
Aircraft Maintenance Mechanic 飛機維修技工	-	-	-
Rolling Stock Tradesman 鐵道車輛技工	636	-	12
Railway Signalling Tradesman 鐵路訊號技工	4	-	-
Sub-total 小計	**38,758**	**1,722**	**1,298**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人			
Labourer 普通工人	1,685	-	35
Semi-skilled Worker 半技術工人	1,235	-	6
Sub-total 小計	**2,920**	**-**	**41**
GRAND TOTAL 總計	**68,766**	**2,546**	**2,309**

THE WHOLE 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 as 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	349	15	9
Electrical Engineer 電機工程師	730	41	59
Refrigeration/Air-conditioning/Ventilation Engineer 冷凝／空氣調節／通風設備工程師	635	13	10
Mechanical Engineer 機械工程師	120	3	6
Plumbing and Drainage Engineer 水喉及渠務工程師	52	-	2
Lift/Escalator Engineer 升降機／自動梯工程師	-	-	-
Fire Services Engineer 消防設備工程師	404	-	-
Electronics Engineer 電子工程師	186	-	-
Control and Instrumentation Engineer 控制及儀器工程師	22	-	-
Engineering Manager 工程經理	459	1	3
Safety Officer 安全主任	272	1	-
Aircraft Maintenance Engineer 飛機維修工程師	-	-	-
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	-	-	-
Sub-total 小計	**3,229**	**74**	**89**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TECHNICIAN LEVEL　技術員級			
Supervisor 監督	1,291	2	13
Building Services Technician 屋宇設備技術員	336	-	-
Draughtsman 繪圖員	129	-	2
Electrical Engineering Technician 電機工程技術員	735	6	38
Refrigeration/Air-conditioning/Ventilation Technician 冷凝／空氣調節／通風設備技術員	970	50	4
Mechanical Engineering Technician 機械工程技術員	161	-	-
Lift/Escalator Technician 升降機／自動梯技術員	-	-	-
Fire Services Technician 消防設備技術員	628	13	4
Electrical Instrument and Meter Technician 電工儀器技術員	44	1	-
Electronics Technician 電子技術員	271	-	-
Telecommunication Technician 電訊技術員	351	-	-
Office Equipment Service Technician 辦公室設備維修技術員	-	-	-
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	168	-	1
Aircraft Maintenance Technician 飛機維修技術員	-	-	-
Rolling Stock Technician 鐵道車輛技術員	-	-	-
Railway Signalling Technician 鐵路訊號技術員	-	-	-
Sub-total 小計	**5,084**	**72**	**62**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TRADESMAN/craftsman Level　技工級			
Foreman/Chargehand 管工／領工	913	21	-
Building Services Mechanic 屋宇設備技工	1,044	24	46
Electrician/Electrical Fitter 電工／電氣打磨裝配工	5,005	166	69
Control Panel Assembler 控制板裝配工	17	-	-
Electrical Wireman 電氣佈線工	1,718	109	1
Refrigeration/Air-conditioning/Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	1,167	93	94
Refrigeration/Air-conditioning/Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	2,563	104	95
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	930	18	26
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	4	-
Refrigeration/Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	263	3	-
Plumber and Pipe Fitter 喉管工	56	-	18
Mechanical Fitter/Machinist 機械打磨裝配工／ 機床工	22	-	-
Lift Mechanic 升降機技工	-	-	-
Escalator Mechanic 自動梯技工	-	-	-
Fire Services Electrical Fitter 消防電氣裝配工	1,086	39	87
Fire Services Mechanical Fitter 消防機械裝配工	960	22	16
Cable Jointer (Power) 強電流電纜接駁工	214	-	-
Overhead Linesman 架空電線技工	-	-	-

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
Electrical Appliances Service Mechanic 電器用具服務技工	173	-	-
Welder 焊接工	61	-	-
Carpenter 木工	77	-	-
Painter 髹漆工	16	-	-
AV and RF Mechanic 影音及射頻技工	8	1	-
Building Security System Mechanic 屋宇防盜系統技工	1	-	-
Communication System Mechanic 電訊系統裝配工	1,329	-	4
Aircraft Maintenance Mechanic 飛機維修技工	-	-	-
Rolling Stock Tradesman 鐵道車輛技工	-	-	-
Railway Signalling Tradesman 鐵路訊號技工	-	-	-
Sub-total 小計	**17,740**	**604**	**462**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人			
Labourer 普通工人	595	-	-
Semi-skilled Worker 半技術工人	572	-	-
Sub-total 小計	**1,167**	-	-
GRAND TOTAL 總計	**27,220**	**750**	**613**

THE WHOLE 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 as 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	15	-	-
Electrical Engineer 電機工程師	21	-	-
Refrigeration/Air-conditioning/Ventilation Engineer 冷凝／空氣調節／通風設備工程師	-	-	-
Mechanical Engineer 機械工程師	1	-	-
Plumbing and Drainage Engineer 水喉及渠務工程師	25	-	2
Lift/Escalator Engineer 升降機／自動梯工程師	-	-	-
Fire Services Engineer 消防設備工程師	2	-	-
Electronics Engineer 電子工程師	1	-	-
Control and Instrumentation Engineer 控制及儀器工程師	-	-	-
Engineering Manager 工程經理	33	-	-
Safety Officer 安全主任	6	-	-
Aircraft Maintenance Engineer 飛機維修工程師	-	-	-
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	-	-	-
Sub-total 小計	**104**	-	**2**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TECHNICIAN LEVEL　技術員級			
Supervisor 監督	60	-	2
Building Services Technician 屋宇設備技術員	47	-	-
Draughtsman 繪圖員	29	-	3
Electrical Engineering Technician 電機工程技術員	59	-	-
Refrigeration/Air-conditioning/Ventilation Technician 冷凝／空氣調節／通風設備技術員	2	-	-
Mechanical Engineering Technician 機械工程技術員	3	-	-
Lift/Escalator Technician 升降機／自動梯技術員	-	-	-
Fire Services Technician 消防設備技術員	2	-	-
Electrical Instrument and Meter Technician 電工儀器技術員	8	-	-
Electronics Technician 電子技術員	-	-	-
Telecommunication Technician 電訊技術員	-	-	-
Office Equipment Service Technician 辦公室設備維修技術員	-	-	-
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	10	-	-
Aircraft Maintenance Technician 飛機維修技術員	-	-	-
Rolling Stock Technician 鐵道車輛技術員	-	-	-
Railway Signalling Technician 鐵路訊號技術員	-	-	-
Sub-total 小計	**220**	-	**5**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TRADESMAN/craftsman Level　技工級			
Foreman/Chargehand 管工／領工	110	-	-
Building Services Mechanic 屋宇設備技工	445	-	2
Electrician/Electrical Fitter 電工／電氣打磨裝配工	1,451	55	13
Control Panel Assembler 控制板裝配工	-	-	-
Electrical Wireman 電氣佈線工	383	-	-
Refrigeration/Air-conditioning/Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	68	-	4
Refrigeration/Air-conditioning/Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	132	-	4
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	-	-	-
Refrigeration/Air-conditioning/Ventilation Mechanic (Thermal Insulation)/Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	-	-	-
Refrigeration/Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	16	-	-
Plumber and Pipe Fitter 喉管工	666	-	-
Mechanical Fitter/Machinist 機械打磨裝配工／ 機床工	2	-	-
Lift Mechanic 升降機技工	-	-	-
Escalator Mechanic 自動梯技工	-	-	-
Fire Services Electrical Fitter 消防電氣裝配工	12	-	5
Fire Services Mechanical Fitter 消防機械裝配工	2	-	-
Cable Jointer (Power) 強電流電纜接駁工	-	-	-
Overhead Linesman 架空電線技工	-	-	-

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
Electrical Appliances Service Mechanic 電器用具服務技工	20	-	-
Welder 焊接工	4	-	-
Carpenter 木工	4	-	-
Painter 髹漆工	5	-	-
AV and RF Mechanic 影音及射頻技工	-	-	-
Building Security System Mechanic 屋宇防盜系統技工	-	-	-
Communication System Mechanic 電訊系統裝配工	-	-	-
Aircraft Maintenance Mechanic 飛機維修技工	-	-	-
Rolling Stock Tradesman 鐵道車輛技工	-	-	-
Railway Signalling Tradesman 鐵路訊號技工	-	-	-
Sub-total 小計	**3,320**	**55**	**28**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人			
Labourer 普通工人	80	-	-
Semi-skilled Worker 半技術工人	117	-	-
Sub-total 小計	**197**	-	-
GRAND TOTAL 總計	**3,841**	**55**	**35**

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

BRANCH III: SERVICING E&M BRANCH
門 類 III： 服 務

MANPOWER STATISTICS
人 力 狀 況

Job Title 職稱	**No. of Employees 僱員人數**	**No. of Trainees 受訓者人數**	**No. of Vacancies as 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	783	72	42
Electrical Engineer 電機工程師	1,400	66	30
Refrigeration/Air-conditioning/Ventilation Engineer 冷凝／空氣調節／通風設備工程師	392	26	9
Mechanical Engineer 機械工程師	498	39	25
Plumbing and Drainage Engineer 水喉及渠務工程師	128	9	1
Lift/Escalator Engineer 升降機／自動梯工程師	326	34	19
Fire Services Engineer 消防設備工程師	103	9	2
Electronics Engineer 電子工程師	131	4	9
Control and Instrumentation Engineer 控制及儀器工程師	44	-	5
Engineering Manager 工程經理	1,000	2	21
Safety Officer 安全主任	171	4	6
Aircraft Maintenance Engineer 飛機維修工程師	-	-	-
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	34	-	-
Sub-total 小計	**5,010**	**265**	**169**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TECHNICIAN LEVEL　技術員級			
Supervisor 監督	1,684	6	35
Building Services Technician 屋宇設備技術員	804	38	32
Draughtsman 繪圖員	292	3	1
Electrical Engineering Technician 電機工程技術員	1,048	127	14
Refrigeration/Air-conditioning/Ventilation Technician 冷凝／空氣調節／通風設備技術員	353	7	17
Mechanical Engineering Technician 機械工程技術員	547	73	40
Lift/Escalator Technician 升降機／自動梯技術員	979	6	53
Fire Services Technician 消防設備技術員	141	-	5
Electrical Instrument and Meter Technician 電工儀器技術員	32	-	-
Electronics Technician 電子技術員	158	-	3
Telecommunication Technician 電訊技術員	52	4	-
Office Equipment Service Technician 辦公室設備維修技術員	20	1	-
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	60	-	1
Aircraft Maintenance Technician 飛機維修技術員	-	-	-
Rolling Stock Technician 鐵道車輛技術員	883	-	10
Railway Signalling Technician 鐵路訊號技術員	380	-	15
Sub-total 小計	**7,433**	**265**	**226**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TRADESMAN/craftsman Level　技工級			
Foreman/Chargehand 管工／領工	697	47	13
Building Services Mechanic 屋宇設備技工	1,436	16	18
Electrician/Electrical Fitter 電工／電氣打磨裝配工	2,274	142	78
Control Panel Assembler 控制板裝配工	14	-	-
Electrical Wireman 電氣佈線工	420	-	2
Refrigeration/Air-conditioning/Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	156	-	-
Refrigeration/Air-conditioning/Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	535	-	2
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	63	-	2
Refrigeration/Air-conditioning/Ventilation Mechanic (Thermal Insulation)/Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	15	-	2
Refrigeration/Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	69	-	-
Plumber and Pipe Fitter 喉管工	175	-	-
Mechanical Fitter/Machinist 機械打磨裝配工／ 機床工	658	266	12
Lift Mechanic 升降機技工	2,286	153	105
Escalator Mechanic 自動梯技工	1,522	187	55
Fire Services Electrical Fitter 消防電氣裝配工	9	-	-
Fire Services Mechanical Fitter 消防機械裝配工	11	-	1
Cable Jointer (Power) 強電流電纜接駁工	202	16	-
Overhead Linesman 架空電線技工	131	10	6

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
Electrical Appliances Service Mechanic 電器用具服務技工	662	-	1
Welder 焊接工	46	-	-
Carpenter 木工	11	-	-
Painter 髹漆工	71	-	-
AV and RF Mechanic 影音及射頻技工	70	-	-
Building Security System Mechanic 屋宇防盜系統技工	12	10	-
Communication System Mechanic 電訊系統裝配工	63	-	-
Aircraft Maintenance Mechanic 飛機維修技工	-	-	-
Rolling Stock Tradesman 鐵道車輛技工	636	-	12
Railway Signalling Tradesman 鐵路訊號技工	4	-	-
Sub-total 小計	**12,248**	**847**	**309**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人			
Labourer 普通工人	408	-	4
Semi-skilled Worker 半技術工人	391	-	4
Sub-total 小計	**799**	**-**	**8**
GRAND TOTAL 總計	**25,490**	**1,377**	**712**

THE WHOLE 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 as 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	535	-	50
Electrical Engineer 電機工程師	513	12	48
Refrigeration/Air-conditioning/Ventilation Engineer 冷凝／空氣調節／通風設備工程師	96	8	12
Mechanical Engineer 機械工程師	354	11	37
Plumbing and Drainage Engineer 水喉及渠務工程師	35	1	-
Lift/Escalator Engineer 升降機／自動梯工程師	-	-	1
Fire Services Engineer 消防設備工程師	5	2	-
Electronics Engineer 電子工程師	201	4	28
Control and Instrumentation Engineer 控制及儀器工程師	2	-	-
Engineering Manager 工程經理	263	1	3
Safety Officer 安全主任	76	4	10
Aircraft Maintenance Engineer 飛機維修工程師	9	-	1
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	-	-	-
Sub-total 小計	**2,089**	**43**	**190**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TECHNICIAN LEVEL　技術員級			
Supervisor 監督	732	-	65
Building Services Technician 屋宇設備技術員	630	22	26
Draughtsman 繪圖員	82	1	1
Electrical Engineering Technician 電機工程技術員	731	26	32
Refrigeration/Air-conditioning/Ventilation Technician 冷凝／空氣調節／通風設備技術員	258	13	17
Mechanical Engineering Technician 機械工程技術員	564	33	29
Lift/Escalator Technician 升降機／自動梯技術員	13	-	3
Fire Services Technician 消防設備技術員	34	-	-
Electrical Instrument and Meter Technician 電工儀器技術員	89	-	6
Electronics Technician 電子技術員	461	-	31
Telecommunication Technician 電訊技術員	260	10	9
Office Equipment Service Technician 辦公室設備維修技術員	7	-	-
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	47	-	8
Aircraft Maintenance Technician 飛機維修技術員	1	-	-
Rolling Stock Technician 鐵道車輛技術員	-	-	-
Railway Signalling Technician 鐵路訊號技術員	10	-	-
Sub-total 小計	**3, 919**	**105**	**227**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TRADESMAN/craftsman Level　技工級			
Foreman/Chargehand 管工／領工	2,125	47	152
Building Services Mechanic 屋宇設備技工	1,273	79	115
Electrician/Electrical Fitter 電工／電氣打磨裝配工	525	50	94
Control Panel Assembler 控制板裝配工	9	-	-
Electrical Wireman 電氣佈線工	40	-	4
Refrigeration/Air-conditioning/Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	288	5	41
Refrigeration/Air-conditioning/Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	91	-	7
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	15	-	-
Refrigeration/Air-conditioning/Ventilation Mechanic (Thermal Insulation)/Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	-	-	-
Refrigeration/Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	7	2	-
Plumber and Pipe Fitter 喉管工	30	-	1
Mechanical Fitter/Machinist 機械打磨裝配工／ 機床工	807	29	81
Lift Mechanic 升降機技工	-	-	-
Escalator Mechanic 自動梯技工	-	-	-
Fire Services Electrical Fitter 消防電氣裝配工	2	-	-
Fire Services Mechanical Fitter 消防機械裝配工	-	-	-
Cable Jointer (Power) 強電流電纜接駁工	45	2	-
Overhead Linesman 架空電線技工	45	2	-

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
Electrical Appliances Service Mechanic 電器用具服務技工	-	-	-
Welder 焊接工	62	-	3
Carpenter 木工	12	-	-
Painter 髹漆工	7	-	-
AV and RF Mechanic 影音及射頻技工	8	-	-
Building Security System Mechanic 屋宇防盜系統技工	-	-	-
Communication System Mechanic 電訊系統裝配工	59	-	1
Aircraft Maintenance Mechanic 飛機維修技工	-	-	-
Rolling Stock Tradesman 鐵道車輛技工	-	-	-
Railway Signalling Tradesman 鐵路訊號技工	-	-	-
Sub-total 小計	**5,450**	**216**	**499**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人			
Labourer 普通工人	602	-	31
Semi-skilled Worker 半技術工人	155	-	2
Sub-total 小計	**757**	-	**33**
GRAND TOTAL 總計	**12,215**	**364**	**949**

THE WHOLE ELECTRICAL AND MECHANICAL ENGINEERING SECTOR
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 (百分比)	**Head Count (人數)**	**Percentage (百分比)**	**Head Count (人數)**
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級					
Branch 1: Contracting (E&M) 門類 I：承造	3,229	80%	2,583	20%	646
Branch 2: Electrical Fitting with Water Plumbing 門類 II：水電工程	104	56%	58	44%	46
Branch 3: Servicing (E&M) 門類 III：服務	5,010	30%	1,503	70%	3,507
Brach 4: Supplementary 門類 I：補充抽樣	2,089	48%	1,003	52%	1,086
Sub-total 小計	**10,432**	**49%**	**5,147**	**51%**	**5,285**
TECHNICIAN LEVEL 技術員級					
Branch 1: Contracting (E&M) 門類 I：承造	17,740	73%	12,950	27%	4,790
Branch 2: Electrical Fitting with Water Plumbing 門類 II：水電工程	3,320	48%	1,594	52%	1,726
Branch 3: Servicing (E&M) 門類 III：服務	12,248	28%	3,429	72%	8,819
Brach 4: Supplementary 門類 I：補充抽樣	5,450	26%	1,417	74%	4,033
Sub-total 小計	**38,758**	**50%**	**19,390**	**50%**	**19,368**

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 (百分比)	Head Count (人數)	Percentage (百分比)	Head Count (人數)
TRADESMAN/craftsman Level　技工級					
Branch 1: Contracting (E&M) 門類 I：承造	5,084	70%	3,559	30%	1,525
Branch 2: Electrical Fitting with Water Plumbing 門類 II：水電工程	220	51%	112	49%	108
Branch 3: Servicing (E&M) 門類 III：服務	7,433	24%	1,784	76%	5,649
Brach 4: Supplementary 門類 I：補充抽樣	3,919	39%	1,528	61%	2,391
Sub-total 小計	**16,656**	**42%**	**6,983**	**58%**	**9,673**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人					
Branch 1: Contracting (E&M) 門類 I：承造	1,167	68%	794	32%	373
Branch 2: Electrical Fitting with Water Plumbing 門類 II：水電工程	197	68%	134	32%	63
Branch 3: Servicing (E&M) 門類 III：服務	799	26%	208	74%	591
Brach 4: Supplementary 門類 I：補充抽樣	757	28%	212	72%	545
Sub-total 小計	**2,920**	**46%**	**1,348**	**54%**	**1,572**
GRAND TOTAL 總計	**68,766**	**51%**	**35,071**	**49%**	**33,695**

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 as at Date of Survey 調查期間空缺數目
PROFESSIONAL/TECHNOLOGIST LEVEL　專業人士／技師級			
Electrical Engineer 電機工程師	31	2	1
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	166	3	5
Mechanical Engineer 機械工程師	360	2	7
Safety Officer 安全主任	24	-	1
Sub-total 小計	**581**	**7**	**14**
TECHNICIAN LEVEL　技術員級			
Electrical Engineering Technician 電機工程技術員	37	-	5
Gas Engineering Technician 氣體燃料工程技術員	245	11	8
Mechanical Engineering Technician 機械工程技術員	389	-	3
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	19	-	1
Supervisor/Chargehand 監督／管工	139	-	1
Sub-total 小計	**829**	**11**	**18**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TRADESMAN/craftsman Level　技工級			
Electrician/Electrical Fitter 電工／電氣打磨裝配工	54	-	-
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	51	-	2
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	281	4	7
Gas Utilisation Fitter (Domestic) 氣體燃料應用技工（住宅式）	497	9	7
Gas Utilisation Fitter (Non-domestic) 氣體燃料應用技工（非住宅式）	266	-	6
Mechanical Fitter 機械打磨裝配工	7	-	-
Welder 焊接工	**19**	-	**1**
Sub-total 小計	**1,175**	**13**	**23**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人			
Driver (LPG Cylinder Wagon) 司機（石油氣瓶車）	22	-	-
Labourer 普通工人	37	-	3
Semi-skilled Worker 半技術工人	13	-	-
Sub-total 小計	**72**	-	**3**
GRAND TOTAL 總計	**2,657**	**31**	**58**

THE AIRCRAFT MAINTENCE 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 as at Date of Survey 調查期間空缺數目
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級			
Building Services Engineer 屋宇設備工程師	11	-	-
Engineering Manager 工程經理	4	-	-
Safety Officer 安全主任	12	-	-
Aircraft Maintenance Engineer 飛機維修工程師	478	-	-
Sub-total 小計	**505**	-	-
TECHNICIAN LEVEL 技術員級			
Supervisor 監督	575	-	40
Building Services Technician 屋宇設備技術員	10	-	-
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	15	-	-
Aircraft Maintenance Technician 飛機維修技術員	543	-	33
Sub-total 小計	**1,143**	**0**	**73**

Job Title 職稱	No. of Employees 僱員人數	No. of Trainees 受訓者人數	No. of Vacancies as at Date of Survey 調查期間空缺數目
TRADESMAN/craftsman Level　技工級			
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	128	-	10
Carpenter 木工	5	-	10
Painter 髹漆工	45	-	30
Aircraft Maintenance Mechanic 飛機維修技工	2,485	468	250
Sub-total 小計	**2,663**	**468**	**300**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人			
Labourer 普通工人	428	-	30
Semi-skilled Worker 半技術工人	78	-	30
Sub-total 小計	**506**	**-**	**60**
GRAND TOTAL 總計	**4,817**	**468**	**433**

THE WHOLE 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	$12,000 or below 或以下	$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
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級								
Building Services Engineer 屋宇設備工程師	-	-	-	0.1%	27.7%	19.5%	40.0%	12.8%
Electrical Engineer 電機工程師	-	-	-	0.4%	33.6%	21.8%	26.4%	17.8%
Refrigeration/Air-conditioning/Ventilation Engineer 冷凝／空氣調節／通風設備工程師	-	-	-	3.7%	56.6%	35.4%	3.9%	0.5%
Mechanical Engineer 機械工程師	-	-	-	0.2%	33.0%	12.0%	27.2%	27.6%
Plumbing and Drainage Engineer 水喉及渠務工程師	-	-	-	-	70.8%	20.4%	4.6%	4.2%
Lift/Escalator Engineer 升降機／自動梯工程師	-	-	-	-	32.4%	40.2%	17.4%	10.0%
Fire Services Engineer 消防設備工程師	-	-	-	1.0%	77.0%	20.2%	0.6%	1.2%
Electronics Engineer 電子工程師	-	-	-	1.8%	37.0%	21.3%	13.2%	26.8%
Control and Instrumentation Engineer 控制及儀器工程師	-	-	-	-	32.4%	5.9%	61.8%	-
Engineering Manager 工程經理	-	-	-	-	5.2%	21.7%	43.7%	29.3%
Safety Officer 安全主任	-	-	-	-	39.7%	51.1%	5.5%	3.7%
Aircraft Maintenance Engineer 飛機維修工程師	-	-	-	-	-	100.0%	-	-
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	-	-	-	-	-	100.0%	-	-
Sub-total 小計	**-**	**-**	**-**	**68**	**3,341**	**2,380**	**2,532**	**1,603**

Job Title 職稱	$12,000 or below 或以下	$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
TECHNICIAN LEVEL　技術員級								
Supervisor 監督	-	-	2.1%	24.9%	65.9%	6.8%	0.3%	-
Building Services Technician 屋宇設備技術員	-	-	8.7%	59.4%	11.1%	17.9%	2.9%	-
Draughtsman 繪圖員	-	0.2%	4.1%	30.0%	57.6%	3.4%	4.6%	-
Electrical Engineering Technician 電機工程技術員	-	-	0.5%	45.2%	28.5%	23.5%	2.2%	-
Refrigeration/Air-conditioning/Ventilation Technician 冷凝／空氣調節／通風設備技術員	-	0.8%	10.6%	60.6%	16.7%	10.4%	0.9%	-
Mechanical Engineering Technician 機械工程技術員	-	-	4.5%	31.6%	23.6%	37.7%	2.6%	-
Lift/Escalator Technician 升降機／自動梯技術員	-	-	1.2%	32.5%	58.2%	8.2%	-	-
Fire Services Technician 消防設備技術員	-	-	3.8%	34.2%	57.0%	5.0%	-	-
Electrical Instrument and Meter Technician 電工儀器技術員	-	-	13.3%	56.1%	30.1%	0.6%	-	-
Electronics Technician 電子技術員	-	-	4.3%	12.5%	26.9%	56.3%	-	-
Telecommunication Technician 電訊技術員	-	9.7%	-	20.2%	70.1%	-	-	-
Office Equipment Service Technician 辦公室設備維修技術員	-	-	63.0%	7.4%	29.6%	-	-	-
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	-	1.8%	4.4%	74.0%	19.4%	0.4%	-	-
Aircraft Maintenance Technician 飛機維修技術員	-	-	-	100.0%	-	-	-	-
Rolling Stock Technician 鐵道車輛技術員	-	-	-	100.0%	-	-	-	-
Railway Signalling Technician 鐵路訊號技術員	-	-	-	97.4%	2.6%	-	-	-
Sub-total 小計	**-**	**77**	**574**	**6,603**	**5,521**	**2,226**	**176**	**-**

Job Title 職稱	$12,000 or below 或以下	$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
TRADESMAN/craftsman Level 技工級								
Foreman/Chargehand 管工／領工	-	0.7%	19.9%	31.6%	47.5%	0.4%	-	-
Building Services Mechanic 屋宇設備技工	-	3.9%	41.1%	53.2%	1.8%	-	-	-
Electrician/Electrical Fitter 電工／電氣打磨裝配工	0.5%	1.0%	19.3%	63.8%	15.4%	-	-	-
Control Panel Assembler 控制板裝配工	-	-	48.6%	35.1%	16.2%	-	-	-
Electrical Wireman 電氣佈線工	-	0.1%	24.4%	75.3%	0.2%	-	-	-
Refrigeration/Air-conditioning/Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	-	2.6%	17.7%	78.4%	1.3%	-	-	-
Refrigeration/Air-conditioning/Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	-	2.4%	12.5%	75.2%	9.9%	-	-	-
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	-	-	11.9%	85.8%	2.3%	-	-	-
Refrigeration/Air-conditioning/Ventilation Mechanic (Thermal Insulation)/Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	-	-	45.5%	37.1%	17.4%	-	-	-
Refrigeration/Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	-	-	25.7%	68.3%	6.0%	-	-	-
Plumber and Pipe Fitter 喉管工	-	1.9%	12.3%	55.5%	30.3%	-	-	-
Mechanical Fitter/Machinist 機械打磨裝配工／ 機床工	-	24.2%	33.3%	40.2%	2.3%	-	-	-
Lift Mechanic 升降機技工	-	0.8%	47.0%	26.9%	25.3%	-	-	-
Escalator Mechanic 自動梯技工	-	-	35.4%	58.3%	6.3%	-	-	-
Fire Services Electrical Fitter 消防電氣裝配工	-	7.4%	5.9%	58.8%	27.9%	-	-	-

Job Title 職稱	$12,000 or below 或以下	$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
Fire Services Mechanical Fitter 消防機械裝配工	-	-	5.1%	78.6%	16.3%	-	-	-
Cable Jointer (Power) 強電流電纜接駁工	-	-	11.9%	54.9%	30.4%	2.8%	-	-
Overhead Linesman 架空電線技工	-	-	22.7%	74.4%	2.8%	-	-	-
Electrical Appliances Service Mechanic 電器用具服務技工	-	-	1.8%	78.6%	19.6%	-	-	-
Welder 焊接工	-	16.7%	40.7%	13.6%	29.0%	-	-	-
Carpenter 木工	-	8.7%	34.6%	12.5%	44.2%	-	-	-
Painter 髹漆工	-	14.6%	11.5%	74.0%	-	-	-	-
AV and RF Mechanic 影音及射頻技工	-	-	30.2%	69.8%	-	-	-	-
Building Security System Mechanic 屋宇防盜系統技工	-	-	-	-	-	-	-	-
Communication System Mechanic 電訊系統裝配工	-	-	12.3%	87.4%	0.3%	-	-	-
Aircraft Maintenance Mechanic 飛機維修技工	-	-	-	-	-	-	-	-
Rolling Stock Tradesman 鐵道車輛技工	-	-	95.9%	-	4.1%	-	-	-
Railway Signalling Tradesman 鐵路訊號技工	-	100.0%	-	-	-	-	-	-
Sub-total 小計	**44**	**895**	**8,433**	**21,268**	**5,209**	**26**	**-**	**-**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人								
Labourer 普通工人	6.0%	48.3%	33.6%	11.7%	0.4%	-	-	-
Semi-skilled Worker 半技術工人	1.5%	44.6%	44.5%	9.5%	-	-	-	-
Sub-total 小計	**106**	**1,204**	**981**	**278**	**6**	**-**	**-**	**-**
GRAND TOTAL 總計	**150**	**2,176**	**9,988**	**28,217**	**14,077**	**4,632**	**2,708**	**1,603**

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	$12,000 or below 或以下	$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
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級								
Electrical Engineer 電機工程師	-	-	-	-	3.2%	90.3%	6.5%	-
Gas Engineer (Fuel Gas) 氣體工程師（氣體燃料）	-	-	-	-	11.3%	78.7%	10.0%	-
Mechanical Engineer 機械工程師	-	-	-	-	-	100.0%	-	-
Safety Officer 安全主任	-	-	-	-	16.7%	83.3%	-	-
Sub-total 小計	**-**	**-**	**-**	**-**	**22**	**524**	**17**	**-**
TECHNICIAN LEVEL 技術員級								
Electrical Engineering Technician 電機工程技術員	-	-	-	40.5%	5.4%	54.1%	-	-
Gas Engineering Technician 氣體燃料工程技術員	-	-	2.7%	53.8%	42.6%	0.9%	-	-
Mechanical Engineering Technician 機械工程技術員	-	-	-	100.0%	-	-	-	-
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	-	-	-	10.5%	89.5%	-	-	-
Supervisor/Chargehand 監督／管工	-	-	-	11.2%	18.7%	70.1%	-	-
Sub-total 小計	**-**	**-**	**6**	**541**	**139**	**116**	**-**	**-**
TRADESMAN/craftsman Level 技工級								
Electrician/Electrical Fitter 電工／電氣打磨裝配工	-	-	-	90.7%	9.3%	-	-	-
Gas Distribution Fitter (LPG) 氣體燃料輸送技工（石油氣）	-	9.8%	46.3%	43.9%	-	-	-	-
Gas Distribution Fitter (Town Gas) 氣體燃料輸送技工（煤氣）	-	-	45.5%	54.5%	-	-	-	-
Gas Utilisation Fitter (Domestic) 氣體燃料應用技工（住宅式）	-	20.9%	24.6%	49.5%	4.9%	-	-	-

Job Title 職稱	$12,000 or below 或以下	$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
Gas Utilisation Fitter (Non-domestic) 氣體燃料應用技工（非住宅式）	-	11.3%	55.6%	30.1%	3.0%	-	-	-
Mechanical Fitter 機械打磨裝配工	-	-	14.3%	85.7%	-	-	-	-
Welder 焊接工	-	-	-	100.0%	-	-	-	-
Sub-total 小計	**-**	**136**	**415**	**565**	**37**	**-**	**-**	**-**
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人								
Driver (LPG Cylinder Wagon) 司機（石油氣瓶車）	-	52.9%	47.1%	-	-	-	-	-
Labourer 普通工人	5.4%	13.5%	81.1%	-	-	-	-	-
Semi-skilled Worker 半技術工人	-	50.0%	25.0%	25.0%	-	-	-	-
Sub-total 小計	**2**	**20**	**41**	**3**	**-**	**-**	**-**	**-**
GRAND TOTAL 總計	**2**	**156**	**462**	**1,109**	**198**	**640**	**17**	**-**

THE AIRCRAFT MAINTENCE 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	$12,000 or below 或以下	$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
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級								
Building Services Engineer 屋宇設備工程師	-	-	-	-	-	100.0%	-	-
Engineering Manager 工程經理	-	-	-	-	25.0%	75.0%	-	-
Safety Officer 安全主任	-	-	-	-	8.3%	91.7%	-	-
Aircraft Maintenance Engineer 飛機維修工程師	-	-	-	-	-	99.4%	0.6%	-
Sub-total 小計	**-**	**-**	**-**	**-**	**2**	**493**	**3**	**-**
TECHNICIAN LEVEL 技術員級								
Supervisor 監督	-	-	0.7%	0.3%	99.0%	-	-	-
Building Services Technician 屋宇設備技術員	-	-	-	-	100.0%	-	-	-
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	-	-	-	-	100.0%	-	-	-
Aircraft Maintenance Technician 飛機維修技術員	-	-	7.5%	0.9%	91.5%	-	-	-
Sub-total 小計	**-**	**-**	**44**	**7**	**1,080**	**-**	**-**	**-**
TRADESMAN/craftsman Level 技工級								
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	-	-	15.6%	84.4%	-	-	-	-
Carpenter 木工	-	-	20.0%	80.0%	-	-	-	-
Painter 髹漆工	-	-	-	100.0%	-	-	-	-
Aircraft Maintenance Mechanic 飛機維修技工	-	-	11.2%	88.7%	0.1%	-	-	-
Sub-total 小計	**-**	**-**	**300**	**2,360**	**3**	**-**	**-**	**-**

Job Title 職稱	$12,000 or below 或以下	$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
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人								
Labourer 普通工人	-	7.0%	93.0%	-	-	-	-	-
Semi-skilled Worker 半技術工人	-	-	100.0%	-	-	-	-	-
Sub-total 小計	**-**	**30**	**476**	**-**	**-**	**-**	**-**	**-**
GRAND TOTAL 總計	**-**	**30**	**820**	**2,367**	**1,085**	**493**	**3**	**-**

DISTRIBUTION OF AVERAGE MONTHLY REMUNERATION PACKAGE OF FULL-TIME EMPLOYEES BY JOB LEVEL
按行業等級劃分的全職僱員每月平均薪酬分佈

(i) E&M Engineering Sector 機電工程行業

Job level 行業等級	$12,000 or below 或以下	$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
Professional / Technologist Level 專業人士／技師級								
Technician Level 技術員級	-	-	-	0.7%	33.7%	24.0%	25.5%	16.2%
Tradesman / Craftsman Level 技工級								
Semi-skilled / General Worker Level 半技術工人／普通工人	-	0.5%	3.8%	43.5%	36.4%	14.7%	1.2%	-

(ii) Gas Sector 氣體燃料行業

Job level 行業等級	$12,000 or below 或以下	$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
Professional / Technologist Level 專業人士／技師級	-	-	-	-	3.9%	93.1%	3.0%	-
Technician Level 技術員級	-	-	0.7%	67.5%	17.3%	14.5%	-	-
Tradesman / Craftsman Level 技工級	-	11.8%	36.0%	49.0%	3.2%	-	-	-
Semi-skilled / General Worker Level 半技術工人／普通工人	3.0%	30.3%	62.1%	4.5%	-	-	-	-

(iii) Aircraft Maintenance Sector 飛機維修工程行業

Job level 行業等級	$12,000 or below 或以下	$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
Professional / Technologist Level 專業人士／技師級	-	-	-	-	0.4%	99.0%	0.6%	-
Technician Level 技術員級	-	-	3.9%	0.6%	95.5%	-	-	-
Tradesman / Craftsman Level 技工級	-	-	11.3%	88.6%	0.1%	-	-	-
Semi-skilled / General Worker Level 半技術工人／普通工人	-	5.9%	94.1%	-	-	-	-	-

Note: As a percentage of total number of employees by corresponding job level
註：佔該行業等級僱員總數百分率

DISTRIBUTION OF PREFERRED AND ACHIEVED EDUCATION LEVEL OF FULL-TIME EMPLOYEES BY JOB LEVEL

按行業等級劃分的全職僱員宜有及已獲得教育程度的分佈

(i) E&M Engineering Sector 機電工程行業

Education level 教育程度	Professional / Technologist Level 專業人士／技師級		Technician Level 技術員級		Tradesman / Craftsman Level 技工級		Semi-skilled / General Worker Level 半技術工人／普通工人	
	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得
Postgraduate Degree 研究生學位	2.8%	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
First Degree 學士學位	97.2%	96.1%	6.6%	11.0%	0.0%	0.2%	0.0%	0.0%
Sub-degree 副學位	0.0%	11.4%	22.2%	21.0%	0.0%	1.0%	0.0%	0.0%
Diploma/Certificate 文憑/證書	0.0%	1.6%	71.3%	65.0%	30.7%	30.8%	0.2%	0.6%
Senior Secondary 高中	0.0%	0.2%	0.0%	6.6%	59.2%	70.8%	30.1%	41.9%
Junior Secondary 初中	0.0%	0.0%	0.0%	5.2%	9.9%	14.0%	69.7%	75.1%
No preference 無意見	0.0%	-	0.0%	-	0.1%	-	0.0%	-
No. of companies with such level of staff 擁有該級別員工的公司數量	**1,085**		**2,001**		**9,026**		**572**	

(ii) Gas Sector 氣體燃料行業

Education level 教育程度	Professional / Technologist Level 專業人士／技師級		Technician Level 技術員級		Tradesman / Craftsman Level 技工級		Semi-skilled / General Worker Level 半技術工人／普通工人	
	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得
Postgraduate Degree 研究生學位	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%	0.0%
First Degree 學士學位	100.0%	83.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sub-degree 副學位	0.0%	8.3%	8.5%	6.8%	0.0%	0.0%	0.0%	0.0%
Diploma/Certificate 文憑/證書	0.0%	16.7%	91.5%	94.9%	16.3%	19.6%	0.0%	0.0%
Senior Secondary 高中	0.0%	0.0%	0.0%	1.7%	79.1%	81.7%	40.6%	43.8%
Junior Secondary 初中	0.0%	0.0%	0.0%	0.0%	4.6%	10.5%	59.4%	59.4%
No preference 無意見	0.0%	-	0.0%	-	0.0%	-	0.0%	-
No. of companies with such level of staff 擁有該級別員工的公司數量	**16**		**66**		**157**		**33**	

(iii) Aircraft Maintenance Sector 飛機維修工程行業

Education level 教育程度	Professional / Technologist Level 專業人士／技師級		Technician Level 技術員級		Tradesman / Craftsman Level 技工級		Semi-skilled / General Worker Level 半技術工人／普通工人	
	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得
Postgraduate Degree 研究生學位	0.0%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
First Degree 學士學位	100.0%	100.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%
Sub-degree 副學位	0.0%	44.4%	62.5%	100.0%	12.5%	12.5%	0.0%	0.0%
Diploma/Certificate 文憑/證書	0.0%	0.0%	37.5%	50.0%	0.0%	75.0%	0.0%	0.0%
Senior Secondary 高中	0.0%	0.0%	0.0%	0.0%	87.5%	87.5%	58.3%	91.7%
Junior Secondary 初中	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	41.7%	41.7%
No preference 無意見	0.0%	-	0.0%	-	0.0%	-	0.0%	-
No. of companies with such level of staff 擁有該級別員工的公司數量		**11**		**10**		**9**		**13**

Note: As a percentage of total no. of company with such level
Company may choose one or more options in already achieved education level and may not added up to 100%
註：擁有該級別員工的公司所佔總數百分率
公司在已獲得教育程度中可選擇一個或以上，總和可能不等於 100%

DISTRIBUTION OF PREFERRED AND ACCUMULATED YEARS OF RELEVANT EXPERIENCE OF FULL-TIME EMPLOYEES
按行業等級劃分的全職僱員宜有及已累積相關年資的分佈

(i) E&M Engineering Sector 機電工程行業

Education level 教育程度	Professional / Technologist Level 專業人士／技師級		Technician Level 技術員級		Tradesman / Craftsman Level 技工級		Semi-skilled / General Worker Level 半技術工人／普通工人	
	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得
10 years or more 十年或以上	14.7%	64.6%	6.0%	44.7%	0.1%	43.3%	0.2%	12.5%
6 years to less than 10 years 六年至十年以下	64.0%	46.1%	22.6%	26.6%	1.0%	42.5%	0.0%	1.0%
3 years to less than 6 years 三年至六年以下	21.2%	6.5%	61.8%	40.4%	34.1%	39.3%	1.7%	27.8%
1 year to less than 3 years 一年至三年以下	0.1%	1.1%	9.0%	2.8%	49.1%	13.8%	42.5%	48.3%
Less than 1 year 一年以下	0.0%	0.2%	0.6%	0.1%	13.9%	0.9%	22.4%	23.2%
No experience 無經驗	0.0%	0.1%	0.0%	0.0%	1.9%	0.8%	33.2%	9.1%
No. of companies with such level of staff 擁有該級別員工的公司數量	**1,085**		**2,001**		**9,026**		**572**	

(ii) Gas Sector 氣體燃料行業

Education level 教育程度	Professional / Technologist Level 專業人士／技師級		Technician Level 技術員級		Tradesman / Craftsman Level 技工級		Semi-skilled / General Worker Level 半技術工人／普通工人	
	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得
10 years or more 十年或以上	0.0%	58.3%	1.7%	33.9%	0.7%	25.5%	0.0%	0.0%
6 years to less than 10 years 六年至十年以下	75.0%	75.0%	1.7%	39.0%	0.0%	45.1%	0.0%	0.0%
3 years to less than 6 years 三年至六年以下	25.0%	8.3%	79.7%	52.5%	18.3%	51.6%	0.0%	21.9%
1 year to less than 3 years 一年至三年以下	0.0%	0.0%	16.9%	8.5%	64.7%	29.4%	40.6%	59.4%
Less than 1 year 一年以下	0.0%	0.0%	0.0%	0.0%	15.7%	0.7%	21.9%	25.0%
No experience 無經驗	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	37.5%	3.1%
No. of companies with such level of staff 擁有該級別員工的公司數量	**16**		**66**		**157**		**33**	

(iii) Aircraft Maintenance Sector 飛機維修工程行業

Education level 教育程度	Professional / Technologist Level 專業人士／技師級		Technician Level 技術員級		Tradesman / Craftsman Level 技工級		Semi-skilled / General Worker Level 半技術工人／普通工人	
	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得	Preferred 宜有	Already achieved 已獲得
10 years or more 十年或以上	0.0%	55.6%	0.0%	12.5%	0.0%	0.0%	0.0%	0.0%
6 years to less than 10 years 六年至十年以下	77.8%	100.0%	0.0%	75.0%	0.0%	50.0%	0.0%	0.0%
3 years to less than 6 years 三年至六年以下	22.2%	44.4%	87.5%	100.0%	0.0%	87.5%	50.0%	50.0%
1 year to less than 3 years 一年至三年以下	0.0%	0.0%	12.5%	25.0%	100.0%	100.0%	0.0%	41.7%
Less than 1 year 一年以下	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	33.3%
No experience 無經驗	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No. of companies with such level of staff 擁有該級別員工的公司數量	**11**		**10**		**9**		**13**	

Note: As a percentage of total no. of company with such level
Company may choose one or more options in accumulated years of experience and may not added up to 100%
註：擁有該級別員工的公司所佔總數百分率
公司在已累積經驗中可選擇一個或以上，總和可能不等於 100%

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

Job Title **職稱**	**No. of Employees as at Survey Reference Date** **在統計日期的僱員人數**	**No. of Trainees as at Survey Reference Date** **在統計日期的受訓者人數**	**No. of Vacancies as at Survey Reference Date** **在統計日期的空缺額**
PROFESSIONAL/TECHNOLOGIST LEVEL 專業人士／技師級			
Building Services Engineer 屋宇設備工程師	141	-	-
Electrical Engineer 電機工程師	200	-	-
Refrigeration/Air-conditioning/Ventilation Engineer 冷凝／空氣調節／通風設備工程師	49	-	-
Mechanical Engineer 機械工程師	90	-	-
Plumbing and Drainage Engineer 水喉及渠務工程師	24	-	-
Lift/Escalator Engineer 升降機／自動梯工程師	4	-	-
Fire Services Engineer 消防設備工程師	17	-	-
Electronics Engineer 電子工程師	36	-	-
Control and Instrumentation Engineer 控制及儀器工程師	7	-	-
Engineering Manager 工程經理	59	-	-
Safety Officer 安全主任	93	-	-
Sub-total 小計	**720**	-	-

Job Title 職稱	No. of Employees as at Survey Reference Date 在統計日期的僱員人數	No. of Trainees as at Survey Reference Date 在統計日期的受訓者人數	No. of Vacancies as at Survey Reference Date 在統計日期的空缺額
TECHNICIAN　技術員			
Supervisor 監督	119	-	-
Building Services Technician 屋宇設備技術員	111	-	-
Draughtsman 繪圖員	54	-	-
Electrical Engineering Technician 電機工程技術員	131	-	-
Refrigeration/Air-conditioning/Ventilation Technician 冷凝／空氣調節／通風設備技術員	110	-	-
Mechanical Engineering Technician 機械工程技術員	67	-	-
Lift/Escalator Technician 升降機／自動梯技術員	54	-	-
Fire Services Technician 消防設備技術員	81	-	-
Electrical Instrument and Meter Technician 電工儀器技術員	38	-	-
Electronics Technician 電子技術員	29	-	-
Telecommunication Technician 電訊技術員	24	-	-
Assistant Safety Officer/Safety Supervisor 助理安全主任／安全督導員	119	-	-
Sub-total 小計	**937**	-	-
TRADESMAN/craftsman Level　技工級			
Electrical Fitter 電氣打磨裝配工	1,627	8	-
Control Panel Assembler 控制板裝配工	260	-	-
Electrical Wireman 電氣佈線工	972	24	-
Refrigeration/Air-conditioning/Ventilation Mechanic (Master) 空調製冷設備技工(全科)	845	-	-

Job Title 職稱	No. of Employees as at Survey Reference Date 在統計日期的僱員人數	No. of Trainees as at Survey Reference Date 在統計日期的受訓者人數	No. of Vacancies as at Survey Reference Date 在統計日期的空缺額
Refrigeration/Air-conditioning/Ventilation Mechanic (Electrical Control) 空調製冷設備技工(電力控制)	272	-	-
Refrigeration/Air-conditioning/Ventilation Mechanic (Unitary System) 空調製冷設備技工(獨立系統)	107	-	-
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	216	-	-
Refrigeration/Air-conditioning/Ventilation Mechanic (Thermal Insulation)/Thermal Insulation Craftsman 空調製冷設備技工(保溫)／保溫技工	63	-	-
Refrigeration/Air-conditioning/ Ventilation Mechanic (Water System) 空調製冷設備技工(水系統)	89	-	-
Drain and Pipe Layer (Master) 地渠及喉管工(全科)	72	-	-
Drainlayer 地渠工	139	-	-
Pipelayer 敷喉管工	420	-	-
Mechanical Fitter 機械打磨裝配工	14	-	-
Lift and Escalator Mechanic (Master) 升降機及自動梯技工(全科)	228	-	-
Lift Mechanic 升降機技工	43	-	-
Escalator Mechanic 自動梯技工	273	-	-
Fire Service Mechanic (Master) 消防設備技工(全科)	16	-	-
Fire Services Electrical Fitter 消防電氣裝配工	333	-	-
Fire Services Mechanical Fitter 消防機械裝配工	118	-	-
Fire Service Portable Equipment Fitter 手提消防設備裝配工	199	-	-
Cable Jointer (Power) 強電流電纜接駁技工	4	-	-

Job Title 職稱	No. of Employees as at Survey Reference Date 在統計日期的僱員人數	No. of Trainees as at Survey Reference Date 在統計日期的受訓者人數	No. of Vacancies as at Survey Reference Date 在統計日期的空缺額
Cable Jointer (Low Voltage) 強電流電纜接駁技工（低壓）	23	-	-
Overhead Linesman 架空電線技工	75	-	-
Electrical Appliances Service Mechanic 電器用具服務技工	47	-	-
General Welder 普通焊接工	293	2	-
Electronic Equipment Mechanic (Construction Work) (Master) 電子設備技工(建造工作) (全科)	112	-	-
Building Security System Mechanic 建築物防盜系統技工	55	2	-
Communication System Mechanic 電訊系統裝配工	35	-	-
Gas Installer 氣體裝置技工	68	1	-
Sub-total 小計	**30**	-	-
SEMI-SKILLED WORKER/GENERAL WORKER　半技術工人／普通工人			
Labourer 普通工人	1,548	-	-
Semi-skilled Worker 半技術工	345	-	-
Sub-total 小計	**1,893**	-	-
TOTAL 總數	**10,598**	**44**	-

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