



# INTELLECT

Exploring Technologies, Advancing Innovation



**Occupational Health Laboratory (OHL), NIOSH**

**Radiography Laboratory, Malaysian Nuclear Agency:  
National Reference Centre For Non-Destructive Testing**

## INTRODUCTION

Welcome to the June 2025 edition of INTELLECT, the quarterly magazine of NIOSH that explores technologies and advances innovation in the field of Occupational Safety and Health (OSH). Intellect is a platform for exchanging information, sharing knowledge and experiences and highlighting the latest developments and achievements of NIOSH and its partners. Intellect aims to benefit all the stakeholders in the OSH community, including research institutes, laboratory service providers, universities, academicians, government and private sectors, employers and students.

We hope that Intellect will inspire and inform you about the exciting and important works that NIOSH and its partners are doing to enhance OSH standards and practices in Malaysia and beyond. We also welcome other organisations who are interested in promoting or sharing their laboratory facilities and services in the field

of OSH. We welcome your feedback and suggestions on how to improve our magazine and services. We would love to hear from you and feature your contributions in our future issues.

If you have any stories, projects, or achievements that you would like to showcase in our magazine, please feel free to contact us at [penerbitan@niosh.com.my](mailto:penerbitan@niosh.com.my). Thank you for your support and interest in NIOSH. We look forward to hearing from you and serving you better.



*Your OSH preferred partner*



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# OCCUPATIONAL HEALTH LABORATORY (OHL)

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Every workplace, whether in an office, factory, or construction site, depends on the health and well-being of its workers. A healthy workforce not only drives productivity but also contributes to safer, more sustainable organizations. Recognizing this, the **National Institute of Occupational Safety and Health (NIOSH) Malaysia** established the **Occupational Health Laboratory**, a centre dedicated to ensuring that employees and employers have access to trusted, science-based health monitoring and testing services.

## A Commitment to Workplace Health and Safety

For more than three decades, NIOSH Malaysia has been at the forefront of promoting occupational safety and health across industries. The establishment of the Occupational Health Laboratory reflects NIOSH's ongoing mission to protect and enhance the well-being of the Malaysian workforce. The laboratory is equipped with advanced technology and staffed by skilled professionals who are committed to delivering accurate, reliable results that organizations can trust.

## Core Functions of the Occupational Health Laboratory

The Occupational Health Laboratory is more than just a testing facility. It serves as:

- **A hub for research and development** in occupational health and fitness, contributing to new knowledge and innovations.
- **A reference centre and leader** in occupational health and fitness, setting benchmarks for quality and expertise.
- **A provider of certified testing and data sampling** that supports both public use and enforcement agencies.
- **An information centre** for occupational health and fitness, offering reliable data and guidance to industries and communities.
- **A leading laboratory provider in Southeast Asia** for occupational fitness testing, positioning Malaysia as a regional leader in workplace health services.

These functions highlight the laboratory's vital role in advancing both national and regional occupational health standards.

## Comprehensive Services for Every Industry

In addition to its strategic functions, the Occupational Health Laboratory provides a wide range of specialized services tailored to workplace needs:

### 1. Health Promotion System (U-TOWN System)

This system supports health promotion and disease prevention through a one-circuit check-up that evaluates physical capability. The results are analysed to generate personalized exercise prescriptions, helping individuals maintain optimal fitness and well-being.

### 2. Basic Medical Examination

Using advanced analysers and monitors, the laboratory provides integrated health screenings that include:

- **Body Composition Test** – Measures obesity, muscle development, visceral fat, body fat mass, basal metabolic rate, and other key parameters. It has describes weight more accurately than Body Mass Index (BMI). Suitable for individuals from 3 to 99 years old.
- **Stadiometer** – Measures height with precision (35–210 cm).
- **Blood Pressure Test** – Records systolic and diastolic pressure, along with pulse rate, to support pre-exercise evaluations.

### 3. Physical Fitness Tests

Through the U-TOWN system, the laboratory conducts comprehensive physical fitness assessments that measure muscle strength, endurance, flexibility, reflex, lung capacity, agility, and balance. These scientific evaluations help develop targeted exercise prescriptions. Key tests include:

- **Lung Capacity Test** –Evaluates cardiac, vascular, and pulmonary functionality.
- **Hand Grip Strength Test** – Assesses musculoskeletal strength.
- **Back Extension Strength Test** – Measures lower back muscle power.
- **Sit and Reach Test** – Evaluates flexibility.
- **Sit-up Test** – Measures abdominal muscle endurance.
- **Leg Extension Strength Test** – Evaluates lower body muscle strength.
- **Skill-Related Fitness Test** – Measures agility, reflex, and balance through specialized tools such as reaction mats and sound stimulus devices.

### 4. Spiroergometry Assessment

Examines the load capacity of the lungs and cardiovascular system under physical stress. In addition to ECG and respiratory activity, the assessment

measures oxygen and carbon dioxide concentration in the breathing air, providing a detailed picture of respiratory and cardiovascular performance.

5. Specialized analyses: Providing customized testing for industries with unique requirements.

These services help organizations comply with national regulations while also promoting a proactive approach to occupational health.

### Why It Matters to Employers and Workers

Workplace hazards are not always visible. From chemical exposure to poor air quality, risks can affect employees' health silently over time. By using the services of NIOSH Malaysia's Occupational Health Laboratory, employers can:

- Ensure compliance with safety and health standards.
- Protect workers from potential health risks.
- Build a healthier, more resilient workforce.
- Strengthen their reputation as a responsible and caring organization.

For employees, these services provide peace of mind, knowing that their health is being safeguarded through professional monitoring and preventive action.

### Supporting a Healthier Malaysia

The Occupational Health Laboratory is more than just a facility; it is part of NIOSH's vision to create safer, healthier workplaces nationwide. By combining scientific expertise with a strong commitment to people's well-being, the laboratory plays a vital role in building a culture of safety and health in Malaysia.

### Partner with Us

NIOSH Malaysia welcomes industries, organizations, academicians and the public to benefit from the services of the Occupational Health Laboratory. Together, we can ensure that Malaysian workplaces remain safe, productive, and focused on what truly matters: the people who make it all possible.

For more information about the Occupational Health Laboratory and its services, please contact NIOSH Malaysia or visit our official website.

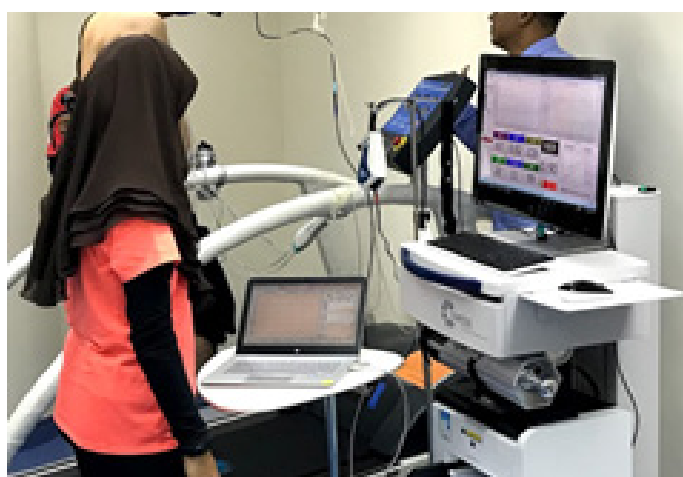


Figure 1 : Spiroergometry Assessment



Figure 2 : Sit up test u-town system



Figure 3 : Information dissemination through OHL visit



Figure 4 : Body Composition analysis



# RADIOGRAPHY LABORATORY, MALAYSIAN NUCLEAR AGENCY: NATIONAL REFERENCE CENTRE FOR NON-DESTRUCTIVE TESTING

**Dr. Mohd Zaki Bin Umar**  
**NDT Course Leader for Centre of Nuclear Excellent**  
**Head of Radiography Lab**

## Introduction

The Radiography Laboratory at the Malaysian Nuclear Agency (Nuklear Malaysia) is a top-level technical facility in the country. It specializes in Non-Destructive Testing (NDT) using radiation. Located in Block 59, the lab is vital for Malaysian industry. It helps make sure that key engineering structures, parts, and welded sections are high-quality, reliable, and safe. Crucially, it does this without causing any damage to the materials being checked.

As an important technical centre, the Radiography Laboratory offers research, technical services, and professional training. This work supports Nuklear Malaysia's main goal to promote the safe and useful application of nuclear technology for the nation's growth.

- Creating and checking the accuracy of new testing methods.
- Offering expert advice and technical help.

All testing strictly follows international standards (like ISO, ASTM, and ASME). This guarantees that the results are consistent, traceable, and reliable, meeting global industry requirements.

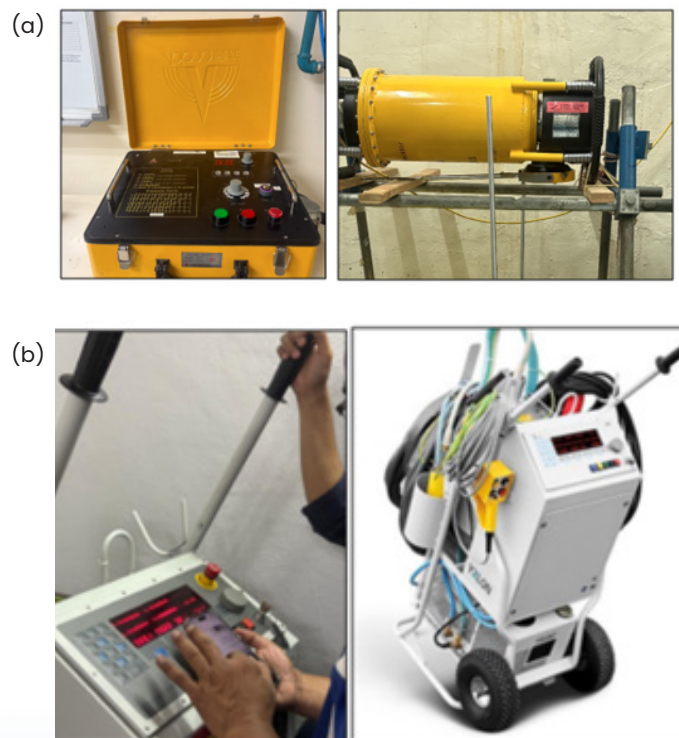


Figure 2 : X ray machine (a) 200 kV Dandong XXG-2005 and (b) 225 kV Yxlon Y.XMB-Serie



Figure 1 : Block 59

## Advanced Facilities and Comprehensive Services

The lab is fully equipped with modern industrial radiography equipment. This includes powerful X-ray machines and radioactive materials like Iridium-192. These tools allow the lab to perform many different types of inspections on materials, welds, and industrial parts. They can find hidden problems or flaws inside the material without damaging its structure.

The lab's main services include:

- Checking industrial parts and welds using radiography.
- Analysing quality and figuring out what defects mean.



Figure 3: Gamma radiography equipment (GED) - DELTA Sentinel 880 with Ir-192 source.

## Building National Competence and Expertise

Besides its technical work, the Radiography Laboratory is also a national centre for training and certifying NDT professionals. It offers training programs for Industrial Radiography at Level 1, Level 2, and Level 3. All these courses follow the international standard, ISO 9712. These organized programs aim to create skilled, certified, and globally recognized personnel. They provide the technical expertise and hands-on knowledge needed to meet the industry's increasing demands.

To ensure effective learning and testing, the lab has excellent practical training areas and examination spaces. This lets participants get real-world experience using actual radiography equipment and safety systems, all under the watch of qualified teachers.



Figure 4 : X-ray Exposure room



Figure 5 : X-ray Exposure room

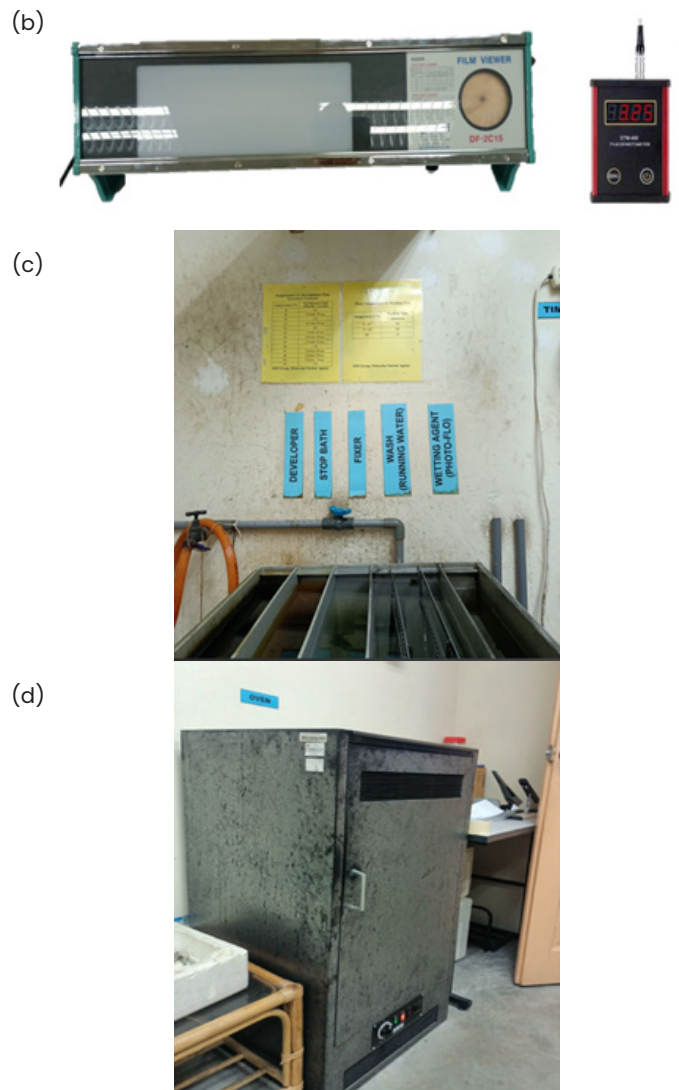


Figure 6 : A selection of specimens and instructional equipment (a) test specimen, (b) viewer/illuminator and densitometer (c) film processing solution and (d) film dryer

To fulfil its goal of promoting the safe and useful application of nuclear science, the Radiography Laboratory is constantly boosting its research, innovation, and development efforts. Current projects are focused on:

- Improving digital radiography (using computers instead of film).
- Using Artificial Intelligence (AI) to analyse images and identify flaws.
- Creating testing methods that use a lower radiation dose but are highly efficient.

These efforts are designed to make industrial radiographic testing more accurate, safer, and faster while keeping the high image quality.

The lab also works closely with local and international universities, businesses, research centres, and government bodies. These partnerships help to share technology, make sure standards match globally, and build capacity. All of this strengthens Malaysia's position and competitiveness in the industrial sector.



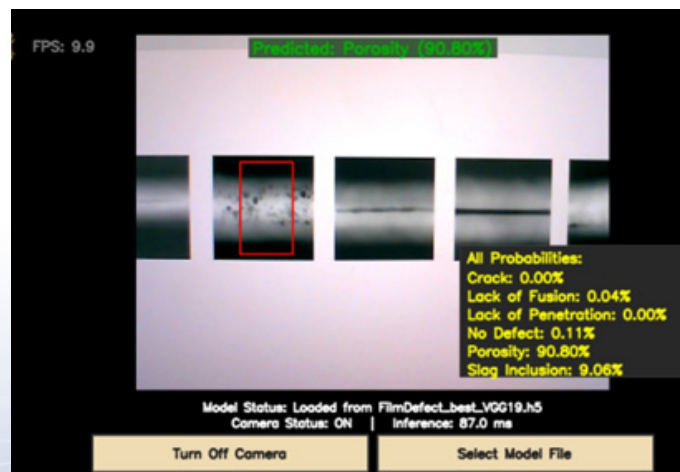
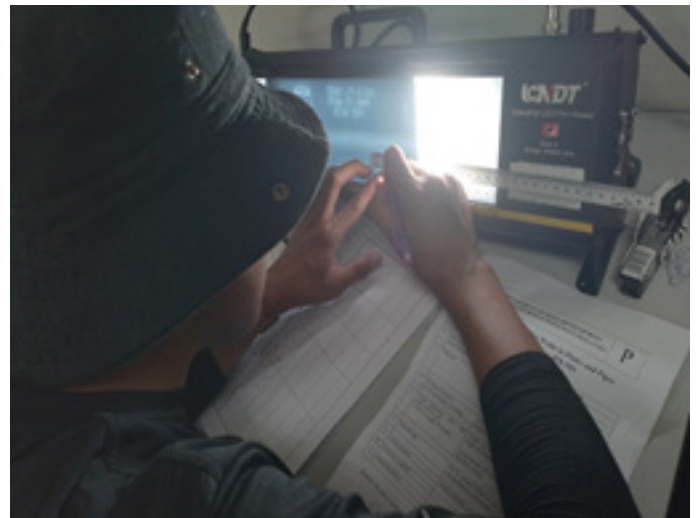
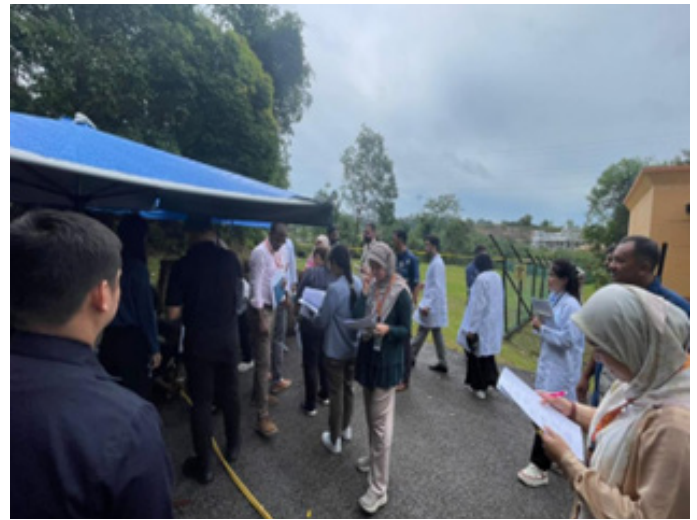


Figure 7 : Photos of training and R&D activities

### Towards a Safer and Sustainable Industrial Future

As the country's main reference centre for industrial radiography, Nuklear Malaysia is fully committed to advancing NDT technology. It ensures that radiation-based techniques are used safely, responsibly, and sustainably across all industries.

Moving into a new era of innovation, the Radiography Laboratory will continue to be vital in supporting key Malaysian industries, such as oil and gas, energy, and construction. It fulfils this role by providing trusted expertise, reliable testing, and continuous improvements in nuclear technology applications.



[www.niosh.com.my](http://www.niosh.com.my)

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