

**Prospects of Nuclear Education in the Countries Embarking on or Expanding their Nuclear Power Programmes” , 06 June, Moscow, Russian Federation**



# **HUMAN RESOURCE DEVELOPMENT FOR NPP PROJECT IN BANGLADESH**

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- 1. Present Status of Nuclear Power Program of Bangladesh**
- 2. Proposed Action Plan for Implementation of Rooppur Nuclear Power Project (RNPP) of Bangladesh**
- 3. HRD Programme for RNPP**
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# **NUCLEAR POWER PROGRAM OF BANGLADESH**

- ❑ **TODAY, Nuclear Power has become an inevitable energy option to meet the increasing demand of electricity**
  - ❑ **To achieve the projected target of 20,000 MW electricity by 2021 as declared in the Vision – 2021 of the present Government of Bangladesh, the Government is committed to implement RNPP with two units**
- ❑ **Decision of immediate implementation on NPP was taken by the National Parliament in 2010**

# NUCLEAR POWER PROGRAM OF BANGLADESH

- ❑ BASICALLY, Nuclear power was identified as a viable proposition for Bangladesh as early as 1960's;
- ❑ The Rooppur Nuclear Power Project (RNPP) site was selected in 1963;
- ❑ A number of feasibility studies were conducted, each of which established that the project is technically, financially and economically feasible;

## **ISSUES AND CHALLENGES FOR INTRODUCTION RNPP**

- ❑ A nuclear programme is a major undertaking – careful planning, preparation and investment
- ❑ Preparation of an appropriate national infrastructure for introduction of nuclear power program includes a wide range of technical competencies, institutions and activities
- ❑ Of course, it cannot be expected that in the arena of NPP, a newcomer developing country, like Bangladesh should have all required infrastructure, professionals and expertise at the stage of Pre-Project activities (Phase-I)

**In this context, IAEA, International Bodies and the Vendor(s) play significant role at different phases of the programme of a newcomer**

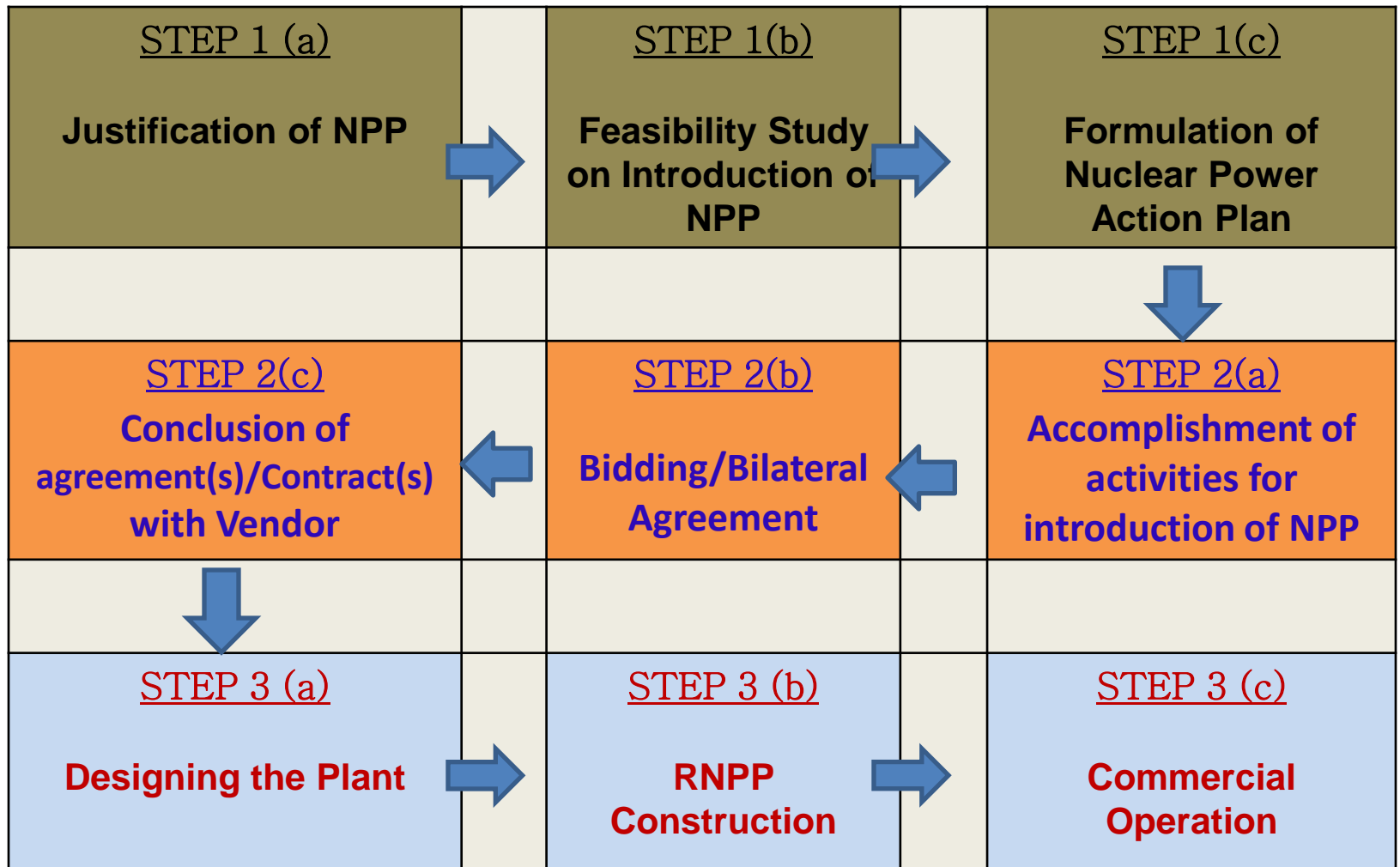
## ROADMAP FOR RNPP

A road map to implement RNPP has been formulated in line with the Comprehensive Approach of Infrastructure Development of the IAEA



A Stepwise Implementation Cycle for RNPP has been established

# ROADMAP FOR RNPP

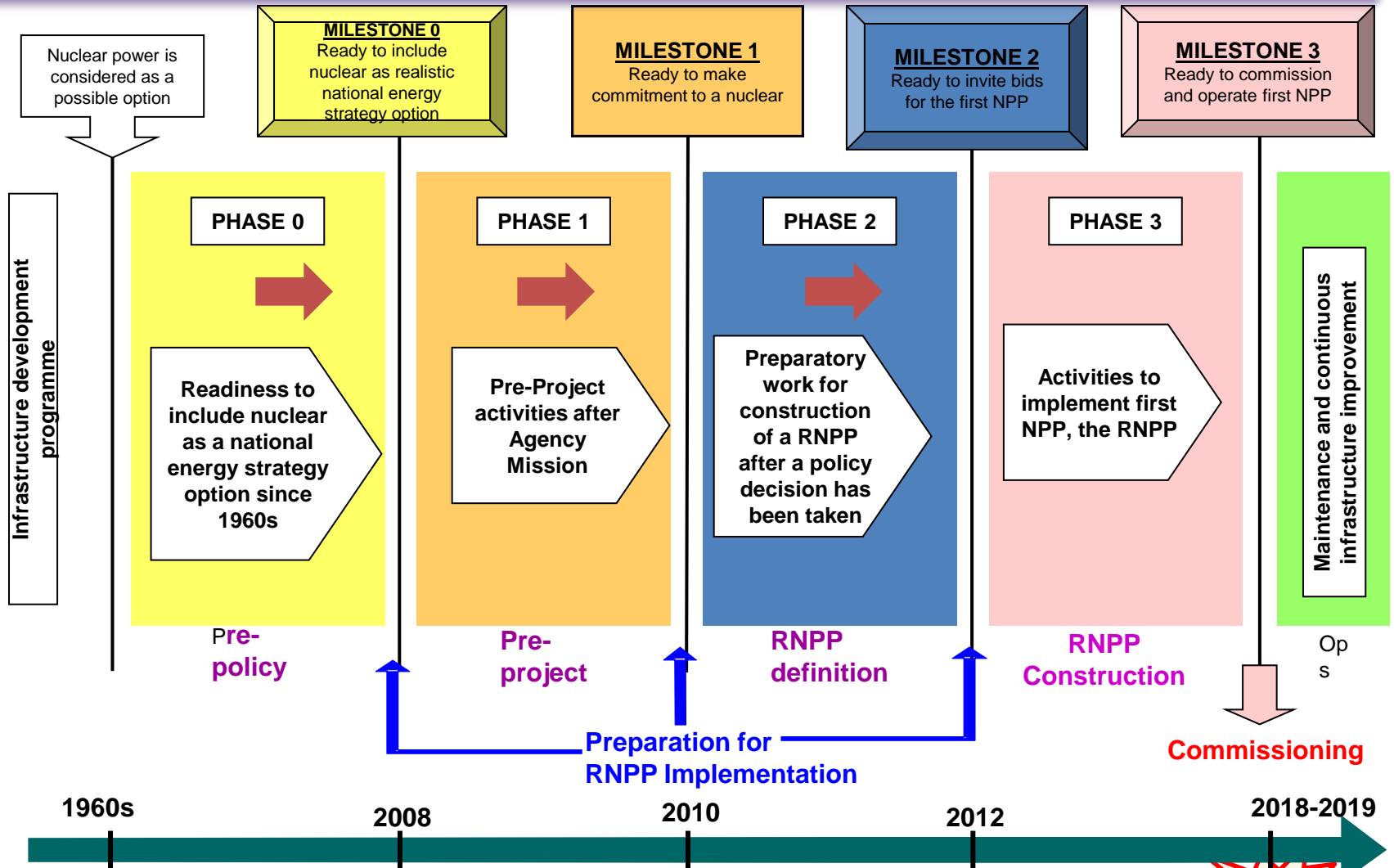


STEP 1: Completed

STEP 2: Ongoing

STEP 3: Planning Stage

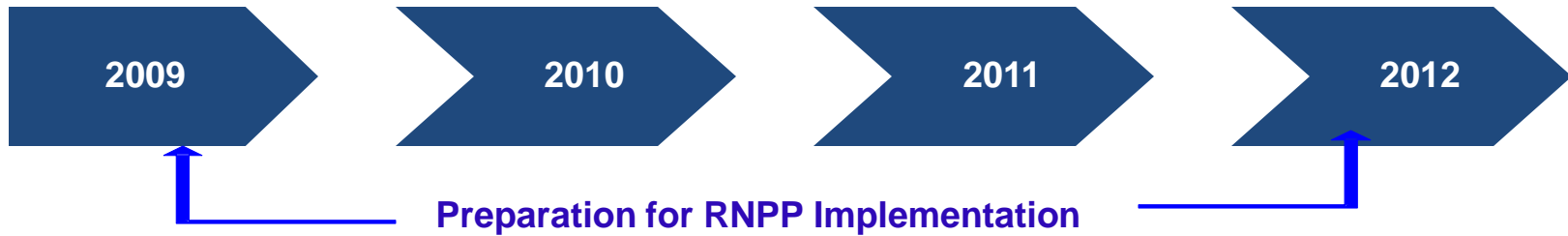
# ROADMAP FOR RNPP



**RNPP Project Timeline (proposed according to Vision 2021 and Sixth Five Year Planning of Bangladesh)**



## Action Plan for STEP-2 of RNPP Implementation Cycle (2009 – 2012)



- Establishment of the RNPP Implementation Process
- Establishing national infrastructure focusing on 19 issues dealing with Milestone 1 and 2 of the IAEA Milestone document;
- Finalization of Site Safety Report RNPP; designing/determining Site Specific Engineering parameters and Preparation of EIA Report;
- Finalizing RNPP implementation scenario
- **Workforce Planning and finalization the modality of staff training and education required for RNPP**
- Establishment of an independent Regulatory Body;
- Elaboration of recommendations on the power grid development aimed at its adaptation for connection of nuclear power reactor (two units) by 2017 and 2018

## Action Plan for STEP-3 of RNPP Implementation Cycle(2012 – 2018)



- Concluding all required contracts/agreements with vendor;
- Site Engineering, Site preparation and Facilities design;
- Development of working documents and NPP design; Manufacture and supply of equipment and materials to site;
- **Training of the personnel and experts for construction and operation of RNPP;**
- Construction work of 1<sup>st</sup> and 2<sup>nd</sup> unit of RNPP;
- Engineering Support for Installation and startup of reactor;
- RNPP Commissioning; Engineering Support for guarantee operation;
- Construction of the town site and administrative facilities

## **Action Plan for STEP-2 & STEP-3 of RNPP Implementation Cycle (2009 – 2020)**

**Finalization of Site Characteristics Study; Preparation of Site related Engineering Data, Preparation of ER Report  
2009 -2012**

**Signing of Essential Agreements/Contracts 2011 - 2012**

**Approval of Siting and Construction licenses and arrangement of Staff Training for RNPP 2012**

**Construction, commissioning and test operation and acceptance of the plant (1<sup>st</sup> and 2<sup>nd</sup> Unit)  
2012 - 2019**

**Commercial operation of Rooppur Nuclear Power Plant  
2019-2020**

### **RNPP Implementation Committee of BAEC**

<b>RNPP Sub-Committee 1:</b>	<b>Legal and Regulatory Aspects as well as International Obligations</b>
<b>RNPP Sub-Committee 2:</b>	<b>Project Management/Ownership /Institutional Framework</b>
<b>RNPP Sub-Committee 3:</b>	<b>Nuclear Fuel Cycle, Management of Radioactive Wastes, Decommissioning and Environmental Monitoring</b>
<b>RNPP SUB-COMMITTEE 4:</b>	<b>HUMAN RESOURCES DEVELOPMENT</b>
<b>RNPP Sub-Committee 5:</b>	<b>Funding , Financing and Procurement</b>
<b>RNPP Sub-Committee 6:</b>	<b>Grid System Development</b>
<b>RNPP Sub-Committee 7:</b>	<b>National Participation</b>

# **WORKING SUB-GROUPS ON RNPP CONSISTING OF RELEVANT STAKEHOLDERS**

**The Govt. of Bangladesh formed 08 (eight) committees with members of different Ministries/Departments/Academic Institutions to assess the entire range of nuclear infrastructure, establish recommendations focusing on the 19 issues dealing with the Milestones 1 and 2 of the IAEA Milestone document and take necessary steps for development of national nuclear infrastructure**

## **1. Legal and Regulatory Aspects as well as International Obligations**

(1) Ministry of Science and ICT; (2) Ministry of Law, Justice and Parliamentary Affairs; (3) Ministry of Foreign Affairs; (4) Ministry of Environment and Forest, (5) Bangladesh Atomic Energy Commission and (6) Others

## **2. Ownership, Project execution and Project Management**

(1) Ministry of Science and ICT; (2) Ministry of Law, Justice and Parliamentary Affairs; (3) Ministry of Finance; (4) Ministry of Establishment; (5) Planning Commission; (6) Ministry of Foreign Affairs; (7) Bangladesh Atomic Energy Commission and (8) Others

# **WORKING SUB-GROUPS ON RNPP CONSISTING OF RELEVANT STAKEHOLDERS**

## **3. DEVELOPMENT OF HUMAN RESOURCES**

**(1) Ministry of Science and ICT; (2) Ministry of Education; (3) Ministry of Foreign Affairs;(4) Bangladesh Atomic Energy Commission and (6)Others**

## **4. Funding and Financing**

**(1) Ministry of Science and ICT; (2) Ministry of Finance; (3) Economic Relations Division;(4) Ministry of Foreign Affairs; (5) Bangladesh Atomic Energy Commission and (6)Others**

## **5. National Participation**

**(1) Ministry of Science and ICT; (2) Ministry of Commerce/Industries (3)Power Division, Ministry of Energy and Mineral Resources; (4) Planning Commission and (6) Bangladesh Atomic Energy Commission.**

# **WORKING SUB-GROUPS ON RNPP CONSISTING OF RELEVANT STAKEHOLDERS**

## **6. Nuclear Fuel Cycle, Waste Management and Environmental Monitoring**

**(1) Ministry of Science and ICT; (2) Ministry of Law, Justice and Parliamentary Affairs; (3) Ministry of Foreign Affairs; (4) Ministry of Environment and Forest; and (6) Bangladesh Atomic Energy Commission.**

## **7. Grid System**

**(1) Ministry of Science and ICT; (2) BPDB, Power Cell, BPGB (3) Power Division, Ministry of Energy and Mineral Resources; (4) Planning Commission and (6) Bangladesh Atomic Energy Commission;**

## **8. Heavy Equipment Transportation Planning**

**(1) Ministry of Science and ICT; (2) Ministry of Communication; (3) Ministry of Shipping; (4) Bangladesh Inland Water Transport Authority (BIWTA); (5) Chittagong Port Authority/Mongla Port Authority and (6) Bangladesh Atomic Energy Commission**

## ESTABLISHING RNPP DECISION MAKING PROCESS IN GOVT.

### WORKING GROUP ON RNPP

**The Working Group headed by the Secretary, Ministry of Science and ICT has been formed** to take Initiatives to accomplish all necessary activities for implementation of RNPP; coordinate to all responsible organizations and ministries and identification the areas of cooperation from supplier sources

### TECHNICAL COMMITTEE ON RNPP

**A Technical Committee headed by the hon'ble State Minister, Ministry of Science and ICT has been formed.** Secretaries of relevant Ministries; Chairman and Members of BAEC; experts of BAEC and Academic Institutions are the members of this Committee.

The **Technical Committee** is responsible to monitor the progress of the project activities, take initiatives for HRD, selection of technology, making liaison with vendor and prepare RNPP implementation guidelines for consideration of the Cabinet Committee on RNPP



### ESTABLISHING RNPP DECISION MAKING PROCESS

#### CABINET COMMITTEE ON RNPP

**A Cabinet Committee on RNPP Headed by Hon'ble Prime Minister has been formed. Hon'ble Ministers and Secretaries of the relevant ministries, Chairman, BAEC and selected scientists by the Prime Minister are the Members of the Committee.**

**The Cabinet Committee is responsible to provide guidelines and directions on ownership, Project execution, Funding mechanism, conclusion agreements/Contracts with vendor, formation of Independent Nuclear Regulatory Body**

## **HRD PROGRAMME FOR ROOPPUR NPP**

## **STRENGTH OF HRD for RNPP in Bangladesh**

- ❖ **BAEC has a good number of professionals in various branches of nuclear technology**
- ❖ **The Core Manpower for pre-implementation phase of the Rooppur Nuclear Power project is available in BAEC**
- ❖ **Fresh professionals are to be appointed soon. Fresh professionals for RNPP will be available from the General Universities, Universities of Engineering and Technology and Technical Institutions during implementation phase from annual out put**

# IAEA Recommendation for Infrastructure of Bangladesh for Nuclear Power

## Human Resource Development

Human Resource Development should include:

- (a) Bulk manpower needs,
- (b) Breakdown by knowledge, skills and discipline,
- (c) Flow of manpower to other projects,
- (d) Available human resources in key stakeholder organizations,
- (e) Human resources nationally developed,
- (f) External human resources,
- (g) Training,
- (h) Expected support from a vendor country

# INTERNATIONAL MECHANISM ON HRD FOR NPP

## IAEA Milestone Documents

Before contract

Phase I

**IAEA PLAYS A MORE RELEVANT ROLE**

**Bangladesh desires cooperation of IAEA and other International bodies during all the implementation phases of the RNPP**

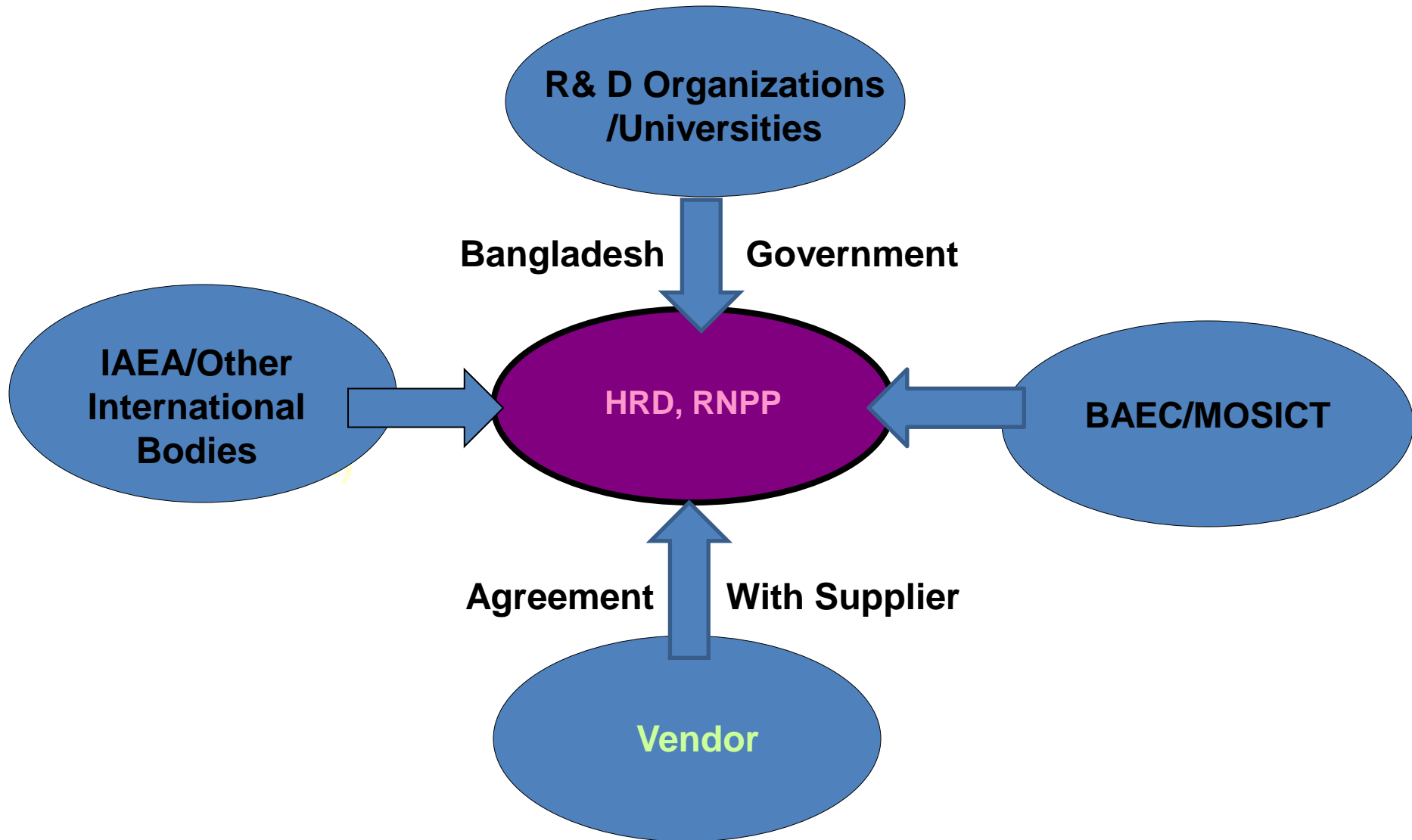
MOU + After contract

Phase II and Phase III

**VENDOR PLAYS A MORE RELEVANT ROLE**

**Bangladesh is looking for a vendor who will show vision and cooperate in implementation of HRD programme for safe and secured operation of RNPP**

# SOURCES OF HRD FOR RNPP



# HRD for NPP Projects of Bangladesh: Vendor Source

## **RNPP-Oriented Human Resources**

- **Project promoting and implementing manpower (professionals, technicians for technical description, design aspects, QA/QC, construction)**
- **Operation & Maintenance (O&M), Maintenance Support and Management Manpower (professionals, technicians)**

## **NPP-Program Oriented Human Resource**

- **Education, Research and development in nuclear science and technology professional**
- **Nuclear Law and regulation professionals**

## Expected Mode of Implementation and Modeling of RNPP

**Russian Federation and the People's Republic of Bangladesh in principle, has agreed to Cooperate in implementing RNPP**

A bilateral agreement on the co-operation in the field of peaceful usage of atomic energy was signed on 21 May, 2010 between Bangladesh and the Russian Federation



**An Intergovernmental Agreement between two governments on Cooperation Concerning the Construction of a Nuclear Power Plant was initialed on 24 February, 2011**



## **WORKFORCE PLANNING FOR RNPP**

**A general approach of recruiting manpower for RNPP year by year during different milestones has been proposed on the basis of the following issues:**

**Different work functions,**

**Qualification of manpower and**

**Experience and Training requirements for different work function categories**

## WORKFORCE PLANNING FOR RNPP

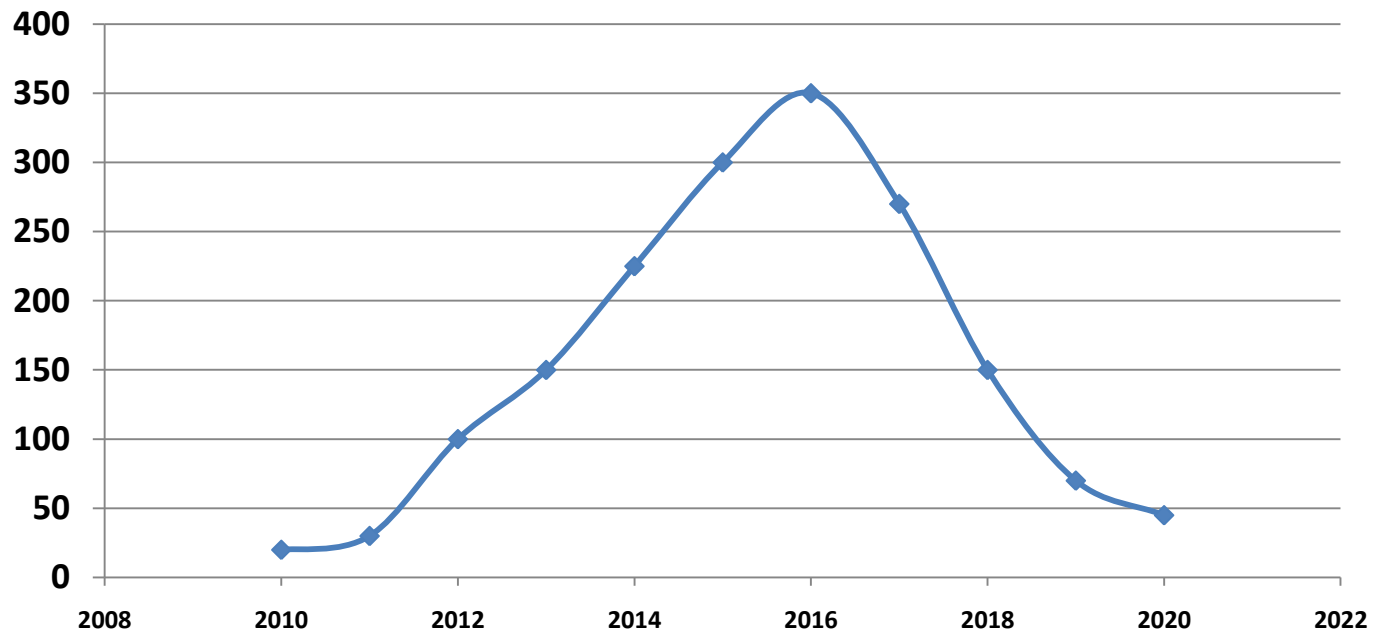
- ❑ **Bangladesh Atomic Energy Commission/Ministry of Science and ICT, GOB has identified total 1635 personnel for the RNPP (2xunit) to perform different work functions**
- ❑ **In addition, 75 personnel have been identified for the Project Management Team**

## RNPP MANPOWER PHASING

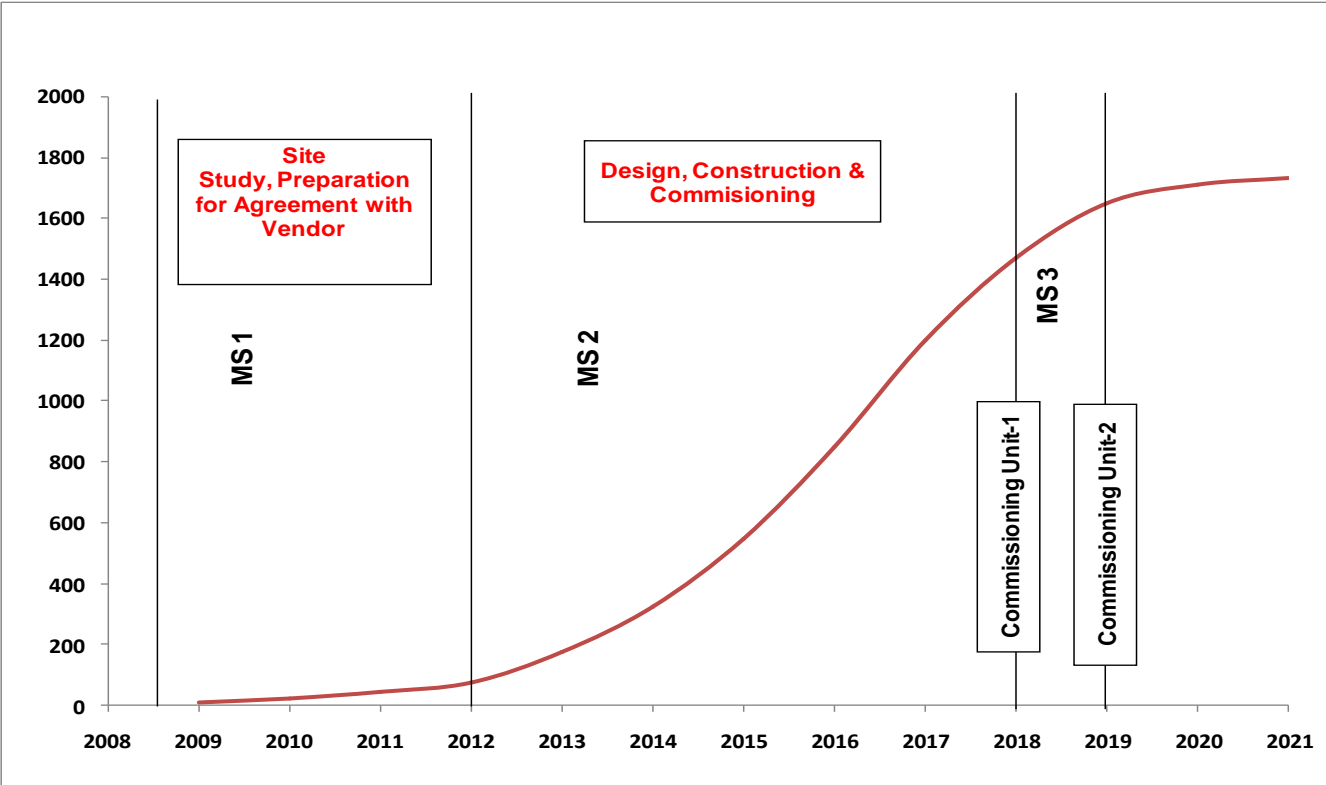
**Main philosophy for recruitment of manpower: the personnel who require more training will be recruited earlier**

- By 2012, all the manpower needed for the Project management will be recruited**
- From 2013 – 2014 the manpower needed for operation and maintenance, QA/QC Modifications Engineering of Unit-1 of RNPP will be recruited**
- In the year 2014 the priority of recruitment will depend on personnel working Operation Support , Maintenance Support and management of Unit 1**
- During 2015-2016 priority of recruitment will be placed on personnel working in Operations, Operation Support, QA/QC Modifications Engineering, Maintenance, Maintenance Support of Unit 2**

# RNPP MANPOWER RECRUITMENT PHASING



# RNPP MANPOWER PHASING



## **SUMMARY**

- **The IAEA and the Vendor can play a vital role in the development of human resources of a newcomer country to NPP**
- **As a newcomer, Bangladesh desires support and cooperation from the IAEA and International bodies as well as the vendor country in implementation of nuclear power programme of Bangladesh**
- **Bangladesh expects assurance for training of personnel and experts for construction and operation of RNPP from the vendor sources**
- **As a vendor country, the Russian Federation may cooperate Bangladesh in finalizing the training plan and training session schedule for RNPP**

## SUMMARY

- **Russian Federation may cooperate in developing human resources required for RNPP through implementing comprehensive multileveled staff-training programme in Russian Federation**
- **The Russian Federation may also cooperate Bangladesh in developing a comprehensive programme of nuclear education for the Regulatory Body, academic institution, RNPP and other relevant stakeholders**

*Thank you very much for your kind attention...*

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