92ND EDITION | DEC 2021

E-NEWSLETTER

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MESSAGE FROM THE PRESIDENT

Malaysia have seen how the pandemic has somehow accelerated the acceptance and adaptation of technology, coupled with the emerging technologies brought by the 4th Industrial Revolution (4IR), fundamentally alter the way we live, work, and relate to each other.

From our perspective, the rapid technological transformations offer the chance to improve and optimize NDT inspection capabilities. Still, they also create concerns about the awareness thus readiness of our local NDT companies and practitioners.

How it will unfold is yet to be known. But one thing is clear, it will definitely alter the future landscape of NDT in Malaysia.

MSNT had its AGM on the 17th November 2021 at the Bangi Resort Hotel. We were blessed that after few postponements, we finally were able to hold a non-virtual meeting. The total number of members present for the AGM exceeded our expectations, and the inimitable feeling having met friends and colleagues of MSNT was remarkably great as expected.

During the AGM, MSNT members were shared PETRONAS's planning and technology adoption in line with 4IR. Future approaches and quality in the inspection were highlighted. The question was asked whether NDT companies in Malaysia are agile enough to adopt and adapt? Hence, we should reflect on where we are with these in-coming challenges.

Will it be an opportunity, or will it be the consequences that deteriorate our competitiveness? Nevertheless, we need to keep ourselves abreast with the coming changes and challenges, or we might not be relevant to the dynamics of the progressive technological development and demands.

As we say goodbye to 2021 and welcome the brand new year 2022, let us take a step back and reflect on how many things there are to be grateful for. It has been again a very challenging year which force us to adapt to new realities. What makes me optimistic is seeing that people are capable of adapting and thriving on change. So, let us encourage ourselves to look for opportunities that come with change, not just the challenges, and tackle them with optimism, resilience, creativity and a renewed sense of purpose.

Happy holidays and Happy New Year to all MSNT members, friends and colleagues!

Malaysia has its own National NDT Certification Scheme (ISO 9712) and it is by the Department of Skills Development (JPK) (ISO 17024).

JPK is one of the Personnel Certification Bodies registered under The International Committee for Non-Destructive Testing (ICNDT) Multilateral Recognition Agreement (MRA).

WHY SHOULD MALAYSIAN NDT SERVICE PROVIDERS ACCREDITED TO MS ISO/IEC 17020?

BY TS. DR. MOHAMAD PAUZI ISMAIL & AMRY AMIN ABAS
(MIBAS TECHNICAL ASSESSORS)

MIBAS (pronounced as my bess) is a unified national inspection body accreditation scheme and is multi-disciplinary in its scope of accreditation activities. Inspection body (IB) accreditation is a formal accreditation of the competence of an inspection body and its inspectors. Inspection examines a product design, product service, process or plant and determines conformity with specific requirements or based on professional judgment. Inspection bodies are accredited based on MS ISO/IEC 17020: 2012 "General Requirement for the Operation of Various Types of Bodies Performing Inspection".

Specific requirements such as ILAC P15, MTR2 and others are used in assessment and accreditation. MS ISO/IEC 17020 specifies requirements for the competence of bodies performing inspection and the impartiality and consistency of their inspection activities. This Standard is suitable for inspection bodies (IB) such as organisations that perform NDT inspection to be accredited by Standards Malaysia as a benchmark against world best practices. It also provides a client assurance that the inspection services of the IB are harmonised with international practices.

The MS ISO/IEC 17020 contains all elements of ISO 9001 while also including technical competence requirements. Organisations performing NDT inspection accredited to MIBAS have demonstrated that they are technically competent with sufficient and relevant resources and can produce inspection results that are reliable and trustworthy. Customers, regulators, and accreditation bodies may also use the Standard in confirming or recognising the competency of a particular NDT company.

The inspection data become part of company quality assurance, leading to a more reliable and trustworthy input for plant owners to safely operate their plant or install new, fixed, or repaired components. The generated NDT report is internationally understood and accepted, subsequently giving credibility to the NDT company and significantly increasing competitiveness and market share. The Standard also encourage NDT company to promote good laboratory practices, leading to improved inspection methods.

The Malaysian NDT service providers should be accredited to MS ISO/IEC 17020 to ensure that every inspection program performed is standardised and recognised by other international parties. It also provides the IB and their clients' assurance that the NDT job is conducted by competent personnel using valid and appropriate methods or techniques. The Standard ensures the impartiality of personnel and all measurements and calibrations are traceable to international standards, and the equipment used is suitable, properly calibrated and maintained.

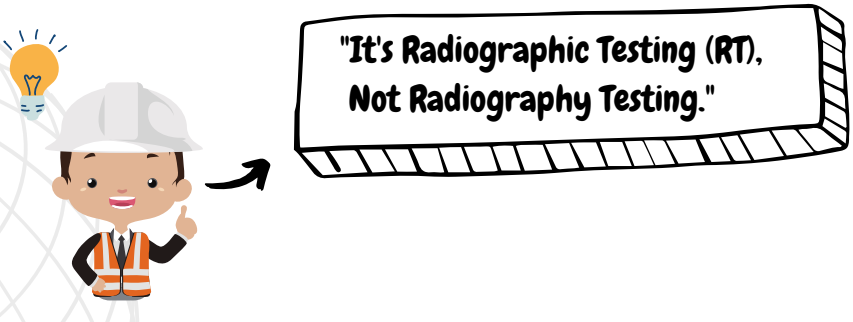
Once the NDT service provider is accredited, the sampling, handling and transportation of inspected items are documented as a procedure and become part of their quality manual. The inspection data becomes part of IB's quality assurance, leading to a more reliable and trustworthy input for plant owners to operate or install new or repaired components safely. The generated NDT report is internationally understood and accepted, subsequently giving credibility to the NDT company and significantly increasing competitiveness and market share.

IBs are also required to participate in a proficiency testing programme in which the inspection results according to the scope of accreditation are compared inter-IBs. Therefore the performance of all accredited IBs in the country is compared and analysed. Any deviation from the established uncertainty values shall be investigated, and corrective actions are required.

Accreditation elevates the level of competitiveness of an IB in a globalised market. It provides the IB advantage in terms of commercial value over the non-accredited NDT service providers. Accreditation provides the clients with a certain level of assurance that the IB is being benchmarked against international practice.

Personnel From An IB Performing Inspection During a Proficiency Testing Programme

Currently, most clients are making it a requirement for the NDT service providers to be accredited. Soon, accreditation will become a mandatory requirement in Malaysia.



FUTURE APPROACH FOR NDT BUSINESS IN OIL AND GAS SECTOR TOWARDS WORLD DIGITALIZATION STRATEGY (INDUSTRIAL REVOLUTION 4.0).

WAN ABDULLAH BIN WAN HAMAT, CUSTODIAN (INSPECTION), NURUL 'AIN BT A AZIZ, EXECUTIVE MATERIAL, CORROSION AND INSPECTION, SY MUHSIN SY A HAMID, EXECUTIVE ASSET INTEGRITY.

Banking and aerospace industries are well-known sectors that fully adopt digitalization for day-to-day business transactions and have proven to be the most reliable way to generate profit in a period of constantly evolving customer demand. More sectors are expected to adopt digitalization, including the oil and gas (O&G) sector, to ensure business sustainability amidst a volatile and unpredictable environment.

NDT businesses in the O&G sector may face their greatest challenge in the 21st century when digitalization becomes the norm. Conventional NDT methods such as Magnetic Particle Testing and Liquid Penetrant Testing may need to be enhanced to anticipate future demand for autonomous technology. Otherwise, its usage may be restricted to cases where human intervention is still allowed. NDT technology enhancement coupled with robotic and autonomous vehicles is likely to be the future of safer and more efficient working methods.

It includes the application of Artificial Intelligence, Machine Learning, Internet of Things, Digital Twin, Big Data for visual inspection and imaging using the drone and smart helmet, radiographic testing (RT) film interpretation, automatic ultrasonic testing (AUT) data analysis, robotic inspection, online corrosion prediction, online equipment integrity assessment, 3D printing/modelling, among others.

Along with autonomous technologies, computerized inspection data acquisition paired with other online data such as process, maintenance records, and chemical injection history will improve predictive and prescriptive integrity modelling. These data help establish, implement, and maintain integrity operating windows (IOWs) and enable real-time monitoring. Any process changes which affect IOW and alter identified corrosivity levels and damage mechanisms will immediately require mechanical integrity assessment to minimize unplanned shutdown due to premature equipment failure and loss of primary containment. Moreover, computerized data acquisition improves data analysis efficiency.

Data validation can be done anywhere, regardless of time and location. It can be utilized for future improvements, such as revising code and standard, facility design philosophy, and process design. These analyses may then be visualized in the form of a live dashboard which can trigger company management attention where timely & effective intervention can be directed.

To achieve this, significant efforts and CAPEX investment must be spent in R&D. In Malaysia, IR4.0 improvements are expected to be fully operationalized within the 3-5 years and supported by the government's digitalization policy "Go-Digital Concept" by major O&G companies. However, the abovementioned benefits are not without their fair share of drawbacks, as issues such as the reduced need for human deployment, reduced inspection scope for manual inspection work and more jobs requiring multi-purpose skills with full-certification and accreditation scheme are all expected to cause some degree of backlash within the working population.

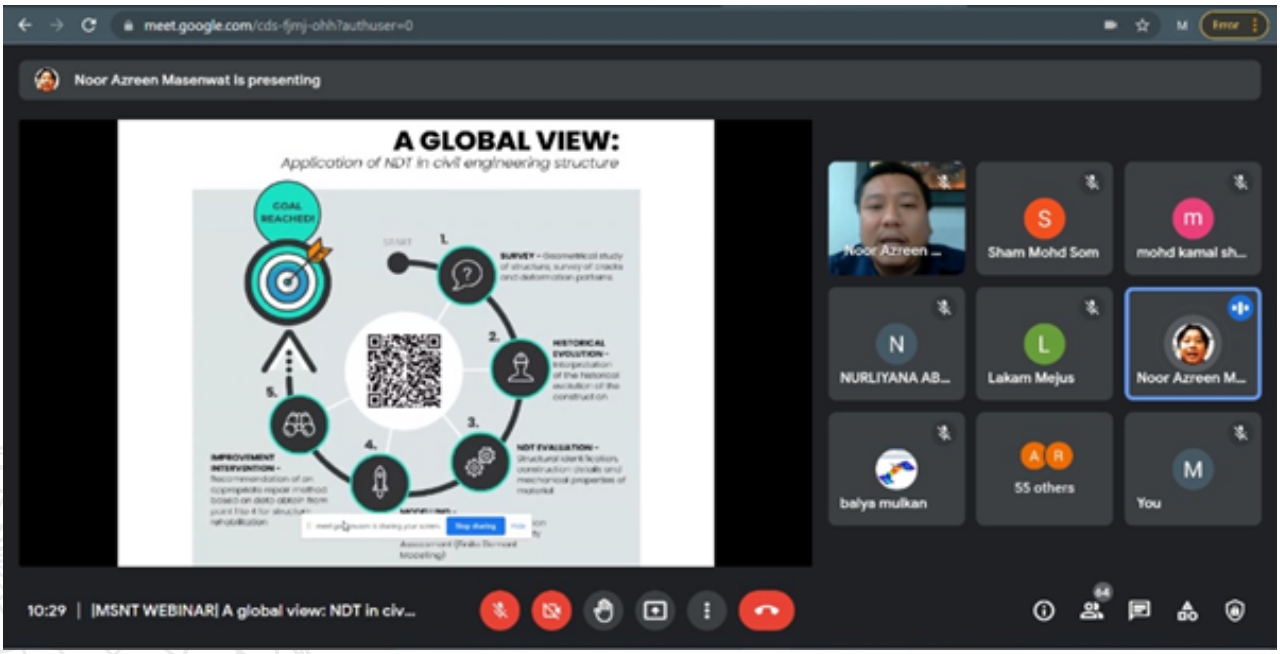
"Undeniably, digital has, and will continue to, lower industry's operating cost - Deloitte

In the context of the Malaysian NDT Sector, our biggest worry is, "Are our NDT service providers ready to scale up their current business scopes toward digitalization?". Options such as improving business portfolio through ISO certification and accreditation schemes, collaboration with O&G Company and/or external experts for digital niche technology, and NDT service providers in Malaysia must consider scaling-up current advanced digital NDT technology to keep pace with the rest of the world.

SUCCESSFUL MSNT WEBINAR SERIES #1: NDT IN CIVIL STRUCTURE INSPECTION

MSNT first webinar session on NDT in Civil Structure Inspection was successfully held on 2nd November 2021. An IAEA Expert, Mr Noor Azreen Masenwat from the Malaysian Nuclear Agency, enthusiastically shared his Global view on NDT in Civil Structure Inspection to 74 participants from various organisations, including regulators, service providers, equipment suppliers, research institutions, and others.

Webinar Poster



Webinar Google Meet Interface

MSNT 32 ND ANNUAL GENERAL MEETING

MSNT successfully held her 32nd Annual General Meeting (AGM) at Bangi Resort Hotel (BRH) on 17th November 2021. The AGM was attended by more than 50 members and included a technical presentation by PETRONAS on the Future NDT Inspection In-line with Industrial Revolution. MSNT appreciate all members who attended the AGM and wish everybody to be safe and sound

Annual General Meeting Arrangement In Compliance With SOP

Welcome to the Malaysia International Non-Destructive Testing Conference and Exhibition 2022 (6th MINDTCE). This conference is apart of the Malaysia Society for Non-Destructive Testing (MSNT) initiative to provide a suitable platform for members of Non-Destructive Testing (NDT) community from allover the world togather and share their latest invention, promote their latest inspection tools, present their research findings, and discuss issues and problems on matters related to the development of NDT Technology.

Engineers, scientists, technologists, supervisors, practitioners, endusers, managers, lecturers, and trainers having direct involvement in NDT technology are invited to attend this conference.The conference highlights a wide range of issues that have direct effect to the effectiveness of the technology in revealing imperfectionso in engineering structure, system and installation.Therefore,we like to invite NDTexperts from all over the World to submit their papers for this conference. In order to maximise the benefit of the knowledge contained in the sepa-pers, suitably presented papers will be published in aprestigious IOP Conference Series, a Scopus Indexed journal.

IMPORTANT DATES

Deadline for Abstract Submission: 19th March 2022
Notification for Acceptance: 9th April 2022
Deadline for Final Paper Submission: 4th June 2022

TOPIC OF INTEREST

- New and Advanced NDT Methods, Equipment and System
- Digital and Imaging NDT Technologies
- Industrial NDT Applications
- Safety and Security of Industrial Radiography Sources
- NDT for non-metallic materials
- NDT Education, Training and Certification
- Research and Development on NDT
- Other Areas Related to NDT

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6th MINDTCE (BOOTH)

6th MINDTCE offers fast-selling 40 booths (3m x 3m) on a first-come, first-serve basis. This biennial event has never failed to attract local and international participants. It has become the best platform for NDT service providers, suppliers, engineers, researchers, academicians, manufacturers, and plant owners to share ideas, knowledge, and experience. This event highlights various NDT applications and disciplines, including aerospace, railway, power generation, and oil and gas. Visitors have the opportunity to meet some of the overseas and local manufacturers and suppliers to discuss business cooperation and ways to improve their cost of operation, productivity, quality and safety. With all of these available things in one conference and exhibition, 6th MINDTCE becomes one of your best opportunities to showcase your products, expertise, solutions, future development, and good business.

Visit https://mindtce.com.my/exhibitorinformation to find any available booths.

PULSED EDDY CURRENT

BY NURUL A'IN BT. AHMAD LATIF

Pulsed eddy current (PEC) is an advanced Non-Destructive Testing (NDT) technique that uses transient waveform for coil excitation. This technique is based on a square wave excitation current to drive the excitations coil, which improves penetration. The Fourier transform of a square pulse consists of a series of frequency contents. Its excitation allows a deeper eddy current penetration having the advantages of higher robustness of anti-interference. The wideband pulse in PEC excitation consists of a series of frequency components leading to the richness of information gathered about the defect. Due to high demand from industry on the defect quantification, including the 3D defect identification, volumetric losses and pattern recognition, PEC provides the quantitative defects evaluation. These advantages facilitate not only forward problems but also an inverse solution for defect assessment and identification. PEC can be applied on both ferrous and non-ferromagnetic components inspection. The common application of PEC is the wall loss detection, corrosion under insulation inspection on the insulated pipe and fireproofing examination. Other potential inspection or measurement includes polymer coating, composite wrap, concrete and insulation of weather jacket. This technology offers new perspectives for the detection and characterisation of defects in test samples by measuring the transient response of the magnetic field.

NDT FOR COMPOSITES MATERIALS

BY S.M.M.AMIR, M.T.H.SULTAN, K.A.M.SALLEH, M.JAWAID, S.MOHD

Composites are materials made by combining minimum of two or more materials which often involve those with different properties. They are known to be anisotropic, inhomogeneous and multi layered materials. Composite materials usually present its unique properties in which the strength to weight ratio is high. Besides, it also provides flexibility in design because it can be moulded into complex shapes. There are vast usage of composite materials in engineering applications. Currently, laminated composites have become popular in the area of aeronautics, wind energy as well as in the automotive industry.

In the industry, most composites used are made of Kevlar, carbon and glass fiber which are categorised as the synthetic fiber. However, due to environmental issues, many efforts have been made to overcome the problems by utilizing the natural fiber by turning it into composite materials through hybridization process. Recently, the world has shown wide interest in hybrid composites involving synthetic and natural fibers due to many factors such as low cost, biodegradable, light weight etc.

Like any other materials, composites also experienced defects during the in-service or manufacturing process. One of the critical defects in composites is the impact damage such as the low velocity impact. The low velocity impact damage in composite materials is usually raises more concern because it is barely visible and the damage often starts at the non impacted surface or it is in the form of internal delamination.

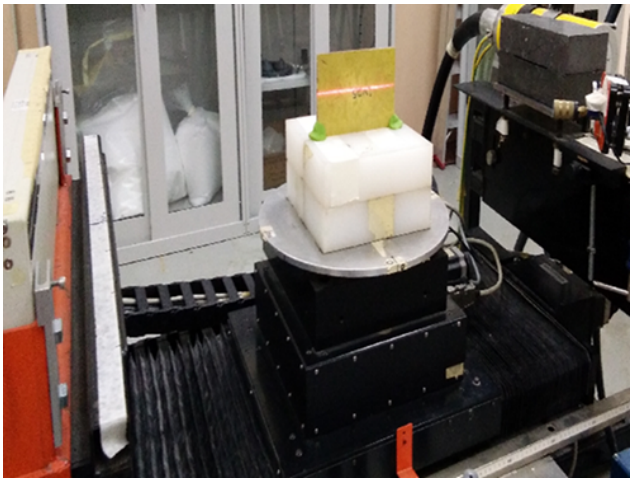

Figure.1 Computed Tomography System

Defects induced due to impact event are delamination, matrix cracking, fibre failures such as fibre breakage and penetration where the impactor fully perforate the impacted object. Since the low velocity impact damage causes internal damage to the structure with very minimal visual detectability, hence NDT is required to detect the internal damage.

Internal defects that are possible to be detected using Computed Tomography method include delamination, porosity and fibre breakage as shown in Figure 2 and Figure 3. However, matrix cracking which is one of the defects from the low velocity impact damage is not able to be detected using Computed Tomography method.

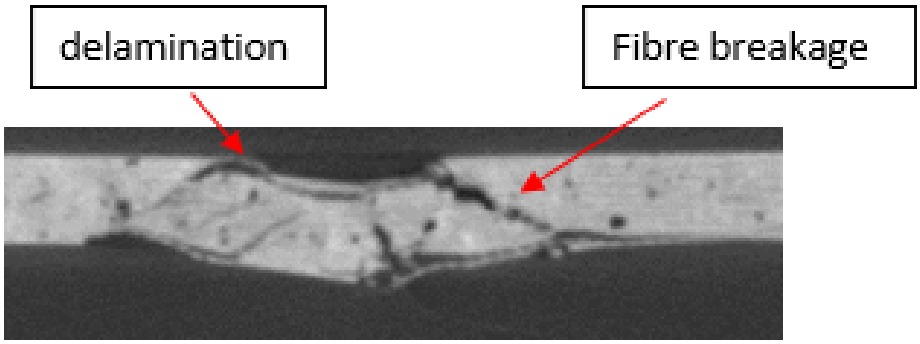

Figure 2. Defects in Composite

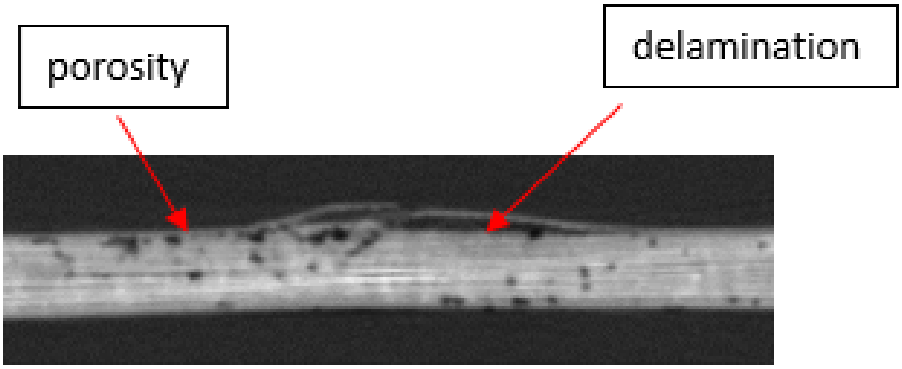

Figure 3. Internal Defects of Composite

Acoustic emission is also another NDT method is being used to detect damage from low velocity impact on composite materials as shown in Figure 4. The advantage of using acoustic emission is that it is able to detect matrix cracking defect. A sensor with suitable frequency is needed for the detection of defects in laminate composites.

Figure 4. Sensor Used in Acoustic Emission

There are also other NDT methods that can be used to detect defects in composites such as ultrasonic, shearography etc. However, with the advancement in the composite materials especially in the hybrid composites between synthetic and natural fiber, conventional NDT methods need to be adapted to the new material. Advanced NDT Techniques or combination NDT techniques are required to evaluate defects especially in the advanced composite materials.