**Mechanical Engineering Technical Division**
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## REGISTRATION

**ONE DAY COURSE ON PIPELINE INSPECTION USING GUIDED WAVES"**
16 May 2017 (Tuesday) | Wisma IEM

| Name(s) | IEM M'ship No. /Grade | Fees (RM) |
|---|---|---|
| | | |
| | | |
| SUB TOTAL | | |
| ADD GST @ 6% | | |
| **TOTAL PAYABLE** | | |

Company:_____

Address:_____

_____

Mobile:_____ Tel(O):_____Fax:_____

E-mail:_____
(*Please write clearly as the "Confirmation Notification" will be sent via email*)

Contact Person:_____ Designation:_____

Signature:_____ Date:_____

## PAYMENT DETAILS

☐ Cash RM_____

☐ Cheque no. _____ for the amount of RM _____
(non-refundable) and made payable to "**THE INSTITUTION OF ENGINEERS, MALAYSIA**" and crossed '**A/C Payee Only".**

**Terms & Conditions:**

- For ONLINE REGISTRATIONS, only ONLINE PAYMENT is applicable [via Credit Card]
- Payment via CASH / CHEQUE / BANK-IN TRANSMISSION / BANK DRAFT / MONEY ORDER / POSTAL ORDER / LO / WALK -IN will be considered as NORMAL REGISTRATION
- For online registrations, please note that **payment MUST be made on registration.**
- **FULL PAYMENT** must be settled before commencement of the course, otherwise participants will not be allowed to enter the hall. If a place is reserved and the intended participants fail to attend the course, the fee is to be settled in full. If the participant failed to attend the course, the fee paid is non refundable. Registration fee includes lecture notes, refreshment and lunches.
- The Organising Committee reserves the right to cancel, alter, or change the program due to unforeseen circumstances. Every effort will be made to inform the registered participants of any changes. In view of the limited places available, intending participants are advised to send their registrations as early as possible so as to avoid disappointment.

IEM
The Institution of Engineers, Malaysia

**Organised by:**
**Mechanical Engineering Technical Division,**
**The Institution of Engineers, Malaysia**

# ONE DAY COURSE ON "PIPELINE INSPECTION USING GUIDED WAVES"

**Date**

**16 May 2017 (Tuesday)**
**9.00am – 5.30pm**

**Venue**

**C&S Lecture Room,**
**Second Floor, Wisma IEM**

**REGISTRATION FEES (SUBJECT TO 6% GST)**

| Grade | Online Fee | Normal Fee |
|---|---|---|
| IEM Graduate Member | RM 150.00 | RM 180.00 |
| Corporate Member | RM 350.00 | RM 400.00 |
| Non IEM Member | RM 700.00 | RM 750.00 |

**Closing Date: 13 May 2017**

**BEM Approved CPD/PDP Hours: 5**
**Ref. No: IEM17/HQ/102/C**

**GST is implemented effective 1 April 2015**

**PERSONAL DATA PROTECTION ACT**

I have read and understood the IEM's Personal Data Protection Notice published on IEM's website at http://www.myiem.org.my and I agree to IEM's use and processing of my personal data as set out in the said notice.

## Introduction

Guided wave testing (GWT) is an advanced non-destructive testing (NDT) method which utilises low frequency ultrasonic (10 to 100 kHz) to detect corrosion and features in pipelines. Currently, GWT is predominantly used to inspect pipelines in the oil and gas industry (British Standards Institution, 2011).

## Trainer Profile

**Dato' Ir. Dr. Mukhlis Chua**

Dr. Chua is a mechanical engineer with over 24 years field experience in the O&G and petrochemical industry. He graduated with a First Class honour degree in Mechanical Engineering from the University of Manchester in 1983 and obtained his Masters in Advanced Applied Mechanics with Distinctions from Imperial College of Science and Technology in 1984.

He began his career as a Design Engineer at Texas Instruments, Singapore in 1984 and his work took him too many countries in the world. He also served two years with Nanyang Technical Institute, Singapore as an Adjunct Lecturer where he taught mechanical engineering undergraduate students in design drawings and fracture mechanics.

Dato' Mukhlis founded Inter-Granite Sdn Bhd in 1990 to provide professional service in coating detailed design for Bredero Price, Malaysia which is an oil and gas pipe coating company based in Kuantan. Since then he has worked in many Engineering, Procurement, Construction and Commissioning projects with other major oil and gas international players. In 2011, he embarked on a part time Engineering Doctorate program in Plant Process Management under the Chemical Engineering Department of Universiti Teknologi Malaysia and completed the course in 2015. He has been instrumental in the success of a research collaboration program between Imperial College of Science, Technology & Medicine and Universiti Teknologi Malaysia in the set-up of "UTM Centre for Non-Destructive Evaluation". In May 2016, Inter-Granite Sdn Bhd signed an agreement with Guided Ultrasonics Ltd, London to promote the education of guided wave ultrasonic testing technology used for the detection of defects and monitoring of corrosion in pipelines and railway tracks.

**Mr. Ben Nooteboom (Level 2 GWT Inspector)**

Mr. Nooteboom is an Australian NDT inspector with over 20 years of work experience in the field of conventional and advanced non-destructive testing methods. Over the last decade, he has conducted more than a hundred guided wave testing training courses across the globe.

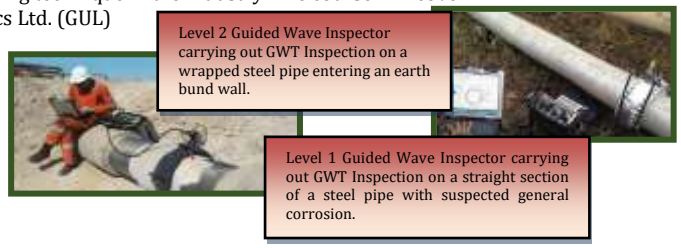
## Who should attend?

Inspection managers and associated staff members who wish to understand the fundamental concepts, strengths, limitations and commercial benefits of GWT. Only basic GWT theory is presented with no mathematical content. This is an introduction to Guided Wave Testing which is a first step towards a certification which would be able to open up to both local and overseas employment opportunities to the certificate holder in future.

## Course Objectives

The objective of this course is to create awareness and fundamental understanding of currently one of the most advanced non-destructive testing technique in the industry. The course will cover:

1. Introduction to Guided Ultrasonics Ltd. (GUL)
2. Guided Wave Testing Basics
3. Software Tools & Analysis
4. Case Studies
5. Guided Wave Inspection Savings
6. Guided Wave Monitoring
7. Training & Support
8. Guided Wave Testing Standards



Level 2 Guided Wave Inspector carrying out GWT Inspection on a wrapped steel pipe entering an earth bund wall.

Level 1 Guided Wave Inspector carrying out GWT Inspection on a straight section of a steel pipe with suspected general corrosion.

## Tentative Program

| | | |
|---|---|---|
| 08:30am – 09:00am | **REGISTRATION** | |
| 09:00am – 9:30am | **Introduction to Guided Ultrasonics Ltd** - *by Dato' Ir. Dr. Mukhlis Chua* | |
| 09:30am – 11:00am | **Guided Wave Testing Basics (Part 1)** – including GWT as a screening and Comparison of GWT and conventional UT inspection – *by Dato' Ir. Dr. Mukhlis Chua* | |
| 11:00am – 11:15pm | **MORNING TEA BREAK** | |
| 11:15am – 13:00pm | **Guided Wave Testing Basics (Part 2)** – including Attenuation and test range, Calibration and DAC curves, types of noise, C-scan display and feature orientation - *by Dato' Ir. Dr. Mukhlis Chua* | |
| 13:00 – 14:00pm | **LUNCH** | |
| 14:00 – 15:30pm | **Guided Wave Monitoring** – including Principles of guided wave monitoring, advantages of monitoring, application areas, the gPIMS® system - *by Dato' Ir. Dr. Mukhlis Chua* | |
| 15:30 – 15:45pm | **AFTERNOON TEA BREAK** | |
| 15:45 – 17.00pm | **Workshop and hands-on demonstration** - *by Dato' Ir. Dr. Mukhlis Chua assisted by Mr. Ben Nooteboom* | |
| | • Effect of frequency and frequency animation<br>• Data collection<br>• Reporting<br>• Preparing for and conducting a test<br>• Classifying anomalies | • Practical implementation<br>• Effect of temperature<br>• Data comparison tools<br>• GUL Training and Support<br>• GWT Procedures and Standards<br>• Guided Wave Testing Case Studies |
| 17:00pm | **END OF COURSE** | |

## Pre-Requisites

There are no pre-requisites for attending this course as it has been designed to be audience-friendly. Reading material notes will be provided during this course.