

제1회 국가 원자력 인력양성 컨퍼런스
2015. 10. 28. 경주 현대호텔

세계 원자력 인력양성 방향 및 ANENT 협력 현황

2015년 10월 28일

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Korea Atomic Energy
Research Institute



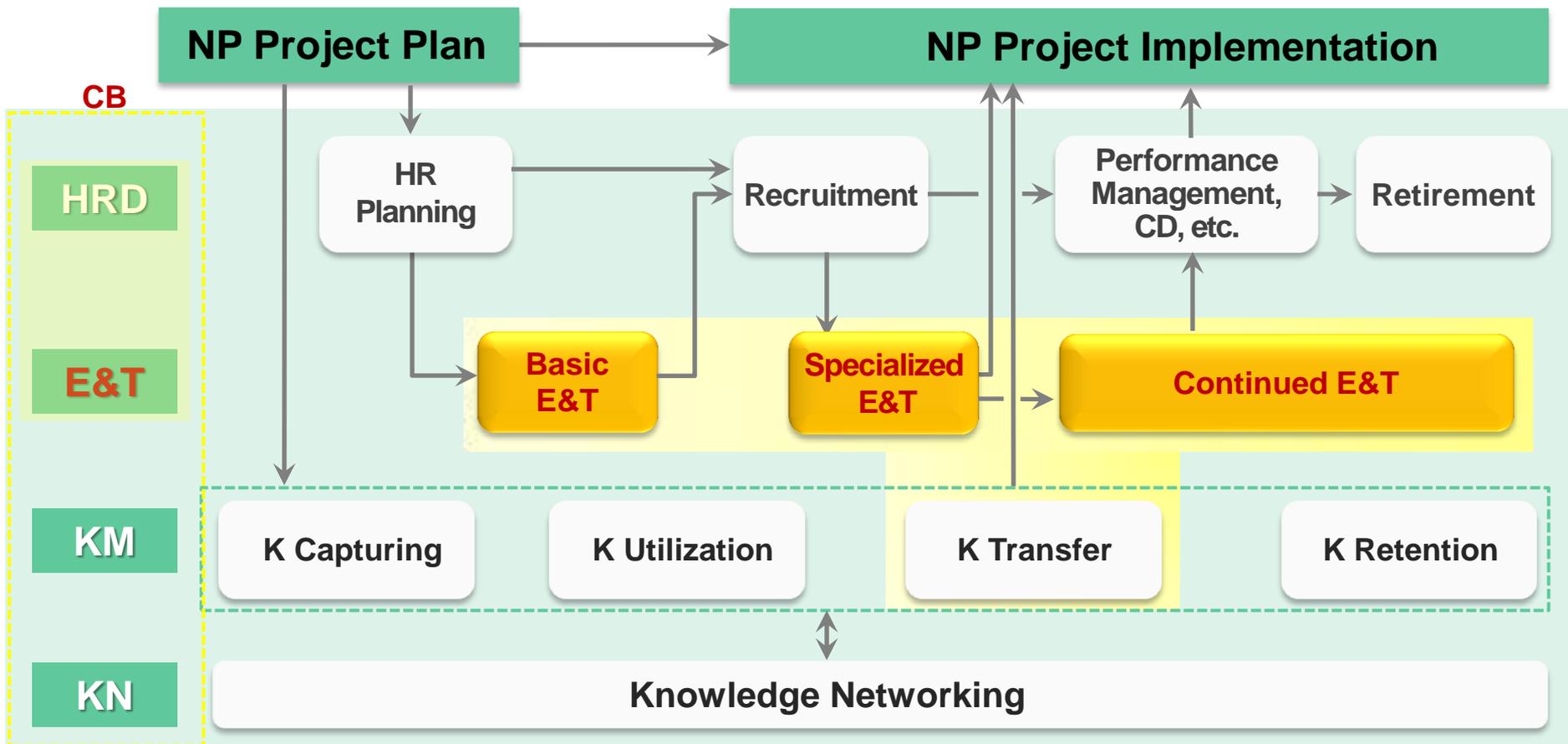
Contents

- **Nuclear E&T Trends and Issues**
- **International Collaboration for Better HRD**
- **ANENT Activities**
 - * ANENT: Asian Network for Education in Nuclear Technology
- **Way Forward**

Nuclear E&T Trends and Issues

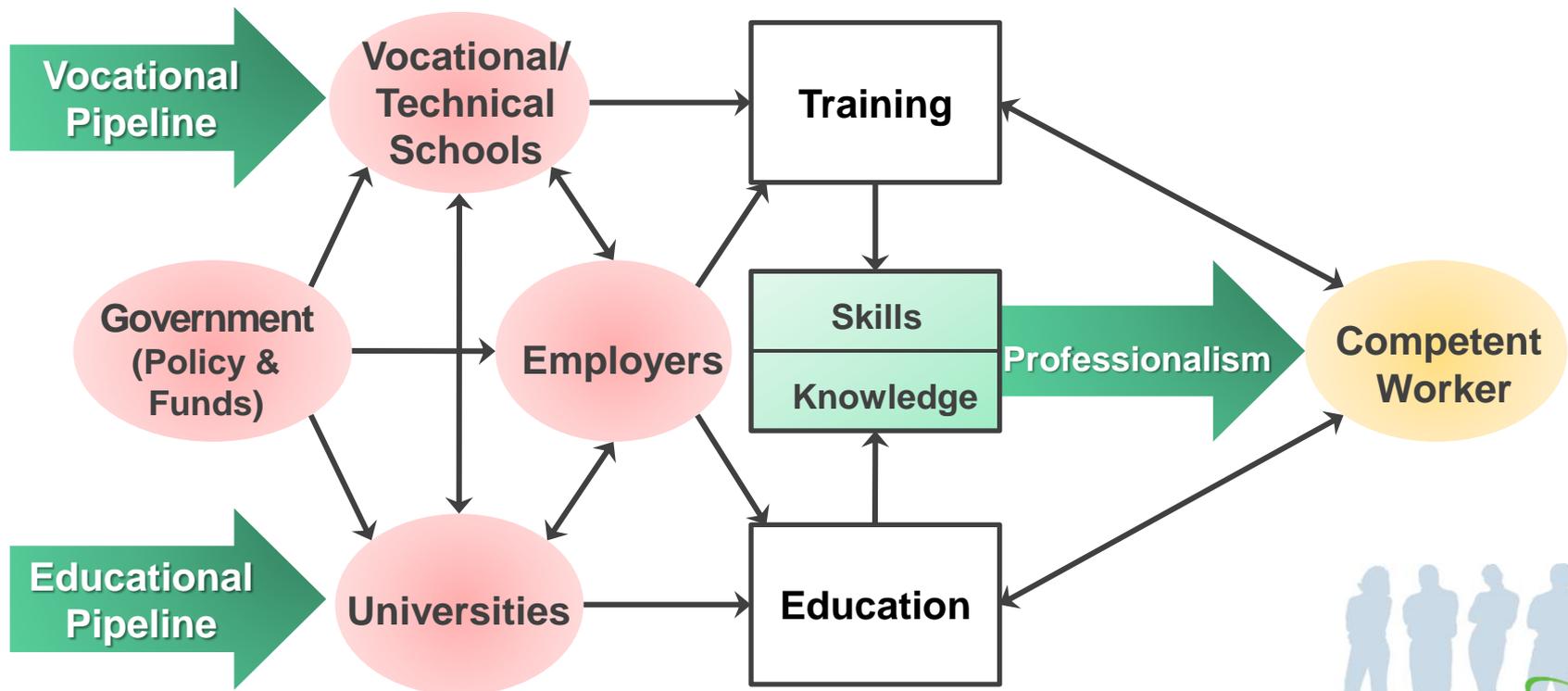
Capacity Building and Nuclear E&T

Capacity Building is a systematic & integrated approach to develop and continuously improve governmental, organizational and individual **competences** & capabilities necessary for achieving safe, secure and sustainable NP program



E&T Framework

- **Competence** is a combination of **knowledge, skill and attitudes** in a particular field which, when acquired, allows a person to perform a job or task to identified standard
- Competence may be developed through a combination of **education, experience and training**



Key Findings in the IAEA HRD Conference(1)

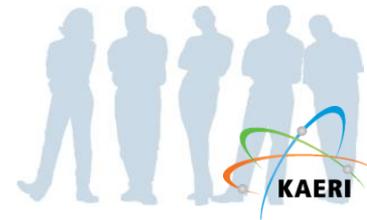
2014 IAEA International HR Conference

- Title: HRD for Nuclear Power Programmes: Building and Sustaining Capacity
- 12 May 2014 at the IAEA headquarters in Vienna
- 300 participants from 70 countries
- 59 plenary presentations and 61 interactive presentations



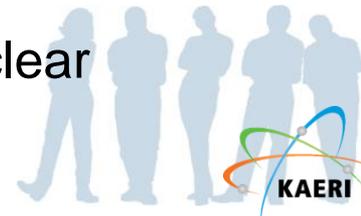
Conference focused on the global challenges of:

- Human resource and capacity building
- Education and training
- Preparing the next generation of nuclear professionals
- Nuclear knowledge management
- Knowledge networks



Key Findings in the IAEA HRD Conference(2)

- Capacity building is on-going need and is being addressed on many levels
 - **Needs analyses** being more systematically undertaken, sometimes at national or even regional level
 - Better recognition of the importance of **vocational training**
 - Good examples of managing & improving the **E&T pipelines** strengthening across the skills pyramid with good **blending** of theory, practical and hands-on experience
 - Need to further develop pathways **“from education to employment”**
- E&T should be integrated into overall strategy for building and maintaining capacity, **supported by government**
- Strategic **outreach plans** crucial to inspire next generation and **build acceptance** of nuclear energy
- **Networks** have become a proven and effective tool for knowledge sharing, capacity building and harmonization
 - Many good examples from corporate national and international levels
- **Knowledge management** should address each area of a nuclear power program from design to decommissioning



Trends and Issues

- **E&T has become more systematic and specialized in addressing emerging issues**

Planning	<ul style="list-style-type: none">• Implemented based on self assessment
Programs	<ul style="list-style-type: none">• Introduced SAT• Addressed emerging issues, e.g.<ul style="list-style-type: none">- safety/security & culture- stakeholder involvement- project management
Methodology	<ul style="list-style-type: none">• Innovative (e.g. ICT), diversified and customized
Infrastructure	<ul style="list-style-type: none">• Built & strengthened
Cooperation	<ul style="list-style-type: none">• Promoted nationally & internationally

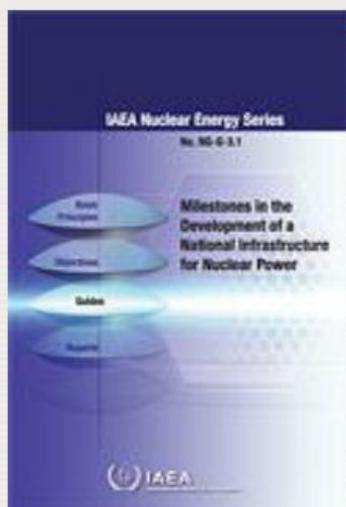
International Collaboration for Better HRD

International Cooperation Issues

International cooperation is an important mechanism for capacity building and sharing E&T experience



19 Infrastructure Issues and Related Issues



The 19 Infrastructure Issues

National position

Nuclear Safety

Management

Funding and financing

Legislative framework

Safeguards

Regulatory framework

Radiation protection

Electrical grid

Human resources development

Stakeholder involvement

Site and supporting facilities

Environmental protection

Emergency planning

Security and physical protection

Nuclear fuel cycle

Radioactive waste

Industrial involvement

Procurement

Related issues

Milestones approach overview

Construction management

SAT

Feasibility study

Management Systems



e-Learning for Nuclear Newcomer Countries

The screenshot shows the IAEA.org website with a search bar and navigation menu. The main content area is titled 'Nuclear Power (NENP)' and features a sidebar with navigation options like 'Home', 'Meetings', and 'E-learning'. The central content area is titled 'E-learning for Nuclear Newcomers' and includes a video player with the text 'Is your country considering nuclear power? The IAEA is here to help!'. Below the video, there is a section for 'E-learning Modules' with a list of modules.

E-learning for Nuclear Newcomers

Is your country considering nuclear power?

The IAEA is here to help!

We have created an interactive e-learning series explaining the IAEA's Milestones Approach to introducing a nuclear power programme. This approach is based on three phases and covers the 19 infrastructure issues that need to be addressed, and brings decades of expertise to life. Both newcomers and those expanding their nuclear power programmes may benefit from the e-learning series.

E-learning Modules

We have developed several interactive and engaging e-learning modules for nuclear power development:

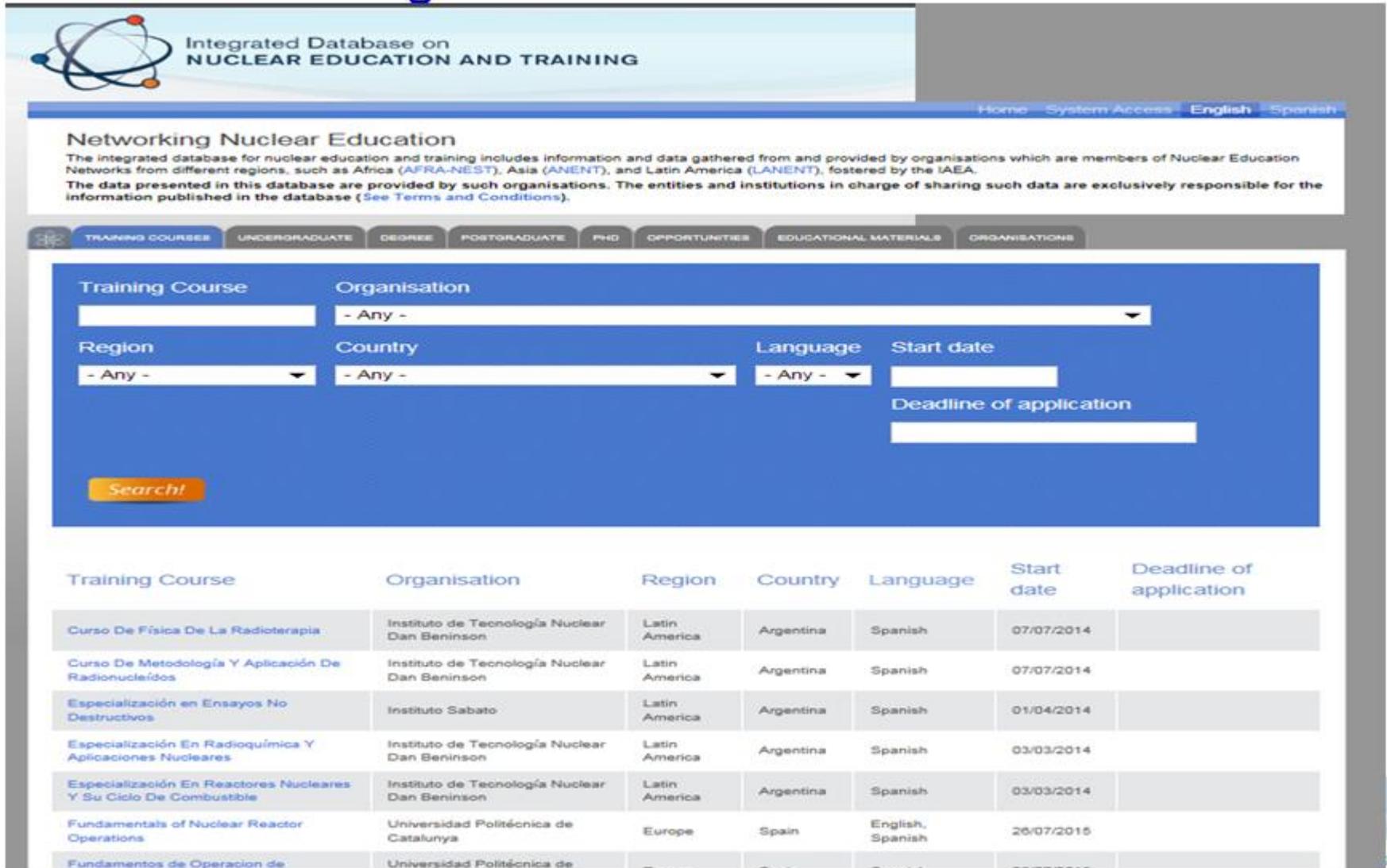
- Module 1: Implementing a Nuclear Power Programme - Introduction**
is an introduction and overview of nuclear power infrastructure development.
- Module 2: Developing a Human Resource Strategy**
focuses on human resources management, a crucial element of a nuclear power programme.
- Module 3: Stakeholder Involvement**
emphasizes the importance of engaging stakeholders in a nuclear power programme.
- Module 4: Management of a Nuclear Power Programme**
explains why strong management and leadership is needed for a successful programme.
- Module 5: Construction Management**
addresses the key challenges in constructing a nuclear power plant as part of the nuclear power programme.
- Module 6: Systematic Approach to Training (SAT)**
is internationally recognized as a key tool for ensuring the competency of all Nuclear Power Programme personnel.
- Module 7: Feasibility Study**
represents an important step in the justification of a nuclear power plant new build project.
- Module 8: Management Systems**
explains why a management system is needed and the steps to develop, implement and continually improve it.

<https://www.iaea.org/NuclearPower/Infrastructure/elearning/index.html>



IAEA Cyber Learning Platform

CLP4NET: Integrated Database on E&T



Integrated Database on NUCLEAR EDUCATION AND TRAINING

Home System Access English Spanish

Networking Nuclear Education

The integrated database for nuclear education and training includes information and data gathered from and provided by organisations which are members of Nuclear Education Networks from different regions, such as Africa (AFRA-NEST), Asia (ANENT), and Latin America (LANENT), fostered by the IAEA. The data presented in this database are provided by such organisations. The entities and institutions in charge of sharing such data are exclusively responsible for the information published in the database (See Terms and Conditions).

TRAINING COURSES UNDERGRADUATE DEGREE POSTGRADUATE PHD OPPORTUNITIES EDUCATIONAL MATERIALS ORGANISATIONS

Training Course Organisation
 Region Country Language Start date
 Deadline of application

Search!

Training Course	Organisation	Region	Country	Language	Start date	Deadline of application
Curso De Física De La Radioterapia	Instituto de Tecnología Nuclear Dan Beninson	Latin America	Argentina	Spanish	07/07/2014	
Curso De Metodología Y Aplicación De Radionucleidos	Instituto de Tecnología Nuclear Dan Beninson	Latin America	Argentina	Spanish	07/07/2014	
Especialización en Ensayos No Destructivos	Instituto Sabato	Latin America	Argentina	Spanish	01/04/2014	
Especialización En Radioquímica Y Aplicaciones Nucleares	Instituto de Tecnología Nuclear Dan Beninson	Latin America	Argentina	Spanish	03/03/2014	
Especialización En Reactores Nucleares Y Su Ciclo De Combustible	Instituto de Tecnología Nuclear Dan Beninson	Latin America	Argentina	Spanish	03/03/2014	
Fundamentals of Nuclear Reactor Operations	Universidad Politécnica de Catalunya	Europe	Spain	English, Spanish	26/07/2015	
Fundamentos de Operacion de	Universidad Politécnica de	Europe	Spain	Spanish	26/07/2015	

ANENT Activities

Introduction to ANENT

- **Asian Network for Education in Nuclear Technology (ANENT)** is a regional partnership, supported by the IAEA, aiming the cooperation toward capacity building, human resource development and knowledge management in nuclear science and technology
- **ANENT Objective** is to promote, manage and preserve nuclear knowledge and to ensure the continued availability of qualified HR in the Asian region for the sustainability of nuclear technology and prepare newcomer countries to commence nuclear power programmes
- **ANENT Strategy** rests upon the principles of cooperation, sharing of information and knowledge for capacity building and better use of available resources through:
 - Integrate available educational resources
 - Promote the utilization of the ANENT e-Learning
 - Facilitate the experienced nuclear professionals



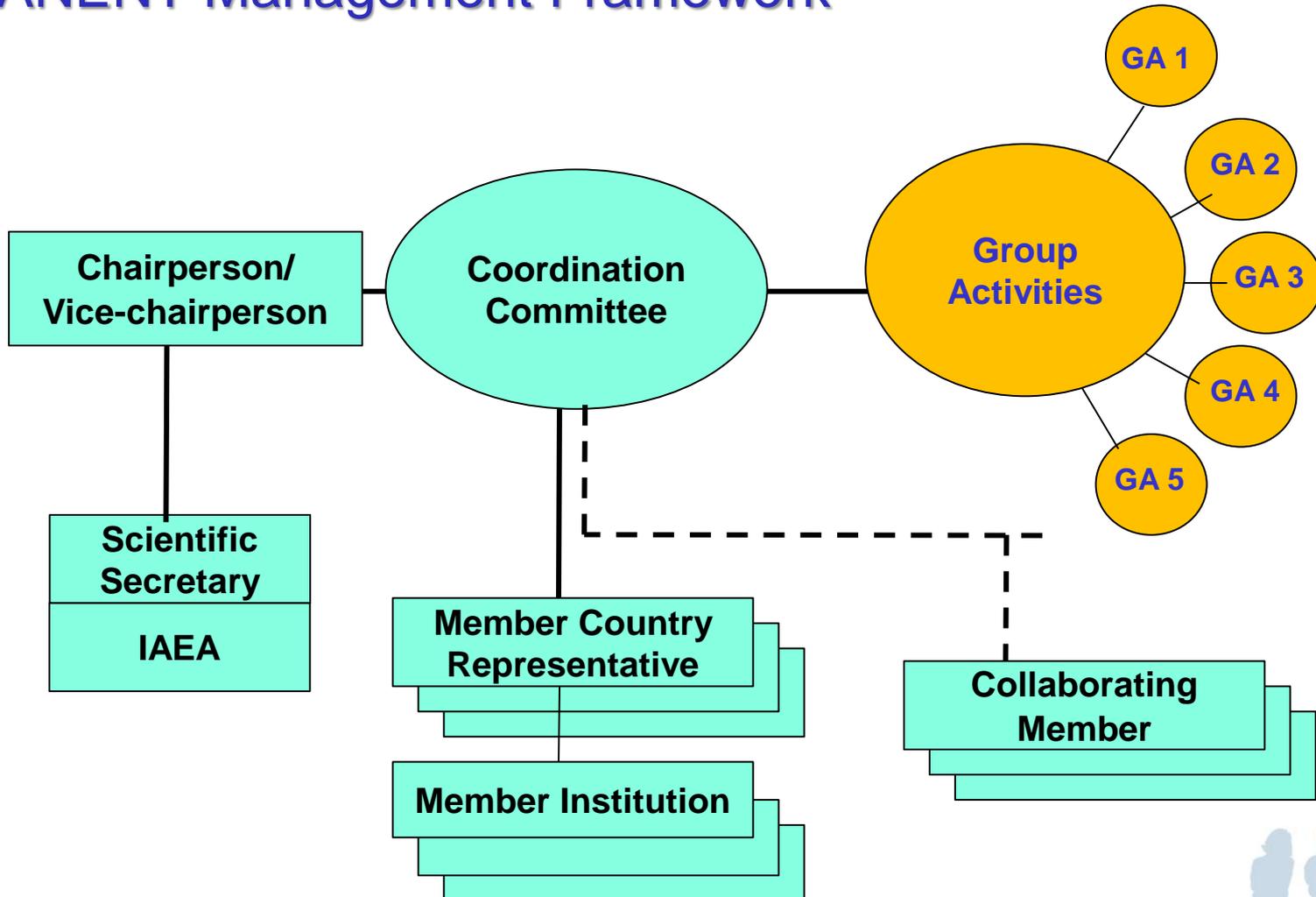
ANENT Members

- ANENT has 19 member countries in Asia and Pacific and 8 collaborating member organizations



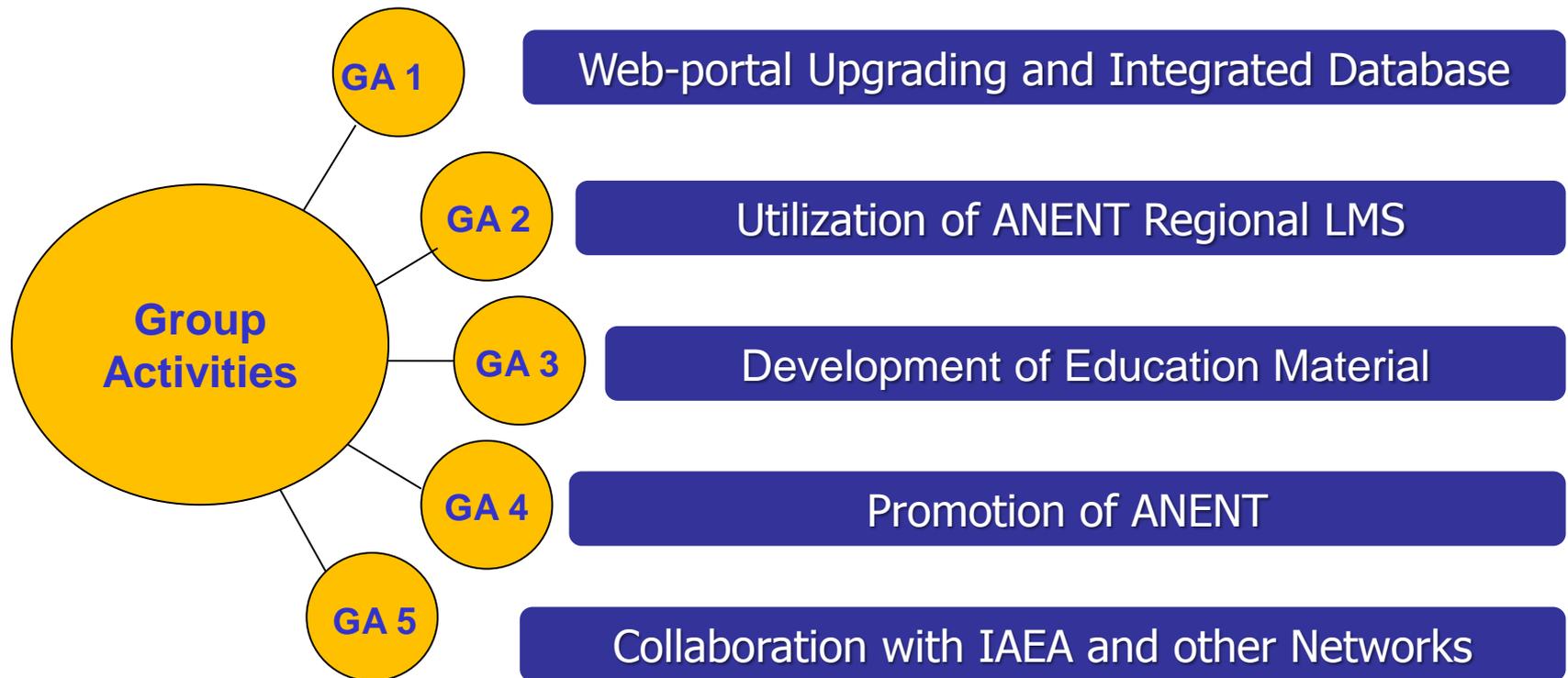
ANENT Framework

ANENT Management Framework



Activities in 2014-2015(1)

- Group activities in 2014-2015 agreed in June 2014



Activities in 2014-2015(2)

Technical Meetings in 2014-2015

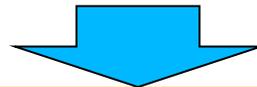
- TM on Regional Network Activities in Asia(ANENT)
 - Daejeon, Korea, 20-23 April 2015
- TM on the Asian Network for Education on Nuclear Technology,
 - Ulaanbaatar, Mongol, 2-5 June 2014



Achievements for Last 10 Years(1)

Summary of achievements in 2004-2014

- Development of ANENT web portal
- Development of ANENT regional /national LMS
- Development of e-Learning materials
- e-Training courses using the LMS (regional and national)
- Meetings, workshops, trainings & fellowships
- Partnerships within ANENT members and beyond Asia



- Establishment of web-based E/T infrastructure in Asia
- Contribution to IAEA inter-regional networking



Achievements for Last 10 Years(2)

- Development of ANENT Web Portal - <https://www.anent-iaea.org>

(Old version)

Renewed in January 2014

Achievements for Last 10 Years(3)

Development of ANENT regional LMS

(Old version)



New "ANENT Regional LMS"
(Moodle based), hosted by KAERI

The screenshot shows the IAEA Learning Management System (LMS) interface. The browser address bar indicates the URL "ilms.kaeri.re.kr". The page header includes the IAEA and KAERI logos and the text "IAEA Learning Management System". Below the header, there is a navigation menu with "Home" and "Site pages". The main content area features a large image of a globe with the text "Communication. Collaboration. Knowledge." below it. On the left side, there is a "Navigation" menu with options like "Home", "My home", "Site pages", "Blogs", "Tags", "Calendar", "Site news", "My profile", and "My courses". The "Site news" section contains a news item titled "Welcome IAEA TTT and TM in Indonesia" by Rho S.P., dated Monday, 6 May 2013, 11:49 AM. The news item includes a "Subscribe to this forum" link and a "Dear Participants," message. The news item also mentions "RAS/0/064 'Supporting Nuclear Education and Training through e-Learning and Other Means of Advanced Information Communication Technology (ICT)'" and "IAEA Technical Meeting on Implementation of e-Learning Platforms for Nuclear Education and Training (ANENT)". The news item is dated "13- 17 May 2013, Jakarta, Indonesia" and includes a link to visit the Web Site "http://www.batan.go.id/". The news item concludes with "Thank you." and the names "K. Hanamitsu, Sipyu, Rho and D. Hendriyanto". On the right side, there is a "Calendar" section for June 2013 and an "Online users" section.

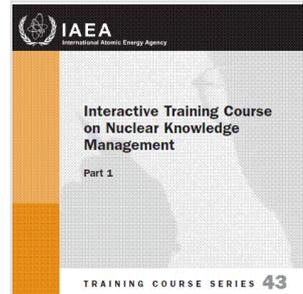
Achievements for Last 10 Years(4)

Development of e-Learning materials

Energy Planning



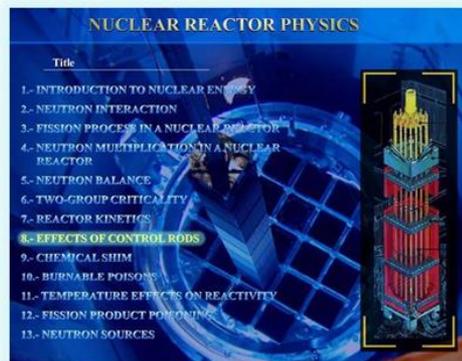
Knowledge Management



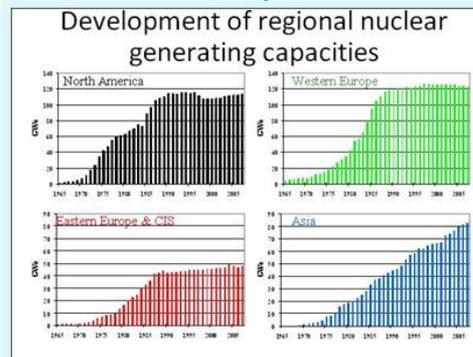
E-Book on Nuclear Medicine standardized by Asian School of Nuclear Medicine



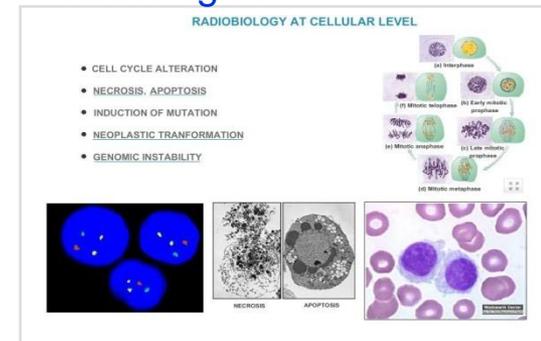
Multimedia of Nuclear Reactors Physics



Scientific and Technical Challenges in Nuclear Power Development



E-Textbook on Nuclear and Ionizing Radiation Technologies



Achievements for Last 10 Years(5)

e-Training courses using ANENT LMS

- 6 TTT(Train The Trainer) courses on ANENT LMS
- 5 e-Trainings on energy planning



Achievements for Last 10 Years(6)

Workshops, Meetings, Trainings & Fellowships

- **Coordination meetings:** once every year for project review & plan and information exchange
- **Webex online coordination meetings:** every 3 ~ 4 months
- **Workshops & Technical Meetings:** curricula, NKM, LMS, etc.
- **Fellowships:** 4 fellows at IAEA for material collection



Achievements for Last 10 Years(7)

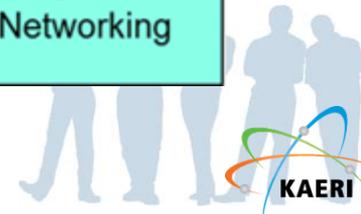
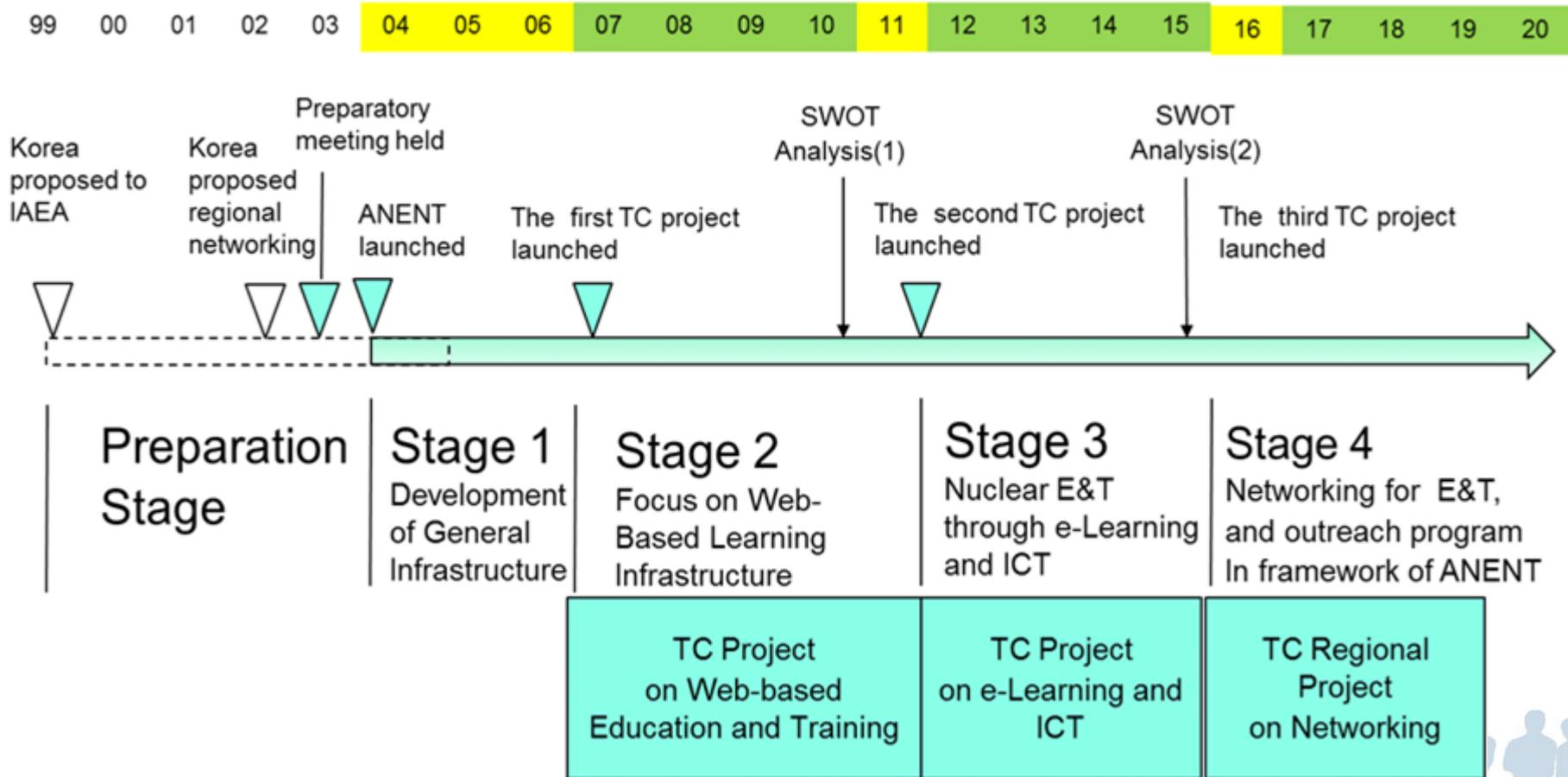
Partnerships within ANENT members and beyond Asia

- Partnership between IAEA and KAERI
 - PA was concluded to promote ANENT activities in April 2009
- Expanded partnership beyond Asia to support ANENT
 - PA between ANENT and ENEN was concluded in June 2009
- Cooperation with other networks
 - Cooperation Agreement with LANENT, AFRA-NEST, and ENEN in 2013



Future Perspective

History and Future



Way Forward

● Integration and harmonization of E&T programs

- with other CB areas, e.g. workforce planning, KM within E&T area
- based on the required competency and organizational responsibilities
- Advanced infrastructure & training framework build-up to adapt and to lead new paradigm

● Addressing emerging issues of E&T

- Safety/security culture
- Stakeholder involvement including outreach to future generation
- Improvement of E&T effectiveness
- e-Training promotion to overcome limitation of time & space

● Strengthening cooperation

- Organizational, national, international levels with a strategic approach
- Leading role in the nuclear society with experiences sharing & international networks



Nuclear Project can start with Man Power



Thank You !

ymnam@kaeri.re.kr