

Potential and Hurdles of Collaboration on NES R&D in Thailand

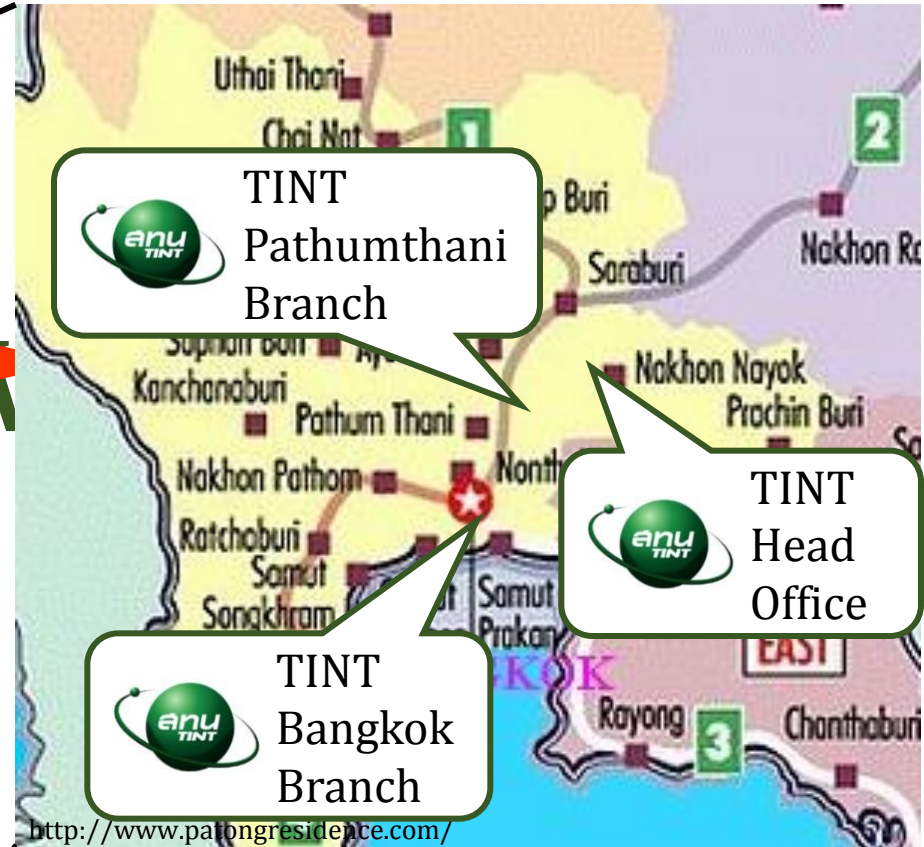


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Status of NES Program of Thailand

- The government declared that it will prepare for the introduction of NPPs in 2010
 - They postponed the NPP development program in 2011 after the Fukushima Dai-ichi NPS accident
- Based on Power Development Plan (PDP) 2010 Rev. 3
 - The energy demand would grow more than twice in 20 years
 - Potential energy sources are:
 - Natural gas
 - (Clean) coal
 - Nuclear
 - Renewables
 - We plan to have two 1000 MWe NPPs by 2026 and 2027
- There is no political decision regarding NPP development by any Governments since 2011
 - However, the Ministry of Energy will most probably keep nuclear power in the new PDP 2015

Stakeholders of R&D of NES in Thailand



Government
Ministry of Energy (MoE)



Research Institute
Thailand Institute of Nuclear Technology (TINT)



Regulatory Body
Office of Atoms for Peace (OAP)



Utility
Electricity Generating Authority of Thailand (EGAT)

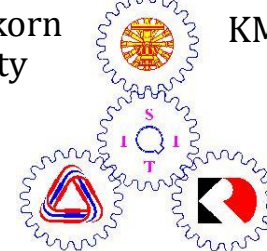


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Why do we need R&D on innovative NES in Thailand?

We are not developing NESs by ourselves, BUT...

- Technical information is necessary to:
 - Realize pros and cons of nuclear power (and other energy sources)
 - Understand all information provided by the technical developers in the bidding stage
 - Keep the NESs safe, if we are going to deploy them
- All stakeholders need to have adequate human resources by the time we start the construction and operation of NESs
 - We need R&D activities to at least maintain the human resources we have at the moment
- We need to be prepared for emergent situations which may happen in NESs being planned/built in the region

Why do we need collaboration?

- We have very limited NES human resources at the moment
 - We have experts in various fields (e.g., reactor core design, thermal hydraulics, aging management, reactor chemistry, probabilistic risk assessment, waste management) unfortunately in *different* organization
 - These experts are often asked to do R&D in different fields in their own organizations
 - *We need internal collaboration to keep these experts together working on NES issues*
 - *We need external collaboration(s) to get opinions, recommendations, and helps from foreign experts to get accurate technical information and to obtain the whole picture of current NES development*
 - *These collaborations may also influence the decision making*

Why can't we easily obtain internal collaboration?

- We do not have clear political statement related to the NES program
 - Many stakeholders, especially the utility, cannot invest their people and money without clear direction for NES deployment
- It is difficult to discover a mutual interest in NES R&D among the experts in different field
 - Most researchers (especially those gained the Ph.D. from abroad) want to continue researches in their own fields
 - We do not have enough researchers in a particular field to propose a collaboration
- It is difficult to determine the leader of the project
 - Most organizations want to lead the project, to be able to claim the right of the outcomes

Why can't we make use of external collaborations?

We have a number of bilateral agreements with several technology developing countries, HOWEVER...

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- We do not have clear political statement related to the NES program
 - Foreign countries are not willing to invest their money if the country has no potential to become a customer
- We have limited human resources
 - This makes it difficult to fully gain benefits from the bilateral agreements
- We have limited knowledge, which exist in different organizations
 - This makes it difficult to determine the scope of collaborations

How participation in INPRO can help us enhance collaboration?

- External Collaboration
 - We can observe how other member countries, especially technology developing countries are doing on NES R&D
 - We can also get to know the stakeholders in those countries
- Internal Collaboration
 - We can use the collaborative projects of INPRO to gather experts in the country
 - The topics are not very specific, and are beneficial to the country
 - It is not so difficult to find internal experts who are interested in this
- Our near term plan
 - We will first use the INPRO collaborative projects as a platform for collaboration within the country

Any comments or
recommendations?