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MATERIALS MIND

Issue 14
July 2016

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Institute of Materials, Malaysia

CORROSION UNDER INSULATION

Join the Conference

October 2016, Kuala Lumpur

NEW!!

- *Certified IMM Courses*
  CATHODIC PROTECTION TECHNICIAN
  CATHODIC PROTECTION ENGINEER

ISSN 2289-9030

Organized by:

Institute of Materials, Malaysia
Under IMM Corrosion Committee

HRDF CLAIMABLE

1-Day Conference on

CORROSION UNDER INSULATION

THEME: EFFECTIVE CUI MANAGEMENT

Date : 13th October 2016
Venue : Level 1, Corus Hotel, Kuala Lumpur
Time : 8.30 am - 5.00 pm

For years, the oil & gas, petrochemical, power, oleo-chemicals, marine and infrastructure facilities had faced Corrosion Under Insulation ("CUI") problems with their cold and hot insulated equipment and pipes. The CUI problems have been attributed to one or more of the following factors:

(1) Incorrect selection and/or installation of insulation materials.
(2) Incorrect selection and installation of insulation/cladding systems.
(3) Incorrect selection and/or application of protective coating systems under the insulation.
(4) Inadequate Inspection and Monitoring of the performance of the materials under the insulation.
(5) Physical and/or mechanical damage to the insulation/cladding systems.
(6) Use of incorrect inspection technique for CUI detection.
(7) No effective CUI surveillance and inspection strategy and plan.

To-date, there has been mainly Quick-Fix Solutions and short-term repairs but no effective long term solutions. This conference is aimed at bringing together experiences, knowledge and ideas to try and tackle this problem in a holistic way going forward. Presenters from the industry and academia involved in plant/facilities operations & maintenance, inspection & monitoring, protective coatings, insulation, cold & hot processes, etc will be gathering at this event to present their knowledge and sharing their experiences. The time spent today to prevent and manage CUI will improve plant/facilities safety and reliability, and reduce its life cycle costs.

Participant Registration Fees:

IMM Member	RM 700 + RM 42 (6% GST) = RM 742.00
Non- IMM Member	RM 800 + RM 48 (6% GST) = RM 848.00

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TENTATIVE PROGRAM

IMM 1-DAY CONFERENCE ON CORROSION UNDER INSULATION
13th OCTOBER 2016
BALLROOM 1, LEVEL 1, CORUS HOTEL, KUALA LUMPUR

TENTATIVE PROGRAM

7:30am	Registration & Light Breakfast
8:30am	Conference Announcements by Master-of-Ceremony
8:40am	Safety Briefing
8:50am	Opening Speech by Mr. Mohd Azmi Mohd Noor, President of IMM
9:00am	**SESSION 1** Chairperson's Introductions
9:05am	**CUI Mitigations — A System Approach via NACE Standard SP0198-2010** (*Mr. Benson Soon, The Sherwin-Williams Company)*
9:25am	Q & A
9:30am	**Thermal Spray Aluminium (TSA) Field Application to Mitigate CUI (CSCC) - A Case Study** (*Mr. Rehan Ahmed, PETRONAS Carigali Sdn Bhd*)
9:50am	Q & A
9:55am	**Ultrathin Thermal Insulation Technology** (*Ms. Elena Alexandrova, Synergy Spectacular Sdn Bhd)*
10:15am	Q & A
10:20am	**COFFEE/TEA BREAK @ CORUS 1**
10:45am	**SESSION 2** Chairperson's Introductions
10:50am	**Utilization of Magnetostrictive Sensor (MsS) Inspection for CUI Piping Inspection at MLNG** (*Mr. Jeremy Yeo, Malaysia LNG Sdn Bhd)*
11:10am	Q & A
11:15am	**Strategy on CUI Assessment and Mitigation in Shell Malaysia Exploration and Production (SMEP)** (*Mr. Mohd Hafiz Zakaria, Shell Malaysia*)
11:35am	Q & A
11:40am	**Factors Leading to CUI in Offshore Facilities** *(Dr. Hamed Mohebbi, PETRONAS)*
12:00noon	Q & A
12:05pm	**Operational Challenges in Dealing with CUI in Power Sector** (*Mr. Mohamad Lutfi Samsudin, Malakoff Power Berhad)*
12:25pm	Q & A
12.30pm	**LUNCH & VISIT TO EXHIBITION HALL @ CORUS 1**
2:00pm	**SESSION 3** Chairperson's Introductions
2:05pm	**Quantitative Acoustic Emission Test Method for Detection, Prevention, Monitoring and Predicting Methods** *(Eng. Talmor Suchard, Sentro Technologies USA)*
2:25pm	Q & A
2:30pm	**Proposing a CUI Testing, Detection, Prevention, Monitoring and Predicting Methods** (*Ir. Dr. Mokhtar Che Ismail, Universiti Teknologi PETRONAS*)
2:50pm	Q & A
2:55pm	**CUI Management, from Engineering Design Perspectives** (*Dr. Lee Chee Hong, Synergy Asset Integrity Management Sdn Bhd)*
3.15pm	Q & A
3.20pm	**COFFEE/TEA BREAK @ CORUS 1**
3:45pm	**KEYNOTE PRESENTATION** **Corrosion Under Insulation (CUI) is a Credible Threat to Asset Integrity** (*Ir. Ong Hock Guan, Sarawak Shell Bhd & Chairman of IMM Corrosion Committee)*
4:15pm	**PANEL DISCUSSION**
4:45pm	Closing Remarks
5:00pm	**ADJOURN**

TABLE-TOP EXHIBITION

Table-top Exhibition (please tick √)

Fees : RM 2,500.00 + RM 150.00 (6% GST) = RM 2,650.00

Table-top exhibition stand package included :
i) 1 Promotional table with 1 chairs ii) 1 pass for Conference Delegate

*Note : Extra delegate will be charge at RM 500/pax

Table-top Exhibition Stand No				Company Name	Contact Person	Contact Number	Amount
E1		E2					
E3		E4					
E5		E6					
E7		E8					
E9		E10					
E11		E12					
E13		E14				TOTAL	

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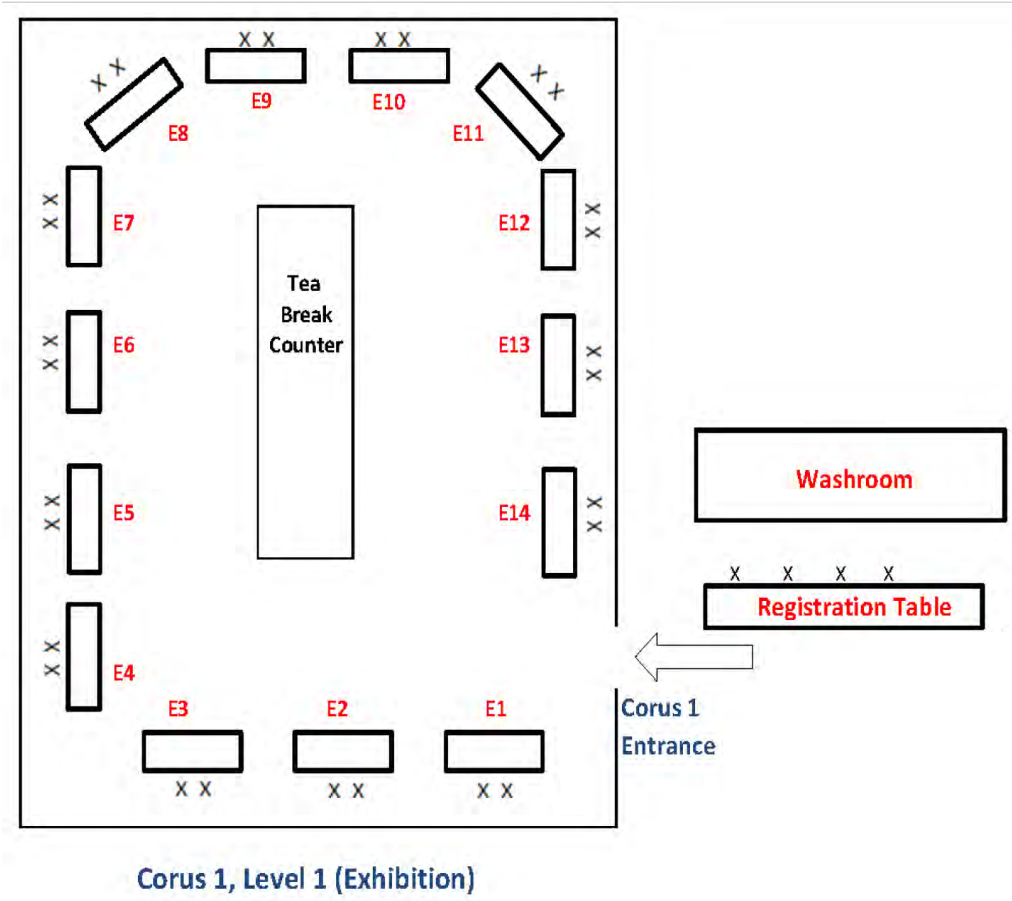

Corus 1, Level 1 (Exhibition)

Please visit our website at **www.iomm.org.my** for more info and online registration.

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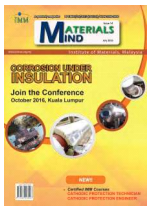

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EDITORIAL

Message from Managing Editor of Materials Mind (term: 2016 – 2018)

A new team of Materials Mind committee has been working on Materials Mind, the IMM quarterly magazine, starting 18th March 2016 (after 26th Annual General Meeting of the IMM). It is my honor to work with the committee members from industry and academia with vast experience in publication.

Materials Mind, with readership of over 8,000 in print and online, is an ideal platform for various committees to promote and report the events and activities of the institute. Readers will have first-hand information on IMM's involvement in the supporting events as well. Technical reports are also published periodically on industry-related topics for the benefits of the readers. For those with higher aspirations to fulfill, there is a wide range of IMM courses designed to meet industrial standards.

Finally, special thanks to all advertisers for this issue of Materials Mind. We are looking forward to working closely with our new and regular sponsors/advertisers in IMM's events and publications. Once again, online articles of Materials Mind can be accessed at www.iomm.org.my

Enjoy the magazine…

Dr. Tay Chia Chay
Managing Editor

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Compiled by: Athirah Talib, IMM Secretariat Officer, Institute of Materials, Malaysia

The information has been updated as of 30th June 2016

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- ✓ Identification and evaluation of coatings using handheld FTIR
- ✓ Metal oxide coatings analysis using the handheld 4100 ExoScan FTIR

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- ✓ Detection of trace contamination on metal surfaces using the handheld 4100 ExoScan FTIR
- ✓ Measure release agent on a polymer reinforced with carbon fiber
- ✓ Measurement of composite surface contamination using the Agilent 4100 ExoScan FTIR with diffuse reflectance sampling interface
- ✓ Analysis of plasma treated carbon fiber reinforced polymer composites by FTIR
- ✓ Epoxy primer thickness on aluminum measured with the handheld 4100 ExoScan FTIR

Maintain:

- ✓ Analysis of partially weathered PET and separate PET hydrolysis evaluation using the 4100 Handheld FTIR
- ✓ Exploring the relationship between ergonomics and measurement quality in handheld FTIR spectrometers

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SECOND IMM Coating Fingerprint Foundation Course

Reported by: Dr. Yoga Sugama Salim, Norimax Sdn Bhd

Supported by:

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Following the success of "first-of-its-kind" Coatings Fingerprint Foundation Course in late 2015, the Institute of Materials, Malaysia (IMM) organized the 2nd course on 23 February 2016. The Coating Fingerprint Foundation Course, which was sponsored by Perkin Elmer Sdn Bhd, was attended by players of oil and gas industry (primarily applicators and paint manufacturers). In addition, some participants were from educational institutions such as TAR University College and Curtin University Sarawak.

The training was given by Assoc. Prof. Dr. Chan Chin Han (Universiti Teknologi MARA) and Dr. Yoga Sugama Salim (Norimax Sdn Bhd) followed by practical hands-on by Mr. Lim Boon Tong (Perkin Elmer Sdn Bhd). The objective of Coating Fingerprint Foundation Course was to create awareness on the current issue and challenges pertaining paint failure and step-by-step guide to improve the quality control of paint materials. The course was concluded with the presentation of certificates by Assoc. Prof. Dr. Chan Chin Han to all participants.

Group photo

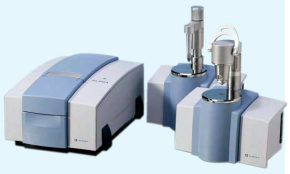
Mr. Lim Boon Tong giving a hands-on knowledge on equipment usage

FIRST "IMM Certified Coating Fingerprint Quality Controller" Course

Prepared by: Assoc. Prof. Dr. Melissa Chan Chin Han, Universiti Teknologi MARA and Dr. Yoga Sugama Salim, Norimax Sdn Bhd

Date 23 & 24 February 2016
Time 9.00 am to 5.00 pm
Venue Four Points Sheraton Hotel, Bandar Puteri, Puchong

Supported by: BRUKER



Introduction

IMM Coating Fingerprint initiatives marked a quantum leap in year 2015, where registration of Coatings Fingerprinting under Cost Reduction Alliance Initiative 2.0 (CORAL 2.0) under Malaysia Petroleum Management (MPM) and requirement of Coating Fingerprint Certification requirement in PETRONAS Technical Standards (PTS) 15.20.03 (replacing previous PTS 30.48.00.31) was officially endorsed.

The training of the "IMM Certified Coating Fingerprint Quality Controller" Course was conducted by Assoc. Prof. Dr. Melissa Chan Chin Han from Universiti Teknologi MARA and Ms. Renee Teo Yong Yin from Bruker (M) Sdn Bhd. The 2-day course was carried out in six sessions which covered theory and hands-on modules. **First batch of certified Coating Fingerprint Quality Controllers with all together 24 graduates were recorded. They are qualified to be the signatories on the Coating Fingerprint Certificate. Congratulations!!**

The emphasis of the course was on

1. Why do we need to fingerprint coatings? and how can we do it?
2. Quality assurance and quality control of polymeric coatings through **IMM Coating Fingerprint Certification Scheme**
3. Practical guides on FTIR analysis of protective coatings.

*The complete rapporteurs' report on First "IMM Certified Coating Fingerprint Quality Controller" Course can be accessed on IMM website

Theoretical session

Hands-on session

Closing remarks

Group photo

10th International Materials Technology Conference and Exhibition

Reported by: Siti Rozana Abd Karim, Materials Technology Education Sdn Bhd

IMTCE2016 featuring COATINGS & CORROSION FABRICATION & WELDING 2016

Gold Sponsors : Agilent Technologies, TA, Waters THE SCIENCE OF WHAT'S POSSIBLE.

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10th International Materials Technology Conference and Exhibition (IMTCE2016), the signature event of Institute of Materials, Malaysia (IMM), was successfully organized with an impressive record of 359 conference participants. A total of 2 plenary, 10 keynote, 69 invited, 102 oral lectures and 177 delegates were noted. IMTCE2016 was the Conference and Exhibition with a good combination of participants from academic institutions and industries (roughly 80:20); as well as from local and overseas (approximately 70:30 from 25 countries), which provided an effective platform in establishment of sustainable industry-academia linkages in materials technology. For the first time, IMM presented the **"IMTCE Loyalty Awards".** These awards were presented to the honourable loyal speakers of IMTCE for their continued sharing of their scientific findings/experience on materials through the platform of IMM since 2004. These awards are to recognize their scientific efforts in promotion and developments of Materials Sciences, Technology and Engineering.

The Banquet Dinner of IMTCE2016 was graced by Y. B. Datuk Dr. Abu Bakar Mohamad Diah, Deputy Minister of Science, Technology and Innovation (MOSTI), Malaysia. Tuan Haji Bacho Pilong, PETRONAS, Malaysia and Prof. Dr. Marek Samoc, Wroclaw University of Technology, Poland shared their latest research findings and vast experience during their plenary lectures.

Tuan Haji Bacho Pilong
PETRONAS, Malaysia

Plenary lecture: Challenges for Materials Quality & Safety Assurance in the Oil & Gas Industry

Prof. Dr. Marek Samoc
Wroclaw University of Technology, Poland

Plenary lecture: Nonlinear Optical Properties of Advanced Materials: What are the Chances for their Practical Applications

The objectives of the conference are to:

- Provide a platform for the exchange of knowledge and expertise among industrial practitioners, industry's professionals and higher learning institutions.
- Provide a forum or discussion and exchange of views on the opportunities that arise in the challenging material processing and applications through collaborations between industry and academia.

Three international symposiums were organised under the auspices of IMTCE2016. They were:

1. **ISAPM2016:**International Symposium on Advanced Polymeric Materials.
2. **ISMAI2016:**International Symposium on Materials & Asset Integrity.
3. **ISCC2016:**International Symposium on Coatings & Corrosion.

On top of the main symposiums, IMTCE2016 had also introduced thematic session of **Coatings Fingerprint Satellite Symposium (FPSS)** and two special session themes under ISAPM2016 and ISMAI2016 with title of 'Poly (hydroxyalkanoates) & Natural Rubber: Synthesis and Properties' and 'Materials Failure Analysis', respectively as initiatives to create public awareness. For the FPSS, a total of 2 keynote and 9 invited speakers shared their knowledge and ideas on the practically of the fingerprint of the polymer coatings using Fourier-transform infrared (FTIR) as one of the effective approaches for QA & QC tools for the enhancement of the overall painting coating quality assurance. Meanwhile, the ISAPM2016 and ISMAI2016 special session themes successfully achieved their aims with total of 12 speakers.

The Pre-Conference Friendly Golf Competition was held on 15th May 2016 morning at Seri Selangor Golf Club, Tropicana, a very scenic golf course in Petaling Jaya, Selangor (about 15-min drive from PWTC). A total of 36 avid golfers attending the conference enjoyed themselves for a morning golf outing. On 19th May 2016, 2 Masterclasses were conducted as post-conference activities (see Table 1). Endless supports from our co-organizers and sponsors marked the success of this prominent event of IMM.

Table 1 List of masterclasses

No.		Trainer	Tittle
1		Mr. Hideaki Harasawa (The Japan Welding Engineering Society, Japan)	Welding appreciation for non-welding personnel
2		Assoc. Prof. Dr. Winie Tan (Universiti Teknologi MARA, Malaysia)	FTIR application for coatings fingerprinting
3		Dr. Pik Leung Tang (Agilent Technologies United Kingdom)	
4		Ms. Soo Chin Heng (Agilent Technologies Singapore)	

Post Show Report of Coatings & Corrosion, Fabrication & Welding 2016 (CCFW2016)

Prepared by: Mr. Chong Nin, ECMI ITE Asia Sdn Bhd

From Left: Mr. Rehan Ahmed, PETRONAS Upstream Malaysia; Assoc. Prof. Dr. Melissa Chan, Organising Chairperson of IMTCE2016; Mr. Mohammad Azmel Harun Rasheed, Malaysia Petroleum Resources Corporation (MPRC); Prof. Dr. Mohamad Kamal Harun, AKEPT Malaysia; Ir. Dr. Shahreen Zainoreen Madros, Executive Director, Malaysian Petroleum Resources Corporation (MPRC); En. Mohd. Azmi Mohd. Noor from PETRONAS, Upstream HSE; Ir. Mohd. Suradi Yassin, Director, Materials Technology Education Sdn Bhd and Mr. CP Saw, Managing Director of ECMI ITE Asia Sdn Bhd.

Jointly organized by ECMI ITE Asia Sdn Bhd and the Institute of Materials, Malaysia (IMM), the inaugural edition of Coatings & Corrosion, Fabrication & Welding 2016 (CCFW2016) was held from 17 to 19 May 2016, at Putra World Trade Centre, Kuala Lumpur, Malaysia.

The exhibition saw a total of 1019 visitors from over 15 countries around the world throughout the 3-day exhibition, visiting 38 exhibitors from 8 countries. The visitors, who were mainly from the construction and oil & gas industries, were here with the objective of discovering the latest technologies and products while looking for new suppliers.

CCFW2016 was officiated by En. Mohd. Azmi Mohd. Noor from PETRONAS, Upstream HSE (the President of IMM) with the presence of Ir. Dr. Shahreen Zainoreen Madros, Executive Director of Malaysian Petroleum Resources Corporation (MPRC); Prof. Dr. Mohamad Kamal Harun of AKEPT Malaysia, Ir. Mohd. Suradi Yassin, Director of Materials Technology Education Sdn Bhd, Assoc. Prof. Dr. Chan Chin Han, IMTCE2016 Organizing Chairperson; Mr. Rehan Ahmed, Head of Material Corrosion & Inspection, PETRONAS Upstream Malaysia and Mr. CP Saw, Managing Director of ECMI ITE Asia Sdn Bhd.

Aside from the exhibits, visitors at CCFW2016 were able to take part in the Technical Seminars throughout the exhibition. Visitors were given the opportunity to learn more about products and technologies from experts from various brands & associations, such as RPR Technologies, Bry-Air, the Italian Institute of Welding (IIS), and the Malaysian Association of Facility Management (MAFM).

To encourage workers in the materials industry to develop their qualifications further, and university students to consider a career in materials science, IMM has initiated the Career Path Elevation Programme, which saw over 150 students exploring post-graduate options available at the booths of University Teknologi MARA (UITM), Universiti Malaya, Italian Institute of Welding, and IMM.

The full post show report is now available on the CCFW website at www.coatcorrosionasia.com.

Students from the Career Path Elevation Programme looking at an exhibitor's product demonstration

Visitors engaging in a discussion with an exhibitor

Report on IMM Taskforce on Coatings Fingerprinting (Phase 1: 2013-2014 & Phase 2 : 2014-2016) IMM

Chaired by Ms. Nurul Asni Mohamed,
Chairperson, IMM Task Force on Fingerprinting Polymer Coatings
Principal Engineer (Corrosion), Group Technical Solutions,
Technical & Engineering Division, PETRONAS GTS, Malaysia

a turnkey industry-academia project that is custom-tailored for oil and gas industry

WHY FINGERPRINT COATINGS?

Why do we need to FINGERPRINT coatings when anti-corrosion paint failures have never caused structural collapse or direct loss of primary containment?

Should the industry allow non-conforming paints to be supplied just because the price of non-conformance is not a direct cause of leak or structural failure?

The **objectives** of this Taskforce shall include but not limited to the followings:-

1. To review the available standards and specifications requiring Fingerprinting of Polymeric Coatings in the Oil & Gas Industry.

2. To review and/or to propose quality control and quality assurance techniques practiced by the paint manufacturers during manufacture and during storage.

3. To review and/or to propose spectroscopic fingerprinting testing methods in regard to the reliability, speed of testing and costs.

4. To propose a Coating Fingerprint Certificate acceptable to all parties involved in the manufacture, application and usage of Polymeric Coatings in the oil & gas Industry.

Deliveries of IMM Taskforce on Coatings Fingerprinting (Phase 1: 2013-2014)

1. Tentative Coating Fingerprint Certificate for 2-component intermediate materials of epoxy coatings was presented.

2. Fourier-transform infrared (FTIR) is a simple and reliable tool for the study of reproducibility (*i.e.* to fingerprint) of the epoxies and hardeners as well as to differentiate different types of epoxies and hardeners without any intrusion of paint formulations.

3. Fingerprinting regions of FTIR for epoxy resin and hardener are proposed and the **confidence level of acceptance** for QA & QC control is proposed at **≥ 0.900.**

Deliveries of IMM Taskforce on Coating Fingerprinting (Phase 2: 2014-2016)

1. Paint manufacturers' mock implementation of Coating Fingerprint Certificate.

2. Inclusion of Coatings Fingerprinting requirement in PETRONAS Technical Standards (PTS) 15.20.03.

3. Joint execution for the pilot study on Coating Fingerprint implementation and the development of guideline documents.

IMM Taskforce on Coatings Fingerprinting (Phase 3: 2016-2018)

Current situation.
Currently, only 2-component epoxy coating (intermediate materials) was used in the evaluation of the practicality of (1) physical analyses [*e.g.* viscosity, density, color code, non-volatile matter (by mass), mass of Zn metal/Total Zn *etc*] and (2) structural analyses (*i.e.* FTIR) for **Coating Fingerprint Certificate.** The physical and structural analyses shall not be limited to 2-component epoxy coating, but has to be extended to incorporate the following systems:-

1. inorganic zinc coatings for service up to 400 °C
2. organic zinc coatings for maintenance
3. polyester coatings for splash zone
4. silicone coatings for service up to 650 °C
5. *Etc.*

This taskforce shall comprise representatives from universities, the oil & gas operators, oil & gas fabricators, oil & gas inspection companies, oil & gas engineering consultants, instrument specialists, raw material suppliers, paint manufacturers, SIRIM *etc.*

In addition to the analyses, the task force committee will also be evaluating suitable test houses as Certified Testing Bodies (CTB) to ensure that adequate support will be made available upon full implementation.

Rapporteurs' Report on Coating Fingerprint Satellite Symposium



Reported by: Dr. Yoga Sugama Salim (Norimax Sdn Bhd), Assoc. Prof. Dr. Chan Chin Han (Universiti Teknologi MARA) and Dr. Chew Khoon Hee (Tunku Abdul Rahman University College)

Edited by: Ir. Max Ong Chong Hup (Norimax Sdn Bhd) and Ms. Nurul Asni Mohamed (PETRONAS GTS)

IMTCE2016 Under the auspices of **10th International Materials Technology Conference & Exhibition"**
a turnkey industry-academia project that is custom-tailored for oil and gas industry"

Date 17 May 2016
Time 8.30 am to 5.30 pm
Venue Putra World Trade Centre, Kuala Lumpur, Malaysia


Handheld FTIR


Benchtop FTIR


Datuk Ir, Kamarudin Zakaria giving his keynote speech

Introduction

In the Fingerprinting Satellite Symposium (FPSS), the practicality of fingerprinting polymeric coatings was highlighted. Datuk Ir. Kamarudin Zakaria, PETRONAS, Malaysia graced FPSS by delivering a keynote speech. He shared that the paints, coatings & corrosion industries in Malaysia generate a total turnover of over RM20 billion per annum across all industries, from oil & gas, buildings, transmission, transportation, defense and the shipping industries. From the recently published NACE International (National Association of Corrosion Engineers), The International Measures of Prevention, Application, and Economics of Corrosion Technologies (IMPACT) Cost of Corrosion Study in March 2016, the global cost of corrosion amounts to as much as US$2.5 trillion per annum. It stated that between 15 to 35% savings, about US$375 to US$875 billion, of this worldwide value, can be realized by implementing corrosion control strategies. He placed the successful collaboration between industry and academia under the IMM Taskforce on Coatings Fingerprinting as contributing to the long term quality assurance of coatings applied, in particular for the oil & gas industry.

Keynote and Invited speakers from different background (users, applicators, researchers, instrument suppliers) and regions gave their insights concerning coatings fingerprinting. It can be concluded that {**Coating Fingerprint Certificate**, which covers (1) physical analyses [e.g. viscosity, density, color code, non-volatile matter (by mass), mass of Zn metal/Total Zn *etc*] and (2) structural analyses (*i.e.* FTIR)} is a suitable QA/QC tool that enables paint manufacturers and customers to access the quality of the paint products, at the same time ensure that the supplied paint products by the manufacturers were not tampered.

Below are the summaries of each session:

Presentation

1. **Can we fingerprint polymer paints?**
by **Assoc. Prof. Dr. Chan Chin Han from Universiti Teknologi MARA, Malaysia**
Multi-component search across different FTIR softwares shows different possible components in all studied materials (e.g. color pigments, 2-pack epoxy intermediate materials). Hence, coatings formula remains trade secret, even though spectra of Fourier-transform infrared spectroscopy (FTIR) are submitted along with the delivery of the polymeric coatings. Characterizations of the raw materials (viscosity and density) as well as final products (adhesion and dry film thickness) can hardly be differentiated for different grades of materials with exception on the salt spray test. The salt spray test is usually performed before the paint manufacturer submits its product for qualification and tender purpose. In other words, batch-to batch Coating Fingerprint Certificate is practical approach for QA/QC. It is found that, different grades of raw materials from same raw materials supplier do not meet the acceptance criteria for the structural analysis by FTIR [*i.e.* degree of similarity (r) < 0.900]; while the same grade of raw materials (with similar specification) from different suppliers meet the acceptance criteria.

2. **Coating performance: Applicators' perspective.**
by **Mark Hew Yoon Onn from Universal Corrosion Engineering, Malaysia**
For a successful paint application, three parties are involved. They are applicators, inspectors and paint manufacturers. Applicators must adhere to standards and follow technical instruction. Improper mixing ratio (e.g. part A and part B) and incorrect use of thinner may lead to coating failure. The applicator should be aware of the weather, pollution and contamination in which the coating is applied. It is advisable that the application is done indoor. Inspectors, on another hand, must ensure the specifications are met and followed correctly. Equipment quality (such as gas compressor, sprayed gun) and weather (humidity and temperature) are two critical factors determining successful coating application. Lastly, paint manufacturers must assure

high paint quality packed with proper packaging. The **Coating Fingerprinting Certificate** can be used to detect non-conformance of paint at early stage, which may decrease the chances of premature coatings failure.

3. **Advance 2-D IR, FTIR imaging spectroscopic technique in complex polymeric material characterizations**. by **Kenneth Way from Perkin Elmer, Malaysia**

Perkin Elmer collaborated with Tsinghua University to develop 2-D FTIR imaging for complex materials (e.g. polymers, proteins, liquid crystals). In the method, they used heat perubation to study the kinetics of complex materials. In the analysis, synchronous and asynchronous can be used to study the whole range of dynamics changes in the materials. Two examples were given on biopolymers and mutagenesis in drug studies for the 2-D FTIR imaging. The distribution of proteins related to serious or mild infected can be easily observed. Imaging technique allows one to determine the ratio of copolymer and chemical microstructure of polymer blends.

4. **Characterization of Zn and non-volatile matter in polymer coating through EDS method towards Coating Fingerprint Certificate.** by **Dr. Mahmood Anwar from Curtin University, Malaysia**

Elemental and physical analyses are among the provided information (in the form of mill certificate) when we purchase metal from industry. It has been long in practice. In polymeric coatings, the similar approach should be implemented. For example, organic zinc-rich coatings, 99.995% pure metallic zinc and more than 94% metallic zinc in their zinc dust have to be revealed in the original mill certificate from the zinc dust supplier. Preliminary studies show that X-ray c/w energy dispersivespectroscopy (EDS) may be useful for timely analysis on metallic zinc purity and concentration.

5. **A world's first coatings fingerprinting: A successful industry-academia collaboration**. by **Nurul Asni Mohamed from Petronas GTS, Malaysia**

The cost of corrosion is as much as $375-875 billion USD per annum according to NACE. Typical QA/QC procedure involves (1) coatings approval control, (2) coatings specification, (3) blaster, painter and coatings inspector certification, and (4) incoming product quality. There is however a missing guideline to the incoming product quality. Coatings fingerprinting is a method of identifying a coating material through laboratory analyses. Coatings fingerprinting has been mentioned in the standards such as ISO20340, NACESP0108, IMP PSPC MSC288(87) and DNVGL-CP-0139 (Dec 2015).

The success of coatings fingerprinting based on epoxy materials has been documented in phase I project. The phase II project is concluding. At the moment, IMM is documenting the fingerprinting standards and will later be made into Malaysia standards and NACE standards. As far as potential implementation issues are concerned, there is no major impact to overall production cost (as low as 2 cents per liter of production with in-house testing and 10 cents per liter for third party laboratory). The **Coating Fingerprinting Certification** resides under IMM and is a long-term solution to cost-effective QA/QC of coatings.

6. **Handheld non-destructive FTIR analysis of a variety of coatings and substrates plus their in-service related spectroscopic changes.** By **Dr. Tang Pik Leung from Agilent Technologies, United Kingdom**

FTIR interpretation depends on interface types. In his talk, he showed a case study of fingerprinting and in-service weathering study. The cost of coating depends on additives and that dictates the performance of the paint. Dr. Tang showed a comparison between diffuse spectra against ATR spectra. According to him, diffuse spectra yield promising results and this sampling method is complementing ATR sampling method for FTIR. ATR sampling method may not be sensitive towards metallic or inorganic component. Application examples are: weathered PVC coating, epoxy cured with and without hardener; and mix epoxy curing.

7. **Possibility and limitations of FTIR finger printing of paints from a coatings producer's perspective**. by **Herdi Lindstrøm from Jotun AS, Norway**

GC-MS, LC, GPC, ICP-OES and SEM are among the tools for the QC of polymeric coatings. The degree of similarity estimated by FTIR software for the sample FTIR spectrum as compared to Reference FTIR spectrum can be used as the QC tool as well. Examples of FTIR spectra of epoxy material were given. Different types of epoxies can be differentiated using degree of similarity estimated by FTIR software. Jotun is positive and confident that coatings fingerprinting is a good QA/QC tool. Jotun would like to know further on the "How are 3rd-party laboratories performing coatings fingerprinting".

8. **Fingerprint technique as a means of ensuring specification compliance**. by **Andrew Smith from Akzo Nobel Pty Limited, Australia**

A brief QC tests conducted was given such as specific gravity, mass solids, ash contents, FTIR trade on the binder. Coatings fingerprinting is for comparison purpose and is not for chemical analysis. The certificate must be produced immediately after each batch of the paint production. There are still some challenging issues to be address for the success in implementation of coating fingerprint certification.

9. **Shell Malaysia's insights on Coating Fingerprint Certificate implementation in Malaysia.** by **Ir. Ong Hock Guan from Shell, Malaysia**

Ir. Ong elaborated Shell practice and current position. At the moment, the coatings fingerprinting is not a requirement in Shell project although it is included in Technical Specification of Shell Global Solutions International B. V. (Shell GSI) (2009) for Design and Engineering Practice (DEP 30.48.0031-Gen) on Protective Coatings for Onshore Facilities. Ir. Ong mentioned that it was probably good because the vendors for Shell also have to comply to PETRONAS qualification specification. One of the contributing factors to coatings failure is due to surface preparation. According to Ir. Ong, Shell at the moment is in neutral position but positive towards coatings fingerprinting. Shell does not check the consistency of batch-to-batch supply of paints and only new coating formulas need coating fingerprinting. Currently, Shell is looking at the development of thin coating that is more moisture-tolerant and surface-tolerant.

10. **Coatings failures: Consequences, recommendations & analysis.** by **Rehan Ahmed from PETRONAS Carigali, Malaysia**

Rehan Ahmed cited a few major incidents from 2006 Alaksan oil spill and 20% of coatings failure are due to improper design specification and poor product formulations. There is also a lack of regulations / law enforcement. For solutions, we need retailed planning (segregate online vs offline based on criticality), and perform root cause failure analysis (RCFA).

11. **Maintenance Coating and Cost of Failure.** by **Mr. M. Farid Mohamed from Petronas GTS, Malaysia**

According to M. Farid Mohamed, PETRONAS ECMP uses priority based on criticality to monitor the coatings performance. They listed down prioritization based on increased plant integrity. The process starts with planning, do, and check.

Several questions were raised during the dialogue session, as follows:-

Q1 According to Pn. Nurul, oil & gas companies are looking into asset life extension. This includes predicting the remaining life of existing coating. Pn. Nurul sought detail on the aging characterization using handheld FTIR from Dr. Tang (Agilent), whether FTIR can differentiate between good and bad coatings, as well as quantifies the remaining lifetime of a coating.

Dr. Tang replied that by using an accelerated aging of a coated steel panel, e.g. epoxy coating, under controlled environment, one can perform FTIR analysis on many spots at different aging time and conditions. In later stage, we could estimate the lifetime of the coating using PCA-based model.

Q2 Ir. Ong Hock Guan from Sarawak Shell Sdn. Bhd. asked Farid Mohamed (PETRONAS) on the applicability of risk-based assessment to the actual description plan for maintenance, e.g. blasting. Does PETRONAS follow the report by Materials, Corrosion and Inspection engineer or they still do conventional maintenance, e.g. 5-year blasting on the whole structure? Ir. Ong further queried about how PETRONAS overcomes the issue of conventional maintenance.

Farid Mohamed replied that to overcome the issue, the stakeholders from inspection, maintenance from civil and asset owner needs to meet up and discuss. Based on discussion, they could get a good flow and act further.

Q3 Jotun sought clarification on (a) the FTIR fingerprinting of inorganic components in paints, (b) library build or generation of Reference spectra, and (c) compliance between third party laboratory and paint manufacturer.

Assoc. Prof. Dr. Chan Chin Han replied that the inorganic components in paints may be IR inactive; thus one needs to evaluate other compliances in instead of only looking at the FTIR fingerprinting. For example, certificate of % purity of zinc by metal manufacturer for organic zinc and inorganic zinc to be appended with **Coating Fingerprint Certificate.** For the generation of Reference spectrum, every paint manufacturer who is involved in the project needs to generate a Reference spectrum by averaging a minimum number of 9 spectra from top, middle and bottom of the mixing tank. This reference spectrum is to be submitted for qualification test and shall be kept by the end user, e.g. PETRONAS or Shell. Pn Nurul added that PETRONAS would like to have their own library on the FTIR Reference spectra.

Q4 Mr. Andrew Smith from Akzo Nobel Protective Coatings asked Ms. Nurul Asni Mohamed from PETRONAS GTS that everybody strives to do the right thing, but who is actually responsible to the coating failure?

Pn. Nurul replied that PETRONAS has never claimed insurance or aim at any parties when coating fails. Paint manufacturers and applicators point finger towards each another for premature coatings failure. Implementation of **Coating Fingerprinting Certificate** should enhance reproducibility of batch-to-batch paint, which will leads to quality assurance in coatings performance.

From the right: Puan Nurul Asni Mohamad from PETRONAS, GTS; En. Mohd. Azmi Mohd. Noor from PETRONAS, Upstream HSE; Datuk Ir. Kamarudin Zakaria, PETRONAS, Vice President of Group of HSE & Operational Excellence; Prof. Dato' Dr. Mansor Salleh, University Kuala Lumpur; Ir. Max Ong Chong Hup, Norimax Sdn Bhd

FPSS audience

Group photo

Career Path Elevation Programme Brought Students Closer to Industry

Reported by: Dr. Lim Teck Hock, Tunku Abdul Rahman University College

Over 150 undergraduate students from several local higher institutions, amongst them MARA University of Technology (UiTM Sham Alam), University Malaysia Pahang (UMP) and Tunku Abdul Rahman University College (TAR UC), participated in a two-day event under **Career Path Elevation (CPE)** Programme initiated as a subset of the **10th International Materials and Technology Conference and Exhibition (IMTCE2016)** recently held at Putra World Trade Centre, Kuala Lumpur between 16-19th May 2016.

Participating students joined the Exhibition and Conference which allowed them to meet and mingle with representatives from 40-plus prominent industry players and roughly 200 international and local scientists/engineers, all under one roof.

The CPE initiative is part of the continuous effort of Institute of Materials Malaysia (IMM) to promote interest in Materials Sciences and Engineering amongst students. By bringing students closer to the industry, students were offered a unique chance to find out by themselves how the knowledge and training they received in universities could be applied in industry to make an impact and help solve real problems.

"Sharing of ideas and dialogue between professionals and students allowed students to understand better the expectation of companies on future employees. Additionally, young entrepreneurs may enhance their skills and gather more information on the current markets throughout the event" - Mustaqim and Farha Husna, President and vice-President of Chemistry Fusion Club, UiTM.

"Good exposure for our final year project students who attended the exhibition and technical seminars" – Prof. Dr. Agus Sutjipto from UMP.

"It's definitely a whole new experience for us"- TAR UC Chemistry and Biology Society and Materials Engineering Students.

The event ended in excitement with a lucky draw in which an ipad Mini was the grant prize. CPE and IMCTE thanks ECMI-ITE, Research Instrument Sdn Bhd, Becker Industrial Coatings (M) Sdn Bhd for sponsoring the lucky draw prizes and door gifts to the CPE's participants.

Supported by:

Oral-O session

UiTM participants

TARUC participants

A representative from Kansai Company explaining to students regarding the latest technology developed by their team

A crowded Oral-O session

Photos of IMTCE2016









IMTCE2016 Pre-Conference Friendly Golf

Reported by: Ir. Max Ong Chong Hup, Norimax Sdn Bhd

36 enthusiastic golfers gathered on Sunday 15th May 2016 morning at the Seri Selangor Golf Club in Damansara Indah, Petaling Jaya, Selangor. This Pre-Conference Friendly Golf Game held just before the start of the IMTCE2016 Conference & Exhibition brought together IMM members, friends and guests from MOGEC & MOGSC. Individual players paid RM400.00 each while corporate sponsors paid RM3,000.00 per flight which contributed to the costs of goodies and prizes. The Sponsors included Bumico-Inspirasi Sdn Bhd, Eaton Industries Sdn Bhd, MECIP Global Engineers Sdn Bhd, Norimax Sdn Bhd, Universal Corrosion Engineering Sdn Bhd, and Ultradex Engineering (Bintulu) Sdn Bhd. IMM will continue such small group friendly golf networking sessions every 3 months (Quarterly IMM Golf Medals).

Champion: Syed Mudzafar Radzin receiving prize from Mohd Azmi Mohd Noor.

1st Runner-up: Norazman Abdullah

Group photo

2nd Runner-up: Mohd Kassim Asman (on the right)

25th Asian Welding Federation Council Meeting in Osaka, Japan

Reported by: Ainil Fidrah Ghazali, Materials Technology Education (MTE) Sdn Bhd
Edited by: En. Mohd Azmi Mohd Noor, PETRONAS

The 25th Asian Welding Federation (AWF) Governing Council Meeting was held from 13th – 15th April 2016 in Osaka, Japan. Representatives from the IMM were En Mohamad Azmi Mohd Noor (IMM President) and Ainil Fidrah Ghazali (IMM Secretariat). Representatives from Japan, China, Singapore, Philippines, Indonesia, Myanmar, Thailand, Vietnam, Mongolia, India and Malaysia attended the Governing Council Meeting and various Task Force committee meetings. This time all Asian Welding Federation member countries were present.

The meetings were focused towards the implementation the AWF Common Welder Certification Scheme (CWCS) based on ISO-9606-1. Indonesia had submitted their application for ACB and granted provisional approval.

During the 3 years effective from July 2015, the Malaysian ACB will grant automatic recognition of all welders' certifications for registration as AWF Certified Welders under the CWCS. All certified welders (AWS, ISO, ASME, API, EN, JIS, TWI, IMM *etc*) can register to be AWF Certified Welder.

Group photo of representative of AWF member countries

Photos of IMTCE2016












First Seminar-Lecture on Repair Welding of Pressure Vessels In Malaysia

Reported by: Leo Paul, Materials Technology Education Sdn Bhd
Edited by: Dr. Tay Chia Chay, Managing Editor of Materials Mind & Ms. Karen Cheng, Materials Technology Education Sdn Bhd

A first seminar-lecture in Malaysia on how damages can be repaired by welding and the service life of equipment extended, was held on 14 & 15 March 2016 at Corus Hotel, Kuala Lumpur. The 2-day event was conducted by 3 experts from The Japan Welding Engineering Society (JWES). A 143-page book '*Guidelines for Repair Welding of Pressure Equipment in Refineries & Chemical Plant*' that prepared by the Japan Welding Engineering Society was made available for reference and purchase (USD 100 per copy).

The Seminar with the opening remarks by En. Mohd. Azmi Mohd. Noor, *Deputy President IMM* and *Chairman, Welding Integrity Improvement Task Force*. This seminar was attended by participants from various industry sectors such as oil & gas, petrochemcial, power plant, oleochemical, inspections etc who are involved in the maintenance, repair and overhaul of welded plant and equipment.

The seminar participants were impressed by the fact that repair welding by using approved welding procedures and specifications can extend the service life of pressurized equipment assets and thereby save on decommissioning, purchasing new equipment, delivery and installation costs.

Group photo

Certificates Presentation Ceremony

IMM Participated in Offshore Technology Conference "OTC-Asia 2016"

Reported by: Ir. Max Ong Chong Hup, Norimax Sdn Bhd

Institute of Materials, Malaysia (IMM) participated in the 2nd Offshore Technology Conference Asia 2016 (OTC Asia 2016) which was held from 22 to 25 March 2016 at Kuala Lumpur Convention Centre. The OTC-USA has been the largest oil & gas conference & exhibition in the world for many years and it was brought to Asia in Kuala Lumpur in 2014 for the first time. The OTC events were organized by the Society of Petroleum Engineers (SPE).

Programme committee members of OTC-Asia 2016

4 IMM Council Members volunteered to be committee members in the OTC-Asia 2016 Conference Programme Committee. They were Ir. Max Ong Chong Hup, Assoc. Prof. Dr. Melissa Chan Chin Han, Dr. Andrew Spowage and Ir. Mohd Suradi Yasin. Over 1,000 delegates attended the 4-day conference.

This exhibition involved many Oil & Gas Operators, EPCC contractors, fabricators, engineering consultants and vendors including corrosion companies & paint manufacturers to exhibit their products, technologies and services. It was a good opportunity for IMM to showcase its educational and technical certification programs to the industry at the IMM Exhibition Booth. Over 10,000 visitors visited the OTC-Asia 2016 Exhibition Booths over the 4 days.

IMM booth at OTC Asia 2016

Materials Integrity and Quality Assurance Forum III

In conjunction with 25th Annual General Meeting of the Institute of Materials, Malaysia

Reported by: Leo Paul (MTE-Welding Advisor)
Edited by: Tay Chia Chay (Managing editor)

Date: Thursday, 17th March 2016
Time: 2.30 pm - 7.00 pm
Venue: Dewan Tunku, Kelab Golf Negara Subang, Selangor

The third MIQA Forum was held at Kelab Golf Negara Subang (KGNS) on 17 March 2016 and was officiated by the President of Institute of Materials Malaysia, Prof. Dr. Mohd Kamal Harun who welcomed the IMM Advisor, the four distinguished speakers; Mr. Mohd Azmi Mohd Noor, Mr. Muhammad Hawari, Mr. Rehan Ahmad and Dato' Ir. Haji Mohd. Abdul Karim.

IMM Advisor, Datuk Ir. (Dr.) Abdul Rahim Hj. Hashim in his opening remarks said that in the oil & gas production industries, the asset life span can be improved through adequate welding fabrication techniques and corrosion prevention by adequate painting and coating processes. This leads to question of skilled and qualified personnel and quality management staff to ensure that work is conducted according to codes and standards. The other factor in ensuring the integrity of assets is the use of right materials, skills and supervision of applicator and quality of paint. Academia Industry collaboration can help in the development of right grade materials for industrial applications in welding, coatings for corrosion prevention.

The next speaker Mr. Mohd Azmi Mohd Noor (Head of Asset Integerity, Upstream HSE, PETRONAS) presented the developments on the subject of welding fabrication since MIQA Forum II. The oil and gas industries, including up-stream and downstream, need qualified welders according to industry codes and standards like ASME, API, AWS, EN. However, there is a gross mismatch of welding skills of SKM certificate holders between skills needed by qualified welders to the specifications of codes and standards like ASME, AWS, API, EN.

The Welding Integrity Improvement Task Force (WII-TF) of IMM is working with the Asian Welding Federation (AWF) on the Common Welder Certification Scheme (CWCS) project to qualify welders for the oil and gas industries. The CWCS project proposes to test and qualify welders to ISO 9606-1 in order to comply to the oil and gas industries requirements for the specification of welding codes and standards, eg. ASME-IX. The CWCS also reduces retesting and requalification costs to welding fabricators as CWCS incorporates a database (MOS) of qualified welders. For the implementation of the CWCS in Malaysia, the AWS has appointed IMM in 2015 as its Authorized Certification Body (MAS-ACB).

The next speaker, Mr. Muhammad Hawari (Group Technical Solutions, PETRONAS) spoke on topic 'Paint Performance Standards & Warranty' for prolong the asset life. The third speaker at the Forum was Mr. Rehan Ahmad (PETRONAS Upstream OE) addressed the subject of upgrading the IMM's present training, examination and certification of blasters, painters, coaters and the associated inspection personnel as paint quality/performance issues only 5 percent in coating failures.

It is proposed that a new revamped training and certification of coating personnel (PCT) to be implemented at 3 levels and the certification valid for a 5 year term, after which the personnel have to take a re-certification program to maintain the validity of certification. The shortcomings in the candidates' language proficiency skills is highlighted.

IMM has started to develop a brand new training and certification program for thermal spray applicators (TSA) and it is expected to be launched by Sept 2017. The entry qualification for the TSA training program would be a *lead* level PCT certification.

The last speaker at the Forum, Dato' Dr. Ir. Haji Abdul Karim Abdullah (Serba Dinamik Bhd) stressed the importance of vibration monitoring as a tool in preserving the live span of assets which have moving parts like motors, engines, machinery, etc. Vibration sensors are very important components of vibration condition monitoring technology in Reliability Centred Maintenance (RCM) program to increase the life span of machines and engines. IMM has a personnel skills certification program, *Vibration Practitioner Certification* based on ISO 18436, Levels 1 – 4 to enhance reliability centred maintenance program and increase the asset lifespan in the oil and gas industries. This event ended with a lively Q&A session followed after the presentation.

Mr. Mohd Azmi Mohd Noor

Mr. Muhammad Hawari

Mr. Rehan Ahmad

Dato' Dr. Ir. Haji Abdul Karim Abdullah

MIQA III audiences

Q & A session

IMM's 26th Annual General Meeting

Change of Guard 2016 - 2020

Reported by Ainil Fidrah Ghazali, Materials Technology Education Sdn Bhd
Edited by Dr. Tay Chia Chay, Universiti Teknologi MARA

Date: 17th March 2016, 6.00 pm – 7.15 pm
Venue: Kelab Golf Negara Subang, Kelana Jaya, Selangor

IMM salutes Prof. Dr. Mohd Kamal Harun for his vision, guidance and leadership during his tenure as President of IMM from 2012 - 2016. He had been instrumental in maneuvering the Academia-Industry collaboration which has proven to be a success in IMM. Through his leadership, IMM has embarked on specific research projects to address problems faced in the industry. The showcase project that is much talked about now in IMM is the Coatings Fingerprinting initiative and of course, more Academia-Industry collaboration will be initiated by IMM. Congratulations and thank you again to Prof. Dr. Mohamad Kamal Harun for his continuous effort of bringing IMM to higher level.

This year's AGM saw a crowd of about 62 members. Before stepping down from his seat as President of IMM, Prof. Dr. Mohamad Kamal Harun gave some highlights on IMM activities that had taken place in 2015 and Ainil Fidrah Ghazali on behalf of the Honorary Treasurer presented the statement of accounts of IMM.

At this year's AGM, the baton was passed on to Mr. Mohd Azmi Mohd Noor as the President of IMM. During the penultimate IMM Council Meeting no. 8 (term: 2014 – 2016) on 13th November 2015 at UTM Space, Jalan Tun Razak, Kuala Lumpur, positions of the Key office-bearers were filled. En. Mohd. Azmi Mohd Noor from PETRONAS Asset Integrity, Upstream Health Safety Environment (HSE) Division automatically succeeded Prof. Dr. Mohamad Kamal Harun as the new President of IMM. Assoc. Prof. Dr. Melissa Chan Chin Han from Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam was elected as Honorary Secretary and Ir. Mohd Suradi Yasin was re-elected as Honorary Treasurer. Ir. Mohd Suradi Yasin has been the Honorary Treasurer since 1996 and he is former PETRONAS manager in Materials, Corrosion and Inspection. The office-bearers of these positions commenced their duties starting on 26th AGM. Mr. Mohd Azmi Mohd Noor has 33 years of experience in the Oil & Gas Industry, 26 of which are with Shell Upstream. He has an Honours Degree in Electronics & Control Engineering from Sunderland. IMM will surely embark to greater height under En. Mohd Azmi's stewardship.

The elected council members for term 2016 – 2018 are:-

Name	Organization
1. Prof. Ir. Dr. Ramesh Singh	Universiti Malaya
2. Assoc. Prof. Dr. Tan Winie	Universiti Teknologi MARA
3. Dr. Andrew Spowage	Woodgroup Intetech, Malaysia
4. Dr. Chew Kong Chin	Becker Industry Coating (M) Sdn Bhd
5. Dr. Hasnah Abdullah	SIRIM Berhad
6. Eur. Ing. Nigel Patrick Brewitt	Norimax-MTIS
7. Ir. Max Ong Chong Hup	Norimax Sdn Bhd
8. Mr. Mohamed Siraj Abdul Razak	MIR Valve Sdn Bhd
9. Mr. Sofiyan Yahya	Cekap Technical Services Sdn Bhd
10. Ms. Nurul Asni Mohamed	PETRONAS GTS

Two members were then nominated as internal auditors; Ms. Nurjaami from Petronas and Dr. Andri Andriyana from University Malaya.

Datuk (Dr.) Abdul Rahim Hashim highlighted that the coatings fingerprinting has proved good IMM advisor – Datuk Ir. (Dr.) Abdul Rahim Hj. Hashim delivered his closing remarks. He recommended IMM continues or expands collaboration with other local industry players (e.g. MOGSC, MOCA, MOGEC, other bodies like IEM, IKM, Academy of Sciences Malaysia, DOSH, CIDB, MOSTI. Ministry of Human Resources *etc*), global entities (e.g. IOM3-UK NACE, SSPC, FROSIO, IIW, TWI, JWES, *etc*). These collaborations can enhance the professional skills of IMM members and at the same time promote IMM globally.

From left: Ms. Ainil Fidrah Ghazali, Mr. Mohd. Azmi, Prof. Dr. Mohd Kamal Harun, Assoc. Prof. Dr. Melissa Chan and Dato Ir. Dr. Ong.

Mr. Mohd Azmi presenting token of appreciation to Prof. Dr. Mohamad Kamal

Prof. Dr. Mohd Kamal handing over stewardship of IMM to Mr. Mohamad Azmi

Members of IMM; from left Dr. Edwin Jong, Ir. Max Ong, Ms Nurul Asni, Datuk Mansur, Dato Dr. Ong Eng Long, Mr. Mohamad Azmi, Datuk Abdul Rahim, Prof. Dr. Mohd Kamal, Mr Siraj, Mr. Sofiyan, Assoc. Prof. Dr. Melissa Chan, Assoc. Prof. Dr. Tan Winie and Datuk Wahiruddin

Site Visit to the Malikai TLP

A Corporate Social Engagement Event with Engineering Institutions

Prepared by: Patricia Ong, Commissioning Engineer - Rotating Equipment Shell Projects & Technology - East Operated
Edited by: Dr. Muhamad Azizi Mat Yajid, UTM

An event was organized on Friday, 29 April 2016 at Malaysian Marine & Heavy Industries (MMHE) Pasir Gudang to share the development of the Malikai project with 23 representatives from six Professional Institutions in Malaysia, namely the Institution of Engineers Malaysia (IEM), the Institute of Marine Engineering, Science & Technology (IMarEST), the Institution of Mechanical Engineers (IMechE), the Institute of Electrical and Electronics Engineers (IEEE), the Institution of Chemical Engineers (IChemE) and the Institute of Materials Malaysia (IMM). IMM was represented by Dr. Muhamad Azizi Mat Yajid, Dr. Mohd Zamri Mohd Yusop and Mr. Khidzir Zakaria.

Malikai is a deepwater oil discovery located ~100km offshore Sabah, Malaysia at a water depth of 500m. It is developed as a floating Dry Tree Unit (DTU) utilising a Tension Leg Platform (TLP). Being a fully manned platform, Malikai comes complete with living quarters (LQ) and control room to deliver nameplate production capacities of 60,000 barrels/day of Liquid and 50 million scf/day of Gas.

The event began with a safety induction for all visitors followed by a welcome speech by Momas Modon, Malikai's Project Manager who provided an overview of the Malikai Tension Leg Platform (TLP). Malikai TLP is a deep-water flagship project within Shell which has infused various industry breakthroughs and was proudly developed by a dynamic team consisting of mainly Malaysian engineers.

The group was then introduced to the Malikai TLP via various technical presentations covering TLP-specific topics such as the Single Combo Top Tension Risers (SCTTR), the Marine Instrumentation/Advisory Systems (MIS/MAS) and the Tendon Tension Monitoring System (TTMS). Video presentations on the Superlift and Loadout operations of Malikai was aired before the group broke out to several interest sessions to explore the Malikai Operator Training Simulator (OTS), material selection of tendons and high-density polyethylene (HDPE) lining used to line some of the pump caissons on the TLP.

Thereafter, the visitors continued with a site visit to the Malikai TLP itself. In groups of 4-5 pax, each Professional Institution were accompanied by a Malikai engineer and was brought around the TLP to look at among others various equipment packages onboard. They were also brought around to explore offshore living conditions in the Living Quarters and briefed on offshore power generation and emergency evacuation methods.

At the end of the visit, the visitors were served scrumptious meal and they networked among members of the various Institutions back in the comfort of the site office. It brings pride to the Malikai team to host the esteemed members of such Engineering Institutions to showcase a locally built engineering marvel. This event will surely promote future collaboration between these Institutions and Oil & Gas companies such as Shell, as well as gained recognition from Engineering Institutions on the professional contribution of their members in the Malikai project.

MATERIALS LECTURE COMPETITION 2016 (MLC 2016)

Reported by: Ir. Dr. Ang Bee Chin, Chairperson, MLC 2016
Assoc. Prof. Dr. Andri Andriyana, Co-Chairperson, MLC 2016
Ms. Nuramalia Kamal Abidin Shah, Secretariat, MLC 2016

From left to right (back): Mr. Ahmad Firdaus Shamsul Baharin (UKM), Ms. Ho Wan Ying (UM), Mr. Hoy Chun Wai (APU), Mr. M.H.M. Mubassir (UTM) and Mr. Muhammad Iqbal (UPM). From left to right (front): Dr. Nazatul Liana Sukiman (UM), Dr. Mahesh Kumar Talari (UiTM), Dr. Chew Khoon Hee (TAR UC), Ir. Mr. Mohd Azmi bin Mohd Noor (IMM President), Ir. Dr. Ang Bee Chin (UM), Prof.Dr Esah Hamzah (UTM/IMM-MLC Chairperson), Assoc. Prof. Dr. Melissa Chan Chin Han (IMM Secretary), Assoc. Prof. Dr. Andri Andriyana (UM) and Eur. Ing. Nigel Brewitt (Norimax Sdn. Bhd.)

The Materials Lecture Competition 2016 was jointly organized by the Center of Advanced Materials (CAM), University of Malaya, the Institute of Materials, Malaysia (IMM) and the Institute of Materials, Minerals and Mining, Malaysia Chapter (IOM3). The Semi Final of MLC2016 competition was held on the 25th April 2016 and the Final was held on 26th May 2016. Both were held at High Impact Research (HIR) Building, University of Malaya.

12 students representing public and private universities in Malaysia participated in this national-wide competition: TAR UC, MMU, UTM, USM, UPM, UKM, APU, UniMAP, UNMC, UTP, UiTM and UM. During the Semifinal, the top five finalists were selected: Mr. Hoy Chun Wai from Asia Pacific University of Technology & Innovation, Ms. Ho Wan Ying from University of Malaya, Mr. M.H.M. Mubassir from Universiti Teknologi Malaysia, Mr. Ahmad Firdaus from Universiti Kebangsaan Malaysia and Mr. Muhammad Iqbal from Universiti Putra Malaysia.

The judges for MLC 2016 finals were from Industries and Universities (Assoc. Prof. Dr. Melissa Chan Chin Han (IMM), Eur. Ing. Nigel Brewitt (Norimax Sdn. Bhd.), Dr. Mahesh Kumar Talari (UiTM) and Dr. Chew Khoon Hee (TAR UC)). Mr. Hoy Chun Wai from Asia Pacific University of Technology & Innovation won the first prize of the Materials Lecture Competition 2016 (MLC 2016). The topic of his lecture was "*Nanocellulose-Beyond Batteries*". As the winner, Mr. Hoy will represent Malaysia to the Young Persons' World Lecture Competition 2016 (YPWLC 2016) to be held in Brazil on October 2016. Ms Ho Wan Ying from University of Malaya came second with her talk on "*From Butterflies & Chameleons to Architectural Revolution*". In third place was M.H.M Mubassir from Universiti Technologi Malaysia who talked about "*Nano-hydroxyapatite, A Promising Biomaterial in Tissue Engineering*". The first, second and third winners of the MLC 2016 Finals received plaques and cash prizes of RM 3000, RM 2000, and RM 1000 respectively. The event was officiated by the Deputy Dean of Engineering, UM and closing remarks was delivered by IMM President.

The five finalists from left to right: Mr. M.H.M. Mubassir (UTM), Mr. Ahmad Firdaus Shamsul Baharin (UKM), Mr. Hoy Chun Wai (APU), Ms. Ho Wan Ying (UM), Mr. Muhammad Iqbal (UPM) and Ir. Dr. Ang Bee Chin (MLC2016 Chairperson)

Institute of Materials, Malaysia launches student chapter at Curtin Sarawak

Author: Dr. Vincent Lee Chieng Chen (MIMM), Public Liaison Officer of IMM Miri Chapter

Miri – 12 May 2016 – The Institute of Materials, Malaysia (IMM) officially launched its Student Chapter at Curtin University, Sarawak Malaysia (Curtin Sarawak), making it the fourth IMM Student Chapter being established in Malaysia.

The launching ceremony held at the Curtin Sarawak campus saw the signing of an official launch certificate by Mr. Mohd Azmi Mohd Noor, President of the IMM, and presented to the Pro Tem Chairman of IMM Curtin Sarawak Student Chapter, Mr. Ker Tze Sheng. The IMM Curtin Sarawak Student Chapter is fully supported by both IMM Council and IMM Miri Chapter. Witnessing the signing and handover were Ir. Assoc. Prof. Dr. Edwin Jong Nyon Tchan, Chairman of IMM Miri Chapter; Ir. Assoc. Prof. Dr. Lau Hieng Ho, Acting Dean of Faculty of Engineering and Science (FOES); and Dr. Vincent Lee Chieng Chen, Public Liaison Officer of IMM Miri Chapter, Chairman of the FOES Industrial and External Relations Committee, and also the student chapter advisor.

Also present at the ceremony were Assoc. Prof. Dr. Sujan Debnath, Head of Department of Mechanical Engineering; Dr. Mahmood Anwar, Course Coordinator of Department of Mechanical Engineering; and Dr. Agus Saptoro, Chairman of the FOES Student and Alumni Committee; FOES lecturers and students.

Ir. Assoc. Prof. Dr. Lau said having an IMM student chapter at Curtin Sarawak not only adds to its prestige as a university but also provides its students a more tangible link with the Institution, so that they are in tune with current advancement in materials engineering and technology, particularly in the area of asset integrity, corrosion, coating, inspection, welding, risk-based inspection assessment, fit-for-service assessment and so forth, can effectively promote the Institution, and engage with IMM members based in Miri and elsewhere.

In concluding remark, Ir. Assoc. Prof. Dr. Edwin Jong Nyon Tchan hoped the student chapter would take advantages of IMM Council and IMM Miri Chapter events, as well as organise activities and projects of its own for the benefit of its members, the campus community, and the community at large in order to promote better network and first-hand experiences with local industries.

IMM is currently offering free student membership to all Curtin Sarawak's engineering students. Students can apply for the student membership through http://iomm.org.my/members/member_student.php

IMM is a non-profit professional society that promotes honourable practice, professional ethics and encourages education in materials science and corrosion engineering, welding technology, inspection techniques and advanced engineering applications. Currently, IMM members comprise of engineers, scientists, academicians, technicians, skilled workers and professionals are amongst the 6800 members nationwide of different professional status.

Curtin Sarawak's Faculty of Engineering and Science offers a wide range of engineering programmes that are fully accredited by Engineers Australia and Board of Engineers Malaysia. It presently has enrolments of about 2,000 students in chemical, mechanical, petroleum, civil and construction, electronic and communications, electrical power, computer system and environmental engineering.

As one of the pioneers of quality engineering education in Malaysia, it has a good pool of researchers and staffs who strive to provide industry-related opportunities to students through close collaborations with relevant industries and partnerships.

For more information on Curtin Sarawak, visit its website (www.curtin.edu.my), its Facebook page (Curtin University Sarawak Malaysia), Twitter profile (curtinsarawak), YouTube channel (CurtinUniSarawak) or Instagram (curtinsarawak).

IMM President, En. Mohd Azmi (right) presents the official launch certificate to IMM Curtin Sarawak Student Chapter Pro Tem Chairman, Mr. Ker Tze Shing (middle) while Ir. Assoc. Prof. Dr. Lau Hieng Ho looks on.

IMM representatives, staff of Curtin Sarawak and IMM Curtin Sarawak Student Chapter Pro Tem Committee in a photo call at the end of the signing.

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The International Journal of the Institute of Materials Malaysia (IJIMM) is an initiative by the Institute of Materials, Malaysia (IMM) to provide a publication platform for sharing and disseminating of primary research findings in Materials Science and Engineering. The Editorial Board of IJIMM comprises international members from the academia and industry who are recognized experts in the subject areas. With two issues a year, IJIMM reports original scientific work that has not been published elsewhere.

Aims and Scope

IJIMM aims to provide a publication platform for new research findings in **Materials Science and Engineering**, and its extended application in major areas such as **Energy, Sports, Biomedical Engineering and Built Environment** including interdisciplinary research performed at the interface of these areas. This includes analysis of properties, processing, characterisation, behaviour and operating environment of engineering materials.

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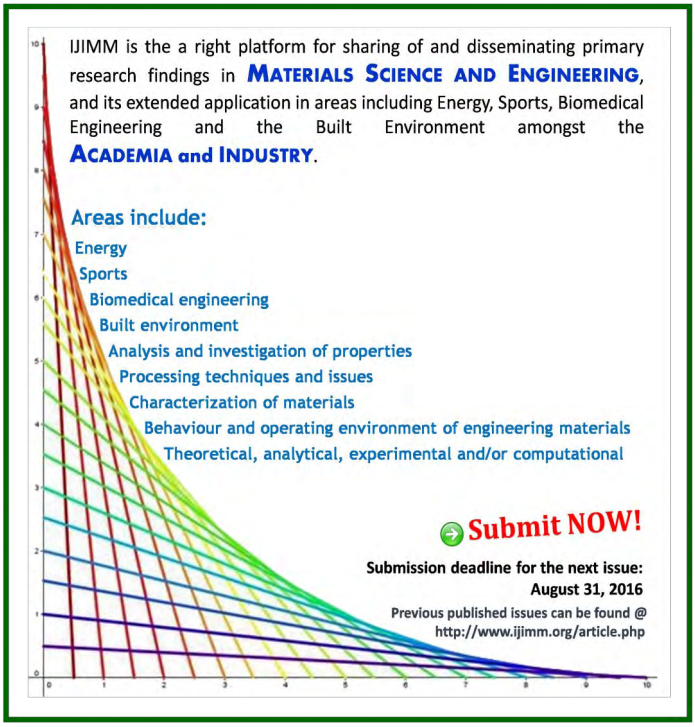

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Now available!

IMM CATHODIC PROTECTION CERTIFICATION PROGRAMS

The Institute of Materials, Malaysia (IMM) now offers 2 new Certification Programs.

- IMM Cathodic Protection Technician
- IMM Cathodic Protection Engineer

Course syllabus covers the following Codes & Standards:

BS EN 15257 : Competency Training of Cathodic Protection Personnel.
DNV RP B 401 : Cathodic Protection Design.
NACE SP 0169 : Control of External Corrosion on Underground or Submerged Metallic Piping Systems.
ISO-15589-1 : Cathodic Protection of Onshore Pipelines.
ISO-15589-2 : Cathodic Protection of Offshore Pipelines.
PTS 30.10.73.10 : Cathodic Protection of Submarine Pipelines.
PTS 37.19.30.30 : Cathodic Protection Systems for New Offshore Fixed Structures.

Each 4-day program will provide candidates with the necessary skills and knowledge to carry out Cathodic Protection services for the Oil & Gas, Petrochemical, Energy, Marine and Infrastructure industries.

There is no minimum entry requirement, however, candidates are recommended to have at least 2 years of field experience and knowledge in Cathodic Protection to succeed in the certification examinations.

Also available is a non-certification 2-day technical training course in Basic Cathodic Protection Technology for anyone interested to learn about this method of underground and underwater corrosion protection.

For more information and registration details, please contact :

Mr. Ikmal - H/P: 013-252 7660, Email: ikmal@mte.com.my
Ms. Karen - H/P: 012-295 2668, Email: karen@mte.com.my

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JOIN IMM FOR FREE

The IMM continues to encourage members of other professional societies and associations to join as Ordinary Members with no annual subscriptions. Materials Science & Technology is essential to everyone and IMM welcomes the sharing of knowledge and experience amongst professionals from all disciplines (medical, dental, nursing, architectural, engineering, science, arts, physics, biology, chemistry, banking, finance, accounting, legal, insurance, marine, oil & gas, petrochemical, geology, *etc*). IMM also offers free "Company Membership" to companies that are members of other Trade Associations such as MOGSC (Malaysian Oil & Gas Services Council), MOCA (Malaysian Offshore Contractors Association), MOGEC (Malaysian Oil & Gas Engineering Council), FMM (Federation of Malaysian Manufacturers) and others, free-of-annual subscriptions. IMM aims to bring greater awareness of Materials Science & Engineering to all sectors of industry and academia, and encourages everyone to share their knowledge, experience and expertise for the benefit of the nation. Visit www.iomm.org.my today and download the application form for Free Ordinary or Company Membership or call **+603-58823574/84** for more information.

CERTIFIED CATHODIC PROTECTION TECHNICIAN

CODE : CPT

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Course Contents

- Basic Corrosion Theory
- Fundamentals of Cathodic Protection
  - Sacrificial Anode Cathodic Protection System
  - Impressed Current Cathodic Protection System
  - CP System for Onshore & Offshore Pipeline
  - CP System for Aboveground Tank
  - CP System for Underground Tank
  - CP System for Offshore Jacket
  - CP System for Jetty
  - CP System for Steel Rebar in Concrete
- Installation of Cathodic Protection System
- Field Measurement
- Special CP and Corrosion Survey
- Troubleshooting of Cathodic Protection System
- Quality Assurance and Quality Control
- Record Keeping
- Safety
- Introduction to CP Interference

Who Should Attend

Technicians, engineers, managers and all involved in corrosion management & control

Course Duration

4 Days

Pre-Requisites

Technician with working experience

Certificate

Certified Cathodic Protection Technician

Date & Venue

Date : 26th-29th September 2016
Venue : IMM Training Room, Puchong, Selangor

CERTIFIED CATHODIC PROTECTION ENGINEER

CODE : CPE

This is a 4 days training course consisting of lectures, classroom practical, case studies and knowledge assessment. It aims to train participants in the understanding of CP principles, to be capable to go to field, accomplish periodical survey, have sufficient troubleshooting skills to handle problems within a CP system

Course Contents

- Corrosion Fundamentals & Principles
- Cathodic Protection Fundamentals
- Field Measurements
- Stray Current Identification
- Installing Cathodic Protection Components
- Troubleshooting
- Basic Design of Cathodic Protection System
- Properties and Application of Sacrificial Anodes & Impressed Current Anode & Equipment
- CP Instrumentation & Their Applications
- Soil Restivity Measurements, Pipe & Cable Locating & Current Requirement Testing
- CP Potential Measurement Including Close Interval Potential Survey (CIPS)
- Datalogging, Mapping with GPS & Coating Defect Survey (DCVG/Pearson)
- Quality Assurance & Quality Control
- Field Testing
- Record Keeping

Who Should Attend

Cathodic Protection Technician, Corrosion Engineers, Managers and all involved in the maintenance, design and specifications

Course Duration

4 Days

Certificate

Certified Cathodic Protection Engineer

Date & Venue

Date : 14th-17th November 2016
Venue : IMM Training Room, Puchong, Selangor

For registration or more information, please contact :

Ikmal (ikmal@mte.com.my)
Materials Technology Education Sdn Bhd
No. 10-1, Jalan Bandar 3, Pusat Bandar Puchong, 47160 Puchong, Selangor Darul Ehsan
Tel: +603-5882 3574/84 Fax: +603-5882 3524

WELDING ENGINEER COURSES

CODE : AWE/WE

Training Date : 19-24 September 2016
Exam Date : 26 September 2016
Venue : Miri, Sarawak

The Institute of Materials, Malaysia (IMM) in collaboration with the Japan Welding Engineering Society (JWES) will conduct certification courses and examinations leading to the status of certified ASSOCIATE WELDING ENGINEER (AWE), WELDING ENGINEER (WE) & SENIOR WELDING ENGINEER (SWE) .

JWES is an organization accredited by Japan National Accreditation Board (JNAB) to certify personnel according to the requirement of ISO 17024

Objectives

- To provide training, knowledge and examination leading to the Welding Engineer Certification in accordance to JWES—WES8013:2008 Standard of Certification of Welding Coordination Personnel and ISO 14731 Welding Coordination Tasks and Responsibilities
- To provide participants with advanced level of certificate "ASSOCIATE WELDING ENGINEER (AWE), WELDING ENGINEER (WE) & SENIOR WELDING ENGINEER (SWE)" to be leaders / instructors to produce skilled welding engineers in the future
- To enhance the participants' flexibility through exercises in this training course

Course Contents

ASSOCIATE WELDING ENGINEER (AWE)

1. Welding Processes and Equipment
2. Materials and Their Behaviour during Welding
3. Design and Construction
4. Fabrication and Application Engineering

WELDING ENGINEER (WE)

1. Advanced Welding Processes and Equipment
2. Advanced Materials and Their Behaviour During Welding
3. Advanced Design and Construction
4. Advanced Fabrication and Application Engineering

Course Duration

AWE : 6 Days Theory + 1 day written exam
WE : 6 Days Theory + 1 day written exam

Pre-Requisites

ASSOCIATE WELDING ENGINEER (AWE)

Welding Engineers in charge of welding engineer / teaching welding engineer / inspector welded products

WELDING ENGINEER (WE)

1. Have passed AWE Examination or
2. Have experience in attending a past AWE training course or
3. Required min number of years in welding engineering/production

Certificate

IMM-JWES Associate Welding Engineer
IMM-JWES Welding Engineer

Course Fees

Associate Welding Engineer (AWE)
FEE = RM 5,500
GST 6% = RM 330
5 Yrs IMM member fee = RM 220
Total RM 6,050

Welding Engineer (WE)
FEE = RM 6,000
GST 6% = RM 360
5 Yrs IMM member fee = RM 220
Total RM 6,580

For registration or more information, please contact us
Karen (karen@mte.com.my) Ikmal (ikmal@mte.com.my) Aisya (aisya.azlin@mte.com.my)
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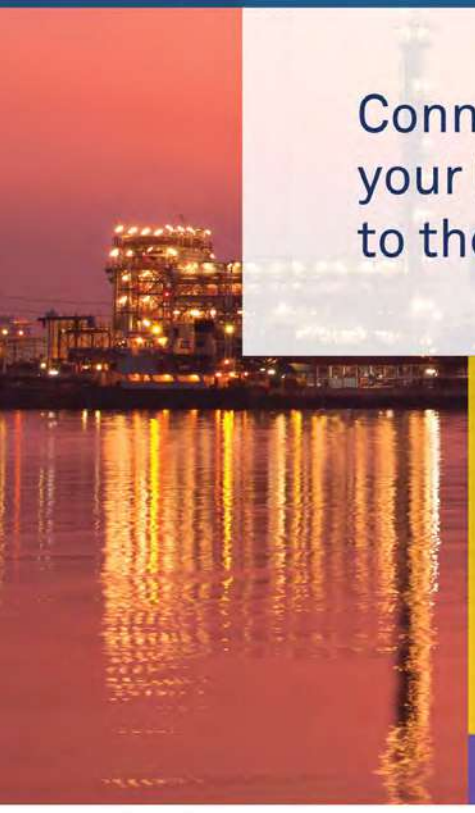

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INSTITUTE OF MATERIALS, MALAYSIA (IMM)

Institute of Materials, Malaysia (IMM) is a non-profit professional society that promotes honorable practice, professional ethics and encourages education in materials science, technology and engineering. Engineers, academicians, technicians, skilled workers and professionals are amongst its members exceeding 6000.

Registered with the Registrar of Societies on 6th November 1987, the Malaysian Materials Science & Technology Society (MMS) changed its name to the Institute of Materials, Malaysia (IMM) on 16th June 1997. The objectives of the IMM include the training and development of individuals and companies in Malaysia to attain professional recognition in various fields of materials science, technology and engineering.

IMM is administered by a council of 30 members, with volunteers leading 18 materials committee, and 7 regional chapters, and supported by a secretariat with full time staffs.

Membership of IMM is categorised into 8 different grades and open to anyone above the age of 17 years - individuals and companies keen in developing and contributing towards the growth of materials science, technology and engineering in Malaysia.

Over the years, IMM have conducted courses on coatings, coatings fingerprinting, corrosion, welding, vibration *etc* in support of the oil and gas industry in Malaysia. Over 600 Coating Inspectors have been trained and certified as well as 2,500 Blasters & Painters, supervisors and Corrosion technicians. Its certification programmes are recognized by PETRONAS and all oil & gas operators. Since January 2011, more than 40 Associate Welding Engineers, 30 Welding Engineers and 10 Senior Welding Engineers were trained and certified.

IMM has also organised 10 International Materials Technology conferences (IMTCE) on a biennial basis, and numerous technical seminars, educational programmes, technical visits, and materials awareness programmes since 1988.

Public courses, such as Microbiologically Influenced Corrosion (MIC) and Welding Technology for Non-Welding Personnel, are been offered occasionally. Training on materials awareness has also been conducted in public listed companies.

The courses and programmes are being organized by Materials Technology Education Sdn Bhd (MTE), a joint-venture between IMM and InterMerger Group.

Collaborations with the Asian Welding Federation, American corrosion society SSPC, Sabah Skills Technology Centre (SSTC), and local universities continue to be part of IMM's vision and long term mission to educate, train and serve the materials fraternity.

GENERAL INFORMATION ON MEMBERSHIP

Membership to the IMM is opened to all individuals and companies in developing the contribution of Materials science, technology and engineering towards industrial growth in Malaysia. The technology of materials is advancing day-to-day throughout the world. Membership to the IMM will enable networking and exchange of knowledge from a very wide variety of specialised areas of expertise. Please feel free to download or print a copy of the application form together with the IMM regulations. If you have any doubt, please do not hesitate to contact our secretariat through the phone; +603-5882 3574 or email to admin@iomm.org.my

Annual subscriptions shall be payable in advance on 1st January of each year. Those admitted into the IMM between 1st July and 31st December in any year shall pay only half the annual subscription. Seniors (above 55 years old) get 50% discount off their annual subscriptions.

We are having online application of membership for selected grades. Membership application forms in document format can be accessed from www.iomm.org.

Kindly fill the form and email to admin@iomm.org.my or fax it to: +603-5882 3524 or send it to:

IMM SECRETARIAT
No. 10-1, Jalan Bandar 3
Pusat Bandar Puchong, 47160 Puchong
Selangor Darul Ehsan, Malaysia

IMM Membership fees schedule as per below.

SCHEDULE OF FEES

	Entrance Fee	Processing Fee	Transfer Fee	Annual Subscription
Company Member	RM50.00	-	-	RM200.00
Ordinary Member	RM20.00	-	-	RM40.00
Fellow (F.I.M.M)	-	RM300.00	RM10.00	RM150.00
Professional member (M.I.M.M)	-	RM150.00	RM10.00	RM100.00
Associate Member (A.M.I.M.M)	-	RM150.00	RM10.00	RM80.00
Student Member	RM10.00	-	-	RM10.00

E-mail: **admin@iomm.org.my**
Website: **www.iomm.org.my**

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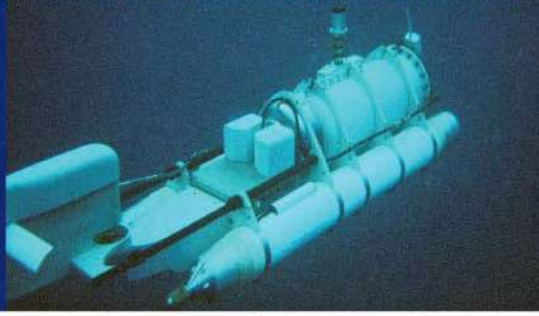
> PIPELINE INTEGRITY
> WELL INTEGRITY



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