

Round Table

on

**Global Effective Partnership in Human Resources
Education, Learning and Development in Nuclear Energy**

ATOMEXPO - 2014

Moscow, Russian Federation

9-11 June 2014

Nuclear Workforce Development in Bangladesh



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Outline

- ❑ **Status of Nuclear Power Program**
- ❑ **Strategy for HRD**
- ❑ **Cooperation with Russian Federation**
- ❑ **Cross Cultural Issues for Cooperation**
- ❑ **Concluding Remarks**

Status of Nuclear Power Program

- ✓ An **IGA** between Bangladesh and Russian Federation on cooperation concerning the **construction of Rooppur Nuclear Power Plant in the territory of Bangladesh** was signed on **02 November 2011**.
- ✓ An Interagency agreement (**IAA**) between the **Russian Regulatory Body** and the **MOST** on cooperation in the areas of nuclear safety regulation was signed on **27 February 2012**.



Signing of the IGA
on 2nd Nov 2011

Status of Nuclear Power Program

- ✓ An ADP project titled “Construction of Rooppur Nuclear Power Plant (1st Phase)” was approved on 02 April 2013 for Rooppur NPP infrastructure development for the period- June 2013 to June 2017.

Status of Nuclear Power Program



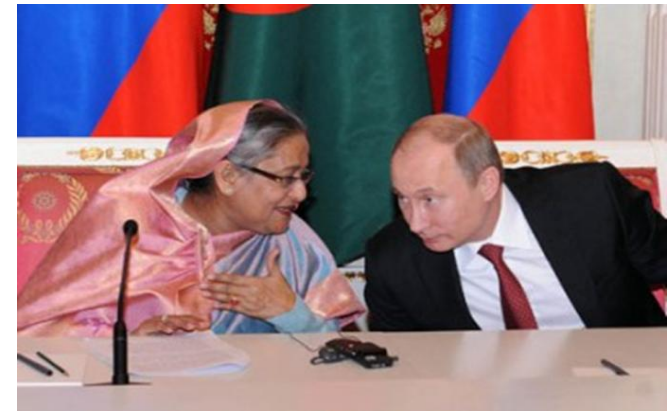
Foundation Laying Ceremony of the Rooppur NPP Project (Phase-1) by the Hon'able Prime Minister at Rooppur Site on 02 October 2013

**Russian Survey Base at
RNPP Site**



Status of Nuclear Power Program

- ✓ Bangladesh signed an State Export **Credit Agreement** with the Russian Federation on **15 Jan 2013** for Preparatory Stage Construction of Rooppur NPP.
- ✓ Under this Agreement **three Contracts** have been signed between **BAEC & Atomstroyexport** of RF as follows:
 - **Contract #1 (27.06.13)**: FE, EIA, First-priority engineering surveys and Environmental Studies, development of various documentations, etc.
 - **Contract #2 (02.10.13)**: Development of the various design and Working documentations, PSAR, PSA-1, QA program for design, etc.
 - **Contract #3 (05.06.14)**: Construction of Pioneer & CE bases and other necessary infrastructures to facilitate main construction, etc.



Strategy for HRD

- ❑ HRD is one of the most important key elements for successful implementation of nuclear power program.
- ❑ Human Resources having adequate knowledge, competency and skill are needed for-
 - ✓ NEPIO (Nuclear Energy Program Implementation Organization),
 - ✓ Technical Support Organizations (TSOs),
 - ✓ Regulatory Body and
 - ✓ NPP Operating & Owner Organizations

Strategy for HRD

- ❑ Bangladesh has the strategy to participate in all the events arranged under **IAEA** through **TC**, **ANSN**, **RCA**, etc. as well as under regional forums like **FNCA** (Forum for Nuclear Cooperation in Asia), **MEXT** Programs of Japan, **KOICA**, etc.
- ❑ **ITC** (Instructor Training Course) & **FTC** (Follow up Training Course) of **JAEA**, **Japan** have been found to be very helpful for developing nuclear HRs in the country. **Since 2010** about **150 BAEC participants** received training on the following areas:
 - (1) Nuclear and Radiological Emergency Preparedness,**
 - (2) Environmental Radioactivity Monitoring and**
 - (3) Reactor Engineering.**

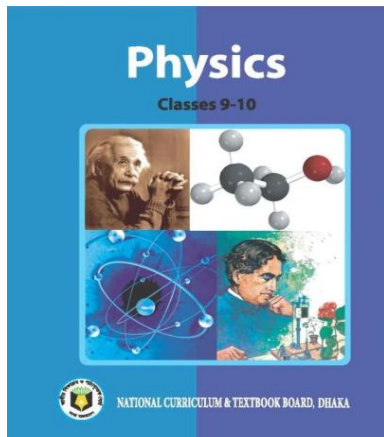
Strategy for HRD



Training Institute, AERE, Savar

Strategy for HRD

- ✓ As a part of the strategy to develop nuclear oriented generations in the country, NE topics has been introduced in the curriculum of Secondary/ Higher Secondary education system.
- ✓ Introduction of Nuclear Engineering Department in Dhaka University in December 2012 with 26 students.
- ✓ Mechanical Engg. Deptt. of BUET, the leading Engg. University of the country has included NE course in its curriculum.



Strategy for HRD

- ✓ BAEC along with the MOST is working to initiate a Project under the ADP program for setting up an Advanced Institute for Nuclear Education & Training. The existing Training Institute and various Lab Facilities of BAEC will also be upgraded under the project and several Simulator & Mockup Labs will be setup.
- ✓ A simulator for training of various NPP personnel & students will be supplied soon by the IAEA.



Views of the Existing Training Institute at AERE, Savar, Dhaka

Strategy for HRD

- ❑ **Strategy for development of HRs for the NPP Operator**
 - ✓ We would like to have strong support from the technology supplier and would expect them to guide us in this regard.
 - ✓ However we have some basic requirements based on our **job culture and practices** and would expect the technology supplier to take those into consideration. These are -
 - At the entry levels of **NPP and Operations Managements** we would prefer to start with **(1) Engineering Graduates, (2) M.Sc. Degree holders** from our local Universities and **not with HSC holders**.
 - We would expect that **English** will be considered as the **medium of instruction** for the training of the above professionals in Russia.

Universities & Outputs

| Institutions | Public/Private | Approx. No. of Outputs with Relevant Degree |
|---|----------------|---|
| Engineering Universities (B.Sc. Engineering) | Public - 5 | ~2,300 |
| | Private - 3 | |
| Universities (General + Sci. & Tech.), (M.Sc.) | Public - 29 | ~4,000 |
| | Private - 49 | |
| Polytechnic /Diploma (4 years after SSC) | Public - 50 | ~9,000 |
| | Private - 180 | |
| Secondary Vocational | Public - 155 | ~90,0000 |
| | Private - 1800 | |
| Higher Secondary Vocational | Public - 64 | ~9,000 |

Cooperation with Russian Federation

- ✓ Under the provisions of the **IGA** (Inter-Government Agreement) **SC ROSATOM** of **Russian Federation** arranged an International Seminar on Nuclear Power in Dhaka, Bangladesh in **May 2013** involving all relevant stakeholders.
- ✓ **Russian experts delivered several lectures** on various aspects of Nuclear Energy in different organizations of Bangladesh during **2012 - 2013**.
- ✓ **SC ROSATOM** also arranged **hands-on-trainings** for the **members** of the **Bangladesh NEPIO** at the under construction NPP site of **Belarus**.



Cooperation with Russian Federation

- ✓ To develop public awareness ROSATOM established a **Nuclear Industry Information Center** at Bangabandhu Sheikh Mujibur Rahman Novo Theatre, Dhaka on **01 October 2013**.



Cooperation with Russian Federation

- ✓ As already mentioned we expect close cooperation of the NPP technology supplier for developing HRs for the NPP Project Management organization, Operating organization, TSOs and Regulatory body.
- ✓ While developing the cooperation programs as mentioned above considerations may be given to use the nuclear and radiation infrastructures that are already in operation in Bangladesh, such as 3MW TRIGA Research Reactor, Reactor calculations labs, Health physics and Waste management lab, NAA lab, SSD lab, NDT lab, etc.

Facilities that may be considered

3 MW TRIGA Mk-II Research Reactor

(Achieved Criticality in September 1986)



Shield Structure of the
TRIGA Reactor

Training
Research
Isotope production
General **A**tomics



Reactor Operators (SROs/ROs) are trained and licensed locally

Facilities that may be considered



Reactor Engineering Lab

- ✓ Nuclear Data Processing
- ✓ Reactor Analysis
- ✓ Fuel burn-up, Heat Transfer & Thermal Hydraulics Studies
- ✓ Radiation Shielding Technology

- ✓ Upgrading of the Safety Analysis Report of the BAEC TRIGA Reactor.
- ✓ Development of two shielding materials namely, Ilmenite-Magnetite (I-M) concrete and Poly-Boron.
- ✓ Contribution to the WIMS Library Updating project, which has been reported in the IAEA publication.



Heat Transfer Rig

Facilities that may be considered

Storage of Radioactive Waste



SSD Lab



Aqueous LIL Radioactive Waste Treatment Plant

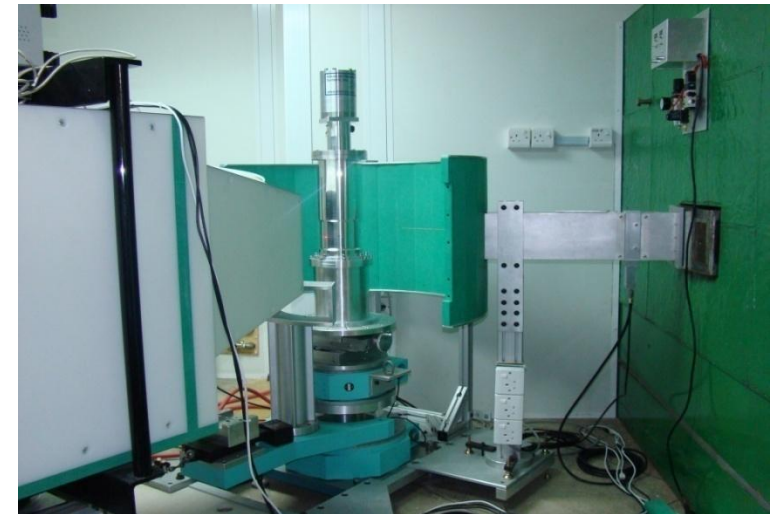


Health Physics and Waste Management Facility

Facilities that may be considered



**NAA Laboratory & HR
Diffractometer**



HR Powder Diffractometer

Facilities that may be considered



3 MV Tandem Accelerator Facility

Facilities that may be considered



- ✓ On-line detection of faults in industrial process systems.
- ✓ Detection of faults causing inconsistent fluid flow.

Non Destructive Testing

- ✓ Development of skilled manpower of international standard.
- ✓ Detection of faults in high pressure pipe lines.



Cross Cultural Issues for Cooperation

- ✓ Language barrier (English is understood well by university graduates),
- ✓ Levels of safety and quality cultures,
- ✓ Cultures that are influenced by natural factors such as weather condition,
- ✓ Regimented religious practices, etc.

Concluding Remarks

- ✓ **RNPP** (Rooppur NPP) is a vital project for the ensuring **energy security** of Bangladesh and as such, government is implementing it as one of the **First-track Projects** of the country.
- ✓ Bangladesh is very much thankful to the Russian government for its kind cooperation and supports towards implementation of the 1st Nuclear Power Plant project at the Rooppur site.

Concluding Remarks

- ✓ Bangladesh expects all out cooperation and support of our **Russian Partners, International Agencies** and all other **relevant Stakeholders** for developing and implementing a **most befitting and effective HRD program** needed for successful implementation of nuclear power program of the country.

The End

**Thank you for your kind
attention !!**