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EHRO-N 2012 Annual Activity Report

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1. Objectives

The overall mission of EHRO-N is to provide

- qualified data on the needs regarding human resources in the nuclear field within the European Union
- high-level expert recommendations on EU-wide nuclear E&T actions, promoting lifelong learning and cross border mobility.

The particular objectives of EHRO-N are to:

- a) produce and regularly update a quality-assured data base on the short-, medium and long-term needs of human resources for the different stakeholders in nuclear energy and radiation protection, with emphasis on nuclear safety and security. The data should be structured according to the required qualifications (i.e. disciplines and specializations, main non-academic and academic levels, specific needs for required knowledge, skills and competences).
- b) identify gaps and deficiencies in the European nuclear E&T infrastructure and elaborate recommendations for remedial actions and optimizations, in synergy with the relevant European Technological Platforms and stakeholders' organizations (e.g. ENEF, SNE-TP, IGD-TP, ENSREG, HERCA, etc).
- c) play an active role in the development of European schemes of nuclear qualifications and mutual recognitions, taking advantage of existing EU initiatives (e.g. ECTS (Bologna agenda for academic education) and ECVET (Copenhagen agenda for continuous professional development))
- d) use existing information (e.g. results of existing national and sectoral surveys and data produced by specific nuclear stakeholders) but should critically review those data in order to ensure their consistency with European energy supply strategies and likely medium- and long-term developments of the global nuclear sector.
- e) regularly communicate relevant data to the Member States governmental, academic and private organisations involved in nuclear education and training. Moreover the Observatory should take an active part in the communication of nuclear HR issues and their relevance to the public, and
- f) provide information and recommendations to the European Commission that could be used to report to the European Parliament and the Council.

Therefore, EHRO-N will cover the following range of activities:

- a) Regular reviews of new surveys and analyses on the human resource (HR) situation related to nuclear energy and radiation protection, with emphasis on nuclear safety and security,
- b) Specification, tendering and quality management of specific studies such as
 - periodic trend analyses for the nuclear HR situation
 - analyses of the quality of European nuclear E&T infrastructure
 - international HR benchmarking, in particular for Asia and the USA

- identification of bottle necks in the supply chain for HR
- c) Organisation of workshops on specific subjects such as
- consolidation of results of surveys and analyses
 - organisation of workshops in connection with the implementation of ECTS (academic education) and ECVET (professional development)).
 - inter-stakeholder communication on HR needs
- d) As far as required: additional polls of European stakeholders in nuclear energy and nuclear safety
- e) Regular compilation of quality-assured data,
- f) Publications and media actions
- periodic publications of key figures and trends of HR needs
 - occasional press conferences and participation in selected media actions and public debates
- g) Developing concepts and elaborating opinions on HR-related issues such as
- European qualification schemes for lifelong learning and cross border mobility
 - interdisciplinary and intersectorial mobility of personnel

2. Organisation and Instruments

The control of the EHRO-N is vested in a Senior Advisory Group (SAG) composed of high-level experts representing different types of nuclear stakeholders (e.g. nuclear power plant operators, nuclear regulators and their technical supports, nuclear manufacturers, educational and training organisations, nuclear research centers) and coming from different EU Member States. The SAG is meeting as a matter of principle at least once, but preferably twice a year.

The SAG is focusing on conceptual issues, such as:

- definition of the types of required data as well as supervision of the analysis of data and its quality assurance
- approval of reports as well as preparation of major communication actions
- drafting of recommendations on EU-wide nuclear E&T actions, aiming at promoting lifelong learning and cross border mobility in the nuclear field.

The day-to-day management of EHRO-N is handled by the Operating Agent (OA), which is the JRC's Institute for Energy and Transport (IET). This choice is made to ensure effective communications, cooperation and an impartial operation of EHRO-N. The OA is responsible for the support to the execution of the tasks under the general direction of the SAG.

The OA does in particular:

- provide the necessary infrastructure, networking contacts and long-term stability,
- collect the above-mentioned qualified data and high-level expert recommendations (in view of EHRO-N reports)
- handle the day-to-day management of EHRO-N and of its activities,
- on behalf of the SAG maintain liaison with other international or national organisations carrying out tasks similar to the EHRO-N ones,
- provide the office for EHRO-N and secretariat of the SAG which must be neutral

The tasks of the secretariat of the SAG are to:

- coordinate the activities and maintain the archives of the SAG and of the EHRO-N in general,
- contribute to the technical work of different Task Groups,
- maintain a website based platform for effective electronic communications,
- take care of the meetings organisation and nominate a secretary for each meeting,
- circulate the documents as requested by the SAG and publish EHRO-N reports as requested by the SAG.

Operating Agent (OA) staff in 2012 included: Ulrik Von Estorff, Veronika Simonovska, Marcello Barboni, Alicia Lacal Molina, Cesar Chenel Ramos, Arlindo Rito de Abreu Duarte, Robert Houghton, Bianca Hirte, Miguel Fernandez Lopez.

3. 2012 activities of EHRO-N

3.1. Two Senior Advisory Group (SAG) meetings

In 2012, two SAG meetings took place, on 16 and 17 April (SAG 5) and on 26 and 27 September (SAG 6).

The aim of these meetings was to build on the achievements stemming from the activities accomplished after the 2011 SAG meetings.

More detailed description of the 2012 SAG meetings can be found in the Annex 1 of this annual report.

3.2. E&I workshop and a visit to the Energy Institute of the Istanbul Technical University

This year the E&I workshop took place on 27 and 28 September in Istanbul, Turkey. On the first day each of the E&I participants gave a presentation on the situation regarding the nuclear energy and the nuclear E&T in his/her respective countries. So, there were on the first day of the E&I workshop (27.9.2012) presentations on the situation in Croatia, Serbia, Macedonia and Switzerland. Turkey was on the schedule on the second day (28.9.2012) of the E&I workshop when we visited the Energy Institute of the Istanbul Technical University.

More detailed description of the E&I workshop deliberations on 27 September (together with SAG participation) and of the visit on 28 September 2012 can be found in Annex 2 of this annual report.

3.3. EHRO-N “Putting into Perspective” Report 2012

On 30 May 2012 the EHRO-N report called: **PUTTING INTO PERSPECTIVE THE SUPPLY OF AND DEMAND FOR NUCLEAR EXPERTS BY 2020 WITHIN THE EU-27 NUCLEAR ENERGY SECTOR** became public and was put on the EHRO-N website <http://ehron.jrc.ec.europa.eu/> (see also Annex 3 of this annual report).

The next EHRO-N Supply/Demand questionnaire will be launched in January 2013.

3.4. EHRO-N presence and presentation of its activities at the VGB training and career event (in original: VGB Studentenkurs „Kerntechnik“)

VGB is EHRO-N SAG Member and in order to disseminate the EHRO-N activity amongst German Students, we were asked to present the EHRO-N report and the career chances of nuclear students in the EU.

Our visit fell into the last day of a 2-week long education on Reactor technology for a group of some 18 students, mostly non-nuclear engineers, but interested in nuclear energy. On 20 September 2012, EHRO-N representatives Ulrik von Estorff and Veronika Simonovska presented:

- the EHRO-N report 2012, and the
- Survey results from 2010 on the Career expectations and orientations of young professionals in the EU.

3.5. EHRO-N Contribution to the SET-Plan

The EHRO-N report 2012 (see point 3 above) was one of the two main references used to produce the report related to the **SET-Plan European Energy Education and Training Initiative (WG Nuclear Energy)**.

On 28 November 2012 the SET-Plan report was issued recommending among other things to support the work of EHRO-N in the future (*see its executive summary in Annex 4 of this annual report*). The full report was prepared by the now EHRO-N SAG member François Weiss from the Grenoble Institute of Technology/CNRS – KIC InnoEnergy.

See the full list of experts consulted for the above mentioned SET-Plan report in Annex 5 of this annual report.

3.6. Preparation of the EHRO-N Roadmap 2020 preparation

At the occasion of the SAG 5 in April 2012 (see point 1 above) it was proposed that a roadmap on EHRO-N activities is prepared. A preliminary draft was presented and discussed at SAG 6. The final draft will be presented at SAG 7 on 10/11 April 2013.

3.7. Launch of the survey on the Mobility of Nuclear Professionals

In October 2012 a short questionnaire on Mobility of Nuclear Professionals was published on the EHRO-N website: <http://ehron.jrc.ec.europa.eu/>. It was a joint initiative between EHRO-N, the European Nuclear Society (ENS) and Thomas Thor Associates. Following a similar survey in 2010 carried out by EHRO-N, the objective was to understand the mobility of nuclear professionals across Europe.

For the purpose of advertising this questionnaire at the ENC 2012 (see point 8 below) the EHRO-N team has prepared a leaflet (*see Annex 6 of this annual report*).

3.8. Attendance at conferences (ENC 2012)

The European Nuclear Conference (ENC), from 9 December to 13 December 2012 (see <http://www.euronuclear.org/events/enc/enc2012/index.htm>), is the largest international conference of its kind on the European event calendar. This European Nuclear Society

(ENS) event has a multidisciplinary approach, looking at nuclear science and technology in energy production, non-power industrial and life science applications.

The goal of EHRO-N's attendance at this conference was:

1. to attend the ENC Career event (*Annex 7*) on 9 December 2012 and promote EHRO-N and its survey on the Mobility of Nuclear Professionals (see point 7 above);
2. to give an oral presentation on the findings of EHRO-N as for the supply/demand situation of nuclear experts in EU-27;
3. and present a conference paper on the findings of EHRO-N as for the supply/demand situation of nuclear experts in EU-27.

See the programme of the ENC 2012 conference [HERE: http://www.euronuclear.org/events/enc/enc2012/pdf/ENC2012-Programme.pdf](http://www.euronuclear.org/events/enc/enc2012/pdf/ENC2012-Programme.pdf).

3.9. Studies by EHRO-N

EHRO-N, collaboration with an external expert, had produced the study: **THE CONCEPT OF INTERNATIONALISATION AND THE INEVITABILITY OF MOBILITY OF HIGHLY SKILLED EMPLOYEES**; What can the nuclear energy sector in Europe learn from it? It was presented and discussed at SAG 6.

3.10. Guidelines on the way to produce a capacity building exercise nationally

A proposal from the SAG group at SAG 6 on 26 and 27 September 2012 was that EHRO-N OA needed to help with the preparations of Guidelines on the way to produce a capacity building exercise nationally. At the moment the first draft is being prepared and is expected to be presented at SAG 7 on 10/11 April 2013.

3.11. Contributions to other DGs of the EC

EHRO-N supports where possible the work of JRC HQ, DG ENER in an adhoc way:

- *JRC HQ*: EHRO-N contributed between July and October towards the preparation of the report called: Facts & figures overview on nuclear industry.
- *DG ENER*: on 13 March 2012 a VC was held between DG ENER (Unit D2 "Nuclear Energy, Decommissioning, Transport and Waste Management") and EHRO-N. Two most important things were discussed and where EHRO-N could potentially contribute in the future: 1) a need for a clearer picture on personnel needs for the radwaste management organizations in the EU, separated from decommissioning and 2) the radwaste directive, which will be transposed to national laws by mid 2013, and the fact that MS will need to prepare national plans and include in them personnel projections by the mentioned date.

- On 5 December 2012 another VC was held on the on the future JRC scientific and technical support to nuclear decommissioning around these points:
 - Knowledge management and communication
 - Innovative techniques and technological support
 - Standardisation
 - Training on decommissioning.

3.12. Networking and EHRO-N relations with other organisations

1) On 27 and 28 February EHRO-N attended the Education, Training and Knowledge Management task force meeting of **Foratom** in Tarragona in Spain.

2) Throughout 2012 the EHRO-N SAG grew by accepting these new members:

New members:

- Monica Sbaffoni from the IAEA
- Emilia Janisz from the ENS
- Helmuth Böck from the ATOMINSTITUT (AT)
- Francois Weiss from KIC InnoEnergy & Grenoble INP (F)
- Brian Molloy from the IAEA (additional)
- Gianluca Ferraro replacing Veronika Simonovska (JRC)

Members upcoming:

- Replacement needed for Brian Murphy (COGENT)
- Replacement needed for Andreas Hamann (AREVA)
- New (GRS)
- New (EdF)

Members leaving:

- David Gilchrist from ENEL.

3.13. EHRO-N website

The activities on the EHRO-N website (<http://ehron.jrc.ec.europa.eu/>) were numerous: before and after each SAG meeting performed during the year, the website was being updated. Specifically, this is the content of the EHRO-N website that was updated:

- Database of Universities offering nuclear energy related programmes was put on EHRO-N website and was several time during the year updated
- Database on the Nuclear stakeholders active in EU-27 was put on EHRO-N website and was several time during the year updated
- Database on the Training possibilities in the area of nuclear energy throughout the EU-27 was put on EHRO-N website and was several time during the year updated

- Database on Training providers was made and put on EHRO-N website
- Database on the Nuclear energy policies of each of the EU-27 member states was put on the EHRO-N website
- Fukushima related attitudes of the member states of EU-27 were presented on the EHRO-N website.
- News
- ECVET Introduction
- EHRO-N Reports, National Reports, Policy Documents and ECVET related documents
(http://ehron.jrc.ec.europa.eu/index.php?option=com_docman&Itemid=55)

The graphical presentation of the EHRO-N Portal was completely refurbished by December 2012 following EC standardized Layout.

3.14. ECVET Activities

The EHRO-N activities in support for the implementation of a nuclear ECVET are reported separately.

ANNEX 1



EUROPEAN COMMISSION
DIRECTORATE-GENERAL JRC
JOINT RESEARCH CENTRE
Institute for Energy and Transport



Petten, 23 April 2012

SFNR/EHRO-N/SAG
meetings/SAG 5

Minutes of the
5th Senior Advisory Group (SAG) Meeting
of the
European Human Resource Observatory in the Nuclear Energy Sector

Place: *Amsterdam (NL)*

Date: *16 and 17 April 2012*

SAG Participants: *Emilia Janisz, Georges van Goethem (present only on 16.4.), Guy Parker, Hans-Werner Otte, Hubert Flocard, Victor Sanchez-Espinoza, Jürgen Krone, Luc Vanhoenacker, Marjatta Palmu, Simonne Henrard, David Gilchrist, Ferry Roelofs, Vladimir Slugen (present only on 16.4.), Monica Sbaffoni, Jose Luis Delgado*

Appologized SAG members: *Anselm Schäfer, Brian Murphy, Eckhard Nithack, Jorma Aurela, Niina Yliknuussi, Laurent Turpin, Ute Blohm-Hieber*

Participants from JRC: *Ulrik von Estorff, Veronika Simonovska, Alicia Lacal Molina, Cesar Chenel Ramos, Marcello Barboni.*

DAY 1: 16 April 2012

The chairman was Ulrik Von Estorff.

1. **Veronika Simonovska** declared the **Minutes from the SAG 4** adopted as no further comments were received.
2. **Veronika Simonovska** enumerated the **actions** taken by the EHRO-N team and SAG members since SAG 4.
3. **Veronika Simonovska** reported about the **EHRO-N Launch** that took place in Brussels on 16 December 2011.
4. **News from ENEF Sub-WG E&T** and **EC Comm**: the representative from ENEF Sub-WG E&T and EC Comm (**Niina Yliknuussi**) was not present at SAG 5
5. **News from SNE-TP ETKM**: the representative from SNE-TP ETKM (**Anselm Schäfer**) was not present at SAG 5

6. News from ENEN and DG RTD

Georges van Goethem from the DG RTD presented Horizon 2020: the EU Framework Programme for Research and Innovation 2014-2020 (including Euratom 2014-2018).

This is a single programme bringing together three separate programmes/initiatives: The 7th Research Framework Programme (FP7), innovation aspects of Competitiveness and Innovation Framework Programme (CIP), EU contribution to the European Institute of Innovation and Technology (EIT).

This document is still a proposal. It means 80 billion € for all research in EU. The EC financial contribution to global EU research effort is 5 % (so called seed money).

This programme has three priorities:

1. Excellent science
2. Industrial leadership
3. Societal challenges

Energy is taken into account under Societal challenges, which deal with:

- Concerns of citizens and society/EU policy objectives (climate, environment, energy, transport etc) that cannot be achieved without innovation
- Breakthrough solutions that come from multi-disciplinary collaborations, including social sciences & humanities
- Promising solutions that need to be tested, demonstrated and scaled up.

The proposed funding (million € in current prices, 2014-2020) for Secure, clean and efficient energy is: 5 782. There is an additional € 1 788m for nuclear safety and security from the Euratom Treaty activities (2014-2018). This does not include ITER.

Regarding the timing, we are now at the point of final calls under 7th Framework Programme for research to bridge the gap towards Horizon 2020. In 2013 there will be an Adoption of legislative acts by Parliament and Council on Horizon 2020. On 1 January 2014 Horizon 2020 will launch its first calls.

The role of the technological platforms like ENSREG (safety authorities), stakeholders (ENEF), research/innovation (SNETP, IGDTP, MELODI) will be very important within Horizon 2020.

Regarding fission:

- Specific activities may be implemented through Joint Undertakings, Public-Public Partnerships (P2Ps), contractual Public-Private Partnerships (PPPS)¹, or through cross-cutting actions

¹What is partnering?

Partnering brings together the public sector at European, national and regional levels in public-public partnerships ("P2Ps") as well as the public and private sector in public-private partnerships ("PPPs"). Partnering can help to maximise the contribution of Research and Innovation to achieving smart and sustainable growth in the EU, by making the research and innovation ("R&I") cycle more efficient and shorten the time from research to market. This is essential to achieve the European Research Area (ERA) by 2014 and to deliver on the Innovation Union, the Digital Agenda and other EU 2020 Flagships. (more details about P2Ps and PPPs below). Source: Presentation of George Van Goethem on Horizon 2020 on 16.4.2012

- In order to maintain the Union expertise, the programme shall further enhance its role in training through the support to training facilities of pan-European interest.

Euratom Programme 2014-2018: Budget: TOTAL in current (2011) prices: € 1665 million, including Fission €336m; Fusion € 673m; JRC € 656m

- What is new?
 - Stronger focus on nuclear safety and nuclear training
 - A single Euratom programme bringing together three separate decisions
 - The same rules for participation as in the Horizon 2020 - simplified access
 - Programme contributes to the implementation of priorities of the 'Horizon 2020'
 - Fusion research programme will be restructured
- Funding for ITER outside MFF in a separate supplementary programme: € 2573 million for 2014-2018

Also in the education and training domain there will be changes: From the “Lifelong Learning Programme” (2007 – 2013) to “Erasmus for all” (2014 – 2020).

7. News from IAEA KM

Monica Scaffoni presented the latest relevant happenings in IAEA KM. The hottest topics, she said, for sustainable development are human resources and safety culture.

In the IAEA Action Plan on Nuclear Safety, established during the last General Conference (12 main actions), action 9 refers to Capacity building: to strengthen and maintain capacity building:

*“Strengthen, develop, maintain and implement their **capacity building programs, including education, training and exercises at the national, regional and international levels, to continuously ensure sufficient and competent human resources necessary to assume their responsibility for safe, responsible and sustainable use of nuclear technologies**”* (Source: IAEA Action Plan on Nuclear Safety, Presentation of **Monica Scaffoni** during SAG 5 on 16.4.2012).

There are 4 pillars regarding Capacity building:

- ✓ Education and Training
- ✓ Human resources development
- ✓ Knowledge Management
- ✓ Knowledge networks

Other IAEA actions:

- IAEA Education and Training Working Group
- Knowledge Networks
- Improve access to high quality resources
- E-learning material creation and dissemination
- Cyber learning platforms, Communities of practice

Among the latest relevant documents of IAEA are:

- Status and trends of nuclear E&T
- Core competences (a document about to be published. These competences are for the nuclear engineering student/graduate
- Advancing Nuclear Engineering teaching

As for the IAEA Global Survey that is being conducted at the moment it was said that it is a Global Nuclear Power Industry Workforce Survey.

Brian Molloy, Christine Messer have adapted the methodology from the US (France, China, Russia input missing).

Work on the Educational Capabilities:

- Through the educational networks , Asia, Latin-America and Africa
- Data Base – Cooperation with JRC (EHRO-N)

8. News from OECD/NEA ETKM

Ron Cameron spoke about the latest information form OECD/NEA, which has no legislative power, is much smaller than the IAEA and exists to provide advice to its 30 member countries.

The activities in E&T are the state of the art reports, the nuclear law school, knowledge management activities in all divisions; coordination of projects and access using nuclear facilities in member countries; maintenance and management of access to computer codes and integral experiments through its databank based on 50 years of worth of knowledge.

The report of OECD/NEA: Nuclear Education and Training: from Concern to Capability came out in April 2012².

The report contains 3 sections: 1) review since the previous report Cause for Concern in 2000; looking at government, industrial and academic initiatives in member countries to deal with the supply of skilled workers. Finding: 1) overall a sustainable pipeline has not yet been achieved in all countries; education and training programmes and certification should recognize the mobility of workers and the need for mutual recognition; education and training programmes need to consider the full range of workforce needs (the workforce ‘pyramid’) 2) utilization of research facilities: there are 2 problems: closing down of facilities and non-utilization of facilities to the optimum; 3) job taxonomy system was outlined/categorize sectors by job profiles; Finding: an accreditation system missing in the training area! The Executive summary can be downloaded from the OECD/NEA website. The report can be purchased for 60EUR or can be obtained via **Ron Cameron**.

Ron Cameron also mentioned that in the week following the SAG meeting a debate on Education & Training will take place at the OECD/NEA.

9. News from ENS E&T

Emilia Janisz informed the SAG members of the upcoming conferences organized by ENS:

1) **RRFM/IGORR 2012: Session Utilization of Research Reactors**: presentation of CEA, MIT or Pennsylvania State University –importance of the Research reactors as E&T tool

2) **Top Safe 2012:**

- Session Safety Culture & Management of Safety: presentation of IAEA and Catholic University of Louvain – importance of the nuclear E&T regarding the safety at nuclear installations
- The session E&T: presentation of OECD on competences taxonomy in nuclear

3) **ENC 2012: Session Education, training and knowledge management**

4) **IYNC 2012:** Presentation of ET&C Platform

5) **2nd International Nuclear Congress:** Presentation of ET&C Platform.

The cooperation between ENS and EHRO-N since SAG 4 was related to the:

2 <http://www.oecd-nea.org/tools/publication?query=&div=NDD&lang=English&period=2y&sort=date&filter=1#p6979>

- MoU with ENEN and a further letter of intent with EHRO-N
- Information exchange between the databases on education and training opportunities (e.g. EHRO-N University locator and ENEN courses)
- Distribution of the EHRO-N questionnaire to ENS MS and ENS corporate members
- Recommendation letter to the JRC Director on including the non-EU countries with nuclear program into the EHRO-N questionnaire

ENS cooperates also within the SET Plan initiative: “*The objective of the assessment report (of the SET Plan initiative) is to address the state of play and needs per job categories (technicians, engineers, scientists) as well as describe the actions required (in relation to undergraduate, graduate, post-graduate education, life-long training, reconversion schemes, professional training) within nuclear energy technology sector*” (source: Presentation of **Emilia Janisz** during SAG 5 on 16.4.2012).

Emilia Janisz informed the SAG members that a Career event within the ENC 2012 is envisaged on 09.-10.12.2012 called: “Create your energy future”.

Vladimir Slugen added that at the beginning of 2013 there will be a radiation protection conference organized by ENTRAP.³

Georges van Goethem added that the SET-Plan (Strategic Energy Technology plan) has 2 related initiatives: 1) on material research 2) on education and training; the research is divided between wind, solar, CCS, coal, nuclear, etc.; Objective of the SET-Plan initiative is to have by 15.5. a first draft of the SET-Plan report (on education and training situation in the ten energy domains and in two horizontal domains: horizontal aspects of E&T and systems integration).

10. News from Foratom E&T

Guy Parker said that Foratom represents 16 national associations within the EU and that a task force on E&T exists within Foratom since 18 months now. Most of the members in this task force are from non-utilities. The last meeting of the Foratom E&T task force meeting was in Tarragona at the end of February 2012.

Foratom is also involved in the SET-Plan initiative.

Relations between Foratom and IAEA: a newly signed practical arrangement has opened the way to further cooperation in various new areas.

News from EU member countries: developments in the UK: the issue about how to find the money for the new-build; situation regarding the nuclear E&T in Germany: maybe interesting for EHRO-N to explore the changes in the nuclear E&T infrastructure in this country and the effects for the wider nuclear energy community in EU-27 in the future.

11. News from IGD-TP

Marjatta Palmu presented the status in April 2012 of the Development of the Implementing Geological Disposal of Radioactive Waste Technology Platform (IGD-TP)⁴.

³ENTRAP is devoted to joint activities related to the verification of conformity of conditioned radioactive waste with regulatory specifications and criteria. Its objectives are to promote and facilitate collaboration in the development, application and standardization of quality checking for waste packages.

⁴ <http://www.igntp.eu/>

The vision of this platform is that by 2025 the first geological disposal facilities for spent fuel, high-level waste, and other long-lived radioactive waste will be operating safely in Europe through these commitments:

- build confidence in the safety of geological disposal solutions among European citizens and decision-makers
- encourage the establishment of waste management programmes that integrate geological disposal as the accepted option for the safe long-term management of long-lived and/or high-level waste
- facilitate access to expertise and technology and maintain competences in the field of geological disposal for the benefit of Member States.

The platform was launched November 2009.

By now there were 3 documents adopted/developed:

1. Vision report in 2009 (it took 1,5 years to develop it)
2. SRA or Strategic report of July 2011 (7 key topics that are common priorities are here) (it took 12-14 months to develop it)
3. Deployment plan: draft of December 2011 (it took 8 months to develop it)

There are over 80 participants within the platform.

The key topics and heart of the SRA are:

- Safety case
- Waste forms and their behaviour
- Technical feasibility and long-term performance of repository components
- Development strategy of the repository
- Safety of construction and operations
- Monitoring
- Governance and stakeholder involvement

The cross-cutting activities are:

- Dialogue with regulators,
- Competence maintenance, Education and Training (CMET),
- Knowledge Management (incl. information preservation, memory keeping),
- Communication interfaces and other activities supporting information exchange.

The working groups (WGs) of the IGD-TP are divided into organizational WGs and Technical WGs.

The CMET WG areas are:

- Transfer of the state of the art in GD, the competence analysis and needs derived from the deployment of the SRA
- Quality assurance of training provided for new and experienced professionals (including ECVET approach on learning outcomes and their accreditation irrespective of the way of acquiring them)
- Develop the content of training i.e. "Curricula" for professionals in geological disposal for the development of joint training or engaging educators and trainers into developing E&T (NOT to be a provider, but to show the directions of CMET needed)
- Ensuring indirectly that providers for CMET exist i.e. ensure the sustainability of providers and infrastructures/facilities.

All relevant decision making bodies from EU member countries are members of the IGD-TP as well.

As for the need of competent workforce *Marjatta Palmu* said that a fairly small amount of people will be needed in the future in the area but if we talk about the lack of people at the front end, we should also look closely at the lack of people at the end of the line!

Hubert Flocard asked how far is the development of the content of the training i.e. "Curricula" for professionals in geological disposal.

Marjatta Palmu responded that this curriculum is not yet developed, since the group has not started to operate.

Monica Sbaffoni commented that the recently launched platform CONNECT contains a section on geological disposal.

<http://nucleus.iaea.org/sites/CONNECT/Pages/default.aspx>).

12. ECVET

Alicia Lacal Molina mentioned the activities within ECVET team during 2011 until March 2012:

1. Identification of competent European Certification Bodies and of a Database for the Learning Outcome Approach between Home and Host Institutions within ECVET Partnership
2. Development of IET-JRC's documents
 - a. IET-JRC Team Documents
 - b. ECVET Nuclear Job Taxonomy Meeting Documents
3. Development of Reference Documents (for other institutions)
 - a. Legal documents
 - b. Information documents
 - c. Other
4. ECVET Nuclear Job Taxonomy Workshops (NJTW)
 - a. 1st NJTW⁵: Bergen (The Netherlands, 10th – 14th October 2011)
 - b. 2nd NJTW: Petten (The Netherlands, 20th – 24th February 2012)

Between April 2012 and December 2012 the ECVET team activities will be:

1. Database updating (KSC's catalogue, MoU, LA, etc...)
2. Disseminate the possibilities of the ECVET system using the EHRO-N website (open a section for ECVET users)
3. ECVET customized seminar for the Nuclear Energy World Seminar (possible Brussels, July 2012). **The aim of this customised seminar is to increase the visibility of ECVET in the nuclear world (cooperating with DG EAC in this process is very important)**
4. ECVET Nuclear Job Taxonomy Workshop: 3rd NJTW: probably at CEDEFOP, Thessaloniki, October 2012) (this workshop is supposed to be the last one, but it doesn't imply that the activity is finished, since the taxonomy will be verified by different experts as well as nuclear platforms). **The goal of the workshops is to have a good view of the skills and competences expected for the human resources in a NPP's live cycle.**

ECVET conclusions on the job taxonomy exercise within the 3 above mentioned workshops:

- 1) it needs improvement constantly
- 2) it is expected to be finished within the 3ed workshop, but activity goes on
- 3) a report due after the 3ed workshop; feedback is expected from SAG experts.

⁵ Nuclear Job Taxonomy Workshop

During the discussion **Hubert Flocard** (similar question by **Jose Luis Delgado**) asked what the objective of the mentioned customized seminar is and when exactly it will be held. **Alicia Lacal Molina** answered that the main objectives of the seminar are: transfer of ECVET objectives and principles, as well as networking. The objective is also to have feedback from the ECVET experts.

Marjatta Palmu commented that among the target groups in the seminar should be sitting also apprentices. **Georges van Goethem** said that already now ECVET team may apply to DG EAC funding schemes in support of its activities.

Georges van Goethem said that taxonomy and accreditation issues were mentioned at the 17th ENSREG meeting on 24 February 2012. He believes that in ENSREG the right people are gathered who can un-block the barriers that exist that are related to ECVET.

Higher level education jobs in the nuclear power plants and fuel cycle facilities that require a national licensing qualification are:

- SPAIN (CSN): reactor operator, shift supervisor, chief of radiological protection service
- UK: HM inspector (HSE), nuclear waste assessor (environment agency)
- BELGIUM (FANC): radiation protection expert (= “health physics expert”, Class 1 academic)
- ROMANIA (CNCAN): director for nuclear safety, chief of radiological protection service, training responsible
- FINLAND (STUK): manager of NPP and his/her deputy, reactor operator, chief of radiological protection service, individuals responsible for (1) emergency response arrangements, (2) physical protection, (3) nuclear material safeguards
- HUNGARY (HAEA): reactor operator, shift supervisor
- SLOVENIA (URSJV): reactor operator, shift supervisor, chief of radiological protection service (for both NPP and research reactor).

For more information see the uploaded presentation on the website <http://ehron.jrc.ec.europa.eu/> (you need to have an account).

Georges van Goethem said that there is a need to harmonize E&T (there is a hint on this in reports of Melodi, IGD-TP, within the nuclear engineering platform there is also a proposal in this direction). He added also that one consequence/implication of Fukushima accident will be the revision of Euratom and of the existing platforms.

Hubert Flocard asked whether the ECVET taxonomy implies only taxonomy for human resource in the NPP life cycle or starting already from mining. He asked also if the OECD taxonomy (presented in the recently published document *Nuclear Education and Training: From Concern to Capability*) is being used also by the ECVET team in JRC-IET. **Alicia Lacal Molina** answered that the taxonomy takes account of the design, operation and decommissioning of NPP, so it only deals with the NPP cycle. At a later stage it will be possible to go further as there will be a point of reference. As for the OECD taxonomy, **Alicia Lacal Molina** answered that this taxonomy has not yet been used at this stage, but that it will be used. She added that the challenge has been to make the OECD layout applicable to the ECVET.

Marjatta Palmu commented that in the process of the Job taxonomy development the European qualification framework (EQF) could be very useful: only the content of profiles could be changed, but the level of outcomes should be harmonized with EQF.

Ron Cameron asked what you see is the outcome; who will own this process; what is the timeframe?

Alicia Lacal Molina answered that the aim is a complete taxonomy for the NPP cycle; the first draft report is supposed to be finished by the end of the year.

Ron Cameron asked about who the user will be of the ECVET taxonomy.

Marjatta Palmu answered that it would be used by organisations like where she comes from (Posiva⁶). She added that in many HR competence systems there are similar instruments and that this practice could be transferred to the nuclear sector. There are practical problems though: for e.g. do we address the minimum requirements or specific level of requirements etc. She believes that there will be a lot of ‘lessons learned’ in this process.

David Gilchrist did not share the opinion that the main barriers for mobility of the jobs enumerated in the presentation of **George Van Goethem** (see above *Higher level education jobs in the nuclear power plants and fuel cycle facilities that require a national licensing qualification*) are the national licensing procedures. He said that this might have been true 2 years ago, but today the situation is that even if you are qualified, that does not mean you can operate in a year time. The main barrier today is the way one gets to sit an exam. Once a person passes the exam, there should not be the problem to employ that person. We should rather focus on the HOW.

George Van Goethem said that ENSREG should look at the new passport and give blessing to the new way of acquiring knowledge and skills. The whole curriculum would not be open to mobility.

David Gilchrist went further saying that the true barrier are the prescriptive requirement (one should pass certain tests; certain body needs to give one a license etc.). The regulator is really interested if one has passed the required PROCESS.

Ron Cameron said that national regulation is inconsistent which then makes the training difficult. The performance requirements in one country should be similar to the performance requirements in another country: at the end we want to have ABLE people.

Monica Scaffoni asked what the end result of this exercise is supposed to be.

Ulrik von Estorff/Alicia Lacal Molina answered that the aim is to design a tool, maybe in the direction of something similar to Bologna for the higher education.

Jose Luis Delgado proposed to write a roadmap.

George Van Goethem said that this process is expected to be long: 10-20 years. He added that EQF is the bottleneck in the EU in general, because the industry and academia do not agree on the list classification of the levels.

Luc Vanhoenacker said that the most important barrier for mobility is the language.

13. End-of-the-day Discussion (there was a chance for those that would not be present at the discussion on 17.4. to sound their recommendations to be added/taken into account in the first EHRO-N report on the supply/demand the nuclear human resource situation in EU-27)

Vladimir Slugen said that the international cooperation in education is very important and it has to be rooted in the national educational system. The final responsibility regarding the qualification of the workforce lies on the national governments, more particularly on the regulators. The advice was that EHRO-N should observe also regulatory authorities and the ways they are keeping the nuclear knowledge in the country at a certain level.

⁶ http://www.posiva.fi/en/nuclear_waste_management/nuclear_waste_management_in_finland

Ron Cameron wondered about the overall goal of EHRO-N and recommends drafting a Road Map.

Ulrik von Estorff responded that DG ENER is the internal EC-customer for EHRO-N but that EHRO-N should fulfill the needs of the nuclear energy stakeholders. So, EHRO-N follows and implements the policy of the EC, but at the same time it has a certain room of maneuver (embodied through the SAG recommendations). However, respecting the subsidiarity principle, EHRO-N can only offer to act as a platform/coordinator/facilitator at European level. If at one time in the future it is decided that EHRO-N is not needed anymore, EHRO-N would stop its activities. **Ulrik von Estorff** confirmed the need expressed by Ron Cameron that an internal vision document or road map on EHRO-N needs to be written. He also explained the proposal from DG ENER regarding the Directive from 19 July 2011 on the safe management of spent fuel and radioactive waste, which should be finalized by 23.8.2013; by then MS need to prepare their national programs⁷. A potential task for EHRO-N could be to find out how much and/or what profiles of experts should be expected to be sufficient per EU MS in the area of radioactive waste management and spent fuel, according to the status of NPP in each MS. This could be done as follows: option 1: we undertake a second more detailed questionnaire (see Annex 4 in Putting into perspective report) to be achieved as a part of a bigger task to gather more detailed HR figures; option 2: we undertake a more detailed study on HR figures in few carefully chosen fields (ex. radioactive waste, welding, instrumentation and control, ...) based on the indication for (most) needed profiles. No direct recommendation was given.

Georges van Goethem also commented on this paper saying that there should be added a piece of history in the direction of EC policy being all about free circulation of goods, people, service and knowledge. Moreover, after Fukushima the EC is concerned about the level of safety in general; The tool for the free circulation of qualified personnel in the nuclear sector could be ECVET. He said that ECVET was for the first time mentioned at the 2002 Copenhagen conference and that 17 billion was dedicated for this purpose. So, there is money, there is a strategy and a roadmap, only the EQF, the taxonomy, and the accreditation remain the barriers at this moment.

Victor Sanchez-Espinoza said that as for nuclear safety a harmonization of national atomic regulation within Europe is needed. Without harmonization/better coordination there will be no free transfer of workers. He suggested that a recommendation in this direction is put in the EHRO-N recommendations (discussed more extensively on 17.4.).

Monica Sbaffoni said that as there are safety standards in place, harmonization/better coordination measures could not be enforced. Also some other SAG members had a different view on the suggestion of **Victor Sanchez-Espinoza**.

Georges van Goethem proposed to add two recommendations:

1. to suggest to existing platforms and DG ENER to stress nuclear E&T more in their future documents (especially in the binding documents like Directives). There is also a need of more budget on this;
2. ask Eurostat⁸ to be more detailed on nuclear education in their future surveys
3. to stress the need for university-industry synergy.

Marjatta Palmu said that Eurostat surveys depend on national inputs that changing the Eurostat statistics would mean changing the national statistics.

⁷ Article 8: “Member States (...) to make arrangements for education and training (...) to cover the needs of the national programme for spent fuel and radioactive waste management in order to obtain, maintain and to further develop necessary expertise and skills”

⁸ The Statistical Office of the EU.

Vladimir Slugen commented on the fact that Nuclear Education is moving from university to the “garage” courses and that keeping research infrastructure at universities is very expensive. He agrees that the university-industry collaboration is important but it can be observed that the industry does not invest in it. The only remedy for this is investment from the governments.

DAY 2: 17 April 2012

The second day of SAG followed these topics:

1. Information of the benchmarking exercise (related to the supply side of EHRO-N data)
 2. EHRO-N Putting into perspective report: presentation of changes made since SAG 4 and discussion on the recommendations
 3. Presentation of EHRO-N website: changes/additions since SAG 4
 4. Workplan of EHRO-N for 2012: discussion on studies to be done
 5. Presentation of Nuclear Fuel Cycle HR Needs Analyses by SAG member Ferry Roelofs.
 6. Information on Mobility study
 7. Information on E&I workshop in second half on 2012
1. The progress of the benchmarking exercise was presented by *Ulrik von Estorff*. The conclusions were that:
- there were only few National centralized supply/demand studies for the nuclear HR
 - when the National information was available centrally, it was used with the best interpretation possible
 - when the information was not available, it was either:
 - tried to reconstruct through other sources than initially used by EHRO-N
 - best estimates from available reports and figures were made.

For more information see the uploaded presentation on the website <http://ehron.jrc.ec.europa.eu/> (you need to have an account).

2. *Veronika Simonovska* presented the changes made since SAG 4 to the EHRO_N Putting into perspective report. A lengthy discussion followed regarding the recommendations for the nuclear energy sector that will be included in the report. The discussed changes were directly added to the report. A final draft version is to be sent to the SAG members on 23.4.2012. The aim is to have a final report prepared by the end of the month and a publication of the same by 15.5.2012 (which is the data for the first draft report of the SET Plan initiative).

3. *Marcelo Barboni* presented the newly added maps of Training Facilities and Training providers on the EHRO-N website. As for the List of Training course he said that a search engine should be added. *Monica Sbaffoni* asked if training descriptors are being used here. It would maybe be very useful to develop a nuclear E&T taxonomy. In any case a keyword indexation would be necessary for searching. *Marcello Barboni* answered that a keyword search is already implemented, but taxonomy would be of additional value. *Marjatta Palmu* proposed to use the already developed framework for the SET plan initiative (by *Marjatta Palmu* and *Veronika Simonovska*) as a basis for the development of training descriptors.

4. Workplan of EHRO-N 2012.

The questions for 2012 are:

- a. should we stay on general EU-27 level or go more into detail

- b. should we observe situation in EU-27 by grouping countries according to their levels of “nuclear development”
- c. should we do the modeling as was done for e.g. by NRG (as presented by Ferry Roelofs)

Jürgen Krone said that the figures in the report are dominated by French and UK figures since 60% of demands arise from these countries. But the fact is that each country should provide sufficient HR to promote safety. Having an average view does not address the specifics that are safety related. That is why he thinks that we should address more the specifics of countries and that we should group countries according to similarities. **Simonne Henrard** agreed with this.

Matrjatta Palmu suggested to group countries in a matrix of countries: for e.g. sufficient/insufficient demand/supply.

5. **Ferry Roelofs** presented a study done by NRG based on a very ambitious pre-Fukushima growth scenario for nuclear energy. The assumptions were that there will be a:

- Phase out of current reactor park (2030-2050)
- Replacement by Gen III LWRs
- 400 LWRs (1400 MWe) in 2100

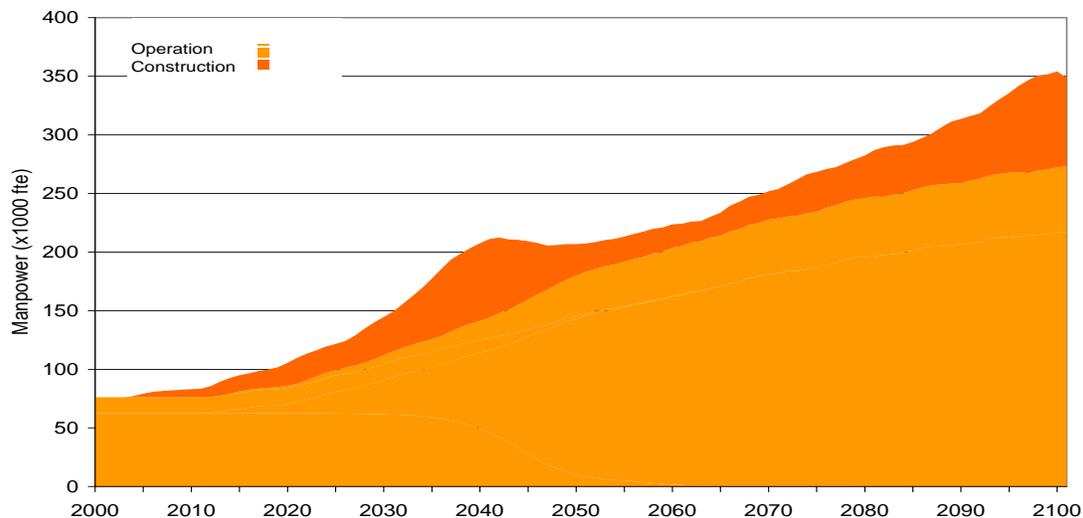
The Manpower requirements were estimated like this: Manpower for operations On-site 400 workers at 1000MWe reactor

– Model: $\text{fte} = 400 \cdot \ln(\text{Power} + 400) - 2450$

The Manpower requirements for construction were based on IAEA data.

The result was this:

- On-site operation
 - Steadily rising from 75 000 to 275 000 fte
- Construction
 - First peak to construct required fleet of Gen-III reactors around 2035
 - Second peak in construction manpower 2090-2100



Source: NRG

For more information see the uploaded presentation on the website <http://ehron.jrc.ec.europa.eu/> (you need to have an account).

SAG members questioned the reliability of information of the subcontractors (*Marjatta Palmu*), the peaks in the graph above (*Jürgen Krone*). Furthermore, the discussion revealed that the scenario considerations before going into this kind of studies are very important (*Ron Cameron* and others). *Guy Parker* commented that the OECD scenario is better than the EC scenario for nuclear. What has already worked out in the past (1970's) should as well be utilized, was the comment (*David Gilchrist*). *Marjatta Palmu* suggested to first identifying what type of limiting factors can impact the outcome the figures. *Monica Sbaffoni* suggested also looking at what the rate of retirement in 5-10 years will be; she added also that to look further than 2050 is pure a science fiction for her. When *Ulrik von Estorff* asked the SAG explicitly, if a study like this with EHRO-N data would be useful, *Jürgen Krone* proposed a need analysis based on EHRO-N data and the SAG agreed with the option to use the EU and the OECD scenarios, considering as well the volume-capacity to produce RPVs. The retirement replacement need is known, but the need for new construction would be a particular interest.

Marjatta Palmu stressed the need of establishing national contact points for EHRO-N similar to how it is in Finland.

Guy Parker informed SAG members that the so called “PINC document” of 2008 is being currently updated by DG ENER (in Ute Blohm-Hiebers Unit, DG Energy). They are going to include in this year's (or early 2013) PINC (Nuclear Illustrative Programme) information related to “Socio-Economic role of Nuclear Energy to Growth and Jobs in the EU for time horizon 2020-2050”. His understanding is that it will be used as an input into a broader document called “Energy Strategy for Growth and Jobs”. He proposes, that EHRO-N's work does have a role to play in this ‘Socio-Economic role of NE’ paper as it is looking at employment figures for the sector and potential for growth and economic benefit to the economy (life-time extension, waste management, decommissioning and new build projects) up to 2050. If jobs growth, what jobs will be created and who are they looking for (for example). In future EHRO-N could also be asking Industry/Member States for employment figures for the sector. He expressed his opinion that the EHRO-N work could provide an important input to this area of the PINC.

6. *Veronika Simonovska* informed the SAG members of an ongoing study on the inevitability of mobility for the skilled personnel within EU-27 and on the recognition procedures of qualifications in different member countries. Results of the study are expected to be presented at SAG 6.

7. *Ulrik von Estorff* informed the SAG members about the organization of the E&I workshop to be held together with SAG 6 on chosen dates at the end of September/beginning of October 2012.

SAG members need to inform EHRO-N team about the dates when they wish this workshop to be held. Proposals will be sent by EHRO-N team to SAG members with the minutes on 24.4.2012.

ANNEX 2



EUROPEAN COMMISSION
DIRECTORATE-GENERAL JRC
JOINT RESEARCH CENTRE
Institute for Energy and Transport



Petten, October 2012

JRC/F4/EHRO-N/SAG meetings/SAG 6 E&I

Minutes of the
6th Senior Advisory Group (SAG) Meeting
of the
European Human Resource Observatory in the Nuclear Energy Sector
and
Enlargement and Integration workshop
(together with a visit to the Energy Institute of the Istanbul Technical University)

DAY 2: 27 September 2012 (SAG/E&I workshop)

Place: *Istanbul, Turkey*

SAG Participants: *Emilia Janisz, Georges van Goethem, Hubert Flocard, Juergen Krone, Simonne Henrard, Jose Luis Delgado, Helmuth Böck, Markus Salletmaier, Jorma Aurela, Tatiana Karseka, Yanko Yanev, Anselm Schaefer*

Enlargement and integration (E&I) workshop participants: *Zdravko Spiric (Croatia), Marco Streit (Switzerland), Dragana Nikolic (Serbia), Nikola Cavlina (Croatia), Anton Causevski (Macedonia)*

Excused SAG members: *Brian Murphy, Eckhard Nithack, Niina Yliknuussi, Ute Blohm-Hieber, David Gilchrist, Guy Parker, François Weiss, Monica Scaffoni, Hans-Werner Otte, Victor Sanchez-Espinoza, Luc Vanhoenacker, Marjatta Palmu, Ferry Roelofs, Vladimir Slugen, Brian Molloy*

E&I workshop - missing participants: *Galip Buyukyildirim (Turkey), Velko Velev (Macedonia)*

Participants from JRC: *Ulrik von Estorff, Veronika Simonovska, Alicia Lacal Molina, Gianluca Ferraro (instead of Veronika Simonovska as of SAG 7)*

The chairman was **Ulrik Von Estorff**. The points covered in the workshop were as follows:

1. News from ENEF Sub-WG E&T and EC communication (Ulrik von Estorff).

There is no recent news as the group has not been convened since some months.

2. News from SNE-TP ETKM⁹ (Anselm Shaefer)

ETKM was not very active the last 1,5 years. The last report on nuclear E&T is from 2010. Next significant report to be published will be by the SET Plan (with 13 recommendations).

All recent reports (from EHRO-N, IAEA, SNE-TP, future SET Plan report) enumerate some 50 recommendations which overlap – this number needs to be reduced by 50% using two criteria: impact and feasibility.

3. News from ENEN and DG RTD (Georges Van Goethem)

Georges Van Goethem gave recent news from DG RTD. Among the central news is the Horizon 2020 (cca. 80 Billion EUR funding including Euratom between 2014 and 2020):



Horizon 2020

= Common Strategic Framework for
research, innovation and technological development

Three main areas, firmly anchored in the Europe 2020 strategy:

- excellence in the science base
- tackling societal challenges
- creating industrial leadership and boosting competitiveness.

⇒eliminate fragmentation and ensure more coherence,
including with national research programmes



"The budget will invest in Europe's brains by increasing the amounts allocated to education, training, research and innovation. These areas are so crucial for Europe's global competitiveness so that we can create the jobs and ideas of tomorrow."

A Budget for Europe 2020, Brussels, 29.6.2011 COM(2011) 500
(= Multiannual Financial Framework /MFF/ 2014 – 2020)
Jose Manuel Durão Barroso, President of the European Commission

⁹ Education and Training and Knowledge Management group



Euratom (2014-2018) within Horizon 2020

Budget TOTAL: € 1788 million, including Fission €355m; Fusion € 709m; JRC € 724m. Funding for ITER outside MFF in a separate supplementary programme: € 2573 million for 2014-2018

Specific objectives for Research & Innovation indirect actions

- support **safe operation** of nuclear systems;
- contribute to efficient solutions for the **management of ultimate waste**;
- Support development and maintain **nuclear competences**;
- foster **radiation protection**;
- ensure availability of **research infrastructures**

<http://ec.europa.eu/research/horizon2020/>

Perfect link with FP7

As for the implementation of ECVET principles (see below), these Euratom Fission Training Schemes were mentioned:

Euratom co-funding of training schemes and qualification processes at EU level, in areas of nuclear fission and radiation protection (each EFTS: Euratom FP-7 "coordination action", 3 years, total budget of circa 1 000 000 Euros)

- (1) TRASNUSAFE: 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
- (8) GENTLE : Graduate and Executive Nuclear Training and Lifelong Education

Link: <http://www.enen-assoc.org/en/training/for-nuclear-community/efts-fp7.html>

4. News from IAEA (Tatiana Karseka)

Discussion:

- IAEA conference on capacity building and HR development is planned for 2014/15
- IAEA has not yet drawn lessons from the Fukushima accident
- Training on building competences and capabilities are a major part of the IAEA action plan
- Harmonization of nuclear E&T with a focus on safety culture; global initiative
- Safety comes from knowledge and competence!
- What is safety culture; put on EHRO-N agenda/roadmap to define this issue (**Georges van Goethem**). **Yanko Yanev** agrees. Also IAEA safety Standard Management tool is under revision (competences and knowledge will be a strong part of it)

- Cooperation between ENS, ENEN and EHRO-N was proposed to be increased (**Helmuth Böck**): but it is already existing for the websites.

5. News from OECD/NEA ETKM

There were no new from OECD/NEA this time as **Ron Cameron** was not present.

6. News from ENS (Emilia Janisz)

Emilia Janisz gave some news on the European Nuclear society's activities in 2012. 2012 started successfully, with three out of the five conferences on this year's ENS events calendar taking place. PIME, RRFM and TOPSAFE have established themselves as regular fixtures on that calendar and were all very well- attended. The feedback from participants on all three was positive. These conferences are part of the backbone of the work that the Society carries out for its members. In the coming months these conferences will be held:

-**European Nuclear Conference (ENC)** in Manchester, UK, between 9 and 12 December 2012

-**PIME, the conference on Public Information Materials Exchange**, is the annual focal point for professional nuclear communicators all around the world; it will be held between 17 and 20 February 2013 in Zurich, Switzerland.

ENC2012 will provide the stage for a get-together of the whole European Nuclear Society community. In addition to the technical program, which will feature papers submitted from all over the world, the conference will be accompanied by a large industry exhibition. Furthermore, for the first time, ENS will organize a careers event, which will run parallel to the conference. This event will bring together our YGN members (and those who might provide the next generation of YGN) and our Corporate Members - their potential future employers. The idea behind this initiative is to enable all our members to benefit from the Society's considerable network of contacts and to concentrate on the important issue of recruiting new professionals to the European nuclear community.

For more, see also: <http://www.euronuclear.org/welcome.htm>

7. News from Foratom (Marco Steit)

Guy parker, a member of SAG and representative of Foratom was not present. **Marco Streit**, president of ENS, gave a short presentation of Foratom's recent activities.

See: <http://www.foratom.org/>

8. EHRO-N website – presentation (Ulrik von Estorff)

Ulrik Von Estorff presented to the E&I participants the EHRO-N website's content. It was observed that an update of the Stakeholders maps is needed. SAG members were asked to report mistakes. Google maps will in the future include also links to relevant E&T organizations and companies in the E&T countries.

9. E&I countries presentations:

- **Croatia**

Zdravko Spiric gave a short presentation on behalf of OIKON Ltd. – Institute for applied ecology. Some information from his PPT:

Overview with the Universities in Croatia

University of Zagreb	Master Programme of Electrical Power Engineering MSc Study programs of Electrical Power Engineering MSc study programs of Electrical Engineering Systems and Technology Graduate study
University of Split	Power Engineering
University Rijeka	Bachelor of Radiology Medicine
Polytechnic for Applied Health Studies	Courses of Radiology Technology

<http://www.euronuclear.org/1-education-training/croatia-uni.htm>

Nikola Cavlina

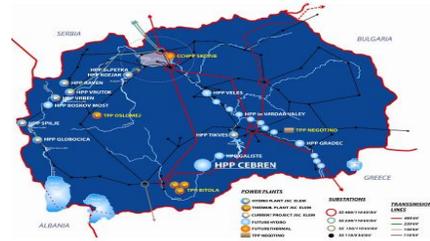
Nikola Cavlina informed about the news since the E&T workshop in Dubrovnik in September 2011. The Croatian government needs still to decide on the future of nuclear in the country by the end of 2012.

Dicussion: Georges van Goethem asked about the process of the mutual recognition of competences in Krsko NPP (mixed ownership between Slovenia and Croatia). **Nikola Cavlina** responded that the safety is the responsibility of the plant and the 2 utilities (owned by the two governments respectively) are the owners of the plant. The competences are thus responsibility of the plant. About the issue of security it was said that E&T should deal also with security issues (**Georges Van Goethem**) and that design plans for NPP should include airplane impact (**Dragana Nikolic**).

- **Macedonia**

Anton Causevski presented the energy situation in Macedonia as well the considerations of starting a nuclear program in the country:

Macedonian Energy Situation



- ⊗ In 2010 Macedonia imported 40% of primary energy needs, and about 15% of electrical energy needs
- ⊗ Key energy source has been lignite obtained by surface mining
 - ⊗ Thermal energy – operating – 820 Mwe (~700 MWe Bitola TE, and Oslomej ~ 125 MWe)
 - ⊗ Thermal energy – reserves – 450 MWe
 - ⊗ Hydro energy – water availability dependent – 600 MWe
- ⊗ Coal reserves are being depleted in the next 5-15 years, and also all of the coal-fired power plants need refurbishment
- ⊗ Other energy sources include hydro, gas, and wind energy
- ⊗ Macedonia planning to further develop up to 2020
 - ⊗ Hydro energy utilization – large to ~700 MWe, and small 160 MWe
 - ⊗ Combined electrical heating gas fired plants – ~ 500 MWe
 - ⊗ Wind power plants – ~200 MWe
- ⊗ Planned new capacities do not meet the energy demand beyond 2035
 - ⊗ Nuclear power plant as an option for energy supply after 2030

8

Other information given was that the Macedonian government has accepted national energy strategy until 2030 (one option for satisfying energy needs beyond 2035 is to build one NPP).

During the **discussion** it was asked if the possibility existed for an Eastern European initiative in nuclear E&T (**Helmuth Böck**), and also about the way of filling the gap of some 2000 GW/h in the future (**Ulrik Von Estorff**). It was said that indeed, the E&I countries are not involved currently in the nuclear power training programmes (**Anselm Schaefer**) and that in order to fill the 2000-3000 GW/h gap, the country is in trouble because the v=coal is exhausted and that gas was only available in the long-term.

- **Serbia**

Dragana Nikolic presented the situation in Serbia as concerns nuclear energy.

History of nuclear sector

(contd)

Education in Nuclear Engineering



Tradition in nuclear engineering :

Faculty of Electrical Engineering, University of Belgrade
Department for Engineering Physics



Institute of Nuclear Sciences "Vinca", Belgrade

Existing educational programmes

Undergraduate & Master degree studies:

Bio-medical and ecological engineering

- ❖ Module comprises 5 courses (6 ECTS each)
 - 3 mandatory courses, 2 courses elective
 - Nuclear
- ❖ Master thesis (30 ECTS)
- ❖ Total **60 ECTS**

PhD studies: Nuclear, medical and ecological techniques

- ❖ Total **180 ECTS**
 - Radiation protection and Dosimetry
 - Selected chapters from Nuclear physics
 - Nuclear reactor theory
 - Numerical simulation of nuclear & radiation processes
 - Methods in Nuclear, Medical & Environmental Measurements

Summary

- Employment of suitably skilled people in the application of nuclear and radiological technology is of more significance than in any other sector
- Worrying strategic shortfall has been encountered: an absence of overall responsibility
- State has obligation to ensure that qualified staff with appropriate education, training and retraining are available for all safety-related activities in or for each nuclear installation, throughout its life (*Convention on Nuclear Safety, Law on Protection against Ionising Radiation and Nuclear Safety (Official Gazette of RS No.36/09)*)
- In the absence of the ability of the nuclear and related sectors to recruit, train and retain staff, the initiative for education and training has to be within Government, Universities and Professional Associations
- Targeted funds for improving universities' capacity to recruit and retain first-rate academics

During the **discussion** it was asked if a Balkan nuclear E&T network could not be envisaged (**Georges van Goethem**). It was mentioned these countries could as well become members of ENEN (**Anselm Schaefer**).

- **Switzerland**

Marco Streit gave a presentation on Switzerland's situation in nuclear E&T. The nuclear situation in the country is the following:

- 40% of electricity is produced nuclear
- Running oldest commercial DWR
- Reactors have unlimited licenses
- Decision to step out in the long term
- Not yet officially confirmed by the people (100 000 signatures needed for a referendum)

The **E&T institutions**:

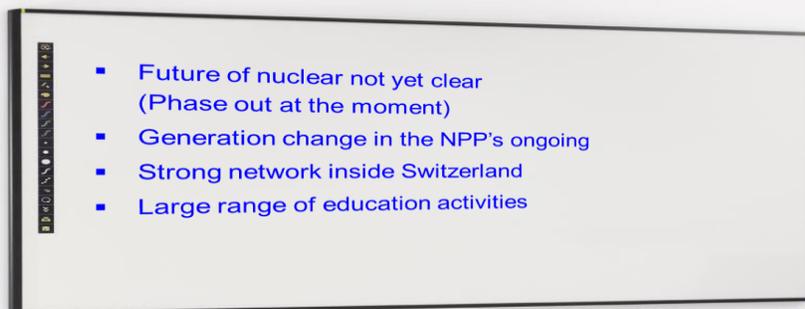
- École Polytechnique Fédérale de Lausanne (EPFL) & Swiss Federal Institute of Technology Zurich (ETHZ)

- Master program in nuclear engineering
- Master in chemistry; physics; material science; ...
- University of Geneva
 - Bachelor of Sciences
 - Master of sciences in nuclear and particle physics
- University of Bern
 - Master of science in chemistry and molecular sciences
- University of Basel
 - Master of Physics
 - Doctoral Program of the Nuclear Physics (European Graduate School “Handrons in Vacuum, Nuclei and Stars” University of Graz, Basel and Tuebingen)

The **scientific institutes** are:

- Paul Scherrer Institute, Villingen (PSI)
 - PhD Program in Natural and Engineering Sciences
 - Traineeship
 - Bachelor's, Master's and Doctoral studies
 - Special Lectures to the Nuclear Masters' Program of ETHZ & EPFL
- Reactor & Radiation protection School, Villingen (PSI)
 - Courses for the NPP Technicians
 - Certificates for NPP Operator
 - Radiation Protection Personnel at NPP
 - Medical professions
 - Emergency organizations
 - Public relations
 - Industry, trade, public authorities
- EMPA, Duebendorf
 - PhD Program in Natural and Engineering Science

Conclusion



During the **discussion** it was said that

- the student numbers in the country are stable and there is no immediate HR problem in the nuclear sector. Most of the people needed are actually not nuclear and this could be a problem for the future
- there is a 3-day basic seminar offered in the country which is open also to journalists and politicians (the response is very good)
- there is a need for a new school for geological disposal in the country besides the ITC¹⁰
- the nuclear sector in the country is very well connected and industry is very much involved as well (e.g. in courses).

10. ECVET

Alicia Lacal Molina gave feedback from the ECVET seminar in Brussels held on 25/26 September 2012. There were 20 high level participants. The impression was that the dissemination process for the nuclear ECVET needs to be improved!

11. Presentation on 2012 Study: Benefits and limitations of nuclear fission for a low carbon economy: defining priorities for Euratom fission research & training (Horizon-2020)

Georges Van Goethem gave a presentation on this Study, the objective of which is to answer “*why – and how – continue developing research and training activities on nuclear fission and radiation protection at EU level?*”. While implemented under the auspices of the DG Research and Innovation, the study will however need to consider both DG Research and Innovation and DG Joint Research Centre actions for implementing respectively indirect and direct Euratom research and training”.

Background: On **28 June 2011**, the Council reached a **political agreement on the EC proposal for a Council decision** concerning the Framework Programme of the European Atomic Energy Community (Euratom) for nuclear research and training activities for 2012-2013 (so-called “**Euratom FP7+2**”). The unanimity, required by the Treaty, was reached under certain conditions, one of which being that the **Commission should organise a symposium in 2013 on the benefits and limitations of nuclear fission for a low carbon economy**, prepared by an interdisciplinary study involving, inter alia, experts from the fields of energy, economics and social sciences.

During the discussion it was said that this study is welcomed but one needs to be careful in writing it (**Yanko Yanev**); one comment was concerning the scientific community’s (dis)ability to write (**Anselm Schaefer**); **Jose Luis Delgado** was interested in the ways of participating in the writing of the study.

12. ECVET Principles

Alicia Lacal Molina gave a presentation on the definition of ECVET, its principles and way of functioning.

ECVET today encompasses 33 countries. Next year there will be an ECVET pilot project in the nuclear energy sector.

During the **discussion** there were questions/comments:

- What does institution in the ECVET context mean (**Gianluca Ferraro**) (=institution is any private/public institution that signs the Learning agreement)
- The idea behind is mobility and Europass is like a driving licence (**Nikola Cavlina**) (= more like a CV and the local regulator will still need to agree because the MoU signed within ECVET does not change the legal system in a country! (**Yanko Yanev**))

¹⁰ <http://www.itc-school.org/>

- It is not meaningful to apply the Europass to regulated professions but international companies might need it for internal reasons and we need to think for which jobs we want to use the Europass; Not yet clear what is added value (**Anselm Schaefer**)
- What if an organization refuses to sign the Europass for a person? In Wetsinghouse they are trying to do something similar to the Europass for internal reasons and this seems already complicated enough (**Simonne Henrard**)
- Small steps approach

13. Summary

E&T countries should be involved more in nuclear E&T initiatives in Europe. Possible ways:

- Balkan network
- ENEN
- Technical cooperation with IAEA
- Regional projects

DAY 3: 28 September 2012 (visit to ITU Energy Institute)

Some SAG members and the E&T participants attended the visit of the Energy Institute of the Istanbul Technology University. The program of the visit was prepared before the actual visit along the following lines:

VISIT TO THE ENERGY INSTITUTE OF THE ISTANBUL TECHNICAL UNIVERSITY ON 28TH SEPTEMBER 2012

The Energy Institute at Istanbul Technical University (Annex 1) is a university-based research and development organization in the broad area of energy science and engineering. It provides education, research and collaborative opportunities with partner organizations and individuals.

The Institute was established in 1961 with the name of the Nuclear Energy Institute to address nuclear energy issues raised by the growing energy demand of Turkey. In 2003, the institute was renamed as the Energy Institute to form a center for advanced research into the energy aspects in a broader respect.

The Energy Institute teaching and research programs on graduate level are of an applied and interdisciplinary nature involving students, faculty, staff and off-campus persons from the fields of Science, Engineering, Architecture and Agriculture. The Institute is engaged in the collection, development, and dissemination of information and research about energy in general and sustainability for the improvement of environment quality, economics, and human life. The Energy Institute emphasizes distinguished research programs in the energy fields, complementing instruction at both graduate and undergraduate levels. It serves for identification, initiation, and execution of interdisciplinary research, policy-related studies on critical energy issues affecting Turkey, and the world. It cooperates with other research institutions (such as the Energy Institute of TÜBİTAK, and UNIDO-ICHET) and with state agencies on studies aimed at solutions of energy problems. As of the 2009-2010 academic year, 160 MSc and 36 PhD students

has been registered in the institute.

The visit of the Energy Institute by the the EHRO-N SAG members and the Enlargement & Integration workshop' participants will take place on 28th September 2012 between 9h00 and 12h00 and should include the following:

- *Presentation of the **ITU TRIGA MARK-II** and a presentation of the education and training activities performed therewith (Annex 2)*
- *Presentation of the **Nuclear Researchers Division:***
 - *Nuclear Engineering Research (Annex 3)*
 - *Radiation Science Research and also the **Radiation Science and Technology (RBT) Master Program** (Annex 4)*

Contacts and visit organisers:

EHRO-N

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Mr. Galip BUYUKYILDIRIM

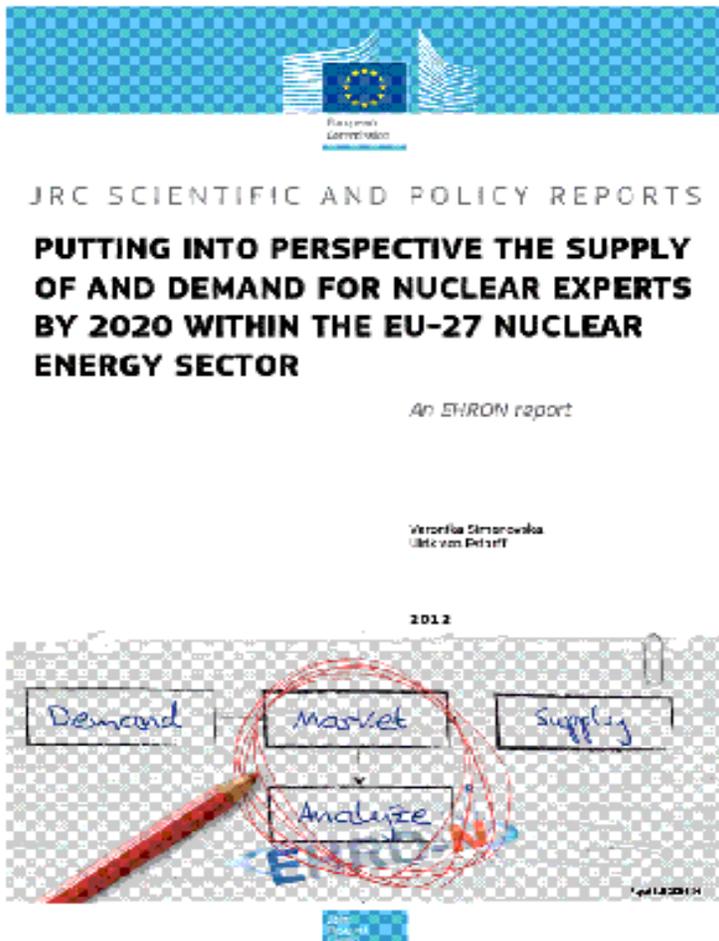
EHRO-N Enlargement and Integration workshop participant 2011

ANNEX 3

From:

http://ehron.jrc.ec.europa.eu/index.php?option=com_content&view=article&id=84&Itemid=145

30.05.2012: In its first HR analysis, EHRO-N concludes that present supply for nuclear experts in EU-27 is insufficient to cover demand until 2020 and needs a boost



On 30 May 2012 EHRO-N, the European Human Resource Observatory in the Nuclear Sector, released its first report analyzing how the supply of experts for the nuclear industry in the EU-27 responds to the demand for the same experts in the region by 2020.

The analysis was based on data received from spring 2010 to spring 2011, thus not taking the effects of the Fukushima-Daiichi accident into account. Nevertheless, the report in its current form still provides a source of relevant information for young people considering working in the nuclear industry, higher educational institutions or companies involved in the nuclear energy sector.

In EU-27, there are today around 80 000 nuclear experts or some 80 nuclear experts per 1000 MW(e) unit. Nuclear experts are estimated to represent some 16% of the total workforce in the nuclear energy sector. That is only the tip of the competence pyramid, which includes also the, so called, nuclearised employees (representing the biggest share of the nuclear energy sector workforce or some 74%) and the nuclear-aware employees (representing some 10% of the total nuclear energy sector workforce).

An alarming finding was that nearly half of the nuclear experts employed today in NPPs in the EU-27 will need to be replaced by 2020.

How does the supply of nuclear experts respond to the demand for experts in the future?

The supply of nuclear engineering graduates and graduates having had a nuclear energy related subject in their studies (some 2800 of these graduated in the EU-27 in 2009) cover up to 70% of the demand for nuclear experts in EU-27 by 2020. The demand for these experts in EU-27 is on average 4000 per year by 2020. This is the most optimistic scenario, where it is assumed that all eligible graduates get employed in the nuclear sector.

Furthermore, non-nuclear engineers (some 3200 per year by 2020), technicians (some 3500 per year by 2020) and other graduates like lawyers, business graduates, project managers, etc. (some 2500 per year by 2020) will also be in demand by the nuclear energy sector up to 2020.

Many of the mentioned graduates, especially the non-nuclear engineers, will need to be covered by the so called STEM graduates or graduates in science, technology, engineering and math.

How is this gap between supply of, and demand for nuclear experts to be bridged?

Following the principle “information is power”, EHRO-N proposes that similar surveys are conducted on a regular basis at the EU level in order to forecast trends and provide information to relevant stakeholders, which could act on its basis. For this to happen, the work of EHRO-N needs active support by the national governments (e.g. by coordinating and organizing their national information), nuclear safety authorities, nuclear industry and the E&T organizations. Furthermore, ways to support the mutual recognition of knowledge, skills and competences relevant for the nuclear energy sector should be considered; ECVET approach should be promoted and, last but not least, coordination between industry and universities should be strengthened.

ANNEX 4

SET-Plan European Energy Education and Training Initiative (WG Nuclear Energy)

Key Messages and Recommendations for Topic 4 (28 November 2012)

Education, training, and research in the nuclear science and engineering community-- keys to sustain nuclear energy's future role in the European Union

The nuclear science and engineering community in the European Union (EU) is beset with numerous challenges that threaten nuclear power's role as a clean and abundant source of reliable energy. These range from growing disinterest in higher education of young and upcoming scientists and engineers, to a nuclear workforce that is rapidly aging and not being replaced. It results in a lack of future generations to operate, promote, and expand the nuclear power sector, as well as the loss of trained experts with the necessary knowledge and technical competencies to safely build, operate, and decommission current and future nuclear facilities. Active nuclear research and education are however of utmost importance to spread knowledge not only in the energy market but also in other very important sectors such as health care and cancer prevention. Therefore they provide qualified and stable employment for mid and long term. Cooperation with other energy sectors is also increasingly important to develop transversal skills and competences oriented to the wellness of society, to analyse globally socio-economic challenges, to create awareness and acceptance for nuclear energy, as part of the whole energy mix. Smart energy education will be the key to changing behaviour.

In order to create and develop the necessary education, research, and training programmes to ensure nuclear energy's future in the EU the following actions are recommended:

- Joint education and training programs between the nuclear energy sector and academic institutions should be formed and encouraged to ensure a stable and highly trained workforce.
- New education programs should be developed to address market and societal needs, and improve linkages between nuclear energy and its benefits to society and the economy.
- Private-public partnerships and collaboration with other EU organizations should be encouraged to harmonize nuclear education and training across the EU, as well as support the expansion in E&T programmes in the nuclear sector.
- European initiatives such as EHRO-N, ENEN and JRC databases, (based on input from and cooperation with national organizations), should be reinforced to support and advise different EU strategic actions.

- Key stakeholders in nuclear energy and nuclear safety should develop a common language for employment in nuclear education and training, including a taxonomy of skills and competencies linked to employment opportunities.
- A framework for mutual recognition of qualifications should be further developed with the objective of including non-academic qualifications and related vocational training to help promote nuclear energy. Pilot exercises should apply a 'learning outcomes' approach within ECVET partnerships.

ANNEX 5

SET-Plan European Energy Education and Training Initiative WG Nuclear Energy

Final Assessment Report

François Weiss, (Grenoble Institute of Technology/CNRS – KIC InnoEnergy)

Ulrik von Estorff (EHRO-N)

Veronika Simonovska (EHRO-N)

Marjatta Palmu (IGD-TP, Posiva Oy)

Hans Menzel (Cern, MELODIE)

Guy Parker (Foratom)

Alexandre Bredimas (SNETP)

Georges van Goethem (EU)

Hamid Aït Abderrahim (EUA-EPUE)

Josef Safieh (ENEN)

Emilia Janisz (ENS)

Miroslav Hrehor, Martin Ruscak (REZ/CZ)

Enrique Gonzalez (CIEMAT)

Monica Ferraris (Politecnico di Torino)

Niek Lopes Cardozo, (TU Eindhoven, FOM – Fusion)

ANNEX 6

Survey on the Mobility of Nuclear Professionals

The objective is to understand the mobility of nuclear professionals across Europe

We would appreciate you taking 3 minutes of your time to complete the questionnaire at

<http://ehron.jrc.ec.europa.eu/>

THANK YOU



ANNEX 7

ENC 2012 Career Event

About the ENC 2012 Career Event

The **ENC 2012 Career Event** will take place on 9 & 10 December 2012. It is supported by the City of Manchester and will take place at Manchester Town Hall, Manchester, UK. The objective of this recruitment event is to bring leading companies active in the nuclear sector into contact with talented young professionals. It is organised by ENS in conjunction with the ENS–Young Generation Network, WiN (Women in Nuclear) Europe and The Nuclear Institute, in the UK.

What's in it for you?

The European Nuclear Society would like to invite companies to participate in the **ENC 2012 Career Event** in order to establish a dialogue with highly-skilled young professionals who are aiming at a career in the nuclear sector. The event is all about being recognised as an attractive employer and recruiting top talent. It is organised within the framework of ENS's prestigious European Nuclear Conference (ENC 2012). ENC is a biannual event which this year is expected to attract more than 800 participants and will feature an extensive parallel Industry Exhibition that covers over 2000 m².

The main benefits of **ENC 2012 Career Event** for participating companies are:

- To meet, recruit and hire the most talented young professionals available in the job marketplace
- To save time and money finding suitable candidates to fill specific positions within interested organisations
- To gain visibility as a proactive employer synonymous with the hiring of top talent
- To make a career in nuclear a more attractive option for young professionals

All participants will be able to fully exploit the synergies that exist between the **ENC 2012 Career Event** and ENC 2012.

Programme

Sunday 9 December 2012

Phase I: Plenary

9:00 – 12:30

Welcome and corporate presentations

12:30 – 13:30

Walking lunch with opportunity for establishing contacts at special information tables

Phase II: Interviews

13:30 – 18:00

Pre-scheduled one-on-one interviews

18:30 Invitation to all participants to take part in the ENC 2012 Welcome Cocktail

Monday 10 December 2012

Phase II: continued

10:00 – 18:00

Pre-scheduled one-on-one interviews

Establishing a dialogue

During the first phase of the event participating companies will have a possibility to present themselves in plenary to all participants. This will be followed by a walking lunch in the foyer of the 'Great Hall', where participating companies will be able to set up information tables and get into contact with participants, in order to answer questions and provide them with additional information.

'Interviewing Career-Partners' will then meet pre-selected candidates for face-to-face interviews. These interviews will take place in syndicate rooms of the Manchester Town Hall and will continue on Monday 10 December 2012 at Manchester Central, the ENC 2012 venue, where a meeting room will be reserved for each 'Interviewing Career-Partner'. This will give participating companies a chance to maximise the synergies that exist between ENC 2012, the ENC 2012 Industry Exhibition and the **ENC 2012 Career Event**.

Targeting talent

The **ENC 2012 Career Event** particularly targets young professionals with between 2 and 7 years of experience, as well as students with a Master or PhD in engineering related subjects who are looking for career opportunities in the nuclear sector. It will be extensively promoted through the entire ENS database of contacts, as well as with its Member Societies, the ENS Young Generation Network, WiN Europe and the Nuclear Institute.

Candidates looking for a job in the nuclear sector will attend the first phase of the event. Candidates selected for interviews will attend the second phase of the event too and will be offered two overnight stays.

There are two packages on offer:

'Informing Career Partners'

- Will benefit from reinforcing their branding as a top-employer in the nuclear sector
- Will be able to present themselves in plenary to all candidates
- Will have an opportunity to get to know potential candidates better at the special information tables

Participation fee: 3000 £ (ex. VAT)

Companies who have already reserved exhibition space at ENC 2012 qualify for a 25% discount!

'Interviewing Career Partners'

- Will benefit from all the above-mentioned advantages **and**
- Have an opportunity to schedule one-to-one interviews with selected candidates

Participation fee: 8000 £ (ex. VAT)

Companies who have already reserved exhibition space at ENC 2012 qualify for a 25% discount!

A maximum of 5 ‘Interviewing Career Partners’ and 5 ‘Informing Career Partners’ will be invited to participate in the event.

Project Planning and Deadlines

Call for candidates: 15 May – 15 September 2012

ENS will create a webpage - linked to the ENC 2012 conference website - which will provide interested young professionals with information on the event. The site will furthermore provide relevant documents for download.

During the Call all organising partners will extensively promote the event:

- ENS will regularly send information about the event to its entire database of over 10.000 contacts. It will also indirectly reach out to the nuclear professional community through its Member Societies in 23 Countries.
- The ENS Young Generation has been one of the driving forces behind the creation of the **ENC 2012 Career Event** and is very much committed to communicate the event to its existing but also to potential future members.
- The Nuclear Institute as the hosting Society of ENC 2012 and its very active Young Generation Section are particularly supportive to the **ENC 2012 Career Event** in Manchester - a region which is home to one of the world’s largest concentrations of nuclear facilities with a renowned skills base and world class expertise in nuclear technology research & development
- Women in Nuclear (WiN) Europe will notably address female professionals.

All incoming CV’s will be registered and classified by a dedicated team at the ENS Secretariat. This team will also be available to provide more information and respond to questions.

Pre-selection of CV’s for companies: 16 September – 29 September 2012

The ENS team, supported by an independent Senior HR professional, will pre-select CV’s according to requirements and profiles specified by ‘Interviewing Career’ Partners.

CV’s transmitted to ‘Interviewing Career’ Partners: 30 September 2012

Selection of candidates by ‘Interviewing Career’ Partners: 1 October – 15 October 2012

In line with available time slots ‘Interviewing Career Partners’ should select 27 preferred candidates from pre-selected CV’s received.

Note that the second phase of ENC 2012 Career Event (scheduled one-to-one interviews) can possibly be extended to Tuesday 11 December and even Wednesday 12 December). Please contact Kirsten Epskamp (Kirsten.Epskamp@euronuclear.org) for further information.

Scheduling of interviews by ENS: 15 October – 1 November 2012

Based on the selection of ‘Interviewing Career’ Partners, the ENS Secretariat will inform candidates and schedule interviews.

9 and 10 December 2012: ENC 2012 Career Event at Manchester Town Hall

The Organisers

ENS is the largest nuclear society providing services for the nuclear science and industry community in Europe. It brings together National Societies from 22 countries in Europe and Israel. In addition, it has around 60 corporate members, which together with the National Societies represent a total membership of around 20,000.



EUROPEAN NUCLEAR SOCIETY

The ENS Young Generation Network is a vibrant network of young professionals aged up to 35 years old. Today, the ENS Young Generation Network is very active in 23 European countries, organising workshops, seminars and debates aimed at facilitating the transfer of knowledge from the nuclear industry's current experienced generation to the younger generation that represents the future of the industry.

Women in Nuclear Europe brings together female professionals working in the many areas



where nuclear science and technology is applied, such as energy, medicine, biology, agriculture, the environment, physics and chemical research. WiN Europe members are active in 12 European countries, representing a total membership of 1500 people.

The Nuclear Institute is a charity made up of a professional institute and a learned society. This structure enables it to deal with a diverse range of external stakeholders, including people working in the government, industrial representatives, environmental and ecological specialists, to mention but a few.



European Commission
EUR 25639 – Joint Research Centre – Institute for Energy and Transport

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Abstract

This report contains information on the activities performed under the framework of EHRO-N or the European Human Resource Observatory for the Nuclear Energy Sector in the year 2012. The mission of EHRO-N is to provide 1) qualified data on the needs regarding human resources in the nuclear field within the European Union, and 2) high-level expert recommendations on EU-wide nuclear E&T actions, promoting lifelong learning and cross border mobility. Following the EHRO-N objectives numerous activities were performed in 2012. These fall under the following headings in the present report:

- Two Senior Advisory Group (SAG) meetings
- E&I workshop and a visit to the Energy Institute of the Istanbul Technical University
- EHRO-N "Putting into Perspective" Report 2012
- EHRO-N presence and presentation of its activities at the VGB training and career event (in original: VGB Studentenkurs „Kerntechnik“)
- EHRO-N Contribution to the SET-Plan
- Preparation of the EHRO-N Roadmap 2020 preparation
- Launch of the survey on the Mobility of Nuclear Professionals
- Attendance at conferences (ENC 2012)
- Studies by EHRO-N
- Guidelines on the way to produce a capacity building exercise nationally
- Contributions to other DGs of the EC
- Networking and EHRO-N relations with other organisations
- EHRO-N website
- ECVET Activities

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new standards, methods and tools, and sharing and transferring its know-how to the Member States and international community.

Key policy areas include: environment and climate change; energy and transport; agriculture and food security; health and consumer protection; information society and digital agenda; safety and security including nuclear; all supported through a cross-cutting and multi-disciplinary approach.