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## SNETP Newsletter n° 10

June 2012

### A few words about the launch of NUGENIA

#### A new European Association dedicated to safe, reliable and competitive nuclear power generation

A new international association - NUGENIA - is set to be launched in Brussels on March 20 with a remit to help develop R&D supporting safe, reliable, and competitive second and third generation nuclear systems.

NUGENIA, which already counts 53 members from 17 countries, brings together the major European nuclear stakeholders, with members from industry, the utilities, research institutions and technical safety organizations.

Jean-Pierre West, Research and Development Senior Vice-President for EDF and first President of NUGENIA, said: "This association is a unique opportunity for each of its members to exercise both technical and financial leverage through increased cooperation and coordination between industry, research centres and technical safety organisations.

"Another key for success will be our ability to integrate projects and expertise developed previously in the European Networks of Excellence that NUGENIA was built upon."

In 2007 the European Commission issued its Strategic Energy Technology Plan (SET-Plan) outlining its main long-term objectives concerning energy production and supply. This essentially meant looking at sustainable development, security of supply and competitiveness.

Technology platforms play a key role in the implementation of the SET-Plan for Research and Innovation.

These platforms cover different technologies and energy sources, including nuclear energy, which represents a safe and proven technology for the production of low carbon energy at a competitive cost. To meet the goals laid down

in the SET-Plan for nuclear power production, the Sustainable Nuclear Energy Technology Platform (SNETP) was launched in late 2007 and is built on three pillars: current technology and its evolution (Generation II & III); future technology (Generation IV, Fast Breeder Reactors) and cogeneration of power and heat.

NUGENIA ("NUclear GENeration II & III Association"), an international non-profit association under Belgian law, was officially set up on November 14, 2011, to provide a single framework for collaborative research and development concerning Generation II & III nuclear systems. Hervé Pero, Head of Unit at the European Commission's Directorate-General for Research and Innovation, supports this evolution: "the launching of NUGENIA is more than welcome, as it will support the safe operation of nuclear power plants which generate today one third of the electricity in Europe, therefore contributing to its security of energy supply", he said.

The association was established with a research and development portfolio of approximately €20M, inherited from its constituents.

NUGENIA will rely on its built-in principles and organisation to reach its objectives and to satisfy its diverse membership. It is light, flexible, transparent and open, with an active secretariat serving the community.

NUGENIA will liaise closely with existing external organisations, directly or through the SNETP.

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■ The SNETP Secretariat has launched the on-line SNETP Members Directory

■ SNETP and NUGENIA participate at the 7th European Nuclear Energy Forum (ENEF) Plenary meeting in Bratislava on 14-15 May 2012

■ SNETP published the SRA annex on Molten Salt Reactor (MSR) on-line



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## ESNII (European Sustainable Nuclear Industrial Initiative)

### Key Performance indicators (KPIs)

In March 2010 the Member States agreed to launch six European Industrial Initiatives of the SET-Plan and called for the establishment of a common set of principles and practices for their implementation, which include the development and systematic use of key performance indicators (KPIs).

In this context ESNII developed fourteen KPIs and reference values, which were categorized in five groups:

1. Safety and Proliferation Resistance & Physical Protection
2. Economical Performance
3. Sustainability
4. Availability
5. Environment

The KPIs will be periodically monitored and reviewed for all three reactor concepts.

More information can be found on the SETIS website at [http://setis.ec.europa.eu/implementation/eii-key-performance-indicators/Key\\_Performance\\_Indicators\\_Nuclear.pdf/view](http://setis.ec.europa.eu/implementation/eii-key-performance-indicators/Key_Performance_Indicators_Nuclear.pdf/view)

### ESNII Conference

**Save the date:  
25 June in Brussels**

The European Sustainable Nuclear Industrial Initiative (ESNII) is pleased to announce the ESNII Conference “Advanced fission research in Horizon 2020”. The event will take place in Brussels on 25 June 2012. The event is organized by the Sustainable Nuclear Energy Technology Platform (SNETP).



The conference will be held at the following address:

**European Economic  
Social Committee**

**Van Maerlant building - ROOM VM3  
Rue Van Maerlant 2,  
1040 Brussels**

Register on:

[www.snetp.eu/esnii-conference](http://www.snetp.eu/esnii-conference)

### SNETP Open Day Rome 19 June

The SNETP organises, jointly with ENEA, a public half day on 19 June 2012 at the ENEA headquarters (Lungotevere Thaon di Revel, 76, Rome).

The event will be a great opportunity to illustrate the status of SNETP activities and R&D perspectives in the EU context, to the Italian stakeholders, media and general audience. This event is labeled as a European Energy Day of EUSEW.



## NC2I (Nuclear Cogeneration Industrial Initiative)

### Demonstration and market deployment of nuclear cogeneration

On the last SNETP Governing Board meeting, Marek Tarka from the Polish process engineering company Prochem delivered an update on the activities of the Nuclear Cogeneration Industrial Initiative (NC2I) Task Force in SNETP. The ultimate aim of NC2I is demonstration and market deployment of nuclear cogeneration.

Several preparatory meetings in 2010-2011 led to a constitutive meeting in June 2011, followed by two other meetings in September 2011 and March 2012. NC2I was shortly introduced at the SET-Plan Conference in November 2011 where its draft Concept Paper (available at the SNETP secretariat) was distributed.

About a dozen companies from across Europe have declared interest in collaborating within NC2I. Several other companies

and R&D organizations are maintaining the links which were tied during the EUROPAIRS project and some more companies work together on technology development in the current FP7



Picture from the chemical complex in Pulawy, Poland 2011

ARCHER project. So far, two European Member States, namely Poland and The Netherlands, have expressed at ministerial level their support for further development of nuclear cogeneration.

NC2I is one of the three pillars of SNETP. Technology companies (R&D, vendors, engineering firms and utilities) are expected to be SNETP members, whereas interested end-users obtain probably too little benefit from participating

in a nuclear technology platform and will, instead, connect to SNETP via an Industry Advisory Group for NC2I. The link to international partners, in particular China and the US, is currently ensured through R&D organizations and the Generation IV International Forum, but may in the future be dealt with by NC2I. As a matter of fact, NC2I was already approached by the US Alliance for NGNP which is interested in tighter cooperation on this subject. The NGNP Alliance had recently selected AREVA's High Temperature Reactor design for its safety and efficiency.

Poland is about to become a particularly strong driver for Nuclear Cogeneration in Europe and for demonstration and deployment. Several companies there show growing interest and provide real-life operation data for an important case study in ARCHER, where examples for technically and economically feasible reactor/process combinations

are being analyzed. Poland is developing a national program on nuclear cogeneration based on High Temperature Reactors. A financing decision for a specific project proposal is expected for May 2012 and is likely to trigger further industry involvement in NC2I. The project will focus on an analysis of the Polish situation for design and construction of a cogeneration plant and will perform R&D in key areas of nuclear engineering and coupling technologies.

In 2012, NC2I plans to finalize its existing draft Concept Paper for demonstration and deployment with focus on near-term High Temperature Reactors for cogeneration of steam and electricity. It is planned to include one or several case studies with real industry data. NC2I will also contribute its share to the update of the SNETP Strategic Research Agenda and is developing a website.

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Continued from Page 1

# NUGENIA (Nuclear Generation II & III Association)

The main value of NUGENIA comes through joining forces to attain scientific and technical excellence.

Professor Rauno Rintamaa, Vice President of VTT, Finland, and Vice-President of NUGENIA, said: "This open innovation platform will use state of the art web-based tools to ensure transparency to members.

"It will become a seeker-solver marketplace where, for example, industry defines a problem and members define research and development projects to solve it. Any member is given a chance to participate."

In order to make the best skills, facilities and technologies available to all of its members, the activities of NUGENIA are organised into six technical areas: plant safety and risk assessment; severe accidents; core and reactor operation; integrity assessment of systems, structures and components; fuel, waste management and dismantling; innovative Generation III design.



Jean-Pierre West and Frantisek Pazdera, Chairs of NUGENIA and SNETP respectively, sign the mandate between both organisations - Brussels, 21 March 2012

Each area will develop and coordinate its own roadmap while ensuring compatibility with the others. The main activity of NUGENIA will be the implementation of these roadmaps.

The association will also deal with two cross-cutting areas: harmonisation and in-service inspection and qualification.



Visit the NUGENIA website  
[www.nugenia.org](http://www.nugenia.org)

NUGENIA will also help projects by identifying the best available sources of funding. This funding may come from industry

**Concerning 8 technical areas**

1. Plant safety and risk
2. Severe accidents
3. Core and reactor operation
4. System and component integrity
5. Fuel, waste and decommissioning
6. Innovative Gen III design
7. Harmonisation
8. Inspection

**Technical Areas (TA)**

or other members, from the European Commission, national resources or even international sources. NUGENIA also offers several other services, such as high-level support for harmonisation, and a professional communication and dissemination service.

The European Commission's Joint Research Centre hosted the launch event of NUGENIA at the Management Centre Europe in Brussels on March 20, 2012, with one hundred decision-makers in the field from all across Europe. The launch was preceded by the first General Assembly of NUGENIA on the same day.

**DEDICATED TO SAFE, RELIABLE AND COMPETITIVE NUCLEAR**

**NUGENIA**  
NUclear GENeration II & III Association

European initiative launched in 2012, NUGENIA is dedicated to the research and development of nuclear fission technologies, with a focus on Generation II and III nuclear plants.

**Our mission**

- To be the integrated framework between industry, research and safety organisations for safe, reliable and competitive Gen II & III fission

**Our services**

- To run an open innovation marketplace
- To promote the emergence of joint research
- To facilitate the implementation and dissemination of R&D results

**Our products**

- R&D roadmap and coordinated project portfolio
- Advanced scientific and technical bases for Gen II & III technology
- Support to harmonisation at European level, in particular for safety requirements

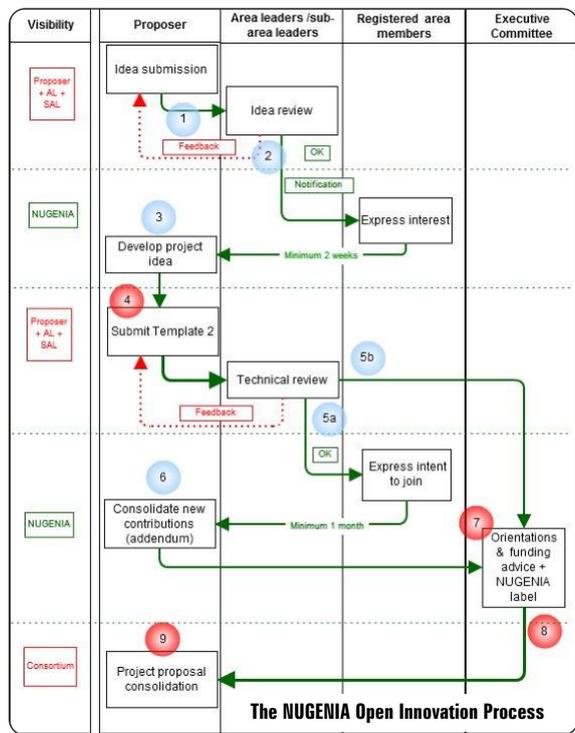
**Governance**

Annual Assembly of members  
Executive Committee  
Advisory Board  
Technical Areas  
Secretariat

**NUGENIA portfolio**

- Growing from initial contributions by NUGENIA, GENET, I&D and GEN III SNETP working group
- Concerning 8 technical areas:
  1. Plant safety and risk
  2. Severe accidents
  3. Core and reactor operation
  4. System and component integrity
  5. Fuel, waste and decommissioning
  6. Innovative Gen III design
  7. Harmonisation
  8. Inspection

NUGENIA is mandated by SNETP to coordinate nuclear Generation II & III R&D



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## HORIZON 2020 and the fission projects perspective

### New Framework Program for Research & Innovation



On 30 November 2011, the European Commission made a proposal for a Framework Programme for Research and Innovation (2014-2020) - Horizon 2020, which will be discussed during the next months by the European Parliament and the European Council in parallel with the EU budget 2014-2020. The legislative acts are expected to be adopted by the Parliament and Council in the middle of 2013 for a start of Horizon 2020 in January 2014. Horizon 2020 has been designed as a tool to promote growth and tackle societal challenges.

It brings together all existing Union research and innovation

funding, including the Research Framework Programme, the innovation related activities of the Competitiveness and Innovation Framework Programme (CIP) and the EU contribution to the European Institute of Innovation and Technology (EIT). With a simplified access, it will couple research to innovation by providing a seamless and coherent funding from idea to market. Horizon 2020 will focus resources on three distinct, yet mutually reinforcing, priorities, where there is clear Union added value. These priorities correspond to those of Europe 2020 and the Innovation Union:

**Excellent Science.** The objective is to raise the level of excellence in Europe's science base and ensure a steady stream of world-class research to secure Europe's long-term competitiveness.

**Industrial Leadership.** This will aim at making Europe a more attractive location to invest in

research and innovation (including eco-innovation), by promoting activities where businesses set the agenda.

**Societal Challenges.** This reflects the policy priorities of the Europe 2020 strategy and addresses major concerns shared by citizens in Europe and elsewhere.

The proposal for the Euratom Research and Training Programme (2014-2018) is an integral part of Horizon 2020. It covers activities of pan-European interest in nuclear energy (fusion and fission) and radiation protection. They are managed by DG Research and Innovation (indirect actions) or performed by the JRC (direct actions). The today proposed budget for the Euratom activities is 1 789 M€: 710 M€ for fusion (which does not include ITER); 355 M€ for nuclear fission safety and radiation protection; 724 M€ for JRC. In comparison, the proposed budget for Horizon 2020 would be around EURO 80 billion.

The specific objectives for indirect actions on nuclear fission are:

- Support safe operation of nuclear systems;
- Contribute to development of solutions for the management of ultimate waste;
- Support development and sustainability of nuclear competences at Union level;
- Foster radiation protection;
- Promote innovation and industry competitiveness;
- Ensure availability and use of research infrastructures of pan-European relevance.

More emphasis will be given to stimulating joint funding from Member States and/or enterprises, based on Public-Public and Public-Private Partnerships, with increased efficiency and consistency, as well as a better visibility and attractiveness at world level.

**Hervé Péro**  
 Director European Commission  
 DG Research & Innovation  
 Directorate K Energy

## The GUINEVERE experiment

### A big step forward on the road to MYRRHA

The Belgian Nuclear Research Centre (SCK•CEN), successfully coupled a reactor to a particle accelerator, as a part of the GUINEVERE Project (Generator of Uninterrupted Intense NEutrons at the lead VEnus REactor).

For the first time in the history of nuclear science, a demonstration model of a reactor, with a pure lead core and a versatile particle accelerator, is in operation. Other partners of the project include: the French Centre National de la Recherche Scientifique (CNRS), the Commissariat à l'Energie Atomique et aux Energies Alternatives (CEA), the German KIT and FZD, the Swedish KTH, the Italian ENEA, the Spanish CIEMAT, other European laboratories and the European Commission. The experiments are conducted within European Framework Programmes

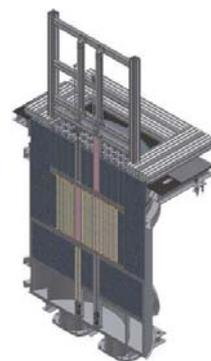
which focus on the transmutation of long-lived nuclear waste.

The development of Accelerator Driven System, ADS technology enables this transmutation of long-lived nuclear waste in a concentrated way (loading of 40-50% of the core with these long-lived elements). Transmutation is the fission of long-lived radioactive waste into products that are much less radio-toxic. This means that it is possible to reduce greatly the quantity and radio-toxicity of this waste. Therefore a decrease of the time required for underground storage is foreseen from several hundred thousand years to less than 1,000 years.

GUINEVERE, designed to support the MYRRHA project, is a test installation with a limited power. Unlike conventional reactors

systems, GUINEVERE and MYRRHA produce fast neutrons that can be used for the transmutation of high level radioactive waste. This research complements the decision in favor of the geological disposal of this type of waste.

The successful launch of GUINEVERE is another important step towards the realization of MYRRHA, SCK•CEN's multi-purpose research facility, which will be operational in 2023.



Guinevere core section (Courtesy of SCK•CEN)

PALLAS

## New Dutch nuclear reactor PALLAS gets 'positive' push forward

**The Dutch government has given the green light for a new research reactor to be built at Petten in the Netherlands, replacing the existing High-Flux Reactor (HFR), which has been in operation since 1961 and is reaching the end of its economic life.**

The decision was announced on 20 January 2012 by the Ministry of Economic Affairs, Agriculture and Innovation. The ministry said in a statement that central government and the province of North Holland had each undertaken to commit 40 million euro (about 50 million US dollars) to the project.

The ministry said the new reactor, to be called Pallas, could be operational in 2022.

The EUR 80 million from the government and North Holland is for the design, tendering and licensing of the unit. The cost of the whole project is put at around EUR 500 million, with the remaining capital due to be raised during phase two of the project from private investment. The second phase will begin once the construction licence is granted.

HFR operator the Nuclear Research & Consultancy Group (NRG) said Pallas's financing costs will ultimately be paid back from future income generated by the sale of medical and industrial isotopes, and for carrying out nuclear technology research. NRG director Rob Stol said the Netherlands has "an extremely strong position" in the world market for medical isotopes and nuclear technology research, and with Pallas will be able to maintain and

expand that position. Pallas project director Paul de Jong said Friday's decision means NRG can continue with the next phase of the project. A European tender for the new reactor will start in the next few months. The HFR has been a vital link in the production chain of radioisotopes for medical purposes. About 24,000 patients a day around the world are exposed to isotopes from the Petten reactor for cancer treatment, diagnostic imaging and pain relief. The nuclear facilities at Petten supply 60 percent of European demand for these isotopes and 30 percent of global demand.

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## Look back at 'Forward Thinking, for 50 years and beyond'



Her Majesty Queen Beatrix of Holland, and Maire Gheogegan-Quinn, the European Commissioner for Research & Innovation, visiting the facilities with local experts.

On November 22, 2011 over 150 high level professionals from the international nuclear playing field visit Petten. In a misty setting, they arrived in the dunes of the OLP (Research Location Petten) to celebrate the 50th anniversary of the High Flux Reactor and the collaboration of NRG and JRC-IET during that time. It was a great honor for the organization, to welcome Her Majesty queen Beatrix of Holland, and Maire Gheogegan-Quinn, The European Commissioner for Research & Innovation. The highlight of their attendance was their visit to the basin of the HFR, a unique moment for both NRG and JRC-IET.

'Forward Thinking, for 50 years and beyond' proved to be a well-chosen theme for this international symposium. It gave the opportunity to look back on achievements that seemed to be impossible at the start in 1961, but have become reality over the years. Many of the attendees were pleased to share their own history with their old colleagues and contacts, and also discuss future times. The discussions during the symposium challenged them to look fifty years ahead, to 2061. To think freely on how the world would have embraced nuclear as a self-evident part of the low-carbon energy mix, and how it would make an indispensable contribution to medical welfare.

To also address to the general public, a 12" film was produced for this event, and an interactive time line. These items can be seen on [www.petten50years.eu](http://www.petten50years.eu) (film in english).

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Who are the members of SNETP?

## DEMOKRITOS : Institute of Nuclear Technology & Radiation Protection

### Focus on the Institute of Nuclear Technology & Radiation Protection (INT-RP)

INT-RP is one of the eight research Institutes of the National Centre for Scientific Research "Demokritos" (NCSR), the only Greek centre encompassing integrated know-how on nuclear technology and radiation protection while supporting the Greek Atomic Energy Commission (GAEC) and Greek State in a large number of relevant activities.

### In the areas of Nuclear Technology and Radiation Protection, the Institute:

- owns, operates and exploits the only Nuclear Research Reactor in Greece (pool type, 5MW) that currently undergoes a refurbishment project which includes replacement of the primary cooling system and renovation of the control system. Reactor applications include materials science, health, environment and cultural heritage



- uses and improves large neutronic codes to support reactor operation and exploitation; also develops new computational tools for conventional and innovative reactor system analysis including Accelerator Driven Systems
- develops realistic models of complex physical phenomena to improve nuclear reactor facilities safety and performance; performs R&D in continuous surveillance and prognosis of component failure implementing novel machine learning architectures
- carries out research on materials for fusion and fission applications and coordinates the Greek Fusion Program. Exploits experimental facilities including neutron diffractometer and reflectometer and irradiation rigs; performs neutron activation analysis including non-destructive analysis of large samples. Complementary tech-

niques are available including prompt-gamma neutron activation using isotopic neutron sources, gamma-ray spectrometry, small angle X-ray scattering, X-ray reflectivity and diffraction

- constitutes an integrated radiation protection facility
- is the sole Greek centre with expertise and equipment for handling radioactive waste while it is capable of providing and implementing solutions to the waste handling problem
- encompasses the only integrated Environmental Radioactivity Laboratory in Greece with an extensive network of sampling/measuring/monitoring stations covering the entire country

### The following facilities are available in the area of Environmental Technology:

- The Environmental Radioactivity Laboratory performs both research and environmental quality evaluation studies, where research in aerosols has recently become a subject of increased interest
- The Laboratory of Environmental Research is rather active on simulating conventional and radioactive pollutant dispersion and air pollutant measurements
- The Laboratory of Thermal-hydraulics and Multiphase Flows is investigating health implications from environmental or occupational exposures
- The System Reliability and Industrial Safety Laboratory is mainly concerned with R&D in matters of risk assessment and management of large technological systems including the effects of large industrial accidents
- The Research Reactor Laboratory employs neutron activation techniques for detecting/identifying contaminants in environmental samples

### The laboratories for Energy Technology can offer :

- The Solar & other Energy Systems Laboratory pursues applied research in solar thermal energy utilization and energy saving systems
- The Laboratory of Environmental Research has been involved in significant research activities in hydrogen technology with



emphasis on the issues of safety and storage, energy efficient separations with focus on nonporous media characterization and applications as well as enhanced hydrocarbon recovery from underground reservoirs with emphasis on fluid flow simulation and dispersion processes

### For the Health Technology area:

- biological tissue disinfection/sterilization (bones, skin, tendons) is performed in the Research Reactor Laboratory with applications in transplant operations
- the Health Physics & Environmental Hygiene Laboratory activities are related to all potential radiation induced health hazards evaluation of radiation overexposures and radiation accidents using biological dosimetry methods and performance of research in radiation protection and radiobiology. It calibrates radiation survey meters, develops individualized protocols for radiotherapy treatment and diagnoses preleukemic and leukemic diseases. It is the reference GAEC laboratory and one of the laboratories selected by the International Atomic Energy Agency for prototyping the methodology of biological dosimetry
- nuclear analytical techniques are under development for in vivo and in vitro studies of the human body composition
- mathematical modeling techniques are under development for "in silico" study of particles / biofluids interaction

The Institute's average annual performance per scientist typically exceeds 2 publications in International Journals, 3 publications in international conference proceedings and 17 citations. INT-RP is in the process of merging with the Institute of Radioisotopes and Radiodiagnostic Products at NCSR, thus extending considerably its spectrum of capabilities.

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## Toward sustainable nuclear fuel cycles

### ASGARD

Relevant research on Gen IV systems is performed in national programmes as well as in several FP7 projects. Unfortunately, today, the integration between reactor, fuel and recycling communities is lacking, in some cases resulting in discrepancies between the reactor design on one hand, and on the other hand the technological feasibility of fabrication, proper fuel behaviour, and dissolution and reprocessing of the selected fuel. The gaps filled by the ASGARD project relating to the sustainable nuclear fuel cycle are shown in Figure 1.



Figure 1, ASGARD in a FP 7 context.

The focus of the ASGRAD project is thus on future fuels for a sustainable nuclear fuel cycle. The main problem today is to tie the recycling of the nuclear fuel to the fabrication of new fuels. As mentioned above the different reactor coolants may work differently with different fuel types and also by themselves the different fuel types have different pros and cons. The domain division of ASGARD is made to reflect this.

Due to the various stages for the different fuel types, the ASGARD project will have different goals for the different fuels. In principle, the aim is to reach an understanding of the manufacturing and recycling of the different kind of fuels to a scientific level approaching that for oxide fuels.

The challenging and ambitious objectives of ASGARD will be addressed by a multi-disciplinary consortium composed of

European universities, nuclear research bodies and major industrial players. Several of the partners of ASGARD are also members of the joint programme of nuclear materials organised under EERA ensuring a clear value increase by an open and simple communication line. This strong ASGARD consortium is capable to generate the fundamental knowledge for future nuclear fuel cycles and then in particular to the Gen IV system in Europe as well as to disseminate the knowledge to all relevant actors and end users over Europe. Thus the results of ASGARD will help Europe to become ready to face the challenges of the new emerging nuclear generation both in terms of people and technology.

#### DM2, Oxides

The oxide dissolution and separation strategy is a fairly mature process being dealt with and optimised in the FP7 ACSEPT project. New separation strategies have been tested on genuine spent fuel and the selected processes will be evaluated for industrial implementation. Whereas the above is valid for actinide oxide fuels, such as MOX and / or Minor Actinide containing MOX, the dissolution and separation issues for inert matrix fuels containing ceramic MgO or metallic molybdenum (Mo), has not been investigated coherently. The ASGARD project focuses therefore mainly on the Inert Matrix Fuels (IMF) with molybdenum or magnesium-oxide. It is of crucial importance to take into account the behaviour of the matrix elements in the dissolution and separation processes and to check their compatibility with the future vitrification (impact on the stability of the waste and amount of generated waste).

In addition, the use of molybdenum as inert matrix poses additional challenges with respect

to its redox chemistry, the need to avoid precipitation or co-precipitation, and to the necessity to recover the Mo material, which is isotopically tailored to improve the fuel behaviour.

Next to the assessment of inert matrix fuels, some basic studies will be performed to assess the dissolution of minor-actinide containing oxides, specifically with high americium and plutonium content.

A final objective of the Domain 2, which is dedicated to oxide fuels, is to address the conversion of the reprocessed solution to suitable precursors for fuel fabrication.

#### DM3 Nitrides

Nitride fuels constitute a high performance alternative to oxide fuel. Major advantages include a higher actinide density and a combination of high thermal conductivity with high melting temperature. The latter are particularly important in the context of transmutation in Generation IV reactors, since the addition of minor actinides to the fuel is detrimental for reactivity feedbacks. A major issue that needs to be addressed is how N-15 recycling is to be implemented. Already in the case of oxide fuels, C-14 is a major contributor to the dose commitment arising from the operation of reprocessing plants. A large scale use of nitride fuel in a closed fuel cycle would increase the C-14 production above regulatory limits if enrichment of nitrogen in N-15 is not undertaken. The cost for this enrichment might however become a significant penalty if N-15 is not recycled. Applying standard dissolution processes, dilution of N-15 in nitric acid is unavoidable. Hence a pre-treatment step involving voloxidation of the nitride fuel and recovery of the N-15 stream should be performed.

The ASGARD project will address all these issues, including improved processes for enrichment, the impact of fabrication route on dissolution performance and recovery of N-15.

#### DM4, Carbides

The high thermal conductivity of carbide fuels makes them conducive to high specific rod powers with relatively low fuel centre temperatures, the power-to-melt margin is increased and fatter (more economic) pins are facilitated. On the down side there is the potential for unacceptable fuel/clad mechanical interaction (FCMI) due to the high swelling and low plasticity of dense carbide materials. Also, the fuel fabrication process involves handling of pyrophoric powders and reprocessing is problematic because carbides dissolve in nitric acid to give a range of organic materials, some of which are flammable while others can interfere with down stream processes. In ASGARD we will mainly address the problems of fuel swelling and the issues concerning the reprocessing of carbide fuels.

A training and education programme will complement the main R&D programme, which aims to share the acquired knowledge among communities and generations, and maintain the nuclear expertise at the fore-front of Europe. The training and educational work package of ASGARD will work in close collaboration or will follow up other training programmes (like e.g. CINCH, ENEN and IAEA) for maximum gain and efficiency in the knowledge dissemination and strengthening the European human capital in this area.

**Coordinator:**  
**Dr. Christian Ekberg**  
Professor, Stena's Chair in Industrial  
Materials Recycling Nuclear  
University of Technology, Goteborg  
Sweden

## The third General Assembly of SNETP

The third General Assembly of SNETP took place in Warsaw on November 29 & 30, 2011, hosted by the Polish Ministry of Economy.

The aim of the event was to bring together the member organisations representing the various stakeholders of nuclear

fission research. As for previous editions, the event was open to the public and external stakeholders, including representatives of European institutions and Member States, as well as journalists from specialised press. More than 160 participants from 22 countries registered to the event.

As main keynotes in the event:

- **Hanna Trojanowska**, Deputy Minister of Economy, introduced Poland's plans to access nuclear energy within a decade.
- **Peter Faross**, Deputy DG at DG Energy, emphasised the need for EU approach on energy policy, and recognised the role of safe nuclear power to address climate change and security of supply.
- **Philip Finck**, chief nuclear research officer at INL, presented the developments ongoing in the US.

**More than 160 participants from 22 countries registered to the event.**

One of the focus of the GA was to inform about the progress of the new EU Member States in the nuclear fission research: creation of NCBJ research center in Poland, funding from structural funds of large nuclear infrastructure SUSEN in Czech Republic and highlight of efforts within FP7 project Newslander coordinated from Romania.

The event was a great opportunity to present the SNETP progress and promote exchanges of views.



### SNETP Calendar

- **May 2012**
  - 4 May 2012, ESNII Task Force Meeting n. 14 (Paris)
  - 29-30 May 2012, NUGENIA Executive Committee meeting n.8 (Berlin)
- **June 2012**
  - 18-19 June 2012, Executive Committee meeting n. 14 (Rome)
  - 25 June 2012, ESNII Conference: "Advanced fission research in Horizon 2020" (Brussels)
  - 8 June 2012, ETKM meeting n.12 (Paris)
- **September 2012**
  - 10-11 September 2012, ESNII Executive Committee and Task Force n°15 Meeting (Brussels)
  - 27 September 2012, SNETP Governing Board n.10 (Genoa)

### Related news

- **7th European Nuclear Energy Forum (ENEF) Plenary Meeting**  
14-15 May 2012: Bratislava (Slovakia)  
More information at [http://ec.europa.eu/energy/nuclear/forum/forum\\_en.htm](http://ec.europa.eu/energy/nuclear/forum/forum_en.htm)
- **Final seminar of the PHEBUS FP programme**  
13 - 15 June 2012: Aix-en-Provence (France)  
More information at <http://www.phebuspf2012-irsn.com>
- **The Energy and Materials Research Conference - EMR2012**  
20 - 22 June 2012: Torremolinos (Spain)  
More information at <http://www.formatex.org/emr2012/>
- **Joint LONGLIFE/PERFORM60 meeting - Symposium On irradiation effects in structural maTERIALs for nuclear reactors (SOTERIA)**  
17 - 21 September 2012: Seville (Spain)  
More information at <http://projects.tecnatom.es/webaccess/longlife/>
- **European Nuclear Conference - ENC2012**  
9 - 12 December 2012: Manchester (United Kingdom)  
More information at <http://www.euronuclear.org/events/enc/enc2012/index.htm>

#### Contact information:

SNETP secretariat: [secretariat@snetp.eu](mailto:secretariat@snetp.eu)

SNETP website: <http://www.snetp.eu>

SNETP internal workspace (members only): <https://extranet.snetp.eu>

Contact the secretariat to be given a login and a password.

### International events

#### International nuclear-engineering conference ICONE20/Power

- **30 July - 3 August 2012**, Anaheim, California (USA)  
More information at <http://www.asmeconferences.org/ICONE20POWER2012/index.cfm>

#### 4th International ATALANTE Conference on Nuclear Chemistry for Sustainable Fuel Cycles

- **3 - 7 September 2012**, Le Corum, Montpellier (France)  
More information at <http://www.atalante2012.org>

#### 6th International Topical Meeting on High Temperature Reactor Technology HTR2012 - Nuclear Energy for the Future

- **28 October - 1 November 2012**, Miraikan, Tokyo (Japan)  
More information at <http://htr2012.jaea.go.jp/>