NUKLEAR MALAYSIA

COUNTRY REPORT: MALAYSIA

Presented by:

Dr Mohd Abd Wahab Yusof

Director General, Malaysian Nuclear Agency

on behalf of

Minister of Energy, Science, Technology, Environment & Climate Change (MESTECC) of Malaysia

20th FNCA Ministerial Level Meeting

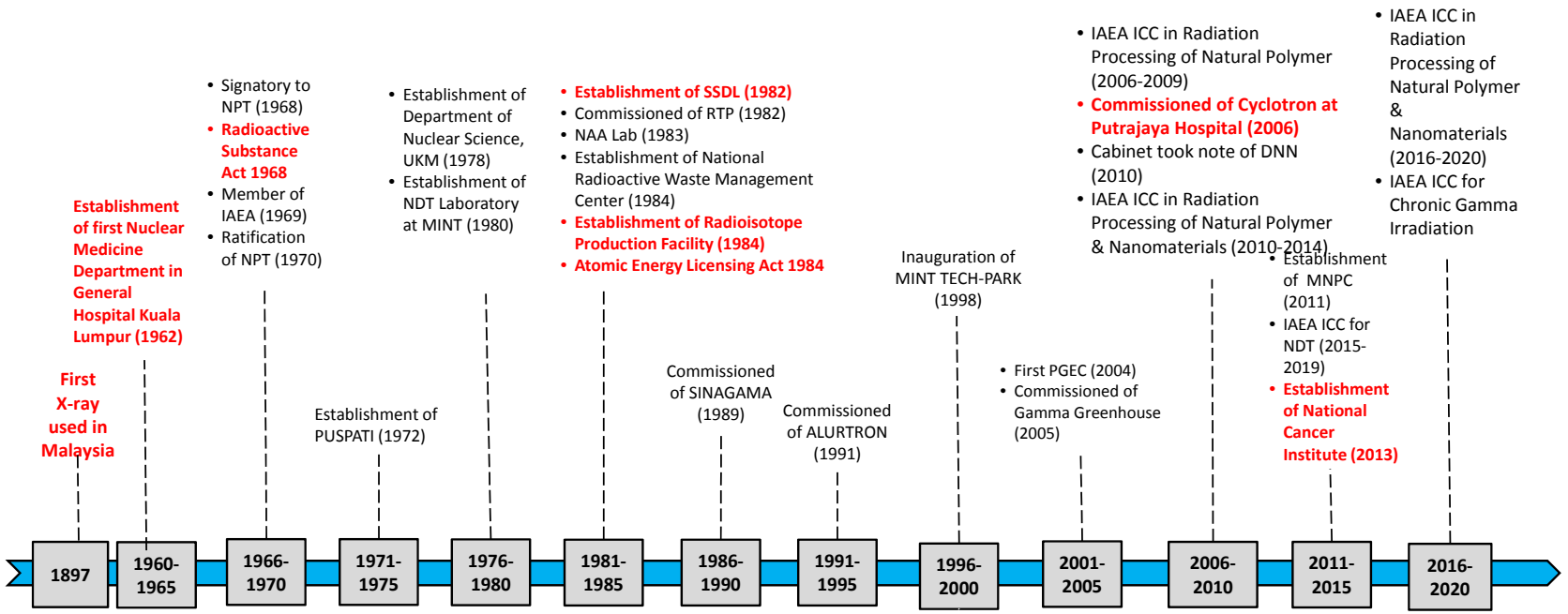
5 December 2019

Tokyo, Japan

OUTLINE

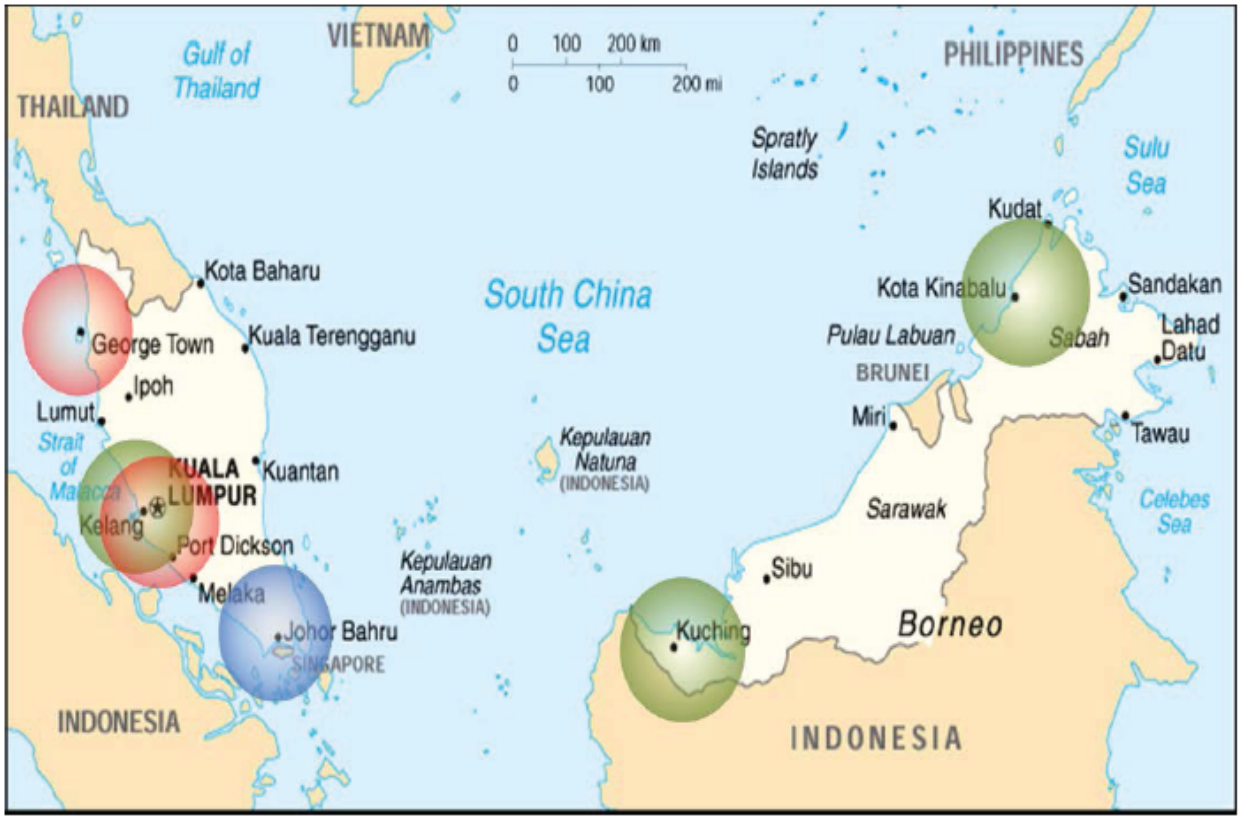
- Overview of Radiation Technology Utilisation in Human Health
- National Policy on the Utilization of Radiation Technology in Human Health
- Status and Challenges of Nuclear Human Resource Development
- Progress of Nuclear Technology Applications
- Summary

Overview of Radiation Technology Utilisation in Human Health



Currently, Malaysia has 38 radiotherapy centres, 36 nuclear medicine centres, 1766 radiology setups of various levels and 9 blood irradiation machines

NUCLEAR MEDICINE FACILITIES IN MALAYSIA



Out of the 6 Nuclear Medicine centers under MOH, two are at the central region. Only 2 centers are equipped with PET-CT service (red) and one is still under the category of Level 1(blue). There is no MOH Nuclear Medicine center at the east coast of Peninsular Malaysia.

Source: Operational policy in nuclear medicine services, Ministry of Health Malaysia, 2018

MEDICAL CYCLOTRONS IN MALAYSIA

Table 2: Types of Cyclotron Available in Malaysia

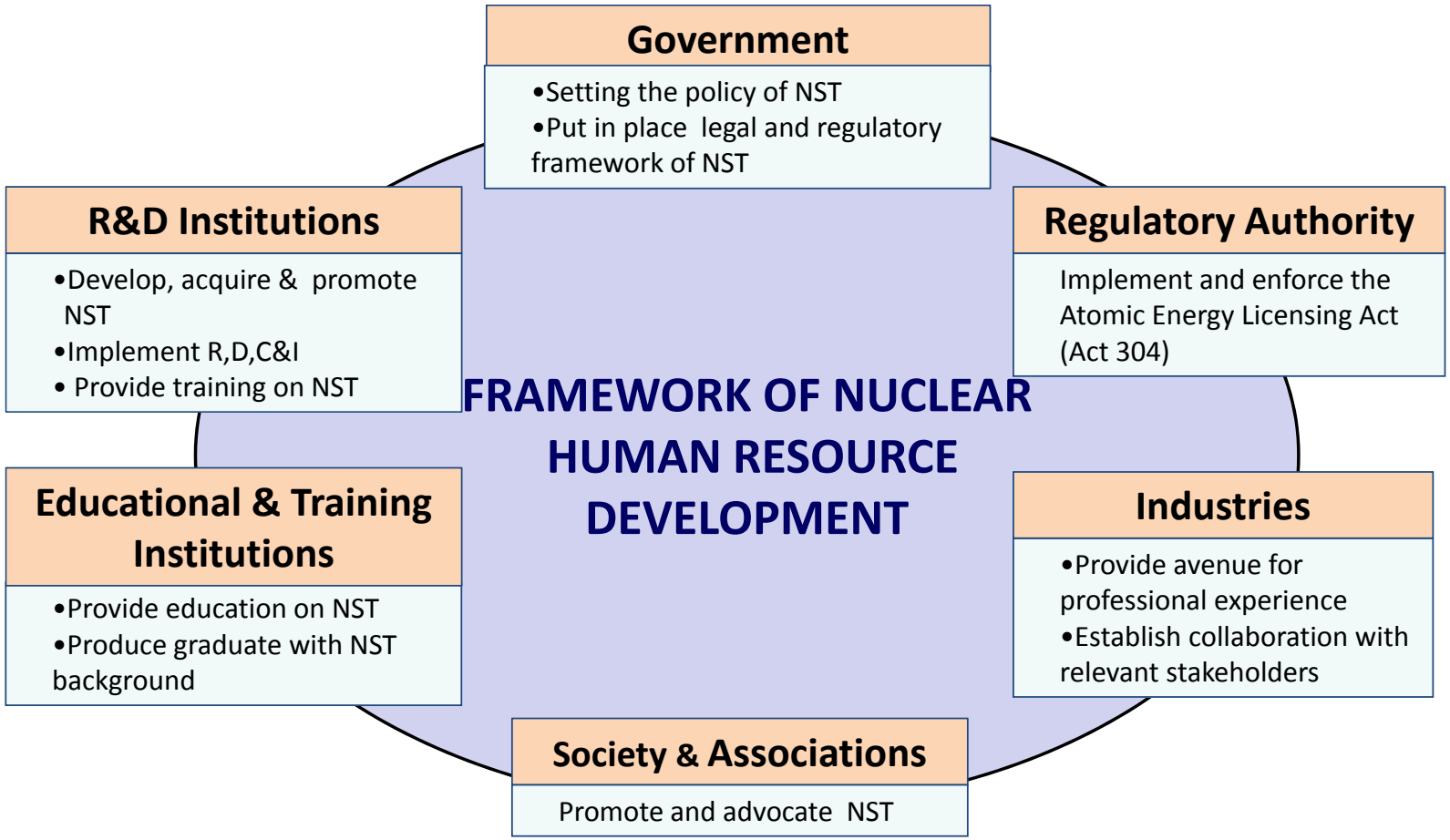
Facility	**Model**	**Manufacturer**	**Beam Type**	**Energy**	**Radioisotope Produced**
National Cancer Institute, Putrajaya	GE PETtrace	GE Healthcare	H^- / d^-	16.5 MeV (H^-) 8.5 MeV (d^-)	F-18 FDG
BioMolecular Industry	Cyclone	IBA	H^- / d^-	18 MeV (H^-) 9 MeV (d^-)	F-18 FDG
Beacon International Medical Centre	RDS 111	Siemens / CTI	H^-	11 MeV (H^-)	F-18 FDG
Austral-Euro Diagnostic	370V	Sumitomo	H^- / d^-	18 MeV (H^-) 9.5 MeV (d^-)	F-18 FDG

Source: Journal of Nuclear and Related Technologies, Volume 12, No. 2, December 2015

NATIONAL PLAN ON THE UTILIZATION OF RADIATION TECHNOLOGY IN HUMAN HEALTH

- **Among Government's initiatives are to <u>improve the overall health status and wellbeing of the people</u>**
- **The provision of <u>better access to healthcare services</u> remains in the Government's focus areas**
- **Efforts will be undertaken to <u>improve the coverage of primary healthcare</u> such as clinics and rural clinics, as well as <u>upgrade health facilities</u>**
- **Hence, <u>radiation technology plays important role and will continue</u> to be utilised in human health sector**

FRAMEWORK OF NUCLEAR HUMAN RESOURCE DEVELOPMENT



NST: Nuclear science & technology

R,D.C&I: Research, development, commercialisation & innovation

STATUS AND CHALLENGES OF NUCLEAR HUMAN RESOURCE DEVELOPMENT

- Nuclear human resource development **is a continuous process** and remains an important focus area in the light of current situation

- The areas of nuclear HRD includes food & agriculture, industry, medical & healthcare, water, natural resource & environment, reactor and accelerator technology, and safety & security

- Nuclear HRD programme is **implemented through partnerships** between public and private sector entities, research and educational institutions and government and non-governmental organisations

STATUS AND CHALLENGES OF NUCLEAR HUMAN RESOURCE DEVELOPMENT (cont.)

Challenges of Nuclear HRD

1. Funding and Incentive

- Limited funding and incentive
- The absence of specific funding
- High competition for funding

2. Facilities, Infrastructure and Human Capital

- High turnover due to retirement
- Aging facilities and infrastructure
- Require high cost to operate and maintain
- Need for new infrastructure and facilities

3. International Collaboration & Strategic Partnership

- Domestic challenges to establish and attract collaboration with reputable international partners (ex: legal issues, bureaucracy, etc.)

PROGRESS IN NUCLEAR TECHNOLOGY APPLICATIONS

INDUSTRY

IAEA Collaborating Centre (2019-2023) for :

- Radiation Processing of Polymers, Waste Polymers & Biocomposites
- Advanced Non-Destructive Testing

FOOD & AGRICULTURE

- New rice varieties (NMR 151 & NMR 152)
- Food Traceability of Edible Birds Nest
- IAEA Collaborating Centre (2019-2023) for Plant Mutation Breeding using Chronic Gamma Irradiation

HUMAN HEALTH

- Continuous use of radiation technology in human health sector
- Radioisotope for bone pain palliation (Samarium -153)
- Radio-iodine capsule for thyroid cancer
- Sterilization of healthcare products

PROGRESS IN NUCLEAR TECHNOLOGY APPLICATIONS

WATER, NATURAL RESOURCE AND ENVIRONMENT

- Mobile Hot Cell Facility
- Borehole Disposal Facility
- Nuclear and isotopic techniques for climate change studies
- Environmental forensics
- Radiocarbon dating

RESEARCH REACTOR & ACCELERATOR APPLICATIONS

- Nuclear Reactor Simulator for education and training
- Material science
- Neutron Activation Analysis
- Radioisotope production (Samarium-153)

SAFETY & SECURITY

- Radiation dosimetry and radiation calibration services
- Nuclear forensics
- IAEA Regional Nuclear Security Support Centre

MALAYSIA'S INVOLVEMENT WITH FNCA

- Malaysia is actively participating in 7 FNCA Projects
- In 2019, Malaysia hosted Mutation Breeding Workshop: Mutation Breeding of Major Crops for Low Input Sustainable Agriculture under Climate Change, 3-6 September 2019
- In 2020, Malaysia will host Workshop of Radiation Safety and Radioactive Waste Management

SUMMARY

- Nuclear and radiation technology continue to be used for human health applications
- Continuous nuclear human resource development is implemented by various entities
- Existing challenges must be addressed in order to effectively develop national nuclear human resource and advancing nuclear technology
- Malaysia believes that FNCA is a good platform to further discuss on strengthening the stakeholder involvement in respond to relevant development priorities

THANK YOU