بسم الله الرحمن الرحيم

In the Name of GOD

EGYPT NUCLEAR & RADIOLOGICAL REGULATORY ATHORITY

IAEA Experts' Meeting on SAM in the Light of the Accident at the Fukushima Daiichi NPP,
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Strengthening National Regulatory Capabilities in Countries Embarking on New Commercial Nuclear Power Programs Post Fukushima Accident

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OBJECTIVE

Among other Arab countries, Egypt is considered one of the newcomer countries, which are planning to introduce NPPs for electricity generation . In the light of the lessons learned from the accident at the Fukushima Daiichi NPP, one of the apparent measures taken in Egypt, to improve its nuclear safety and regulatory management system, is the Strengthening and re-organizing its newly developed and independent nuclear regulatory body (ENRRA). The main objective of this presentation is to highlight the Governmental Measures undertaken in Egypt for strengthening the nuclear and radiological regulatory effectiveness.

INTRODUCTION : HISTORICAL CHRONOLOGY

The Egyptian Regulatory Legislative Framework Chronology

1982, The establishment of the nucleus of a competent regulatory body in Egypt (Nuclear Regulatory and Safety Committee) .

1991, The Presidential Decree No. 47 , the National Centre for Nuclear Safety and Radiation Control (NCNSRC) was established

2006, Presidential Decree no. 152 (ESAC),& Executive Ministerial Decrees No.(419,420 and 421) for control of NMs

2007 : the Strategic Decision for the peaceful electricity by NPPs

2010 , By the Law No.7 ratified by the President in 29 March2010 An independent " Nuclear and Radiological Regulatory Authority (NRRA)" was established …

2011 : The Executive Law or The code of practice was issued (26 Oct.)

2012 : Full independence of NRRA (5 March). Chairman & Vice-chairman.

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Nuclear & Radiological Facilities Working in EGYPT

Nuclear and Radiological Facilities Regulated and Controlled by ENNRA in EGYPT

I- ***Nuclear Facilities:***

- The first research reactor) (ET-RR-1) 1961
- The second research reactor (ET-RR2) 1998
- Fuel Manufacture pilot plant (FMPP) 1998
- Nuclear Power Plants Authority (NPPA). 1976

II- ***Radiological Facilities:***

- Charged Particle Accelerator in NRC
- Gamma Irradiators
- Radioisotope Production Facility (RPF)
- Radiological Laboratories : (industry, Research, medical,…etc)

Nuclear Power Program Status in Egypt

- The adoption of nuclear power was foreseen in Egypt early since 1960s.
- In Sep. 2006 , a national debate was initiated to develop a comprehensive energy strategy and to assess the feasibility to use nuclear energy. The former president declared the strategic decision in Oct.2007. This declaration stated that: Egypt is now suffering from energy provision problems and huge shortage in electricity as well as in oil, so:
  - Construction of a number of nuclear power plants for electricity generation is a must and strategic solution.
  - Implement the necessary steps to construct the first nuclear power plant at El-Dabaa site.
  - Develop the program in cooperation with many other international partners and IAEA.
  - The program to be conducted within the framework of transparency and respect of commitments of the non proliferation regime.

The Current Status of the 1st NPP in Egypt

- Egypt is now at the final phase and ready to invite bidders.
- However, due to the recent political situation in Egypt and post Fukushima Accident, the Cabinet decided to postpone tendering process until the election of new parliament to secure commitment to the project.
- The main feature of the Egyptian 1st NPP are:

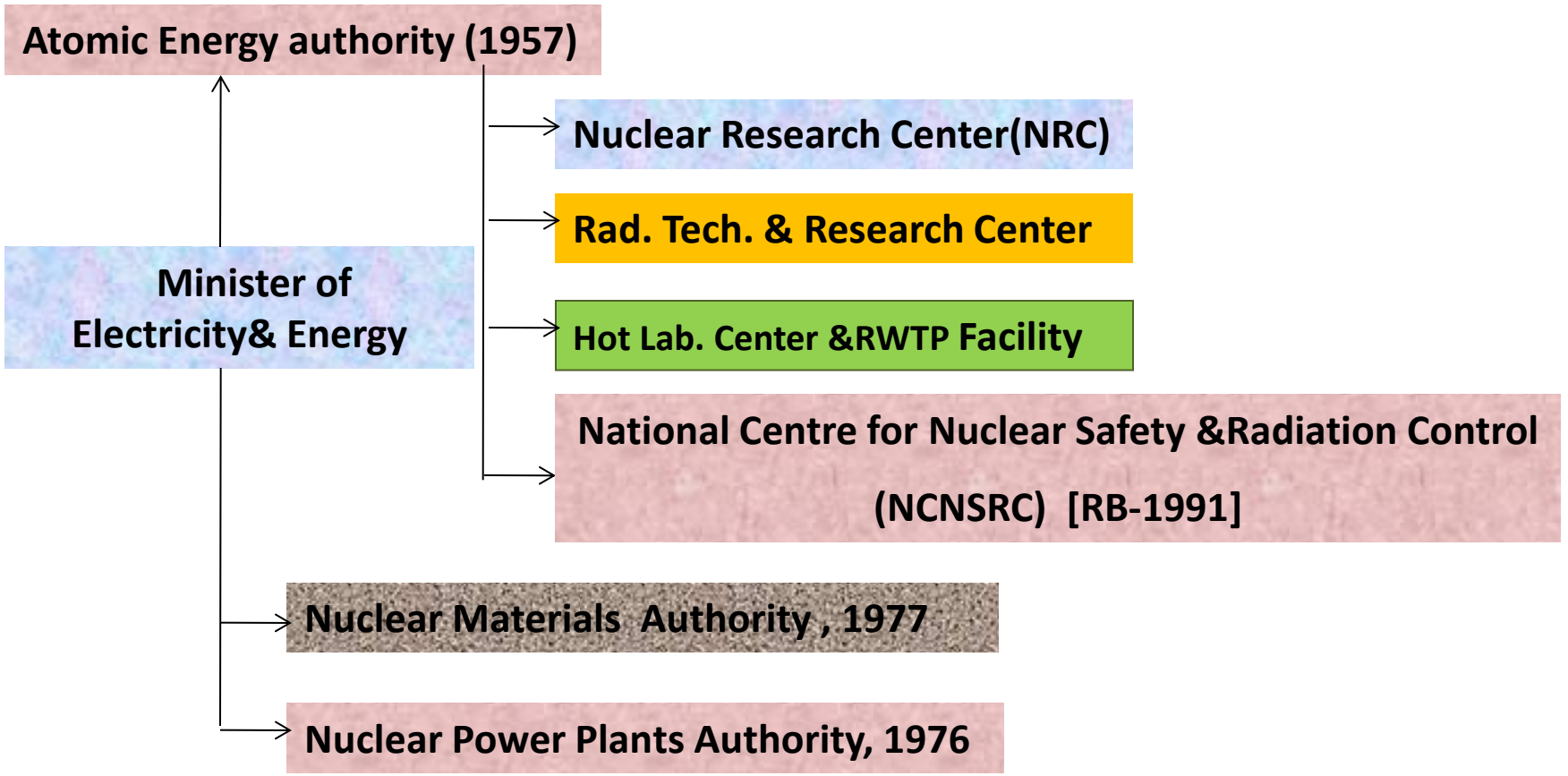
- PWR reactor type Gen.III, for the first two units.
- Unit size ranges from 1000 up to 1650 MWe.
- The project will be a Turnkey Contract.
- Proposed NPP shall be licensable in the country of origin.
- Plant shall meet all the IAEA Safety requirements.
- National or local capabilities shall be utilized to the possible maximum extent.

The Egyptian National Nuclear Regulatory System Framework

The Regulatory Status Before Fukushima

Before Oct.2011, The [RB] was: The National Centre for Nuclear Safety & Radiation Control(NCNSRC), which was a part of the Egyptian Atomic Energy Authority (EAEA).

Regulatory Status of Nuclear and Radiological Facilities in Egypt



Post Fukushima Regulatory Status in Egypt

By Oct. 2011, and after Issuing the code of Practice of the Egyptian Nuclear Law No.7,2010, the National Center of Nuclear Safety and Radiation Control became an Independent Regulatory Authority under the Name: NUCLEAR AND RADIOLOGICAL REGULATORY AUTHORITY (ENRRA)

The Egyptian Nuclear& Radiological Regulatory Authority(ENRRA)

Is A Fully Independent Regulatory Authority, which is Assigned Directly to the Cabinet, founded in Cairo according to the Egyptian Nuclear Law No.7,2010 and its Executive Law issued in Oct. 2011.

❖ The Primary Roles or Functions of ENRRA:

- Issuing Regulations, Guides &Safety Requirements
- Tasks of Review & Assessment
- Authorization (Licensing)
- Regulatory Inspections
- Enforcement Actions
- R & D Activities Relevant to Regulatory Practices.

Regulatory Actions or Modifications Implemented Post Fukushima Accident

- Full Independency from the Egyptian nuclear Facilities.
- Reorganizing of ENRRA Management System.
- Human Resources Development (HRD), Recruitment and Requalification.
- Revision and updating the Egyptian Nuclear Regulations Regarding Site Evaluation, Design and Operation in the light of IAEA Safety Requirements for the proposed NPP at EL-Dabaa.

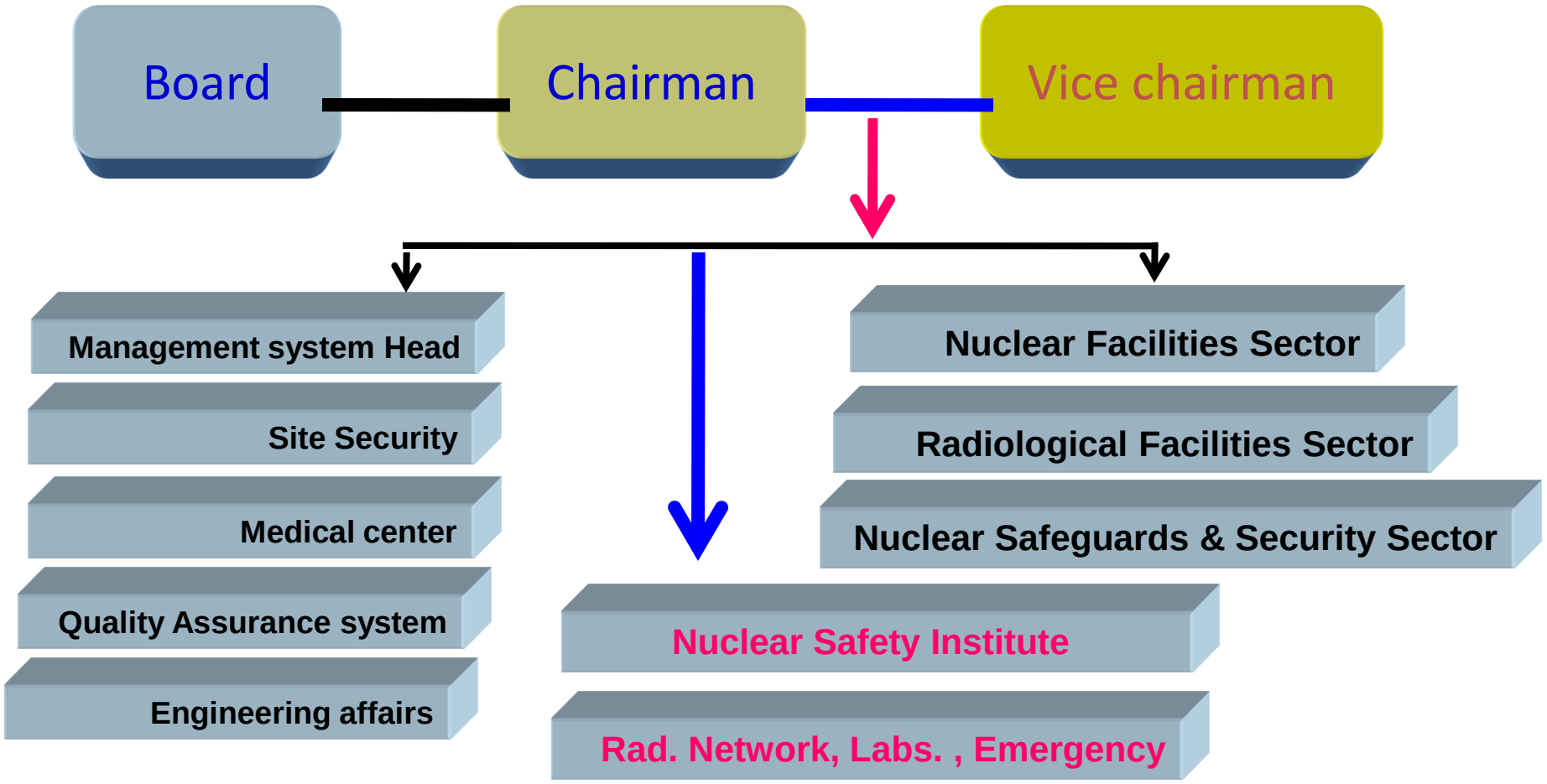
Regulatory Actions or Modifications Implemented Post Fukushima Accident (continu.)

- Reviewing and assessment as well as regulatory inspection committees in the ENRRA have been activated for the enforcement processes regarding research reactors, fuel manufacturing pilot plant and other radiological activities in the country, to update and improve their safety requirements, guides and emergency plans according to the lessons learned after Fukushima accident.

Activities Done in ENRRA for HRD After Fukushima Regarding

- Several IAEA Training Missions
- ENRRA-KOICA- KINS Capacity Building Programmes Activation .
- EC – ENSTTI Training Programme.
- ENRRA- AAEA – Egyptian Universities Educational Networks.

Organization Structure of ENRRA



Structure of Nuclear Safety Institute of ENRRA

Chairman (NRRA)

Vice-Chairman

Central Lab. For Radiation Measurements

Radiation Monitoring Network

Licensing unit for radioactive sources & Emergency room

Regulations & Nuclear Emergency Division

- Nuclear Law & Licensing Dept.
- Safeguards & Phy. Protection Dpt
- Quality Assurance Dept.

Radiation Control Division

- Radiological Safety Dept.
- Site & Environmental Dept.
- Radiation Protection Dept.

Safety of Nuclear Installations Division

- Engineering Safety Dept.
- Operation & Human Factor Dept.
- Fuel Cycle's Safety Dept.

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National and Radiological Emergency Plan Framework in the light Of the IAEA Requirements Post Fukushima Accident,

Improvement Events After Fukushima Regarding NREC

- Reorganizing or Restructuring of the Nuclear& Radiological Emergency Centre (NREC) in ENRRA.
- Reorganizing & Strengthening of the National Supreme Committee of N/R Emergency.
- Enhancement and Development of NREC Human Resources Development (HRD), especially Intervention Teams.
- Strengthening and Improving the Practical Capabilities of the NREC on both the National and International Levels by Participating in IAEA International Drills e.g. :Cnvex2b& Convex-3.

Improvements and Planning Regarding NREC-2

- Towards an effective and successful EPR plan implementation by the NPPA, a parallel preplanning of pre-established EPR plans approach is adopted by ENRRA-NPPA in the revision and evaluation of NPPA-EPR plans.
- EL-DABAA selected site for the proposed first Egyptian NPP, characteristics, qualifications and Infrastructure regarding EPR have been reviewed and evaluated by the NREC experts Team.

Improvements and Planning Regarding NREC-3

- The NPPA as an Operator for the proposed NPPs is usually carrying out many corrections and Improvements which are suggested by NREC experts team in Site Provisions for continuous updating of NPPA- EPR plans .
- Many lessons learned from Fukushima EPR plans have been considered during the NPPA-EPR plans updating processes.

Future Improvements and Planning Regarding NREC

- Egypt shared in IAEA's Workshop (Oct. 2013)on Strengthening National Incident Emergency Preparedness & Response Capabilities for evaluating its activities to support the strengthening of Member State Capacities for incident and emergency preparedness and response (EPR). The evaluation was focusing in particular at the work of the IAEA's Incident and Emergency Centre (IEC) during the period 2008-2012.
- This evaluation aims to gather views on the IEC's work around EPR, and is being circulated to the National Competent Authorities identified under the Convention on Early Notification of a Nuclear Accident and Convention of Assistance in the Case of Nuclear and Radiological Emergency.

National Radiological Emergency Organization in the Light of IAEA Requirements Post Fukushima Accident

National Emergency Preparedness and Response

Emergency Control Center (ECC)

Intervention Teams of ECC in Response to N/R Accident

Radiation Monitoring and Survey Team

Medical Team

Radiation Measurements and Samples Collection Team

Decontamination Team

Quality assurance and Management Team

Radiation Sources Recovery Team

Evaluation & Lessons Learned Team

Public Announcement

National Radiological Emergency Plan in the Frame Of IAEA Requirements Post Fukushima Accident

Supreme Committee for National N/R Emergency

Head of Supreme Committee for N/R Emergencies(ENRRA Chairman)

Head of ECC (National Coordinator)

Notification of N/R Accident

Ensure and Analyses the notification, Classification of the emergency

Response Ministries and Organizations

Interior, Foreign Affairs, Communications, Agriculture Transportations, …….etc.

IAEA

Contact point

Emergency control Center (National Coordinator)

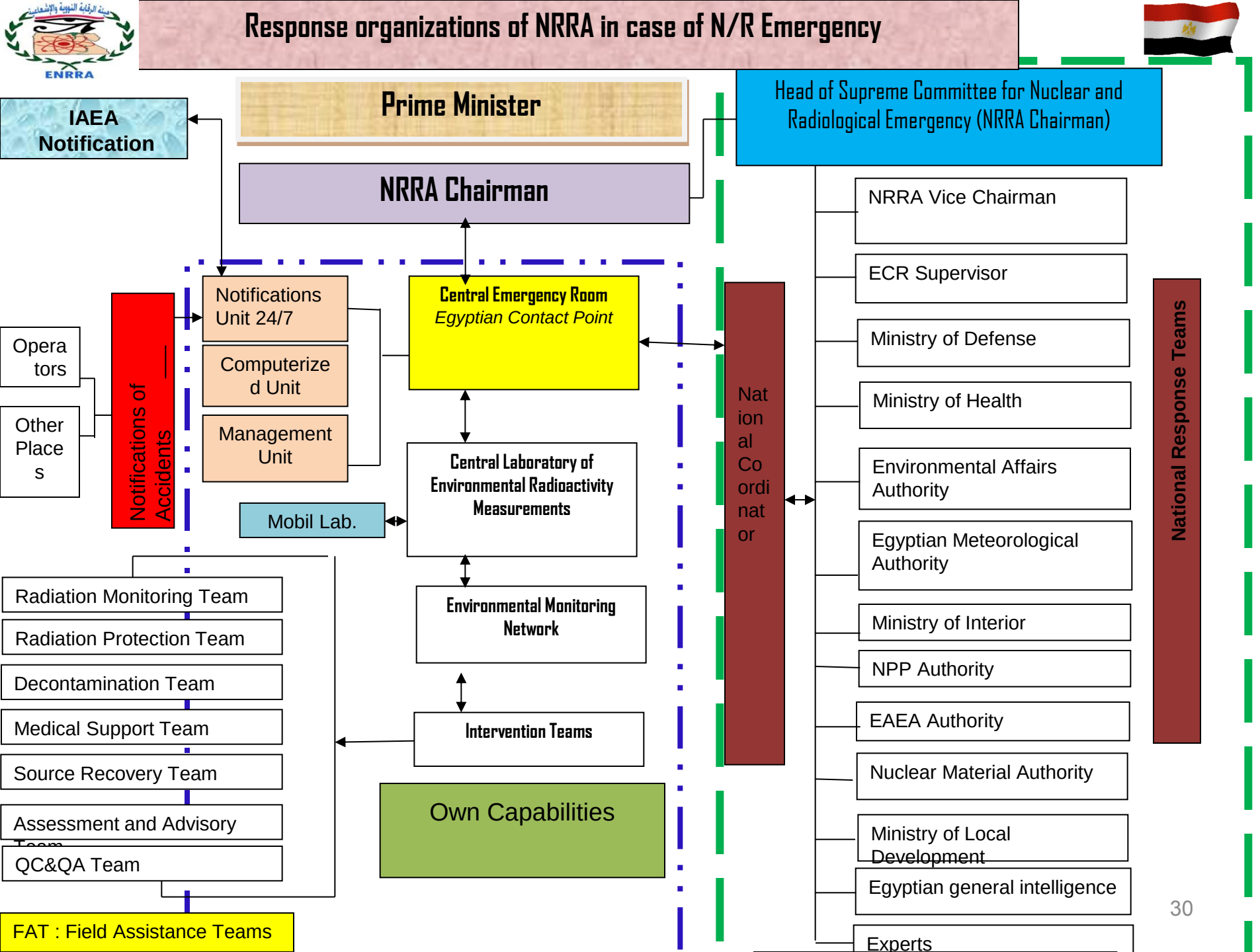
Activation of the Response Organizations and Concerning Facility EAEA

Activation of intervention teams

Management of the Accident in Coordination with the On-Scene Controller

Communication Management , Reporting and Documentation

Response organizations of NRRA in case of N/R Emergency



Challenges Encountered Newcomer Countries in EPR

- Staffing ; Quantitative and Qualifications
- Strong and Robust Co-ordination and Communication System among different parties or Organizations participating in the National EPR system.
- Efficient National Legislative and Enforcement Framework.

Regulatory Implications for New NPPs After Fukushima

- Technical Solutions Regarding Lessons Learned from Fukushima Acc. and BDBAs Issues (Loss of Off-Site, on-Site & DC power, Spent Fuel Issue and Other External Effects),
- Strong and Effective Coordination and Co-operation Among Designers, Nuclear Industries, Operators and Regulators, on National and International Levels on BDBAs Issue, and
- Strong and Robust National Nuclear Regulators.

CONCLUSIONS

- No doubt that the severe accident at Fukushima Daiichi Nuclear Power Station, triggered by the natural disaster on March 11, 2011, taught Japan and the world many important lessons on nuclear safety and regulatory issues.
- Among other things, the issue of the national regulatory frameworks and the national regulatory authorities. These lessons have opened many more issues to be learned, especially in newcomer countries embarking on new nuclear power programs for electricity generation. Following this accident,
- Many regulatory bodies all over the world carried out a complete and intensive review of safety guidelines and regulatory requirements with the aim of formulating a set of new regulations to protect people and the environment.

CONCLUSIONS(continu.1)

- A complete reorganizing process for ENNRA has been initiated by the separation between the research and the regulatory sectors.
- Additional activation processes have been achieved to strengthen the practical capabilities of the regulatory sector with emphasis to human resources capacity building, accident management, and on-site and off-site emergency management.
- Reviewing and assessment as well as regulatory inspection committees in the ENRRA have been activated for the enforcement processes regarding research reactors, fuel manufacturing pilot plant and other radiological activities in the country, to update and improve their safety requirements, guides and emergency plans according the lessons learned after Fukushima accident.

CONCLUSIONS(continu.2)

- Reorganizing & Strengthening of the Nuclear& Radiological Emergency Centre (N/REC).
- Reorganizing & Strengthening of the National Supreme Committee of N/R Emergency.
- Enhancement and Development Human Resources Development (HRD), especially Intervention Teams of NREC .
- Strengthening and Improving the Practical Capabilities of the N/R-EC on both National and International Levels by Participating in IAEA International Drills e.g. :Cnvex2b& Convex-3.

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