



WM2011

Phoenix, USA 28 February - 3 March 2011

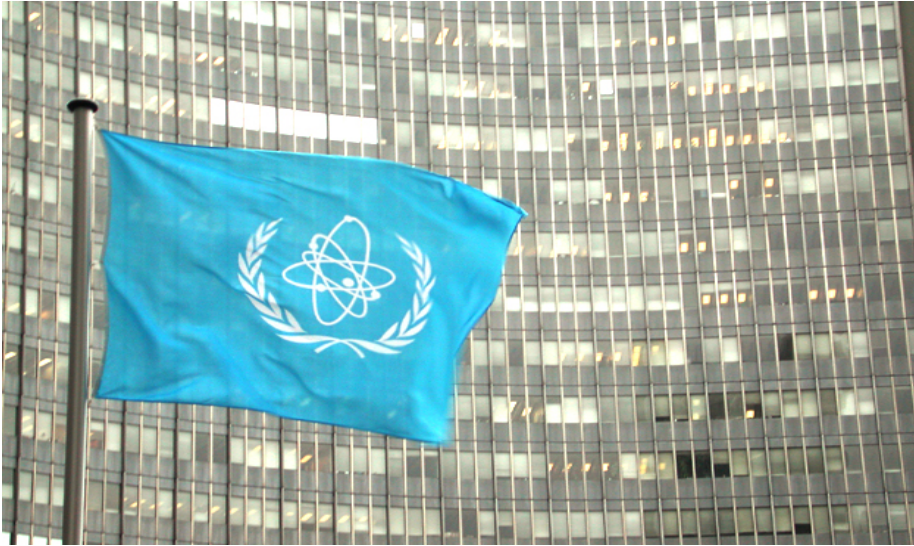
The Role of the IAEA in the Provision of Education and Training for Radioactive Waste Management

Paul Degnan
Waste Technology Section, IAEA

Overview of the Presentation

- The Role of the IAEA
- RWM Challenges Related to E&T
- E-Learning
- Face-to-Face Training
- Coordination and Future Developments

IAEA ...atoms for peace



Article VIII (C) of IAEA statute reads:

“ The IAEA shall take positive steps to encourage the exchange among its members of information relating to the nature and peaceful uses of atomic energy and shall serve as an intermediary among its members for this purpose”

The role of the Agency in E&T is to assist in the transfer of knowledge from existing “centres of competence” to “centres of growth and need”.

Our activity areas:

- Radioactive Waste Management
 - Pre-disposal
 - Disposal
- Discharge of Radioactive Effluents
- Decommissioning of Installations
- Environmental Remediation of Contaminated Sites
- Management of Disused Radioactive Sources

RWM Challenges Related to E&T - 1

- Worldwide the nuclear industry is suffering from a critical shortage of skilled personnel. Consequently:
 - (i) the numbers of professionals involved in all areas of nuclear industry needs to be increased. This will require increased opportunities in education (new courses, increased numbers of students graduating) and enhanced opportunities for re-training to support transfer across industrial sectors.
 - (ii) professionals working in the RWM sector need to be supported throughout their career lifetime. The nature of RWM may change in an organisation as it evolves. An individuals career aspirations may also change. This will require well designed career development programmes for employees.

RWM Challenges Related to E&T - 2

- Member States may have problems providing satisfactory Education and Training opportunities in the nuclear field due to:
 - No historical need (Newcomers)
 - Inadequate long-term planning
 - Low levels of funding and other resources, and
 - A lack of suitable infrastructure
 - Opportunities for skilled trainers elsewhere (Brain-drain)
- Workforce ageing and retirement, loss of critical knowledge through changes in responsibilities (both institutional and individual), the international marketplace for nuclear skills etc. all contribute to the determination of needs in E&T

RWM Challenges Related to E&T - 3

- The training needs of Member States are always evolving, both in the scope of technical coverage that is required and in depth
- An increasing number of Member States require support to provide suitable education and training opportunities
- Some individual Member States have national efforts to support E&T. The strategic focus is variable.
- Regional efforts are also underway. Coordination and acceptance of qualifications are an issue.

RWM Challenges Related to E&T - 4

- Through its E&T support, the Agency needs to provide value over and above national and regional efforts
- Mechanisms used by the IAEA to deliver training courses are currently almost exclusively based on face-to-face events - there is a clear limit on the number of people who can benefit
- The range of training material to be provided will need to be significantly increased in the future
- The materials need to be accessible to a much larger audience than is currently possible

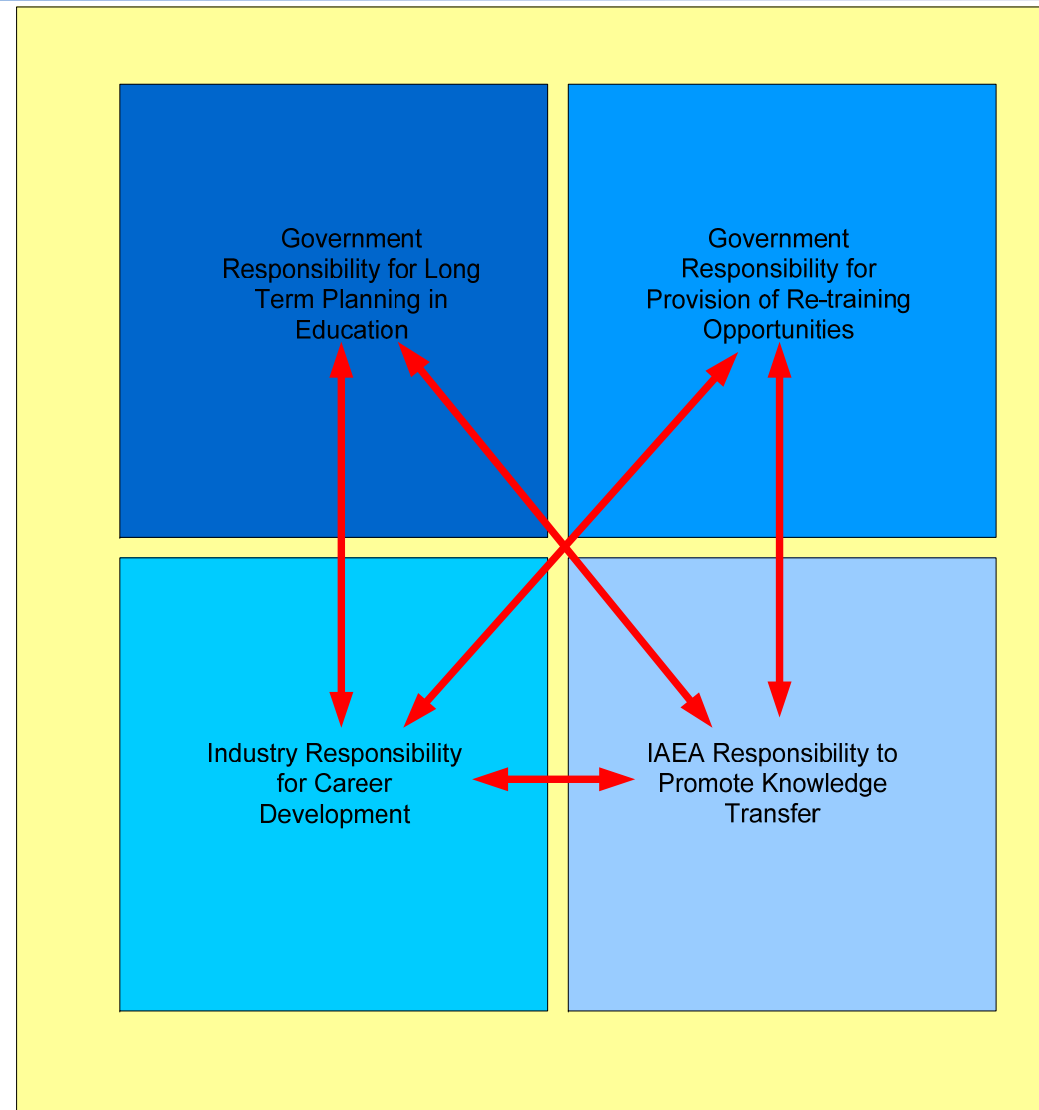
Responsibilities

- **Industry must address immediate requirements and plan for the long-term**

- Strategic career development
- The move from research to operations to closure will mean different demands
- Conventional Health & Safety issues arise especially during repository operation

- **Governments must address longer term issues**

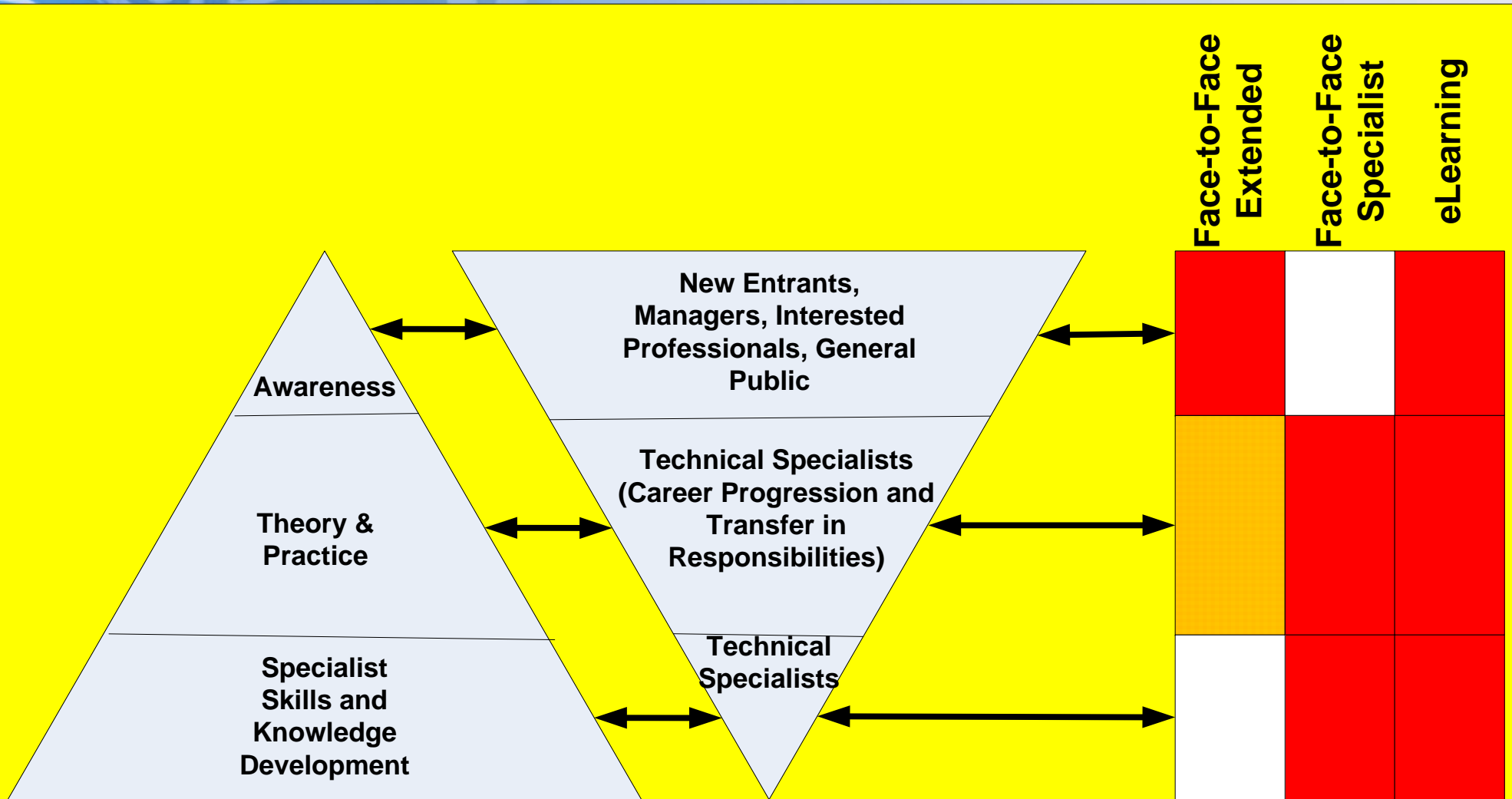
- Policy-making to allow identification of future requirements
- Funding for education & infrastructure
- Coordination of support in R&D for underlying science & engineering



IAEA Involvement in E&T

- Face-to-Face Training
 - Ad hoc training courses (one day to several weeks duration)
 - Fellowships (2-12 months duration)
 - Fundamentals of RWM (4 to 6 weeks duration)
- E-Learning
- Support to Governments (for Policy and Strategy development) and organisations (review of training needs and plans)

Training Levels, Audiences & Delivery



Face-to-Face Training: via Networks e.g. Geological Disposal

- 2003 to 2010: The URF Network organized 23 training courses and workshops for over 250 candidates from 25 participant countries
- Venues in Europe (12), North America (7) and Asia (1)
- 8 courses on the fundamental aspects of geological disposal
- 15 events concerned:
 - numerical modelling (4),
 - stakeholder involvement (3)
 - other specialized topics on geological disposal (8).



Face-to-Face Training via Support to National Programmes

- Both WTS and WES provide RWM training courses to individual member States on an 'as needed' basis.
- Funding is generally through IAEA Technical Cooperation programmes
- The level of training ranges from awareness building through to hands-on skills development and in-depth knowledge transfer in specialist technical areas
- Training can be provided in several languages

Where Are We Now?

- Face-to-face training courses are expensive and can only be held periodically, in line with the limited funding availability.
- The quality of the candidates, in terms of their preparedness to receive the training, cannot be assured. To optimise learning, candidates would ideally be selected or prepared so that they start from a common level.
- Traditional lectures and training courses are intensive. Research indicates that only 10-20% of what is typically taught will be absorbed and assimilated into personal knowledge. This demonstrates that conventional learning needs to be reinforced by private study.
- The courses can only accommodate a limited number of participants at any one time. Furthermore, the numbers of students being taught is small in relation to the growing needs of the nuclear industry. We do not reach all the people who would benefit from the face-to-face training opportunities.

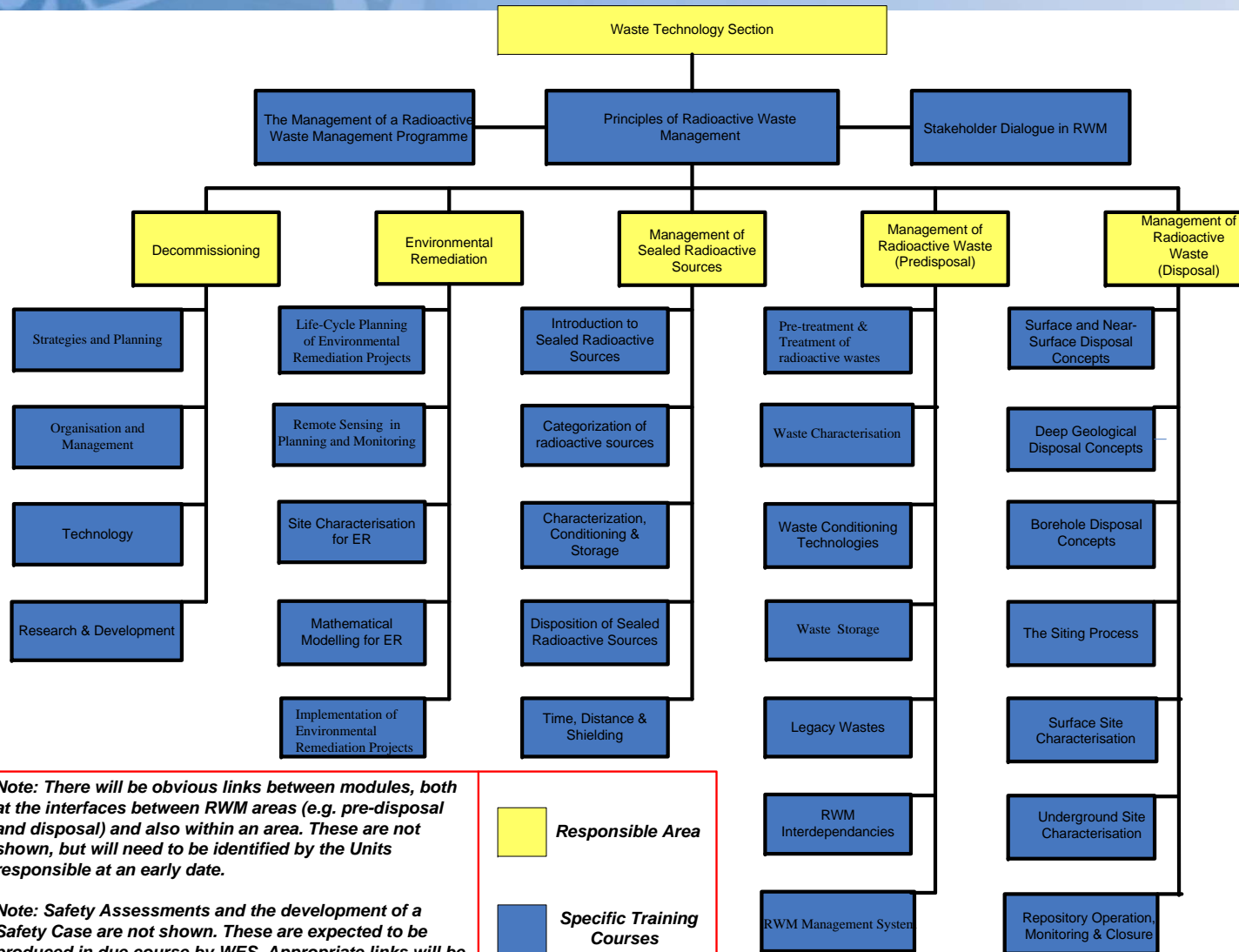
eLearning - The Vision

- ***A comprehensive and structured library of high quality e-Learning materials***
- ***Comprising pre-recorded lectures, real-time lectures, interactive programmes, videos, reports, databases and other resources.***
- ***The e-learning materials and services will be globally available***
- ***Use to be made of robust, reliable and user-friendly internet and PC-based delivery channels.***

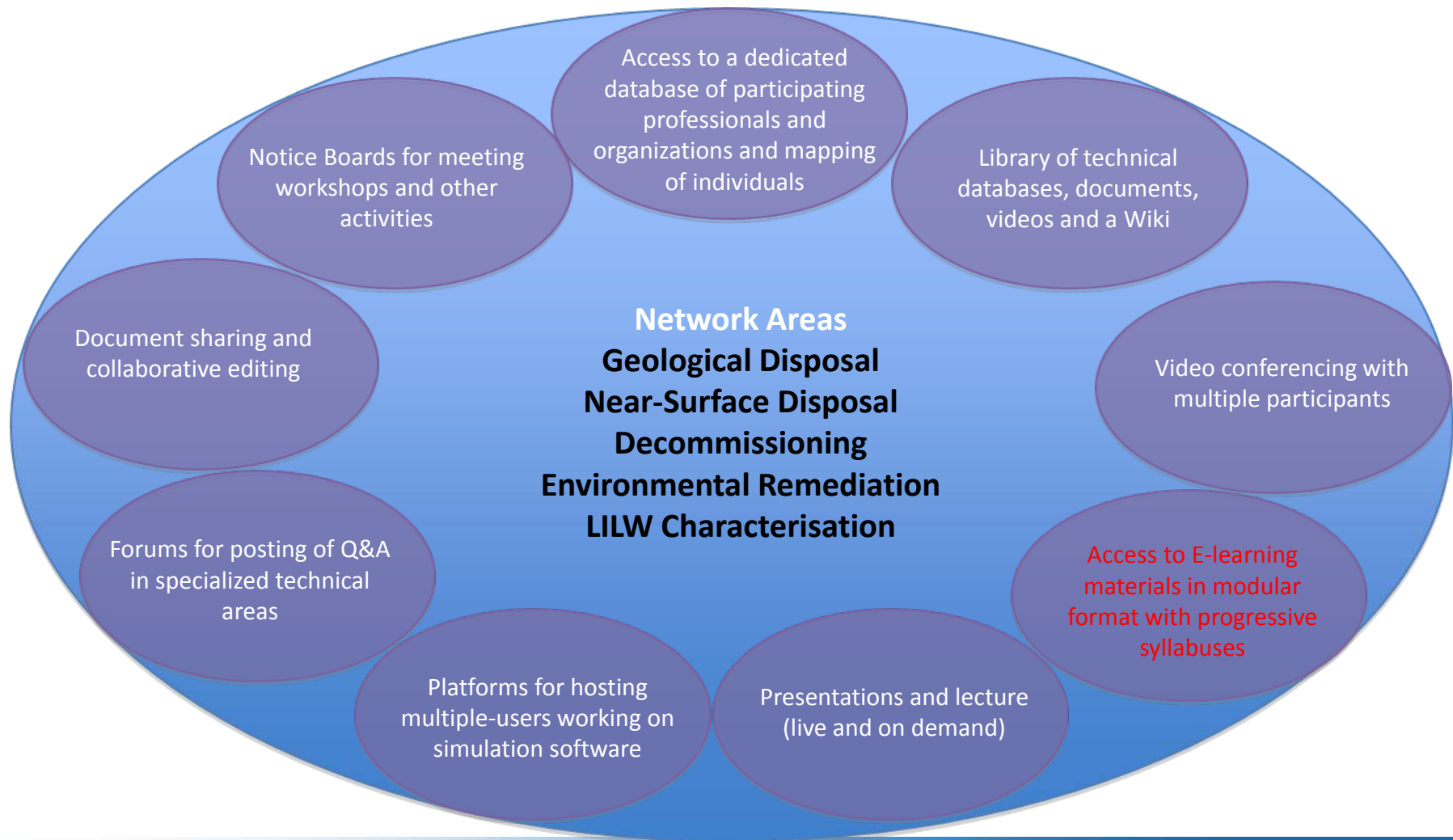
eLearning - The Goals

- Enhance and improve technical competencies and capabilities
- Facilitate the cost effective dissemination of technical information
- Promote stakeholder awareness, understanding and confidence

eLearning – Map of Modules



CONNECT - Functionality



Regional Training Centres

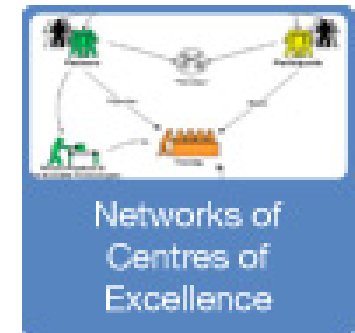
- We are exploring establishing Face-to Face training centres in strategic regional locations (for both extended and short courses)
- Intend to use local expertise as far as possible, supported by world-wide network of experts.
- IAEA investment in resources (train the trainers, software, equipment etc.)

KEY MESSAGE

Managing nuclear knowledge requires long-term planning and remains the responsibility of governments, as a part of national development plans, and organisations. The IAEA is ready to support the development of capabilities and capacity in its Member States through the provision of Training and support for strategic planning in Education & Training.

IAEA On-Line Training Resources

- <http://www.iaea.org/Publications/Training/index.html>
- **Training Materials**
- **Training Services and Tools**
- **Training Courses and Fellowships**
- **E-learning and Online Courses**





Thank you for your attention

P.Degnan@iaea.org