

# CPD Series: Railway Signal Control and Communications

Lecture: 3 August – 14 September 2024 (9:00 am - 12:00 pm, 1:30 pm - 4:30 pm) &  
Examination: 28 September 2024 (9:00 am – 11:00 am) (Saturdays)

Course Code: SC 24-012

Co-organized with IRSE (Hong Kong Section)

## Objectives and Learning Outcomes

Signalling system is very important for safe operation of railway. The course is designed to provide participants with practical understanding of the railway signalling principles; headway calculation for a typical signalling layout, control tables' input and the station communications.

Upon completion of this course, participants will be able to:

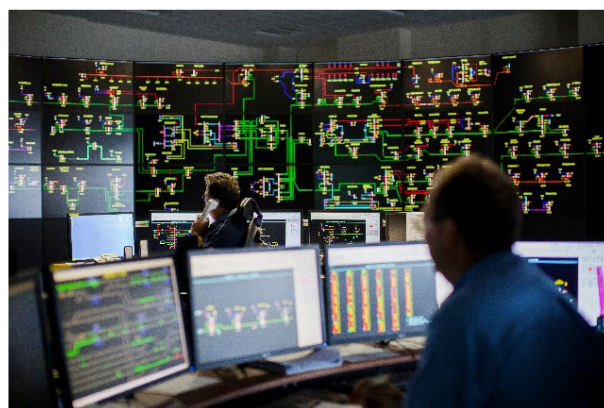
- Evaluate the signalling principles and apply them in practical systems;
- Evaluate headway calculation and understand the railway safety and RAMS; and
- Compile a control table for a given layout according to interlocking requirements.

## Who Should Attend

- Practitioners in railway industry who wish to refresh and upgrade their knowledge in the railway signalling and communications areas.
- Graduate Engineers who wish to develop a career in railway industry.
- Potential candidates sitting for IRSE Professional Examination.
- Engineering students who are interested in railway signalling.

## Language

Lectures will be conducted in Cantonese and supplemented by English terminology and terms. Course materials, including examination, are written in English.



## Venue

MTR Academy - Kowloon Bay Depot Centre  
/ Hung Hom Centre

## Mode of Learning

Classroom lecture

## Course Structure

The programme comprises 4 main parts:

- Signalling principles and their applications
- Railway infrastructure and signalling equipment
- RAMS and Communications
- Signalling safety design elements - Route Table, Signal Table and Point Table formation

## Professional Speakers



**Mr. K.W. Pang, FIRSE,  
Past Chairman of IRSE (HK)**

**K. W. Pang** has over 40 years' experience in the railway industry covering design, maintenance, management, development and multi-discipline large scale projects. His last post in the MTR was the Infrastructure Development & Engineering Asset Manager, who acts as the Asset Owner to coordinate with all infrastructure related Project Teams (including Civil, Power, Track, Signal, Control & Communications) on design, implementation, testing of all new Lines, Extensions and major asset replacements to assure that they comply with the operation, maintenance, safety and recovery requirements at the lowest Life Cycle Cost and minimal impact to existing services.

After leaving MTR, he was the Executive Vice President for the Hong Kong Nicaragua Development Group planning for construction of the Nicaragua Canal. He is the present Vice Chairman of the Institute of Railway Signal Engineers (Hong Kong Section), Senior Consultant for China Railway Construction Corporation Hong Kong Limited, Project Director for contract 1142 of the Guangzhou-Shenzhen-Hong Kong High Speed Rail, Ex-Senior Consultant for the China Railway Signal & Communications Group, present Founder of Leon Rail Solutions .... etc.



**Mr. Y. T. Tai, FIRSE  
Chairman of IRSE (HK)**

**Timothy Y. T. Tai (Tim)** is a professional signal engineer with over 40 years of experience in maintenance, implementation, design; test and commissioning of relay interlocking, Computer Based Interlocking, Automatic Train Control and Communications-based Train Control (CBTC) systems. He is currently employed as a consultant for the New ATC Replacement Project for the Urban Lines in HK. Before this post, he is the Signalling & Electronic Control Engineering Manager to in-charge of the section with responsibility of design, implementation, test & commissioning of modification for the Signalling & Electronic Control system in Operating Railway and the on-coming new line interfacing systems.

Tim was a Visiting Lecturer in the Hong Kong Polytechnic University, teaching Signalling and Train Control Systems in MSc course in year 2009, 2013 and 2019. Tim was also a visiting lecturer for MTR Academy from 2017 to 2023. For the years of 2019 and 2020, he conducted Intermediate Railway Signalling course. He also provided tutorials to the examiners in the UK annual IRSE examination in the past.



**Mr. K. L. Tsang**

**K. L. Tsang** has over 30 years' experience in the railway industry involved in design, installation, T&C, first line and second line maintenance of S&T works. His last post in the MTR was the S&T Maintenance Manager assigned for the Hangzhou Line1 Project in Hangzhou, China.

K. L. was a competence assessor approved by IRSE to undertake competence assessments for the licensing categories of design, installation, testing and maintenance works.



**Mr. Y. F. Sung, FIRSE**

**Y. F. Sung** is a retired professional signal engineer with over 32 years of experience in maintenance, installation, design, T&C of railway signaling system. His last job position was the Signal Maintenance Manager in KCRC, responsible for the first line and second line maintenance of East Rail, West Rail, Ma On Shan Rail and Light Rail.

Mr. Sung was a Visiting Lecturer of VTC, teaching Railway Signalling in the year of 2006, 2008, 2010 and 2014. Mr. Sung was also a visiting lecturer in MTR Academy, teaching Intermediate Railway Signalling course and Basic Railway Signalling course from 2018 to 2023.

He is the General Secretary of IRSE (HK Section).

# Schedule

Time & Date	Lesson	Topics	Speakers
3 August 2024 <b><u>9:00 am – 12:00 pm</u></b> & <b><u>1:30 pm - 4:30 pm</u></b>	1	<b>Railway Infrastructure</b> <ul style="list-style-type: none"> <li>i. Rolling Stock</li> <li>ii. High Voltage and Overhead Line Equipment</li> <li>iii. Permanent Way</li> <li>iv. Signal and Communications</li> </ul>	Mr. YF Sung
	2	<b>Signalling Principles</b> <ul style="list-style-type: none"> <li>i. Signalling Standard Principles</li> <li>ii. Signalling Principles for Interlocking Design</li> </ul>	Mr. YF Sung
10 August 2024 <b><u>9:00 am – 12:00 pm</u></b> & <b><u>1:30 pm - 4:30 pm</u></b>  17 August 2024 <b><u>9:00 am – 12:00 pm</u></b>	3, 4 & 5	<b>Signalling Equipment</b> <ul style="list-style-type: none"> <li>i. Point Machines</li> <li>ii. Train Detections, Axle counter</li> <li>iii. Signals and Indicators</li> <li>iv. Automatic Warning System (AWS)</li> <li>v. Safety Relays</li> <li>vi. Level-Crossing Equipment               <ul style="list-style-type: none"> <li>-Half barrier LX</li> <li>-Full Barrier LX</li> </ul> </li> <li>vii. Trackside Installation</li> </ul>	Mr. KL Tsang
24 August 2024* & 31 August 2024* <b><u>*9:00 am – 12:45 pm</u></b>	6 & 7	<b>RAMS</b> <ul style="list-style-type: none"> <li>i. Description of RAMS</li> <li>ii. Fail Safe Concept</li> <li>iii. Human Errors, SPAD and WSF</li> <li>iv. Train Accidents</li> <li>v. Accidents' Investigation</li> <li>vi. Rule and regulation</li> </ul>	Mr. KW Pang
7 September 2024* <b><u>*9:00 am – 12:45 pm</u></b>	8	<b>Communications</b> <ul style="list-style-type: none"> <li>i. PABX, PAX, SPT, Direct line and Help point</li> <li>ii. CCTV</li> <li>iii. PA System</li> <li>iv. PIDS</li> <li>v. Transmission lines, copper and optical cable</li> <li>vi. Data Network Communications</li> </ul>	Mr. KW Pang
14 September 2024 <b><u>9:00 am – 12:00 pm</u></b> & <b><u>1:30 pm - 4:30 pm</u></b>	9 & 10	<b>Control Table</b> <ul style="list-style-type: none"> <li>i. Train Operation. Entrance and Exit</li> <li>ii. Organizations and drafting Route Control Table, Point Control Table and Signal Control Table</li> <li>iii. Control Table exercise and practice</li> <li>iv. Case study: past examination questions of control table</li> </ul>	Mr. Tai Yin Tung
28 September 2024 <b><u>9:00 am – 11:00 am</u></b>	11	<b>Module Examination</b>	Mr. YF Sung OR Mr. Tai Yin Tung

## Certificate of Attainment

Signed jointly by MTR Academy and the Hong Kong Section of Institution of Railway Signal Engineers, a Certificate of Attainment will be issued to each participant if he/she passes the final assessment AND satisfies a minimum attendance requirement of 70% in the course.

*This training course is recognized for 150 CPD points by the Chartered Institute of Logistics and Transport in Hong Kong (CILTHK).*

Programme Fee	Early Bird Fee	Discount Scheme
\$7,800	<b>\$7,020</b> (Paid registration on or before 21 July 2024)	<b>15% off for</b> <ul style="list-style-type: none"><li>– members of supporting professional bodies<sup>^</sup></li><li>– full-time staff of MTR and its subsidiary companies<sup>^</sup></li><li>– full-time students (Senior Secondary or above)</li></ul> <sup>^</sup> Latest details, please refer to our webpage

## Application Methods

### Online

Applicants can enrol and pay online by credit card at <https://www.mtracademy.com>

### Enquiry in Person

Address: 1/F, MTR Hung Hom Building, 8 Cheong Wan Road, Hung Hom, Kowloon

Opening hours: Monday – Friday 9:30am – 7:30pm; Saturday: 9:30am – 12:30pm

Closed on Sundays and Public Holidays

## Closing Date for Registration

Please note that due to limitations of venue capacity and relevant logistics, all registrations must be made at least 2 working days prior to the delivery date of individual modules. **No walk-in registration will be entertained.**

\*MTR Academy reserves the right to turn away successfully enrolled individuals who do not meet prerequisite.