

# International Conference on Human Resource Development for Introducing and Expanding Nuclear Power Programmes

## **Panel Discussion: IAEA Role in Knowledge Transfer**

### Agency Priorities in Addressing the Knowledge Transfer Challenge Through Education, Training and Capacity Building

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# The Role of the IAEA in Sharing Knowledge related to Nuclear Power

## Statute of the IAEA, Article III A, paragraphs 3 and 4

*"The Agency is authorized to [...]"*

*3. to foster the exchange of scientific and technical information on the peaceful uses of atomic energy,*

*4. to encourage the exchange of training of scientists and experts in the field of peaceful uses of atomic energy,*

- The role for the Agency is to assist in the transfer of knowledge from “centres of competence” to the “centres of growth”.
- Potentially high risk of knowledge loss and additional cost for future generations must be avoided, and the Agency can help to integrate this long-term aspect into today's strategic decisions.

# Knowledge Areas Needed for a Nuclear Power Programme

- National position
- Nuclear safety
- Management
- Funding and financing
- Legislative framework
- Safeguards
- Regulatory framework
- Radiation protection
- Electric grid
- Human resource development
- Stakeholder involvement
- Site and supporting facilities
- Environmental protection
- Emergency planning
- Security and physical protection
- Nuclear fuel cycle
- Radioactive waste
- Industrial involvement
- Procurement

# The Knowledge Management Activities

## Knowledge MANAGEMENT

## Knowledge CULTURE

2002  
Meeting of Senior  
Officials 1<sup>st</sup> GC  
Resolution on  
Managing Nuclear  
Knowledge

2000

2004  
1<sup>st</sup> NKM Conference  
ANENT, WNU SI  
established  
GC Resolution on  
Managing Nuclear  
Knowledge

2003

2005  
1<sup>st</sup> KM Assist Visit  
NKM  
Methodology  
& Guidance  
developed

2005

2006/2007  
2<sup>nd</sup> NKM Conference  
Nuclear Knowledge  
Portal  
ANENT Cyber Platform  
launched  
3<sup>rd</sup> GC Resolution

2007

2009

2008/9 – 2010/11  
1. Promoting Knowledge  
Management Culture  
2. Providing Services  
3. Developing knowledge  
products  
4. Facilitate networking and  
knowledge sharing.

2011

Analyzing Needs

Promoting NKM

Guidance & Methodology

Providing Services & Support

**Support  
Catalyze  
Build**



# IAEA Supports Capturing and Sharing Knowledge

- Documents that provide guidance and lessons learned
- Networks and Data Bases
- Services
- Training Courses/Workshops
- Fellowships and Scientific Visits



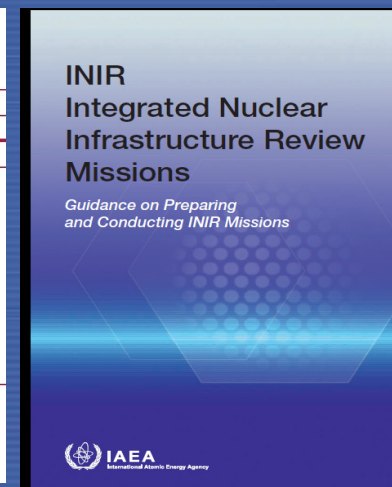
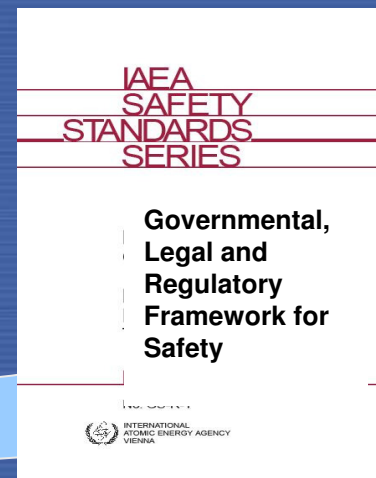
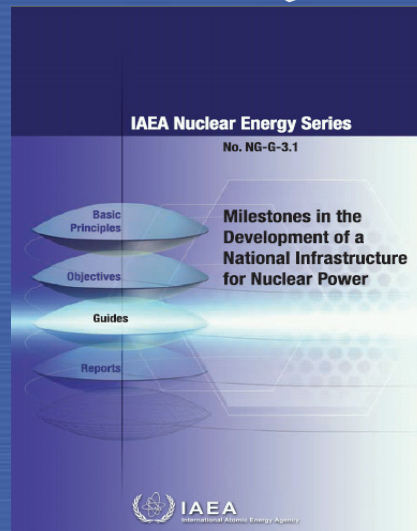
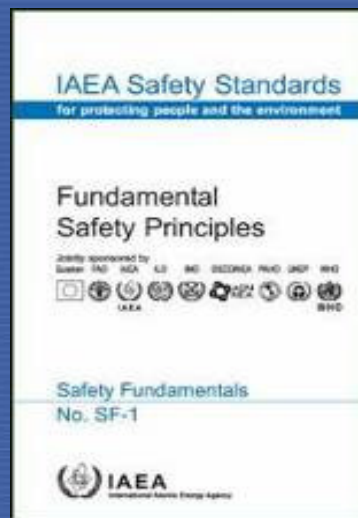


# Knowledge Transfer through Technical Cooperation

## Milestone Approach

TC programme and  
Technical Services

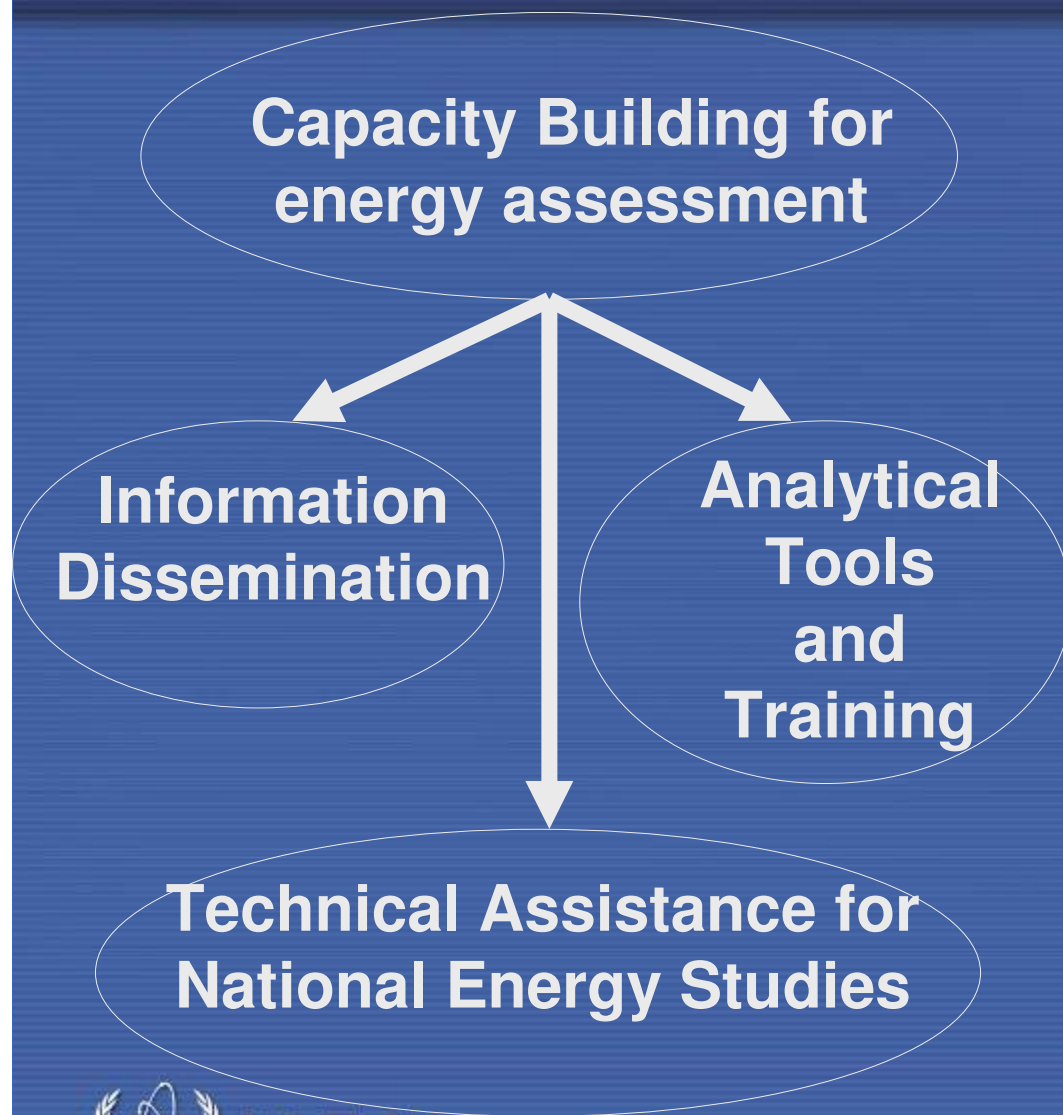
## Member State NP Infrastructure Activities



Feedback



# Knowledge Transfer for Energy Assessment



# Tele-Support Expert Service for Users of IAEA Energy Tools

Tele Support Expert Service - Microsoft Internet Explorer provided by IAEA

http://tses.iaea.org/tses/index

File Edit View Favorites Tools Help

Tele Support Expert Service

Welcome to  
**Tele Support Expert Service**  
for Users of  
IAEA analytical tools for energy systems analysis and planning

IAEA's Tele Support Expert Service (TSES) is designed to provide technical help to the users of IAEA's analytical tools for energy systems analysis and planning (also called energy models like MAED, WASP, ENPEP, MESSAGE, FINPLAN, SIMPACTS). These models are now being used in over 100 countries. In many cases, the users may have a question about (or a problem in) the use of above analytical tools. Such questions can be posted through TSES to the IAEA experts, who will help resolve the problem. All communications will be through TSES and will be preserved.



User:  Password:

[Apply for Registration](#)  
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# Technology Supported Learning e-Training Courses



# Examples of IAEA Publications on HR and Training

<http://www.iaea.org/OurWork/ST/NE/NESeries/ClickableMap/>

<http://www-ns.iaea.org/publications/default.htm>

## IAEA Nuclear Energy Series

No. NG-G-2.1

### Managing Human Resources in the Field of Nuclear Energy

Basic Principles

Objectives

Guides

Technical Reports



## IAEA Nuclear Energy Series

No. NG-T-2.2

### Commissioning of Nuclear Power Plants: Training and Human Resource Considerations

Basic Principles

Objectives

Guides

Technical Reports



## IAEA Nuclear Energy Series

No. NG-T-2.3

### Decommissioning of Nuclear Facilities: Training and Human Resource Considerations

Basic Principles

Objectives

Guides

Technical Reports



## IAEA SAFETY STANDARDS SERIES

### Recruitment, Qualification and Training of Personnel for Nuclear Power Plants

IAEA-TECDOC-1024

#### SAFETY GUIDE

No. NS-G-2.8



*Selection, competency development and assessment of nuclear power plant managers*

## IAEA Safety Standards

for protecting people and the environment

The Operating Organization and the Recruitment, Training and Qualification of Personnel for Research Reactors

Safety Guide  
No. NS-G-4.5



IAEA-TECDOC-1502

### Authorization of nuclear power plant control room personnel: Methods and practices with emphasis on the use of simulators



July 2000

## IAEA Nuclear Energy Series

No. NG-T-1.2

### Establishing a Code of Ethics for Nuclear Operations Organizations

Basic Principles

Objectives

Guides

Technical Reports



IAEA-TECDOC-1500

### Guidelines for upgrade and modernization of nuclear power plant training simulators



June 2000

IAEA-TECDOC-1202

### Assuring the competence of nuclear power plant contractor personnel

INTERNATIONAL ATOMIC ENERGY AGENCY



July 2001

### Competency Assessments for Nuclear Industry Personnel



INTERNATIONAL ATOMIC ENERGY AGENCY

IAEA

June 1998

## IAEA SAFETY STANDARDS SERIES

Organization and Staffing of the Regulatory Body for Nuclear Facilities

#### SAFETY GUIDE

No. GS-G-1.1



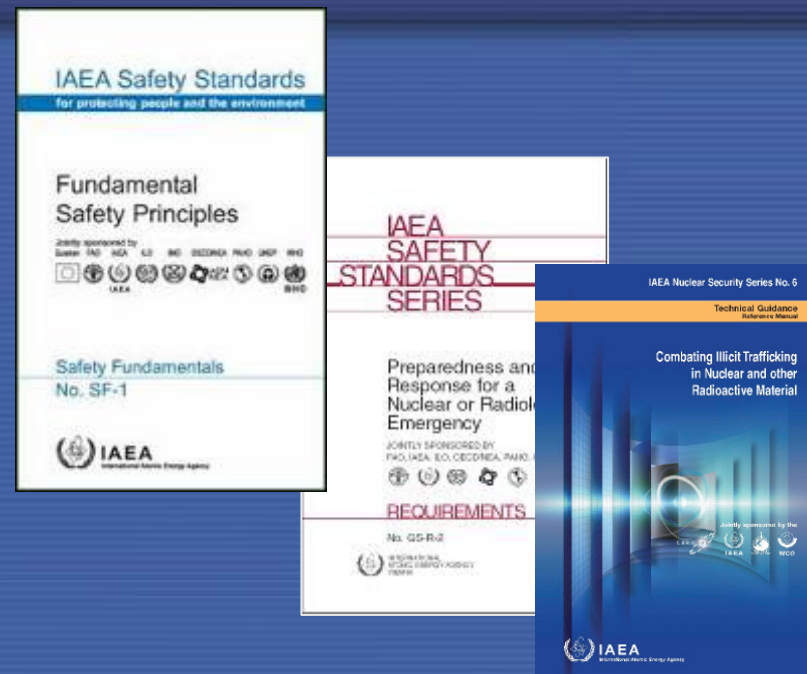
# Capacity Building Through Knowledge Transfer in Nuclear Safety & Security

## IAEA Publications

- *Safety Standards*
  - Nuclear Safety
  - Radiation, Transport and Waste Safety
  - Emergency Preparedness and response
- *Security Guidelines*

## Missions and services

- *Integrated Regulatory Review Services (IRRS)*
- *International Nuclear Security Advisory Service (INSServ)*
- *International Physical Protection Advisory Service (IPPAS)*
- *Emergency Preparedness Reviews (EPREV)*
- *Operational Safety Review Team (OSART)*
- ...and more



# Capacity Building Through Knowledge Transfer in Nuclear Safety & Security

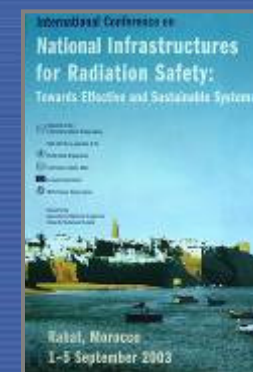
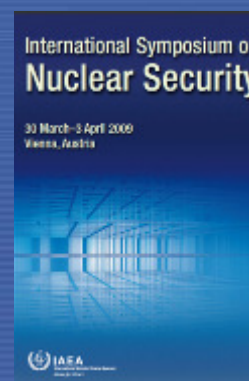


## Review and Information Exchange Meetings

- *Nuclear Safety Convention*
- *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*
- *Convention on the Physical Protection of Nuclear Material & Amendment*
- *Convention on Early Notification of a Nuclear Accident*
- *Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency*
- *Codes of Conduct: Radioactive Sources; Research Reactors*

## Conferences, Symposia

- *Such as:*





**Building capacity through Education  
and Training in Nuclear and  
Radiation Safety and Nuclear  
Security**

**Post Graduate Education  
and Training Course in  
Radiation Protection and  
the Safe Use of Sources  
(PGEC)**

**Master of Science and  
Certificate Programme in  
Nuclear Security**

**Basic Professional  
Training on Nuclear Safety**

**On-the-job  
training**

**Fellowships**

**Technical  
Visits**

**Train the Trainers  
Workshops**

**Distance Learning**

**Specialized Training  
Courses on Thematic  
Areas**

**General Training**

**Sustainable education and training programme compatible with the  
requirements of the IAEA Safety Standards and international instruments  
for nuclear security**



**IAEA**

# Capacity Building Through Education and Training

## Education and Training

- *Postgraduate education courses for future leaders and senior managers*
- *Basic Professional Training Course on Nuclear Safety (BPTC)*
- *Topical training courses to build expertise (e.g.: for regulators, security officials, plant operators)*
- *Train-the-Trainers workshops to build capacity at the national level*
- *Establishment of regional training centres and capacity building centres*
- *Implementation of IAEA strategic plans for E&T*
- *Guidance to assist States develop national strategies for building competence*

# Knowledge Transfer supporting NP Operations

**Agency work in this area includes:**

- **assembling expert teams for advisory missions to facilities to identify potential improvements;**
- **publishing technical guidance and reference documents;**
- **maintaining databases on operating experience;**
- **disseminating operating experience, new knowledge and best practices;**
- **providing direct training and computer packages for distance learning; and**
- **coordinating research among groups working on common problems.**

# Knowledge Transfer Supporting Advanced and Innovative NPP Designs

➤ **The Agency serves as a catalyst.**

**It coordinates research and promotes information exchange for current reactor lines and for innovative nuclear energy systems.**

**The Agency seeks to stimulate innovation in nuclear power through activities in four areas:**

- Technological progress along the main reactor lines: light water, heavy water, fast and gas cooled reactors;
- The International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO);
- Small and medium sized reactors;
- Non-electric applications such as hydrogen generation and desalination using nuclear energy.



# Networking in Nuclear Safety & Security

## Global Nuclear Safety and Security Network (GNSSN)

- *Sharing mega knowledge globally applicable (e.g. IAEA Safety Standards, IAEA E&T packages)*
- *Sharing information at the international level (e.g. RegNet for sharing information among national regulators)*

*Network of Networks*

### Regional Networks

*Expanding and Strengthening IT and Human Networks for developing regional capacity building systems, well adapted with the regionally unique situation and culture*



*Strengthening Inter-regional Human Networks for sharing knowledge and practical experiences*

# Networking Nuclear Education

RAS/O/047: Supporting Web-Based Nuclear Education and Training through Regional Networking

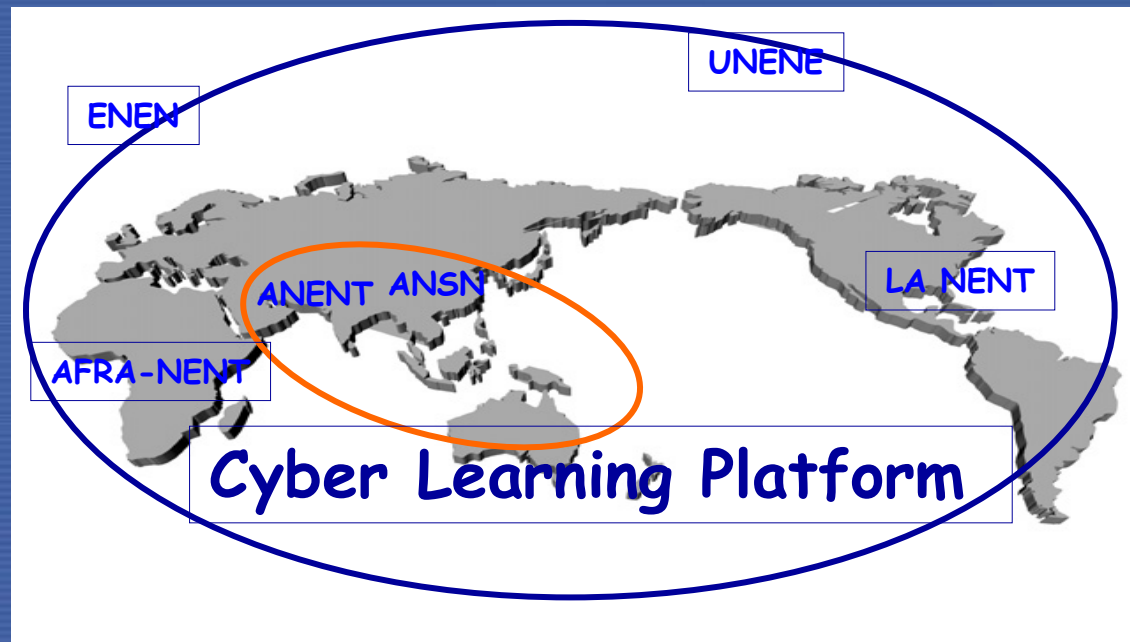
- 26 Countries in the Asia-Pacific Region - ANENT

Afghanistan, **Bangladesh, China, Indonesia**, (Iran), Iraq, Israel, Jordan, Kuwait, **Lebanon**, Marshall Islands, **Malaysia, Mongolia**, Myanmar, **Pakistan**, Palestinian A., **Philippines**, Qatar, **Korea**, Saudi Arabia, Singapore, **Sri Lanka, Syrian Arab Rep., Thailand, United Arab Emirates, Vietnam, Yemen**

**Australia, India**

- Main Objective

Support to develop, consolidate, and utilize the web-based standardized E&T materials



## Assist Visits on Nuclear Education: a Direct Service to Member States

- **2007**

Lithuania (Kaunas Univ. of Tech.)

- **2008**

Bruce Power  
Zaporozie NPP  
Kazakhstan AEC

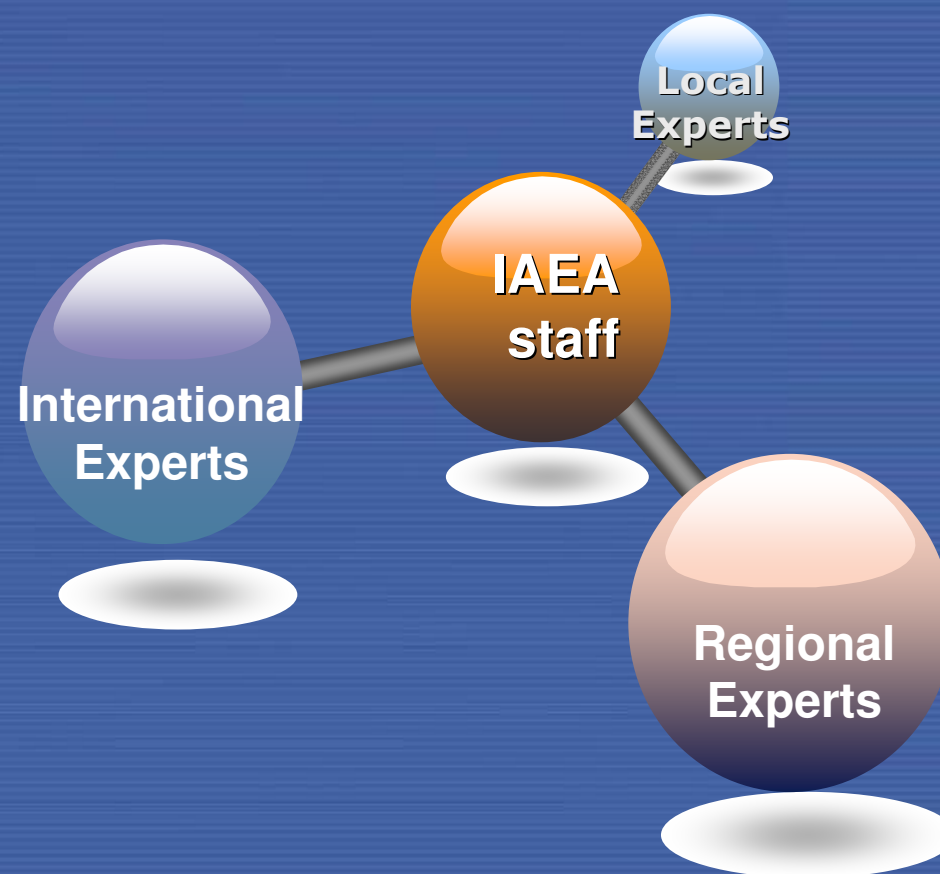
- **2009**

Malaysia  
Montenegro  
Argentina  
Bulgaria  
AECL **Canada**

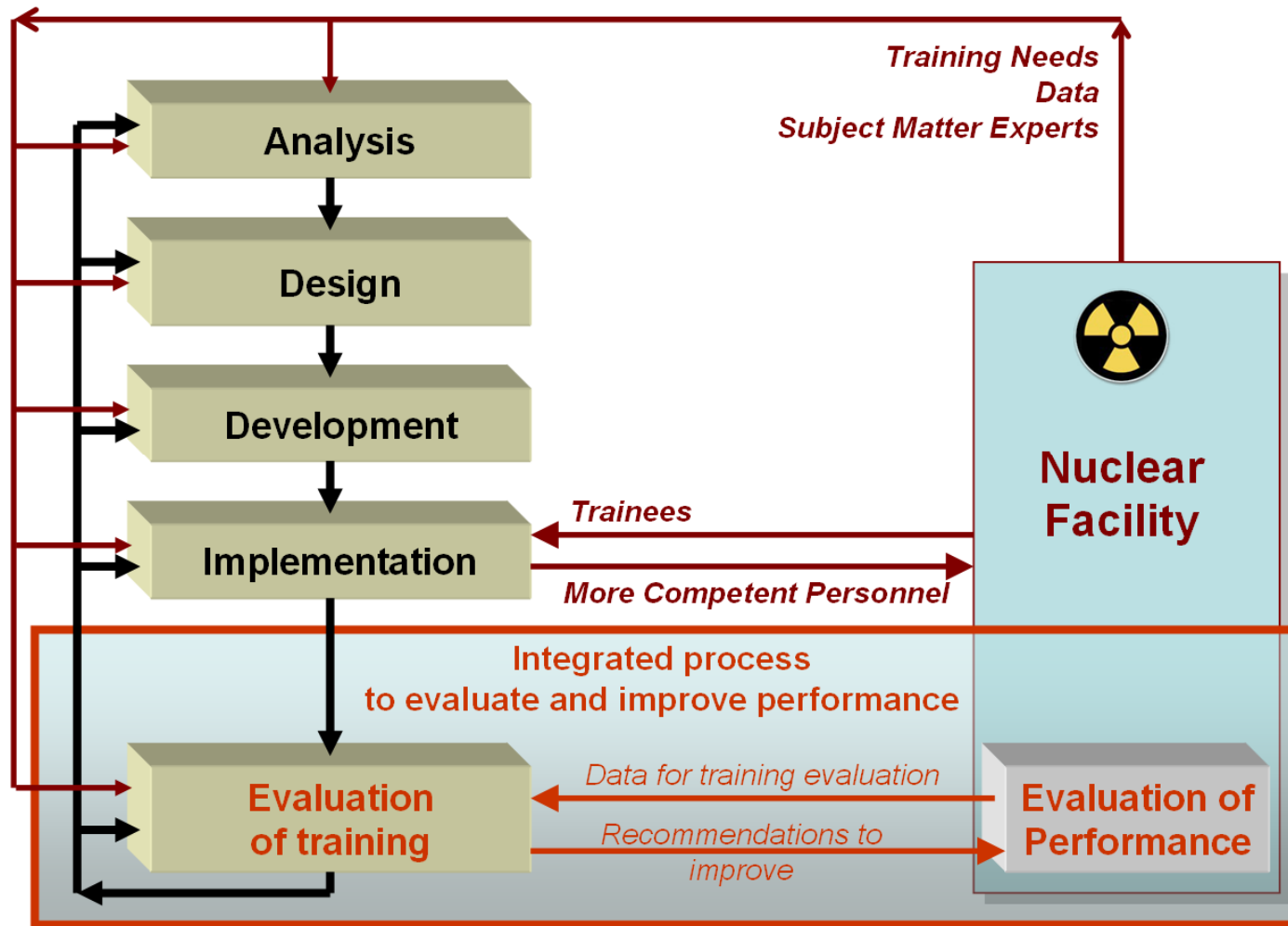
- **2010:** Philippines, Russia, ...



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# Systematic Approach to Training (SAT): An IAEA Expectation



IAEA  
SAFETY  
STANDARDS  
SERIES

Recruitment,  
Qualification and  
Training of  
Personnel for  
Nuclear Power Plants

SAFETY GUIDE

No. NS-G-2.8

INTERNATIONAL  
ATOMIC ENERGY AGENCY



TECHNICAL REPORTS SERIES No. 380

Nuclear Power Plant  
Personnel Training  
and its Evaluation  
A Guidebook



INTERNATIONAL ATOMIC ENERGY AGENCY, VIENNA, 1996

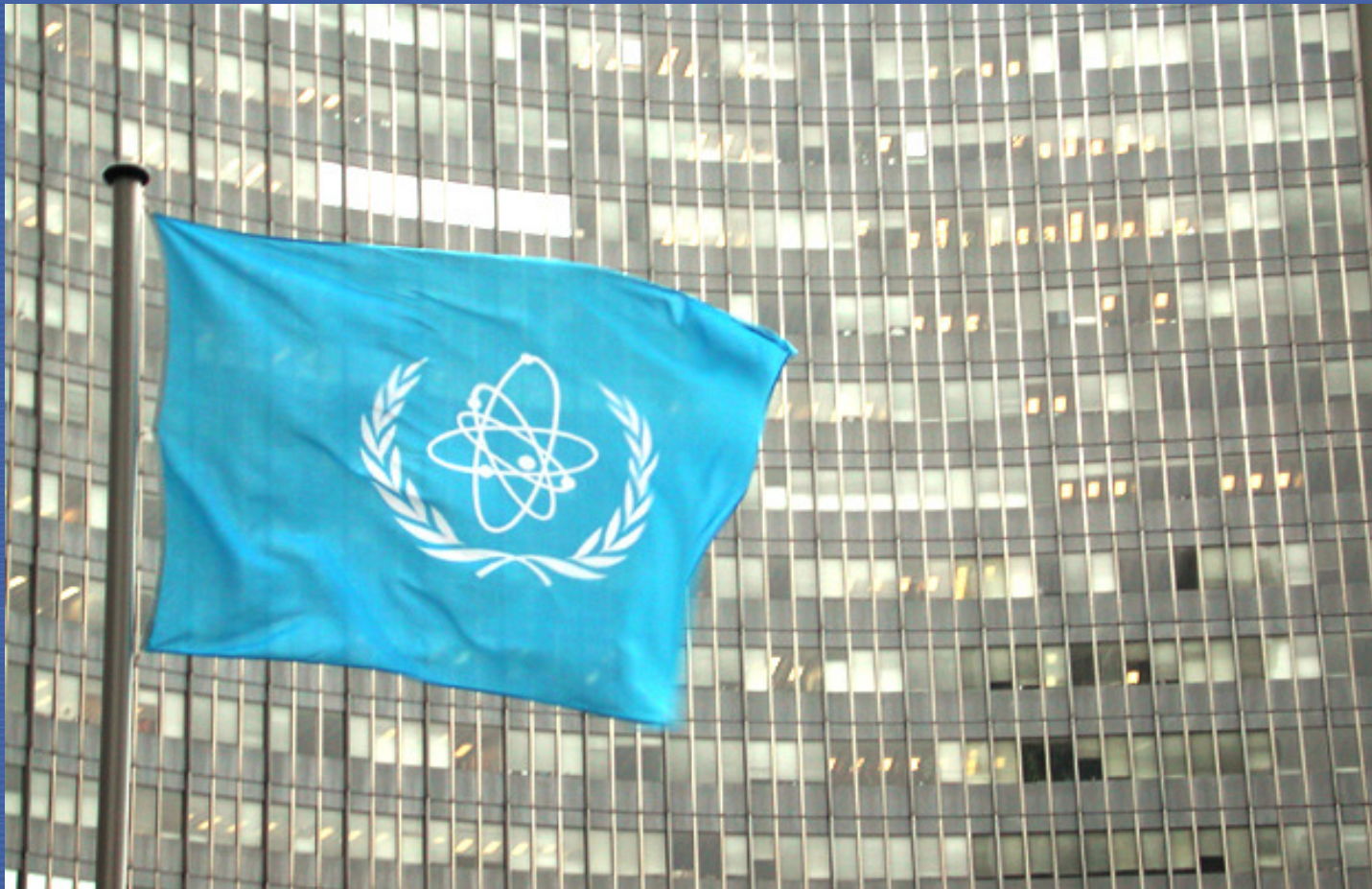


## **How to consider KM from the beginning of a Nuclear Power Programme?**

- **Use an integrated, systematic approach toward considering and implementing a NP programme (The “Milestones” Approach)**
- **Develop workforce/staffing plans that are based upon the roles and responsibilities for the activities in each of the 3 Phases**
- **Require SAT for all training programmes**
- **Include SAT, and knowledge capture and transfer requirements in supplier(s) contracts**
- **Maintain this integrated workforce planning approach and KM programme through the entire lifecycle of the facilities/programmes**
- **Networking to share knowledge regionally and internationally**

*Thank you for your attention*

IAEA



*...atoms for peace.*