

CHALLENGES AND OPPORTUNITIES FOR HUMAN RESOURCES DEVELOPMENT IN EGYPT

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Milestones of the Egyptian Nuclear Power Programme

- **Atomic Energy Commission** 1955
- **Atomic Energy Establishment (Authority)** 1957
- **Operation of 1st Research Reactor** 1961
- **International Bidding for NPDP (1)** 1964
- **War with Israel** 1967
- **Limited International Bidding for NPP (2)** 1974
- **Establishment of NPPA** 1976
- **Establishment of NMA** 1977

Milestones of the Egyptian Nuclear Power Programme

- **TMI** 1979
- **Egypt Ratifies NPT** 1981
- **Establishment of NCNSRC** 1982
- **International Bidding for NPP (3)** 1983
- **Chernobyl and suspension of the Project** 1986
- **Operation of 2nd Research Reactor** 1998
- **Revival of the Nuclear Power Program** 2006
- **The Strategic Decision to Launch NP Program** 2007
- **Contracting an International Consultant** 2009

Stakeholders

- **Electricity and Energy Sectors**
 - **Egyptian Atomic Energy Authority (EAEA)**
 - **Nuclear Material Authority (NMA)**
 - **Egyptian Electricity Holding Company (EEHC).**
- **National Center of Nuclear Safety and Radiation Control (NCNSRC).**
- **Universities & Research Centers.**
- **Industry**

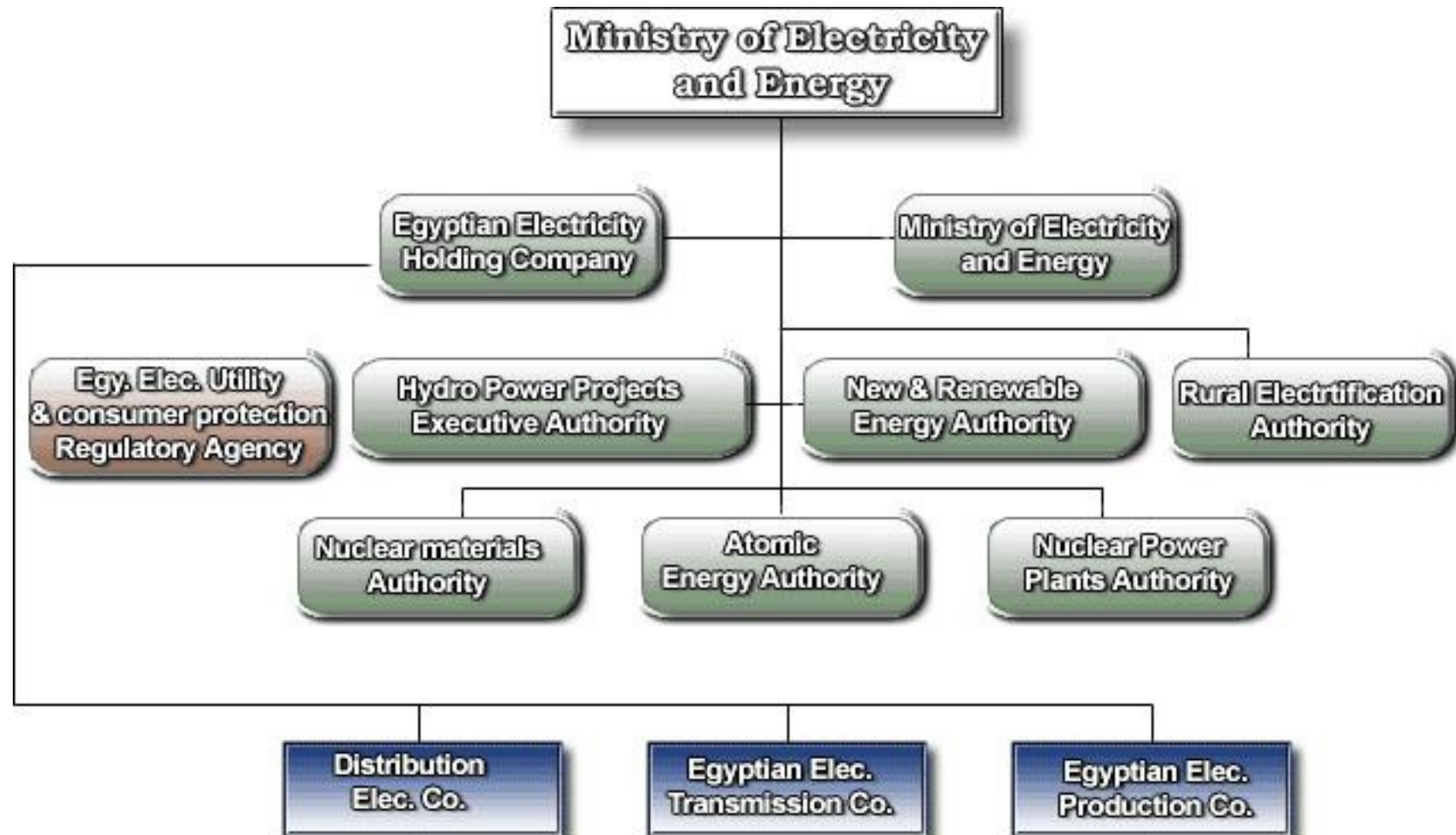
Stakeholders

- **Public (Individuals + Organizations)**
 - **Central and provincial government officials of the related ministries, police, military, other public servants**
 - **Political party leaders, members of the parliament, elected members of provincial governments, etc.**
 - **Investors (Financial company, economic policy makers, economic development research institutes)**
 - **Environmental conservation groups, nature preservation groups, etc.**
 - **Local population living nearby nuclear facilities, elected members of the local communities, etc.**

NPPA MISSION

- **Propose NPPs projects for electricity generation and seawater desalination.**
- **Carry out R&D activities needed for NPPs projects.**
- **Prepare technical specifications for NPPs projects.**
- **Implementation of NPPs and related projects and supervise their administration and ensure that the latest scientific, technological and preventive measures are applied.**

Authorities and Companies Affiliated to Ministry of Electricity and Energy



REVIVAL OF THE NUCLEAR POWER PROGRAM

Presidential Decision to go ahead in October 2007

- **Start a programme to construct a number of Nuclear Power Plants for electricity generation.**
- **Start the implementation of the necessary steps to construct the first Nuclear Power Plant for electricity generation.**
- **Start legislative and structural procedures related to the energy sector in general, and the mechanisms and bodies specific to nuclear energy in particular.**

RECENT AND CURRENT ACTIVITIES

- **Formation of Top-level committees overseeing, monitoring, and coordinating different activities of the programme:**
 - **Supreme energy council, headed by Prime Minister, participated by relevant ministers, with staff members.**
 - **Supreme council for peaceful uses of Nuclear Energy, headed by the President, participated by relevant ministers: with staff members.**
 - **Coordinating Committee (3 Nuclear Authority + EEHC).**

RECENT AND CURRENT ACTIVITIES

Following the Presidential Strategic Decision

- Bid invitation for consulting services announced in February 2008. Bid evaluation process completed, and Contract concluded on June 18th, 2009.
- The scope of services include:
 - Sites Selection and Evaluation, and Pre-contract Activities:
 - Updating El-Dabaa site studies;
 - Selection of Additional Sites
 - Pre-contract activities including Technology Assessment, Quality Assurance Program, Preparation of Contract, Training and Technology Transfer to NPPA Personnel, and Financial Assessment .
 - Consultation Services for Project Implementation:
 - Construction management,
 - Field engineering ,
 - Start-up and commissioning services

REASONS FOR HIRING A SINGLE INTERNATIONAL CONSULTANT

- **Lack of national capabilities in nuclear power technology.**
- **The complexity of activities related to the construction of the first NPP.**
- **Similar to having a main contractor during the construction phase, a single Consultant would prevent problems of interface between different activities.**

Future Activities

- **NPP Sites Studies:**
 - **Completion of El-Dabaa Site Studies**
 - **Selection of Additional Sites for the NPP Program**
- **Completion of nuclear technology assessment studies**
- **Development of related strategies:**
 - **Financing NPP Program.**
 - **Optimization of Local Participation.**
 - **Long-term Supply of Nuclear Fuel.**
- **Continuation of Restructuring of Nuclear Authorities and Regulatory Body.**

Future Activities

- **Finalization of QA programs in cooperation with project Consultant, IAEA and International Governmental organizations.**
- **Development of Technical Specifications for the 1st NPP.**
- **Formation of the Project Team that will:**
 - **Review and approve the Technical Specifications**
 - **Evaluate international bids, as well as, negotiate and conclude the Contract.**
 - **Supervise the construction of the NPP.**
- **Invitation for Bids, bid evaluation, negotiations and contracting**

Challenges

- **The repeated interruptions of the nuclear programme led to the fragmentation of the programme.**
- **The severest impacts affected the human resources:**
 - **Many of the highly qualified personnel left the country to join nuclear organizations in the advanced countries, and the international organizations.**
 - **Inability of the nuclear engineering department to attract good students due to limited employment opportunities.**
 - **Inability of nuclear authorities to attract high caliber fresh engineering graduates due to weak salary scale that could not be improved while the programme was frozen.**
 - **There is an aging problem due to long period of stagnation of the nuclear program. Most experienced staff is nearing retirement.**
 - **Lack of National Nuclear Training Centers, and limited financial and human resources**

Facing the Challenges

- **Develop a comprehensive re-structuring plan that includes better salary scale, to attract, employ and retain qualified human resources.**
- **Concentrate in the present stage of the programme on providing the training needs required for the pre-contract phase.**
- **Use of Egyptian experts who have been recently retired from national or international nuclear organizations, and who still have the ability to work efficiently.**
- **Utilize existing expertise in the Egyptian electricity and energy sectors who have relevant experience in non-nuclear activities such as construction and installation of large conventional power plants and oil refineries.**
- **Utilize available international cooperation opportunities.**
- **Utilize the services of an international consultant**

Technical Cooperation Expectations

- **Assistance in Restructuring of NPPA Organization to Achieve:**
 - **Appropriate organizational structure to carry out all anticipated duties during the first NPP project (pre-contract, post-contract activities).**
 - **Staffing and recruitment issues including job description, qualifications, training and salary scales.**
- **Assist NPPA in establishing a specialized Nuclear Safety Group through:**
 - **Advise on the strategy to form this group with a clear role within a turn-key project.**
 - **Advise on the job-description, qualifications and various responsibilities within the Group.**
 - **Provide training to Group's Members (formal and on-the-job).**
- **Development and Implementation of QA Program**

Technical Cooperation Expectations

- **Training the Trainers for Basic Training Courses:**
 - Nuclear Theory and Fundamentals
 - Nuclear Policy, Planning, and Project Management.
 - Nuclear Power Technology
 - Nuclear Power Safety
 - Safeguards and Nuclear Fuel Cycle
 - Nuclear Security
- **Nuclear Power Plants Technology Assessment through:**
 - Nuclear power plant system technology
 - Factors to be considered in choosing NPP technology
 - Strategies for localization and technology transfer: International experience and lessons learned
 - NSSS design, analysis and safety classification
 - Quality assurance of nuclear power
 - WCR technology and fuel design and management in Republic of Korea.
 - Impact of technology on Preparedness to radiological emergency

CONCLUSIONS

- Egypt was one of the few developing countries that realized the importance of nuclear energy in the sustainable supply of electricity and water.
- The Egyptian Nuclear power programme was suspended following the Chernobyl accident in 1986.
- In October 2007 the strategic decision was taken to re-start a nuclear power programme.
- Egypt is proceeding with its Nuclear Power Program.
- There could be several areas for international cooperation with the international partners, including IAEA, EU, and Bilateral Agreement countries.

