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MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION



'Teknologi Nuklear Pemacu Wawasan Negara'
'Nuclear Technology Propels The Nation Vision'

Stakeholders Involvement in Strengthening the Capability of Radiation Processing Facilities

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INTRODUCTION

- Radiation processing facility plays an important roles in industry.
- As part of the process chain either as feeder, intermediate or end-products
- Malaysia has 10 radiation processing facilities (6 gamma and 4 EB)
- Full support from government – implies acts, regulations, standards



MINTec-SINAGAMA

- Has been operating since year 1990.
- MINTec-Sinagama located in Nuclear Technology Park Malaysia.
- 2 km from the main complex and 30 km from Kuala Lumpur.
- Using cobalt-60 source of gamma radiation
- Ability to perform the irradiation with different doses of radiation at one time (incremental dose).
- Certified with ISO 9001 and ISO 13485, also registered with MOH as a Food Irradiation Premise.

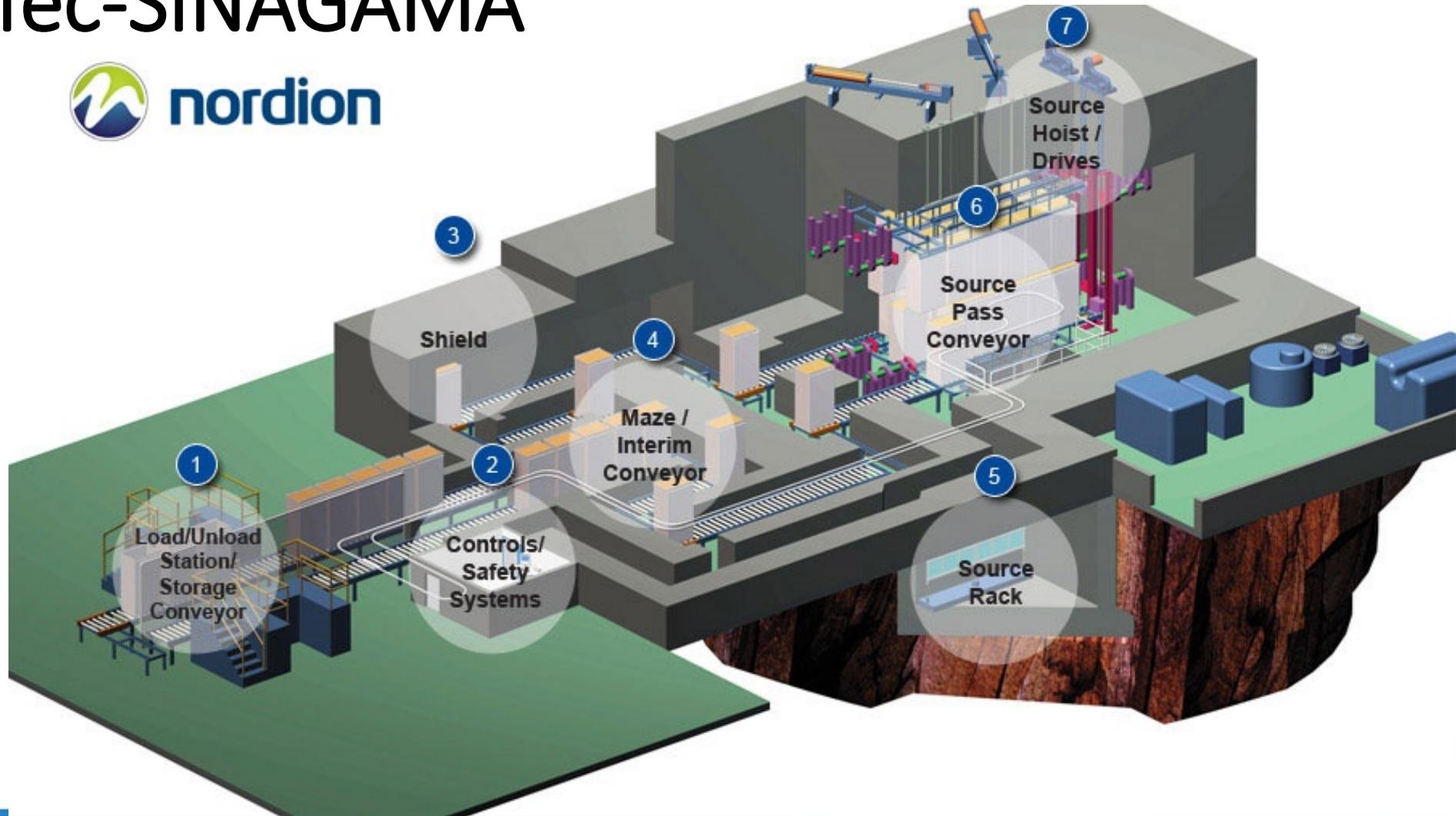


MINTec-SINAGAMA

- Provides gamma irradiation services for medical products like bone allograft, preserved amnion, catheter, gloves, also raw material of pharmaceutical products, food products and other product like, fertilizer, corn cobs & mouse pallets (animal feed), baby toys, capsule for pharmaceuticals product and raw materials for cosmetics.
- Customers varies from manufacturers, third-party industry, SME, researchers (inside or outside NM) etc.



MINTec-SINAGAMA



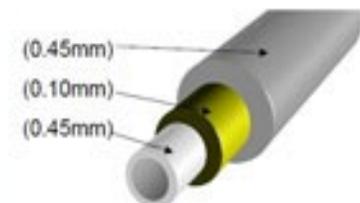
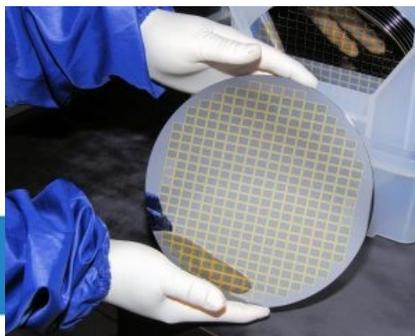
ALURTRON

- Has been operating since year 1992.
- Located in Nuclear Technology Park Malaysia.
- 2 km from the main complex and 30 km from Kuala Lumpur.
- Using electron beam machine to produce radiation.
- Certified with ISO 9001.



ALURTRON

- Currently providing EB radiation services to manufacturer of:
 - Wire, cable and tube products for crosslinking effects
 - Semiconductors for enhancing the electronics property
 - Product development of wound care dressing product
 - R&D
- Customers varies from manufacturers, third-party industry, SME, researchers (inside or outside NM) etc.



ALURTRON

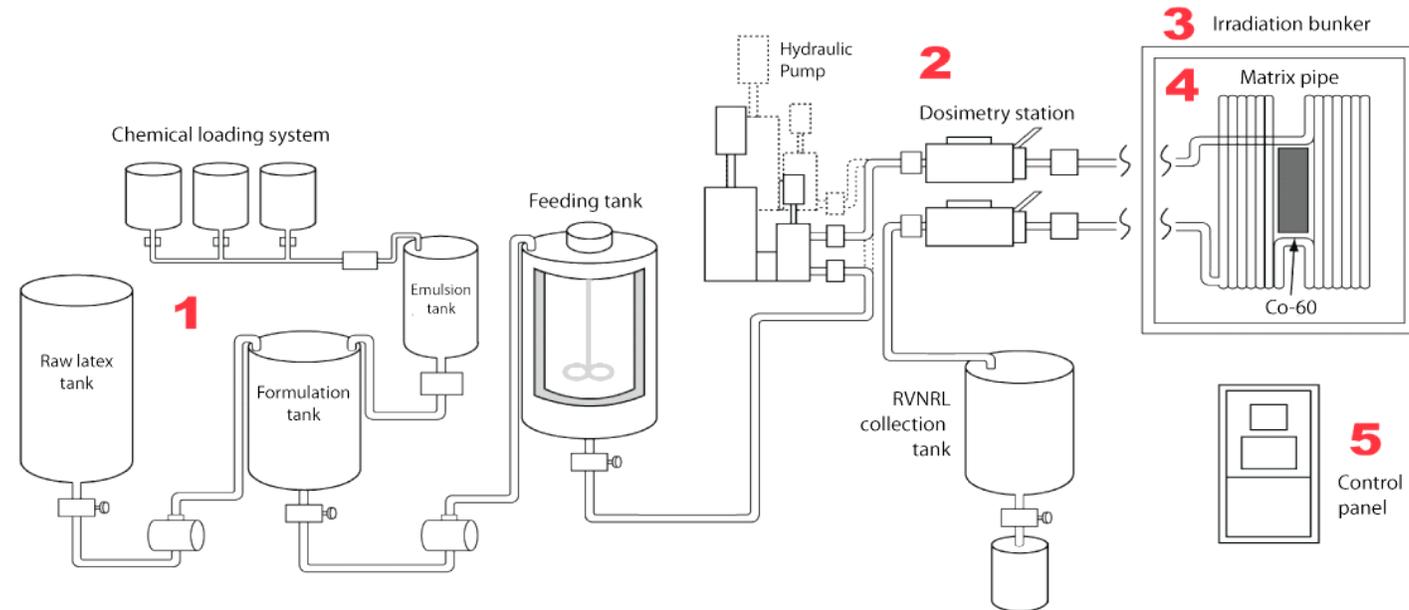


RAYMINTEX

- A pilot plant for research, preparation and commercialization of radiation vulcanization of natural rubber latex (RVNRL)
- Commissioned in 1996
- Equipped with latex storage, testing, processing and gamma irradiation facilities



RAYMINTEX



Schematic diagram and facilities for preparation of RVNRL in RAYMINTEX Plant



1. Latex storage and formulation facilities



2. Latex pump and dosimetry station



3. Irradiation bunker



4. Matrix pipe



5. Control panel

ROLES OF STAKEHOLDERS

The word “stakeholder” was first appeared in a 1963 internal memorandum at the Stanford Research Institute and of which was defined as “a member of groups without whose support the organization would cease to exist”.

Guidance on social responsibility ISO 26000:2010 defines stakeholder as “individual or group that has an interest in any decision or activity of an organization”.



Nuclear Technology Ecosystem

Capacity Builders

Academic institutions (IHL) , TVET,
Industry players , JPK, Nuklear
Malaysia, MOHE

Connectors

KASA, KeTSA, MOT, MITI, MOSTI, SEDA,
EC, MIGHT, MOH, MAFI, MPI

Market Access Providers

MGTC, KASA, MOT, KeTSA, MITI, MIDA, SEDA,
Potential industry players: Automotive (Hyundai
Motors, Toyota Motor), Oil & Gas (PETRONAS,
Linde Malaysia, Air Products)

Producers and Manufacturers

Manufacturing industry players, e.g. Top
Glove, UMW, Airproducts

Supply Chain and Logistics Providers

Logistic companies, state energy companies

Technology Providers

Nuklear Malaysia/MOSTI, RIs, IHL
(Universities), MGTC, TPM, other
international collaborators

Standards Setters and Regulators

MTDC, MyIPO, DSM, JPK, SEDA, KeTSA, CAAM, KASA, MOT,
SIRIM, DOSH, AELB, MOH, MAFI, NPRA

Financing Providers

MIDA, MOSTI, EPU, private investors,
Cradle, Venture Tech



Source : Final Report on National Nuclear Technology Policy, ASM & Nuklear Malaysia, 2021

CASE STUDY 1 - Private-Public Partnership

- MINT-Sinagama's issue
 - Cost of cobalt replenishment
 - Marketing of services
 - Maintenance; preventive & corrective (cost and response time)
 - Labour/staff



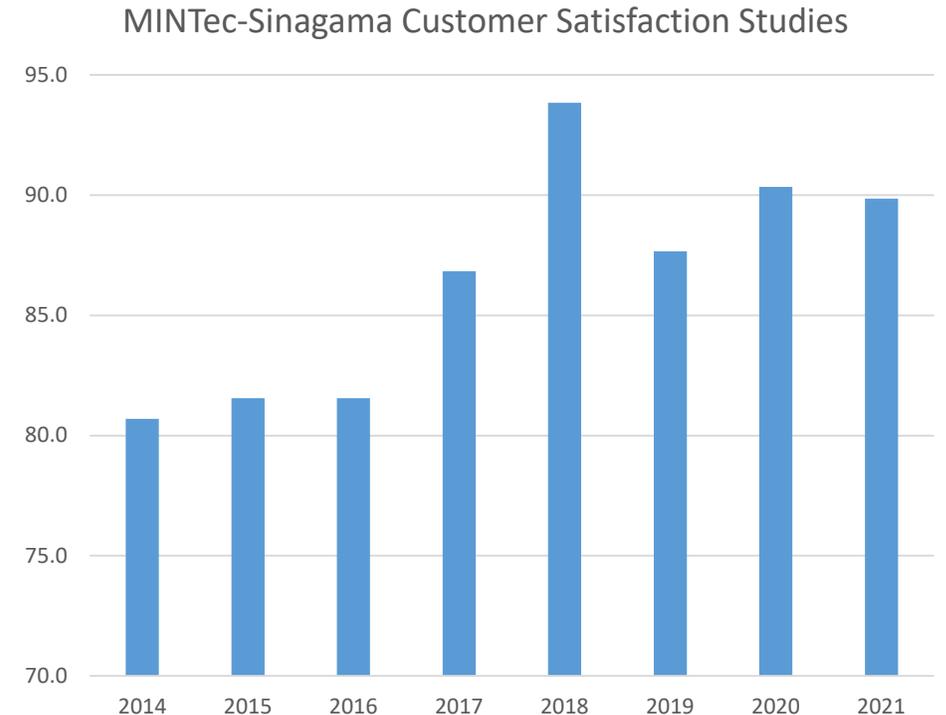
MINTec-Sinagama – Public partner

- MINTec-Sinagama contributions:
 - Gamma irradiator
 - Building
 - Operations of gamma irradiator including security & safety issues
- Public partner contributions:
 - Cobalt replenishment
 - Maintenance; preventive & corrective
 - Labour
 - Marketing



MINTec-Sinagama – Public partner

- Customer satisfaction studies
- Cobalt replenishment
 - Cobalt was repelenish 3 times
- Service disruptions
 - Availability of service is at average of 90-95%;
- Plant shutdown
 - Plan shutdown: 7 days a year
 - Un-plan shutdown: 1-2% due to product shortage



CASE STUDY 2 – Business Continuity Management System (BCMS) Certification

- Nuclear Malaysia is among the local pioneers to develop and implement BCMS.
- Project started in 2016, certified to ISO 22301:2012 BCMS by CyberSecurity Malaysia in January 2019.
- Aimed to protect against, reduce the likelihood of occurrence, prepare for, respond to, and recover from disruptive incidents when they arise, i.e. to ensure business continuity.
- Scope of BCMS covers 5 facilities in Nuklear Malaysia including radiation processing facilities, i.e. MINTec-SINAGAMA and RAYMINTEX.



- One of the main requirements of BCMS is the establishment of business continuity plan for each of the facilities, which includes organizing an alternative work area recovery site, i.e. an alternative site to enable recovery and operation during a prolonged service disruption.
- MINTec-SINAGAMA is the alternative site to RAYMINTEX Plant for the RVNRL irradiation process in the event of gamma irradiator malfunction.
- RAYMINTEX Plant has been experiencing interruption in its RVNRL preparation service since year 2015 due to recurrent malfunction on the control panel of the gamma irradiator.



Receive order and raw latex from customer



Quality control on raw latex



Latex formulation (pre-irradiation)



Latex irradiation



Latex formulation (post-irradiation)



Quality control on RVNRL



RVNRL delivery to customer

Quality control and latex formulation done at RAYMINTEX Plant

Gamma irradiation process done at alternative site MINTec-SINAGAMA

- RAYMINTEX Plant continues to provide RVNRL preparation service despite of the malfunction control panel, which make possible by the support from MINTec-Sinagama as a stakeholder (alternative site).
- RAYMINTEX Plant started to upgrade its control system in 2017. Its business continues as usual with the implementation of BCMS.



Way Forward

- Involvement of stakeholders in strengthening the capability of radiation processing facilities are proven to be crucial and effective.
- The approach adopted by MINTec-Sinagama, i.e. involvement of private partner in human resource, marketing and maintenance of the irradiation facilities has produced positive outcomes to both parties.
- The involvement of regulators that beyond enforcement is very much needed of which they should also act as advisor and facilitator to the industry.
- Stakeholders' involvement should be made as a principle of an organization by incorporating it in organization policy so that both top management and employee will commit and contribute to its success.

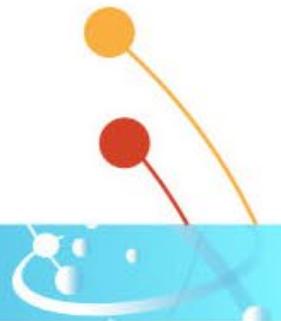


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Nuklear Malaysia