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Title: Present Status and Future Nuclear activities in Bangladesh

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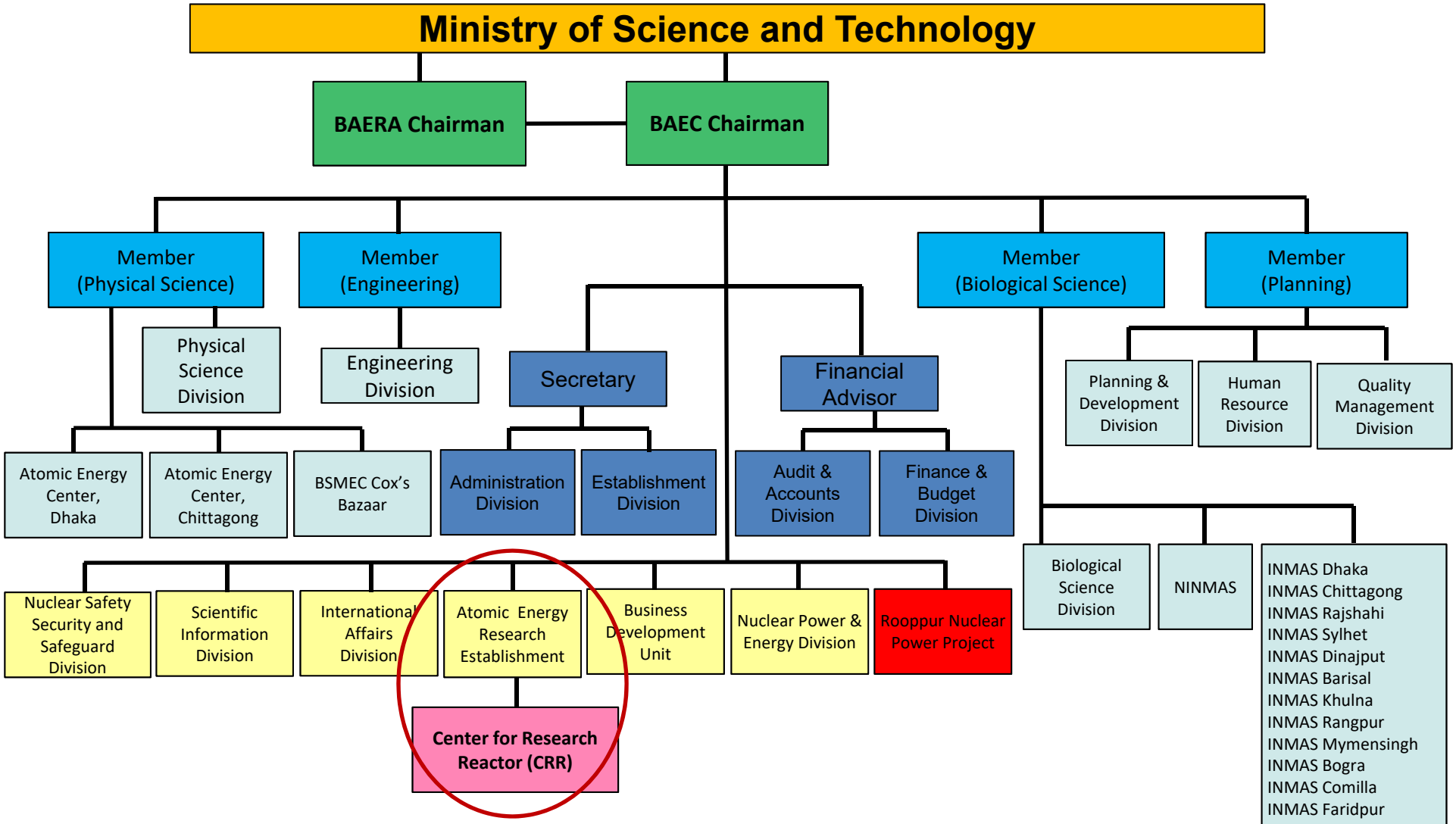
Organization: BAEC

Organogram



BSMEC-Beach Sand Minerals Exploitation Center
NINMAS-National Institute of Nuclear Medicine and Allied Sciences
INAMS-Institute of Nuclear Medicine and Allied Sciences

The administrative channel of Atomic Energy Research Establishment (AERE) is directly linked to the Chairman, BAEC and the channels for R&D activities of AERE are linked to the respective Member of BAEC.

Organization: BAEC

Vision

Promotion of nuclear science and technology for peaceful uses of atomic energy to achieve self-reliance for socio-economic development of Bangladesh.

Mission

- Promotion of fundamental, advanced and applied research programs involving nuclear science and technology in the various fields of physical, biological and engineering disciplines;
- Implementation of nuclear power program;
- Rendering nuclear technology based services to various stake holders;
- Application of nuclear technology in agriculture, industry, health and environment;
- Development of human resources in the area of nuclear science and technology;
- Establishment of radiation safety culture;
- Application of nuclear technology in exploration and exploitation of mineral resources.

Organization: BAEC

Major Infrastructures of BAEC:

1. 3 MW TRIGA Mark-II Research Reactor,
2. Radioisotope Production Laboratory,
3. 3 MeV Van De Graff Accelerator Facility,
4. 3 MeV TANDEM Accelerator Facility,
5. 350 kCi & 50 kCi Co-60 Gamma Irradiators,
6. Reactor Physics and Engineering Laboratory,
7. Analytical laboratories including Isotope Hydrology laboratory
8. Radioactive Waste Management Facility,
9. SSDL Facility, NDT Laboratory, NAA & NS Laboratories,
10. Neutron Powder Diffractometer and
11. Several Nuclear Medical Centers,
12. Medical Physics Institute, etc.
13. Two units of Rooppur Nuclear Power Plant (RNPP) is under construction now.

BAEC TRIGA Research Reactor (BTRR)

- Construction Started: May1981
- Criticality: 14 Sept 1986
- Reactor Power: 3 MW (thermal)

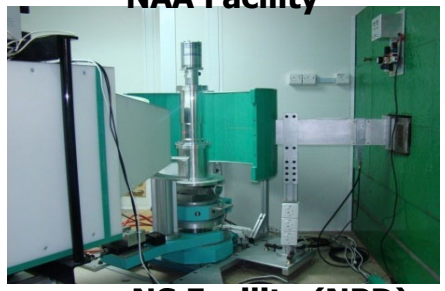
Utilization of the BTRR

Areas of Utilization of BTRR

- Experimental Reactor Safety Analysis
- Neutron Activation Analysis (NAA)
- Neutron Scattering (NS)
- Neutron Radiography (NR)
- Radioisotope Production
- Training and Education

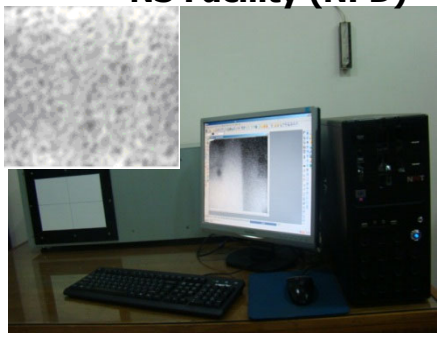
Digital Control Console

NAA Facility



NS Facility (NPD)

I-131 Production Facility



NR Facility

Utilization of the BTRR

Experimental Reactor Safety Analysis:

Conducted different practical experiments at the Center for Research Reactor (CRR) on the neutronic and radiological safety analysis of the reactor;

Neutron Activation Analysis (NAA):

The NAA group used the Activation Analysis technique to determine very low level of arsenic present in drinking water, human nail, paddy, rice and also toxic elements in soil e.g. Cr, Mn, etc.

Neutron Radiography (NR):

The NR group used the NR technique to detect voids, cracks, internal continuity in materials and determine water absorption behavior of jute plastic composites and various types of building materials e.g. bricks, tiles, etc.

Neutron Scattering (NS):

Nuclear and magnetic structures of crystalline materials are studied by neutron scattering technique. The micro-structural information obtained by neutron scattering method is very essential for determining its technological applications. This technique is unique for understanding the magnetic behavior of materials. Ceramic, steel, electronic and electric industries can be benefited from this facility for improving their products and fabrication process.

Utilization of the BTRR

Radioisotope Production:

The production of medical radioisotope (Iodine-131) was continued until 2008 to meet the country's demand. The production was stopped due to the unavailability of the TRIGA fuel. At present medical radioisotopes (Iodine-131, Mo-99) are imported from the foreign countries to supply different nuclear medicine centers of Bangladesh.

Training and Education:

Nuclear reactor technology related training and education program has been extended to provide necessary supports to the students undertaking nuclear engineering courses in various public universities of the country. The reactor facility along with the associated laboratories has been used successfully for carrying out routinely thesis works in the field of nuclear science and technology of B.Sc./MSc./Ph.D. students from different public universities of the country. Currently, about 300 students are given practical training from different universities using reactors every year. Research, education and human resource development programs enhance significantly with view to implement the Nuclear Power Program in the country.

Practical Training on Reactor Operation of the Student of IUT, Gazipur, Bangladesh

Future Activities of Research Reactor

CRR has taken an ADP Project (Annual Development Program) with a view to strengthen reactors operational safety and utilization. Main objectives of the ADP are-

- To increase operating life of the BTRR for about 15 to 20 years by implementing ageing management of different systems/components of the reactor facility;
- Design and development of spent fuel transfer cask;
- Build a new spent fuel storage facility;
- Upgrade Digital Control Console and collection of spare parts of the Digital Console;
- Renovation and modernization of area radiation monitoring systems, reactor hall ventilation and emergency purging system;
- Strengthen physical protection system installing IP based camera, remote monitoring system of the facility.

BAEC has Plan to establish a new high power multipurpose (15-20 MW_{th}) Research Reactor at AERE, Savar.

Conclusion

- BAEC TRIGA Research Reactor has been operating safely for more than 36 years for various peaceful applications;
- BTRR is playing an important role for research, education, human resources and infrastructure development for nuclear science and nuclear power programs in the country;
- BAEC highly appreciates the assistance of the IAEA, FNCA and other international stakeholders for their continued supports for addressing various safety related issues associated with the O&M and utilization of the Research Reactor of Bangladesh.