



## Background

- ✓ The one and only nuclear research reactor in Malaysia
- ✓ Operated in 1982
- ✓ First [criticality](#) on 28 June 1982

## Background

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Trainning  
Research  
Isotope Production  
General  
Atomics

## Reactor Characterization

Reactor model	TRIGA MARK II
Maximum power	1MW thermal (steady state)
Pulsing peak power	1200MW (pulse width 11ms)
Nuclear fuel	U-ZrH1.6 (Standard TRIGA)
Enrichment	8.5% w/o, 12% w/o, 20% w/o
Moderator / coolant	Light water (demineralized)
Reflector	Graphite
Typical neutron flux	$1 \times 10^{12} \text{ cm}^{-2} \text{ s}^{-1}$ (rotary rack)
Maximum neutron flux	$1 \times 10^{13} \text{ cm}^{-2} \text{ s}^{-1}$ (central thimble)
Maximum coolant / moderator temperature	49°C
Maximum fuel element temperature	500°C
Cold clean critical loading	2.5 kg U-235
Operational loading	3.3 kg U-235

## Reactor Description

- ✓ Pool type
- ✓ 2.5m thick concrete wall :
  - to attenuate the emission
  - to shield the reactor environment from contamination
- ✓ Water in the reactor tank :
  - as a moderator
  - prevents radioactive N-16 reaching the surface

## Reactor Description

- ✓ Equipped with control system
- ✓ Electronic instruments
  - to monitor reactor parameter
  - automatically shut down if exceeded the safety limit
- ✓ Area radiation monitoring (ARM)
  - to monitor the contamination level
  - covers several strategic location around the hall

## Irradiation Facilities

✓ Three locations in RTP :

- in the reactor core
- near the region of reactor core
- outside the reactor using beam ports and thermal column

## Irradiation Facilities

Irradiation facilities	Location
Central Thimble (CT)	Ring A1 (center of reactor core)
Dry tube (DT)	Ring F11
Isotope Production System (IPS)	Ring G8
Pneumatic Transfer System (PTS)	Ring G20
DNA irradiation tubes (Cd covered)	Ring F29
DNA irradiation tubes (bare)	Ring G1
Hexagonal irradiation position	Ring A1, ring B1 to B6
Triangle irradiation position	Ring D5, F6, F7 and ring D14, E18, E19
Small Angle Neutron Scattering (SANS)	Beamport #4 (beam size at specimen: 12 to 15mm)
Neutron Radiography (NUR2)	Beamport #3 (inlet aperture 5.4cm)
Thermal Column	-
Unused beamports	beamport #1 (radial with plug) beamport #2 (tangential)

## Applications of Irradiations

Neutron Activation Analysis (NAA)	<ul style="list-style-type: none"> <li>• Environmental Science</li> <li>• Life Science</li> <li>• Material Science</li> <li>• Geological Science</li> <li>• Archeology and Forensic Science</li> <li>• Nuclear Materials</li> </ul>
Radioisotope Production	For medical, industrial and agriculture application
Small Angle Neutron Scattering (SANS)	Structural studies of materials related to metals, ceramics, polymers and biology
Neutron Radiography (NR)	Non-destructive testing
Education	<ul style="list-style-type: none"> <li>▪ Reactor physics and engineering</li> <li>▪ Reactor instrumentations</li> <li>▪ Reactor utilization</li> <li>▪ Nuclear materials</li> <li>▪ Radiation source</li> </ul>
Manpower Training	<ul style="list-style-type: none"> <li>▪ Reactor operation and maintenance</li> <li>▪ Nuclear safety</li> </ul>





