

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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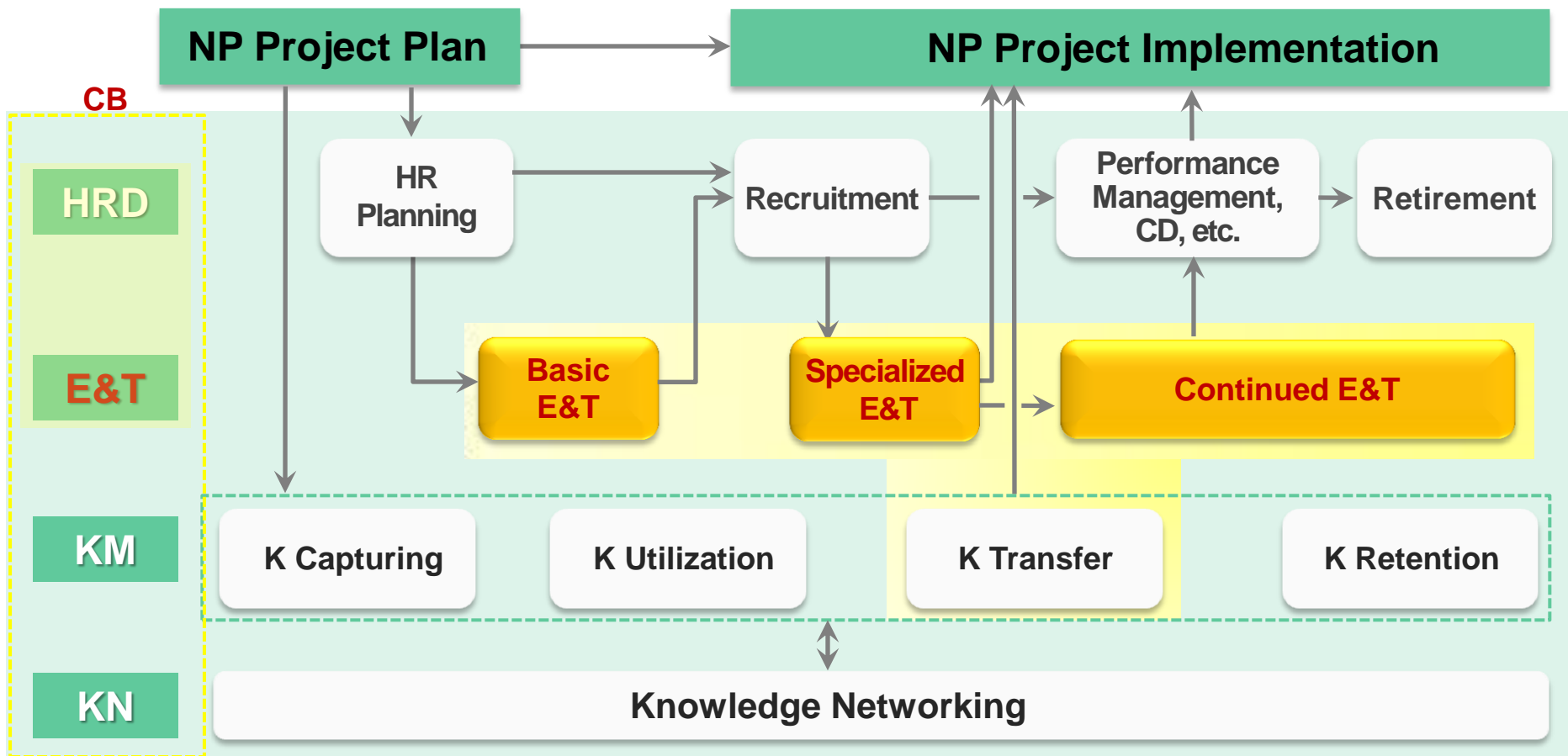
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- **International Collaboration for Better HRD**
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- **Way Forward**

Nuclear E&T Trends and Issues

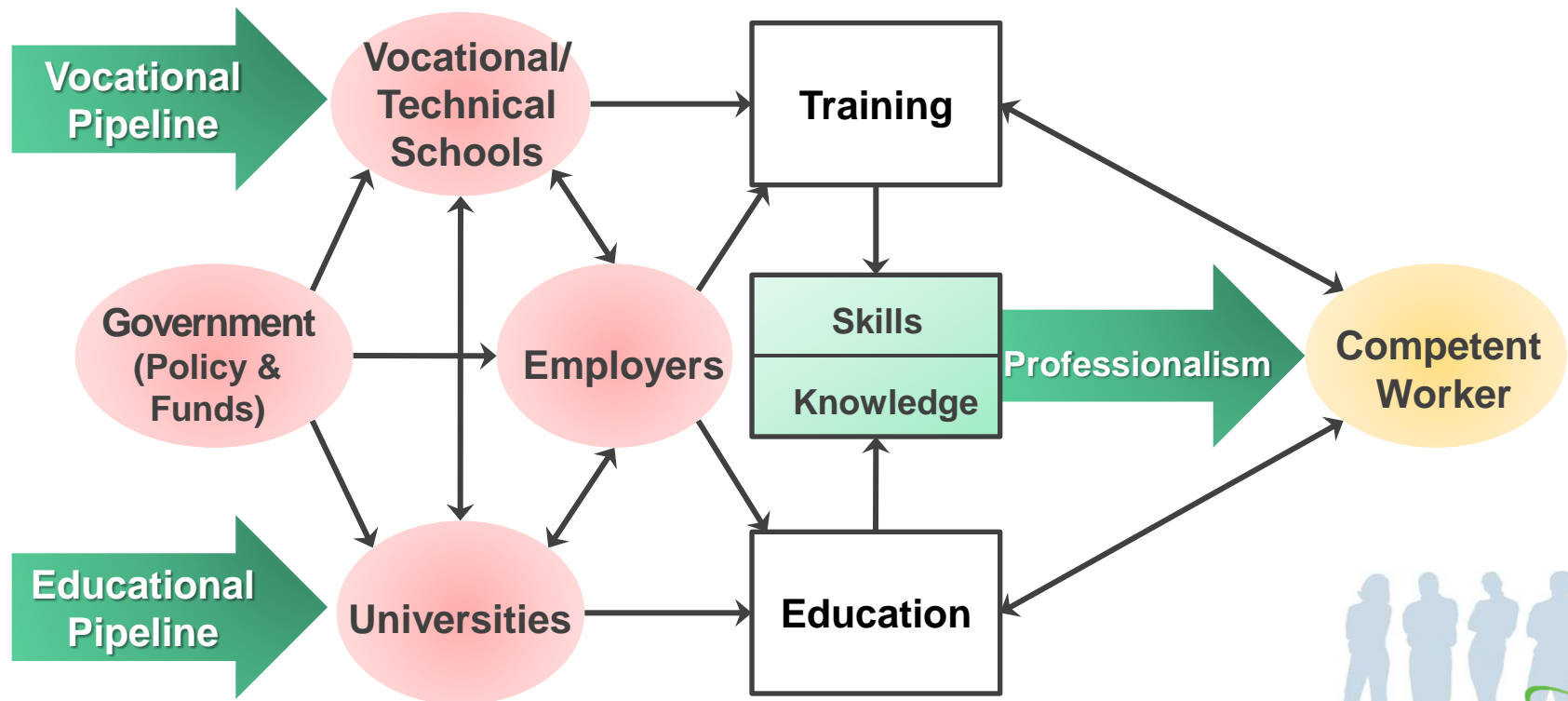
Capacity Building and Nuclear E&T

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



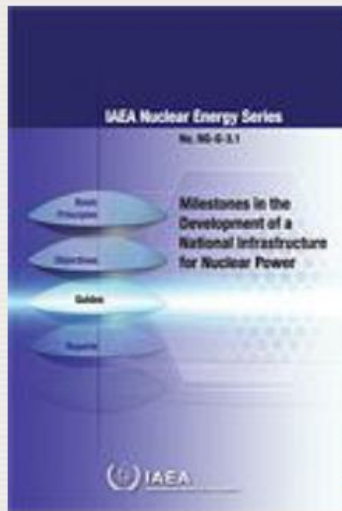
International Collaboration for Better HRD

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

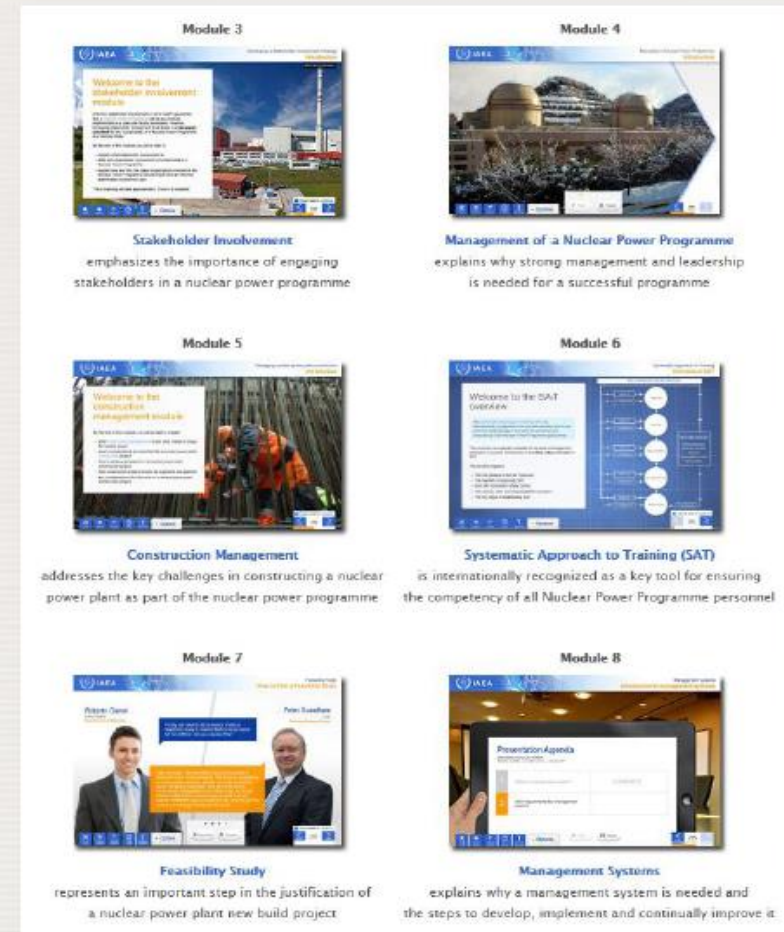
Management Systems



e-Learning for Nuclear Newcomer Countries



The screenshot shows the IAEA.org website with the 'Nuclear Power (NENP)' section selected. The left sidebar lists various categories including Nuclear Power Engineering, Nuclear Power Technology Development, INPRO, Infrastructure, Home, Meetings, Publications, Bibliography, Assistance & Review Services, Training, E-learning, Technical Working Group, Meetings, Publications, Information Systems & Databases. The main content area features a video player titled 'E-learning for Nuclear Newcomers' with the text 'Is your country considering nuclear power? The IAEA is here to help!'. Below the video player, it states: '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.'



The grid displays eight e-learning modules:

- 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

Additional modules shown include:


- 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

<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-NET), 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](#)
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[POSTGRADUATE](#)
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Training Course

Organisation

- Any -

Region

- Any -

Country

- Any -

Language

- Any -

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 Operación 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



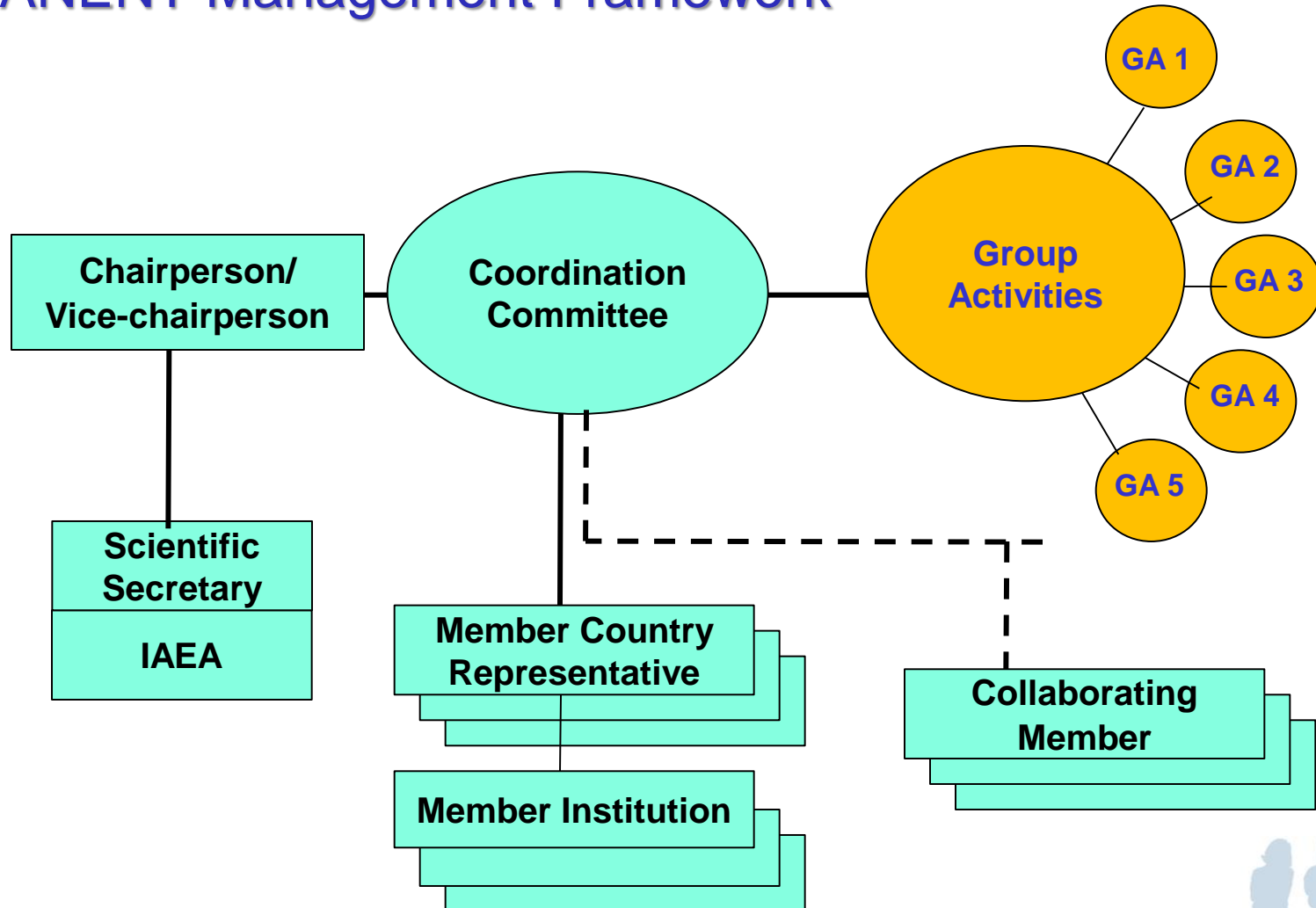
ANENT Members

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



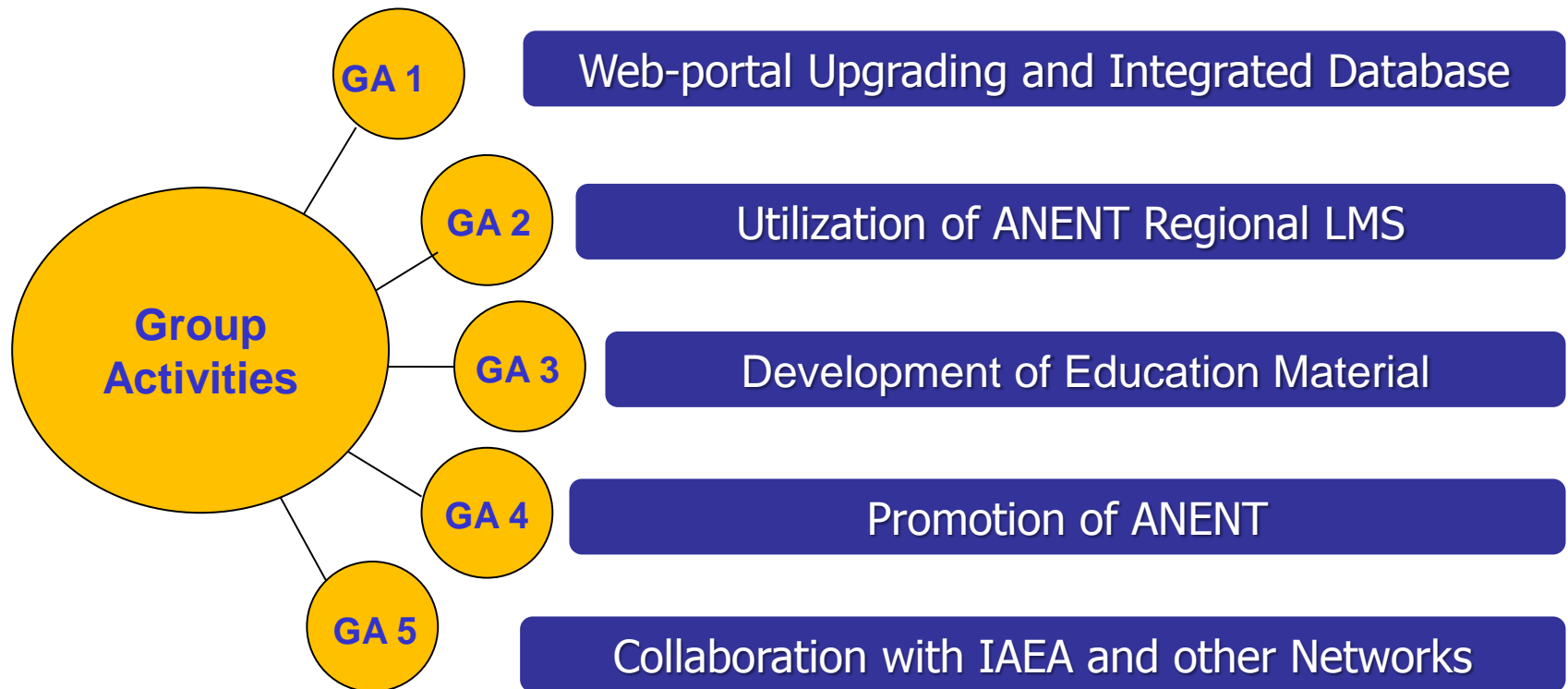
ANENT Framework

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

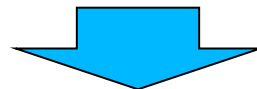
- TM on Regional Network Activities in Asia(ANENT)
 - Daejeon, Korea, 20-23 April 2015
- TM on the Asian Network for Education on Nuclear Technology,
 - Ulaanbaatar, Mongol, 2-5 June 2014



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)



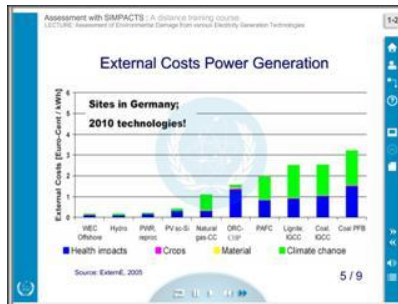
New “ANENT Regional LMS”
(Moodle based), hosted by KAERI

The screenshot shows the IAEA Learning Management System (LMS) interface. The top navigation bar includes links for Home, Site pages, and Site news. The main content area features a large banner with a globe and the text 'Communication. Collaboration. Knowledge.' Below the banner, there is a 'Navigation' sidebar on the left with links for Home, My home, Site pages, Blogs, Tags, Calendar, Site news, My profile, and My courses. The main content area displays a 'Site news' section with a welcome message from Rho S.P. dated Monday, 6 May 2013, 11:49 AM. The news section includes a list of participants and a list of courses, including '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)'. A 'Calendar' section on the right shows the month of June 2013. The bottom of the page features a 'Main menu' and a 'Site news' section.

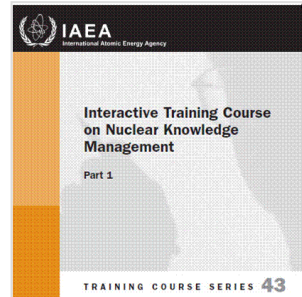
Achievements for Last 10 Years(4)

Development of e-Learning materials

Energy Planning



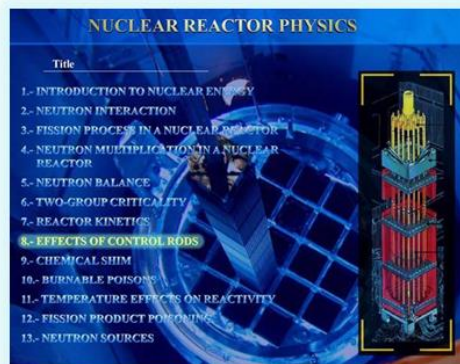
Knowledge Management



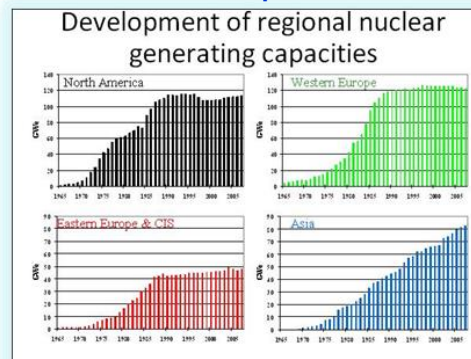
E-Book on Nuclear Medicine standardized by Asian School of Nuclear Medicine



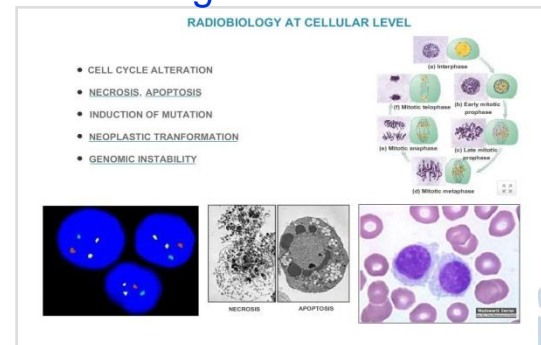
Multimedia of Nuclear Reactors Physics



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)

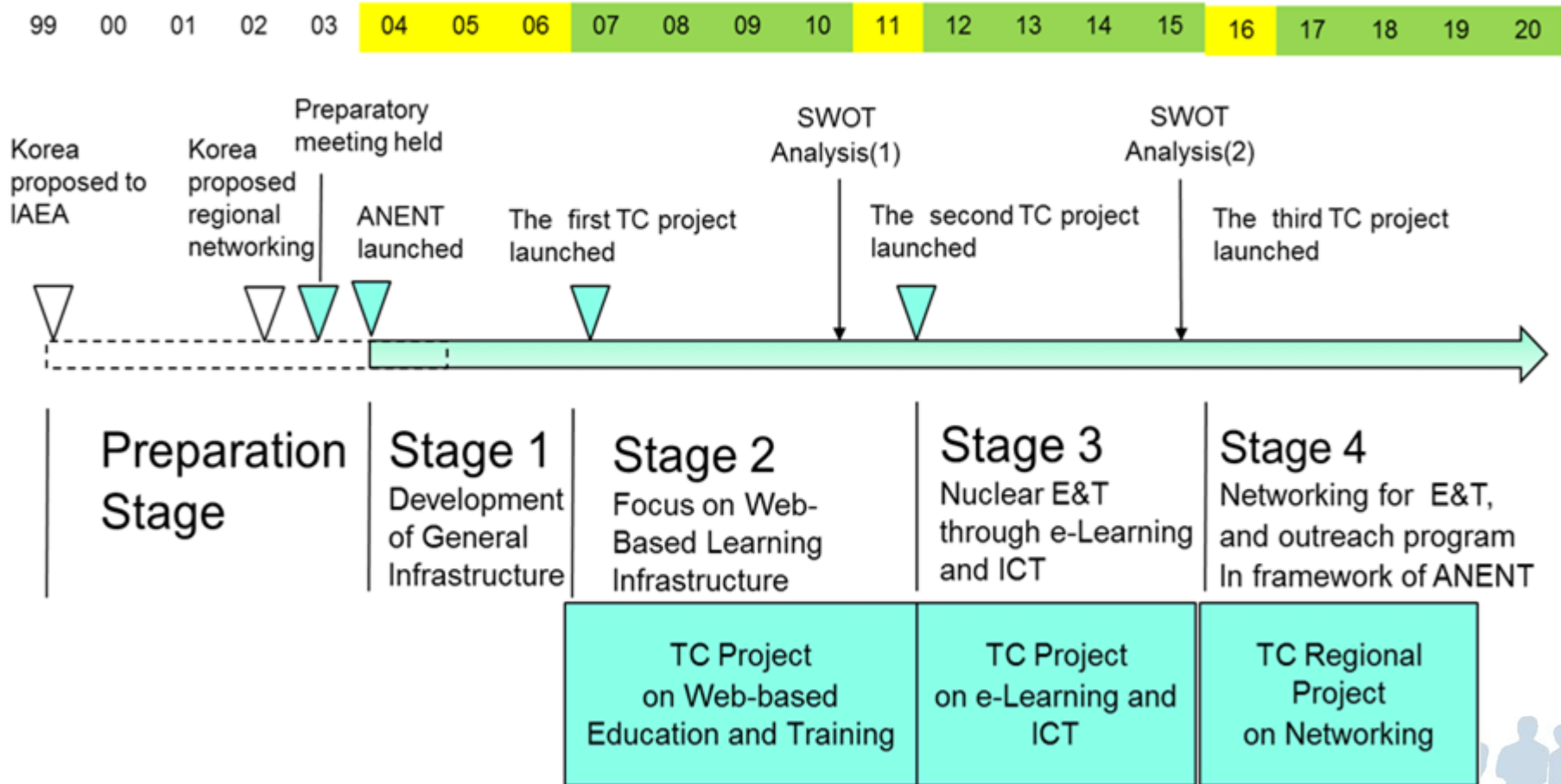
● Partnerships within ANENT members and beyond Asia

- 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 !

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