

## Technical Presentation & Demonstration on

A novel and innovative system that can inspect defects occurred in buried and wall-covered pipes with its effectiveness proven by on-site tests using real and in-service gas pipes  
創新的系統用於檢測地下和被牆壁覆蓋的管道缺陷和腐蝕 – 已通過實地試驗引證其效用



A great time to learn a new technology that may benefit to your career in a relaxing and enjoyable high-tea environment!

**Date** : February 21, 2019, Thursday

**Venue** : 城峰閣 9th floor Restaurant, 9<sup>th</sup> floor, Bank of China (HK) Building, City University of Hong Kong, Kowloon Tong, Hong Kong (can seat up to 100 people only)



**Time** : 2:00 pm to 3:30 pm (Registration starts at 1:45 pm. Presentation will be started at 2:15 pm. Tea reception will be served at 3:00 pm.)

**Presenter:** Ir Dr. Peter TSE: [mepwtse@cityu.edu.hk](mailto:mepwtse@cityu.edu.hk)

### **Organizers:**

- Smart Engineering Asset Management laboratory (SEAM), Department of Systems Engineering and Engineering Management (SEEM), City University of Hong Kong, website: <http://www6.cityu.edu.hk/seam>
- Hong Kong Institute of Utility Specialists (HKIUS), website: <http://www.hkius.org.hk/>

**Sponsor:** MSDI Limited

### **PROGRAMME HIGHLIGHTS**

Pipeline is an essential infrastructure in any modern city for supplying and distributing water, natural gas, sewage wastes, chemicals etc., to various households and industries. A fatal rupture of pipe may cause huge economic loss and even human casualties. In a high-rise building, an external piping system, which is erected along the external walls of the building, is used to deliver gas and water to each household unit. The pipes enter kitchens and bathrooms through the building concrete wall. The section of pipes that are covered by the wall are prone to corrosion if there is water leaking into the wall. Corrosion occurs in this section is very difficult to be detected. Unfortunately, as of today, no effective system that is commercially available can detect pipe defects that are covered by concrete walls. A novel and non-destructive-testing-based inspection system called, Guided Wave (GW), has recently become popular because of its prominent capability in detecting defects occurred in buried or covered pipes. Unlike common ultrasonic inspection methods, which can only provide a short inspection distance and a tedious point-to-point inspection process, GW has low energy attenuation that enables it to have a long inspection distance, covers the entire pipe area and sensitive to small defects. It only requires a single point located at a kitchen or bathroom to install the novel sensor so that it can be used to emit the desired GW and then receive the defect information. The current GW-based inspection system includes an innovative GW sensor designed by us, a compact and portable USB-based data acquisition box and a portable computer that has built-in virtual instruments designed by us to analysis the received GW signals. The results obtained from both laboratory experiments and field tests using real and in-service building pipes prove that the GW system is effective in detecting wall-covered corrosion. Even the inspected gas pipes have multiple coatings, the GW signal can penetrate

through the coatings and enter into the main body of pipes so as to detect the extent of corrosion. This system can be applied to not only covered pipes, but also wall covered steel rods and strands. With the help from this innovative system, the physical extents of a pipe's corroded area can be determined and then trigger an early warning for repair. The maintenance staff can then arrange proper remedy to avoid fatal breakdown.

### **Biography of Speaker**

Ir Dr. Peter W. Tse is a Fellow of the American Society of Mechanical Engineers (美国机械工程院院士), a Foundation Fellow of the International Society of Engineering Asset Management, a Fellow of BSOMES, a Founder Fellow of IIUS and a member of HKIE. He is currently the Director of Croucher Optical Nondestructive Testing Laboratory and the Smart Engineering Asset Management Laboratory. He is a Guest Professor of Qingdao University of Technology and also the O-Committee Member of several ISO's Technical Committees. As of today, he has published more than 400 articles in various journals and proceedings, technical reports and his work has been reported in a number of newspapers and TV news. Currently, his research outcomes have been applied to over 30 local and international companies, including the world largest oil sand exploration and production company.

### **Fee**

**Free of Charge**

### **Media**

Cantonese with the content of slides in English

### **Request of CPD Certification**

A 1.5-hour CPD certificate will be given to qualified attendants. Please inform us if you need such certificate.

### **Registration & Enquiries**

The venue of the presentation can only host a maximum capacity of 100 persons. Priority of registration will be given to those applicants who work in a company that has maintenance and inspection duties related to pipes and structures. For registration, please visit the website listed below. The deadline for application is **Feb. 15, 2019** or when the registration is full. Once you have registered, please ensure that you will attend the presentation on time as we have to pay the refreshment charge for each attendant. In case if you cannot attend the presentation after completing the registration process, please inform us on or before Feb. 15, 2019 by email. Successful applicants will be informed by receiving a confirmation e-mail sent after the Chinese New Year. A copy of the confirmed email is required to be presented at the registry of the venue entrance for verification. If the applicants have not received the confirmation e-mail on or before Feb. 18, 2019, their applications will be regarded as not successful. If typhoon signal no. 8 or black rainstorm signal is in force and still hoisted after 10:00 am on Feb. 21, 2019, the presentation will be cancelled without further arrangement or notification.

For any enquiry, please email to [seamlab@cityu.edu.hk](mailto:seamlab@cityu.edu.hk) or contact us via 34422651 or 34424602.

### **Website for registration:**

**The full URL for the registration form:**

[https://docs.google.com/forms/d/e/1FAIpQLSeXOrQhDTPbdrIVtF8nCjPENqowElhVY1Ua9Lj\\_iKMbeJrFzA/vi\\_ewform](https://docs.google.com/forms/d/e/1FAIpQLSeXOrQhDTPbdrIVtF8nCjPENqowElhVY1Ua9Lj_iKMbeJrFzA/vi_ewform)

**The QR code for the registration form:**



For knowing more about the research work and achievements of the speaker, Ir Dr. Peter Tse, please visit the websites: [www6.cityu.edu.hk/seam](http://www6.cityu.edu.hk/seam) and [www6.cityu.edu.hk/cndt](http://www6.cityu.edu.hk/cndt)

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