Competence Profiles for Lift and Escalator Engineers
Guidance for Applicants and Assessors

Purpose

This guidance note (GN) serves to provide general reference for applicants from lift and escalator engineering industry to better prepare for the Professional Assessment under the Control, Automation and Instrumentation (CAI) Discipline (MHKIE(CAI)) via both formal training/ general experience route. The GN also serves as reference for Assessors considering and preparing recommendation of Professional Assessment interviews with applicants from lift and escalator engineering.

This GN is advisory in nature and is designed to facilitate the applicants to prepare the application. It should not be construed in anyway as to supersede the relevant requirements stipulated in HKIE website for MHKIE admission application.

Introduction

Competence-based Professional Assessment has been implemented for application after 1 Apr 2019. In 2020/21, all received applications are assessed in accordance with competence-based requirements. Th HKIE has provided seminars/training of general requirements about competence-based assessments.

According to Part 2 Section 1(a) and Part 4 Section 1(a) of Schedule 9 of the Lifts and Escalators Ordinance (Cap. 618), if an applicant is a registered professional engineer under the Engineers Registration Ordinance (Cap. 409) in any of the relevant disciplines such as CAI and with at least 2 years' relevant working experience and necessary practical experience, he/she shall have satisfied the requirement for registration as registered lift engineer or registered escalator engineer under Cap. 618. The Engineers Registration Board ("ERB") accepts the qualification of the person if he/she is a member of the Hong Kong Institution of Engineers ("HKIE") and of a relevant discipline for registration as a registered professional engineer under Cap. 409.

Application and Professional Assessment Interview for MHKIE (CAI)

Application

Before preparing the application, applicant should go through details of relevant information in HKIE web site including Information on Membership Classes, Routes to Membership, Application Form requirements and confirm if their academic qualifications, professional experiences, CPD hours, etc. satisfy MHKIE(CAI) requirements

The applicant is suggested to submit the Report on Training and Experience as per the template in **Appendix I**. The report is suggested arranging in following four broad areas to demonstrate his professional experiences fulfilling the 12 competences:-

i. Applying CAI Engineering Knowledge (C1, C2, C11)
ii. Developing Technical Solutions (C3, C4)
iii. Managing Engineering Work (C5, C6, C7, C12)
iv. Upkeeping Professional Acumen (C8, C9, C10)

Interview

The Applicant should prepare about 15-minute presentation of his projects submitted and evidences to illustrate his professional experiences such as reports, plans, calculations, photographs, etc. as appropriate.

Suggested allocation of time for 15-minute presentation

- 2-minute Introduction of applicant's academic qualifications, training and professional/responsible experiences;
- 4-minute Project experiences for applying CAI engineering knowledge;
- 4-minute Project experiences for developing technical solutions for complex engineering problems;
- 3-minute Management experiences for complex engineering works or activities;
- 2-minute Experiences for upkeeping professional acumen.

Presentation slide should be concise and precise. Each slide in a PowerPoint presentation should normally be bound within 1-minute. Each slide should be confined to present about 3 major points. Staying too long in one slide may indicate unclear explanation of elements. Photos, schematic or drawings should be clearly presented in the PowerPoint slides. Copying details from the report to the slide is inappropriate. Relevant part or sessions of reports, plans, calculations, photographs, etc. should be extracted in appropriate format which is easy for discussion in the meeting. Photos / drawings should be cropped / zoomed in appropriate scale to facilitate subsequent dialogues.

Assessment of Competence for Applicants from Lift and Escalator Industry

DAP(CAI) with the endorsement from Qualification and Membership Board considered that with evidence to support the following experiences in lift and escalator engineering would satisfy the MHKIE competence requirements in CAI.

Table 1: Relevant Lift and Escalator Engineering Experiences to fulfill HKIE Competence Requirements

HKIE Competence Requirements		*Relevant Lift and Escalator Engineering Experiences*
Applying CAI Engineering Knowledge (C1, C2, C11)		
C1.	Comprehend and apply knowledge of accepted principles underpinning widely applied good practice for professional engineering;	Apply professional knowledge and skills in CAI engineering to design, implement, operate and maintain, investigate incidents and provide professional advice on CAI equipment for lift and/or escalator systems to analyse the integrity of system concerned, and CAI system of operation and safety device.
C2.	Comprehend and apply knowledge of accepted principles underpinning good practice for professional engineering that is specific to Hong Kong; and	Understand and familiar with statutory requirements of Lifts and Escalators Ordinance (Cap. 618), relevant local code of practice, regulations and related ordinance; and Apply professional knowledge and skills in CAI engineering, in accordance with Cap. 618, to design, implement, operate and maintain, investigate incidents and provide professional advice on CAI equipment for lift and/or escalator systems.
C11.	Maintain the currency of his or her professional engineering knowledge and skills.	Organise and attend related CPD activities.
Developing Technical Solutions (C3 and C4)		
C3.	Define, investigate and analyse complex engineering problems in accordance with good practice for professional engineering; and	Plan and supervise the development, manufacture, construction, installation, operation, maintenance and repair of the lift and/or escalator systems; and Investigate infrequently encountered complex engineering problems without precedent reference of solutions and be responsible to resolve the problems with originality in analysis.
C4.	Design or develop solutions to complex engineering problems in accordance with good practice for professional engineering.	Design and develop new installations and/or modernise the lift and/or escalator systems including the CAI system to meet the defined requirements and objectives.

HKIE Competence Requirements		*Relevant Lift and Escalator Engineering Experiences*
Managing Engineering Work (C5, C6, C7 and C12)		
C5.	Be responsible for making decisions on part or all of one or more complex engineering activities;	Be responsible for the management of installation and/or maintenance of the lift and/or escalator systems; and Manage the use of diverse resources including people, money, equipment, materials and technologies; and Participate the resolution of critical problems arising from interactions between wide-ranging technical, engineering and other issues.
C6.	Manage part or all of one or more complex engineering activities in accordance with good engineering management practice;	Supervise the installation of the lift and/or escalator systems and inspect the quality of the work and to deal with any problems that arise; and Carry out extraordinary and emergency maintenance work on lifts and/or escalators when a breakdown, fault or other CAI issues encountered.
C7.	Identify, assess and manage engineering risk; and	Conduct risk assessment and manage the risks associated with the installation, repair, maintenance and overhaul of the lift and/or escalator systems.
C12.	Exercise sound professional engineering judgement.	Be responsible for engineering activities requiring judgement in technical, manpower, financial, safety, environment aspects.
Upkeeping Professional Acumen (C8, C9 and C10)		
C8.	Conduct engineering activities to an ethical standard prescribed by the HKIE;	Understand and familiar with HKIE ethical standard and show how to apply them in projects.
C9.	Recognise the reasonably foreseeable social, cultural, health, safety, sustainability and environmental effects of professional engineering activities generally;	Respond to emergency breakdowns and ensure health and safety regulations are met and produce risk assessment reports and legal and insurance documents.
C10.	Communicate clearly with other engineers and others that he or she is likely to deal with in the course of his or her professional engineering activities.	Demonstrate the effective communication skills with workers, engineers, stakeholders and public related to design, implementation, operation and maintenance, incidents investigation and providing professional advice on mechanical, electrical and control equipment for lift and/or escalator systems.

Appendix I

Report Template on Training and Experience

Periods of Training and Experience

i. Chronological order, giving inclusive dates in months and years
ii. As details of duties can be found in application form, they may not be repeated in this report.

Training

From	To	Company	Position
		Projects	
Sub Total : (Months/Years)			

Professional Experience

From	To	Company	Position
		Projects	
		Company	Position
		Projects	
Sub Total : (Months/Years)			
Total : (Months/Years)			

Professional Experiences

i. state your precise positions have occupied in each case and describe clearly the degree of your responsibility assigned; use the first person (I, me, my) to show your personal contribution;
ii. indicate the size and *cost* of the works; keep in about 3 – 4 projects or works demonstrating all competences;
iii. elaborate on any particular *problems* encountered and how you arrived at viable solutions with consideration of *options or alternatives*;
iv. provide evidence to demonstrate the competences (At most four relevant competences should be quoted at a time);
v. provide evidence or examples of recent work to support their claim of attaining professional status, such as reports, plans, calculations, photographs, etc. as appropriate.

Applying CAI Engineering Knowledge	**Competence**
Project Title: *(provide project title here)* **Position:** *(Company position may be assistance engineer. However, in the project, you can be in charge of design as design engineer)* **Project Brief:** *(provide brief description of the project and indicate the size and cost)* **Sample Professional Experiences** ● **Apply professional knowledge and skills in engineering to design and advise on CAI equipment for lift and/or escalator systems** ● **Application of CAI engineering knowledge** ● **Same as above but with specific experience in compliance with the local code of practice, regulations and legislations.** ● **Organise and attend related CPD activities.** ----------HKIE Competence Requirements---------- C1 - Comprehend and apply knowledge of accepted principles underpinning widely applied good practice for professional engineering - understand and grasp appropriate engineering knowledge and work from first principles to make reliable predictions of outcomes - seek advice, where necessary, to supplement own knowledge and experience - read understand, evaluate literature and put into practice new knowledge C2 - Comprehend and apply knowledge of accepted principles underpinning good practice for professional engineering that is specific to Hong Kong - demonstrate an awareness of legal requirements and regulatory issues in Hong Kong relevant to the RPE(CAI) under assessment - demonstrate an awareness of and apply appropriately the CAI discipline specific engineering requirements in Hong Kong relevant to the CAI discipline under assessment C11 - Maintain the currency of his or her professional engineering knowledge and skills - demonstrate a commitment to extending and developing knowledge and skills - participate in education, training, mentoring or other programmes contributing to his/her professional development - engage in collaborative activities with professional engineers	C1, C2, C11

Developing Technical Solutions	**Competence**
Project Title: *(provide project title here)* **Position:** *(Company position may be assistance engineer. However, in the project, you can be in charge of design as design engineer)* **Project Brief:** *(provide brief description of the project and indicate the size and cost)* **Sample Professional Experiences** ● **Plan and supervise the development, manufacture, construction, installation, operation, maintenance and repair of the lift and/or escalator systems;** ● **Involve in infrequently encountered issues and was responsible to resolve complex engineering problems that have no obvious solutions and require originality in analysis** ● **Design and develop new installations and/or modernise the lift and/or escalator systems** ----------HKIE Competence Requirements---------- C3 - Define, investigate and analyse complex engineering problems in accordance with good practice for professional engineering - identify and understand the scope of the problem - look into details relevant information using quantitative and qualitative techniques - verify the correctness of results - conduct any necessary research and reaches substantiated conclusions C4 - Design or develop solutions to complex engineering problems in accordance with good practice for professional engineering - identify needs, requirements, constraints and performance criteria - formulate concepts and design possible solutions based on engineering principles - engage stakeholders in developing possible solutions - evaluate the pros and cons of the possible solutions and select a solution that best satisfies needs, requirements and criteria - plan and implement effective, efficient and practical systems or solutions - evaluate outcomes against original criteria and assumptions "Complex engineering problems" have some or all of the following characteristics: - involve wide-ranging or conflicting technical, engineering, and other issues	C3, C4

- have no obvious solution and require originality in analysis - involve infrequently encountered issues - are problems beyond the scope of standards and codes of practice for professional engineering - involve diverse groups of stakeholders with widely varying needs - have significant consequences in a range of contexts - cannot be resolved without in-depth engineering knowledge	
Managing Engineering Work	**Competence**
Project Title: *(provide project title here)* **Position:** *(Company position may be assistance engineer. However, in the project, you can be in charge of design as design engineer)* **Project Brief:** *(provide brief description of the project and indicate the size and cost)* **Sample Professional Experiences** ● **Responsible for the management of installation and/or maintenance of the lift and/or escalator systems;** ● **Involve in the use of diverse resources including people, money, equipment, materials and technologies;** ● **Participate the resolution of critical problems arising from interactions between wide-ranging technical, engineering and other issues.** ● **Supervise the installation of the lift and/or escalator systems and inspect the quality of the work and to deal with any problems that arise;** ● **Carry out extraordinary and emergency maintenance work on lifts and/or escalators when breakdowns, faults or other CAI issues occur.** ● **Conduct risk assessment and manager the risks associated with the installation, repair, maintenance and overhaul of the lift and/or escalator CAI systems** ● **Evidence demonstrates that applicant has been responsible for engineering activities requiring judgement in technical, financial or safety aspects.** ----------HKIE Competence Requirements---------- C5 - Be responsible for making decisions on part or all of one or more complex engineering activities	C5, C6, C7, C12

- take full responsibility during the course and/or for the outcome of complex engineering activities undertaken - act appropriately and make decisions during the course and/or for the outcome of complex engineering activities undertaken C6 - Manage part or all of one or more complex engineering activities in accordance with good engineering management practice - plan, schedule and organise projects to deliver specified outcomes - apply appropriate quality assurance techniques to manage engineering projects - manage resources, including personnel, finance and physical resources in engineering projects - manage conflicting demands and expectations - demonstrate awareness of financial considerations in managing engineering projects C7 - Identify, assess and manage engineering risk - locate hazards, apportion frequency of occurrence and formulate risk profile in design and operations - develop corresponding management policies, procedures and protocols to manage - manage risks in work and operations according to the policies, procedures and protocols C12 - Exercise sound professional engineering judgement - demonstrate the ability to identify alternative options - demonstrate the ability to choose between options and justify decisions - be recognised by peers for his/her ability to exercise sound professional engineering judgement "Complex engineering activities" mean engineering activities or projects that have some or all of the following characteristics: - involve the use of diverse resources including people, money, equipment, materials and technologies - require resolution of critical problems arising from interactions between wide-ranging technical, engineering and other issues - have significant consequences in a range of contexts - involve the use of new materials, techniques, or processes or the use of existing materials, techniques, or processes in innovative ways	

Upkeeping Professional Acumen	**Competence**
Project Title: *(provide project title here)* **Position:** *(Company position may be assistance engineer. However, in the project, you can be in charge of design as design engineer)* **Project Brief:** *(provide brief description of the project and indicate the size and cost)* **Sample Professional Experiences** ● **Understanding of HKIE ethical standard and to show how to apply them in projects.** ● **Respond to emergency breakdowns and ensure health and safety regulations are met and produce risk assessment reports and legal and insurance documents.** ● **Evidence to show the effective communication with workers, engineers and stakeholders related to professional engineering activities.** ----------HKIE Competence Requirements---------- C8 - Conduct engineering activities to an ethical standard prescribed by the HKIE - demonstrate understanding of HKIE Rules of Conduct - behave in accordance with the HKIE Rules of Conduct in difficult circumstances (including demonstrating an awareness of limits of capability; acting with integrity and honesty and demonstrating self-management) C9 - Recognise the reasonably foreseeable social, cultural, health, safety, sustainability and environmental effects of professional engineering activities generally - consider and take into account of the impact and long-term effects of engineering activities on social, culture, health, safety, sustainability and the environment - project the outcome of professional engineering activities in the context of social, cultural, health, safety, sustainability and environmental aspects C10 - Communicate clearly with other engineers and others that he or she is likely to deal with in the course of his or her professional engineering activities - use oral and written communication to convey clear message to his/her audience that meet their needs and expectations of his/her audience - communicate using a range of media suitable to the audience and context - treat people with respect - develop empathy and uses active listening skills when communicating with others - operate effectively as a team member	C8, C9, C10