SEMINAR ON BUILDING FAÇADE INSPECTION 2022

and

Launch of TR 78-2:2021: Building facade inspection using unmanned aircraft systems (UAS) – Part 2: Specification for quality management and application of artificial intelligence (AI)

28 April 2022 (Thu)
9.00am – 5.00pm

Venus Grand Ballroom
Level 3
Furama RiverFront

CPD (Approved)
6 PDU (PE, CEng)
STU (2 Safety, 3 Structural)

CPD (Pending)
CPD (FSE, FSM)

SPEAKERS

Er. Tay Ah Ching
BCA

Mr Mathieu Meur
DP Facade

Mr Teong Soo Soon
WG for TR 78:2-2021

Dr Martin Saerbeck
TÜV SÜD

Er. Chin Leong Siong
BCA

Mr Adrian Brown
Meinhardt

Er. David Ng
ONE SMART Engineering

Ms Carol Lee
TÜV SÜD

Mr Justin Chan
Avetics Global

Er. Sivakumaran Murugesu
Façade Inspector JAC / IES Academy

FEES

IES Members: $306.02
RE/RTO, CIJC Members: $348.82
Non-Members: $380.92

(Inclusive of one complimentary copy of TR 78-2:2021. All prices inclusive of GST)

****10% off** for group registrations of 5 or more participants*

P.S.: Only registered participants who are fully-vaccinated will be allowed entry into the event venue. Walk-ins/partially/non-vaccinated persons will turned away.

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For enquiries, please contact Desmond (desmond@iesnet.org.sg) or Jiayu (jiayu@iesnet.org.sg).

ABOUT THE SEMINAR

To ensure the performance of building façade systems over their designed life-span and to mitigate the risk of injury due to falling façade elements, the new Periodic Façade Inspection (PFI) regime has come into effect since 1 January 2022. The aim of the regime is to help detect and address façade deterioration in a timely manner.

The Building and Construction Authority (BCA) has been encouraging the use of available technologies to increase productivity and efficiency in the Built Environment sector. When conducting façade inspections, Unmanned Aircraft Systems (UAS), or drones, can be used to assist the Competent Person (CP) in performing visual inspections. The use of drones makes façade inspections safer, more efficient and less labour-intensive.

Further, BCA has developed, together with industry stakeholders, the world's first Technical Reference on using drones to conduct building façade inspections under the Singapore Standardisation Programme administered by Enterprise Singapore.

The seminar will highlight the above aspects relating to building façade inspection and will also present some initiatives in the training and certification of personnel.

PROGRAMME

0900	Opening Brief
0905	An Overview of the New Periodic Façade Inspection (PFI) Regime by **Er. Tay Ah Ching**, Deputy Director, Façade Engineering & Technology Department, BCA
0935	Importance of Façade Inspections - Case Studies by **Mr Mathieu Meur**, Director, DP Façade
1010	Q&A 1
1030	Tea Break 1
	Launch of TR 78-2:2021 Building Façade Inspection using Unmanned Aircraft System (UAS) – Part 2: Specification for quality management and application of artificial intelligence (AI)
1055	Introduction to TR 78-2:2021 by **Mr Teong Soo Soon**, Convenor, TR 78-2:2021
1115	Opportunities and challenges of adopting drone façade inspection by **Dr Martin Saerbeck**, CTO Digital Service, TÜV SÜD
1145	Creating a technology enabled and competent Periodic Façade Inspection ecosystem through Accreditation Programme by **Er. Chin Leong Siong**, Principal Engineer, Façade Engineering & Technology Department, BCA
1155	Q&A 2
1225	Lunch
1325	Is your façade 'safe'? by **Mr Adrian Brown**, Global Director, Fire Engineering Performance, Meinhardt
1400	Possibilities offered by Advanced Technologies for Building Façade Inspection by **Er. David Ng**, Co-Founder & Executive Director, ONE SMART Engineering
1435	Smart Façade Inspection by **Ms Carol Lee**, Senior Engineer, Drone Façade Inspection, TÜV SÜD
1510	Tea Break 2
1535	UAVs for facade inspection: Risk mitigation for flights in high-density urban environments by **Mr Justin Chan**, Business Development Manager, Avetics Global
1610	Certificate in Façade Inspection Course by **Er. Sivakumaran Murugesu**, Co-Chair, Façade Inspector JAC, and Trainer, IES Academy
1645	Q&A 3
1715	End of Seminar

Er. Tay Ah Ching
BCA

An Overview of the New Periodic Façade Inspection (PFI) Regime

To mitigate the risk of falling façades, due to our ageing building stock, a new Periodic Façade Inspection (PFI) regime has been implemented, since January 2022, to ensure public safety. This presentation will cover (i) the PFI framework and its implementation status, (ii) technology-enabled inspection methodologies, such as drone technology, to conduct visual inspection of building facades, (iii) the launching of the TR 78-2:2021 – 'Specification for quality management and application of artificial intelligence (AI)' and (iv) development of the Accreditation Programme for Drone Service Providers (DSPs) offering facade inspection services.

Er. Tay is a registered PE (Civil) with more than 25 years of experience in engineering practice. She was involved in the drafting of the PFI legislations, developing façade inspection courses, formulating façade inspection guidelines and conducting R&D studies on the latest technological developments for façade inspection. Er. Tay was the co-convener of the working group for the drafting of TR 78-1:2020 and TR78-2:2021.

Mr Mathieu Meur
DP Facade

Importance of Façade Inspections - Case Studies

Through selected case studies, we can highlight various issues experienced in building envelopes, that could have been catastrophic, had they not been detected at an early stage. We will review the external signs that pointed at the underlying problems, as well as the methods and tools adopted to detect these issues. In each case, we explain exactly what went wrong, what could have been done to avoid them happening, and what was eventually done to fix the problems.

Mr Mathieu Meur provides strategic and technical leadership, as the Director of DP Façade. Through his training as a multi-disciplinary engineer, and subsequent years of experience heading one of the largest façade consultancies in the world, he has developed extensive knowledge of all types of building envelope systems, their design, engineering, and related codes of practice. Mr Meur has worked on numerous major construction projects on five continents, including Resorts World Sentosa and Changi Airport Terminal 1 Upgrading, in Singapore, and The Dubai Mall, in Dubai.

He is a frequent speaker at conferences, writes for technical publications, and has been a Lecturer at the Building and Construction Authority for many years.

Mr Meur has also been an active member of several Singapore Standards Working Groups, since 2005, writing and updating local standards related to the building envelope.

Launch of TR 78-2:2021 Building Façade Inspection using Unmanned Aircraft System (UAS) – Part 2: Specification for quality management and application of artificial intelligence (AI)

Synopsis

The use of Unmanned Aircraft Systems (UAS) is known to be a smarter, more efficient and more productive alternative to the conventional methods for conducting visual inspection of the facades of high-rise buildings. In December 2020, the TR 78-2:2020 was published to provide guidance on conducting facade inspection works using UAS. However, the adoption of this mass data capturing inspection method has called for new standards in data management and data interpretation. To assist Competent Persons in addressing these challenges, an industry workgroup composed of experts in UAS, AI, and facade inspection was formed in 2021 to develop Part 2 of TR 78, which requires UAS operators to possess internationally recognised quality management systems and specific competency in using AI to produce reliable inspection results consistently. TR 78-2:2021 was successfully published in December 2021.

Mr Teong Soo Soon, the convenor of TR 78-2:2021, will share on the details of this TR. It provides a set of non-exhaustive specifications for the use of AI for facade defect detection and privacy protection. It also specifies the qualifications and duties of a UAS operator to become an Inspection Service Provider (ISP).

Dr Martin Saerbeck from TÜV SÜD will provide insights into the opportunities and challenges of adopting UAS for facade inspection. While this technology offers tremendous opportunities even beyond façade inspection, it also introduces technological and socio-technological challenges. Through the lens of an Inspection Services Provider, Dr Saerbeck will share how we can best navigate these challenges with the adoption of TR 78.

Er. Chin Leong Siong from BCA will talk about the upcoming accreditation program for ISPs to become accredited Inspection Bodies. This accreditation programme builds on TR 78-1 and TR 78-2 as the conformance reference and standard, and will be developed in collaboration with Singapore Accreditation Council as part of BCA's holistic effort in creating a technology enabled and competent PFI ecosystem.

Mr Teong Soo Soon
Convenor, TR 78-2:2021

Mr Teong is currently heading ST Engineering's Unmanned Aircraft Systems (UAS) business, overseeing the technology and product development as well as business operations for both military and commercial markets. With over 20 years of aviation experience for both manned and unmanned aircraft related programmes, Mr Teong led the development of the DroNet solution which was granted the first Beyond-Visual-Line-of-Sight (BVLOS) permit in Singapore in 2019. Mr Teong was the co-convenor of the working group for the drafting of TR 78-1:2020 and TR78-2:2021.

Dr Martin Saerbeck
TÜV SÜD

In his role as CTO Digital Service at TÜV SÜD, Martin leads strategic research and development initiatives of novel digital testing solutions in the domains of AI, Robotics, and IoT technology. Martin holds a degree in Computer Science and a PhD in Industrial Design. He has 15+ years of experience in leading the development of trusted technical solutions for both industry and academia. He represents TÜV SÜD in several national and international standardisation committees. Martin Saerbeck contributed on behalf of TÜV SÜD to the development of TR 78-1:2020 and TR78-2:2021, addressing the technological challenges of drone and AI for façade inspection.

Er. Chin Leong Siong
BCA

Er. Chin is a Principal Engineer in the Façade Engineering and Technology Department of Building Resilience Group, Building and Construction Authority. Prior to joining BCA, he was involved in major infrastructure and building projects both in Singapore and overseas. He has participated in technical committees and working groups to review and develop design codes, standards and technical references. He is a registered Professional Engineer with the Professional Engineer Board and a Chartered Engineer with the Institution of Structural Engineers, UK.

Mr Adrian Brown
Meinhardt

Is your façade 'safe'?

Following the 2017 Grenfell Tower fire, the UK government banned the use of combustible aluminium composite panel (ACP) in rain screen facades of new constructions and recommended the removal or replacement of combustible ACP and cavity insulation from existing high rise buildings. A flow chart determine the safety of facades (i.e. having external wall systems which contain only limited-combustibility materials) was also included. Due to problems created by the recommendations, the government replaced it with a more objective risk assessment methodology published by the British Standards Institute. This presentation will give a high level view of the process which relies on both table top and on-site analysis, in which the use of drones will be imperative.

Adrian is the Global Director for Fire Engineering Performance at Meinhardt Singapore. He previously supported Dubai Civil Defence (DCD) as a Fire Service Technical/Policy Advisor in respect of Operational Intervention, Fire Engineering design, Training, Crisis and Strategic Risk Assessment and Management, Companies Approvals and forensic fire investigation.

In this role, he had the responsibility for the review and approval of engineering designs and fire strategies for complex and high-rise building projects as well as the issue of façade approvals. Adrian has also spent 38 years with the UK Fire and Rescue Service, the last four of which as the Director of the Fire Engineering, Building Design and Fire Investigation courses at the UK National Fire Service College.

Er. David Ng
ONE SMART Engineering

Possibilities offered by Advanced Technologies for Building Façade Inspection

The Building and Construction Authority (BCA) has introduced a new Periodic Facade Inspection (PFI) regime to facilitate the early detection of facade deterioration and allow defects to be rectified in a timely manner. Drone and Artificial Intelligence (AI) technologies will be deployed to carry out the PFI in a more efficient and practical way to improve the productivity and enhance safety of the Competent Persons (CPs) and Façade Inspectors (FIs). This can save a lot of time and avoid potential human errors in carrying out the 100% visual inspection that is done by analysing the photos to identify defects. This presentation will elaborate on the potential and benefit of using advanced technologies such as drones and AI for PFI, with particular reference to public sector buildings.

Er. David Ng is a Professional Engineer (Civil), Specialist Professional Engineer (Geotechnical), Qualified Erosion Control Professional (QECP), ABC Water Professional and Competent Person (CP) for Periodic Facade Inspection (PFI) in Singapore. He has more than 20 years of experience in management, planning, design and construction of major infrastructure and transportation projects in Singapore, Malaysia and India.

Ms Carol Lee
TÜV SÜD

Smart Façade Inspection

Operational safety has always been a major concern for inspectors especially when working at height. With buildings getting smarter, building operation and the inspection services are also going digital. It is necessary to adopt a façade inspection solution that leverages modern technology to stay competitive, minimise risk and increase efficiency. This presentation introduces a case study using next generation drone facade inspection that utilises drone technology, Artificial Intelligence (AI) and the digital twin concept to construct a 3D reality model of the building façade.

As the Senior Engineer for Drone Façade Inspection in the TÜV SÜD Digital Service team, Carol supports the development of 3D mapping technology using drones to improve conventional façade inspection and provide a better, faster and safer option to building owners. Carol is also a registered Façade Inspector and has eight years of experience as a façade specialist, which included exploring and implementing various façade system design concepts and technical principles, and bridging the gaps between general architectural designs, technical standards and codes of compliance. Apart from providing façade consultancy services, she has also developed façade manuals for clients and provided technical guidelines for façade construction, based on the latest design requirements and QA/QC procedures as laid down by the relevant authorities.

Mr Justin Chan
Avetics Global

UAVs for facade inspection: Risk mitigation for flights in high-density urban environments

Drones are a revolutionary technological development that aids in the safe and comprehensive visual inspection of buildings, with greater time efficiency than with traditional access solutions. Systems on drones are affected by various environmental factors, ranging from metal density affecting signal fidelity to reflective surfaces affecting obstacle avoidance systems. Also, the regulatory environment can further constrain drone operations. This presentation covers operating constraints governing facade inspections and how drone operators can mitigate the risks associated with such inspection missions.

Justin has been active in developing awareness of drones for commercial use, speaking at the BCA-IOSH 2017 Seminar, MOM WSH Technology Symposium 2017 and other forums. In addition, he has represented Avetics and presented its technological developments at several events including MOM Work At Height WSH Conference 2017/19 and World Safety Congress 2017. Justin is also a part-time lecturer at BCA Academy since 2019, teaching the Advanced Construction Technology (Drones) course under the Specialist Diploma in Construction Productivity, and was a member of the Working Group on the Technical Reference TR 78 – Building Facade Inspection Using Unmanned Aircraft Systems (UAS).

Er. Sivakumaran Murugesu
Façade Inspector JAC / IES Academy

Certificate in Façade Inspection Course

This presentation will briefly outline the general duties of the Competent Person and Façade Inspector, based on BCA's Guidelines on Periodic Façade Inspection. Next, the Certificate in Façade Inspection Course, offered by IES Academy (IESA) to develop a competent workforce in this area, will be introduced. The learning outcomes, outlines, and some course insights and tips will be shared. An overview of the upcoming courses to provide exposure for the inspection of different façade types such as cladding, precast, masonry, and curtain walls will also be provided.

Er. Sivakumaran is the Managing Director of SMS Consulting Engineers which he set up in 1999 and has grown into a medium size company providing consultancy services in the civil/structural discipline. His firm specialises in the structural design of façades and the inspection & rectification of façade structures. Gardens by the Bay, MBFC, Marina One, Reflections and Ion Orchard are some of the projects completed under his supervision.

He has been a council member of the Association of Consulting Engineers Singapore (ACES) for the past 9 years and was Chairman of its Civil & Structural Practice Committee. He currently serves as the Honorary Treasurer.

Er. Sivakumaran has been an active participant in standards development and was presented with the Enterprise Singapore Award recognising his contribution. His company also won the ACES Enterprise Award in 2014.

TERMS & CONDITIONS

Registration
Registration will be on a first-come-first-served basis and will only be confirmed upon receipt of full payment, unless otherwise invoiced. All registrations must be submitted with the completed online Registration Form.

Closing Date & Payment
The closing date for registering for the seminar shall be Monday, 25 April 2022. Payment via credit card, PayPal and invoice should be settled at least 2 business days before the event.

Confirmation of Registration
Confirmation of registration will be given at least 2 business days prior to the seminar, or earlier where possible, via email. We reserve the right to allow only confirmed registrants to attend the event.

Refunds
No refunds will be made for withdrawals. Replacements will be allowed only if written notice is received by us at least 3 business days before the seminar. However, when an IES member is replaced by a non-member, the participant shall pay the difference in the relevant fees at least 3 business days before the seminar.

Cancellation/Postponement
Changes in venue, date, time and speakers for the events can occur due to unforeseen circumstances. The organiser reserves the full right to cancel or postpone the event under such circumstances without prior reasons. Every effort, however, will be made to inform the participants or contact person of any cancellation or postponement.

Fees will be refunded in FULL if the Event is cancelled by the organiser.

Vaccination Status
This is a fully vaccinated event and all registered attendees will be required to present their proof of being fully vaccinated at the point of check-in at the event venue. Registered attendees may risk being turned away at the event should they not be able to produce proof of being fully vaccinated by the event day. For more information on vaccination status, please refer to https://file.go.gov.sg/vdsmminfo.pdf.

Entry to event venue
Registered participants who have made payment and comply with vaccination requirements will be allowed into the event venue. No walk-in registrations will be allowed.

Enquiries
For group registration and more information, please email: **desmond@iesnet.org.sg** or **jiayu@iesnet.org.sg**