Regional Workshop on Managing the Interface Between Safety and Security for Research Reactors

Safety and Security for Research Reactors in Viet Nam

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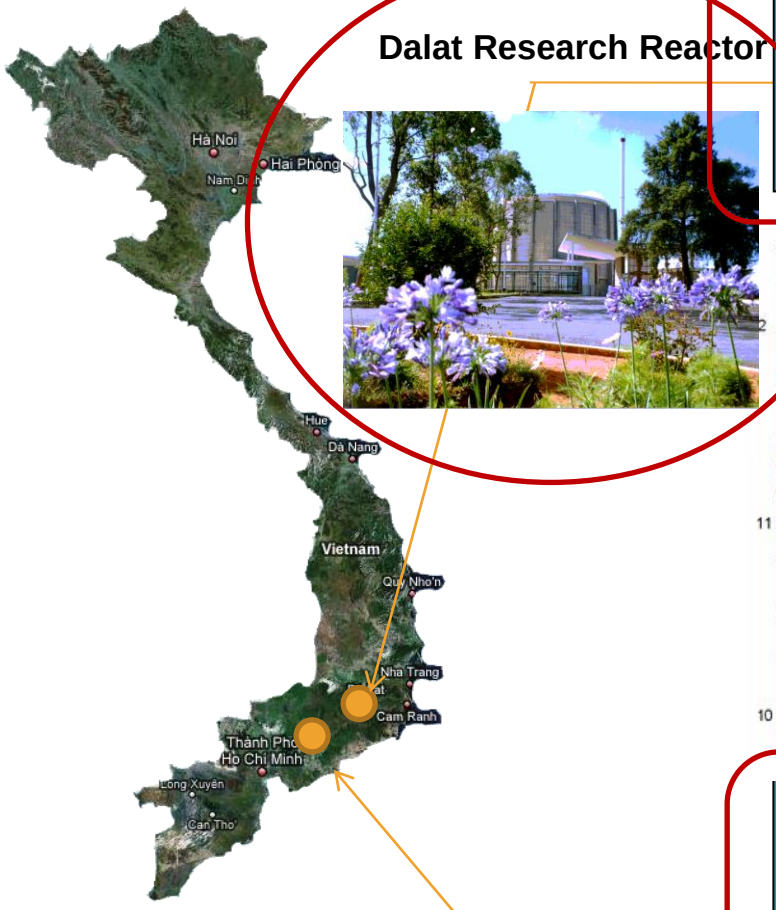
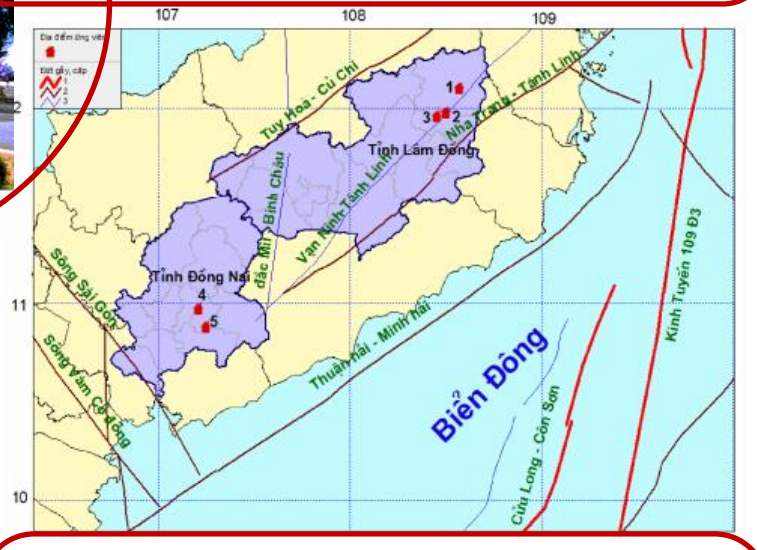
I. Sites for Research Reactors in Viet Nam

Sites for existing and new RRs



Dalat Research Reactor

TRIGA MARK II, 500 kWt, built in 1963
It was modified and upgraded in 1980s
Its purposes include radioisotope production, sample irradiation, training, etc.

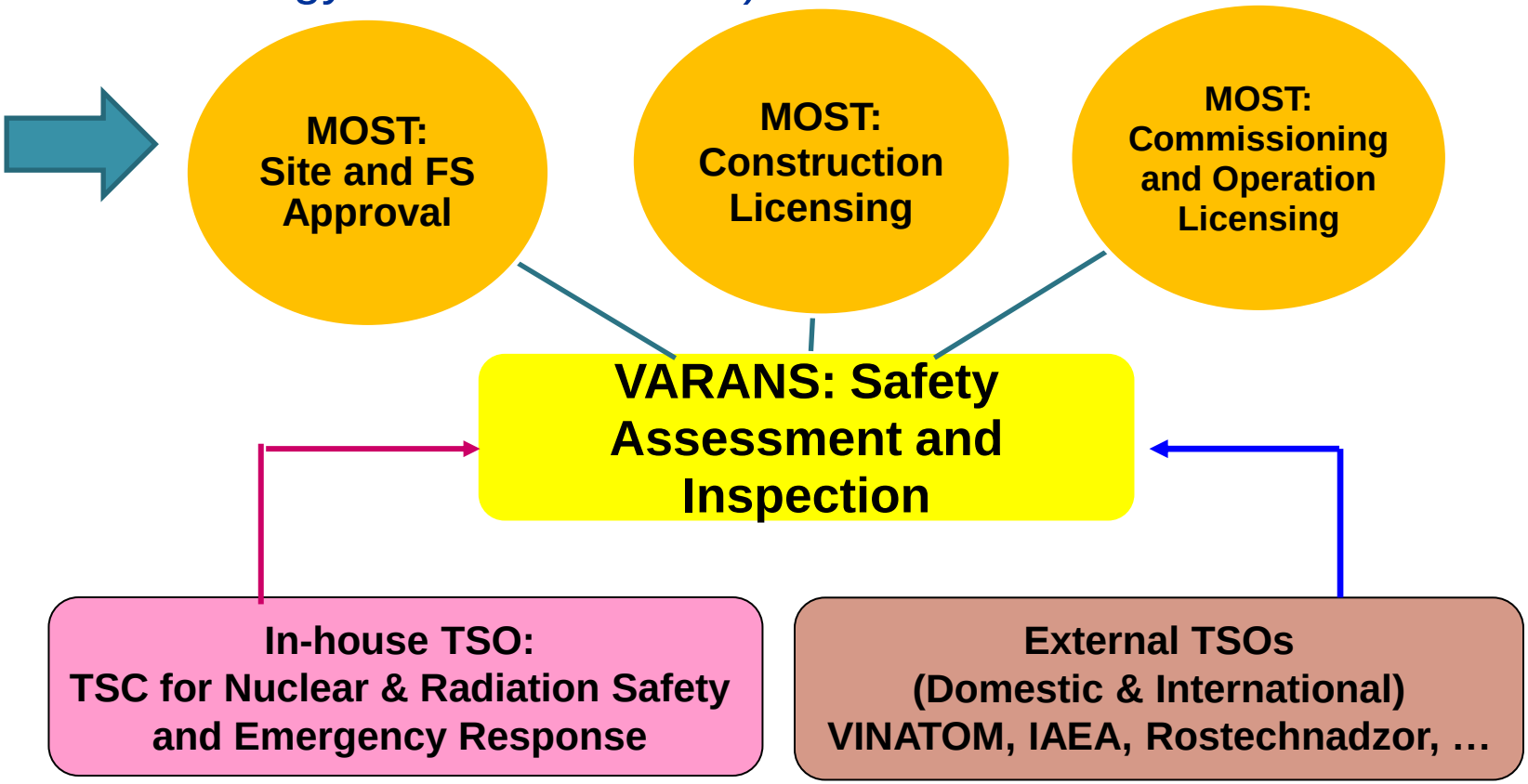


New Research Reactor

Russian Technology, 10-15 MWt
Multipurpose
Proposed Site in Dong Nai province
PreFS decided in 11/2018
Developing the dossiers for Site&FS aproval

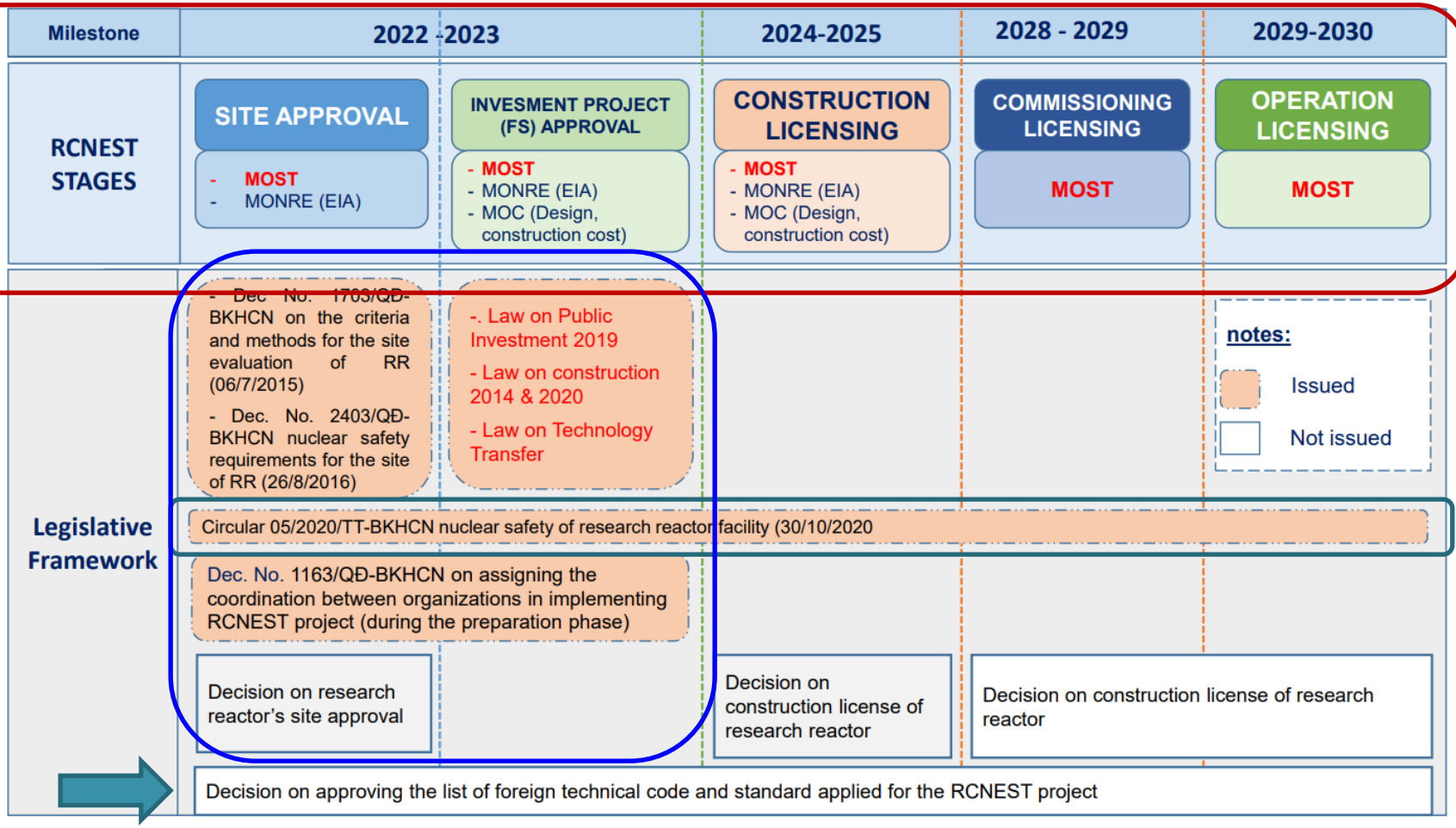
II. Regulatory Framework of New Research Reactor

For New Research Reactor: VARANS under MOST has duty assessment and inspection in all stages (Article 8, 42 & 43 of the Atomic Energy Law of Viet Nam)



II. Regulatory Framework for new Research Reactor

Safety Regulations Issue Plan



III. Safety and Security Systems for Research Reactors

III. Safety and Security for Research Reactors

Safety is concerned with the radiological risk to humans and the environment, whatever the cause of this risk. At a research reactor facility, the cause could be human error, equipment failure, an internal event or an external event. It could also be a security event – an act or acts with malicious intent leading to a release of radioactivity into the facility or into the environment. (IAEA Techdoc 1801)

Security is concerned with reducing the vulnerability of the facility to the theft of nuclear material (in the form of fresh and irradiated reactor fuel or isotope targets) or other radioactive material, and to sabotage resulting in the release of the large inventories of fission and activation products and other high activity radioactive materials contained in the research reactor facility. (IAEA Techdoc 1801)

III. Safety and Security documents for Research Reactors

Security Regulations

- Atomic Energy Law, 2008;
- Circular 38/2011/TT-BKHCN on Requirements on ensuring security of nuclear materials and nuclear installations
- Circular 01/2019/TT-BKHCN on Requirements on physical protection of radiation source;
- Circular 05/2020/TT-BKHCN on Requirements on nuclear safety of research reactor

III. Safety and Security at Da Lat Nuclear Research Reactor

Safety analysis

The postulated initiating events affect safe operation of the reactor, including their consequences on the environment and population:

- Loss of electric power supply;
- Insertion of excess reactivity;
- Loss of flow;
- Loss of coolant;
- Failure of equipment;
- Special internal events;
- External events; and
- Human error.

The events of loss of coolant from the reactor pool and reactivity insertion are considered as the most potential events.

III. Safety and Security at Da Lat Nuclear Research Reactor

EMERGENCY PLANNING AND PREPAREDNESS

- Physical protection system was implemented
- The emergency scenarios at the DNRI have been build as follows:

- Accidents in the Reactor: RIA, LOCA, etc…
- Accidents out of the reactor but with significant radioactive contamination: Release of radioactive substances or gases and airborne from labs to environment.
- Conventional accidents/incidents with potential consequences: Fire and explosion accidents.

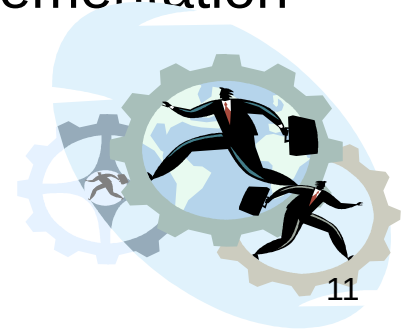
The drills on the anticipated emergencies that might occur onsite are performed every two years.

ANTI-TERRORISM

- Coordinate with local government, MOST, MPS to plan anti-terrorism drill in 2023

IV. Conclusions

- Managing safety and security of RRs is a complicated work and needs the collaboration of VARANS, VINATOM, MOST to improve:
  - Legal documents system;
  - Equipment;
  - Human resource.
- Safety and Security are managed and improved separately
- Procedures following every improvement of safety and security took long time to be considered and approved.
- Viet Nam legal documents on safety and security is still incomplete. Viet Nam needs to improve these documents to create a legal corridor to the new RR project implementation



Thank You !