

MALAYSIA

SUPPORTING INDUSTRIAL COMPETITIVENESS WITH NDT

THE SITUATION

Non-Destructive Testing (NDT) is the testing of engineering materials or components to detect and evaluate defects using methods and techniques which do not damage nor destroy the material under test. In general, NDT is used to improve the level of safety, quality and reliability of a product or system. Therefore, it has become compulsory for NDT to be implemented during construction, in-service maintenance and system repairs.

In Malaysia, NDT is applied for plant and structural integrity assurance in various types of engineering industry, especially in the sectors of oil and gas, power generation, aerospace, automotive, petrochemical, railway, and manufacturing.

The development of the oil and gas industry in the early 80s had a positive impact on NDT, bringing significant changes to the field. Plants and factories which grew as spin-offs from the oil and gas industry made NDT an increasingly important testing technique.

Soon after, NDT end users began to realize that NDT inspectors must have a high level of skill and competency to ensure that test results are accurate and reliable. This led to the formation of industrial codes and standards to ensure that NDT can only be performed by qualified and certified personnels.

For example, a person performing NDT shall have gone through a minimum number of hours of formal training before he/she



can take an examination for certification purpose.

Prior to the establishment of the local NDT industry, national oil and gas and power generation companies were highly depended on expensive NDT services that performed by foreign workforce and expertise.

The Government of Malaysia thus realized the importance of having a national NDT certification scheme and took rapid measures to produce a trained and certified local workforce for NDT in Malaysia.

ACTIONS TAKEN

Malaysia Nuclear Agency (Nuklear Malaysia) began to implement the International Atomic Energy Agency (IAEA) technical cooperation project in the early 1980s. At that time, Nuklear Malaysia had identified the Department of Skills Development (DSD) under the Ministry of Human Resources as the National Certification Body (NCB) for NDT.

A Committee was then established to develop the Industrial Radiographic Certification Scheme in January 1986.

Table 1: Expert missions, fellowships and scientific visits implemented under national IAEA technical cooperation projects

Project Code and Name	Expert Missions Received	Fellowships Attended	Scientific Visits Attended
MAL8006: Non-Destructive Testing Certification (1986-1995)	7	2	2
MAL8017: Advanced Non-destructive Testing of Structural Integrity in Components related to Oil and Gas Industries (2003-2009)	8	9	3
MAL8021: Establishment of Digital Radiography Methods and Procedures for Small and Medium-Sized Enterprises (2007-2012)	3	1	4
MAL1011: Developing Efficient Non-Destructive Testing (NDT) Data Management through Integrated NDT Modalities (2012-2013)	5	2	5
MAL1013: Enhancing the National Non-Destructive Testing Capabilities for the Nuclear Power Programme (2014-2015)	-	4	2
MAL1014: Establishing National Non-Destructive Testing Capacity for the Nuclear Sector (2016-2017)	1	8	8
MAL1016: Strengthening Capability in the Application of Nuclear and Related Technology in Industry (2018-2020)	-	-	3

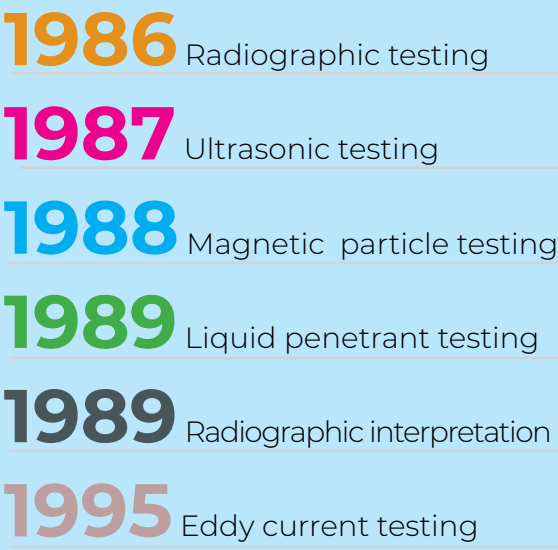
This committee was comprised of 15 members representing the private sector and various government agencies. Then in June 1986, a craftsmanship testing panel was established to take responsibility for administering the implementation of the NDT national examination.

Malaysia implemented its NDT certification scheme in stages, as shown in Figure 1. Some of the NDT certifications were needed urgently due to legal and safety factors. The NDT certification schemes were based on the ISO 9712 standard and the syllabus was developed following IAEA recommendations and guidelines.

Getting international recognition

The national NDT certification scheme is continuously developed and updated with the goal of making the scheme equal to that of other NDT certification schemes around the world.

Figure 1:
IMPLEMENTATION OF
MALAYSIA'S
NDT Certification Scheme



In 2005, an effort was initiated to accredit the national-level NDT certification scheme in compliance with the ISO 17024 standard. This effort was made in collaboration with the IAEA. Its final objective was to ensure that NDT certificates issued by NCB are recognized not only nationally but also internationally.

The DSD, acting as the NCB for NDT in Malaysia, undertook various efforts to achieve this objective. In 2010, the documents which described the quality system practiced by the NCB was completed and then audited by the Department of Standards Malaysia, the national accreditation body.

In 2012, the DSD was accredited as the Personnel Certification Body for NDT based on the ISO/IEC 17024:2003.

The IAEA helped to develop local expertise by providing experts and organizing

fellowship trainings and scientific visits. With IAEA assistance, and in collaboration with the DSD, Standards and Industrial Research Institute of Malaysia (SIRIM), and the Atomic Energy Licensing Board (AELB), Nuklear Malaysia conducted the first NDT training course in Radiographic Testing in 1986. Since the first national training course, Malaysia has taken steps to produce qualified and certified NDT personnels for local industries.

Worker at a car assembly plant in Malaysia. (Photo: A.Razak Latif/123RF.com)



ACHIEVEMENTS

The implementation of national NDT certification scheme has produced skilled professionals in the field of NDT required for national development.

Since then, more than 9,000 personnels have undergone training in various NDT methods and at various levels of competencies.

From this number, more than 4,000 are certified NDT inspectors. They work with more than 90 local NDT companies providing testing services in various sectors.

The majority of certified NDT personnel in Malaysia are in the Radiographic Testing (RT) method. The RT is often used in the oil and gas industries to inspect components, such as pressure vessels and valves, to detect for flaws.

Figure 2: Percentage of certified NDT personnels according to NDT methods

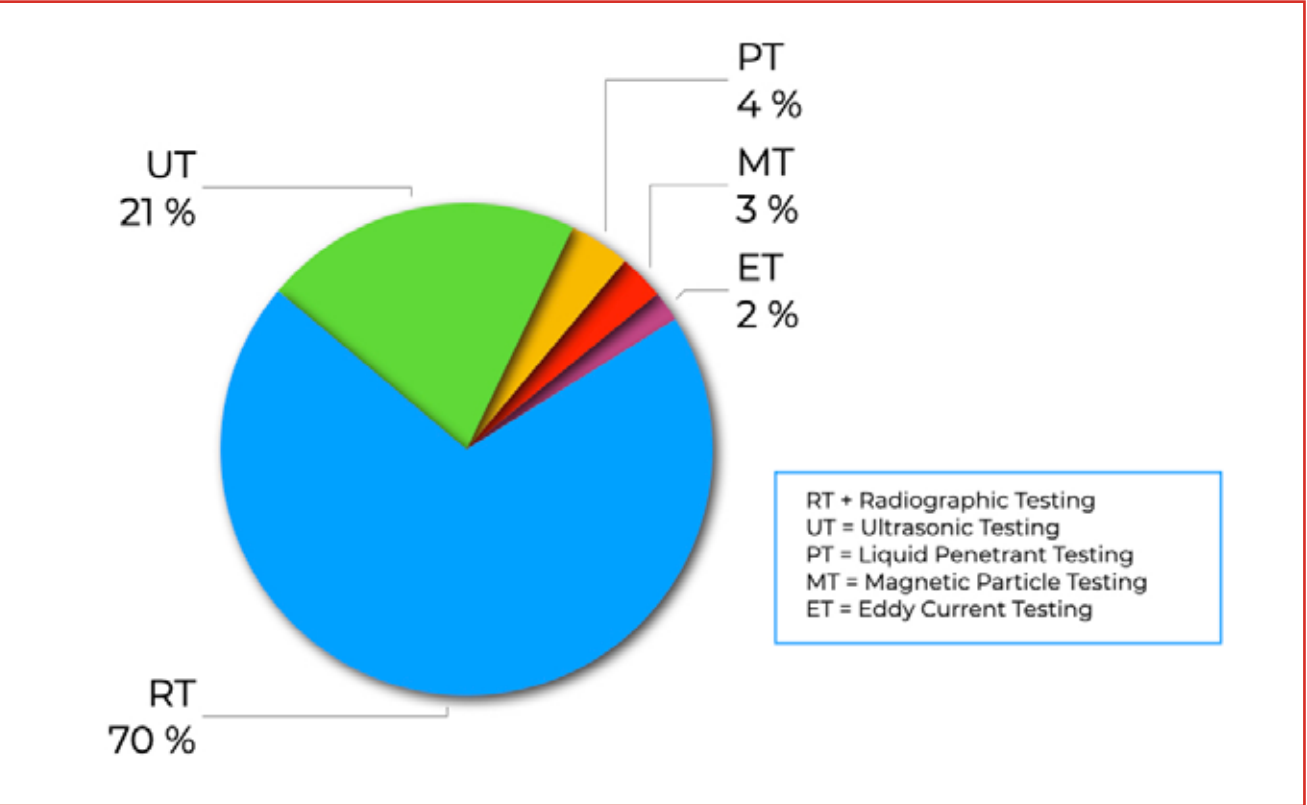
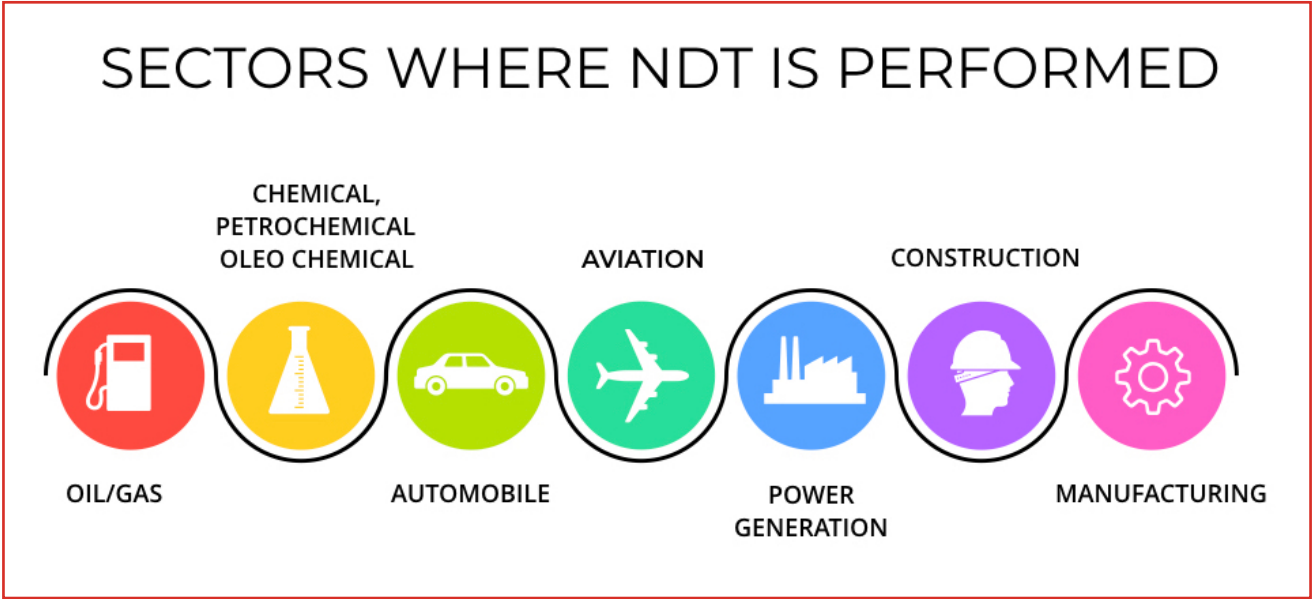


Figure 3: Sectors where NDT is performed



Milestones:

With the accreditation of the DSD as Personnel Certification Body for the scope of NDT based on MS ISO 17024: 2003, Malaysia became the fourth country in Asia and the Pacific region where the NCB

for NDT is accredited according to ISO 17024:2003. The three others countries are Australia, New Zealand and China.

The establishment of an internationally recognized NDT training, qualification and certification scheme in Malaysia has contributed towards the improved safety and optimized operation of industrial plants. Apart from providing NDT services using local workforce, NDT has also enhanced the employment prospects of graduates and non-graduates.

Companies in the oil and gas sector account for around 70% of all NDT inspection business in Malaysia. Power plants, shipyards and the aviation industry are other important clients benefiting from this technology. The cost of local inspections is about one fifth of the cost of hiring inspectors and using technology from overseas.

In 2015, the IAEA designated Nuklear Malaysia as the IAEA Collaborating Centre for NDT until 2019. This was a significant achievement in the area of NDT. It provides close and valuable cooperation between Malaysia and the IAEA in various regional

activities, including research, development and training.

Malaysia's NDT certification system was also recognized by the International Committee for Non-Destructive Testing for the Multilateral Recognition Agreement. In 2018, the President of the Malaysian Society for Non-Destructive Testing (MSNT) was awarded the Prime Minister's Award for his contribution towards the establishment and promoting the national certification scheme for NDT.

The national certification scheme for NDT in Malaysia was developed, established and sustained due to excellent collaboration and partnership among the DSD as the NCB, Nuklear Malaysia as NDT training centre, MSNT, Atomic Energy Licensing Board (AELB) as the regulatory body, and with strong support from the IAEA.

Malaysia's NDT training programme.



Companies in the oil and gas sector account for around 70% of all NDT inspection business in Malaysia.

Malaysia's training system and national NDT certification scheme have become reference centres for many countries. Sudan, for example, has adopted Malaysia's certification scheme.

Malaysia also receives prospective inspectors from Myanmar, Sri Lanka, Syria and others for training and certification. From 1994 to 2018, Malaysia have trained 59 fellows and scientific visitors from other countries in the area of NDT.

The success of Malaysia's NDT training programme can serve as a model and inspiration for other countries wishing to develop their own national NDT certification programme.

Technical support provided by Nuklear Malaysia to the Regional Training Course on Digital Industrial Radiography and Industrial Computed Tomography

(implemented under RCA Project RAS1020) had enabled IAEA to deliver ISO 9712:2012 Level-2 training and to conduct examinations on digital radiography in accordance with the syllabus of the Australian Institute for Non-Destructive Testing.

This was a breakthrough result achieved for the first time in the framework of an RCA project, in which a regional training course was done with theoretical and practical examinations, and then led to an internationally recognized certification in accordance with ISO 9712:2012 standards.

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