

# **52<sup>nd</sup> IAEA General Conference 2008**

**Scientific Forum : Session on Nuclear Energy**

**30 September 2008, Vienna**

## **Future IAEA Roles**

**in support of building infrastructure, capacity and  
human resources : perspectives of a prospective  
newcomer - - Thailand**

**Dr. Kopr Kritayakirana**

**Nuclear Power Program Development Office (NPPDO)**

**Ministry of Energy, Thailand**

# Thai Nuclear Power Planning Kick-off

- The National Energy Policy Council (NEPC) approved Thailand's **Power Development Plan 2007-2021 (PDP 2007)** and the **Thai Cabinet** acknowledged and approved the PDP in **June 2007**.
- One major initiative in the PDP 2007 is the designation of **nuclear power** generation option to supply **2,000 MWe** of electricity **in 2020** and another **2,000 MWe** in **2021**.
- To launch the preparatory work for nuclear power, the NEPC appointed the **Nuclear Power Infrastructure Preparation Committee (NPIPC)**, in **April 2007** chaired by **Dr.Kopr Kritayakirana**

# Possible IAEA Roles

to help newcomers to nuclear power by helping with and providing :

## 1. Initial Impetus

Boosting **confidence** and **acceptance** through public statements and exposure with senior figures.

## 2. Planning Framework

By providing **guidelines, standards, criteria, procedures, handbooks, data on available resources, sample cases of planning, etc.**

## 3. Technical Cooperation

By providing **funds for experts, training, workshops, seminars, conferences,** including initial planning meetings at IAEA HQ.

## 4. Networking

By introducing **key players** such as **regulators, suppliers, strong users, relevant institutions and organizations.**

# Possible IAEA Roles (Cont.)

## 5. Planning Review

Review, comment and advice on all key aspects of the **first plan, intermediate plans** and the **full final plan**.

## 6. Planning Evaluation

**Technical assessment** and **formal evaluation** at critical stages of planning.

## 7. Program Launch Support

**Support policy decision** to launch nuclear power program through meeting decision makers and/or public statements and public functions

## 8. Program Monitoring and Advice

Monitoring important aspects of infrastructure establishment and **1<sup>st</sup> NPP operation before and after commissioning** and **providing timely advice and assistance**.

# IAEA Roles : Initial Impetus

## Boosting Confidence and Acceptance

**Dr.M. ElBaradai**, IAEA Director General, delivered a keynote speech on nuclear energy at the Annual Science Congress in Bangkok in July, 2007.

Dr.Elbaradai, accompanied by the

Minister of Science and Technology, called on the Thai **Prime Minister** at the Government House on the same day.



# IAEA Roles : Planning Framework

## Nuclear Power Planning Approach of the NPIPC

1. Planning for **Nuclear Power Infrastructure** was carried out in parallel with the planning for **Nuclear Power Utility**.
2. The work approach, criteria, standards and procedures of the **International Atomic Energy Agency (IAEA)**, as represented in a number of reference documents, have been **adopted** to kick off the nuclear power program planning in Thailand. Being a member of IAEA, Thailand has also requested technical assistance and support from IAEA experts.
3. The study outcome was reported in the form of **“Nuclear Power Infrastructure Establishment Plan (NPIEP)”**

# IAEA Roles : Planning Support (Technical Cooperation)

## Getting Started on the Right Track

Dr.Kopr Kritayakirana,  
Chairman of the  
NPIPC, and a  
delegation of NPIPC  
members visited IAEA  
Headquarters in  
Vienna in August 2007  
to discuss the  
planning approach  
and to secure **IAEA support** and provision of **IAEA Experts**.



# IAEA Roles : Technical Cooperation

## IAEA Contribution to Early Planning by provision of experts

- The four IAEA experts and officer participating in the NPIEP Review Workshop on 25-27 September 2007 were
  - 1) **Mr. R. Ian Facer**, Nuclear Power Engineer, Nuclear Power Engineering Section, Division of Nuclear Power
  - 2) **Mr. A. Cherf**, Legal Officer, Nuclear and Treaty Law Section, Office of Legal Affairs
  - 3) **Mr. M. El-Shanawany**, Section Head, Safety Assessment Section, Division of Nuclear Installation Safety
  - 4) **Mr. Nabil Lutfi**, Program Management Officer, East Asia and the Pacific Section, Department of Technical Cooperation



# IAEA Roles : Planning Review

## Workshop to review the NPIEP

Four IAEA  
Experts/Officers  
attended a **three-**  
**day** workshop to  
review and  
comment on the  
first nuclear power  
planning document  
-- the **NPIEP**.



# Thai Government Approval of Nuclear Power Planning

- On 30 October 2007, the Thai Cabinet approved:
  - (1) The Preliminary Nuclear Power Infrastructure Establishment Plan (NPIEP)
  - (2) The establishment of the Nuclear Power Program Development Office (NPPDO) under the Ministry of Energy to coordinate the NPIEP implementation
  - (3) The work plan and budget for NPPDO and the NPIEP implementation during 2008-2010 (3 years), with an operating budget
- On 18 December 2007, the Cabinet further approved:
  - (1) The Final Nuclear Power Infrastructure Establishment Plan (NPIEP)
  - (2) The appointment of the Nuclear Power Infrastructure Establishment Coordination Committee (NPIECC)

# Thai NPIEP Milestones

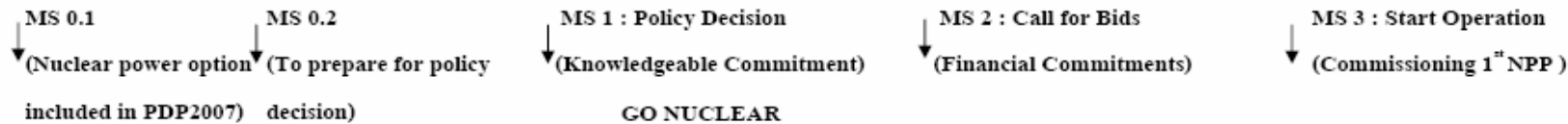
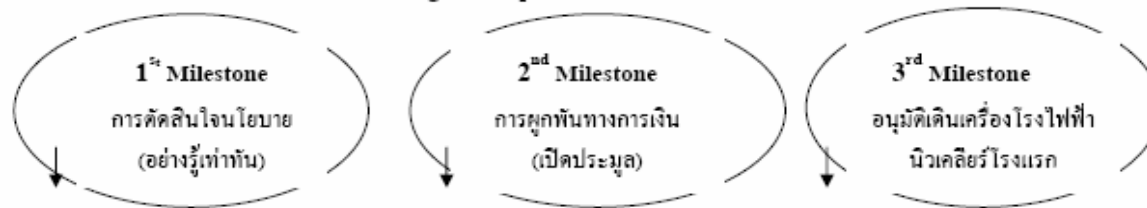
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24 September 2007

NPI	: Nuclear Power Infrastructure
NPIEP	: NPI Establishment Plan
NPPDO	: Nuclear Power Program Development Office
NPP	: Nuclear Power Plant
NRB	: Nuclear Regulatory Body

## ขั้นตอนสำคัญของแผนงานโครงการโรงไฟฟ้านิวเคลียร์

### NPIEP Milestones for Nuclear Power Program Implementation



### GO NUCLEAR

ตัดสินใจใช้พลังงานนิวเคลียร์

Phase	Phase	Phase	Phase	Phase
Phase 0.1 Preliminary Phase	Phase 1 : Pre-project Activity Phase	Phase 2 : Program Implementation Phase	Phase 3 : Construction Phase	Phase 4 : Operation Phase
- NPIPC & 7 SCs appointed - Issues & Milestones considered - NPIEP prepared	- approve NPIEP - set up NPPDO - infrastructure work started - survey of potential sites - feasibility study completed - public information & participation	- implement NPIEP with Milestones - full NRB established - legislation & international protocols enacted - suitable sites for bid selected - technology/qualified suppliers selected - prepare to call bids	- NPIEP fully implemented - bidding process completed - design & engineering - manufacturing - construction & installation - test runs & inspection - NPP commissioning license	- commercial operation - O&M - planning for expansion - industrial and technology development plan
ระยะที่ 0.1 เตรียมการขั้นต้น (เตรียมการศึกษา)	ระยะที่ 1 เตรียมเริ่มโครงการ (เตรียมการตัดสินใจ)	ระยะที่ 2 จัดทำโครงการโรงไฟฟ้านิวเคลียร์ (เตรียมการก่อสร้างโรงไฟฟ้า)	ระยะที่ 3 ก่อสร้างโรงไฟฟ้านิวเคลียร์	ระยะที่ 4 เดินเครื่องโรงไฟฟ้านิวเคลียร์
← 1 ปี	← 3 ปี	← 3 ปี	← 6 ปี	
2550 2007	2551 2008	2554 2011	2557 2014	2563 2020

# Thai National Nuclear Power Program (NNPP)

## Outline

- I. **NATIONAL NUCLEAR POWER POLICY (NNP POLICY)**
  - A. **National Nuclear Power Policy Package (Policy 1, 2 3 and 4)**
- II. **NATIONAL NUCLEAR POWER PROGRAM (NNP PROGRAM)**
  - B. **NNP Utility Development Program (Coordination)**
    - B1 NNP Utility Feasibility Studies
    - B2 NNP Utility Establishment Plan
  - C. **NNP Infrastructure Development Program**
    - C1 NNP National Nuclear Administration System Development Program
    - C2 NNP Industrial Infrastructure and Technology Development Program
    - C3 NNP Human Resources Development Program
    - C4 Nuclear Safety, Security, Safeguards and Environmental Issues
  - D. **NNP Public Information and Acceptance Program (Coordination)**
    - D1 NNP Public Information Program
    - D2 NNP National Participation and Public Acceptance Program

# Thai National Nuclear Power Program (NNPP)

## Outline (Cont.)

### III. NATIONAL NUCLEAR POWER READINESS (NNP READINESS)

#### E. National Nuclear Power Readiness Indication Package

E1 NNP Policy Readiness indication

E2 NNP Utility Readiness indication

E3 NNP Infrastructure Readiness indication

E4 NNP Public Acceptance Readiness indication

# Thai National Nuclear Power Program (NNPP)

## Programs / Projects

### PROGRAM A : National Nuclear Power Policy Package

A1. NNP Policy 1 : NNP Size and Timeframe Policy

A2. NNP Policy 2 : Nuclear Technology Localization Policy

A3. NNP Policy 3 : National Nuclear Safety, Security and Safeguards Policy

A4. NNP Policy 4 : Fuel Cycle, Fuel Supply and Spent Fuel Policy

# **Thai** National Nuclear Power Program (NNPP)

## **Programs / Projects (Cont.)**

### **PROGRAM B : NNP Utility Development Program Package (Coordination)**

#### **B1. NNP Utility Feasibility Studies**

**B1.1 Energy Economics and financing**

**B1.2 Technical and Safety aspects of nuclear power**

**B1.3 Fuel cycle and waste management**

**B1.4 Reactor technology, reactor supplier and fuel supplier selection**

**B1.5 Site and Environmental study**

**B1.6 Human resources development and management aspects**

#### **B2. NNP Utility Establishment Plan (to be developed)**

# Thai National Nuclear Power Program (NNPP)

## Programs / Projects (Cont.)

### PROGRAM C : NNP Infrastructure Development Program

#### C1. NNP National Nuclear Administration System Development Program

##### C1.1 National Nuclear Administrative Structure

##### C1.2 NNP Legal System

##### C1.3 NNP Regulatory System

##### C1.4 NNP International Protocols / Communication System

#### C2. NNP Industrial Infrastructure and Technology Development Program

##### C2.1 Nuclear Technology Localization Policy Goals and Strategy

##### C2.2 NNP Industrial Infrastructure Scope and Strategy

##### C2.3 NNP Initial Technology Transfer Strategy

##### C2.4 NNP Long Term Technology Development Plan



# Thai National Nuclear Power Program (NNPP)

## Programs / Projects (Cont.)

### PROGRAM C : NNP Infrastructure Development Program

#### C3. NNP Human Resources Development Program

C3.1 HRD Plan for NNP Utility (Short Term / Long Term)

C3.2 HRD Plan for NNP Regulatory System (Short Term / Long Term)

C3.3 HRD Plan for NNP Industrial Infrastructure (Long Term)

C3.4 HRD Plan for NNP Technology Transfer (Short Term)

C3.5 HRD Plan for NNP Technology Development (Long Term)

C3.6 HRD Plan for NNP Public Information & Acceptance (Short Term / Long Term)

#### C4. Nuclear Safety, Security, Safeguards and Environmental Issues

C4.1 Roles of Nuclear Regulatory Body (NRB)

C4.2 Emergency Preparedness and Response (EPR)

C4.3 Preparation and Evaluation of Safety Analysis Report (SAR)

C4.4 State System of Accounting for and control of Nuclear Material (SSAC)

C4.5 Nuclear Safeguards Issues

# Thai National Nuclear Power Program (NNPP)

## Programs / Projects (Cont.)

### PROGRAM D : NNP Public Information and Acceptance Program (Coordination)

D1. NNP Public Information Program

D2. NNP National Participation and Public Acceptance Program

### PROGRAM E : National Nuclear Power Readiness Indication Package

E1. NNP Policy Readiness Indication

E2. NNP Utility Readiness Indication

E3. NNP Infrastructure Readiness Indication

E4. NNP Public Acceptance Readiness Indication

# IAEA Roles : International Cooperation

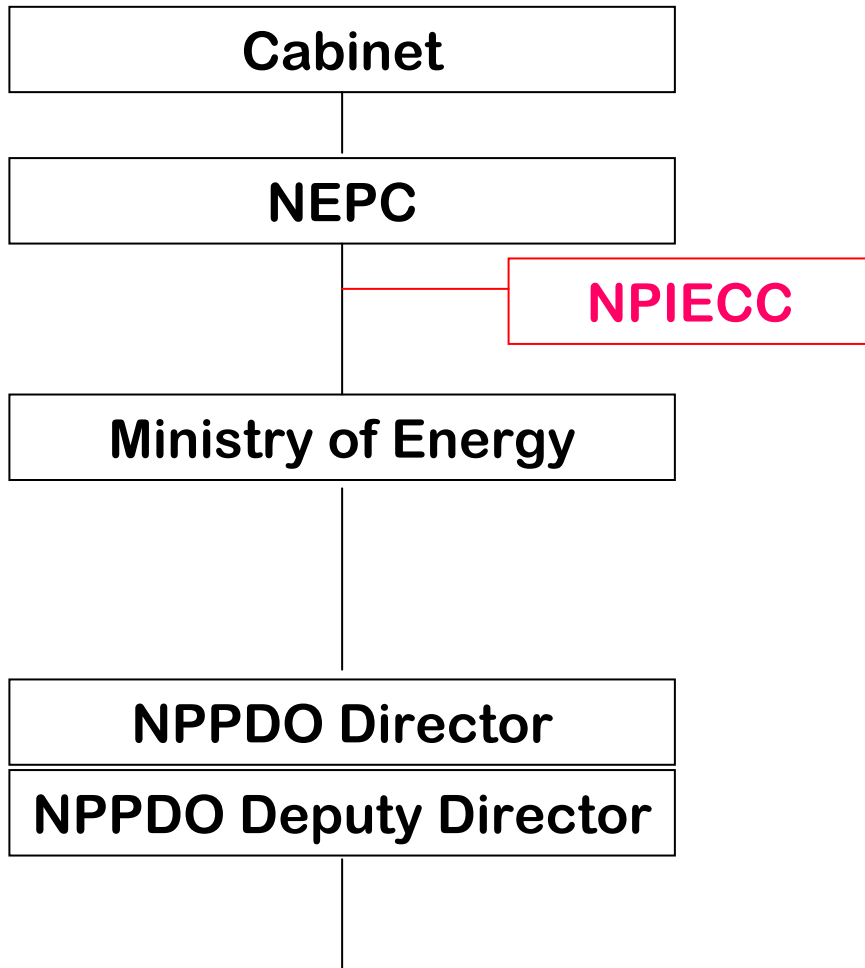
## Exposure and Networking

The Outline of the **National Nuclear Power Program (NNPP)** was presented at the **ASEAN+3 Forum** on Nuclear Energy Safety, held in Bangkok on 16-17 June 2008. **Mr.T.Taniguchi**, IAEA DDG for Nuclear Safety and Security, and other IAEA executives and officials attended and remarked on expanding IAEA roles to support Asian newcomers to nuclear power.



# Nuclear Power Program Development Office (NPPDO)

## Proposed Organization



**Nuclear Power Administration Development Coordination Division**

- NNP Policy Development Coordination Group
- NNP Administrative System Development Group
- NNP Legal System Development Group
- NNP Regulatory System Development Group
- International Protocols & Communications Development Group

**Nuclear Power Infrastructure Coordination Division**

- Utility Development Coordination Group
- Industrial Infrastructure Development Group
- Technology Transfer & Development Group
- HRD Planning & Development Group
- Safety, Safeguards & Environment Group

**Public Information and Acceptance Division**

- Media Preparation and Procurement Section
- Media Promotion and Dissemination Section
- Technical Section
- Administrative Section

**Administrative Service Division**

Finance Section / Personnel Section / Library & Data  
Office Facilities & Service / Office Communications

**NEPC** : National Energy Policy Council

**NPIECC** : Nuclear Power Infrastructure Establishment  
Coordination Committee

**Nuclear Power Infrastructure Establishment Coordinating Committee (NPIECC)** has set up 6 subcommittees to coordinate planning efforts :

**SC 1 :** Sub-Committee (SC) on the Legal System, the Regulatory System and International Protocols

**SC 2 :** on Nuclear Power Plants and Utility Planning

**SC 3 :** on Industrial Infrastructure, Technology Transfer and Technology Development Planning

**SC 4 :** on Nuclear Safety, Security, Safeguards and Environmental Protection

**SC 5 :** on Public Information and Public Acceptance Programs

**SC 6 :** on Human Resources Development Planning

# IAEA Roles : Technical Cooperation

## Planning for Experts Support

IAEA Executive, **Mr. Peter Salema**, Director for Asia Pacific Technical Cooperation, visited NPPDO to discuss IAEA **expert support** for the formulation of the **National Nuclear Power Program (NNPP)**



# NPPDO Requirements for Planning Experts

Number of man-months

Program	Requirements for Planning Experts	2008	2009	2010
C1.1	Experts on General Planning for NNP Program and the Nation Nuclear Administrative Structure	3	2	3
C1.2	Experts on the Structure, Content and Legislative Process for Establishing the Legal System for National Nuclear Power Program	2	1	1
C1.3	Experts on the Responsibilities, Competencies, Structure and Authorization of the Full NRB for the NNP Program	2	1	1
C1.4	Experts on National Nuclear Power Policy on Nuclear Safeguards and International Protocols for the NNP Program	1	1	1
C2	Experts on Nuclear Technology Localization Policy, Industrial Infrastructure and Technology Development Program	3	3	3
C2	Experts on Short Term Technology and Knowhow Transfer Programs for the Utility, the NRB and the NEPIO	2	2	2
C3	Experts on Short Term / Long Term Manpower Planning and HRD Program	3	3	3
C4	Experts on Nuclear Safety, Security, Safeguards and Environmental Issues	2	1	2

Experts support to be requested from IAEA and other nuclear countries, such as France, Japan, South Korea, China and the USA.

**Thank you for your attention.**

