KEMENTERIAN SAINS, TEKNOLOGI DAN INOVASI
MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION

NUKLEAR MALAYSIA

REPORT ON THE RCA TECHNICAL COOPERATION PROGRAM - INDUSTRY

DR. ROSLI DARMAWAN
National Representative
Malaysia
roslid@nm.gov.my

Overview of RAS1028

Improving the Quality Management Practices in Radiation Processing Facilities for Better Performance and Applications

BACKGROUND

TITLE

Improving the Quality Management Practices in Radiation Processing Facilities for Better Performance and Applications

OBJECTIVE

To improve the level of competitiveness and customer satisfaction of radiation processing facilities of RCA GPs

APPROVED FUNDING

USD641,150

BACKGROUND

MEMBER STATES

17 member states participate in the RAS1028 project with three types of member states according to their implementation level of quality management practices for radiation processing facilities

3 resource/advanced countries:

Australia, China, Korea

5 beginner countries:

Cambodia, Lao P.D.R, Mongolia, Myanmar, Nepal

9 intermediate countries:

Bangladesh, India, Indonesia, Malaysia, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam

BACKGROUND

OUTPUTS

- Guidelines on conforming to the international standards relevant to the radiation processing facilities established
- Personnel trained in establishing integrated/QM practices in radiation processing facilities
- Laboratories are capable of carrying out calibrations and measurements required to conform to quality standards
- Documentation required to obtain certification of the QMSs from certification bodies of the participating GPs established

ACTIVITIES

OUTPUTS

Guidelines on conforming to the international standards relevant to the radiation processing facilities established

- Guidelines procurement on quality management procedures
- Guidelines familiarization
- Mock audit activity

Personnel trained in establishing integrated/QM practices in radiation processing facilities

- 5 Regional Training Course (RTC)
- 1 Regional Workshop (RW)
- 1 Conference participation
- 1 Scientific Visit Group

Laboratories are capable of carrying out calibrations and measurements required to conform to quality standards

- Expert mission: Upgrade/establish the laboratories to meet the requirements of the quality manual with expert assistance
- Inter-comparison exercises to validate dose measurements in SSDLs and quality control/assurance

Documentation required to obtain certification of the QMSs from certification bodies of the participating GPs established

- Documentation preparation which required by national certification bodies to obtain certification with expert assistance

ACTIVITIES

OUTPUT 1

Guidelines on conforming to the international standards relevant to the radiation processing facilities established

Procurement of

14 ISO standards

by the IAEA and distributed to all member countries for training use. During regional training courses and workshops, participants are exposed to the standard for understanding.

My Drive › RAS1028 › Standards

Type | People | Modified

Name

- ISO_13004_2022(en).pdf
- ISO_ASTM_51707_2015(en).pdf
- ISO_14470_2011(en).pdf
- ISO_13485_2016(en).pdf
- ISO_IEC_17025_2017(en).pdf
- ISO_TS_11137-4_2020(en).pdf
- ISO_17994_2014(en).pdf
- ISO_6222_1999(en).pdf
- en-iso-11137-2-2015.pdf
- ISO_4831_2006(en).pdf
- ISO_9001_2015(en).pdf
- ISO_11137-2_2013(en).pdf
- ISO_11137-1_2006(en).pdf
- ISO_4832_2006(en).pdf
- ISO_11137-3_2017(en).pdf
- en-iso-11137-1-2015.pdf

ACTIVITIES

OUTPUT 2

Personnel trained in establishing integrated/QM practices in radiation processing facilities

INPUT

- 5 RTC
- 1 RW
- 1 Conference
- 8 Experts
- 17 Potential publications

ACTIVITIES

RTC 1: Guidelines and Standards of Quality Management for Radiation Processing Facilities

RTC2: Significance and Importance of Dosimetry System and Associated Uncertainty for Radiation Processing Facilities

RTC3: Quality Assurance and Quality Control for Gamma Dosimetry Applications

RTC4: Quality Assurance and Quality Control for Electron Beam Dosimetry Applications

RTC5: QC Procedures Implementation of ISO 13485 with provision of ISO 11137 for Medical Device Industries

RTC6: ICARST 2025 participation

RW1: Dosimetry Intercomparison, QA/QC and Quality Management Practices

OUTPUT

300

Personnel trained by Q4/2025 from regional and national training courses

ACTIVITIES

OUTPUT 3

Laboratories are capable of carrying out calibrations and measurements required to conform to quality standards

Procurement of:

19 sets of alanine dosimeters and holders

for dosimetry intercomparison exercise for 19 radiation processing facilities (RFP) involved. This exercise is crucial for RFP to ensure the quality of their services.

3 sets of dosimeters

(gamma calibration set, EB calibration set and EB calorimeter). It helps member states to develop laboratories with the capacity to carry out calibrations and measurements.

1 Dosimetry intercomparison exercise to validate dose measurements at radiation processing facilities. The identified SSDL will validate the measurements and compare the results among the participants.

ACTIVITIES

OUTPUT 4

Documentation required to obtain certification of the QMSs from certification bodies of the participating GPs established

One

Group Scientific Visit on the development of EB irradiator and its quality management system for targeted member states - Laos, Cambodia, Myanmar, Mongolia, Nepal.

One

QMS document per targeted member states that conform to the certification bodies.

IMPLEMENTATION

Activities	2022				2023				2024				2025			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Output 1: Guidelines on conforming to the international standards relevant to the radiation processing facilities established																
Procurement of ISO standards																
Mock audit																
Output 2: Personnel trained in establishing integrated/QM practices in radiation processing facilities																
RTC1: Guidelines and Standards of Quality Management for Radiation Processing Facilities																
RW: Dosimetry Intercomparison, QA/QC and Quality Management Practices																
RTC2: Significance and Importance of Dosimetry System and Associated Uncertainty for Radiation Processing Facilities																
RTC3: Quality Assurance and Quality Control for Gamma Dosimetry Applications																
RTC4: Quality Assurance and Quality Control for Electron Beam Dosimetry Applications																
RTC5: QC Procedures Implementation of ISO 13485 with provision of ISO 11137 for Medical Device Industries																
Conference: ICARST 2025 participation																
Output 3: Laboratories are capable of carrying out calibrations and measurements required to conform to quality standards																
Procurements of gamma calibration set, EB calibration set and EB calorimeter																
Procurements of 19 sets of alanine dosimeters and holders for dosimetry intercomparison exercise																
Dosimetry intercomparison exercise																
Output 4: Documentation required to obtain certification of the QMSs from certification bodies of the participating GPs established																
Documentation preparation																
One draft documentation																

IMPLEMENTATION

2022

1st Meeting – 28-31 March, online via MS Teams

RTC1 – Guidelines and Standards of Quality Management for Radiation Processing Facilities, 28 Nov-2 Dec, Putrajaya, Malaysia

2023

RW - Dosimetry Intercomparison, QA/QC and Quality Management Practices, 19-23 June, Jeongoup, Korea

RTC2 – Significance and Importance of Dosimetry System and Associated Uncertainty for Radiation Processing Facilities, 13-17 Nov, Bangkok, Thailand

2024

Mid-term Meeting – 4-8 March, Suzhou, China

RTC3 – Quality Assurance and Quality Control for Gamma Dosimetry Applications, 24-28 June, Philippines

RTC4 - Quality Assurance and Quality Control for EB Dosimetry Applications, 7-11 Oct, Ho Chi Minh City, Vietnam

2025

RTC5 – QC Procedures Implementation of ISO 13485 with provision of ISO 11137 for Medical Device Industries, Q1, Sri Lanka

ICARST 2025, 7-11 Apr, Vienna

SV – Group Scientific Visit on EB irradiator development, Q3, TBD

Final Meeting – Q4, Malaysia







CONCLUSION

As planned, the project went smoothly with strong support from the IAEA and all member countries. It is a good start to strengthen the current and future requirements of radiation processing facilities in complying with legislative and customer requirements.

IAEA RCA

RAS1029

Enhancing Regional Capabilities in Advanced Non-Destructive Testing Techniques for Improved Safety and Inspection Performance in Industries (RCA)

Background

RAS1029

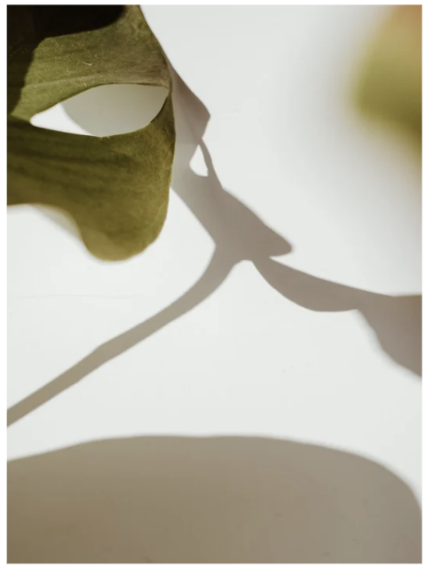
RCA NDT project RAS 1029

Currently a total of **21 Member State** participates in the RCA project on NDT.

Australia, Japan, New Zealand and South Korea volunteered to work as **resource countries**.

RAS1029

2023 – 2026



Title

Enhancing Regional Capabilities in Advanced Non-Destructive Testing Techniques for Improved Safety and Inspection Performance in Industries (RCA)

Objective

To establish regional advancement in NDT to fulfil the requirements set by global standards for self-reliance and sustainable NDT systems of GPs

Approved funding

EUR 660,625

ADVANCED NDT

NDT FOR CIVIL STRUCTURES

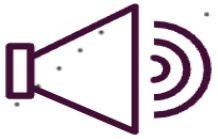
NDT FOR COMPOSITE

RAS1029

Outputs

Output 1

Personnel trained and competent in advanced NDT inspection



Output 2

Personnel trained and competent in NDT for civil structures

Output 3

Capabilities in advanced radiation-based NDT for composite inspection established

ACtivities

RAS1029

OUTPUT 1

Personnel trained and competent in advanced NDT inspection

ACTIVITY

- Establishing capabilities in Radiographic Testing-Digital (RT-D) technique
- Developing capabilities in Phased Array Ultrasonic Testing (PAUT) technique

OUTPUT 2

Personnel trained and competent in NDT for civil structures

ACTIVITY

Establishing capabilities in NDT inspection for civil structures

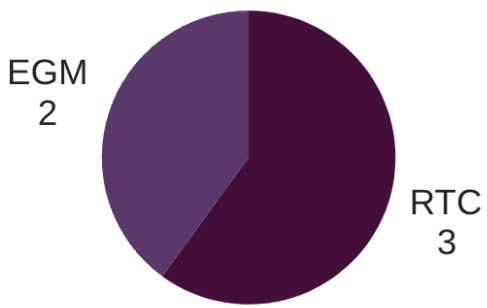
OUTPUT 3

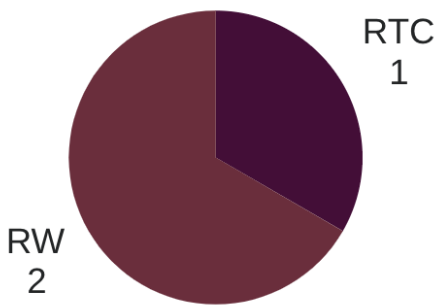
Capabilities in advanced radiation-based NDT for composite inspection established

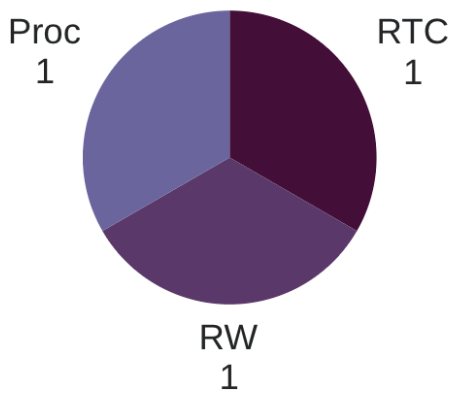
ACTIVITY

Instituting NDT application for composite inspection

Inputs

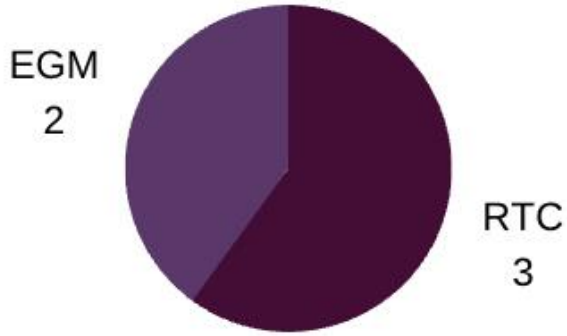






EGM = Expert group meeting; RTC = Regional Training Course; RW = Regional workshop

RAS1029 | OVERVIEW



OUTPUT 1

Personnel trained and competent in advanced NDT inspection

ACTIVITY

- Establishing capabilities in RT-D technique
- Developing capabilities in PAUT technique

RTC 1

Train the trainers on RT-D Level 2 with certification

RTC 2

RTC on PAUT with ISO 9712 Level 2 certification

RTC 3

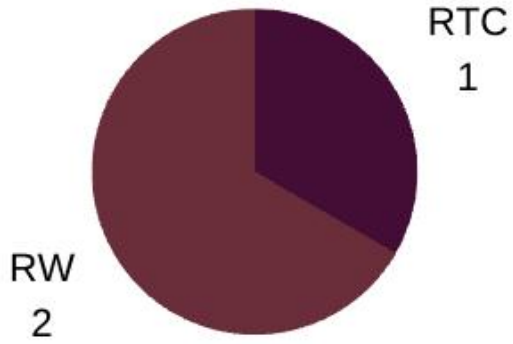
RTC on RT-D Level 3 for personnel involve in the NDT qualification and certification scheme

EGM 1

EGM to develop a draft document and question banks on PAUT

EGM 2

EGM to develop question banks on RT-D



OUTPUT 2

Personnel trained and competent in NDT for civil structures

ACTIVITY

Establishing capabilities in NDT inspection for civil structures

RTC

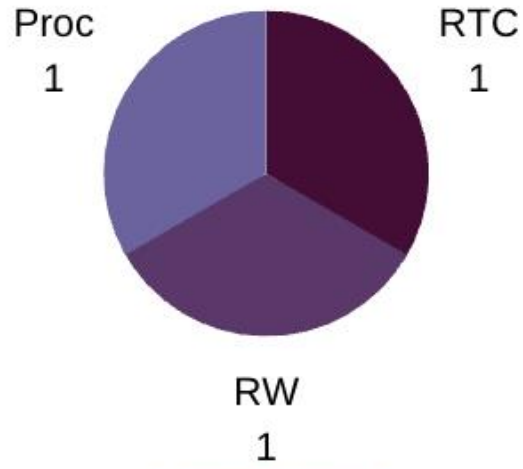
RTC on NDT for civil structures for certification as per ISO 9712

RW 1

RW on NDT techniques for quality control in civil engineering

RW 2

RW on ISO 9712 qualification and certification requirements in NDT for civil structures



OUTPUT 3

Capabilities in advanced radiation-based NDT for composite inspection established

ACTIVITY

Instituting NDT application for composite inspection

RTC

RTC on 3D volumetric visualization of composite using advanced-radiation based NDT techniques.

RW

RW on the practical operation and application of CT for NDT inspection of composite

PROC

Procurement of some NDT essential items of equipment for participating countries

Implementation

RAS1029

RAS1029 Workplan

Activities	2023				2024				2025				2026			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Establishing capabilities in RT-D technique																
Train the trainers on RT-D Level 2 with certification																
EGM to develop question banks on RT-D																
RTC on RT-D Level 3 for personnel involve in the NDT qualification and certification scheme																
Developing capabilities in PAUT technique																
RTC on PAUT with ISO 9712 Level 2 certification																
EGM to develop a draft document and question banks on PAUT																
Establishing capabilities in NDT inspection for civil structures																
RW on NDT techniques for quality control in civil engineering																
RW on ISO 9712 qualification and certification requirements in NDT for civil structures																
RTC on NDT for civil structures for certification as per ISO 9712																
Instituting NDT application for composite inspection																
Procurement of some NDT essential items of equipment for participating countries																
RW on the practical operation and application of CT for NDT inspection of composite																
RTC on 3D volumetric visualization of composite using advanced-radiation based NDT techniques																

2023

MALAYSIA

Train the trainers on RT-D Level 2 with certification (15 May - 1 June)

INDONESIA

Meeting on Harmonization of National Programs for Development and Application of NDT Techniques in line with the Objectives of RAS1029 (21 - 25 Aug)

SOUTH KOREA

RTC on PAUT with ISO 9712 Level 2 certification (16 Oct - 8 Nov)

IAEA

Procurement of some NDT essential items of equipment for participating countries.

2024

NEW ZEALAND

EGM to develop a draft document and question banks on PAUT (15 – 19 Apr)

BANGLADESH

EGM to develop question banks on RT-D (1 – 5 July)

SINGAPORE

RW on NDT techniques for quality control in civil engineering (16 – 20 Sept)

THAILAND

Mid-Term Review Meeting for NPCs to review the project progress and discussion on gaps and strategy for successful implementation (7 – 11 Oct)

2025

INDONESIA

RW on ISO 9712 qualification and certification requirements in NDT for civil structures (Q1)

MALAYSIA

RTC on RT-D Level 3 for personnel involve in the NDT qualification and certification scheme (Q2)

SOUTH KOREA

RW on the practical operation and application of CT for NDT inspection of composite (Q4)

2026

SINGAPORE

RTC on NDT for civil structures for certification as per ISO 9712 (Q2)

SOUTH KOREA

RTC on 3D volumetric visualization of composite using advanced-radiation based NDT techniques (Q3)

VIET NAM

Final review meeting to assess the achievements and planning of future project. (Q4)

Highlights 2023

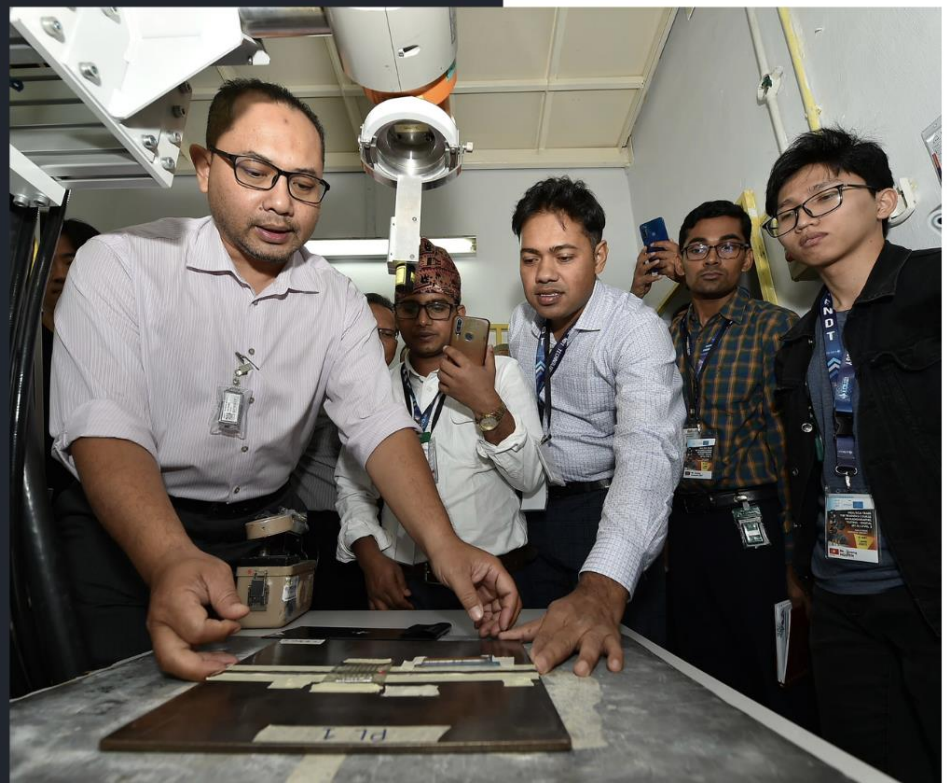
RAS1029

IAEA
International Atomic Energy Agency
Atoms for Peace

RAS1029

TRAIN THE TRAINERS COURSE ON RT-D LEVEL 2

Malaysian Nuclear Agency



HIGHLIGHTS

01. 17 eligible participants from 10 GPs took part in the RTC.

02. The training course provided RT-D Level 2 training and examinations in accordance with ISO 9712

03. 14 candidates passed the theoretical and practical examinations and qualified to apply for the internationally recognized ISO 9712 RT-D certification, pending fulfilment of industrial experience and visual requirements.

IAEA
International Atomic Energy Agency
Atoms for Peace

RAS1029

RTC ON PAUT WITH ISO 9712 LEVEL 2 CERTIFICATION

Wonkwang University

HIGHLIGHTS

01. Attended by 21 participants from 14 GPs

02. This course was designed to train participants and qualify them for PAUT Level 2 certification in accordance with ISO 9712

IAEA
International Atomic Energy Agency
Atoms for Peace

RAS1029

MEETING ON HARMONIZATION OF NATIONAL PROGRAMMES FOR DEVELOPMENT AND APPLICATION OF ADVANCED NDT TECHNIQUES

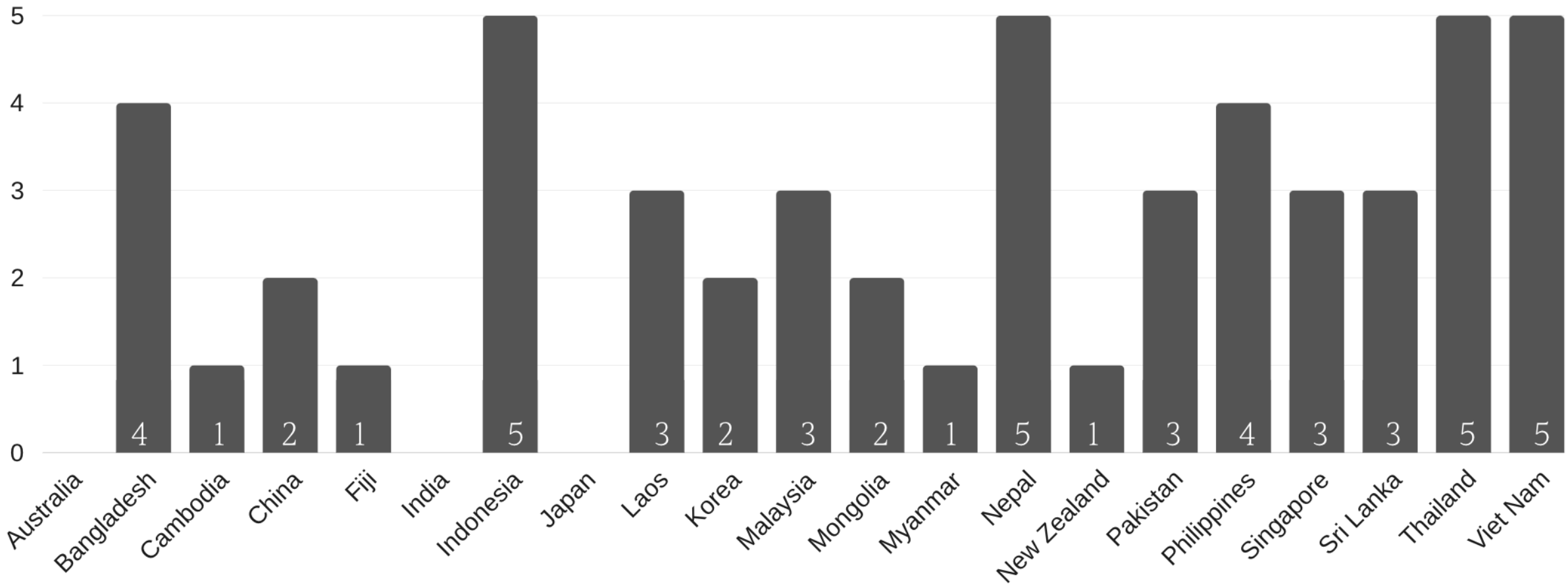
BRIN

HIGHLIGHTS

01. The meeting dedicated to deliberate upon the programs and activities that participating GPs will implement at the national level for the advancement and utilization of advanced NDT techniques

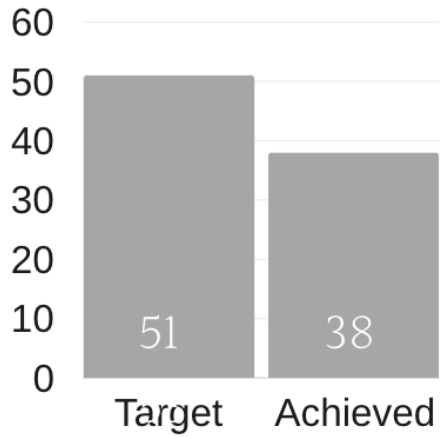
02. Through the discussion sessions, harmonized work plans were devised for the 21 participating GPs, ensuring their alignment with the overarching RAS1029 work plan.

Participation analysis – RAS1029



Performance Indicators – RAS1029

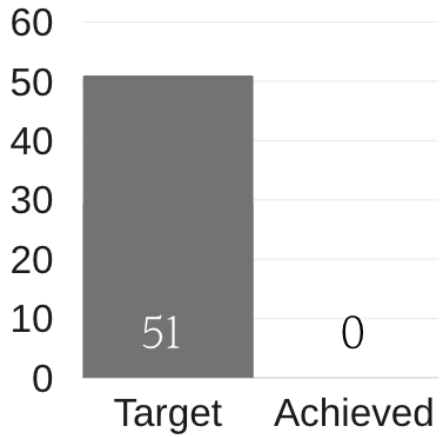
3 RTC



ADVANCED NDT

51 trained personnel in advanced NDT techniques

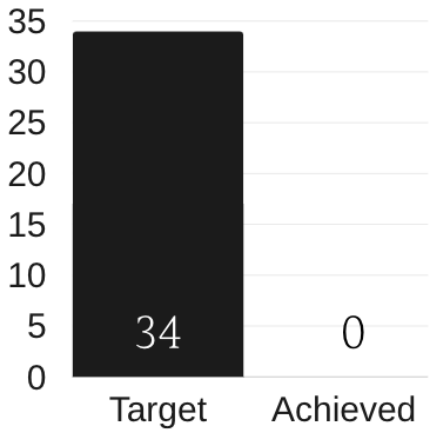
1 RTC, 2 RW



CIVIL STRUCTURES

51 trained personnel in NDT for civil structures

1 RTC, 1 RW



COMPOSITE

34 trained personnel in advanced radiation-based NDT for composite inspection

Conclusion

RAS1029

RAS1029

The project is progressing well with great support and cooperation received from the IAEA and National Project Coordinators (NPCs) in the planning and implementation of activities.

IAEA RCA

RAS1029

Enhancing Regional Capabilities in Advanced Non-Destructive Testing Techniques for Improved Safety and Inspection Performance in Industries (RCA)

KEMENTERIAN SAINS, TEKNOLOGI DAN INOVASI
MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION

NUKLEAR MALAYSIA

Thank you

DR. ROSLI DARMAWAN

Director General
Malaysian Nuclear Agency
Ministry of Science, Technology and Innovation

roslid@nm.gov.my