



Strengthening National Data Centre Through Regional Empowerment: A story of Malaysia

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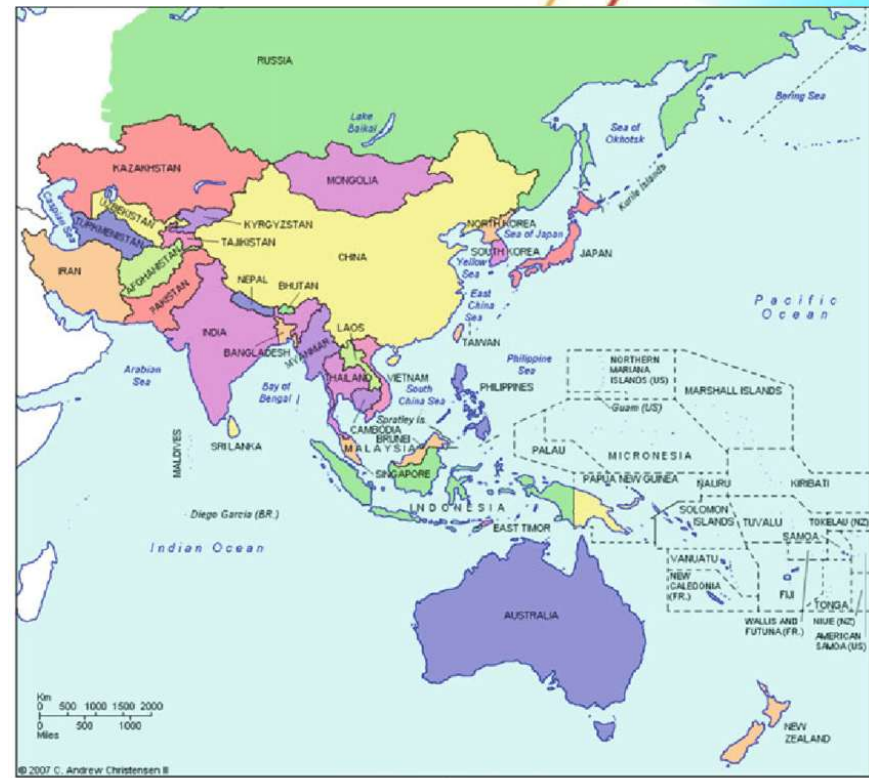
Malaysia

Malaysia is located in **Southeast Asia**, partly on the **Malay Peninsula** (West Malaysia) and partly on the island of **Borneo** (East Malaysia).

- Borders:** Thailand to the north, Singapore to the south (by causeway/bridge), and Indonesia and Brunei on Borneo.

- Seas:** South China Sea (separates West and East Malaysia), Straits of Malacca (to the west), and Sulu & Celebes Seas (to the east).

- Capital city:** Kuala Lumpur (administrative), Putrajaya (federal government centre).



CTBT in Malaysia: Why it is matter to Malaysia

- Support Malaysia's commitment to the Non-Proliferation Treaty (NPT), Nuclear Weapon Free Zone (NWFZ), and international commitment to the peaceful uses of nuclear technology
- Indirectly support to strengthen and improve our National Disaster Management
- Contributions and involvement in international high technology, scientific knowledge, and academia



CTBT in Malaysia: the Development


Phase 1:
Geopolitical & Policy


Phase 2:
Infrastructure Establishment


Phase 3:
Capacity Building and Technical Know-how Sustainability

December 20, 2005
Establishment of Malaysian
National Data Centre, (My-
NDC)

January 17, 2008
Malaysia ratifies the Comprehensive
Nuclear-Test-Ban Treaty

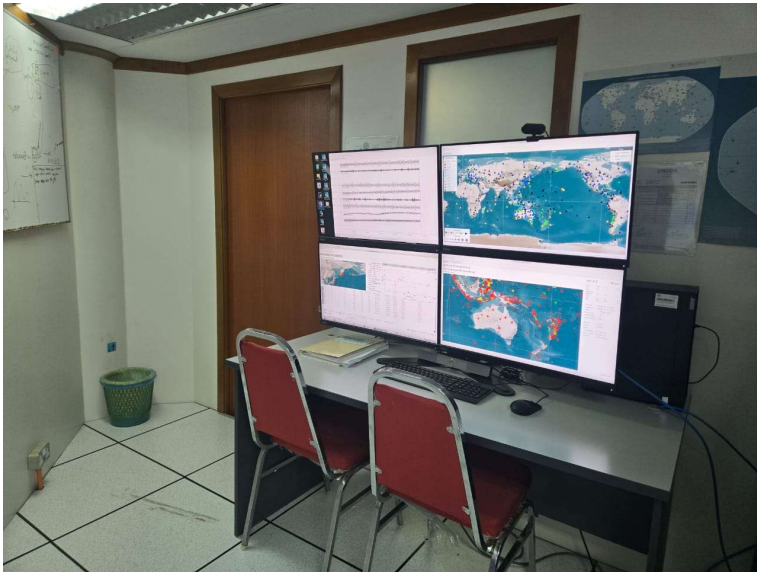
August 18, 2011
Malaysia signs Agreement between the
Preparatory Commission for the
Comprehensive Nuclear-Test-Ban
Treaty Organization and the Government of
Malaysia concerning the use of primary seismic,
auxiliary seismic and hydroacoustic data for
tsunami warning purposes

July 23, 1998
Malaysia signs the Comprehensive
Nuclear-Test-Ban Treaty

August 28, 2007
Construction of IMS Radionuclide
Monitoring Station (RN42)

July 14, 2009
Certification of RN42

CTBT in Malaysia: My-NDC



Installed : 20 December 2005 at Malaysian Nuclear Agency

Software : NDC in Box and Seiscomp 6.4.1

Hardware : i. Satellite Router: iDirect 3000
ii. VPN Router: Cisco 1811
iii. Baseline switch: 3Com 2816
iv. Server : Poweredge 2850
v. Computer: 3 Desktops

Staff : 4 personnel

Two data channels:

- i. First data channel is linked to the NDC at Malaysian Nuclear Agency
- ii. Second data channel is linked to National Tsunami Early Warning Centre (NTEWC) located at the Malaysian Meteorological Department (MMD).

The role of My-NDC

1

Enhancing National and International Security

Treaty Obligations

Fulfilling commitments under international treaties

Long-term Support

Ensuring continuous monitoring of nuclear tests

2

Improve National Disaster Management

Malaysian Network Extension

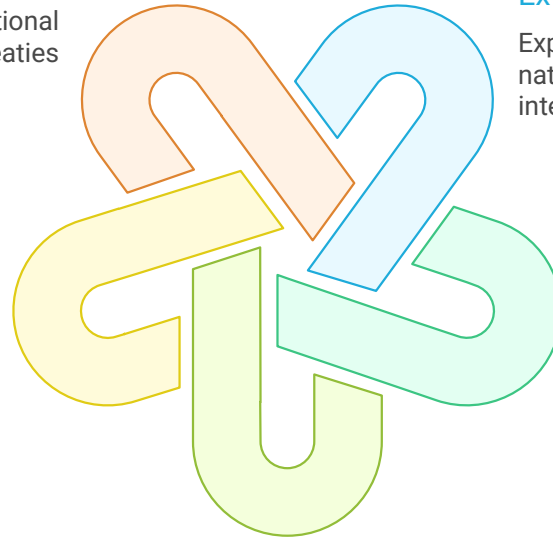
Expanding reach nationally and internationally

System Integration

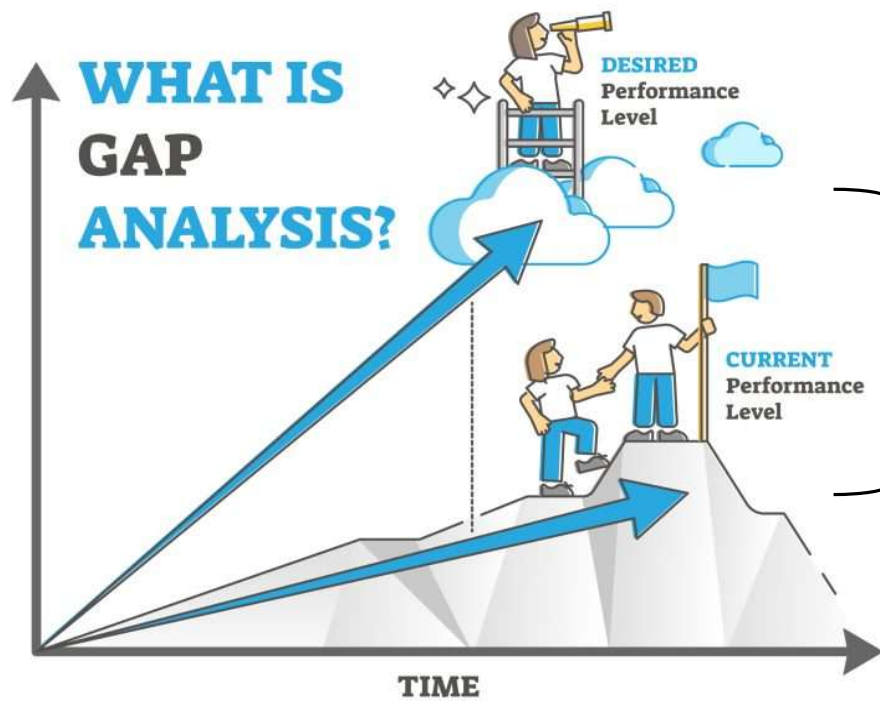
Streamlining operations into a coherent system
So that My-NDC functions as one unified system for data analysis, reporting, and decision-making.

Disaster Management

Improving response to disasters and public safety

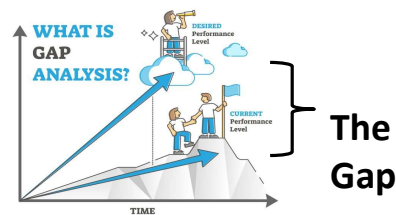


METHODOLOGY 1 : GAP ANALYSIS



1. Limitation of technical know-how
2. insufficiency of national expertise and short of staff (need a strategy to gain)
3. Resource constraints are anticipated despite the need for rapid outcomes, encompassing financial limitations, expert availability, and time constraints.
4. Knowledge sustainability
5. Gain continuous support from the Government

Gap Analysis: The strategies



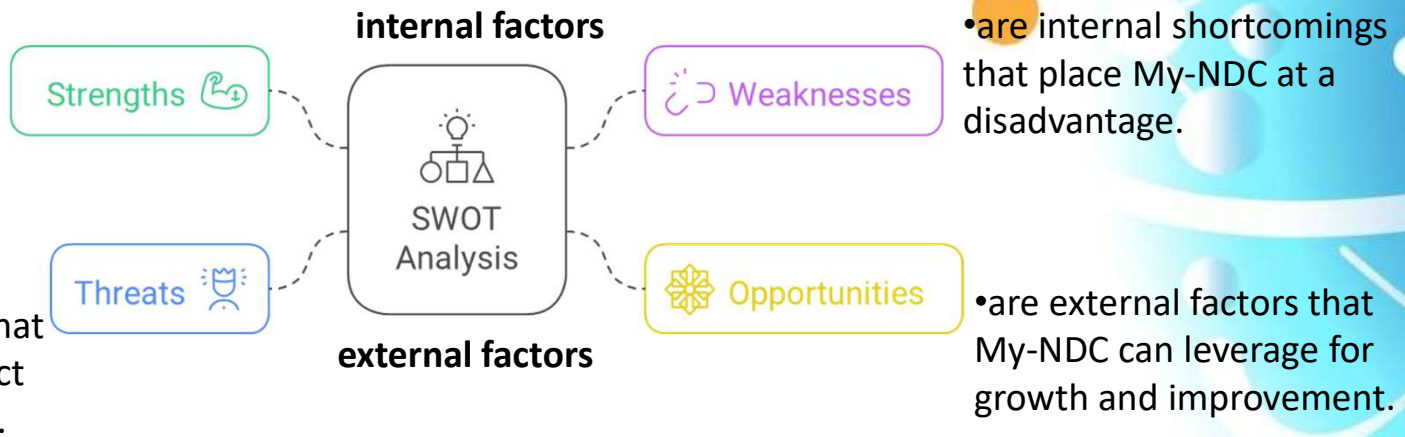
The Gap	Strategies for Malaysia to narrow the gap
1. Limitation of technical know-how	- Seeking strategic partnerships with advanced member states and exploring collaborations, including national (inter-agency coordination). - Continuous support from the CTBTO
2. insufficiency of national expertise and short of staff	Facilitating collaboration among departments and agencies to form a dedicated CTBT team, aims to train them as experts who can actively contribute to global CTBT activities (such as the Program for OSI surrogate inspectors program,)
3. Resource constraints are anticipated despite the need for rapid outcomes, encompassing financial limitations, expert availability, and time constraint	- Regularly staying informed about the PTS program to identify resources that can benefit the country. - Exploring the use and contribution of CTBT data in civil applications that align with national and global interests, and integrating these activities into the national policy, as well as incorporating them as key performance indicators (KPIs) for the agency and ministry. Positioning CTBT in the national agenda and interest includes areas such as national emergency preparedness and the National Nuclear Technology Policy. - to include the promotion of the use of monitoring data for civil and scientific purposes - To monitor and produce a special report to the Government in response to any major global event that may affect Malaysia. Eg: earthquakes in regions near the nuclear reactor facilities - and - Outreach Program – to educate policy decision-makers, educators (universities, etc), researchers
4. Sustainability of knowledge	Train the Trainers Program and Mentoring Program Consistency in training – online and e-learning
5. Gain continuous support from the Government	include CTBT in National Agenda and Interest: eg: National Emergency Preparedness, National Nuclear Technology Policy Involve as all relevant ministries and agencies in CTBT activities and national decision : Malaysia has form inter-agency committee. (at national level)

Methodology 2 : SWOT analysis

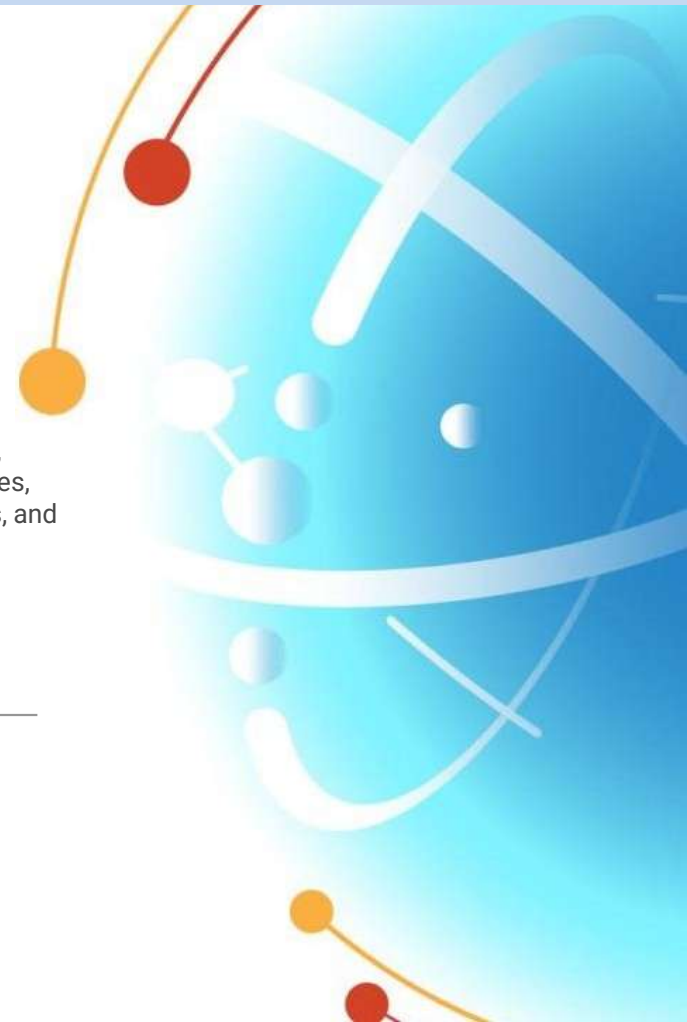
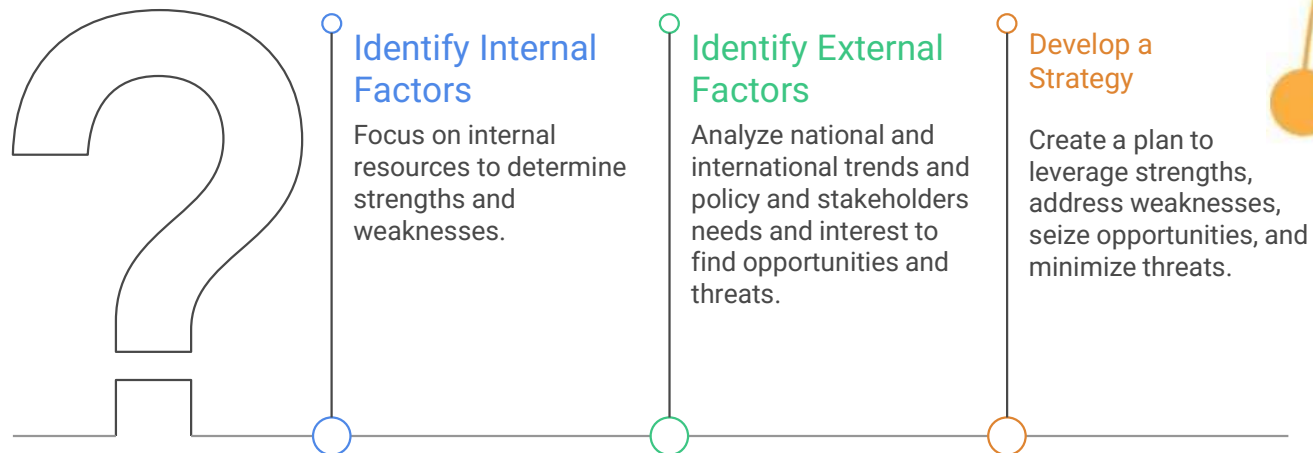
A SWOT analysis is a strategic planning framework used to identify an organization's internal **Strengths and Weaknesses**, as well as external **Opportunities and Threats**. The goal is to gain insights into MY-NDC current position to make informed strategic decisions, leveraging advantages, minimizing disadvantages, capitalizing on growth opportunities, and mitigating potential risks.

SWOT Analysis: Components and Impact

are internal advantages that give distinctive capabilities of My-NDC.

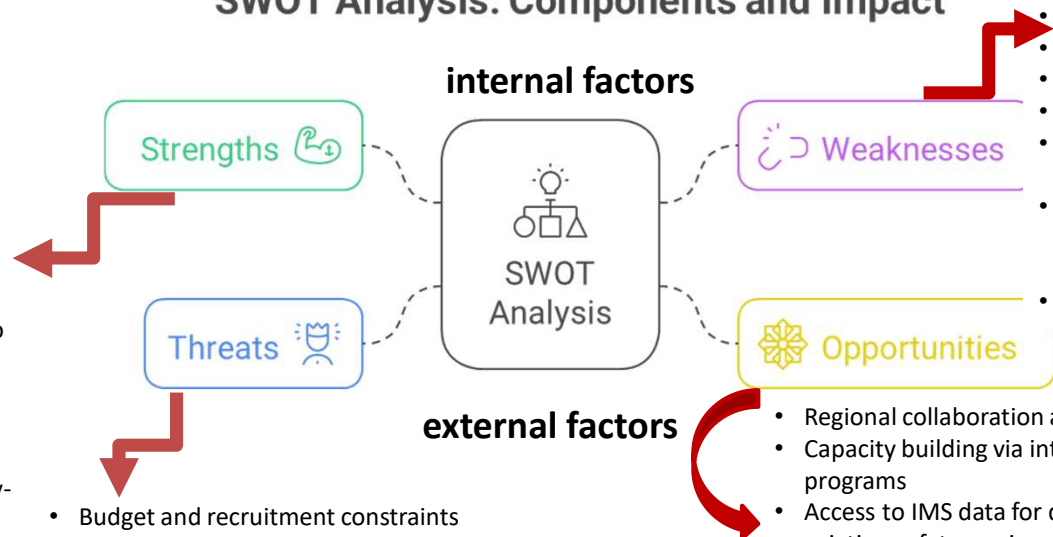


How we conduct a SWOT analysis?



the Findings from SWOT Analysis

SWOT Analysis: Components and Impact



Strengths



internal factors

SWOT
Analysis

Weaknesses



Threats



external factors

Opportunities



- Risk of declining interest among new analysts
- Budget and funding constraints
- Limited training opportunities for new analysts
- Additional workload on existing staff
- insufficiency of national expertise and short of staff
- Limitation of technical know-how and about CTBT-less interest
- Resource constraints are anticipated despite the need for rapid outcomes, encompassing financial limitations, expert availability, and time constraint
- Sustainability of knowledge

- Budget and recruitment constraints
- Competition with others for project funding
- Limited training opportunities – a major challenge with the growing number of analysts
- Limited knowledge about CTBT
- Bureaucracy in administration – Requires approval from multiple parties, resulting in a lengthy process
- Limited CTBT knowledge among policymakers – requires greater awareness and understanding

- Regional collaboration and empowerment through CTBT networks
- Capacity building via international training, workshops, and exchange programs
- Access to IMS data for dual-use applications (e.g., disaster management, aviation safety, environmental monitoring)
- Strengthening partnerships with universities and research institutions (academic collaboration) Increasing visibility in international forums (CTBTO, UN, ASEAN, etc.)
- Potential for technology transfer and high-technology development
- Enhancing Malaysia's leadership role in nuclear non-proliferation and disarmament
- Strong support from gov, other relevant ministries, CTBTO and CTBT Member States.
- the Asia-Pacific region includes strong CTBT Member States well-versed in CTBT technologies, such as Australia, China, Japan, Korea and many others.

- CTBT contribution to verification and scientific knowledge- attract gov's support
- Malaysia has clear policy on big data analytic policy supporting high tech– allow My-NDC to use existing national resources : HCD fund for training, Malaysia Plan – to helps with physical development of My-NDC
- CTBT verification and scientific knowledge- attracts research officers/scientist and regulator to involve which can be trained as analysts
- Staff with diverse educational backgrounds: geology, physics, nuclear science, etc. enhance My-NDC by bringing complementary expertise that strengthens analytical capability, improves data interpretation, and supports multidisciplinary approaches to nuclear test monitoring. This diversity fosters innovation, ensures comprehensive problem-solving, and builds greater resilience in addressing CTBT-related challenges.”

Findings Conclusion

In the case of Malaysia, to help strengthen the capability and capacity of the National Data Centre (NDC), it is important to:

1. Foster partnerships through collaboration with Member States that possess more advanced expertise and proficiency in CTBT-related technologies
2. Ensure sustained political and financial supports.
3. Build both local and regional ownership.

Local ownership

- Ensuring Malaysia develops the skills, infrastructure, and expertise to operate and sustain its NDC.
- Reducing reliance on CTBTO experts or external consultants by training local analysts, pursuing regional strategic partnerships, securing national budgets, and integrating CTBT into national policies.
- Positioning the NDC as a recognized national asset that supports both CTBT obligations and other national priorities (e.g., disaster management, research, security).

Regional ownership

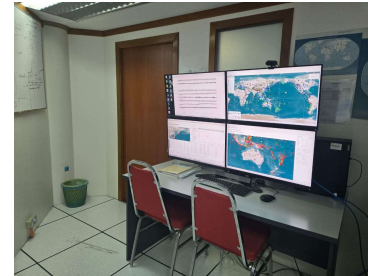
- Encouraging cooperation among countries in the same region to share knowledge, experiences, and resources.
- Strengthening regional networks of NDCs to support each other in training, technology use, and problem-solving.
- Promoting a sense of shared responsibility for the success of CTBT verification in the region, not just globally.
- Malaysia hopes that such collaboration may be extended to other SEAPFE countries, thereby strengthening regional nuclear test monitoring efforts and contributing to sustainable development as well as the well-being of the public

The Result

1. MY-NDC grew from 3 to 19 national analysts, 42% of whom are women

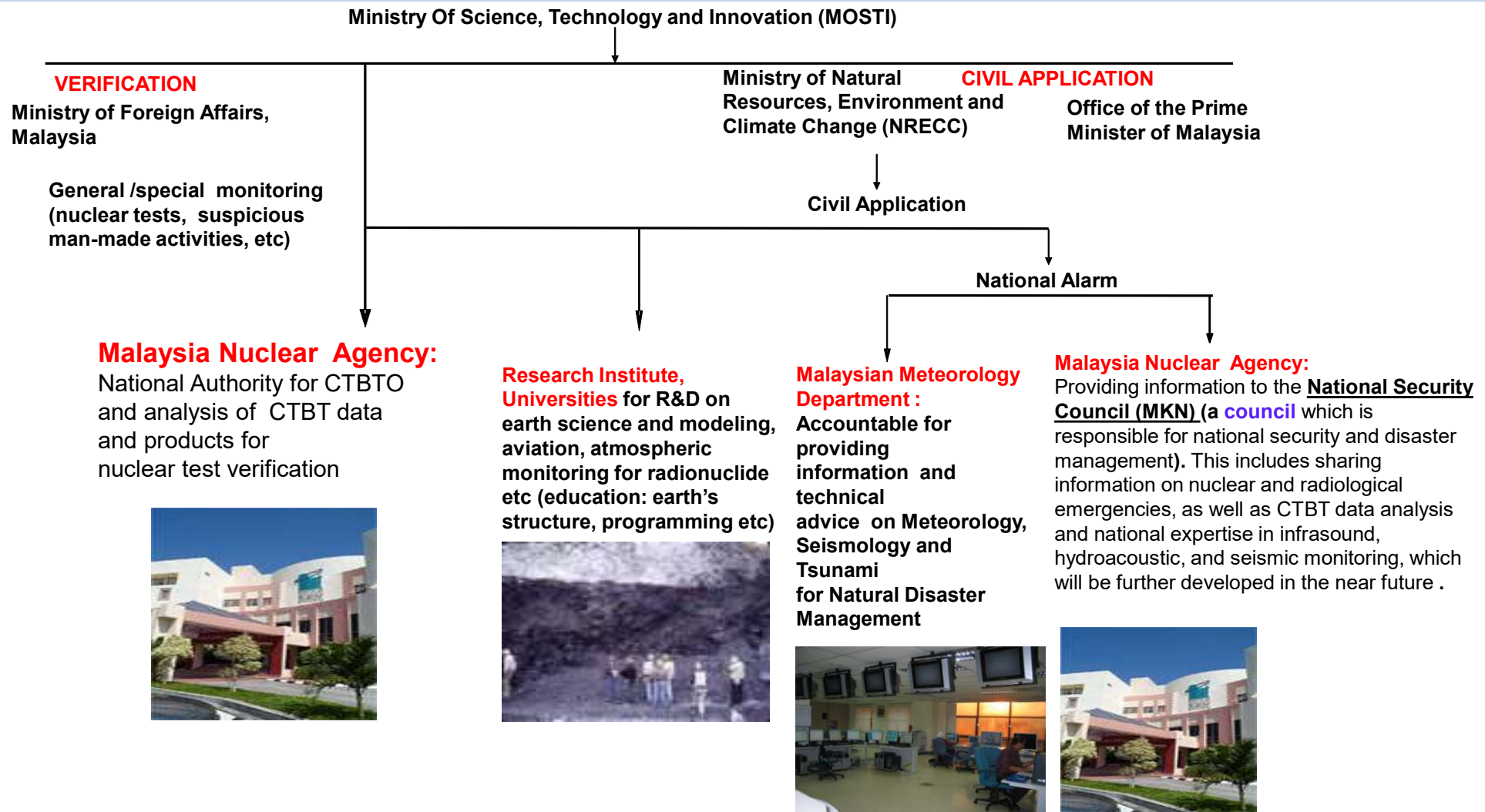


2. Better workstations for MY-NDC this is part of government's support for a succeed implementation of CTBT: this indirectly motivate national analysts and to make Malaysia keep up with CTBT latest analytical technology.



3. Broader ministry involvement – gaining support and highlighting the CTBT's importance to national interests
4. Successfully conclude agreement with the Government of Australia

CTBT Governance In Malaysia For Broader Ministry Involvement



CTBT Activities in Malaysia: Strengthening the Capability and Capacity of My-NDC through Strategies Developed from the Study

Result: CTBT as part of National Policy and National Interest

Gaining the government's confidence to include CTBT's activities in National Policies

- Wawasan Nuklear Malaysia 2030 (Nuklear Malaysia Vision 2030)-
 - ☐ under the Thrust Strategic 4 of the document: National and International Nuclear Governance :
 - ☐ Strategy 2 of the vision ; Strengthening its role as the national authority for the implementation of the Comprehensive Nuclear-Test-Ban Treaty (CTBT)
- Dasar Teknologi Nuklear Negara 2030 (National Nuclear Technology Policy 2030)
- Included in the top management and Ministry's Key Performance Indicator (KPI)



CTBT Activities in Malaysia: Strengthening the Capability and Capacity of My-NDC through Strategies Developed from the Study

Result: INTERNATIONAL COLLABORATION
Malaysian Nuclear Agency and ASNO, Australia



The signing of agreement between the Government of Malaysia and the Government of Australia dated 4 March 2024, under the Practical Arrangement Between the Government of Malaysia And the Government of Australia on **Cooperation in The Areas of Science and Technology and Their Applications for The Implementation of The Comprehensive Nuclear-Test-Ban Treaty** during the second Australia-Malaysia Annual Leaders' Meeting. During the meeting, Prime Ministers Anthony Albanese and Anwar Ibrahim also reaffirmed both countries' Comprehensive Strategic Partnership.

This partnership highlights the importance of regional empowerment in successfully implementing the CTBT

CTBT Activities in Malaysia: Strengthening the Capability and Capacity of My-NDC through Strategies Developed from the Study

Result: INTERNATIONAL COLLABORATION between Malaysian Nuclear Agency and ASNO, Australia

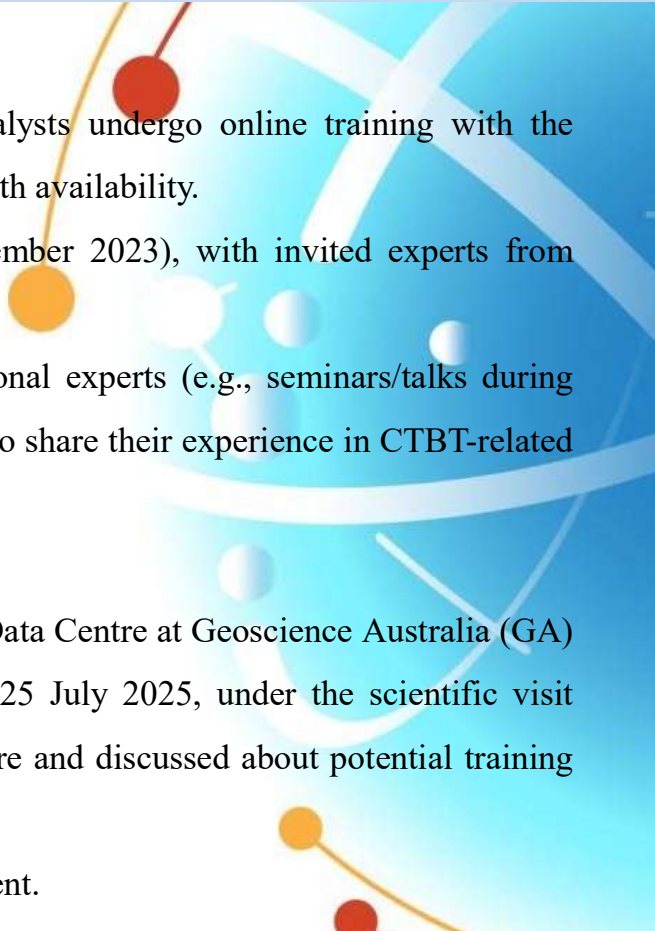
MAIN AREA OF COOPERATION:

- a) discussions, consultations, visits, and meetings among scientific and verification experts;
 - b) Exchange of information and data consistent with Paragraph 5(2) [does not authorize the exchange of nationally classified information] of this Practical Arrangement;
 - c) **Assistance in training and capacity building**, including through training courses, seminars and workshops, fellowships, scientific visits and expert missions;
 - d) Sharing of experiences and best practices through suitable platforms;
 - e) Joint projects or other means as may be mutually determined in writing by the National Authorities;
 - f) Joint “Research and Development” (R&D) activities in the areas related to the CTBT science and technologies; and
 - g) Any other forms of activities in related fields to be mutually decided upon by the Participants.
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CTBT Activities in Malaysia: Strengthening the Capability and Capacity of My-NDC through Strategies Developed from the Study

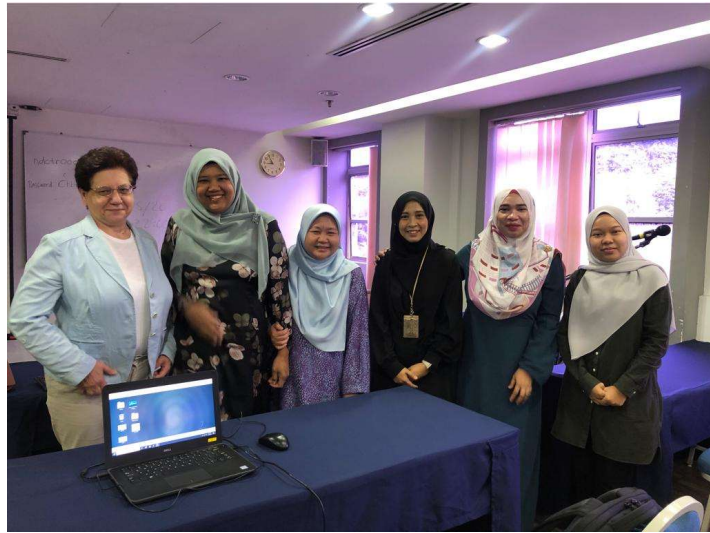
Result: INTERNATIONAL COLLABORATION between Malaysian Nuclear Agency and ASNO, Australia

Activities that were carried out under the cooperation:

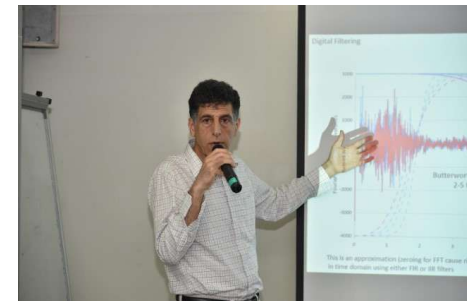
1. Developed a Train-the-Trainers Programme . Currently there are three Malaysian analysts undergo online training with the Geoscience Australia which started in 2023 and will be continued time to time based on both availability.
 2. Organized a National Training Course on CTBT Seismic Data Analysis (18–22 September 2023), with invited experts from Geoscience Australia.
 3. Conducted outreach programmes to identify and attract more participation among national experts (e.g., seminars/talks during colloquia). Participation of experts from ASNO and Geoscience Australia wh are willing to share their experience in CTBT-related matter by giving presentation during the outreach program.
 4. Assisted Malaysia NDC with SeisComP configuration.
 5. Coordinated a scientific visit by officers from Nuklear Malaysia to the CTBTO National Data Centre at Geoscience Australia (GA) and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), 21–25 July 2025, under the scientific visit programme aimed at sharing experiences in strengthening the CTBT National Data Centre and discussed about potential training between NDCs
 6. Exchange report between NDCs (waveform and radionuclide) if there is CTBT-interest event.
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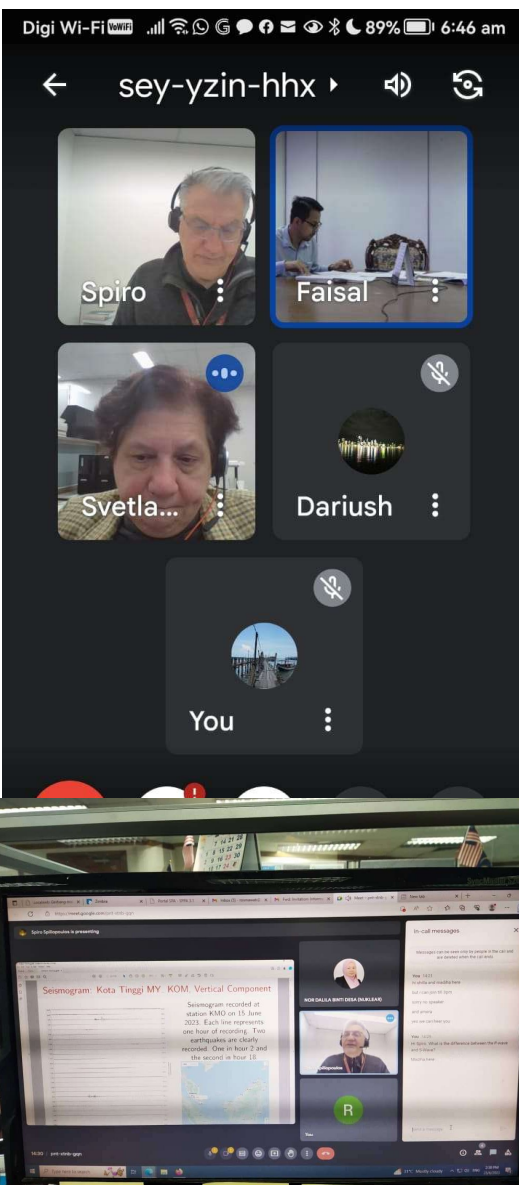
CTBT Activities in Malaysia: Strengthening the Capability and Capacity of My-NDC through Strategies Developed from the Study

Result: INTERNATIONAL COLLABORATION
Malaysian Nuclear Agency and ASNO, Australia



Training Course on the CTBT Seismic Data Analysis

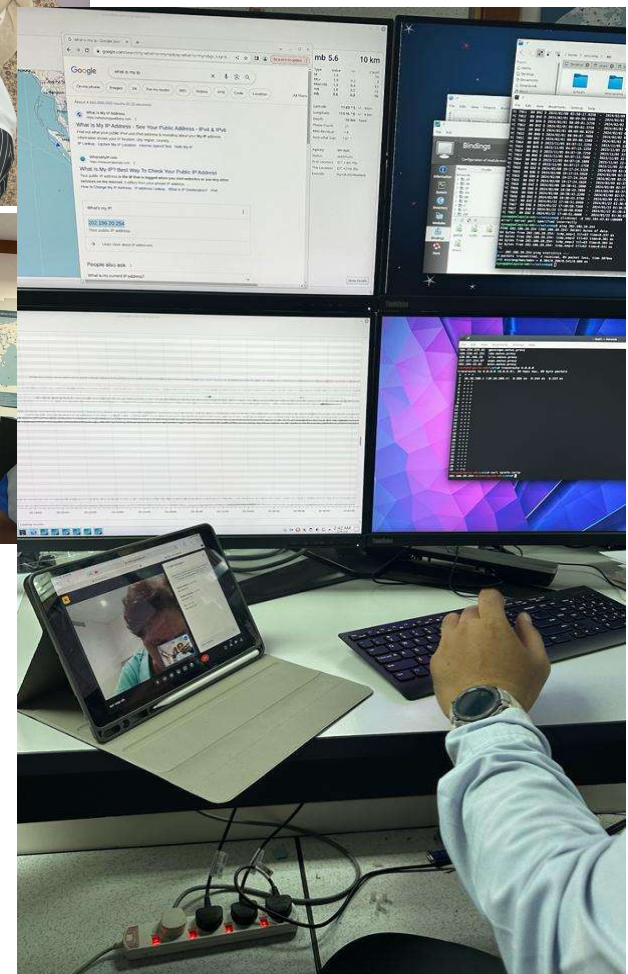
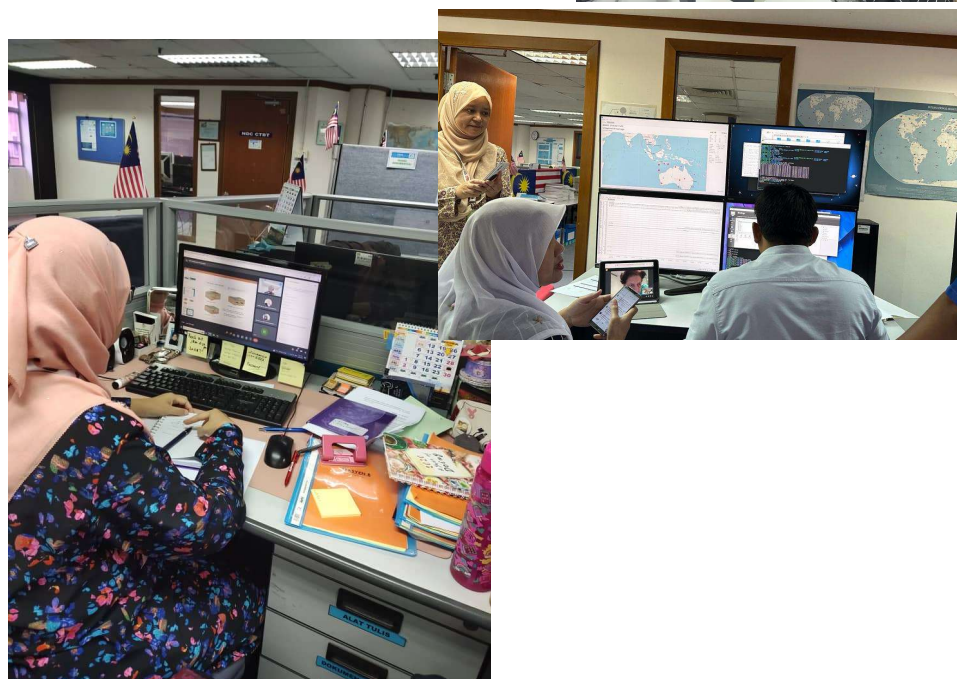




Online training -Train the Trainers Program 2023 [During lunch hour]
3 trainees for 1st batch



Helps with My-NDC workstation Seiscomp configuration



CTBT Activities in Malaysia: Strengthening the Capability and Capacity of My-NDC through Strategies Developed from the Study

Result: NATIONAL COLLABORATION between Malaysian Nuclear Agency and Malaysian Meteorological Department (MET Malaysia)

Activities that were and will be carried out under this cooperation:

1. Developed a Train-the-Trainers Programme. Developed silibus on seismic CTBT-related technology
2. Joint hosting National Training Course on CTBT Seismic Data Analysis-focusing basic seismology
3. Assisting Malaysia NDC with SeisComP configuration and other IT-related matters for the NDC.
4. Sharing meteorology data for R&D purpose that using CTBT data or CTBT-related event.
5. Advising My-NDC on seismic event that may related to CTBT-interest event
6. As station operators
7. Allocation of land for the establishment of the IMS Radionuclide Monitoring Station, RN42



IMPLEMENTATION OF CTBT IN MALAYSIA

INTER AGENCY COLLABORATION

	ministries and agencies
1	Malaysian Nuclear Agency
2	Jabatan Meteorologi Malaysia
3	Ministry of Science, Technology and Innovation (MOSTI)
4	Attorney General Chamber (AGC)
5	Ministry of Defense (MINDEF)
6	Ministry of Foreign Affairs (MOFA)
7	Ministry of Home Affairs (KDN)
8	Ministry of Finance (MOF)
9	Ministry of Health (MOH)
10	Ministry of Communication and Multimedia (MCMC)
11	National Security Council (MKN)
12	National Disaster Management Agency (NDMA)
13	Science Technology Research Institute for Defense (STRIDE)
14	Royal Malaysian Customs Department
15	Royal Police Malaysia (PDRM)
16	Jabatan Tenaga Atom (JTA)

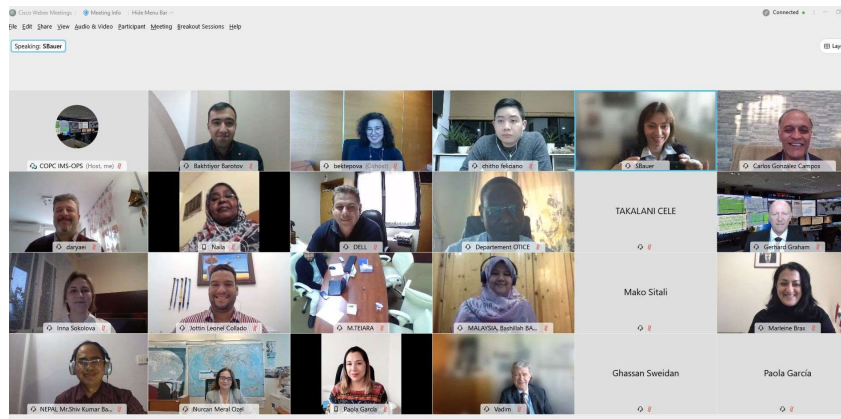
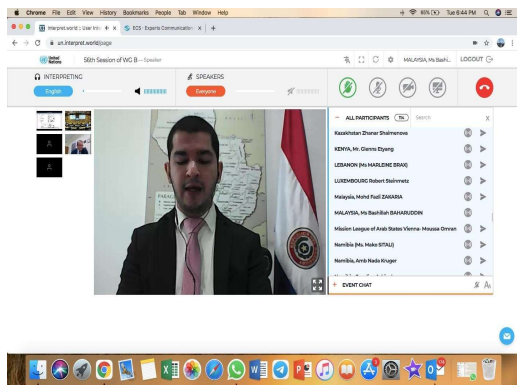


CTBT Activities in Malaysia: Strengthening the Capability and Capacity of My-NDC through Strategies Developed from the Study

1) NDC Monthly and Annual Reports

YEAR	TECHNICAL REPORTS	MONTHLY/QUARTERLY
2020	12	MONTHLY
2021	12	MONTHLY
2022	12	MONTHLY
2023	12	MONTHLY
2024	12	MONTHLY
2025	5	QUARTERLY

2) Participate in the CTBTO Working Group A and Working Group B and Experts Meetings



CTBT Activities in Malaysia: Strengthening the Capability and Capacity of My-NDC through Strategies Developed from the Study

- 3) Annual Inter-Agency Meeting on the Implementation of CTBT in Malaysia [1/year]
- 4) Establishment of National Analysts for CTBT [consists of 19 analysts]- soon will open to other relevant agencies
- 5) Hosted in house training courses
 - LINUX Essential Hands-on Tutorial for CTBTO User
 - CTBT Seismic Data Analysis Training Course
 - CTBT Introductory course dan CTBT Basic data analysis
- 6) CTBT Outreach Program
 - Participate in Regional Geoscience Congress of Southeast Asia [GEOSEA 2022]
 - Organize Technical Colloquium between Nuklear Malaysia and university
 - Participate in National Climate Forum





Terima Kasih

Your questions are always welcome—please contact me anytime:
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