Euratom E&T approach
to borderless mobility and lifelong learning

Towards EU-wide mutual recognition of learning outcomes related to KSC (Knowledge, Skills and Competences)

Example: ECVET based Definition of four NPP Job Profiles under the current FP-7 project ENEN III

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INSAG 4 (IAEA - 1991) definition:
“Safety culture has two general components. The first is the necessary framework within an organization and is the responsibility of the management hierarchy. The second is the attitude of staff at all levels in responding to and benefiting from the framework.”
1 - Euratom Education and Training (E&T): focus on EU-wide safety culture and mutual recognition

Nuclear education and training is a concern in the EU:

- “Skills in the nuclear field – Council conclusions”
  (EU Council / Competitiveness (incl. research), 1 - 2 Dec 2008)

- “Expertise and skills in nuclear safety”

- “Expertise and skills”

http://ec.europa.eu/energy/nuclear/index_en.htm

Main goal of Euratom education and training (E&T)

- contribute to the continuous EU-wide improvement of the nuclear safety culture: competence building (on top of knowledge creation) in all nuclear domains, while achieving the desired "free movement" of nuclear experts (mutual recognition).

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL
“1ST SITUATION REPORT ON EDUCATION AND TRAINING IN THE NUCLEAR ENERGY FIELD IN THE EUROPEAN UNION”

The role of nuclear energy is currently undergoing an intense debate at national and international level and it is finally up to the Member States to make their decision, be it “as planned” or long-term operation, power upgrade, new build or phase out. The recent Fukushima events (Japan, earthquake and tsunami, 11 March 2011) suggest continuing to improve the various information and training policies on nuclear matters and to coordinate them on a global scale.

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The objective of this 1st situation report is to provide – to the extent possible – a comprehensive picture of the situation, to identify the current challenges, and to present the spectrum of both current or planned EU, national or international initiatives which could address the identified challenges in the most efficient and systematic manner possible. The report thus responds to the Europe 2020 strategy as well as the Council Conclusions 15406/08.

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While it is obvious that challenges at university and post-graduate level have to be addressed mainly at national level, the added value of EU initiatives is increasingly acknowledged at governmental, regulatory and industrial level. All opportunities and options available to increase effectiveness through the use of synergies and cooperation should be used to further improve the situation.

“Coo-petition”

a challenging mix of cooperation and competition

Global competition
Reminder: all Euratom RTD actions (in particular, Education and Training) are of the pre-competitive type; no commercial issue should obstruct fair collaboration amongst the stakeholders.
Definition of education and training

**Education** is a basic and life-long learning process

- broader than training, encompassing the need to maintain completeness and continuity of expertise across generations
- essentially a *knowledge creation* process, involving academic institutions as suppliers and students as clients
  => it deals mainly with knowledge (and understanding)

**Training** involves learning a particular skill or competence (attitude) required to perform a specific job, usually to an established standard

- concerned with schooling activities other than regular education programs
- essentially a *competence building* process, involving VET providers and academic experts as suppliers and professionals as clients
  => mostly about skills and competences (or attitudes), in addition to knowledge

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The ENEN Association (**European Nuclear Education Network**)

A non-profit international organization established on September 22, 2003 under the French law of 1901 and located at CEA-INSTN Paris.

**Mission**
The preservation and further development of higher nuclear education and expertise in all areas of nuclear fission and radiation protection (education and training)

**Composition (as of March 2011)**

- 60 members from 17 EU Member States, plus Switzerland
- further international collaboration: external Memorandums of Understanding (e.g., with South Africa, Russia, Ukraine and Japan) and partnership agreements (e.g., with ENS, IAEA/ANENT, Canada and WNU) + special agreement with the Joint Research Centre (DG JRC)

Website = [http://www.enen-assoc.org/](http://www.enen-assoc.org/)

Euratom education and training strategy: four principles
("fifth freedom" in the internal market (2008): free movement of knowledge)

- MODULAR COURSES AND COMMON QUALIFICATION APPROACH (designing and awarding qualifications or recognising units or other functions linked to ECTS and/or ECVET)
- ONE MUTUAL RECOGNITION SYSTEM FOR MASTER GRADES and/or “EUROPEAN PASSPORTS” (framework of competent institutions for ECTS and/or ECVET partnerships and for procedures of cooperation)
- MOBILITY FOR TEACHERS (TRAINERS) AND STUDENTS (LEARNERS) ACROSS THE EU (and beyond) (continuous improvement of knowledge, skills and competencies through borderless mobility and lifelong learning)
- FEEDBACK FROM "STAKEHOLDERS" (ETKM in EU platforms SNE-TP, IGD-TP and MELODI) (participation of the stakeholders – that is: the "future employers" - in the definition of the "learning outcomes")

+ facilitate the access to large RTD infrastructures (governmental and industrial laboratories)
- define in detail the needed research infrastructures of common interest, define and provide legal and financial structures for facilitating the access of students and scientists to existing facilities
- a special effort from the stakeholders is needed regarding internships for learners (an internship is a unique opportunity for students to work within industry to acquire hands-on experience).

Seven Euratom Fission Training Schemes
(TRANUSAFE, ENEN III, ENETRAP II, PETRUS II, CINCH, CORONA and EURECA!)

Seven Euratom FP-7 "coordination actions" of the EFTS type => examples of competencies required by stakeholders, concerned with specific societal and industrial challenges

(1) TRANUSAFE: health physics sector (e.g., ALARA principle)
(2) ENEN III Training schemes: nuclear systems suppliers
(3) ENETRAP II: nuclear safety authorities (e.g., Radiation Protection Expert)
(4) PETRUS II: radwaste agencies (e.g., repository and engineered systems)
(5) CINCH: nuclear and radio-chemistry (e.g., chemistry of nuclear fuel cycle)
(6) CORONA: Regional Center of Competence for VVER Technology
(7) EURECA!: Cooperation between EU and Canada on Super-Critical Water Reactors
2 - New needs for nuclear E&T: borderless mobility and lifelong learning (1/3)

⇒ need for an evolution of knowledge and skills of the future workforce

- not only related to the renaissance of nuclear energy in some countries

- but also to changes in the structure of industry and regulation:
  - e.g. the increasingly international character of the industry and of the regulatory activities related to nuclear energy
  - e.g. a clear trend towards outsourcing of business activities
  - e.g. a dependence of future developments on market forces

Source: SNE-TP Working Group on ETKM (December 2010) Nuclear Education and Training: Key Elements of a Sustainable European strategy EURACT, Preston, 16/12/2011

New needs for nuclear E&T: borderless mobility and lifelong learning (2/3)

Politics of a competence based approach

• Emphasises ability to do the job irrespective of routes of acquisition (tacit, informal)

• Learning outcomes are associated with a learner-centred pedagogic approach

• Promotes mobility (career, sectoral, spatial), employability, adaptability

• Widens access to accreditation and provides ladders of opportunity (inclusion)

• Essential for continuous development and lifelong learning

⇒ EU tool proposed since June 2009 = ECVET: “European Credit system for Vocational Education and Training”

Source: SNE-TP Working Group on ETKM (December 2010) Nuclear Education and Training: Key Elements of a Sustainable European strategy EURACT, Preston, 16/12/2011
New needs for nuclear E&T: borderless mobility and lifelong learning (3/3)

New governance in education and training in the EU (ECTS, ECVET)

Mobility in Higher Education (ECTS)

- European Credit Transfer System (1989):
  Ministers from DE, FR, IT, UK (Socrates Programme)
- Bologna Declaration (June 1999):
  29 Ministers for HE committed to establish
  a European wide system of credit accumulation and transfer
- Berlin Communiqué September (2003): compatibility between HE and VET

Mobility in VET (ECVET)

- Leonardo da Vinci Programme 1995
- Copenhagen Declaration 2002:
  Reference levels (QCA London) - Credit transfer (Kassel University)
  Typology of KSC (ESC Toulouse)

Source: SNE-TP Working Group on ETMK (December 2010)
Research and Innovation / Energy (Fission) / GVG 14/36

ECVET / European Credit System for Vocational Education and Training (1/4)

Declarations of Bologna (1999) and Copenhagen (2002)

EDUCATION: Bologna Declaration on the European space for higher education in June 1999
(29 countries signed => ECTS)

- three cycle system of the Bologna process:
  * first cycle: university and polytechnic degrees (Bachelor’s degrees)
  * second cycle: university and polytechnic Master’s Degrees.
  * third cycle: scientific and artistic post-graduate degrees (doctoral degrees)

TRAINING: Copenhagen Declaration on enhanced European cooperation
in vocational education and training (VET) in November 2002
(all EU Member States signed => ECVET).

- Europass - a single framework for transparency of qualifications and competences,
- European Credit Transfer and accumulation System (ECTS),
- European CV, diploma supplement, Europass,
- European Quality Charter for Mobility (EQCM),
- European Qualification Framework (EQF) relating different national qualifications systems to a common European reference framework
- European Quality Assurance Reference Framework (EQARF)
- European credit system for VET (ECVET), a recommendation since 2008.
Faced with challenges such as intensified global competition, high numbers of low-skilled workers and an ageing population, vocational education and training (VET) is vital to prepare individuals for today’s society and ensure Europe’s future competitiveness and innovation.

ECVET is aimed at facilitating the transfer, recognition and accumulation of assessed learning outcomes of individuals on their way to achieving a qualification portfolio of learning outcomes or “European Nuclear Competence Passport”

Graduate or young professional:

principal question asked will no longer be: "what did you do to obtain your degree (or your qualification) ?”

but rather: "what can you do now that you have obtained your degree ?”

new concepts:

- “Learning Outcomes” (units of L.O., assessed and recognized throughout the EU)
- “ECVET Partnership” and “Memorandum of Understanding” (agreement between competent institutions)
- “Learning Agreement” between a “home” and a “hosting” institution
- “Personal Transcript” (European Passport, portfolio of learning outcomes)


ECVET / European Credit System for Vocational Education and Training (3/4)

EUROPEAN COMMISION / Education and Culture
Life-long learning: Policies and Programme
Professional training; Leonardo da Vinci

- new European instrument to support lifelong learning, the mobility of European learners and flexibility of learning pathways to achieve qualifications.

- adopted by the European Parliament and by the Council (OJ 2009/C 155/02) - 18 June 2009

- progressive implementation until 2012

= > gradual application of ECVET to VET qualifications across.

Who allocates ECVET points?
In the context of the current ECVET pilot projects, the range of institutions experimenting ECVET points allocation is wide and ranges from ministries, sectoral organisations or social partners to training centres.

Focus on competencies required by nuclear system suppliers:

- Basic Nuclear Topics for Non-Nuclear Engineers
- Design Challenges for Generation III NPP (2 professional profiles)
- Construction Challenges for Generation III NPP (2 professional profiles)
- Design Challenges for Generation IV Reactors

Special attention to the following competencies: System and Process Engineer, Safety Evaluation, HVAC Project Implementation, digital I&C Engineering

19 Participants: ENEN Association as coordinator (duration 2009 – 2013)

+ SCK-CEN, UCL, TKK, LUT, INSTN, AREVA, ISAR, BME, CIRITEN (POLITO, UNIPI), DUT, UPB, UL, JSI, TECNATOM, UNED, UPM, UPC, SULTAN

Steps of Training Scheme Implementation (1/2)

- Each Training Scheme should follow a similar path for the achievement of the designed learning outcomes knowledge, skills, competences / attitudes).
- The complete Training Scheme is presented in this Figure (1/2 and 2/2).
- Step no 1 was defined above – steps no 2 to 5 are still to be done!

1. **Step 1**
   - Definition of training scheme learning outcomes and modules

2. **Step 2**
   - Student pre-requisites assessment and student selection

3. **Step 3**
   - Student interview for development of the individual training plan

4. **Step 4**
   - Start of the training activities (training scheme)

Source: ENEN-III project

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Steps of Training Scheme Implementation (2/2)

- Learning to know
  - A. Training Method
    1. Classroom training
    2. E-Learning
    3. Case studies
    4. Know how transfer during on the job training
  - B. Evaluation method
    1. Written examination
    2. Oral presentation of a chosen subject

- Learning to do
  - A. Training Method
    1. Analytical calculation during workshops
    2. Practical training on mock-ups
    3. Experiments at small scale facilities
    4. Practical on the job training
  - B. Evaluation method
    1. Written examination
    2. Practical examination (oral or written)

- Learning to be
  - A. Training Method
    1. Visit nuclear facilities
    2. Sensibilisation workshops
    3. On the job training
  - B. Evaluation Method
    1. Evaluation by the mentor

5. **Step 5**
   - Mutual recognition and European Pass

Source: ENEN-III project
ECVET definition: "learning outcomes" means statements of what a learner knows, understands and is able to do on completion of a learning process.

"Learning outcomes" should be achievable through a variety of education and training paths (be they in a formal, non-formal or informal context).

Learning outcomes refer to specific competencies and consist of a mix of:

- **Knowledge** (Learning to know – “know that” or “savoir”) => cognitive
  (e.g. needed to support operational and technical decisions)

- **Skills** (Learning to do – “know how” or “savoir faire”) => psycho-motor
  (e.g. translation of safety culture into practical terms)

- **Competence** (Learning to live together) => social - attitudinal
  (e.g. nuclear safety values and beliefs)

Points: 60 ECVET points analogous to 60 ECTS points for higher education.
Big difference however: ECVET is based on learning outcomes,
whereas ECTS is based on time spent in course and/or in laboratory exercises.

4 – Nuclear KSC (Knowledge, Skills and Competences)
and Learning Outcomes

Training Schemes for Design Engineers of GEN III Nuclear Power Plants

ToC of FP-7 project ENEN III Deliverable D1.3 (draft document)

Job 1 - System and Process Engineer
Job 2 - Safety Evaluation Engineer

3. **Job Profile / Description**

3.1 **System and Process Engineering (job 1)**
   3.1.1 Main function of the job
   3.1.2 Detailed Tasks
   3.1.3 Knowledge, skills and competences / attitudes
       required for the job tasks

3.2 **Safety Analysis Evaluation Engineer (job 2)**
   3.2.1 Main function of the job
   3.2.2 Detailed Tasks
   3.2.3 Knowledge, skills and competences / attitudes
       required for the job tasks
**Job 1 - System and Process Engineer**

Knowledge, skills and competences (attitudes) required for the fulfillment of the job tasks:

**Knowledge**
- Nuclear Power Plant Knowledge
- Basic Nuclear Safety Knowledge ([more details further down](#))
- System/System Group Knowledge
- Nuclear Engineering Design Knowledge
- Flow and Thermo Dynamics Knowledge

**Skills**
- Working with Self-developed Engineering Tools or Off-the-Shelf Tools
- Cost Estimates (costs, time) for the Engineering Work
- Order Processing (Project Management)

**Competences / Attitudes**
- Formal Quality Control of Result Reports
- Individual, Critical Examination of the Tasks
- Presentation and Documentation of Work Results
- Teamwork/Communication

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**Job 2 - Safety Evaluation Engineer**

Knowledge, skills and competences (attitudes) required for the fulfillment of the job tasks:

**Knowledge**
- Extended Nuclear Safety Knowledge ([more details further down](#))
- Thermo hydraulic Knowledge
- Basic Knowledge of Power Plant Engineering
- Basic Knowledge of Plant, System and Component Engineering

**Skills**
- Working with Self-developed Engineering Tools or Off-the-Shelf Tools
- Order Processing (Project Management)
- Formal Quality Control of Result Reports
- Presentation and Documentation of Work Results
- Teamwork/Communication

**Competences / Attitudes**
- Individual, Critical Examination of the Tasks
3. Job Profile / Description

3.1 HVAC Project Implementation Engineer
   3.1.1 Main Function of the Job
   3.1.2 Detailed Tasks
   3.1.3 Knowledge, Skills and Competences (Attitudes)
       Required for the Job Tasks

3.2 Fluid System Construction and Commissioning Engineer
   3.2.1 Main Function of the Job
   3.2.2 Detailed Tasks
   3.2.3 Knowledge, Skills and Competences (Attitudes)
       Required for the Job Tasks

Reminder: HVAC = Heating, Ventilation and Air Conditioning

4. Knowledge Skills and Competences (Attitudes) in Terms of Learning Outcomes

4.1 Learning Outcomes in the Knowledge Area (Learning to know)
   4.1.1 Nuclear Power Plant Knowledge
   4.1.2 Nuclear Safety Knowledge
   4.1.3 Mechanical Engineering Knowledge
   4.1.4 Thermal-Hydraulic Knowledge
   4.1.5 Nuclear Power Plant Systems Knowledge
   4.1.6 Technical System/Process Engineering Knowledge of Ventilation
   4.1.7 Electrical, Instrumentation and Control Knowledge

4.2 Learning Outcomes in the Skills Area (Learning to do)
   4.2.1 Skills for Job Profile “HVAC Project Implementation Engineer”
   4.2.2 Skills for Job Profile “Fluid System Construction and Commiss.”

4.3 Learning Outcomes in the Competence (Attitude) Area
   (Learning to live together and/or Learning to be)
Recommendations (ENEN-III project)

- The acquisition of the knowledge in all cognitive areas (knowledge, comprehension, application, analysis, evaluation) is clearly a challenging objective and should not be seen as an exclusive task of this training scheme. Further training and overall refreshment of the knowledge should be encouraged in the continuous development programs.

- In comparison with the area of knowledge, the skills and competences (attitudes) area are more demanding. Knowledge can be easily structured and transferred to the interested person. Skills and Competences (Attitudes) have to do with the psychological and emotional profile of each trainee. Pure theoretical training courses should have at least one learning outcome in the area of skills and competences (attitudes).

- An individual profile should be documented for each participant in the training scheme, where the need and choice of training activities will be investigated. In short: Not everyone takes part in all training activities but rather with a very well defined target. Such document should be the result of an interview with the work package coordinator and if possible with representative of Human Resources. This step should be taken before the “Learning Agreement” is signed by the (counter) parts.

5 - Conclusion:

a new generation of mobile nuclear experts through ECVET

⇒ develop ECVET partnerships between Home and Hosting Institutions, aiming at facilitating borderless and lifelong learning for a new generation of highly qualified professionals (ENEN plays a key role in this networking process)

Challenges
• translation of terms and concepts (KSC) in different cultural contexts
• few European-wide examples of competence frameworks
• operationalising the typology (national qualifications frameworks, typologies per sector / occupation (e.g. process industries), per enterprise (e.g. nuclear)

Future work
• compare qualifications frameworks of all member states
• systematic comparison of key sectors and occupations (e.g. managers)
• integrate with ongoing projects such as Leonardo da Vinci
Euratom research and training programs
(FP-7 => Horizon-2020)
towards a common nuclear safety culture

- Safety
- Numerical simulation
- Material research
- Research infrastructures

(1) TRASNUSAFE : Nuclear Safety Culture

Focus on competencies required by the health physics sector
(e.g., ALARA principle)

- designing, developing and validating two training schemes on nuclear safety culture, with a common basis: nuclear industry and installations making use of ionising radiation
- target public: professionals, at the managerial level, in charge of health physics control in nuclear power plants and of radiotherapy services in hospitals

19 Participants: UCL (B) as coordinator

- TECNATOM (E); SCK-CEN (B); ITN (P); JSI (SLO); CEPN (F); EAN (EU); UPB (RO); UNIMAN (UK); STUBA (SK); CIRTEN (I); UPM (E); ND-DACMT (UK); ENEN association (INSTN, TKK, BME); CNCAN (RO); TRACTEBEL ENG. (B); EITA (EU); SNN (RO); SEAS (SK)

6 – Annex:
description of the seven EFTS under Euratom FP-7
(2) ENEN III Training schemes: Generation III and IV engineering

Focus on competencies required by nuclear system suppliers

- four training schemes:
  - Basic Nuclear Topics for Non-Nuclear Engineers
  - Design Challenges for Generation III NPP (2 professional profiles)
  - Construction Challenges for Generation III NPP (2 professional profiles)
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Special attention to the following competencies: System and Process Engineering, Safety Analysis Evaluation, HVAC Project Implementation, digital I&C Engineering

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(3) ENETRAP II
European Network on E&T in Radiological Protection

Focus on competencies required by nuclear safety authorities

- legal basis = Euratom legislation on Basic Safety Standards (96/29/EURATOM) and forthcoming revision (including “RPE Recognition”)
- EU standards for initial education and continuous professional development for radiation protection experts (RPEs) and radiation protection officers (RPOs)
- development of the “European radiation protection training scheme” (ERPTS) for RPE training

12 Participants: SCK-CEN, BELGIUM as coordinator

+ CEA-INSTN, FRANCE; KIT-FTU, GERMANY; BIS, GERMANY; ENEA, ITALY; NRG, THE NETHERLANDS; CIEMAT, SPAIN; HPACRCE, UK; ENEN Association (TKK, ISAR), FRANCE; ITN, PORTUGAL; BME-NTI, HUNGARY; UPB, ROMANIA

Council Directive 96/29/Euratom sets up a framework for the control of exposure of workers and members of the public to ionising radiation
(http://ec.europa.eu/energy/nuclear/radiation_protection/publications_en.htm)
(4) PETRUS II: Program for Education, Training, Research on Underground Storage

Focus on competencies required by radwaste agencies (e.g., repository and engineered systems design)

- development of a Science and Technology Passport, related to the following competencies: Site Investigation Design and Management; Underground Construction; Repository and Engineered Systems Design; Above Ground Waste Handling Facility Design/Operation; Underground Systems Engineering (Waste Handling); Operational and Post-Closure Safety

Survey of the "market": use existing courses (in France, Switzerland, Germany, United Kingdom, Sweden, Finland and Slovenia) + add new courses to fill in the gaps

14 Participants: Institut National Polytechnique de Lorraine, FR, as coordinator

+ ANDRA, FR; ARAO, SI; Cardiff University, UK; ENRESA, ES; ENEN Association (UPM, CTU, TKK, BME), FR; GRS, DE; ITN, PT; ITC School of Underground Waste Storage and Disposal, CH; Microbial Analytics Sweden AB, SE; NDA, UK; Posiva Oy, FI; RAWRA, CZ; Universitaet Clausthal, DE

(5) CINCH: Cooperation in education In Nuclear Chemistry

Focus on competencies required by nuclear and radio-chemistry (e.g., chemistry of nuclear fuel cycle, separation chemistry, chemistry of actinides, radio-analytical chemistry, low-level radionuclide detection, radio-pharmaceutical chemistry, etc.)

- a set of compact joint modular courses (including internships) will be produced - the EU experience will be faced with the Russian expertise

- e-learning platform with pilot topics in the chemistry of the nuclear fuel cycle, that is: nuclear fuel and chemistry of the front-end of the nuclear fuel cycle; nuclear spent fuel recycling; waste conditioning; chemical problems in radioactive waste management and repository design

- a set of common qualification criteria and a mutual recognition system in view of a "European training Passport" will be developed following the guidelines of ENEN

- A long term sustainable strategy for the nuclear chemistry education will be established, including a roadmap for its implementation

7 participants: CESKE VYSOKE UCENI TECHNICKE V PRAZE (CTU, Czech Republic) as coordinator

+ CHALMERS TEKNISKA HOEGSKOLA AB (Sweden); HELSINGIN YLIOPISTO (JH, Finland); Moscow State University (Russia); Ecole Nationale Supérieure de Chimie de Paris (France); USTAV JADERNEHO VYZKUMU REZ A.S (NRI, Czech Republic); NATIONAL NUCLEAR LABORATORY LTD (United Kingdom)
(6) CORONA:
“Establishment of a Regional Center of Competence for VVER Technology and Nuclear Applications”

Focus on competences required by VVER personnel
- unify existing VVER related training schemes according to IAEA standards and commonly accepted criteria recognized in EU.

1) Training schemes for VVER nuclear professionals; for non-nuclear specialists and subcontractors, involved in nuclear sector; and for students
2) VVER related knowledge management system, which will accumulate information regarding design data, operational experience, training materials, etc.
3) Specialized regional training center for supporting VVER customers with theoretical and practical training sessions, training materials and general and special assignment training tools and facilities......

11 Participants: KOZLODUY NPP PLC, Bulgaria, as coordinator (lipironkov@npp.bg) + AEKI Hungary, FORTUM Finland, INRNE Bulgaria, JRC-IET Netherlands, MEPHI Russian Federation, CVREZ Czech Republic, PM Dimensions GmbH Austria, RISK ENGINEERING LTD Bulgaria, TECNATOM S.A. Spain, INTELECTUAL TECHNOLOGY-SLAVUTICHI Ukraine

(7) EURECA!
“Cooperation between EU and Canada in Education, Training and Knowledge Management on Super-Critical Water Reactors”

Focus on competences required by Generation IV research and training experts (RTD of the Super-Critical Water-cooled Reactor /SCWR/ in Europe and Canada)
- definition of an international education & training program which
  (i) enhances the skills of current professionals in the nuclear sector,
  (ii) attracts young graduates and professionals in other sectors to work in the nuclear field
  (iii) enhances the mobility of professionals in the EU and Canada

* 6 EU Participants: TECHNISCHE UNIVERSITEIT DELFT Netherlands, as coordinator
  + UNIVERSITAET STUTTGART Germany, KUNGLIGA TEKNISKA HOEGSKOLAN Sweden, CVREZ Czech Republic, ENEN France, UNIVERSITA DI PISA Italy

* Canadian participants: the “University Network of Excellence in Nuclear Engineering” (UNENE) is a Canadian based alliance of universities, nuclear power utilities, research and regulatory agencies for the support and development of nuclear education, research and development capability in Canadian universities - http://www.unene.ca/index.htm
Communication

Need for a better dialogue between the nuclear community and the decision makers, the opinion leaders and the general public

Bjorn Wahlström

Available links

- EU Energy research: http://ec.europa.eu/research/energy/index_en.htm
- Information on FP7 and access to programmes and calls: http://cordis.europa.eu/fp7/home_en.html

- CORDIS publications
  - Euratom FP6 Research Projects and Training Activities, Volume I-II and III (PDF)
  - Euratom FP7 Research Projects and Training Activities, Volume I (PDF)

- Research*eu magazine http://ec.europa.eu/research/research-eu/index_en.html
Training and Information programme, drawing the lessons from Fukushima (1/2)

“Support action” of 4 years (cost sharing) through a "grant to named beneficiary"

1 – Objectives

Set up a "catalogue" of training schemes and information actions to be conducted across the EU, identify the appropriate "trainers" amongst all stakeholders of the nuclear sector, and carry out the resulting training and information programme, having in mind the following objective:

=> improve the awareness of the role of nuclear safety culture amongst nuclear experts and policy makers in the EU and share the best practices of risk governance.