

# Seminar on Vibration Technology in the Era of Industry 4.0



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**Venue: Impiana KLCC Hotel, Kuala Lumpur**

One of the main activities organised by the IMM Vibration Committee in 2018 was a seminar to create awareness programmes and educate the audience on the importance of vibration technology and its significant benefits to health, safety and environment. This conference was attended by a total of 98 participants which comprised of various industry players, Royal Malaysian Navy and academicians.

In the morning session, **Tuan Mohd Syukri and Ir. Mohamad Afif who are Rotating Equipment Lead and Senior CPBM Engineer respectively from Sarawak Shell Berhad** jointly presented a topic entitled **Technology and Big Data Analytics for Turbomachinery Analysis**. They explained how it all started during a compressor failure in 2016, its root causes and lessons learnt before describing Shell's proactive technical monitoring and remote monitoring and diagnostic centre including justifications to implement these two solutions.



*Figure 1: Mr. Mohd Azmi Mohd Noor, President of IMM delivered his opening speech*

Next, **Asso. Prof. Dr. Rahizar from the Department of Mechanical Department, Faculty of Engineering at University of Malaya** presented a topic entitled, **Application of Acoustic Emission Technique in Reciprocating Machines**. He shared a case study on a valve failure in reciprocating compressors and how to classify a defective valve by implementing Artificial Intelligence (AI). He also pointed out several key challenges such as identification of valve defect employing Acoustic Emission (AE) technique as a non-intrusive method and severity of defects which requires more information (variation of loading, speeds and pressure affecting the energy emitted from the defective valves) before concluding that the use of AI can significantly improve diagnostic capabilities.

**Juarez Salih Lowe, Corporate Consultant from VROC (M) Sdn Bhd** compared several advantages between 'with AI and without AI' in plant maintenance such as predicting failures before it occurs, maintenance personnel have time to outsource expertise and order parts, and maintenance personnel perform repairs as scheduled without significant loss of productivity. He also shared a case study of one of analytical engines developed by VROC to address the outstanding issue of centrifugal compressor tripping every 48 hours over the last 2 years. The analytical engine was able to zoom into the root cause of its failure within 90 minutes much faster than 8 engineers which took more than 10 weeks to reach the same conclusion.



*Figure 2: Dato' Dr. Ir. Mohd Abdul Karim Abdullah presented an interesting topic entitled "Synergy Between Industry 4.0 and Vibration Technology".*

During afternoon session, **Tuan Shaharuddin Hamid Mustapha, Head of Integrated Operations, Centre of Excellence Upstream Business, Petronas** explained that Industry 4.0 has forced Petronas' personnel to embrace the digitalisation for its entire operations. Starting from the smallest equipment in the plants to monitoring their daily operations, he humbly said that despite all these efforts, PETRONAS is still at Industry 2.0 and they have been striving very hard to achieve Industry 4.0 as soon as possible.

**Dato' Paduka Udani Dato' Seri Mohamed Daud, the Group Executive Chairman from MaxEnergy Group** presented **A Case Study of Loss of Primary Containment (LOPC) and Vibration Impact**. He reminded the audience that despite the advancement of technology in the era of Industry 4.0, the competency level of maintenance personnel is still crucial to reduce the incidents of LOPC. He also presented a research carried out by Malaysian Petroleum Management (MPM) which reported that most LOPC incidents were found in three areas such as small bore and vibration piping, valve and joint flanges.



*Figure 3: Participants from industry, Royal Malaysian Navy and academia*

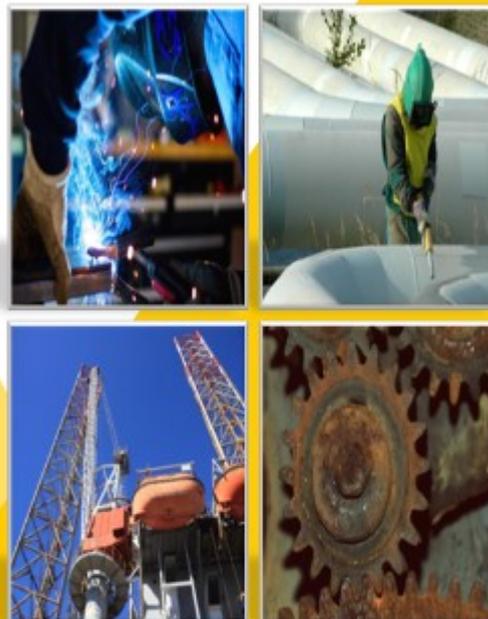
Dato' Abdul Karim, the President/Group CEO of Serba Dinamik Holdings Berhad presented a topic entitled **Synergy Between Industry 4.0 and Vibration Technology**. He explained the fundamental theory of vibration technology and relates it to Reliability Centred Maintenance (RCM). Then, he described generated factors of **Stress Corrosion Cracking (SCC)** caused by stress, material and environment. He also explained industry 4.0, the historical of industrial revolutions, role of big data and analytics, pillars of industry 4.0 and its impact, ecosystem of industry 4.0, examples of industry adoption, current scenario, why it is important and job disruption. He also shared Asset Integrity Management System (AIM), its components and key benefits, Conditioned Based Monitoring (CBM) technologies, Risk Based Inspection (RBI) Non-Destructive Testing (NDT) technologies and samples technologies for AIM services.

Tuan Megat Shamsul Ariff Megat Khamaruddin, Senior Development Manager from Trisystem Engineering Sdn Bhd presented a topic entitled **Turbomachinery Digitization Implementation Experiences**. He presented an overview of digitization from Systems Integrator (SI) perspective followed by sharing his experiences in digitizing turbomachinery assets such as vibration data to historian systems, predictive analytics and digital twin. He ended his presentation by emphasizing that in the era of Industrial 4.0, it is essential to benefit from data analytics which can result in higher productivity, more cost savings, better profit margin and improved quality services.

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\*As updated on 26<sup>th</sup> Feb 2018