



Thailand Institute of Nuclear Technology
(Public Organization)

4th Virtual Annual Meeting on ASEAN Network
on Nuclear Power Safety Research
2-4 June 2021



Progress and Interest in Nuclear Power Safety Research in Thailand

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Thailand Team in ASEAN NPSR



Thailand Institute of Nuclear Technology (TINT)



Office of Atoms for Peace (OAP)



Chulalongkorn University (CU)



National Energy Technology Center (ENTEC)



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Outline

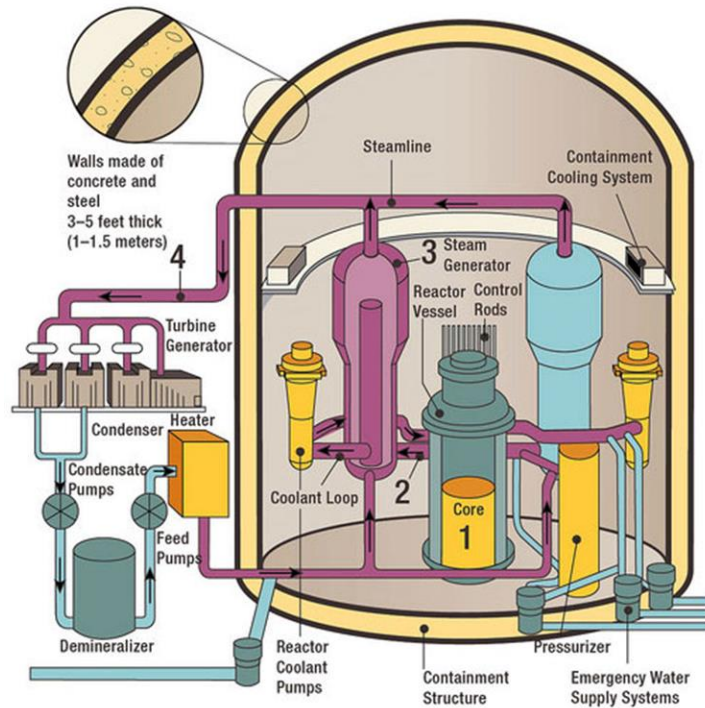
Progress on nuclear power safety research in Thailand is classified based on four nuclear-facility types;

- **Traditional NPPs**
- **Advanced/Innovative NPPs**
- **SMRs**
- **Research Reactors**

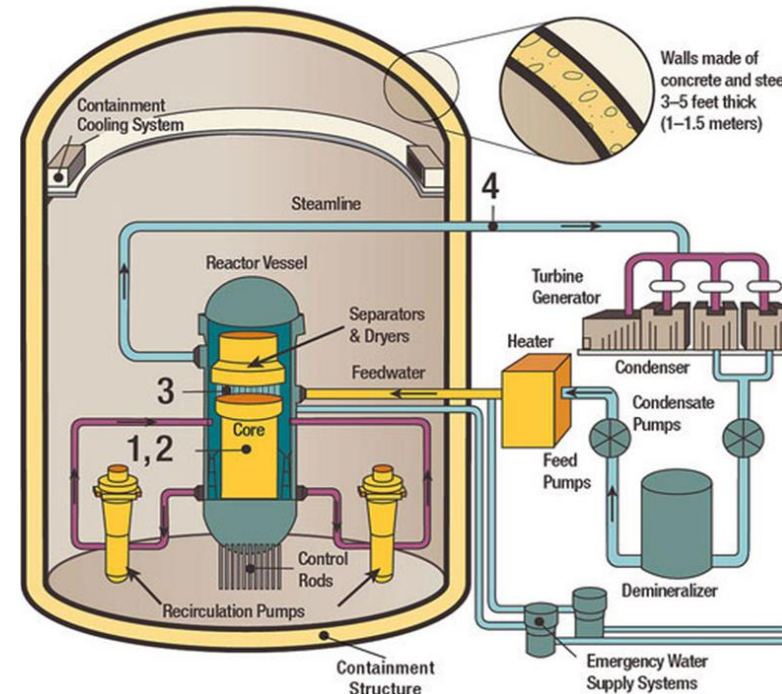


Traditional NPPs

Traditional NPPs in Thailand perspective refers to Gen II reactors or a commercial nuclear reactors that were designed to be economical and reliable.



Pressurized Water Reactors (PWR)



Boiling Water Reactors (BWR)

Ref: <https://www.nrc.gov>

Research related to Traditional NPPs

Severe Accidents Analysis

- Thermal Hydraulics → RELAP5
- Fission Product Analysis → Modified ART Mod 2

Accident Consequences Analysis

- Atmospheric Dispersion Assessment
- Dose Assessments
- Radiation Monitoring



Advanced/Innovative NPPs

Advanced/innovative NPPs in Thailand perspective refers to Gen III – Gen IV reactors or commercial nuclear reactors that concerned design improvements of passive safety system with economical concerns as well as reactors with novel designs and novel safety systems.

Ref: <https://www.flickr.com/photos/na0905/3286343773/>



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Research related to Advanced/Innovative NPPs

Severe Accidents Analysis

- Thermal-hydraulics → RELAP5
- Two-phase flow modeling

Others (Interest)

- Key Indicators for Innovative Nuclear Energy Systems (KIND), IAEA



SMRs

- Small modular reactor (SMR) in Thailand perspective refers to is the reactors that are **smaller than conventional reactors**.
- SMR designs may employ **light water** as a coolant or other **non-light water** coolants such as a gas, liquid metal, or molten salt.
- SMR deployable either as single or multi-module plant, offers the possibility to **combine nuclear with alternative energy sources, including renewables** in order to fulfil the need for flexible power generation for a wider range of users and applications.

Ref: <https://www.iaea.org/topics/small-modular-reactors>

Ref: <https://www.energy.gov/ne/nuclear-reactor-technologies/small-modular-nuclear-reactors>



Research related to SMRs

Research Interest

- Key Indicators for Innovative Nuclear Energy Systems (KIND), IAEA
- Impact of SMR-renewable hybrid energy



Research Reactors

- **Research Reactor is recognized only one nuclear facility type in ASEAN region using fission reaction to generate power.**



Research related to Research Reactors

ASEAN NPSR

ASEAN Network on Nuclear Power Safety Research



ASEAN
Large **N**uclear
and **S**ynchrotron
Facility **N**etwork

ASEAN NPSR vs ASEAN LNSN: Future Work

- **Research Reactor** is recognized only one nuclear facility type in ASEAN region for research sharing with each other. **(ASEAN LNSN framework)**
- **Risk of nuclear consequences from Research Reactor in ASEAN region is concerned** about the nuclear accident and consequences as in NPP accidents. **(ASEAN NPSR framework)**
- Research of Probabilistic Risk Assessment (PRA) of **Research Reactor in ASEAN region** is considered the potential collaborative research between **ASEAN NPSR** and **ASEAN LNSN** in the future.





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Q&A

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