

Networking Nuclear Education and Training

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Nuclear Knowledge

- ⊕ Nuclear knowledge is the basis for almost all nuclear activities
- ⊕ History
 - ▣ Accumulated over 5 decades
 - ▣ IAEA established in 1957: international collaboration – a form of an "institutionalized network"
 - ▣ Factors affecting sharing of knowledge
 - military use, commercial use
 - sustainable development
- ⊕ Where does nuclear knowledge reside today?
 - ▣ Governmental authorities, academia, private sector, individuals

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Working definition

- ⊕ *Knowledge* can range from technical information laid down on paper or electronically to knowledge embodied in people and in their capabilities and skills.
- ⊕ Knowledge extends beyond *information* in that knowledge also includes the value added, that is, expertise required to turn raw nuclear information into an understanding of (nuclear) issues or, in other words, to give the information a *meaning*.
- *Nuclear knowledge* is specifically knowledge about or relevant to nuclear related activities.

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Knowledge → human resources

- ① Issues in Member States
 - ▣ Knowledge base erosion?
 - ▣ Student enrolment
 - ▣ Succession planning
 - ▣ Stagnation vs. expected renaissance and expansion
- Existing nuclear knowledge can either be
 - ▣ preserved for future use ("archived") or
 - ▣ passed on to the next generation: human resources
- ① Human resources
 - ▣ Knowledge embodied in people ...
 - ▣ ... for it's application and use in active projects

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Human resources → education

- ⊕ Means for intergenerational transfer of knowledge
 - ▣ Higher education (universities)
 - ▣ Training courses
 - ▣ On-the job training and mentoring
 - ▣ Indirectly (people – preservation – future use)
- Human resources in nuclear technology
 - ▣ Awareness is growing in most Member States
 - ▣ Great number and variety of actions taken
 - National plans, governmental funding
 - International initiatives
 - *Networking*

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The need for human resources

- ⊕ Nuclear human resources are needed for different reasons in different situations:
 - ▣ Operation of existing facilities
 - ▣ Capacity building
 - ▣ Innovation and R&D
- Education and training are priorities in many Member States, but with different motivation

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"Networking" - background

⊕ Network types

- ▣ Networks of information or of people
- ▣ Formal or informal in character
- ▣ Outcome or framework/documentation oriented

⊕ Means of exchange within the network

- ▣ Exchange of people
- ▣ Exchange of information

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"Networking" background

⊕ Key factors to be considered for networks

- ▣ Sharing information and knowledge
- ▣ Inter- and multidisciplinary approach
- ▣ Intercultural exchange
- ▣ Soft skills, tolerance, openness, respect...

⊕ Timeframe

- ▣ Project experience suggests years to achieve full sharing culture and maximum benefit derived from it

⊕ Potential benefits

- ▣ Timeliness, efficiency and effectiveness of activities
- ▣ Quality control
- ▣ Stabilisation and flexibility

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Networks in the nuclear field

- ⊕ Overall number very large, possibly thousands of "networks"
 - Only a minor fraction of those is institutionalized, i.e. "formal" in character
 - A fraction of those networks in turn concerns education and training
- ⊕ Driving forces for networks in education and training come from two sides:
 - From the educational side, e.g. universities and their teaching agenda
 - From the nuclear side, e.g. cooperation of nuclear centres

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National educational networks

- Examples of university networks
 - University Network of Excellence in Nuclear Engineering (UNENE), Canada
 - Belgian Nuclear Engineering Network (BNEN)
- Governmental programs with networking components
 - US DOE programs
 - Nuclear Engineering Departments Heads Organization (NEDHO), US
- Mixed networks
 - Alliance for Competence in Nuclear Technology

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International educational networks

● Regional

- Asian Network for Education in Nuclear Technology (ANENT)
- European Nuclear Education Network (ENEN)

● Global

- World Nuclear University (WNU)

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ANENT

- Proposed by Republic of Korea, supported by IAEA
- ANENT is a network of education and training institutions
 - Objective: *"to facilitate co-operation in higher education, related research and training in nuclear technology in the Asian region."*
 - Activities: Information sharing, distance learning, credit transfer, reference curricula and linking to other networks
- Status: operational
 - Preparatory meeting in 2003, Republic of Korea
 - 1st Coordination Committee meeting in February 2004, Malaysia
 - 18 institutions from 12 Member States, 3 collaborating institutions

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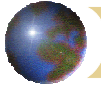
From networks to institutions: example

- ▣ European FP 5 (2002-2003)
 - ▣ Support for a new European Nuclear Engineering Network (ENEN)
- ▣ European FP 6 (2004-2005)
 - ▣ NEPTUNO as follow-up project to ENEN
 - ▣ Funding significantly increased
- ▣ Plus: In 2003 *ENEN Association*
 - ▣ Stand-alone legal body
 - ▣ Goal: administer and award the new degree



Conclusion

- ▣ Networking has become a key element of nuclear education and training and is shaping it's character
- ▣ Benefits have been recognized, and networks are being established on national, regional and global levels
- ▣ Outlook: networking might even become more important in the future, both in terms of number and of depth of cooperation



Contact

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