SIXTH FRAMEWORK PROGRAMME

PRIORITY [#]

CONSOLIDATION OF EUROPEAN NUCLEAR EDUCATION, TRAINING AND KNOWLEDGE MANAGEMENT

Contract for:

COORDINATION ACTION

Annex I - "Description of Work"

Project acronym: **ENEN-II**
Project full title:

CONSOLIDATION OF EUROPEAN NUCLEAR EDUCATION, TRAINING AND KNOWLEDGE MANAGEMENT

Proposal/Contract no.: **FP6-036414**
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Coordination Actions

CONSOLIDATION OF EUROPEAN NUCLEAR EDUCATION, TRAINING AND KNOWLEDGE MANAGEMENT

ENEN-II

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1. Project Summary

CONSOLIDATION OF EUROPEAN NUCLEAR EDUCATION, TRAINING AND KNOWLEDGE MANAGEMENT

ENEN-II

The Coordination Action consolidates and expands the achievements of the ENEN and the NEPTUNO projects attained by the European Nuclear Education Network Association in respectively the 5th and 6th framework programme. The ENEN-II project is aiming at developing ENEN Association in a sustainable way in the areas of nuclear engineering, radioprotection and radwaste management, including underground disposal. Nuclear education and training networks will be developed at the national level to provide a solid basis for networking at the European dimension. Advisory groups and discussion forums will be established to strengthen guidance, interaction and feedback from End Users and stakeholders regarding higher level training needs. In addition to EC funding, third-party funding will be attracted to support mobility of teachers and students at masters', doctoral and postdoctoral level. The approach used so far successfully for education will be developed and extended to training activities. It relies on the principles of a modular approach and common qualification criteria, a common mutual recognition system across the European Union, and the facilitation of teachers and student mobility through Public-Private Partnerships. The project activities will be mainly structured around the five committees of the ENEN Association in close collaboration with selected consortium partners. The Training and Academic Affairs Committee and the Advanced Courses and Research Committee develop and implement non-overlapping schemes covering one full academic year (60 ECTS) of courses in nuclear disciplines leading to Master degrees. The latter Committee also promotes interactions between research conducted at European universities and nuclear research centres, and end users such as utilities, power plants, regulatory bodies, industries, etc. It organises exchanges and meetings between doctoral and postdoctoral students in the framework of seminars, workshops and courses on topics at the edge of current scientific research. The Training and Industrial Projects Committee facilitates interactions between training organisations and professionals in nuclear industries to provide pertinent and harmonised training programmes for continual training on new topics as well as to refresh and update capabilities and qualifications. The Knowledge Management Committee operates the ENEN web site, advertises courses and events of interest, develops and disseminates E-learning tools, courses and training packages on a variety of media, maintains data banks and communication systems. The project also develops a "Think Tank" function with reviews on nuclear energy and applications in various fields, evaluating performance, achievements, expectations, potential, and costs including also public perception and social aspects. The quality of the ENEN products and the project deliverables, the reports, courses, training packages, certificates, and the reliability of the information is continuously monitored by the ENEN Quality Assurance Committee.

2. Project objectives and state of the art

It has been stated earlier that "many of the highly competent engineers and scientists, who helped create the present nuclear industry, and its regulatory structure, are approaching retirement age[1]". Nuclear energy, and without any doubt also non-energy applications of nuclear technologies, still play an important role in satisfying the present society needs and are expected to continue this role in the future, independently of the current social perceptions and political decisions. Existing plants will operate for several decades from now; reprocessing will continue; decommissioning of plants will last until the second half of the century; and waste management will be around at least until towards the end of the century. All of these facilities need to be managed safely, demanding high quality, technically competent personnel with nuclear specific skills to staff also the Licensees organisations, the Support companies and the Regulatory bodies. In addition, radiation protection specialists will be required[2] . Under pressure by the commitments of the Kyoto protocol, confronting tangible effects of global warming and facing the disappointing contribution of renewable energy sources with respect to the expectations to fulfil current energy requirements, a slow but unmistakeable change in policies is observed in favour of the reactivation of nuclear programmes. Major countries have decided to construct new large nuclear power plants after an extensive evaluation of viable alternatives and in full consensus with the public opinion. Clearly an apparent scarcity of professionals in the nuclear fields would hypothecate such decision.

Still some adverse effects of the deregulation of the markets are affecting society: the pressure to reduce costs and the lack of a centralised long term planning. It still means that educational and training structures for a few students or trainees in nuclear disciplines are not maintained; although pre-retirements in the industry will be curbed, retirement and replacement rates will remain an issue as well as the change of the required professional profiles by the industry. Lack of long term planning, predictable regulations and political opportunism will continue to paralyse or postpone decisions with respect to nuclear issues and result in fragmented "last minute", local initiatives to palliate problems "as they arise", that makes any particular solution inefficient and, in some cases, only partially effective.

The problem has been identified worldwide and several references can be found in the USA[3,4] and Canada[5,6] where, after quantifying the problem, initiatives have been put in place integrating industry and university. International organisations like NEA[7] or IAEA[8,9] have issued several reports, supporting networking initiatives such as the World Nuclear University and the Asian Network for Education in Nuclear Technologies, and programmes on Nuclear Knowledge Management.

1 "Strategic issues related to a 6th Euratom Framework Programme (2002-2006)." Scientific and Technical Committee Euratom. Euratom. EUR 19150 EN.

2 HSE. Nuclear Education And Training Forum (UK, February 2001)

3 "Manpower Supply and Demand in the Nuclear Industry", (The Nuclear Engineering Department Heads Organization –NEDHO- 2000)

4 "The future of Nuclear Engineering Programs and University Research and training Reactors" (The Nuclear Energy Research Advisory Committee –NERAC/DOE-2000)

5 Candu Owners Group Report 00-204-I.

6 UNENE (University Network of Excellence in Nuclear Engineering)

7 "Nuclear Education and Training; Cause for concern?" (NEA, 1999)

8 "The Best and Brightest: Education and Training in Nuclear Fields" (IAEA Bulletin Vol 43/1, 2001)

9 IAEA World Survey on Nuclear Power Plant Personnel Training (IAEA-TECDOC-1063)

For as long as we continue to consume nuclear energy, there will be the inevitable production of associated radioactive waste. However, a hypothetical halt to all nuclear programmes would by no means signify an end to the production of nuclear waste. The dismantling of the existing nuclear installations would also be a source of radioactive waste for many years, requiring the implementation of a secure and safe storage programme. Thus, regardless of the policy adopted by public authorities, the control and management of radioactive waste will persist as a prime concern for at least several decades. In this context, it is naturally essential to maintain, if not improve, our expertise and scientific competence. However, social and political environment and the disparagement of nuclear energy have resulted in an increasingly serious lack of motivation on the part of the younger generation of researchers and engineers to enter nuclear fields. This was clearly stated by the International Atomic Energy Agency (IAEA)[10]: "*Because of the poor image that nuclear ependenenergy has had in some countries, teaching in nuclear technology and nuclear safety at universities has also diminished considerably. It follows that new researchers are not entering such programmes, raising concerns about the continuity of knowledge even in universities."*

Recently, the Canadian Nuclear Waste Management Organisation (NWMO) has performed a comprehensive international background review on Education and Training related to high level radioactive management waste. The conclusion of the report[11] published in August 2004 underlines "*an overall weakness in education and training (E&T) across most sectors identified by the NWMO."*

The specific European response, going beyond generic recommendations is the ENEN[12] project, launched under the 5th Framework Programme with the main objective of producing a roadmap for the way ahead in nuclear engineering education in Europe and organising pilot sessions. As an outcome of this project the ENEN Association was founded as a legal entity. Its members, universities and research centres, implemented together with a few training organisations and industrial partners the NEPTUNO project under the 6th Framework Programme.

The membership of the ENEN Association now consists of 35 universities members and 6 research centres. Supported by the 5th and 6th Framework Programme of the European Community, the ENEN Association established the delivery of the European Master of Science in Nuclear Engineering certificate. In particular, education and training courses have been developed and offered to materialise the core curricula and optional fields of study in a European exchange structure. Pilot editions of those courses and try-outs of training programmes have been successfully organised with a satisfying interest, attendance and performance by the students and the support of nuclear industries and international organisations. The involvement of ENEN in the 6th EC Framework project EUROTRANS will further enlarge its field of activities into a realm of nuclear disciplines. The ENEN Association further contributes to the management of nuclear knowledge within the European Union as well as on a world-wide level, through contacts with its sister Network ANENT in Asia, and by its participation to activities of the World Nuclear University.

10 Maintaining Knowledge, Training and Infrastructure for Research and Development in Nuclear Safety, IAEA 2003, INSAG-16

11Education and Training in Nuclear Waste Management. Survey of the Status of International Training and Capacity Building Programmes. NWMO, August 2004

12 European Nuclear Engineering Network (www.sckcen.be/enen/)

The objective of the ENEN-II project is to consolidate, the results and achievements obtained by the ENEN Association and its partners during the ENEN and the NEPTUNO projects and to extend and expand the activities of the ENEN Association. One of the objectives of the project is also to enlarge the effective membership of the ENEN Association by expanding into the new fields and nuclear disciplines, attracting universities and faculties active in those fields, and to increase the number of associated members by strengthening the cooperation with regulatory bodies, nuclear industries and waste management organisations.

Consolidate

"Consolidate" by implementing the education and training modules proposed and developed in the past few years and tested during the pilot sessions. "Consolidate" by applying the course evaluation criteria to the actual course and training performance, taking into account feedback from the participants and their companies, the end users and other stakeholders (see Figure 1). "Consolidate" by combining and organizing scattered web sites, data bases and course information in a well-designed and accessible communication and knowledge management system derived from the NEPTUNO communication system. "Consolidate" by testing in practice, and in collaboration with accreditation authorities, the developed mutual recognition schemes for academic education in nuclear disciplines.

Extend

"Extend" by moving outside the academic education area into professional and even vocational training, thereby strengthening the interactions and collaboration of universities, research centers, training organizations and industries to make training offers better respond to industry needs and enhance mutual recognition of professional qualifications across European countries. "Extend" to make a better use of and facilitate the access to EU tools to increase mobility of students and professors in nuclear disciplines.

Testing of formulated best practices for mobility, accreditation and recognition of qualified licensed staff and in general all staff needing some form of education, schooling or training before operating in the nuclear industry. "Extend" by strengthening the links with nuclear education and training networks outside Europe, the World Nuclear University, and by developing a viable Erasmus scheme for Master of Science in Nuclear Engineering within the ENEN Association.

Expand

"Expand" by moving beyond the disciplines related to nuclear engineering for power plant design, construction and operation, into a broader area including nuclear engineering and other disciplines in support of reactor safety, radiation protection, radioactive waste management, radiochemistry, decommissioning and industrial applications of nuclear technologies. "Expand" by addressing the needs for education, training and skills development expressed by other groups of End Users in the framework of networks, such as ENETRAP, CETRAD, EUNDETRAF, EURAC, etc. Of particular concern, to the EU Commission (see EUTERP Final Report (EUTERP, 2004)), authorities, industry and professional, university-based scientists are special skill-base deficits within nuclear radiological protection, radioecology and radiochemistry at masters and doctorate levels. It is contended that skills in these areas are of strategic, as well as immediate, importance for the maintenance of European nuclear operations and options within the evolving EU economy.

They are also important for meeting the challenges presented by unpredicted nuclear events (e.g., the Windscale fire, Chernobyl accident, terrorist and sabotage activities). In order to mitigate the effects of this decline the EURAC project identified remaining capabilities within the EU higher education sector, identified a need for about 100 trained specialists per year and proposed three European Masters courses that would meet the identified need. The ENEN-II project will expand education and training activities into those fields and mobilise the identified, existing fragmented capabilities to form the critical mass required to implement the courses and meet the radiological protection, radioecology and analytical radiochemistry postgraduate education needs of the European Union. In order to achieve the above it will be necessary to finalise a detailed syllabus for each of the proposed degrees and identify education institutions providing the course/module materials that are required to teach it, and having the laboratory facilities and equipment for practice training and research. Gaps in the curricula will have to be filled by developing, validating and having accredited the missing course modules.

Until now, education and training in waste management and underground storage were not addressed by these projects. Although the waste management is only a corner of the whole nuclear activities, the lack of commitment in this field is worrying, especially since the study of radioactive waste storage is a complex subject that requires an ever-increasing conjunction of different scientific disciplines. Moreover, difficulties exist of achieving scientific and technical consensus in this field. Indeed, growing environmental awareness lead to make difficult the social endorsement of any real waste storage solution without formal scientific demonstration of its safety. In this frame, available fundamental knowledge on numerous phenomena, particularly on coupled phenomena governing the behaviour of the underground disposal has still to be improved and requires sustainable academic researches.

The need for an important educational effort directed towards increasing the research capacity is obvious however, as very little specific programmes are available in the European universities. Besides, the fall in the number of PhD students on the one hand and the rise of the average age of the faculty members on the other hand, leads us to anticipate imminent problems for the continuation and renewal of the skilled teams in several countries. Faced with this situation, the ENEN-II project will expand education and training activities and promote inter-university collaboration aimed at creating a common educational programme on the radioactive waste disposal, compatible with the European educational road map (Bologna declaration). The project will construct a common educational programme for radioactive-waste storage both by considering the diversity of the scientific issues involved and by anticipating the future needs of stakeholders in term of competence. As the long-term goal is to promote academic research, the courses encompassed in the programme will be targeted for delivery at the final year of Engineering and second year of Master (MS) degree, in order to arouse students' interest in pursuing radioactive-waste storage studies in third academic cycle (PhD level. The common educational programme will be tested by organising pilot sessions in four of the universities adhering to the project. The methodology adopted for teaching consists in using multi-media facilities for broadcasting in live each lecture taught in one of the partner universities to the other partners. In this cost-effective way all the students will receive the same pedagogic programme independently of their geographic situation. Moreover, the outcome assessment of the pilot sessions will be facilitated by using the same evaluation criteria regardless to the specific constraints in each university.

"Expand" will thus include the development of networking within the ENEN Association to cover additional fields, e.g. reactor safety, and by establishing new networks, for example for radiochemistry, radioecology and the geological disposal and underground storage of

radioactive waste. “Expand” by developing courses, workshops, seminars and training modules on new topics such as GEN IV, waste management, decommissioning, lifetime extension and other topics to be defined. “Expand”, finally, by developing a “think tank” functionality on a range of issues in modern societies where nuclear energy and applications are part of the possible options.

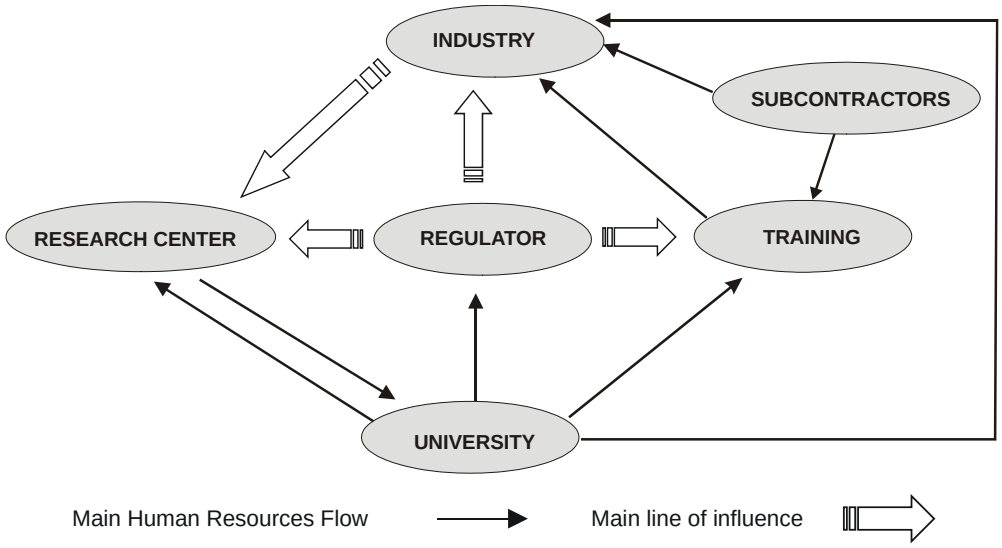

Fig 1: Main players in the Nuclear Education and Training

3. Participants list

Note : 10 members of ENEN marked with * are full contractors; 14 members of ENEN are represented through the ENEN Association as third parties.

Role	No		Participant name	Acronym	Country	Project *	
						Enter	Exit
CO*	1		European Nuclear Education Network Association	ENEN	International	1	24
	1	1*	(Institut National des Sciences et Techniques Nucléaires)	(CEA-INSTN)	France	1	24
	1	2	Katholieke Universiteit Leuven	KUL	Belgium	1	24
	1	3	Université Catholique de Louvain	UCL	Belgium	1	24
	1	4	Atominstitut de Österreichischen Universitäten	ATI	Austria	1	24
	1	5*	(Helsinki University of Technology)	(TKK)	Finland	1	24
	1	6	Delft University of Technology	DUT	Netherlands	1	24
	1	7	Swiss Federal Institute of Technology	EPFL	Switzerland	1	24
	1	8*	(University Politehnica Bucharest)	(UPB)	Romania	1	24
	1	9*	(Consorzio Interuniversitario per la Ricerca Tecnologica Nucleare)	(CIRTEN)	Italy	1	24
	1	10*	(Universidad Politecnica de Madrid)	(UPM)	Spain	1	24
	1	11	Kungl Tekniska Högskolan	KTH	Sweden	1	24
	1	12*	(Jozef Stefan Institute)	(JSI)	Slovenia	1	24
	1	13	Czech Technical University	CTU	Czech Republic	1	24
	1	14	Budapest University of Technology and Economics	BUTE	Hungary	1	24
	1	15*	(Studiecentrum voor Kernenergie/Centre d'Etude de l'Energie Nucléaire)	(SCK/CEN)	Belgium	1	24
	1	16	Slovak University of Technology in Bratislava	SUTB	Slovakia	1	24
	1	18	Institute for Safety and Reliability	ISAR	Germany	1	24
	1	19*	(University of Ljubljana)	(UL)	Slovenia	1	24
	1	22	University of Stuttgart	IKE	Germany	1	24
	1	24	Ustav jaderného vyzkumu	REZ	Czech Republic	1	24
	1	27*	(HMS Sultan)	(HMS)	United Kingdom	1	24
	1	33	University of Liège	ULG	Belgium	1	24
	1	36	University of Sevilla	USE	Spain	1	24
	1	40	Universitat Politecnica de Catalunya	UPC	Spain	1	24
CR	2		Middlesex University	MU	United Kingdom	1	24
CR	3		University College Dublin	UCD	Ireland	1	24
CR	4		Norwegian University of Life Sciences	UMB	Norway	1	24
CR	5		Westlakes Research Ltd	UCLAN WEST	United Kingdom	1	24
CR	6		Institute of Radioprotection and Nuclear Safety	IRSN	France	1	24
CR	7		Lund University	ULUND	Sweden	1	24
CR	8		European Underground Research Infrastructure for Disposal of Nuclear Waste in a Clay Environment	EURIDICE	Belgium	1	24
CR	9		Consorzio Interuniversitario per la Ricerca Tecnologica Nucleare	CIRTEN	Italy	1	24
CR	10		Institut National Polytechnique de Lorraine	INPL	France	1	24
CR	11		Agence Nationale pour la Gestion des Déchets Radioactifs	ANDRA	France	1	24
CR	12		Technische Universität Clausthal	TUC	Germany	1	24
CR	13		Ecole Polytechnique	EP	France	1	24

CR	14		Radioactive Waste Repository Authority	RAWRA	Czech Republic	1	24
CR	15		Universidade da Corunia	UDC	Spain	1	24
CR	16		Posiva	POSIVA	Finland	1	24
CR	17		Gesellschaft für Nuklear Service	GNS	Germany	1	24
CR	18		Deutsche Gesellschaft zum Bau und Betrieb von Endlagern für Abfallstoffe	DBE	Germany	1	24
CR	19		Institut National des Sciences et Techniques Nucléaires	CEA-INSTN	France	1	24
CR	20		Helsinki University of Technology	TKK	Finland	1	24
CR	21		University Politehnica Bucharest	UPB	Romania	1	24
CR	22		Universidad Politecnica de Madrid	UPM	Spain	1	24
CR	23		Jozef Stefan Institute	JSI	Slovenia	1	24
CR	24		Czech Technical University - Geotechnics	CTUG	Czech Republic	1	24
CR	25		Studiecentrum voor Kernenergie/Centre d'Etude de l'Energie Nucléaire	SCK/CEN	Belgium	1	24
CR	26		University of Ljubljana	UL	Slovenia	1	24
CR	27		HMS Sultan	HMS	United Kingdom	1	24

CO: Coordinator
CR: Contractor

Co-ordinator's name	Peter Paul DE REGGE
Co-ordinator's organisation name	European Nuclear Education Network Association
Co-ordinator's email	peter.de.regge@sckcen.be
Co-ordinator's telephone	+33 1 6908 3421 or +32 14 33 3447
Co-ordinator's fax	+33 1 6908 9950

4. Relevance to the objectives of the EURATOM Programme

The ENEN-II project addresses the Euratom specific objectives for the harmonisation of nuclear education and training schemes across the European Union as formulated in chapter 3 of the EURATOM Work Programme 2005/2006.

Two years after its founding, the ENEN Association has developed to one of the cornerstones of the European Higher Education Area in the nuclear field and acquired considerable visibility in academic and industrial circles. In the NEPTUNO project course frameworks, training modules, procedures, best practices, accreditation criteria, guidelines and recommendations have been developed, based on documented and perceived needs of the stakeholders. Pilot sessions have been organised to some extent. The objective of the ENEN-II project is the full implementation, demonstration and testing of the NEPTUNO developments in actual practice, building confidence within the ENEN Association and the academic environment and demonstrating to the industrial world that the concept is working, that it is productive and providing added value to the European Union. The ENEN-II project further includes an action plan to extend training activities from the academic environment into post-graduate, post-doctoral and professional training, following and testing the recommendations elaborated during the NEPTUNO project. The ENEN-II project plans to expand as well the academic education as the post-graduate training and research beyond nuclear engineering by addressing radiation protection, analytical radiochemistry, radioecology and geological disposal and underground storage of radioactive waste. Resources within the ENEN Association will be coordinated with other education and training organisations and End User networks to ensure that there is no future shortage of skills to continue the safe and efficient operation of Europe's nuclear industry and the next generation of nuclear power plants, to maintain and develop the wealth of non-power nuclear applications in our modern societies, to protect and monitor people and their environment with respect to radiation and radioactive contamination, to take care of decommissioning and dismantling obsolete nuclear installations, and eventually to ensure the safe disposal of radioactive waste in underground storage facilities and selected geological formations.

In this way, the ENEN-II project will provide means to strengthen European co-operation, for mitigating prospective risks of scarceness of both researchers and skilled academic teachers in the fields of radiation protection, analytical radiochemistry, radioecology and geological disposal of radioactive waste. It will harmonise the education programme to the current and future needs of the End Users and create attractive courses, which arouse students to choose and pursue studies in those fields. To some extent, the academic programmes set up within the project could also be used as pedagogic materials for professional training activities.

Beyond the educational and training objectives, the ENEN-II project will federate European academic efforts for improving and developing multidisciplinary research. The development of new academic research programmes generally implies a heavy investment in both human resources and equipment. Organising a constructive dialogue between End Users, teachers and researchers, pooling resources, structures and facilities, and facilitating access and mobility will help to accelerate the emergence of new research programmes. In this way, ENEN-II contributes to the construction of the European Research Area.

5. Potential impact

Due to the nature and scope of the ENEN-II project, the exploitation of its results affects virtually and effectively the whole European "nuclear" community. The project impact is in this respect huge. As for the NEPTUNO project in the past, the European universities, the students in nuclear fields, the nuclear professionals, training centres, nuclear operators, regulators and research institutions in each country, and the related international organisations are the potential customers and beneficiaries of the project achievements.

The practical implementation of the project outcomes will result in the consolidation of a sustainable European Area of Higher Education and Training covering nuclear engineering, nuclear safety, radiation protection, analytical radiochemistry, radioecology, and radioactive waste management and disposal. It will contribute to the preservation of the nuclear knowledge in Europe and make it more accessible. It will facilitate the mobility of individuals, as well students as professionals, and enhance the mutual recognition of their diplomas and qualifications across the European Union. Through the mechanisms implemented within the project, it will be possible to achieve European certifications of an educational type, such as for the European Master of Science and for advanced courses on a variety of nuclear disciplines, and for the professional type, like training programmes or post-graduate courses to be imparted and recognized anywhere in Europe.

The European impact will be dependent on the extent of dissemination and the accessibility of the results, the participation of young professionals and students to the pilot sessions, and the involvement of the stakeholders.

Virtually the whole range of nuclear players will be represented: apart from the educational institutions themselves, the End Users, such as research institutions, the government institutions, the nuclear enterprises, the regulatory bodies and the nuclear learning societies will become involved in the project.

A higher level of networking of nuclear related organisations and industries at the European level will be obtained, in particular within the nuclear disciplines, such as engineering, radiation protection, analytical radiochemistry, radioecology, decommissioning, radioactive waste management and disposal, and between the academic institutions, the training organisations and the end-user associations. This will enhance the adjustment of curricula and training packages to the end-user needs, thereby improving the employment and career opportunities, and the qualifications of the young professionals. At the world-wide and intercontinental level, networking will enhance opportunities for European teachers and professionals to disseminate their expertise and produce added value by exporting the leading position of the European Union in nuclear power plant construction and other nuclear applications.

Non-overlapping education schemes in nuclear disciplines, an Erasmus curriculum for nuclear engineering and more transparent teacher and student mobility schemes will facilitate the certification of highly qualified specialists as well as the formation of young professionals with a broad view on nuclear applications, safety aspects and regulatory issues. Procedures and guidelines for advanced courses in nuclear fields will facilitate the organisation of such

courses, optimising and coordinating the contents, collect practice in the joint organisation of joint courses and enhance their quality.

Efficient communication tools established between academia and schools and the end-users, should result in a better gearing of short term research work, such as internships, master theses and postdoctoral work to the needs of nuclear industries, research centres and regulatory bodies. Mobility schemes for those student groups will become available. Dissemination of information on research results and socio-economic studies of relevance to the general public will be enhanced by respectively a major ENEN conference and the development of a "Think Tank" functionality within ENEN. At the same time, PhD students will have a forum for presenting their work and its relevance not only to a group of specialists in their own field, but also for meeting the challenge of transferring their essential message to the broader public.

A survey of training provided outside universities will be assessed for its relevance to the needs of the end-users, in particular to their staff of young professionals. Pilot courses jointly organised in cooperation with end-users in the fields of LWR neutronics, advanced safety analysis, management of radioactive waste and decommissioning to optimise the course content to their requirements. For the implementation of common qualification criteria and mutual recognition of training schemes at the European level, the concept of "European Training Passports" will be explored in cooperation with training organisations and End Users.

All web sites related to the ENEN Association will be reachable through a single internet address, which will also link, with a semantic web structure with mutual recognition of authentication information, to other databases for nuclear applications. Contacts in the ENEN countries will be available ensuring regular verifications and timely updates of databases on education and training. The potential and role of the ENEN Association as a producer of outputs related to nuclear applications (books, CDROMs, E-learning modules, multimedia presentations, etc.) to the benefit of students, young professionals and the general public will be tested. Finally tools and instruments will be available to secondary schools and youngsters to get acquainted with nuclear applications, their often unknown impact on current societies and their perspectives for the choice of a career.

5.1 Contributions to standards

A contribution to standards will be made through several tasks and deliverables in the ENEN-II project. The development of procedures for the mutual recognition of education provided by ENEN members will contribute to the realisation of an international standard on this issue. The procedure will also include an objective and standardised way to allocate in objective way the appropriate number of ECTS to a given course and the examination criteria for awarding the ECTS after completion of the course. Procedures for the organisation of joint courses will contribute to the standardisation of such events and should facilitate the communication and interactions between all parties involved. Application of Systematic Approach to Training (SAT) methodology to the training programmes will be an objective. Standardized criteria and processes for the certification of training programmes will be applied and tested. The construction and operation of databases will be subject to criteria according to standardised or recommended practices and provide experience on the utilisation of such practices.

The European Masters in Radiological Protection, Analytical Radiochemistry and Radioecology, as implemented by the project will be directly relevant to those provisions of the EURATOM treaty that are related to the promotion of research and the establishment, and enforcement, of uniform standards to protect the health of workers and of the general public - Title II, Article 2. In addition, with regard to Radiological Protection the European Commission has specified standards for the academic training of "qualified experts". These were defined in European Directive 96/29/EURATOM and the required basic academic syllabus was specified in Annex 1 of the Commission Communications 98/C 133/03. A similar standard syllabus was produced by the IAEA (Standard Syllabus: Postgraduate Education Course in Radiological Protection and the Safety of Radiation Sources (IAEA, 2002)) for radiological protection experts in relation to the implementation of IAEA Basic Safety Standards. The project will implement a European Masters curriculum in Radiological Protection that will fully meet the EU / IAEA academic training standards in coordination with the activities carried out under the ENETRAP project. It is also intended that the degrees offered should meet competence / qualification standards defined by the stakeholders, including regulators, enabling graduates to find jobs easily. To this end, ENEN-II will seek stakeholder accreditation and approval for the degrees - for example, in the case of the European Masters in Radioecology, from the International Union of Radioecologists.

Quality standards and quality assurance procedures will be developed and applied to the delivery process of the ENEN-II Work Packages 2 to 5 and to the deliverables. The associated quality monitoring mechanisms will be designed. The findings and conclusions of the ENEN Quality Assurance Committee with respect to the delivery of the project products and the management of the project itself will be reported.

6. Project management and exploitation/dissemination plans

6.1 Project management

6.1.1 The Consortium

For the purpose of this project a consortium agreement will be established between the ENEN Association, representing also its members actively involved in the tasks and contractors, and signed by their administrative official with the relevant level of authority and mandate. The purpose of this Consortium Agreement is to specify the organisation of the work related to this project between the ENEN members and the external partners, to organise the management of the Project, to define the respective rights and obligations of the participants, including, but not limited to, their liability and indemnification, to set out rights and obligations of the participants, supplementing but not conflicting with those of the EC Contract. The participants agree to cooperate pursuant to the terms of this Consortium Agreement in order to execute and fulfill the EC Contract with the EC and perform the tasks designated in the activities in the present document.

6.1.2 Project Coordinator

The project will be coordinated by the ENEN Association, in particular by the members of its Board of Governors and the office of the Secretary General for the daily management. The Board of Governors is composed according to the ENEN Statutes. The institutions represented in the ENEN Board of Governors have acquired considerable experience in nuclear education, training and knowledge management and the qualifications of their representatives as well as their experience with Euratom and EU R&D contracts is beyond questioning. They have been managing as coordinator the FP5 contract ENEN FIR1-CT-2001-80127, and are currently involved in the management of the FI6O-CT-2003-508849 NEPTUNO project. The ENEN Association, its Board and the office of the Secretary General are currently managing the participation of seventeen universities to the Integrated Project FI6W-2005-516520 IP EUROTRANS. The ENEN Board of Governors is responsible for discharging the duties of the ENEN Association as project coordinator, acting through the office of the Secretary General, which is the interface to the European Commission for all bilateral and multilateral aspects. The Board represents the project coordinator in all technical and administrative matters and is responsible to organize the timely delivery of contractual documents, reports and cost statements.

The coordinator shall convene three plenary meetings of the consortium partners. The first one at the start of the project, the kick-off meeting (two days), a mid-term meeting (three days) and a final meeting (two days) in respectively the 13th and 24th month of the project. However, meetings shall also be convened upon request of 1/3 of the consortium partners.

6.1.3 The ENEN General Assembly

The General Assembly is composed by representatives of all ENEN members and meets according to the ENEN statutes. At its 4th meeting in Pisa on March 3rd, 2006, the ENEN General Assembly agreed to and supported the participation of the ENEN Association as coordinator of the project. Except for the definition of the role of the ENEN Association in the

project and the endorsement/amendment of the distribution of the tasks among the ENEN Members, as decided by the ENEN Board in its capacity of coordinator, the ENEN General Assembly has no specific management tasks to perform in the ENEN-II project.

6.1.4 The Project Management Committee

The ENEN-II project is structured around five main Work Packages involving three groups of consortium partners. The first group consists of third parties represented by the ENEN Association in the project. The second group is composed of partners with a main interest in radiation protection, analytical radiochemistry and radioecology. The third group is composed of partners with a main interest in radioactive waste management, underground storage and geological disposal of waste. Those groups will be represented in the Project Management Committee as follows: two persons, representing the ENEN Association as project coordinator; two persons, represent each of the second and third groups of consortium partners; five persons appointed as the Work Package Leaders. They will meet shortly before each of the three plenary project meetings (kick-off, mid-term and final) to prepare the meetings, and once around the 7^{th} and the 18^{th} month to evaluate the progress made, discuss the results, and review the resource allocation and the financial issues. It is expected and intended that all multilateral issues in the framework of the ENEN-II project can be solved between the ENEN members and the external partners in mutual agreement under guidance of the Project Management Committee.

6.1.5 The Work Package leaders and partners

The project is split up in Work Packages. Each has a Work Package leader, appointed by the ENEN Management Committee (ENEN/MAC) on a proposal made by the responsible ENEN Working Committee (TAAC, AC&RC, T&IPC, QAC, KMC). The ENEN Committee members, the other ENEN members and external partners contribute to the work packages according to the work plan and resource allocation plan established by the Project Management Committee. The primary responsibility for the completion of the tasks and the production of the deliverables is with each partner. The next levels of decision are within the hands of the Work Package leader and finally the Project Management Committee.

6.1.6 The Advisory Committee

An Advisory Committee will be established in order to provide guidance on the implementation of the project and on the selection of activities and products. The Advisory Committee will act as a communication channel for transferring information on the needs of the End Users and as an independent evaluator of the project deliverables. The Advisory Committee will be formed by selected representatives of End Users (e.g. nuclear suppliers, plant operators, research centers, training centers, regulators, waste managers) and representatives of nuclear education and training networks (e.g. WNU, ANENT, …).

6.2 Plan for using and disseminating knowledge

The plan for using and disseminating the knowledge acquired and results achieved during the project relies on a variety of communication channels and media to reach the different audiences with a potential interest in the project.

The following channels will be considered:

Press releases

More than in the past ENEN and NEPTUNO projects, attention will be paid to press releases, highlighting the different activities, training courses and events organised in the framework of the ENEN-II project. In particular the 2006 awarding of the European Master of Science in Nuclear Engineering certificates will be accompanied by a press release, as well as important ENEN training courses (D.2.3.2, D.2.3.3, D.3.2, D.3.3, D.4.2.1, D.4.2.2, D.4.2.3, D.4.2.4, D.4.2.5, D.6.1, D.6.3).

Press conferences

With the growing series of international training courses and international events, ENEN has acquired a solid basis of achievements and maturity to organise a press conference at the opportunity of several activities in the CENETOM project, for example in conjunction with the awarding of the EMSNE certificates, the publication of the "Think tank" report (D.3.3), the organisation of the conference for PhDs and post-graduate activity reports (D.3.2), the release of ENEN media products (D.5.3), etc.

Newspaper and media articles

Events and training courses organised in the framework of ENEN-II will be announced and reported on and publicised on a larger scale than in the former ENEN and NEPTUNO projects in newspapers and media. In particular the national ENEN contacts will care for the local and regional dissemination of information about ENEN, its objectives and its achievements (D.1.4).

Radio or TV broadcasted interviews and information

Special events within the realm of the ENEN-II project activities with a great interest or impact on the general public will be evaluated with respect to a radio or TV broadcasted interview and at least one such large scale dissemination of information to the general public will be organised.

World Wide Web

The web sites related to the ENEN activities and the ENEN-II project will be integrated with the NEPTUNO database on nuclear education and training courses and further expanded with an increasing content of information covering all nuclear applications as well as links to general information related to nuclear issues in the countries covered by the ENEN-II national contacts (D.1.4, D.5.1.1). In addition, the World Wide Web will increasingly become a vehicle for the dissemination of ENEN products, such as courses, training packages, distance/E-learning modules, multimedia information on nuclear issues and events (D.5.3). Nevertheless the results achieved so far in the ENEN and NEPTUNO projects already are impressive. A google search on nuclear/education delivers several references to ENEN on the first few pages of 200.000 hits and a search on nuclear/education/ENEN produces currently more than 900 direct hits.

Publications

An impressive number of publications on coordinated European nuclear education and on the activities within the ENEN and NEPTUNO projects have been written and published in first class journals. This series will continue during the ENEN-II project with reports on activities, achievements and events. Several ENEN-II deliverables will directly or indirectly result in journal publications.

Presentations at Seminars, Workshops and Conferences

Within the ENEN-II project itself at least two conferences, two seminars and two workshops will be organised, aiming at the dissemination of PhD and post-graduate research work, of some project deliverables and the discussion/evaluation of the project achievements and results. In addition, the project will be reported on in numerous seminars, workshops and conferences organised by other parties within an outside Europe.

Audio Visual Media

Several products of the ENEN-II project, in particular in Work Package 5 consist of multimedia and audio visual packages directed towards the general public, bachelors and high school students, and specialists. Pilot courses, education and training modules conducted within the project Work packages are invariably supported and accompanied by audio visual documentation material on CD-rom.

6.3 Raising public participation and awareness

Raising public participation to and awareness of the ENEN-II project is mainly achieved though the web sites, addressing a very large group and the advertisements of the training courses, events and conferences, disseminated directly to more than 500 organisations. Advertisements to students with respect to international courses are likely to involve their relatives in the decision to participate. Several deliverables of the ENEN-II project are products directed to a broad audience in the general public. Furthermore the ENEN national contacts will locally and regionally solicit public interest for the ENEN activities and products, delivered within the ENEN-II project.

7. Detailed implementation plan

The Workplan of the ENEN-II Coordination Action consists of the Coordination Activities and the Management Activities. The Coordination Activities can be broken down in five main Work Packages. The sixth Work Package combines the project meetings and the seventh Work Package groups the Management Activities. The Work Packages are broken down into individual tasks, leading to the project deliverables and results.

7.1 Introduction - General Description and Milestones

The Working packages constituting together the Coordination Activities are the following:

7.1.1 Integration of the European Nuclear Education, Training and End User Networks.

The first Work Package consists of establishing and strengthening cooperation with other European Networks in order to coordinate the activities, share networking experience, establish contact points and information channels and merge networks in cases where this would produce added value. Experience learned that integration and coordination at the European level benefits from the prior existence of national networks for education and training. Although the full establishment of operational national networks is beyond the scope of this project, the initiation and follow-up of such networks according to the models in Belgium (BNEN), Italy (CIRTEN), Germany (Kompetenzverbund), United Kingdom (NTEC) will be supported in this Work Package. National representatives (e.g. the ENEN voting members) will be responsible for the promotion of emerging national or regional networks and follow-up of established networks, reporting on a regular basis on the progress made, on the network activities and achievements, and on the obstacles and problems encountered. Those representatives are expected as well to play an active role in establishing contacts with the end users and stakeholders at a national or regional level, and in the promotion and selling of ENEN products. The project will provide opportunities and tools for exchange of information, experience and best practices among the national/regional representatives. The first Work Package will address as well the strengthening and cooperation with other European Networks. This will include cooperation with networks on Education and Training in Radiological Protection, Radioactive Waste Management and Decommissioning, such as the current ENETRAP, CETRAD and EUNDETRAF, as well as with European Networks of Excellence (Severe Accident Phenomenology, e.g. SARNET, Life prediction and Extension, e.g. NULIFE) to contribute in covering training needs. This will also include cooperation with networks of end-users, e.g. the European Utility Requirements EUR, and with the Western European Union Regulators Association WENRA. The Work Package also aims to strengthen the interactions and cooperation with worldwide organisations, such as IAEA and OECD/NEA, and with regional/national networks such as the World Nuclear University, the Asian Network for Education in Nuclear Technology, the (Canadian) University Network of Excellence in Nuclear Engineering UNENE, the (United States) Nuclear Engineering Department Heads Organisation NEDHO, etc.

7.1.2 Development, Harmonisation and Consolidation of Academic Nuclear Education.

The second Work Package concerns the development of non-overlapping education schemes covering 60 ECTS in nuclear disciplines in regional geographic university clusters within the

ENEN Association for Nuclear Engineering, Radiation Protection, Geological Disposal and Underground Storage of Radioactive Waste and Analytical Radiochemistry. The mutual recognition of the education schemes will be tested in practice in collaboration with the accreditation authorities. The Work package also includes the elaboration of proposals for Nuclear Engineering and Radiation Protection under Erasmus Mundus. The Work Package aims further at the development and establishment of procedures and structures for the joint organisation of advanced courses on current nuclear topics by ENEN members. Two joint courses will be organised accrding to this scheme. Academic curricula and advanced courses will be subject to evaluations on pre-established quality assurance criteria, including feedback from participants and end-users.

7.1.3 Facilitating and Supporting Research

The third Work Package addresses the facilitation and support of nuclear research by collecting and updating information from end users, industries, research centres and regulatory bodies, to feed internships, master theses and post-doctoral work with relevant topics for applied research, thereby strengthening the interactions between academia and the end users and creating added value. Explore and develop financing schemes for student mobility using EU and ENEN resources. For doctoral students, the structures and procedures for an annual "ENEN event" will be established, where the candidate nuclear PhDs can present their research work. One pilot edition of the event will be organised to test the concept and the response. This Work Package further includes the development and implementation of a "Think Tank" functionality within ENEN with two demonstrations on actual topics.

7.1.4 Professional Training Programmes

The fourth Working Package addresses current education and training programmes outside universities in order to produce a documented survey and evaluation of such programmes to be compared to the end users needs. In this Working Package the possible gaps, needs and opportunities are identified in order to organise professional training courses in complement to existing programmes. In addition to the proven self-supporting courses developed during the NEPTUNO project, three pilot courses will be organised on respectively "Neutronics of LWR", "Management of Radioactive Waste" and "Decommissioning".

7.1.5 Nuclear Knowledge Management

The fifth Working Package groups the tasks related to the collection, organisation, preservation and dissemination of nuclear knowledge. The current web sites operated on different places and servers will be integrated and maintained into a single site derived from the NEPTUNO Communication System. The site will adopt the role-based approach of the NEPTUNO CS and include its databases. It will form Electronic Library Systems with integrated databases (ODIN, GRS, etc.) with single entry points and mutual recognition of authentication information. The web-based communication system will also maintain dynamic updatable databases on nuclear education and training courses, advanced courses and themes for internships, master theses, PhDs and post-doctoral work, with search capabilities. Contact points will be established in every country covered by the ENEN Association, which will be responsible for collecting, maintaining and upgrading the respective databases. Within this Work Package two E-learning modules, one textbook and two multimedia presentations will be produced respectively for professionals, students and the general public.

7.1.6 Project meetings

In order to plan, organise and tracking the project meetings and the related expenses, they are combined in a separate Work Package and include

The meetings of all parties (ENEN members and external partners) involved in the project.

The meetings are convened by the Office of the ENEN Secretary General:
- Kick-off meeting within one month after the start of the project;
- Mid-term meeting and workshop after 12 months;
- Final project meeting in the 24th month.

Management Committee meetings

Shortly before each of the meetings under (6a) the extended ENEN Management Committee will have a meeting, together with the Work Package leaders (if not already represented) to evaluate the project progress, prepare the progress meetings and decide on the allocation of project resources.

Work Package meetings

The Work Package leaders will organise meetings of the parties involved to decide on the distribution of tasks, the time schedule and the use of resources within their Work Package. Each Work Package will meet as required with a minimum of three meetings during the implementation phase of the project.

It is obvious that the involvement of a large number of participants in the Project Progress and the Work Package meetings results in an appreciable number pmm's dedicated to meetings. The Kick-off meeting, the three progress meetings and the final meeting amount to at least five days for each participant. The three Work Package meetings add another week, resulting in about half a month per participant and amounting to 10 pmm in total for the meetings. As this represents a sizeable fraction of the project, the meetings are grouped in a separate Work Package in order to avoid that the time and financial allotments provided to the smaller partners consume their resources without actual work being done.

7.1.7 Management of the ENEN-II Project

The Work Package includes all actions related to the management of the project, the coordination of the Work Packages, the collection and dissemination of management and financial information, the preparation of contractual documents and reports related to the project management, the conduction of financial surveys and audits, the financial settlements, banking activities, and the financial reporting. It also includes to some extent the external communication and dissemination of information about the ENEN-II project. The management tasks will be carried out essentially by the Board of the ENEN Association as the coordinator of the project and the extended Project Management Committee. Daily management is assured by the Office of the ENEN Secretary General.

7.2 Work Planning and Timetable

	Calendar	Months													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Task ID	**Task description**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**
	Work Package 1														
T.1	Contact and establish a cooperation and information exchange structure with:														
T1.1.1	European Network on Education and Training in Radiological Protection, including ENETRAP, Radioactive Waste Management, Geological Disposal of Radioactive Waste, Decommissioning (EUNDETRAF)													D111	
T1.1.2	European Networks of Excellence, for example on Severe Accident Phenomenology and Life Prediction and Extension (e.g. SARNET, ACTINET, NULIFE)													D112	
T1.2.1	End Users: the European Utility Requirements EUR													D12	
T1.2.2	End Users: the Western European Union Regulators Association WENRA													D12	
T1.2.3	Environmental Protection Agencies														
T.1.2.4	Geological Disposal Agencies														
T1.3.1	Assist the World Nuclear University in developing curricula														D13
T1.3.2	Assist the Asian Network for Education in Nuclear Technology ANENT														
T1.3.3	the Canadian UNENE, the US NEDHO, etc.														
T.1.4	Develop national Euopean nuclear education networks						D14							D14	
	Work Package 2														
T.2.1	Develop non-overlapping modular education schemes covering 60 ECTS for Nuclear Disciplines														
T.2.1.1	Nuclear Engineering														
T.2.1.2	Radiological Protection						D2121								
T.2.1.3	Analytical Radiochemistry						D2131								
T.2.1.4	Radioecology						D2141								
T.2.1.5	Geological Disposal											D2151		D2152	
T.2.1.6	Develop selected course modules to fill curricula gaps														
T2.2.1	Develop procedures for the formalisation of mutual recognition														
T2.2.2	Implement a structure and tools for student mobility schemes within the ENEN Association drawing on EU funding								D222						
T2.2.3	Prepare an application for an Erasmus scheme in Nuclear Engineering														
T.2.2.4	Prepare an application for an Erasmus scheme in Radiation Protection														

7.2 Work Planning and Timetable (continued)

	Calendar	Months													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Task ID	**Task description**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**
	Work Package 2														
T2.3.1.	Develop and implement structures and procedures for the joint organisation of advanced courses.						D231								
T2.3.2	Conduct one pilot course on advanced topics (e.g. safety, GEN IV, etc.)											D232			
T2.3.3	Conduct a pilot courses on radioecology													D233	
T.2.4.1	Develop quality criteria for curricula and courses														
T.2.4.2	Apply quality assurance criteria to deliverables													D242	
	Work Package 3														
T.3.1	Construct an information system to collect from end users, industry, research centres, regulatory bodies, the needs for applied research and to feed data to academia as a basis for internships, master theses and postdoctoral work.														
T.3.1.1	Nuclear Engineering						D311								
T.3.1.2	Radiation protection/Radiochemistry/Radioecology											D312			
T.3.1.3	Geological Disposal											D313			
T.3.1.4	Develop and implement a financing scheme for student mobility for internships and master theses.												D314		
T.3.1.5	Implementation of the financing scheme for several students in five countries														
T3.2	Organise a pilot event for the annual international ENEN event to disseminate knowledge resulting from PhD research				D32										
T3.3	Develop a "Think tank" functionality within the ENEN Association and apply it to two demonstration cases on actuality issues.													D33	
T3.4	Apply quality assurance methods to the delivery process and quality assurance criteria to													D34	
	Work Package 4														
T4.1	Evaluate and assess data on education and training courses outside universities and evaluate them against the end users needs. Identify gaps and opportunities for organising professional training courses the role of the ENEN Association to provide added value.								D41						

7.2 Work Planning and Timetable (continued)

	Calendar	Months													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Task ID	Task description	S	O	N	D	J	F	M	A	M	J	J	A	S	O
	Work Package 4														
T4.2	Organise joint pilot training courses for professionals in cooperation with other European networks and End-User Associations:														
T4.2.1	Neutronics of LWR												D421		
T4.2.2	Management of Radioactive Waste														
T4.2.3	Decommissioning														
T4.2.4	Zero level pilot test of a course on geological disposal and underground storage with different simultaneous teaching locations and course evaluation report.														
T.4.2.5	Workshop to communicate and discuss the results of the pilot course														
T4.3	Apply quality assurance methods to the delivery process and quality assurance criteria to the deliverables													D43	
	Work Package 5														
T5.1.1	Integrate the information on different web sites and databases within the ENEN Association into a single communication system									D511					
T.5.1.2	Develop and implement a semantic web structure to achieve mutual recognition of authentication information with other databases, such as the the ODIN database														D512
T.5.2.1	Appoint contact points in every country covered by the ENEN Association for maintaining and updating databases and information on nuclear education and professional training programmes.												D521		
T5.2.2	Test and evaluate the response time and the correctness of the data.														
T.5.3	Develop ENEN products														
T.5.3.1	0ne textbook related to nuclear education								D531						
T.5.3.2	One multimedia presentation of interest to the general public														D532
T.5.3.3	Two E-learning modules to the benefit of nuclear professionals														
T.5.4	Develop instruments and tools for promoting the choice for nuclear education and career perspectives to be disseminated in secondary schools												D54		
T5.5	Apply quality assurance methods to the delivery process and quality assurance criteria to the deliverables													D55	

7.2 Work Planning and Timetable (continued)

	Calendar	Months													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Task ID	**Task description**	**S**	**O**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**
	Work Package 6														
T.6	Organise project meetings:														
T.6.1	General plenary meetings														
T.6.1.1	Kick-off meeting	D61													
T.6.1.2	Progress meetings/workshops														D63
T.6.2	Project management meetings	D61						D62						D63	
T.6.3	Work Package meetings														
	Work Package 7														
T.7	Coordinate the Work Packages and motivate the involved parties.														
T.7.1	Meeting preparation														
T.7.2	Compilation of information														
T.7.3	Reporting		D71											D71	D72
T.7.4	Presentations	D73						D73						D73	
	Total PMM														

7.2 Work Planning and Timetable (continued)

	Calendar	Months												
		15	16	17	18	19	20	21	22	23	24			
Task ID	Task description	N	D	J	F	M	A	M	J	J	A		PMM	PMM
	Work Package 1													**12,50**
T.1	Contact and establish a cooperation and information exchange structure with:													
T1.1.1	European Network on Education and Training in Radiological Protection, including ENETRAP, Radioactive Waste Management, Geological Disposal of Radioactive Waste, Decommissioning (EUNDETRAF)								D111		D15		5,6 0,6	
T1.1.2	European Networks of Excellence, for example on Severe Accident Phenomenology and Life Prediction and Extension (e.g. SARNET, ACTINET, NULIFE)										D15		0,6	
T1.2.1	End Users: the European Utility Requirements EUR										D15		1	
T1.2.2	End Users: the Western European Union Regulators Association WENRA										D15		0,5	
T1.2.3	Environmental Protection Agencies												0	
T.1.2.4	Geological Disposal Agencies												0	
T1.3.1	Assist the World Nuclear University in developing curricula										D15		1,6	
T1.3.2	Assist the Asian Network for Education in Nuclear Technology ANENT		D13						D15				0,5	
T1.3.3	the Canadian UNENE, the US NEDHO, etc.								D15				0,5	
T.1.4	Develop national Euopean nuclear education networks				D14				D14				2,2	
	Work Package 2													**43,00**
T.2.1	Develop non-overlapping modular education schemes covering 60 ECTS for Nuclear Disciplines													
T.2.1.1	Nuclear Engineering				D211								1,5	
T.2.1.2	Radiological Protection		D2122										5,4	
T.2.1.3	Analytical Radiochemistry		D2132										4,3	
T.2.1.4	Radioecology		D2142										2	
T.2.1.5	Geological Disposal		D2153										12,5	
T.2.1.6	Develop selected course modules to fill curricula gaps								D216					
T2.2.1	Develop procedures for the formalisation of mutual recognition	D221											1,25	
T2.2.2	Implement a structure and tools for student mobility schemes within the ENEN Association drawing on EU funding												1,25	
T2.2.3	Prepare an application for an Erasmus scheme in Nuclear Engineering		D223										1,25	
T.2.2.4	Prepare an application for an Erasmus scheme in Radiation Protection		D224										2,7	

7.2 Work Planning and Timetable (continued)

	Calendar	Months												
		15	16	17	18	19	20	21	22	23	24			
Task ID	Task description	N	D	J	F	M	A	M	J	J	A		PMM	PMM
	Work Package 2													**43,00**
T2.3.1.	Develop and implement structures and procedures for the joint organisation of advanced courses.												1	
T2.3.2	Conduct one pilot course on advanced topics (e.g. safety, GEN IV, etc.)												3,75	
T2.3.3	Conduct a pilot courses on radioecology												5,1	
T.2.4.1	Develop quality criteria for curricula and courses							D241					0,75	
T.2.4.2	Apply quality assurance criteria to deliverables										D242		0,25	
	Work Package 3													**14,80**
T.3.1	Construct an information system to collect from end users, industry, research centres, regulatory bodies, the needs for applied research and to feed data to academia as a basis for internships, master theses and postdoctoral work.													
T.3.1.1	Nuclear Engineering												1,5	
T.3.1.2	Radiation protection/Radiochemistry/Radioecology												4,3	
T.3.1.3	Geological Disposal												4,5	
T.3.1.4	Develop and implement a financing scheme for student mobility for internships and master theses.												1	
T.3.1.5	Implementation of the financing scheme for several students in five countries							D315					0,25	
T3.2	Organise a pilot event for the annual international ENEN event to disseminate knowledge resulting from PhD research				D32								1,5	
T3.3	Develop a "Think tank" functionality within the ENEN Association and apply it to two demonstration cases on actuality issues.						D33						1,5	
T3.4	Apply quality assurance methods to the delivery process and quality assurance criteria to										D34		0,25	
	Work Package 4													**16,75**
T4.1	Evaluate and assess data on education and training courses outside universities and evaluate them against the end users needs. Identify gaps and opportunities for organising professional training courses the role of the ENEN Association to provide added value.												3,5	

7.2 Work Planning and Timetable (continued)

	Calendar	Months												
		15	16	17	18	19	20	21	22	23	24			
Task ID	Task description	N	D	J	F	M	A	M	J	J	A		PMM	PMM
	Work Package 4													**16,75**
T4.2	Organise joint pilot training courses for professionals in cooperation with other European networks and End-User Associations:													
T4.2.1	Neutronics of LWR												1,5	
T4.2.2	Management of Radioactive Waste	D422											2	
T4.2.3	Decommissioning				D423								1,5	
T4.2.4	Zero level pilot test of a course on geological disposal and underground storage with different simultaneous teaching locations and course evaluation report.							D424					7,25	
T.4.2.5	Workshop to communicate and discuss the results of the pilot course									D425			0,5	
T4.3	Apply quality assurance methods to the delivery process and quality assurance criteria to the deliverables										D43		0,5	
	Work Package 5													**13,70**
T5.1.1	Integrate the information on different web sites and databases within the ENEN Association into a single communication system												2	
T.5.1.2	Develop and implement a semantic web structure to achieve mutual recognition of authentication information with other databases, such as the the ODIN database												0,5	
T.5.2.1	Appoint contact points in every country covered by the ENEN Association for maintaining and updating databases and information on nuclear education and professional training programmes.												0,75	
T5.2.2	Test and evaluate the response time and the correctness of the data.	D522											0,5	
T.5.3	Develop ENEN products													
T.5.3.1	0ne textbook related to nuclear education												2,5	
T.5.3.2	One multimedia presentation of interest to the general public												2	
T.5.3.3	Two E-learning modules to the benefit of nuclear professionals				D533								3,7	
T.5.4	Develop instruments and tools for promoting the choice for nuclear education and career perspectives to be disseminated in secondary schools												1	
T5.5	Apply quality assurance methods to the delivery process and quality assurance criteria to the deliverables										D55		0,75	

7.2 Work Planning and Timetable (continued)

	Calendar	Months												
		15	16	17	18	19	20	21	22	23	24			
Task ID	**Task description**	**N**	**D**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**		**PMM**	**PMM**
	Work Package 6													**14,20**
T.6	Organise project meetings:													
T.6.1	General plenary meetings													
T.6.1.1	Kick-off meeting												2,8	
T.6.1.2	Progress meetings/workshops										D65		5,6	
T.6.2	Project management meetings					D64				D65			0,8	
T.6.3	Work Package meetings												5	
	Work Package 7													**9,25**
T.7	Coordinate the Work Packages and motivate the involved parties.													
T.7.1	Meeting preparation												1,7	
T.7.2	Compilation of information												1,7	
T.7.3	Reporting									D71	D72		4,6	
T.7.4	Presentations					D73					D73		1,25	
	Total PMM												124,2	**124,20**

7.3 Graphical Presentation of Work Packages

The Work Packages are relatively independent from each other. The individual tasks within the Work Packages and their interrelations are represented in the planning and the time schedule graphs. The time schedule is more dependent on the availability of resources with the different partners than on the availability of specific deliverables from different Work packages. A graphical presentation of the Work Packages brings therefore not much additional information, which would not already be available in the paragraphs 7.2, 81 and 8.3.

7.4 Work Package List

Work-package No[13]	Work Package title	Lead contractor No[14]	Person-months[15]	Start month[16]	End month[17]	Deliv-erable No[18]
1	Integration of the Nuclear Education, Training and End User Networks	ENEN MAC	12,7	0	24	D111 D112 D12 D13 D14 D15
2	Development, Harmonisation and Consolidation of Academic Nuclear Education	TAAC	43,4	0	24	D211 D2121 D2122 D2131 D2132 D2141 D2142 D2151 D2152 D2153 D216 D221 D222 D223 D224 D231 D232 D233 D24
3	Facilitating and Supporting Research	AC&RC	14,95	0	24	D311 D312 D313 D314 D315 D32 D33 D34
4	Professional Training Programmes	T&IPC	16,5	0	24	D41 D421 D422 D423 D424 D43
5	Nuclear Knowledge Management	KMC	13,2	0	20	D511 D512 D521 D522 D53 D54 D55

[13] Workpackage number: WP 1 – WP n.
[14] Number of the contractor leading the work in this workpackage.
[15] The total number of person-months allocated to each workpackage.
[16] Relative start date for the work in the specific workpackages, month 0 marking the start of the project, and all other start dates being relative to this start date.
[17] Relative end date, month 0 marking the start of the project, and all ends dates being relative to this start date.
[18] Deliverable number: Number for the deliverable(s)/result(s) mentioned in the workpackage: D1 - Dn.

6	Project Meetings	ENEN MAC	14,2	0	24	D61 D62 D63 D64 D65
7	Management of the ENEN-II project	ENEN MAC	9,25	0	24	D71 D72 D73 D74
	TOTAL		124,2			

7.5 Deliverables List

Deliverable No[19] Responsible	Deliverable title	Delivery date [20]	Nature [21]	Dissemination level [22]
D.1.1.1 INPL	Harmonisation Strategy and framework for mutual recognition of education modules on geological disposal and underground storage.	22	R	PP
D.1.1.2 ENEN	12-month Interim Report on the status and modalities of the cooperation structures with networks of excellence.	13	R	PP
D.1.2 INSTN-CEA	12-month Interim Report on the status and modalities of the cooperation structures with networks of end users.	13	R	PP
D.1.3 KTH	12-month Interim Report on the status and modalities of the cooperation with regional education and training networks outside Europe and with worldwide networks.	13	R	PP
D.1.4 CIRTEN	Periodic dynamic reports on the status of national/regional networks for nuclear education and training.	6, 12, 18 and 24	R	PP
D.1.5 ENEN	Final report on the status and modalities of the cooperation structures with other networks.	24	R	PP
D.2.1.1 HMS INPL MU	Non-overlapping modular education schemes covering 60 ECTS for Nuclear Disciplines, including Radiation Protection, Analytical Radiochemistry, Radioecology, Geological Disposal and Underground Storage of Radioactive Waste, Radioactive Waste Management, etc.	17	P	PU
D.2.1.2.1 IRSN	List of academic institutions that will deliver the degree of Master of Science in Radiological Protection.	6	R	PP

[19] Deliverable numbers in order of delivery dates: D1 – Dn
[20] Month in which the deliverables will be available. Month 0 marking the start of the project, and all delivery dates being relative to this start date.
[21] Please indicate the nature of the deliverable using one of the following codes:
R = Report
P = Prototype
D = Demonstrator
O = Other
[22] Please indicate the dissemination level using one of the following codes:
PU = Public
PP = Restricted to other programme participants (including the Commission Services).
RE = Restricted to a group specified by the consortium (including the Commission Services).
CO = Confidential, only for members of the consortium (including the Commission Services).

D.2.1.2.2 IRSN	Report detailing course materials and syllabi for the Master of Science in Radiological Protection.	15	R	PP
D.2.1.3.1 UCD	List of academic institutions that will deliver the degree of Master of Science in Analytical Radiochemistry.	6	R	PP
D.2.1.3.2 UCD	Report detailing course materials and syllabi for the Master of Science in Analytical Radiochemistry	15	R	PP
D.2.1.4.1 UMB	List of academic institutions that will deliver the degree of Master of Science in Radioecology.	6	R	PP
D.2.1.4.2 UMB	Report detailing course materials and syllabi for the Master of Science in Radioecology.	15	R	PP
D.2.1.5.1 UPM	Evaluation of available pedagogic materials for the education on geological disposal and underground storage.	11	R	PP
D.2.1.5.2 INPL	Plan for building an educational programme on geological disposal and underground storage	11	R	PP
D.2.1.5.3 TUC	Quality objectives and criteria for the educational programme on geological disposal and underground storage.	14	R	PP
D.2.1.6 HMS	Selected modular courses developed to fill some gaps in the curricula	22	P	PP
D.2.2.1 HMS	Procedures for mutual recognition within the ENEN Association	6	R	PU
D.2.2.2 CIRTEN	Structure and tools for student mobility schemes within the ENEN Association	9	R	PU
D.2.2.3 HMS	Application for an Erasmus Mundus scheme in Nuclear Engineering	13	P	PP
D.2.2.4 MU	Application for an Erasmus Mundus scheme in Radiation Protection	13	P	PP
D.2.3.1 ISAR	Structure and procedures for the joint organisation of advanced courses	7	R	PP

D.2.3.2 ISAR	Organisation of a pilot advanced course on a subject to be selected	11	O	PU
D.2.3.3 UMB	Organisation of a pilot course on Radioecology	13	O	PU
D.2.4.1 BUTE	Evaluation schemes and quality assurance criteria for curricula, education schemes and advanced courses	24	R	PP
D.2.4.2 TKK	To assure the quality of Work Package 2 deliverables	24	R	PP
D.3.1.1 UPB	Demonstration of a communication system and database on research needs for internships and master theses in Nuclear Engineering	6	D	RE
D.3.1.2 WEST	Demonstration of a communication system and database on research needs for internships and master theses in Radiation Protection, Analytical Radiochemistry and Radioecology	11	D	RE
D.3.1.3 CTUG	Demonstration of a communication system and database on research needs for internships and master theses in Geological Disposal and Underground Storage of Radioactive Waste	11	D	RE
D.3.1.4 EPFL	Report on a sustainable financing scheme for student mobility for internships and master theses	12	R	PU
D.3.1.5 JSI	Implementation of the financing scheme for several students in different countries	21	D	PP
D.3.2 HMS	Pilot Event for the dissemination of PhD and post-graduate research results	18	O	PU
D.3.3 UCL	“Think Tank” reports on one actual issue of socio-economic relevance related to the nuclear sector and its applications	20	R	PU
D.3.4 TKK	Quality assurance report on Work Package 3 deliverables	24	R	PP
D.4.1 UPB	Report on the offer of education and training courses outside universities compared to the end users needs – Opportunities for ENEN and added value.	8	R	RE
D.4.2.1 INSTN-CEA	Joint pilot training course on Neutronics of LWR and course evaluation report	12	O	PU

D.4.2.2 UPB ANDRA	Joint pilot training course on Management of Radioactive Waste and course evaluation report	15	O	PU
D.4.2.3 INSTN-CEA SCKCEN	Joint pilot training course on Decommissioning and course evaluation report	18	O	PU
D.4.2.4 INPL UPM	Zero level pilot test of a course on geological disposal and underground storage with different simultaneous teaching locations and course evaluation report.	21	D	PP
D.4.2.5 INPL	Workshop to communicate and discuss the results of the pilot course	23	O	PP
D.4.3 UPB	Quality assurance report on Work Package 4 deliverables	24	R	PP
D.5.1.1 ENEN	Integrated communication system including operational mutual recognition features with respect to other databases	9	D	PU
D.5.1.2 IKE	Semantic web structure including operational mutual recognition features with respect to other databases	14	D	PU
D.5.2.1 SUTB	Contact points and dynamic database on nuclear education courses and professional training programmes	12	O	PU
D.5.2.2 SUTB	Report on an evaluation of the response and correctness of the information in the database	15	R	PP
D.5.3.1 INSTN-CEA UPC MU	Products of relevance to the European Nuclear Higher Education Area and society in general: one textbook, two E-learning modules and one multimedia presentation	8	O	PU
D.5.3.2 UPC	Products of relevance to the European Nuclear Higher Education Area and society in general: one multimedia presentation	14	O	PU
D.5.3.3 USE	Products of relevance to the European Nuclear Higher Education Area and society in general: two distance/ E-learning modules	18	O	PU
D.5.4 SCKCEN	Implementation of instruments and tools for promoting the selection of a career in nuclear applications	12	O	PU

D.5.5 BUTE	Quality assurance reports on Work Package 5 deliverables	20	R	PP
D.6.1	Kick-off meeting	1	O	PP
D.6.2	Project management meeting after 6 months	7	O	PP
D.6.3	Mid-Term Progress Meeting and workshop after 12 months	13	O	PP
D.6.4	Project management meeting after 18 months	19	O	PP
D.6.5	Final meeting	24	O	PP
D.7.1	Project progress meeting reports after Kick-off, mid-term and final meeting.	2, 14, 24	R	PP
D.7.2	Project financial reports and audit certificates according to the contract	13, 25	R	PP
D.7.3	Project dissemination of information and external communication	continuous	R	PU
D.7.4	Final report	25	R	PP

7.6 Work Package Descriptions

WP 1 - Integration of nuclear education, training and end user networks

Work Package number	**1**		**Start date or starting event:**						0	
Participant identification	1	2	4	9	10	12	19	20	21	22
Person-months :	2,95	0,2	0,2	0,6	2	1	0,25	0,4	0,2	1,25
Participant identification	23	24	25	26	27					
Person-months :	0,7	1	0,7	0,7	0,55					
ENEN Member identification	KUL	ATI	DUT	KTH	CTU	ISaR	IKE			
Person-months :	0,6	0,4	0,1	1,25	0,25	0,15	0,2			

Objectives

- To establishing and strengthening cooperation of the European Nuclear Education Network Association with other European Networks in order to achieve integration of their activities within ENEN, share networking experience, establish contact points and information channels with European Networks of Excellence and with End User organisations and stakeholders. Merge networks in case this would result in added value.
- To strengthen and structure the interactions and cooperation of the European Nuclear Education Network Association with regional networks outside Europe and worldwide networks related to education and training in nuclear disciplines.

Description of work

Establish an Advisory Committee to advise and evaluate the activities of the ENEN Association and to provide guidance for the implementation of the ENEN-II project. The Advisory Committee will be formed by selected members of Networks on Education and Training and End Users.

Develop national networks in the EU member states represented in ENEN to coordinate nuclear education and training at the national level (using BNEN, NTEC, etc. as a model) by appointing a national coordinator in charge of

- the reporting on a regular basis on achievements and obstacles related to this objective;
- promoting the dissemination and use of ENEN products at the national level;
- involve stakeholders at the national level in the definition of ENEN objectives, activities and products

Contact and establish cooperation and information exchange structures in a framework of mutual recognition with

- European Networks on Education and Training in Radiological Protection, Radioactive Waste Management, Decommissioning, etc.
- European Networks of Excellence, for example on Severe Accident Phenomenology and Life prediction and Extension, to cover training needs (e.g. SARNET, NULIFE, ACTINET)

Contact and establish cooperation and information exchange structures with End-user Networks

- the European Utility Requirements EUR;
- the Western European Union Regulators Association WENRA;
- the environmental monitoring and protection agencies;
- the agencies in charge of geological disposal and underground storage of nuclear waste.

Enhance cooperation with worldwide organisations, such as IAEA and OECD/NEA, and with worldwide and regional and networks on Education and Training
- the World Nuclear University;
- the Asian Network for Education in Nuclear Technology ANENT.
- the Canadian UNENE, United States NEDHO, …

Deliverables

- D.1.1.1 Harmonisation Strategy and framework for mutual recognition of education modules on geological disposal and underground storage.
- D.1.1.2 12-month Interim Report on the status and modalities of the cooperation structures with networks of excellence.
- D.1.2 12-month Interim Report on the status and modalities of the cooperation structures with networks of end users.
- D.1.3 12-month Interim Report on the status and modalities of the cooperation with regional education and training networks outside Europe and with worldwide networks.
- D.1.4 Periodic dynamic reports after 6, 12, 18 and 24 months on the status of national/regional networks for nuclear education and training.
- D.1.5 Final report on the status and modalities of the cooperation structures with other networks.

Milestones[23] and expected result

Evaluation and follow-up of the progress related to the cooperation with the other networks after 6 and 12 months: decisions on pursuing the actions or otherwise

[23] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

WP 2 - Development, Harmonisation and Consolidation of Academic Nuclear Education

Work Package number	**2**		**Start date or starting event:**							0
Participant identification	1	2	3	4	5	6	7	8	9	10
Person-months :	6	2,9	3,3	4,5	1	2,4	2,4	0,5	1,5	1,5
Participant identification	11	12	13	14	15	16	17	18	19	20
Person-months :	0,5	2,25	0,5	0,5	0,5	0,5	0,5	0,5	0,65	1,5
Participant identification	21	22	23	24	25	26	27			
Person-months :	0,75	2,25	1,5	1,25	0,25	1,5	2			

ENEN Member identification	KUL	EPFL	BUTE	SUTB	ISaR	USE	ULG	UPC
Person-months :	0,25	0,5	0,15	1,5	0,9	1,7	0,5	0,5

Objectives

- To develop at least one non-overlapping education scheme and curricula covering 60 ECTS in nuclear disciplines in university clusters within the ENEN Association
- To obtain a curriculum for Nuclear Engineering and Radiation Protection under the Erasmus Mundus scheme for ENEN members
- To set up the structure and procedures for the joint organisation of advanced courses in the academic environment on current nuclear topics

Description of work

- Develop at least one non-overlapping modular education scheme covering 60 ECTS for Nuclear Disciplines, such as Radiation Protection, Analytical Radiochemistry, Radioecology, Geological Disposal and Underground Storage of Nuclear Waste, Nuclear Waste Management, etc. The education schemes are defined as the necessary basket of knowledge to satisfy the needs of end users and stakeholders in terms of academic knowledge and skills acquired.
- Produce an inventory of institutes delivering master degrees and related courses in those nuclear disciplines and evaluate the availability of pedagogic materials.
- Identify gaps in the curricula and educational schemes and develop course modules as required, in collaboration with ENETRAP, EUTERP, etc.
- Develop procedures for the formalisation of mutual recognition.
- Implement a structure and tools for student mobility schemes within the ENEN Association drawing on EU and third party funding, oriented to facilitate the participation to courses and the performing of Master theses.
- Prepare an application for an Erasmus Mundus scheme in Nuclear Engineering and in the field of Radiation Protection/Analytical Radiochemistry/Radioecology .
- Develop and implement structures and procedures for the joint organisation of advanced courses. Conduct one pilot course on a topic to be decided (e.g. Novel Probabilistic Safety Assessments and Advanced Nuclear Safety Analysis, GEN IV, INPRO..)
- Conduct a pilot course on Radioecology (Norwegian University of Life Sciences).

- Develop quality assurance criteria and evaluation schemes for curricula, education schemes and advanced courses.

Deliverables

- D.2.1.1 One non-overlapping modular education scheme covering 60 ECTS for a Nuclear Discipline, selected from Radiation Protection, Analytical Radiochemistry, Radioecology, Geological Disposal and Underground Storage of Radioactive Waste, Radioactive Waste Management, etc.
- D.2.1.2.1 to D.2.1.5.1 Inventory of institutes delivering master degrees and related courses in those nuclear disciplines and a report (D.2.1.2.2 to D.2.1.5.2) on the availability and quality of pedagogic materials.
- D.2.1.6 Modular courses developed to fill some gaps in the curricula.
- D.2.2.1 Procedures for mutual recognition within the ENEN Association.
- D.2.2.2 Structure and tools for student mobility schemes within the ENEN Association.
- D.2.2.3 Application for an Erasmus Mundus scheme in Nuclear Engineering.
- D.2.2.4 Application for an Erasmus Mundus scheme in Radiation Protection.
- D.2.3.1 Structure and procedures for the joint organisation of advanced courses.
- D.2.3.2 Organisation of a pilot advanced courses on a subject to be selected.
- D.2.3.3 Organisation of a pilot course on Radioecology.
- D.2.4 Evaluation schemes and quality criteria for curricula, education schemes and advanced courses.

Milestones[24] and expected result

- Definition of the curricula, the institutes delivering the master degrees and the availability status of pedagogic materials.
- Definition of regional clusters of ENEN members for implementing the non-overlapping education schemes and student mobility schemes.
- Selection of topics for pilot advanced courses.
- Selection of partners in the Erasmus application.

[24] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

WP 3 – Facilitating and Supporting Research

Work Package number	**3**		**Start date or starting event:**							0
Participant identification	1	3	4	5	8	9	10	11	12	13
Person-months :	2,65	1	1	2,3	0,25	0,9	0,25	0,25	0,25	0,25
Participant identification	14	15	16	17	18	19	20	21	22	23
Person-months :	0,25	0,25	0,25	0,25	0,25	0,35	0,5	0,75	0,6	0,75
Participant identification	24	26	27							
Person-months :	1	0,25	0,4							

ENEN Member identification	UCL	EPFL	BUTE	ISaR	ULG	UPC		
Person-months :	0,5	0,75	0,5	0,4	0,25	0,25		

Objectives

- To establish a communication system between academia and end users for exchange of information on applied research needs and topics for internships, post-graduate and postdoctoral work.
- To establish within ENEN financing schemes and share experience for student mobility for internships and master theses.
- To establish the structure and modalities for an annual ENEN event for the dissemination of knowledge resulting from post-graduate and PhD research.
- To establish a "Think Tank" functionality within the ENEN Association.

Description of work

- Construct an information system to collect from end users, industry, research centres, regulatory bodies, the needs for applied research and to feed the data to academia to form a basis for internships, PhDs and postdoctoral work.
- Develop and try to implement within ENEN financing schemes for student mobility for internships and PhDs.
- Organise a pilot event for the annual international ENEN event to disseminate knowledge resulting from post-graduate and PhD research.
- Develop a "Think tank" functionality within the ENEN Association and apply it to one demonstration case on an actual issue.

Deliverables

- D.3.1.1 Demonstration of a communication system and database on research needs for internships and master theses in Nuclear Engineering.
- D.3.1.2 Demonstration of a communication system and database on research needs for internships and master theses in Radiation Protection, Analytical Radiochemistry and Radioecology.
- D.3.1.3 Demonstration of a communication system and database on research needs for internships and master theses in Geological Disposal and Underground Storage of

Radioactive Waste.

- D.3.1.4 Report on a sustainable financing scheme for student mobility for internships and master theses.
- D.3.1.5 Implementation of the financing scheme for several students in three countries.
- D.3.2 Pilot Event for the dissemination of PhD research results.
- D.3.3 "Think Tank" reports on one actual issue of socio-economic relevance related to the nuclear sector and its applications.
- D.3.4 Quality assurance report on Work Package 3 deliverables.

Milestones[25] and expected result

- Selection of financing schemes for student mobility for internships and master theses.
- Selection of location and local organiser for the pilot ENEN event.
- Definition of modus operandi and participation modalities of the ENEN "Think Tank" .
- Selection on topics to be studied by the ENEN "Think Tank".

[25] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

WP 4 – Professional Training Programmes

Work Package number	**4**		**Start date or starting event:**							0
Participant identification	1	5	8	10	11	12	13	14	15	16
Person-months :	2,75	1	0,75	1	0,25	1	0,25	0,25	0,25	0,25
Participant identification	17	18	19	20	21	22	23	24	25	
Person-months :	0,25	0,25	2	0,5	1,5	1,5	0,25	1,25	1,25	
ENEN Member identification	DUT	EPFL	KTH	BUTE	ISaR	REZ	ULG	UPC		
Person-months :	0,75	0,25	0,25	0,1	0,4	0,5	0,25	0,25		

Objectives

- To produce a documented survey of nuclear education and training programmes outside universities as compared to the end users needs. To identify gaps, needs and opportunities for the organisation of education and training programmes addressing professionals.
- To organise advanced pilot courses for professionals in cooperation with other networks as referred to under Work package 1.

Description of work

- Evaluate and assess data on education and training courses outside universities against the end users needs. Identify gaps and opportunities for organising professional training courses and the role of the ENEN Association to provide added value.
- Organise joint pilot training courses for professionals in cooperation with other European networks and End-User associations, for example:
  - Neutronics of LWR
  - Management of Radioactive Waste
  - Decommissioning
- Organise a zero level pilot session on a course module of geological disposal and underground storage with simultaneous transmission at different course locations.
- Evaluate the potential for the organisation of Radiological Protection Training in collaboration with the FP 6 ENETRAP project.

Deliverables

- D.4.1 Report on the offer of education and training outside universities compared to the End Users needs – Opportunities for ENEN and added value.
- D.4.2.1 Joint pilot training course on Neutronics of LWR and course evaluation report.
- D.4.2.2 Joint pilot training course on Management of Radioactive Waste and course evaluation report.
- D.4.2.3 Joint pilot training course on Decommissioning and course evaluation report.
- D.4.2.4 Geological Disposal and Underground Storage remote teaching pilot course and

course evaluation report.

- D.4.2.5 Workshop to communicate and discuss the pilot course results
- D.4.3 Quality assurance report on Work Package 4 deliverables.

Milestones[26] and expected result

Decisions and cooperation agreements for the organisation of joint training courses for professionals.

Conduction of the courses under D.4.2.

Evaluation reports for the courses under D.4.2.

[26] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

WP 5 – Nuclear Knowledge Management

Work Package number	5		**Start date or starting event:**						0	
Participant identification	1	2	4	9	19	20	21	25		
Person-months :	6,9	1,5	1,4	0,5	1,25	0,25	0,5	0,9		
ENEN Member identification	ENEN	ATI	DUT	CTU	BUTE	SUTB	IKE	UPC		
Person-months :	1	0,1	0,1	0,25	0,2	1,25	0,3	3		
ENEN Member identification	USE									
Person-months :	0,7									

Objectives

- To consolidate the different web sites and databases within the ENEN Association into a single communication system with access to other databases by mutual recognition of authentication information.
- To establish contact points in all ENEN countries for maintaining and updating database information on education programmes and training courses.
- To produce outputs of relevance to the European Nuclear Higher Education Area
- To promote career perspectives in nuclear applications at the career decision stage (secondary schools)

Description of work

- Integrate the information on different web sites and databases within the ENEN Association into a single communication system.
- Develop and implement a semantic web structure to achieve mutual recognition of authentication information with other databases, such as the ODIN database.
- Appoint contact points in every country covered by the ENEN Association for maintaining and updating databases and information on nuclear education and professional training programmes. Test and evaluate the response time and the correctness of the data.
- Develop one textbook related to nuclear education and one multimedia presentation of interest to the general public.
- Identify existing relevant distance/E-learning modules and develop two new products to the benefit of nuclear professionals.
- Identify suitable instruments and tools for promoting the choice for nuclear education and career perspectives at the secondary and bachelor school level and disseminate them at an international level.

Deliverables

- D.5.1.1 Integrated web sites and communication system providing access to all relevant databases (NEPTUNO, ENEN, courses, training, etc.).
- D.5.1.2 Semantic web structure including operational mutual recognition features with

respect to other databases.

- D.5.2.1 Contact points and dynamic database on nuclear education courses and professional training programmes.
- D.5.2.2 Report on an evaluation of the response and correctness of the information in the database.
- D.5.3 Products of relevance to the European Nuclear Higher Education Area society in general: one textbook, two distance/E-learning modules and one multimedia presentation.
- D.5.4 Dissemination of instruments and tools for promoting the selection of a career related to nuclear applications at secondary school and bachelor level.
- D.5.5 Quality assurance report on Work Package 5 deliverables.

Milestones[27] and expected result

Decisions on web site structure and operational features.

Web site and communication system integrated.

Selection and specification of ENEN products (books, distance/E-learning modules, multimedia presentations,..)

[27] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

WP 6 – Project Meetings

Work Package number	**6**		**Start date or starting event:**							0
Participant identification	1	2	3	4	5	6	7	9	19	20
Person-months :	6,1	0,6	0,5	0,6	0,5	0,5	0,5	0,5	0,6	0,5
Participant identification	21	22	23	25	26	27				
Person-months :	0,5	0,5	0,5	0,7	0,5	0,6				
ENEN Member identification	KUL	UCL	ATI	DUT	EPFL	KTH	BUTE	SUTB		
Person-months :	0,5	0,4	0,4	0,5	0,5	0,5	0,4	0,5		
ENEN Member identification	ISaR	IKE	REZ	UPC	USE					
Person-months :	0,5	0,5	0,4	0,5	0,5					

Objectives

To organise and document the ENEN-II project meetings

Description of work

- Organise project progress meetings:
  - Kick-off meeting within one month after the start of the project;
  - Progress meetings and workshop after 12 months;
  - Final progress meeting in the 24th month.
- Organise five project management committee meetings, three of them shortly preceding the above meetings to evaluate the project situation and decide on actions and resource allocations, and two additional ones around the 6th and the 18th month.
- Organise meetings for each of the Work Packages 1 to 5, as necessary, maximum two per year to discuss the distribution of tasks and resources, to organise the production of the reports and deliverables and to evaluate the status of the Work Package.
- Organise two Advisory Committee meetings to provide guidance to the project and to evaluate the activities of the ENEN Association.

Deliverables

- Organise project management committee meetings shortly preceding the plenary meetings to evaluate the project situation and decide on actions and resource allocations.
- Organise Work Package meetings as necessary, maximum 2 per year per Package
- Organise
  - D.6.1 Plenary Kick-off meeting
  - D.6.2.1 Project management meeting after 6 months
  - D.6.2.2 Plenary Mid-term Progress meeting and Workshop after 12 months
  - D.6.2.3 Project management meeting after 18 months
  - D.6.2.4 Plenary Final meeting

Milestones[28] and expected result

- Project meetings

[28] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

WP 7 – Project Management

Work Package number	**7**	**Start date or starting event:**							0	
Participant identification	1	2	4	10	12	21	22	23	24	25
Person-months :	0,5	1,5	1,5	0,25	0,5	0,5	0,5	0,5	0,5	2,5
Participant identification	27									
Person-months :	0,5									

Objectives

To manage the ENEN-II project to time schedule and budget.

Description of work

- To coordinate the Work Packages and motivate the involved parties.
- To allocate project resources according to the needs.
- To produce the contractual documents and supervise the production of the deliverables
- To convene and conduct the project progress meetings and management committee meetings

Deliverables

According to the contractual deliverables mentioned in Appendix C "Reporting Procedures for Coordination Actions" including:

- D.7.1 Project progress meeting reports on Kick-off, mid-term and final meetings.
- D.7.2 Project financial statements and reports according to the contract.
- D.7.3 Project dissemination of information and external communication.
- D.7.4 Final project report.

Milestones[29] and expected result

- Decisions on the project work distribution and resource allocations at Kick-Off meeting, at the mid-term meeting, and the project management and work package meetings.

[29] Milestones are control points at which decisions are needed; for example concerning which of several technologies will be adopted as the basis for the next phase of the project.

8. Project Resources and Budget Overview

8.1 Efforts for the Project

The legal entity "European Nuclear Education Network Association" with a current membership of 34 universities, one university consortium and six research centres located in 18 European countries constitutes the main partner of the ENEN-II project. The ENEN Association is a de facto consortium and a legal entity, and will act as the Coordinator vis-à-vis the European Commission in the contract covering the project. About half of the tasks covered in 57 man-months are carried out by the ENEN Association. Fifteen members of the ENEN Association are considered as third parties in the project structure according to the special clause 23 (EC Decision DL2003/3188 dated 27.11.2003). Nine members of the ENEN Association, having relatively larger budget shares and the Consorzio Interuniversitario per la Ricerca Tecnologica Nucleare, a consortium within the ENEN Association, are individual contractors.

There are 16 further partners in the Consortium, 10 of which are specifically involved in tasks related to education and training in Geological Disposal and Underground Storage of Radioactive Waste, and 6 involved in tasks related to the Master degrees and Post-graduate research in the fields of Radiation Protection, Analytical Radiochemistry and Radioecology. The group of 10 partners involved in Geological Disposal consists of 4 institutes, which are providing higher education and training, 4 national organisations in charge of the safe handling of radioactive waste and nuclear materials, and two private industries. Together with 5 universities and one nuclear research centre, members of the ENEN Association, they will carry out the tasks related to education and training in the field of Geological Disposal, covering 31 man-months. The group of 6 partners, involved in the Master degrees and Post graduate research activities in the fields of Radiation Protection, Analytical Radiochemistry and Radioecology, consist of 5 universities and a regulatory body. Together with one university and one research centre, members of the ENEN Association, they will carry out the tasks related to those master degrees, covering 36.2 man-months. They include one Norwegian partner covering 9.2 man-months, which are supported by Norwegian resources, leaving 27 man-months to be funded by Euratom FP6.

Structure of the ENEN Association

Advisory Committee	General Assembly Board of Governors			Honorary Members
Management Committee				
		Secretary General		
Chairperson Committee 1	Chairperson Committee 2	Chairperson Committee 3	Chairperson Committee 4	Chairperson Committee 5
Teaching & Academic Affairs Committee	Advanced Courses & Research Committee	Training and Industrial Projects Committee	Quality Assurance Committee	Knowledge Management Committee
4*+2**	3*+2**	2*+3**	3*+2**	3*+2**

* Effective Member ** Associated Member

The ENEN association is managed by a Board of Governors, elected by the General Assembly and the work within the ENEN Association is organised through a Management Committee. The Management committee is constituted by the Secretary General, appointed by the Board of Governors, and the Chairpersons of the five working committees, which are dedicated to specific areas of activity. For the purpose of this project, the ENEN Management Committee will be strengthened as described in section 6.1 above and constitute the Project Management Committee.

The commitments and obligations assumed by the Coordinator of the Consortium with respect to the project deliverables and the availability of the resources within the ENEN Association are granted by its governing bodies and in particular the Board of Governors, who approved the submission of the proposal on its meeting of October 4th 2005 in Budapest, and the ENEN General Assembly, who approved to enter into negotiations with the European Commission on this project during its meeting of March 3, 2006 in Pisa. The statutes of the ENEN association are presented in Appendix C. The commitments and obligations assumed by the other partners of the consortium are granted by their adherence to the Consortium Agreement.

The work within the ENEN Association is performed by the ENEN Committees. They will cooperate and join resources with the partners outside the ENEN association for carrying out the work according to the detailed work plan, a summary of which is given in the Work Packages. The core of the committees is formed by five to six Effective and Associated members nominated by the Board of Governors. The core calls on any other ENEN member and on the project partners according to the Work Packages for carrying out specific tasks and producing specific deliverables in the framework of the project. The Work packages of the ENEN-II project and planned resources to be provided are distributed over the five ENEN Committees and a number of external partners. Work package leaders will be appointed by the Project Management Committee. For the sake of transparency, the Work Package Descriptions refer to resources provided by the ENEN Management Committee and the five ENEN Committees. A summary description of the individual ENEN Members and the external partners, their credentials and their staff eventually involved in the ENEN-II project are listed in Appendix A1. The ENEN members represented by the ENEN Association are listed in Appendix A3. At the current stage, no subcontracting is foreseen in the project, and Appendix A2 is void accordingly. No major equipment will be purchased. Two participants will be funded by third countries, the first one being a third party, member of the ENEN Association N° 1-7, the Swiss Federal Institute of Technology, Lausanne, Switzerland and the second being Consortium partner N° 4, the Norwegian University of Life Sciences, Oslo, Norway. Further details are provided in Appendix A.4.

The project focuses on a coordination approach for education, training and knowledge management in European Nuclear Higher Education Area. The amount of work in the work packages is valued at 124.2 professional man-months (pmm). The current distribution of the pmm's over the different work packages reflects the required personnel contribution of the ENEN members in the five ENEN Committees and the external partners. In the more detailed work and resource plan, the pmm's are delegated to ENEN Members and external partners within their respective competences, capabilities and resource availability. The distribution of the tasks and the allocation of resources within the ENEN Association are the responsibility and the task of the ENEN Management Committee. The ENEN-II project will be managed by the Project Management Committee, formed by the ENEN Secretary General, a member of the ENEN Board, the Work Package Leaders and four Task Leaders, appointed by Middlesex University, the Norwegian University of Life Sciences, the Institut National Polytechnique de Lorraine and the Technische Universität Clausthal.

A kick-off meeting (two days) will be held at the start of the project. A mid-term project progress meeting, in combination with a workshop as foreseen in the work planning (three days), will be held

in the 12th month. A final project meeting will be held in the 24th month (two days). Those meetings require the presence of representatives of all ENEN members, involved in the project, as well as the external partners. They will normally be preceded by a project Management Committee meeting (two days) to prepare the meeting, to discuss and evaluate the progress, to allocate resources and to settle financial matters. Work Package leaders will organise meetings for the ENEN members and external partners involved in the different work packages, as needed with a minimum of three meetings of two days over the duration of the project. Each ENEN member involved in the project and all external partners have the responsibility to participate to appropriate events for disseminating the results of the project and the knowledge acquired.

The tables on the following pages show the distribution of the efforts and resources over the contractors and selected ENEN members, according to the Work packages. The selected ENEN members are dedicated to specific tasks and indicated here for a better transparency in the project preparation sequence. The tables provide a break-down of the efforts and resources over the ENEN Working Committees. A complete overview of the efforts and resources of the contractors and the ENEN members involved in the different Work packages as third parties is provided in the following tables.

CA Project Effort Form -- Full duration of project
(person-months for activities in which partners are involved)
ENEN-II

PARTNERS	ENEN MEMBERS Represented by the ENEN Association															ENEN ASSOC	SUB TOTAL ENEN ASSOC
	KUL	UCL	ATI	DUT	EPFL	KTH	CTU	BUTE	SUTB	ISaR	IKE	REZ	UPC	USE	ULG		
Co-ordination activities																	
WP 1 Integration of Nuclear Education, Training and End User Networks	0,6		0,4	0,1		1,25	0,25			0,15	0,2						2,95
WP 2 Development, Harmonisation and Consolidation of Academic Nuclear Education	0,25				0,5			0,15	1,5	0,9			0,5	1,7	0,5		6
WP 3 Facilitating and Supporting Research		0,5			0,75			0,5		0,4			0,25		0,25		2,65
WP 4 Professional Training Programmes				0,75	0,25	0,25		0,1		0,4		0,5	0,25		0,25		2,75
WP 5 Nuclear Knowledge Management			0,1	0,1			0,25	0,2	1,25		0,3		3	0,7		1	6,9
WP 6 Project Meetings	0,5	0,4	0,4	0,5	0,5	0,5		0,4	0,5	0,5	0,5	0,4	0,5	0,5			6,1
Total Co-ordination Activities	1,35	0,9	0,9	1,45	2	2	0,5	1,35	3,25	2,35	1	0,9	4,5	2,9	1	1	27,35
Management activities																	
WP 7 Project Management									0,5								0,5
Total Management									0,5								0,5
TOTAL ACTIVITIES	1,35	0,9	0,9	1,45	2	2	0,5	1,35	3,75	2,35	1	0,9	4,5	2,9	1	1	27,85

CA Project Effort Form -- Full duration of project
(person-months for activities in which partners are involved)
ENEN-II

PARTNER	SUBTOTAL(1) ENEN MEMBERS	2 MU	3 UCD	4 UMB	5 WEST	6 IRSN	7 ULUND	8 EURI DICE	9 CIRTEN	10 INPL	11 ANDRA	SUBTOTAL(2) PARTNERS
Co-ordination activities												
WP 1 Integration of Nuclear Education, Training and End User Networks	2,95	0,2		0,2					0,6	2		5,95
WP 2 Development, Harmonisation and Consolidation of Academic Nuclear Education	6	2,9	3,3	4,5	1	2,4	2,4	0,5	1,5	1,5	0,5	26,5
WP 3 Facilitating and Supporting Research	2,65		1	1	2,3			0,25	0,9	0,25	0,25	8,6
WP 4 Professional Training Programmes	2,75				1			0,75		1	0,25	5,75
WP 5 Nuclear Knowledge Management	6,9	1,5		1,4					0,5			10,3
WP 6 Project Meetings	6,1	0,6	0,5	0,6	0,5	0,5	0,5		0,5			9,8
Total Co-ordination Activities	27,35	5,2	4,8	7,7	4,8	2,9	2,9	1,5	4	4,75	1	66,9
Management activities												
WP 7 Project Management	0,5	1,5		1,5						0,25		3,75
Total Management	0,5	1,5	0	1,5	0	0	0	0	0	0,25	0	3,75
TOTAL ACTIVITIES	27,85	6,7	4,8	9,2	4,8	2,9	2,9	1,5	4	5	1	70,65

CA Project Effort Form -- Full duration of project
(person-months for activities in which partners are involved)
ENEN-II

PARTNER	SUBTOTAL(2) PARTNERS	12 TUC	13 EP	14 RAWRA	15 UDC	16 POSIVA	17 GNS	18 DBE	19 CEA	20 TKK	SUBTOTAL(3) PARTNERS
Co-ordination activities											
WP 1 Integration of Nuclear Education, Training and End User Networks	5,95	1							0,25	0,4	7,6
WP 2 Development, Harmonisation and Consolidation of Academic Nuclear Education	26,5	2,25	0,5	0,5	0,5	0,5	0,5	0,5	0,65	1,5	33,9
WP 3 Facilitating and Supporting Research	8,6	0,25	0,25	0,25	0,25	0,25	0,25	0,25	0,35	0,5	11,2
WP 4 Professional Training Programmes	5,75	1	0,25	0,25	0,25	0,25	0,25	0,25	2	0,5	10,75
WP 5 Nuclear Knowledge Management	10,3								1,25	0,25	11,8
WP 6 Project Meetings	9,8								0,6	0,5	10,9
Total Co-ordination Activities	66,9	4,5	1	1	1	1	1	1	5,1	3,65	86,15
Management activities											
WP 7 Project Management	3,75	0,5	0	0	0	0	0	0	0	0	4,25
Total Management	3,75	0,5	0	0	0	0	0	0	0	0	4,25
TOTAL ACTIVITIES	70,65	5	1	1	1	1	1	1	5,1	3,65	90,4

CA Project Effort Form -- Full duration of project
(person-months for activities in which partners are involved)
ENEN-II

PARTNER	SUBTOTAL(3) PARTNERS	21 UPB	22 UPM	23 JSI	24 CTUG	25 SCKCEN	26 UL	27 HMS		TOTAL PARTNERS
Co-ordination activities										
WP 1 Integration of Nuclear Education, Training and End User Networks	7,6	0,2	1,25	0,7	1	0,7	0,7	0,55		12,7
WP 2 Development, Harmonisation and Consolidation of Academic Nuclear Education	33,9	0,75	2,25	1,5	1,25	0,25	1,5	2		43,4
WP 3 Facilitating and Supporting Research	11,2	0,75	0,6	0,75	1		0,25	0,4		14,95
WP 4 Professional Training Programmes	10,75	1,5	1,5	0,25	1,25	1,25				16,5
WP 5 Nuclear Knowledge Management	11,8	0,5				0,9				13,2
WP 6 Project Meetings	10,9	0,5	0,5	0,5		0,7	0,5	0,6		14,2
Total Co-ordination Activities	86,15	4,2	6,1	3,7	4,5	3,8	2,95	3,55		114,95
Management activities										
WP 7 Project Management	4,25	0,5	0,5	0,5	0,5	2,5		0,5		9,25
Total Management	4,25	0,5	0,5	0,5	0,5	2,5	0	0,5	0	9,25
TOTAL ACTIVITIES	90,4	4,7	6,6	4,2	5	6,3	2,95	4,05		124,2

8.2 Overall Budget for the Project

Participant Number	Organisation Short Name Cost Model	Estimated Eligible Costs and EC Contribution (Whole duration of the project)		Costs and EC Contribution per Type of Activities			Total
				Coordination Activities	Training Activities	Management Activities	
1	ENEN Association FC	Eligible Costs	Direct Costs	227 917		4 167	232 084
			Of which subcontracting				
			Indirect Costs	45 583		833	46 416
			Total eligible costs	273 500		5 000	278 500
		Requested EC Contribution		273 500		5 000	278 500
2	MU FCF	Eligible Costs	Direct Costs	43 333		12 500	55 833
			Of which subcontracting				0
			Indirect Costs	8 667		2 500	11 167
			Total eligible costs	52 000		15 000	67 000
		Requested EC Contribution		52 000		15 000	67 000
3	UCD AC	Eligible Costs	Direct Costs	40 000		0	40 000
			Of which subcontracting				0
			Indirect Costs	8 000		0	8 000
			Total eligible costs	48 000		0	48 000
		Requested EC Contribution		48 000		0	48 000
4	UMB FC	Eligible Costs	Direct Costs	64 167		12 500	76 667
			Of which subcontracting				0
			Indirect Costs	12 833		2 500	15 333
			Total eligible costs	77 000		15 000	92 000
		Requested EC Contribution		0		0	0
5	WEST FC	Eligible Costs	Direct Costs	40 000		0	40 000
			Of which subcontracting				0
			Indirect Costs	8 000		0	8 000
			Total eligible costs	48 000		0	48 000
		Requested EC Contribution		48 000		0	48 000

Participant Number	Organisation Short Name Cost Model	Estimated Eligible Costs and EC Contribution (Whole duration of the project)		Costs and EC Contribution per Type of Activities			Total
				Coordination Activities	Training Activities	Management Activities	
6	IRSN FC	Eligible Costs	Direct Costs	24 167		0	24 167
			Of which subcontracting				0
			Indirect Costs	4 833		0	4 833
			Total eligible costs	29 000		0	29 000
		Requested EC Contribution		29 000		0	29 000
7	ULUND AC	Eligible Costs	Direct Costs	24 167		0	24 167
			Of which subcontracting				0
			Indirect Costs	4 833		0	4 833
			Total eligible costs	29 000		0	29 000
		Requested EC Contribution		29 000		0	29 000
8	ESV EURIDICE FC	Eligible Costs	Direct Costs	12 500		0	12 500
			Of which subcontracting				0
			Indirect Costs	2 500		0	2 500
			Total eligible costs	15 000		0	15 000
		Requested EC Contribution		15 000		0	15 000
9	CIRTEN AC	Eligible Costs	Direct Costs	33 333		0	33 333
			Of which subcontracting				0
			Indirect Costs	6 667		0	6 667
			Total eligible costs	40 000		0	40 000
		Requested EC Contribution		40 000		0	40 000
10	INPL AC	Eligible Costs	Direct Costs	39 583		2 083	41 666
			Of which subcontracting				0
			Indirect Costs	7 917		417	8 334
			Total eligible costs	47 500		2 500	50 000
		Requested EC Contribution		47 500		2 500	50 000

Participant Number	Organisation Short Name Cost Model	Estimated Eligible Costs and EC Contribution (Whole duration of the project)		Costs and EC Contribution per Type of Activities			Total
				Coordination Activities	Training Activities	Management Activities	
11	ANDRA	Eligible Costs	Direct Costs	8 333		0	8 333
			Of which subcontracting				0
	FC		Indirect Costs	1 667		0	1 667
			Total eligible costs	10 000		0	10 000
		Requested EC Contribution		10 000		0	10 000
12	TUC	Eligible Costs	Direct Costs	37 500		4 167	41 667
			Of which subcontracting				0
	AC		Indirect Costs	7 500		833	8 333
			Total eligible costs	45 000		5 000	50 000
		Requested EC Contribution		45 000		5 000	50 000
13	EP	Eligible Costs	Direct Costs	8 333		0	8 333
			Of which subcontracting				0
	AC		Indirect Costs	1 667		0	1 667
			Total eligible costs	10 000		0	10 000
		Requested EC Contribution		10 000		0	10 000
14	RAWRA	Eligible Costs	Direct Costs	8 333		0	8 333
			Of which subcontracting				0
	AC		Indirect Costs	1 667		0	1 667
			Total eligible costs	10 000		0	10 000
		Requested EC Contribution		10 000		0	10 000
15	UDC	Eligible Costs	Direct Costs	8 333		0	8 333
			Of which subcontracting				0
	AC		Indirect Costs	1 667		0	1 667
			Total eligible costs	10 000		0	10 000
		Requested EC Contribution		10 000		0	10 000

Participant Number	Organisation Short Name Cost Model	Estimated Eligible Costs and EC Contribution (Whole duration of the project)		Costs and EC Contribution per Type of Activities			Total
				Coordination Activities	Training Activities	Management Activities	
16	POSIVA	Eligible Costs	Direct Costs	8 333		0	8 333
			Of which subcontracting				0
	FC		Indirect Costs	1 667		0	1 667
			Total eligible costs	10 000		0	10 000
		Requested EC Contribution		10 000		0	10 000
17	GNS	Eligible Costs	Direct Costs	8 333		0	8 333
			Of which subcontracting				0
	FC		Indirect Costs	1 667		0	1 667
			Total eligible costs	10 000		0	10 000
		Requested EC Contribution		10 000		0	10 000
18	DBE TEC	Eligible Costs	Direct Costs	8 333		0	8 333
			Of which subcontracting				0
	FC		Indirect Costs	1 667		0	1 667
			Total eligible costs	10 000		0	10 000
		Requested EC Contribution		10 000		0	10 000
19	CEA-INSTN	Eligible Costs	Direct Costs	42 500		0	42 500
			Of which subcontracting				
	FC		Indirect Costs	8 500		0	8 500
			Total eligible costs	51 000		0	51 000
		Requested EC Contribution		51 000		0	51 000
20	TKK	Eligible Costs	Direct Costs	30 417		0	30 417
			Of which subcontracting				
	FC		Indirect Costs	6 083		0	6 083
			Total eligible costs	36 500		0	36 500
		Requested EC Contribution		36 500		0	36 500

Participant Number	Organisation Short Name Cost Model	Estimated Eligible Costs and EC Contribution (Whole duration of the project)		Costs and EC Contribution per Type of Activities			Total
				Coordination Activities	Training Activities	Management Activities	
21	UPB FC	Eligible Costs	Direct Costs	35 000		4 167	39 167
			Of which subcontracting				
			Indirect Costs	7 000		833	7 833
			Total eligible costs	42 000		5 000	47 000
		Requested EC Contribution		42 000		5 000	47 000
22	UPM FC	Eligible Costs	Direct Costs	50 833		4 167	55 000
			Of which subcontracting				
			Indirect Costs	10 167		833	11 000
			Total eligible costs	61 000		5 000	66 000
		Requested EC Contribution		61 000		5 000	66 000
23	JSI FC	Eligible Costs	Direct Costs	30 833		4 167	35 000
			Of which subcontracting				
			Indirect Costs	6 167		833	7 000
			Total eligible costs	37 000		5 000	42 000
		Requested EC Contribution		37 000		5 000	42 000
24	CTUG	Eligible Costs	Direct Costs	37 500		4 167	41 667
			Of which subcontracting				
			Indirect Costs	75 00		833	8 333
			Total eligible costs	45 000		5 000	50 000
		Requested EC Contribution		45 000		5 000	50 000
25	SCKCEN	Eligible Costs	Direct Costs	32 500		20 000	52 500
			Of which subcontracting				
			Indirect Costs	6 500		4 000	10 500
			Total eligible costs	39 000		24 000	63 000
		Requested EC Contribution		39 000		24 000	63 000

Participant Number	Organisation Short Name Cost Model	Estimated Eligible Costs and EC Contribution (Whole duration of the project)		Costs and EC Contribution per Type of Activities			Total
				Coordination Activities	Training Activities	Management Activities	
26	UL	Eligible Costs	Direct Costs	24 583		0	24 583
			Of which subcontracting				
	FC		Indirect Costs	4 917		0	4 917
			Total eligible costs	29 500		0	29 500
		Requested EC Contribution		29 500		0	29 500
27	HMS	Eligible Costs	Direct Costs	28 750		5 000	33 750
			Of which subcontracting				
	FC		Indirect Costs	5 750		1 000	6 750
			Total eligible costs	34 500		6 000	40 500
		Requested EC Contribution		34 500		6 000	40 500
	TOTAL	Eligible Costs	Direct Costs	957 914		77 085	1 034 999
			Of which subcontracting				
			Indirect Costs	191 586		15 415	207 001
			Total eligible costs	1 149 500		92 500	1 242 000
		Requested EC Contribution		1 072 500		77 500	1 150 000

8.3 Management level description of resources (man-months) and budget

Summary

Partner		Name	Acronym	Country		Man-months	Staff costs	Other expenses	Indirect costs	Budget	EC funding
1		European Nuclear Education Network Association	ENEN	International	b	1	10000	15000	5000	30000	30000
19		Institut National des Sciences et Techniques Nucléaires	CEA-INSTN	France		5,1	37500	5000	8500	51000	51000
1	**2**	Katholiek Universiteit Leuven	KUL	Belgium		1,35	7083	4167	2250	13500	13500
1	**3**	Université Catholique de Louvain	UCL	Belgium		0,9	4167	3333	1500	9000	9000
1	**4**	Atominstitut de Österreichischen Universitäten	ATI	Austria		0,9	4167	3333	1500	9000	9000
20		Helsinki University of Technology	TKK	Finland	a	3,65	26250	4167	6083	36500	36500
1	**6**	Delft University of Technology	DUT	The Netherlands		1,45	7917	4166	2417	14500	14500
1	**7**	Swiss Federal Institute of Technology	EPFL	Switzerland	b	2	12500	4167	3333	20000	0
21		University Politehnica Bucharest	UPB	Romania		4,7	35000	4167	7833	47000	47000
22		Universidad Politecnica de Madrid	UPM	Spain	a	6,6	50833	4167	11000	66000	66000
1	**11**	Kungl Tekniska Högskolan	KTH	Sweden		2	12500	4167	3333	20000	20000
23		Jozef Stefan Institute	JSI	Slovenia	a	4,2	30833	4167	7000	42000	42000
1	**13**	Czech Technical University	CTU	Czech Republic		0,5	4167	0	833	5000	5000
24		Czech Technical University-Geotechnics	CTUG	Czech Republic		5	37500	4167	8333	50000	50000
1	**14**	Budapest University of Technology and Economics	BUTE	Hungary		1,35	7917	3333	2250	13500	13500
25		Studiecentrum voor Kernenergie/Centre d'Etude de l'Energie Nucléaire	SCK/CEN	Belgium		6,3	46667	5833	10500	63000	63000
1	**16**	Slovak University of Technology in Bratislava	SUTB	Slovakia		3,75	27083	4167	6250	37500	37500
1	**18**	Institute for Safety and Reliability	ISAR	Germany		2,35	15416	4167	3917	23500	23500
26		University of Ljubljana	UL	Slovenia		2,95	20417	4166	4917	29500	29500
1	**22**	University of Stuttgart	IKE	Germany		1	4166	4167	1667	10000	10000
1	**24**	Ustav jaderného vyzkumu	REZ	Czech Republic		0,9	4167	3333	1500	9000	9000
27		HMS Sultan	HMS	United Kingdom		4,05	28750	5000	6750	40500	40500
1	**33**	University of Liège	ULG	Belgium		1	7333	1000	1667	10000	10000
1	**36**	Universidad de Sevilla	USE	Spain		2,9	20000	4167	4833	29000	29000
1	**40**	The Universitat Politecnica de Catalunya	UPC	Spain	a	4,5	33333	4167	7500	45000	45000
2		Middlesex University	MU	United Kingdom		6,7	50833	5000	11167	67000	67000
3		University College Dublin	UCD	Ireland		4,8	35833	4167	8000	48000	48000
4		Norwegian University of Life Sciences	UMB	Norway		9,2	71667	5000	15333	92000	0
5		Westlakes Research Ltd	WEST	United Kingdom		4,8	35833	4167	8000	48000	48000

Partner		Name	Acronym	Country		Man-months	Staff costs	Meeting expenses	Indirect costs	Budget	EC funding
6		Institute of Radioprotection and Nuclear Safety	IRSN	France		2,9	20000	4167	4833	29000	29000
7		Lund University	ULUND	Sweden		2,9	20000	4167	4833	29000	29000
8		European Underground Research Infrastructure for Disposal of nuclear waste in Clay Environment	EURIDICE	Belgium		1,5	11000	1500	2500	15000	15000
9		Consorzio Interuniversitario per la Ricerca Tecnologica Nucleare	CIRTEN	Italy		4	29167	4166	6667	40000	40000
10		Institut National Polytechnique de Lorraine	INPL	France		5	37500	4166	8334	50000	50000
11		Agence Nationale pour la Gestion des Déchets Radioactifs	ANDRA	France		1	7333	1000	1667	10000	10000
12		Technische Universität Clausthal	TUC	Germany		5	37500	4167	8333	50000	50000
13		Ecole Polytechnique	EP	France		1	7333	1000	1667	10000	10000
14		Radioactive Waste Repository Authority	RAWRA	Czech Republic		1	7333	1000	1667	10000	10000
15		Universidade da Corunia	UDC	Spain		1	7333	1000	1667	10000	10000
16		Posiva	POSIVA	Finland		1	7333	1000	1667	10000	10000
17		Gesellschaft fur Nuklear Service	GNS	Germany		1	7333	1000	1667	10000	10000
18		Deutsche Gesellschaft zum Bau und Betrieb von Endlagern fur Abfallstoffe	DBE	Germany		1	7333	1000	1667	10000	10000
						124,2	896330	155335	210335	1262000	1150000
Splitting of resources, budget and funding of some partners in different faculties											
20		Helsinki University of Technology	TKK	Finland	a	1	8333	0	1667	10000	10000
20		Helsinki University of Technology	TKK	Finland	a	2,65	17916	4167	4417	26500	26500
22		Universidad Politecnica de Madrid	UPM	Spain	a	5	37500	4167	8333	50000	50000
22		Universidad Politecnica de Madrid	UPM	Spain	a	1,6	10000	3333	2667	16000	16000
23		Jozef Stefan Institute	JSI	Slovenia	a	1	8333	0	1667	10000	10000
24		Jozef Stefan Institute	JSI	Slovenia	a	3,2	22500	4167	5333	32000	32000
1	**40**	The Universitat Politecnica de Catalunya	UPC	Spain	a	1	8333	0	1667	10000	10000
1	**40**	The Universitat Politecnica de Catalunya	UPC	Spain	a	3,5	25000	4167	5833	35000	35000

(a): Resources, budget and funding refers to more than one group or faculty of the ENEN member and have to be split accordingly.

(b): ENEN members located in third countries are included in the overall resources and budget of the ENEN Association, but will not be funded by the European Union. The corresponding amount is reserved by the ENEN Association as Coordinator for various project related expenses of a general nature (meetings, bank guarantee, reimbursement of expenses for auditing certificates, etc.)

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 1		**INTEGRATION OF NUCLEAR EDUCATION, TRAINING AND END USER NETWORKS**						
				Establish information exchange structures and cooperation						
				T.1.1.1				T.1.1.2		
				Education and training				Networks of Excellence		
				Radiological protection	Analytical radiochemistry	Radioecology	Geological Disposal	SARNET	NULIFE	ACTINET
Partner		**Acronym**	**Country**							
1		ENEN	International							
19		CEA-INSTN	France							
1	**2**	KUL	Belgium							
1	**4**	ATI	Austria							
1	**5**	TKK	Finland						0,2	
1	**6**	DUT	The Netherlands							
21		UPB	Romania							
22		UPM	Spain							
22		UPM	Spain				1			
1	**11**	KTH	Sweden							
23		JSI	Slovenia		0,2					
1	**13**	CTU	Czech Republic							
24		CTUG	Czech Republic				1			
25		SCK/CEN	Belgium	0,2						0,2
1	**18**	ISAR	Germany							
26		UL	Slovenia							
1	**22**	IKE	Germany					0,2		
27		HMS	United Kingdom							
2		MU	United Kingdom	0,2						
4		UMB	Norway			0,2				
9		CIRTEN	Italy							
10		INPL	France				2			
12		TUC	Germany				1			

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 1 (continued)		**INTEGRATION OF NUCLEAR EDUCATION, TRAINING AND END USER NETWORKS**					
				Establish information exchange structures and cooperation					
				T.1.2.1	T.1.2.2	T.1.3.1	T.1.3.2	T.1.3.3	T.1.4
				End Users		Worldwide	Regional	National	
				EUR	WENRA	World Nuclear University	ANENT	UNENE NEDHO	Networks
Partner		**Acronym**	**Country**						
1		ENEN	International						
19		CEA-INSTN	France	0,25					
1	**2**	KUL	Belgium			0,2	0,2		0,2
1	**4**	ATI	Austria			0,3			0,1
1	**5**	TKK	Finland						0,2
1	**6**	DUT	The Netherlands						0,1
21		UPB	Romania						0,2
22		UPM	Spain						0,25
22		UPM	Spain						
1	**11**	KTH	Sweden		0,25	0,5	0,25	0,25	
23		JSI	Slovenia	0,25	0,25				
1	**13**	CTU	Czech Republic						0,25
24		CTUG	Czech Republic						
25		SCK/CEN	Belgium				0,15	0,15	
1	**18**	ISAR	Germany						0,15
26		UL	Slovenia	0,5					0,2
1	**22**	IKE	Germany						
27		HMS	United Kingdom			0,25		0,2	0,1
9		CIRTEN	Italy						0,6
10		INPL	France						
12		TUC	Germany						

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 2 (a)		**DEVELOPMENT, HARMONISING AND CONSOLIDATION OF ACADEMIC NUCLEAR EDUCATION**						
				Develop non-overlapping modular education schemes						
				T.2.1.1	T.2.1.2	T.2.1.3	T.2.1.4	T.2.1.5	T.2.2.1	T.2.2.2
				Academic Curricula					Mobility	
				Nuclear Engineering	Radiological protection	Analytical radiochemistry	Radioecology	Geological Disposal	Formalisation of Mutual Recognition	Student Mobility Schemes
Partner		**Acronym**	**Country**							
1		ENEN	International							
19		CEA-INSTN	France	0,25					0,15	
1	**2**	KUL	Belgium							
20		TKK	Finland						0,15	
20		TKK	Finland					0,5		
1	**7**	EPFL	Switzerland						0,25	0,25
21		UPB	Romania						0,25	0,25
22		UPM	Spain					2		
23		JSI	Slovenia							
23		JSI	Slovenia			1				
24		CTUG	Czech Republic					1,25		
1	**14**	BUTE	Hungary							
25		SCKCEN	Belgium							
1	**16**	SUTB	Slovakia							
1	**18**	ISAR	Germany							
26		UL	Slovenia	0,25					0,25	0,25
27		HMS	United Kingdom	0,5					0,5	0,25
1	**33**	ULG	Belgium					0,5		
1	**36**	USE	Spain			1				
1	**40**	UPC	Spain					0,5		

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 2 (b)		**DEVELOPMENT, HARMONISING AND CONSOLIDATION OF ACADEMIC NUCLEAR EDUCATION**						
				Develop non-overlapping modular education schemes						
				T.2.2.3	T.2.2.4	T.2.3.1	T.2.3.2	T.2.3.3	T.2.4.1	T.2.4.2
				Erasmus Mundus		Advanced Courses			Quality Assurance	
				Nuclear Engineering	Radiation Protection	Procedures joint advanced courses	Pilot courses on advanced topics	Pilot course radioecology	Quality criteria for curricula and courses	Quality assurance of deliverables
Partner		**Acronym**	**Country**							
1		ENEN	International							
19		CEA-INSTN	France			0,25				
1	**2**	KUL	Belgium	0,25						
20		TKK	Finland				0,4		0,2	0,25
20		TKK	Finland							
1	**7**	EPFL	Switzerland							
21		UPB	Romania	0,25						
22		UPM	Spain			0,25				
23		JSI	Slovenia			0,25	0,25			
23		JSI	Slovenia							
24		CTU	Czech Republic							
1	**14**	BUTE	Hungary						0,15	
25		SCKCEN	Belgium			0,25				
1	**16**	SUTB	Slovakia				1,5			
1	**18**	ISAR	Germany				0,9			
26		UL	Slovenia	0,25		0,25	0,25			
27		HMS	United Kingdom	0,25		0,25	0,25			
1	**33**	ULG	Belgium							
1	**36**	USE	Spain					0,7		
1	**40**	UPC	Spain							

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 2 (c)		**DEVELOPMENT, HARMONISING AND CONSOLIDATION OF ACADEMIC NUCLEAR EDUCATION**						
				Develop non-overlapping modular education schemes						
				T.2.1.1	T.2.1.2	T.2.1.3	T.2.1.4	T.2.1.5	T.2.2.1	T.2.2.2
				Academic Curricula					Mobility	
				Nuclear Engineering	Radiological protection	Analytical radiochemistry	Radioecology	Geological Disposal	Formalisation of Mutual Recognition	Student Mobility Schemes
Partner		**Acronym**	**Country**							
2		MU	United Kingdom		1					
3		UCD	Ireland		1	1,3	1			
4		UMB	Norway				1			
5		WEST	United Kingdom			1				
6		IRSN	France		2,4					
7		ULUND	Sweden		1					
8		EURIDICE	Belgium					0,5		
9		CIRTEN	Italy	0,25						0,5
10		INPL	France					1,5		
11		ANDRA	France					0,5		
12		TUC	Germany					2,25		
13		EP	France					0,5		
14		RAWRA	Czech Republic					0,5		
15		UDC	Spain					0,5		
16		POSIVA	Finland					0,5		
17		GNS	Germany					0,5		
18		DBE	Germany					0,5		

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 2 (d)		**DEVELOPMENT, HARMONISING AND CONSOLIDATION OF ACADEMIC NUCLEAR EDUCATION**						
				Develop non-overlapping modular education schemes						
				T.2.2.3	T.2.2.4	T.2.3.1	T.2.3.2	T.2.3.3	T.2.4.1	T.2.4.2
				Erasmus Mundus		Advanced Courses			Quality Assurance	
				Nuclear Engineering	Radiation Protection	Procedures joint advanced courses	Pilot courses on advanced topics	Pilot course radioecology	Quality criteria for curricula and courses	Quality assurance of deliverables
Partner		**Acronym**	**Country**							
2		MU	United Kingdom		1			0,9		
3		UCD	Ireland							
4		UMB	Norway		1			2,5		
5		WEST	United Kingdom							
6		IRSN	France							
7		ULUND	Sweden		0,7			0,7		
8		EURIDICE	Belgium							
9		CIRTEN	Italy	0,25		0,25			0,25	
10		INPL	France							
11		ANDRA	France							
12		TUC	Germany							
13		EP	France							
14		RAWRA	Czech Republic							
15		UDC	Spain							
16		POSIVA	Finland							
17		GNS	Germany							
18		DBE	Germany							

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 3		**FACILITATING AND SUPPORTING RESEARCH**							
				Information system on the needs and opportunities for research and supporting mechanisms							
				T.3.1.1	T.3.1.2	T.3.1.3	T.3.1.4	T.3.1.5	T.3.2	T.3.3	T.3.4
				Research needs					Dissemination of results		Quality assurance
				Nuclear engineering	Radiation protection Radioecology	Geological Disposal	Develop training schemes	Develop financing schemes	Pilot event for PhD presentations	Think tank demonstration on one issue	Quality assurance of deliverables
Partner		**Acronym**	**Country**								
1		ENEN	International								
19		CEA-INSTN	France						0,15		0,2
1	**3**	UCL	Belgium							0,5	
20		TKK	Finland								0,25
20		TKK	Finland			0,25					
1	**7**	EPFL	Switzerland				0,5			0,25	
21		UPB	Romania	0,75							
22		UPM	Spain						0,1	0,25	
22		UPM	Spain			0,25					
23		JSI	Slovenia				0,5	0,25			
24		CTUG	Czech Republic			1					
1	**14**	BUTE	Hungary						0,5		
1	**16**	SUTB	Slovakia								
1	**18**	ISAR	Germany						0,15	0,25	
26		UL	Slovenia							0,25	
27		HMS	United Kingdom						0,4		
1	**33**	ULG	Belgium			0,25					
1	**40**	UPC	Spain			0,25					

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 3 (continued)		**FACILITATING AND SUPPORTING RESEARCH**							
				Information system on the needs and opportunities for research and supporting mechanisms							
				T.3.1.1	T.3.1.2	T.3.1.3	T.3.1.4	T.3.1.5	T.3.2	T.3.3	T.3.4
				Research needs					Dissemination of results		Quality assurance
				Nuclear engineering	Radiation protection Radioecology	Geological Disposal	Develop training schemes	Develop financing schemes	Pilot event for PhD presentations	Think tank demonstration on one issue	Quality assurance of deliverables
Partner		**Acronym**	**Country**								
3		UCD	Ireland		1						
4		UMB	Norway		1						
5		WEST	United Kingdom		2,3						
8		EURIDICE	Belgium			0,25					
9		CIRTEN	Italy	0,75					0,15		
10		INPL	France			0,25					
11		ANDRA	France			0,25					
12		TUC	Germany			0,25					
13		EP	France			0,25					
14		RAWRA	Czech Republic			0,25					
15		UDC	Spain			0,25					
16		POSIVA	Finland			0,25					
17		GNS	Germany			0,25					
18		DBE	Germany			0,25					

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 4		**PROFESSIONAL TRAINING PROGRAMMES**						
				Identify opportunities for professional training courses from end users needs						
				T.4.1	T.4.2.1	T.4.2.2	T.4.2.3	T.4.2.4	T.4.2.5	T.4.3
				Assessment	Joint pilot courses					Quality assurance
				Assess data on training courses	Neutronics of LWR	Radioactive Waste management	Decommissioning	Geological disposal remote teaching pilot	Workshop to disseminate pilot course results	Quality assurance of deliverables
Partner		**Acronym**	**Country**							
1		ENEN	International							
19		CEA-INSTN	France		0,5		1,5			
1	**3**	UCL	Belgium							
20		TKK	Finland							0,25
20		TKK	Finland					0,25		
1	**6**	DUT	The Netherlands		0,75					
1	**7**	EPFL	Switzerland	0,25						
21		UPB	Romania	0,5		1				
22		UPM	Spain	0,25						
22		UPM	Spain					1,25		
1	**11**	KTH	Sweden	0,25						
23		JSI	Slovenia	0,25						
24		CTUG	Czech Republic					1,25		
1	**14**	BUTE	Hungary							0,1
25		SCK/CEN	Belgium	0,25			1			
1	**18**	ISAR	Germany		0,4					
1	**24**	REZ	Czech Republic	0,25	0,25					
1	**33**	ULG	Belgium					0,25		
1	**40**	UPC	Spain					0,25		

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 4 (continued)		**PROFESSIONAL TRAINING PROGRAMMES**						
				Identify opportunities for professional training courses from end users needs						
				T.4.1	T.4.2.1	T.4.2.2	T.4.2.3	T.4.2.4	T.4.2.5	T.4.3
				Assessment	Joint pilot courses					Quality assurance
				Assess data on training courses	Neutronics of LWR	Radioactive Waste management	Decommissioning	Geological disposal remote teaching pilot	Workshop to disseminate pilot course results	Quality assurance of deliverables
Partner		**Acronym**	**Country**							
5		WEST	United Kingdom	1						
8		EURIDICE	Belgium					0,25	0,5	
10		INPL	France					1		
11		ANDRA	France					0,25		
12		TUC	Germany					1		
13		EP	France					0,25		
14		RAWRA	Czech Republic					0,25		
15		UDC	Spain					0,25		
16		POSIVA	Finland					0,25		
17		GNS	Germany					0,25		
18		DBE	Germany					0,25		

Estimated resources to be provided per partner/third parties for the completion of the tasks; subject to revision by the Work Package leaders

		WORK PACKAGE 5		**NUCLEAR KNOWLEDGE MANAGEMENT**								
				Develop and implement knowledge dissemination instruments								
				T.5.1.1	T.5.1.2	T.5.2.1	T.5.2.2	T.5.3.1	T.5.3.2	T.5.3.3	T.5.3.4	T.5.4
				Web sites		Databases		Products				Quality assurance
				Integrate web sites and communication systems	Implement semantic web structure	Appoint country contact points	Evaluate response time and data correctness	Textbooks	Public information multimedia tools	Distance and E-learning modules	Secondary school nuclear information packages	Quality assurance of deliverables
Partner		**Acronym**	**Country**									
1		ENEN	International	1								
19		CEA-INSTN	France	0,25				0,75				0,25
1	**4**	ATI	Austria	0,1								
20		TKK	Finland									0,25
1	**6**	DUT	Netherlands	0,1								
21		UPB	Romania							0,5		
1	**13**	CTU	Czech Republic								0,25	
1	**14**	BUTE	Hungary									0,2
1	**15**	SCK/CEN	Belgium	0,15				0,5			0,25	
1	**16**	SUTB	Slovakia	0,25		0,25	0,75					
1	**22**	IKE	Germany	0,3								
1	**36**	USE	Spain							0,7		
1	**40**	UPC	Spain					0,75	2		0,25	
2		MU	United Kingdom							1,5		
4		UMB	Norway							1,4		
9		CIRTEN	Italy			0,25			0,25			

		WORK PACKAGE 6		**PROJECT MEETINGS**			
				Meetings			
				T.6.1.1	T.6.1.2	T.6.2	T.6.3
				General meetings		Management	Work Package
				Kick-off meeting	Progress meetings	Management meetings	Workshops and Work package meetings
Partner		**Acronym**	**Country**				
1		ENEN	International				
19		CEA-INSTN	France	0,1	0,2	0,1	0,2
1	**2**	KUL	Belgium	0,1	0,2		0,2
1	**3**	UCL	Belgium	0,1	0,2		0,1
1	**4**	ATI	Austria	0,1	0,2		0,1
20		TKK	Finland	0,1	0,2		0,2
1	**6**	DUT	The Netherlands	0,1	0,2		0,2
1	**7**	EPFL	Switzerland	0,1	0,2		0,2
21		UPB	Romania	0,1	0,2		0,2
22		UPM	Spain	0,1	0,2		0,2
1	**11**	KTH	Sweden	0,1	0,2		0,2
23		JSI	Slovenia	0,1	0,2		0,2
24		CTU	Czech Republic	0,1	To be decided		
1	**14**	BUTE	Hungary	0,1	0,2		0,1
25		SCK/CEN	Belgium	0,1	0,2	0,2	0,2
1	**16**	SUTB	Slovakia	0,1	0,2		0,2
1	**18**	ISAR	Germany	0,1	0,2		0,2
26		UL	Slovenia	0,1	0,2		0,2
1	**22**	IKE	Germany	0,1	0,2		0,2
1	**24**	REZ	Czech Republic	0,1	0,2		0,1
27		HMS	United Kingdom	0,1	0,2	0,1	0,2
1	**33**	ULG	Belgium	0,1	To be decided		
1	**36**	USE	Spain	0,1	0,2		0,2
1	**40**	UPC	Spain	0,1	0,2		0,2
2		MU	United Kingdom	0,1	0,2	0,2	0,1
3		UCD	Ireland	0,1	0,2		0,2
4		UMB	Norway	0,1	0,2	0,2	0,1
5		WEST	United Kingdom	0,1	0,2		0,2
6		IRSN	France	0,1	0,2		0,2
7		ULUND	Sweden	0,1	0,2		0,2
8		EURIDICE	Belgium	0,1	To be decided		
9		CIRTEN	Italy	0,1	0,2		0,2
10		INPL	France	0,1	In WP7	In WP7	In WP7
11		ANDRA	France	0,1	To be decided		
12		TUC	Germany	0,1	In WP7	In WP7	In WP7
13		EP	France	0,1	To be decided		
14		RAWRA	Czech Republic	0,1	To be decided		
15		UDC	Spain	0,1	To be decided		
16		POSIVA	Finland	0,1	To be decided		
17		GNS	Germany	0,1	To be decided		
18		DBE	Germany	0,1	To be decided		

		WORK PACKAGE 7		PROJECT MANAGEMENT			
				Management			
				T.7.1	T.7.2	T.7.3	T.7.4
				Collecting information		Communicatio n	
				Meeting preparation	Compilation of information	Reporting	Presentations
Partner		**Acronym**	**Country**				
1		ENEN	International				
21		UPB	Romania	0,1	0,1	0,2	0,1
22		UPM	Spain			0,5	
23		JSI	Slovenia	0,1	0,1	0,2	0,1
24		CTU	Czech Republic			0,5	
25		SCK/CEN	Belgium	0,5	0,5	1,25	0,25
1	**16**	SUTB	Slovakia	0,1	0,1	0,2	0,1
27		HMS	United Kingdom	0,1	0,1	0,2	0,1
2		MU	United Kingdom	0,4	0,4	0,4	0,3
4		UMB	Norway	0,4	0,4	0,4	0,3
10		INPL	France			0,25	
12		TUC	Germany			0,5	

All resources in the tables are given in man-months and are estimates based on the efforts needed to carry out the tasks and produce the deliverables. The resources are subject to revision and reallocation following a motivated decision of the Project Management Committee.

According to Annex II of the contract, paragraph II.25, Coordination actions, indirect costs have been estimated at a flat rate of 20 % of the direct costs. Travel expenses have been estimated on the basis of the project plenary meetings, work package meetings, workshops and management meetings. No subcontracting is foreseen in the project. There is no need for major equipment purchases or infrastructures. Consumables and various services (e.g. information technology, communications, etc.) are to be covered by the indirect costs.

9. Other issues

9.1 Ethical issues

The project participants conform to current legislation and regulations in their respective countries and to all the relevant EU legislation mentioned in the document Guide for Proposers –Coordination actions; EURATOM Call 2003- (17 December 2002). Participants also respect the international conventions and declarations mentioned in the same document.

Do some of the project activities raise sensitive ethical questions related to:	**YES**	**NO**
Human beings		NO
Human biological samples		NO
Personal data (whether identified by name or not)	YES	
Genetic information		NO
Animals		NO

Data bases including personal information will be managed and protected according to the current European legal requirements.

Are some of the project activities related to :	**YES**	**NO**
Research activity aimed at human cloning for reproductive purposes,		NO
Research activity intended to modify the genetic heritage of human beings which could make such changes heritable[30];		NO
Research activity intended to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer;		NO
Research involving the use of human embryos or embryonic stem cells with the exception of banked or isolated human embryonic stem cells in culture[31].		NO

[30] Research relating to cancer treatment of the gonads can be financed.

[31] Applicants should note that the Council and the Commission have agreed that detailed implementing provisions concerning research activities involving the use of human embryos and human embryonic stem cells which may be funded under the 6th Framework Programme shall be established by 31 December 2003. The Commission has stated that, during that period and pending establishment of the detailed implementing provisions, it will not propose to fund such research, with the exception of the study of banked or isolated human embryonic stem cells in culture.

9.2 Gender issues

There are no particular gender issues associated to the ENEN-II project. The selection of the ENEN members and the partners of the consortium, is based on a set of criteria established by the ENEN Quality Assurance Committee. The criteria are not related to gender issues. The criteria are purely derived from the academic curricula, the qualifications of the university staff, the admission of the students and the relative importance of research work in nuclear disciplines. All ENEN members have non-discriminatory policies with respect to the recruitment of staff and admission of students and several ENEN Members have gender action plans to promote gender equality.

Historically education and training in nuclear disciplines have been mainly attracting and attended by male students, resulting in a majority of male staff in institutes, organisations and industries related to nuclear applications. This situation is slowly but definitely changing, as it has been observed in the participation of young female professionals and students to the pilot courses organised in the framework of the ENEN and NEPTUNO projects. The ENEN-II project will further advertise, promote and encourage the participation of female students and female young professionals to the different activities, such as pilot training courses, advanced courses, access to databases, mobility schemes, etc. This promotion and encouragement, however, will maintain a strictly non-discriminatory character with respect to gender issues.

Appendix A – A.1 Consortium Description

Partner 1 ENEN – The European Nuclear Education Network Association

The temporary network, established through the European 5th Framework Programme project ENEN, was given a more permanent character by the foundation of the European Nuclear Education Network Association, a non-profit-making association according to the French law of 1901, pursuing a pedagogic and scientific aim. The organisation has its legal registered office in the premises of INSTN on the site of CEA Saclay. Its Mission, objectives and structure were formulated in the Statutes (See Appendix B), following the conclusions and recommendations of 5th FP ENEN Project, with as its main objective the preservation and the further development of higher nuclear education and expertise. This objective is realized through the co-operation between the European universities, involved in education and research in the nuclear engineering field, the nuclear research centres and the nuclear industry.

To achieve this objective, the ENEN Association has to:

- Promote and further develop the collaboration in nuclear engineering education of engineers and researchers needed by the nuclear industry and the regulatory bodies;
- Ensure the quality of nuclear academic engineering education and training;
- Increase the attractiveness for engagement in the nuclear field for students and young academics.

The basic objectives of the ENEN Association are to:

- Deliver a European Master of Science Degree in Nuclear Engineering and promote PhD studies;
- Promote exchange of students and teachers participating in the frame of this network;
- Increase the number of students by providing incentives;
- Establish a framework for mutual recognition;
- Foster and strengthen the relationship with research laboratories and networks, industry and regulatory bodies, by involving them in nuclear academic education and by offering continuous training.

The ENEN association is managed by a Board of Directors, elected by the General Assembly and the work is organised through a Management Committee. The management committee is constituted by the Secretary General, appointed by the Board of Directors, and the Chairmen of the five different working committees, which are dedicated to specific tasks in order to realise the dissemination and management of knowledge.

The strategy followed to achieve the aims of the ENEN Association includes:

- Discussion on educational objectives, methods and course contents among the members and with external partners, particularly national and European industries;
- Organisation of internal audits on the quality of nuclear engineering curricula;
- Awarding the label of "European Master of Science in Nuclear Engineering" to the curricula satisfying the criteria set up by the ENEN Association;
- Cooperation between the members, and with the research centres and the nuclear industry for enhancement of mobility of teachers and students, organisation of training and advanced courses, use of large research and teaching facilities or infrastructures;
- Cooperation with international and national governmental institutions, agencies and universities;

- Identification and development of solutions to specific problems and deficiencies which hinder the attainment of the aims of the Network;
- Facilitating the exchange of information between the Members of the ENEN Association - on course objectives, content, modes of presentation and other matters.

There are two types of Members in the ENEN Association, the Effective Members and the Associated Members. Effective and Associated Members are institutions or corporate bodies.

The Effective Members are academic institutions or clusters of such institutions having a legal status and meeting all following criteria:
- Provide high-level scientific education in the nuclear field -as full time teaching and providing the basis for doctorate studies- based on internationally recognized research in nuclear engineering and/or nuclear sciences, which is carried out jointly by the teaching staff, the students, and the doctoral and post-doctoral researchers in the same geographic location or in association with a nuclear research centre.
- Use selective admission criteria conforming to legal provisions and/or national practices.
- Be based in the European Union or in one of its candidate member countries.

The Associated Members are corporate bodies having a legal status, such as nuclear education and research organisations, government institutions, nuclear companies, regulatory bodies, nuclear learning societies, who conform to the following criteria:
- commit themselves to support the ENEN Association;
- have a firmly established tradition of relations with some of the members in the fields of education, research and training;
- are based in the European Union or in one of its candidate member countries.

The legal entity “European Nuclear Education Network Association” with a current membership of 34 universities, one university consortium grouping six universities and six research centres located in 18 European countries constitutes the consortium of the ENEN-II project. The Board of Governors of the ENEN Association will act as the coordinator of the ENEN-II project, mainly through the Office of the Secretary General for the everyday follow-up and management of the project.

1-2 Katholieke Universiteit Leuven (KUL)

K.U.Leuven Research and Development is a branch of the "Katholieke Universiteit Leuven" (K.U.Leuven; University of Leuven), Leuven, Belgium, that promotes and manages the research contracts of the university research groups with third parties. The K.U.Leuven is the oldest and largest university in Belgium (founded in 1425). The centre that will perform the work proposed in this proposal is the K.U.Leuven Center for Nuclear Engineering. This interdepartmental centre offers the Nuclear Engineering programme at the university (organised at the post-graduate level). Next to its teaching activities, its members perform research work in subjects such as nuclear materials, nuclear thermal hydraulics, nuclear safety, nuclear waste management and nuclear fusion. Over the last six years, the Centre has successfully collaborated with the university of Ghent (Belgium) in offering a common nuclear engineering program, and is presently heavily involved in the discussion to construct one single Belgian programme. It is in this context that the Centre is interested to broaden the scope even further in trying to participate in a European exchange network.

William D'haeseleer is a Full Professor at the University of Leuven (K.U.Leuven). He presently teaches courses in the domains of Nuclear Engineering (Nuclear Reactor Physics, Nuclear Reactor

Technology, Reactor Kinetics and Stability, Radiation Shielding, and Safety in Nuclear Installations), Energy Management, and Applied Thermodynamics & Energy Conversion. His research activities concentrate on energy systems, energy management and energy policy. Current research projects include the greenhouse-gas emissions of the Belgian electricity-generation system, the physics of condensation in the presence of non-condensible gasses in nuclear reactors, amongst others. He is presently Chairman of the K.U.Leuven Centre for Nuclear Engineering and is Director and Chairman of the Executive Committee of the University of Leuven Energy Institute. He is also the founder of the K.U.Leuven Energy Foundation Industry-University. He received the degree of University Graduated Engineer in Electro-Mechanical Engineering, option Energy, at the University of Leuven (K.U.Leuven, 1980) after which he obtained the degree in Nuclear Engineering in 1982 from the same University. After obtaining his doctoral degree from the University of Wisconsin-Madison, USA, in 1988, he joined the European NET Team at the Max-Planck-Institut fur Plasmaphysik in Garching-bei- Munchen, Germany. From 1993 until 1996, he was active at Tractebel Energy Engineering, where he headed the Section of Mechanical Studies of the Nuclear Department. He was also Research & Development Manager of the Nuclear Department. Furthermore, he acted as Fusion Project Manager of Tractebel and Belgatom. In 1996, he was called to the University of Leuven to become Full Professor in "Energy Systems and Rational Use of Energy".

1-3 Université Catholique de Louvain (UCL)

Universite catholique de Louvain, located in Louvain-la-Neuve is a research based higher education institution involving all disciplines of human sciences, medicine and exact sciences Nuclear sciences and engineering are present in several departments (physics, chemistry, nuclear medicine and mechanical engineering). Within the school of engineering and its department of mechanical engineering, TERM (Unite Thermodynamique) is a division active in fluid flow and heat transfer including two-phase thermal-hydraulics. The division involves 5 full time professors, 3 researchers with a PhD degree in engineering, 6 technicians and secretary, and 12 PhD students.

The school of engineering contributes actively to the teaching of neutron physics and thermal-hydraulics of the post-graduate programme of nuclear engineering of the French Community of Belgium.

Prof. Dr.ir. Michel Giot : Professor of transport phenomena and two-phase systems including nuclear thermal-hydraulics, doing himself or conducting research on multiphase flows for more than 30 years. DHC of the University Politehnica of Bucharest, member of the European Academy of Sciences and Arts, member of the Board of Governors of the Nuclear Research Centre of Mol, Prof. Giot has a broad view of nuclear thermal-hydraulics and nuclear safety, and useful experience in quality assessment of research and teaching of foreign institutions. He is also member of the editorial boards of several international journals, and of the scientific assessment committee on reactor physics of the French CEA and of the Paul Scherrer Institute (Switzerland).

Prof. Dr. ir. Ernest Mund: Professor of nuclear reactor theory, reliability and safety analysis his field of research consists in the applied mathematical aspects of reactor physics, time-dependent problems in neutron transport, high order methods for fluid flows, Monte-Carlo method etc Prof Mund is Research Director at the Belgian National Science Foundation, member of the Scientific Advisory Committee of the Nuclear Research Centre of Mol and member of the board of NIRAS-ONDRAF, the Belgian agency for fissile materials and nuclear waste. He participated to the AMPERE Committee in charge of advising the Belgian Government on national energy issues. He has a scientific co-operation with many scientists from Europe, USA and Mexico.

1-4 Atominstitut de Österreichischen Universitäten (ATI)

The Atominstitut is an inter-university institute founded in 1962 and attached to the Technical University Vienna. Its main task is to train students in the following fields of academic research: neutron- and solid state physics, nuclear technology and reactor safety, radiochemistry, radiation protection and dosimetry, low temperature physics and fusion research and X-ray physics. Students are offered more than 100 specialised theoretical course and 10 practical courses for training in the above fields and they graduate with Masters - or PhD degree. In addition, due to the proximity of the IAEA there is a close co-operation in the form of research projects, training courses, and fellowship acceptances between the IAEA and the Atominstitut. Staff members of the institute are frequently hired by the IAEA as short-term expert and consultants to be involved in projects in Asia, Africa or South America. The main instruments for training and education is a 250 kW TRIGA Mark II reactor, a 2 MeV Van de Graff generator, a Helium liquefaction plant X-ray equipment etc.

Helmuth Böck graduated in 1966 with a Masters Degree in Nuclear Engineering and 1969 with a PhD in nuclear engineering from the Technical University Vienna. In 1979, he obtained the Assistant Professorship in reactor safety. Since 1967, he is Reactor Manager of the TRIGA Mark II reactor. During his professional career he published more than 200 papers in international journals and international conferences, he carried out more than 40 missions for the IAEA to developing countries in the fields of nuclear engineering, reactor safety and research reactor utilisation He co-ordinated and supervised more than 40 Master thesis and 15 PhD thesis projects at the Technical University of Vienna.

1-6 Delft University of Technology (DUT)

The Reactor Institute Delft (RID), part of the Delft University of Technology is the Dutch universities centre for research and training in which its nuclear reactor, radionuclides ionising radiation and related expertise play a central role. The institute's activities can be divided into five categories:

- research aiming at further development of the specific IRI facilities and expertise;
- fundamental and applied research using these facilities and expertise;
- provision of a home base for experiments at large international radiation sources;
- education and training of students and specific professional groups;
- routine services.

The fundamental research comprises radiochemistry, radiation chemistry, chemical reaction kinetics condensed matter physics as well as reactor and neutron physics. The institute employs some 220 persons.
The Section Physics of Nuclear Reactors (PNR) focuses its research on the physics and thermal-hydraulic aspects of three lines of innovative designs of nuclear reactors: boiling water reactors (BWRs) with passive safety features, high temperature gas-cooled reactors (HTRs) and accelerator-driven subcritical systems (ADSs). Being a university group, exotic designs are being investigated as well. An example of the latter type is a fluidised bed nuclear reactor.
Presently, part of the research concentrates on high temperature reactors; especially the long-term control of excess reactivity by means of burnable poisons, and system studies to investigate the dynamic behaviour of direct-cycle helium-cooled reactors during normal and abnormal situations. Experience includes measurements of reactivity effects and kinetic parameters at the PROTEUS facility in Switzerland and at the HTTR in Japan.
As educational activities the staff members of the department are lecturing in several reactor physics subjects and radiation shielding at the Delft University of Technology and supervise undergraduate

students and PhD. students during their research work. They also supervise a laboratory course with experiments at the 2 MW swimming pool type research reactor of RID.

Prof. Dr. T.H.J.J. van der Hagen is professor at the Department of Applied Sciences of Delft University of Technology. He is heading the Department of Reactor Physics of IRI He has been working in the field of BWR physics since 1985, with emphases on stability monitoring signal processing, two-phase flow diagnostics and experimental campaigns on the interaction of neutronics and thermal-hydraulics. He has (co-)authored more than 100 papers in international journals and conference proceedings on these and other nuclear reactor topics.

1-7 Swiss Federal Institute of Technology (EPFL)

The EPFL offers 13 complete study courses in Engineering, Basic Sciences and Architecture as well as a Master's programme in the Management of Technology. Engineering professionals can reinforce or expand upon their education in the EPFL's continuing education programme. Recently recognized by the Times Higher Education supplement as the world's most "international" university, EPFL has redesigned its degree programmes to conform to the Bologna Accords, giving students new mobility and opening up even more opportunities for international exchange and postgraduate work. With 107 nationalities represented on campus and 50% of the teaching staff originating from abroad, the EPFL has a truly international vocation.

Students working towards a doctoral thesis form the backbone of a thriving research institution. The EPFL's doctoral school, launched in 2002, is a stimulating intellectual community dedicated to providing its doctoral students with the research opportunities, coursework and support they need to succeed in this challenging part of their education.

The Laboratory for Reactor Physics and Systems Behaviour (LRS) at EPFL represents, on an international scale, a rather unique organisation in the field of nuclear education and research, in that it is a university laboratory with a research base linked directly to the principal national centre for energy related R&D. The latter, in the case of Switzerland, is the Paul Scherrer Institute (PSI) at Villigen, which is a research institute within the EPF-Domain. Thus, EPFL is responsible for tasks related to "teaching" (including Master's and PhD research) of reactor physics and systems behaviour, while PSI carries the charge for the corresponding "professional R&D". As a consequence, the research conducted in LRS at EPFL, i.e. Master's and PhD work on nuclear (fission) energy related topics, is closely related to the R&D activities in LRS at PSI. The latter essentially address two fundamental aspects determining the sustainability of nuclear energy, viz. (i) an in-depth understanding of the complex phenomenology underlying nuclear reactor safety, and (ii) the development of advanced fuel cycles for improved plutonium management and the reduction of long-lived wastes. The principal experimental facility used in this context is the PROTEUS research reactor at PSI.

Teaching efforts in LRS aim principally to inculcate basic knowledge of nuclear power plants in EPFL's science and engineering students at large. This is achieved, on the one hand by the offer of optional courses on nuclear engineering topics to 3rd and 4th year students in physics and mechanical engineering and, on the other hand, by the integration into physics laboratory classes of introductory reactor experiments conducted at the CROCUS teaching reactor on the EPFL campus. Efforts are currently underway to establish, in collaboration with the EPF-Zurich (ETHZ), PSI and the Swiss utilities, a new Master's programme in Nuclear Engineering which, for the first time in Switzerland, will enable candidates to acquire specialised training leading to a university graduate-level degree in the field.

Rakesh Chawla, born in 1947, is Professor of Reactor Physics and Systems Behaviour at EPFL since 1994. He is also laboratory head at PSI and, as such, responsible for the research conducted there in the areas of reactor physics and nuclear power plant (NPP) safety analysis. His teaching activities, including the guidance of Master's and doctoral research, relate to various physics aspects of nuclear engineering. His current research interests include experimental reactor physics, NPP dynamic behaviour and advanced fuel cycle studies. He has authored/co-authored over 200 publications in international journals and conference proceedings.

1-11 Kungl Tekniska Högskolan (KTH)

Royal Institute of Technology (RIT), in Stockholm, Sweden is a technical university with first-class education and research. It provides one-third of Sweden's capacity for engineering studies and technical research at post-secondary level. RIT has about 11,900 students and 2900 employees and there are about 1300 active post-graduate students. RIT trains architects and engineers at Master's and Bachelor's level, as well as doctors and licentiates. RIT is organised in six schools and a college of applied engineering. There are some 40 departments. Each possess a wide and comprehensive scientific competence for research and undergraduate education. Most activities related to nuclear energy are performed in Department of Energy Technology, which is organized in six divisions including Nuclear Power Safety, Nuclear Reactor Engineering and Center of Nuclear Technology. In the Division of Nuclear Power Safety, the research program is directed towards resolution of the safety issues that are important to the Swedish nuclear power plants. In particular, experimental and analytical research are performed for the physical phenomena inherent in the scheme adopted in Sweden for management of the severe accidents. Additionally, research is performed on the safety of eastern reactors with particular emphasis on the Ignalina plant in Lithuania.

A large laboratory is available in which induction and resistance furnaces have been installed and two containments have been constructed in order to perform large scale experiments with high temperature oxide mixture melt material, interacting with water or structural materials (vessel). A Phillips 320kV X-Ray source and a Thomson 290 mm quadfied image intensifier were purchased to perform continuous visualization measurements. The multi-sensor void probe technology was developed to measure local void fraction. A PC base 312 kS/s data acquisition system was obtained. A high pressure system (up to 25 bar) was also developed to perform the FOREVER Vessel Failure experiments with high pressure. The laboratory has performed many large scale experiments in the last 4 years in the EU projects.

Professor **Tomas Lefvert** is Corporate Scientific Adviser at Vattenfall AB and adjunct professor in Reactor Physics at the Kungliga Tekniska Högskolan in Stockholm (www.kth.se). At Vattenfall he has been managing departments in the areas of nuclear fuel technology, safety analysis, computer code development and in-core fuel management. He is presently Director of the Swedish Centre of Nuclear Technology (www.nuclear-tech-centre.org), an organisation supporting research and education in nuclear technology at the main technical universities in Sweden. On the international arena he is the present chairman of the OECD NEA Nuclear Science Committee, member of the OECD NEA Committee on the Safety of Nuclear Installations and the Swedish representative to the European Atomic Energy Society.

Professor **Wacław Gudowski** specializes in neutron and reactor physics at Kungliga Tekniska Högskolan (KTH) - The Royal Institute of Technology in Stockholm, Sweden, where he has been a professor since 1999. A member of the Royal Academy of Ingineering Sciences (IVA), Dr. Gudowski received his PhD from the University of Mining and Metallurgy in Krakow (Poland)

based on the work done on the design of the fast-pulsed research reactor IBR-2 in Dubna, Russia. From 1983 until 1992, Professor Gudowski worked with neutron scattering, conducting basic research on the structure and dynamics of liquid metals. In 1991, his interest shifted towards transmutation of nuclear waste. He is one of the European pioneers of accelerator driven transmutation of waste, the so-called Accelerator Driven Systems (**ADS)**. Since then, he has successfully conducted research within Sweden and on many European projects. Currently Wacław Gudowski is coordinating a large European project "Impact of Transmutation and Reduction of Waste on Geological Waste Repository – RED-IMPACT ". He participates very actively in an international program, helping Russian nuclear weapon specialists conduct peaceful projects like ADS. He teaches reactor physics and physics of transmutation together with Monte Carlo methods. An expert on computer assisted teaching, Professor Gudowski will provide Institute participants with an opportunity to see how creatively one can use computers in educational processes.

1-14 Budapest University of Technology and Economics (BME)

The Budapest University of Technology and Economics (BME), as one of the greatest Hungarian higher education institutions regards its mission the differentiated, multi-level, wide base quality education, elite-training, research and development, based on a strong primary training corresponding to social demands and the general development of science.

Aim of the BME is the high level university and college basic training, professional further training, scientific training, and scientific qualification on several fields of natural and technical sciences, of the inanimate and animate natural sciences as well as social sciences.

According to its good traditions the University ensures in the education the unity of theory and practice, namely the high level theoretical foundation and the practical training also based on industrial, agricultural, and other economic connections.

The University issues in university (college) basic training a diploma on the university (college) degree and speciality, and in special further training based on university (college) degree a diploma on the speciality branch training. The University's mission is - together with the education - the cultivation of sciences: scientific research, ensuring the image of the "research university".

The University may award, after organised PhD training or individual studies, a doctor's (PhD) degree; after organised master training at the Faculty of Architecture or individual studies a master (DLA) degree.

The University undertakes, with employing the available personal and objective capacities beside its basic tasks in the field of education, research and development pay-service activities.
Main areas of the enterprise activity:

- offering training and services not connected to complying with study duties included in qualification requirements and curricula for students taking part in state financed higher education,
- payments courses in specialist education on all training levels and in all forms using different technical means
- supporting of lifelong learning
- payment courses in secondary education
- organisation of admission courses
- as enterprising activity performing for outside employers and orderers training, research works, developing, consulting, servicing and other tasks.

Dr. Csaba Sükösd graduated in physics in 1971 and got the doctoral degree in 1975 at the Eötvös Lorand University Faculty of National Sciences Budapest. He got the PhD in Physics from the Hungarian Academy of Sciences in 1983. From 1971 to 1992, he was at the Eötvös Lorand University Faculty of Nat. Sc. Dept of Atomic Physics. Since 1992 he is associate university professor, vice-dean of the Faculty of Sciences, deputy director of the Institute of Nuclear Techniques and head of the Department of Nuclear techniques of BME. He lectured at the Université Catholique de Louvaine-la-Neuve in 1993-1994, was at the Kernforschungsanlage Jülich in 1984-1985 and 1978-1980 and at the CEA Saclay in 1973-1974. His research fields are experimental nuclear physics, neutron physics, nuclear fission, nuclear reactors, giant resonances, radioactive beams and nuclear astrophysics. He lectures in nuclear physics, nuclear techniques, nuclear energetics and radiation protection. He leads nuclear laboratory sessions for physicists and math-physics teachers.

1-16 Slovak University of Technology in Bratislava (SUTB)

The Slovak University of Technology (SUT) in Bratislava was founded in 1941 and it is the largest and oldest University of Technology in Slovakia. More than 50% of highly educated professionals working nowadays in nuclear industry in Slovakia graduated from this university. Our Faculty of Electrical Engineering and Information Technology awarded more than 700 doctoral degrees and more than 18 000 master degrees up to now. One of the study branches concerns nuclear power engineering. It offers programs leading to bachelor's, master's, and doctoral degree in nuclear engineering. There exists a long, extensive and effective international collaboration. Student graduates in nuclear power engineering from our faculty perform practical exercises and experiments at nuclear facilities in Vienna, Budapest and Prague. Co-operation between the faculty and nuclear power plants industry in Slovakia is documented by annual visits and excursions of our students to power plants and their practical training in training centres. In addition, we have long tradition in the organisation of post-gradual courses for operation staff of nuclear power plants.

Marcel Miglierini, (Professor, DSc.) was born in Bratislava, Slovakia (1956). In 1981 he graduated from the Slovak University of Technology in Bratislava in the area of experimental electrophysics. Since 1983, he works at the Department of Nuclear Physics and Technology, Faculty of Electrical Engineering and Information Technology of the Slovak University of Technology, since 1992 as associate professor, since 1997 as a full professor in condensed matter physics. His main field of research and teaching activities comprise condensed matter studies by means of nuclear-based spectroscopic techniques. He is a principal investigator of national and international scientific projects. He is a representative of Slovakia to the International Board on the Application of the Mössbauer Effect and president of Slovak Spectroscopic Society.

Ján Haščík, (PhD.) born in Žilina, Slovakia (1944). In 1970 graduated from the Moscow Power Institute in the area of nuclear installations. He gained the PhD degree from the Faculty of Electrical Engineering and Information Technology of the Slovak University of Technology in the specialization of nuclear equipment. Since 1970 he works at the Department of Nuclear Physics and Technology as a senior lecturer. The main field of research and teaching activities are physics of nuclear reactors and application of spectroscopic methods to the investigation of materials used in nuclear industry. He has published more than 100 original papers in scientific journals or at international conferences. He is also member of Examination board of Nuclear Regulatory Authority for verification of specific abilities of operating staff of nuclear installations.

1-18 Institute for Safety and Reliability (ISaR)

The ISaR **Institute for Safety and Reliability** is a scientific organisation in the field of safety- and reliability engineering with a focus on nuclear technology. Areas of particular interest are quantitative risk and reliability assessment, simulation of nuclear power plants, nuclear systems technology as well as interdisciplinary questions related to safety and reliability.

Key missions of the institute are:
- to perform applied research on safety and reliability issues related to the operation of nuclear power plants,
- to develop and run solutions tailored to the German phase-out situation for high-level academic education in nuclear technology and for training of young nuclear professionals.

A particular engagement concerns the transfer of knowledge to students and young professionals by co-operating with the Technische Universität München in the education and specialization of students in nuclear technology and by on-the-job training within the projects of the Institute.

The ISaR Institute for Safety and Reliability is a limited liability company (GmbH) located at the research campus in Garching near Munich. Shareholder is the TUM-Tech GmbH, a technology-transfer organisation of the Technische Universität München. Funding is mainly provided by German utilities and by the Bavarian State Government. The Institute was founded in 2001 and started operation in January 2002.

According to the Institute's mission, ISaR staff is built of a group of highly qualified senior experts with long-standing experience and of an almost equal number of young scientists and engineers. At present, total staff is about 20 scientists and engineers.
Anselm Schaefer : Diploma in Physics (TU München), DEA (University Strasbourg);
Current Activity: Managing director of ISaR GmbH;
Previous Activity: Head of strategic group at the Gesellschaft für Anlagen- und Reaktorsicherheit (GRS);
Key Qualifications: Reactor physics, simulation and accident analysis of NPP's, nuclear safety assessments, safety concepts and strategies.

1-22 University of Stuttgart (IKE)

The Universität Stuttgart is situated in the middle of a highly dynamic economic region with a worldwide reputation for excellency in the fields of mobile and information technology, production, process engineering as well as in life sciences. The Universität Stuttgart was founded in 1829, at the beginning of the industrial age in Europe, and will celebrate its 175 th anniversary in 2004. The cooperation between technical, physical and human sciences has always been an advantage of the Universität Stuttgart. Today the university is a modern, achievement-orientated institution with a comprehensive range of subjects and a focus on technical and physical disciplines. The maxim is not only „job-qualification", but "technology, knowledge and education for mankind", as the motto of the Universität Stuttgart says.

The 100 mio. Euro of annual third-party funding show that the university is a popular partner for European and German, federal and private organisations and the economy. 5.000 employees work in over 140 institutes,10 faculties and in central institutions; this makes the Universität Stuttgart one of

the greatest employers of the region. At the moment, 18.500 students are registered, 1.800 students graduate every year and start their careers. Additionally, about 150 trainees from many different branches train for their jobs here. They become mechanics, mathematic-technical assistant and many other trades - in the workshops and laboratories of the university.

As campus university with two well connected locations, close to attractive recreation possibilities in the environment and closely integrated in the cultural live of the city, the university provides the best conditions for studying and working as well as a diversity of job chances for graduates. Together with modern information technologies, comfortable hostels and housing for guest lecturers, the neighbouring institutions of the Max Planck-, the Fraunhofer Institute and the German Aerospace Center constitute a fertile ground for innovations and scientific communication. And those who want to found a company with their new know-how can find support and office space in the local center for technology. And what`s more, the quality of life is also high: The charming position of Stuttgart between forests and vineyards , the Swabian Mountains and the Black Forest with their attractive leisure activities and a wide range of cultural events - from ballet to variète - make living here a pleasure.

The core competence of the Universität Stuttgart is the interdisciplinary integration of research activities. This can be seen by its top position in special research areas, its focussed projects and graduate conferences, as well as by its established integrated and international courses of study. Research is centered around the fields of enviroment and enviromental engineering, power engineering, traffic and automotive engineering (cars as well as aerospace), combustion research, industrial engineering, micro systems and nano technology, process engineering, information and communication technology, cultural theory as well as questions regarding the value of man-technology interaction, social research and management, architecture, creative civil engineering and town planning. Characters like the philosopher Friedrich Theodor Vischer, the philologist Fritz Martini, the economic theoretician Max Bense or the philologist Käte Hamburger shaped the social and human sciences in Stuttgart.

Graduates of the Universität Stuttgart are prepared for the international competition by stays abroad and an increasing number of master and bachelor courses of study in English language. The share of international students (25 %) is far above average. Right from their start in Germany foreign students are taken care of with a special welcome program. An alumni program is designed to help stay in touch with the university after graduation.

1-24 Ustav jaderného vyzkumu (REZ)

Nuclear Research Institute REZ plc (NRI), a joint-stock company, is the immediate successor of the Nuclear Research Institute which was founded as a part of R&D base for the Czechoslovak nuclear programme within the Czechoslovak Academy of Sciences in 1955. In 1971, the Institute was transferred under the authority of the Czechoslovak Atomic Energy Commission. In eighties, following the worldwide trend, light water VVER (PWR) reactors became the priority in the Institute's reactor-related tasks. In 1992, the Institute has been transformed into joint - stock Company.

Currently, NRI Rez concentrates on research and development in nuclear technologies and radioactive waste management, with emphasis on:

- Providing support to authorities in the area of strategic nuclear power planning and nuclear waste management, including the sitting and licensing procedures, environment impacts

assessment, development a conception of the safety information systems, and support to the State Office for Nuclear Safety,
- Research and services for nuclear power plants aimed at their efficient operation, attaining the internationally accepted safety level and life extension of plants in operation,
- Development of information systems,
- Application of the ionising radiation and irradiation services for research, industry and medicine,
- Fuel cycle back-end (co-ordination of activities),
- Nuclear waste disposal (research and services),
- Services in radiation chemistry and production of radiopharmaceuticals,
- Environmental protection with respect to nuclear issues,
- Special consulting services,
- Education and training of engineers and scientists for the nuclear research, industry and applications in close co-operation with Czech Technical University.

This is the main reason for participation and role of the Institute in ENEN project.With a staff of about 610 NRI operates seven business divisions, each responsible for a particular market sector.

Prof. Ing. Frantisek Klik : Born on April 9, 1930. Master degree in Mechanical Engineering in 1952. PhD in technical sciences in 1959. 1955 - 1967: researcher in Nuclear Research Institute Rez. 1967 - 1972: safeguards inspector in International Atomic Energy Agency, Vienna. 1972 - 1977: Chief of the Department of Nuclear Safety and Safeguards of Czechoslovak Atomic Energy Commission. 1977 - 1982: Director of Safeguards Operation in International Atomic Energy Agency Vienna. 1982 - 1995: Professor of Nuclear Power Engineering of the Czech Technical University. 1995 till now: Emeritus professor of the Czech Technical University and Secretary of the Scientific Board of Nuclear Research Institute Rez plc. Author of about 150 publications.

1-33 University of Liège (ULG)

The University of Liège is the only complete public University of the French-speaking part of Belgium. It is financed, for the largest part, by the local government. The missions of the ULG are threefold: teaching, research and support to the Region. ULG has eight faculties including Science and Engineering. Research at ULG is run by the departments. Concerning nuclear sciences, ULG has developed expertise in thermohydraulics of nuclear reactors and has a his level program in theoretical nuclear physics, in particular in spallation and transmutation. ULG has an agreement with the SCK-CEN, Mol, Belgium, for collaboration in the ENEN teaching program and for exchanges of researchers.

Prof. Joseph Cugnon is the head of the theoretical physics group. He has a longstanding experience in nuclear reaction theory, in particular for heavy ion collisions and for antiprotonnucleus physics. Recently he has developed an intranuclear cascade model for spallation reactions. Within the HINDAS collaboration this model has been translated in the INCL4 code, which has been proven to be very successful and which has been included in the MNCPX code system.

1-36 University of Sevilla (USE)

This university is one of Spain's largest with 70,000 students and has a well-recognised research output. Participants to the EURAC project are from the interdepartmental Applied Nuclear Physics Group. Since 1980, this department has undertaken significant research in environmental

radioactivity, radionuclide measurements and mathematical modelling and has participated in several FP projects. The group and the university have extensive experience of international university collaboration at the post-graduate level.

Prof. R. Garcia-Tenorio has 23 years experience of radionuclide research and has collaborated in several FP projects, as well as in many postgraduate masters and doctorate programmes. He is an expert in the field of post-graduate provision within the discipline and has extensive teaching experience.

Prof. M. Garcia-Leon is Director of the National Accelerator Centre in Seville and has published extensively in the field of radionuclide metrology. Responsible for some 40 national / international projects and many post-graduate masters and doctorate programmes.

The research programme of the Atomic, Molecular and Nuclear Physics Department of the University of Sevilla concentrates on the three research areas of Nuclear Structure, Nuclear Reactions and Molecular Physics. The Nuclear Structure research is devoted to the application of the Interacting Boson Model to the description of collective states in medium and heavy nuclei, development of microscopic models beyond the harmonic approximation of RPA and consistent use of pairing interaction (preserving the Galilean invariance) for the description of the giant dipolar resonance and the structure of N=Z nuclei. The research on Nuclear Reactions concentrates on reaction mechanisms in reactions induced by polarized heavy ions, weakly bound systems, semi-classical description of relativistic coulomb excitation, electron scattering and development of optical potentials for nucleon-nucleus collisions.

Dr. Jose Manuel Quesada is Professor Titular de Universidad at the Department of Atomic, Molecular and Nuclear Physics. After finishing studies in Sevilla University in 1981, he spent two years at the Niels Bohr Institut of Copenhaguen doing his Ph.D. research work on the imaginary part of the optical potential for heavy ion collisions. After getting a permanent position in 1987, he spent one year at CERN as scientific associate in the Proton Synchrotron division, participating in he design (beam dynamics studies) of the RFQ injector for the Lead Ion Linac. Since 2000 he is the scientific person in charge of the group of University of Sevilla participating in the nTOF Collaboration. His main research field is the optical potential for nucleon-nucleus reactions.

1-40 Universitat Politecnica de Catalunya (UPC)

Universitat Politecnica de Catalunya, Barcelona, has 28,362 students, 2,604 lectures, 1,280 administrative and service staff. The budget for 2004 was 242,835,638 € and the income managed by the Technology Transfer Centre is 41,537,661 € in 2004.

Every year about 700 UPC students go abroad for exchanges of four months in average.

UPC has 10 schools, one of them is “Escola Tecnica Superior d’ Enginyers Industrials de Barcelona (ETSEIB)” founded in 1851. This school has 4.000 students and 300 lectures.

The UPC is an academic institution providing high level scientific education in nuclear disciplines. For instance at the degree level in ETSEIB is providing about 60 ECTS every year on purely nuclear engineering oriented, and in 2004 has inaugurate a Conceptual Simulator of Nuclear Power Plants (SIREP 1300). UPC has a PhD program on Nuclear Engineering.

The research activities related to nuclear engineering are developed in the Department of Physics and Nuclear Engineering and in the Institute of Energy Technologies.

The education and research activities related to nuclear engineering at UPC are developed by: 2 professor, 9 lectures, 8 PhD researches, and 16 PhD students.
The research topics are: nuclear technology, nuclear safety, environmental impact,
ionizing radiation technology, radiation protection, nuclear fusion, nuclear instrumentation, particle accelerators, thermal-hydraulics, radioactive waste,
non destructive evaluation, radon, dosimetry.

Javier Dies, Industrial Engineering degree (energy specialty) at ETSEIB-UPC in 1985. Award First Master Thesis by Catalunya Industrial Engineering Association 1985. Received his PhD at Universitat Politecnica de Catalunya (UPC) in 1989. PhD Award with special distinction 1989. Since 1985 is lecturer at UPC and in 2003 win the post of Nuclear Engineering Professor at UPC. Contact person of the Nuclear Engineering Research Group (NERG) at UPC. Since 1995 to 2002 was Sub director of Economic Affairs at ETSEIB. He is author of about 90 publications. Since 1999 is director of Nuclear Engineering Section at DFEN - UPC. Contact person at UPC for ENEN.

Partner 2 Middlesex University (MU)

Middlesex University is one of the United Kingdoms largest universities with more than 25,000 registered students. It is located on five main campus sites located close to Enfield in north London. Within the university masters-level programmes are taught that include radiological protection content and, in addition, several masters / PhD students are undertaking radiological protection / radioecology research projects. Members of staff undertake research projects in collaboration with European partners and have experience of co-ordinating FP projects.

Prof. N. Priest is Professor of Environmental Toxicity. He is Head of the Decision Analysis and Risk Management Research Centre and the former programme leader for the MSc Risk Management. Relevant research conducted in the areas of radiobiology and radioecology. Has previous experience of co-ordination of and participation in FP5/6 projects- including the EURAC project. Previously, was a research scientist at the National Radiological Protection Board and was the Head of Biomedical Research at the UK Atomic Energy Authority, Harwell.

Dr. H. Garelick is a principle lecturer in the School of Health and Social Sciences. She is the school postgraduate programme co-ordinator in the area of public health and environmental science and has considerable experience of the development of post-graduate programmes and of EU-funded education programmes, e.g., SOCRATES and ERASMUS. Her main area of expertise is in water chemistry and microbiology. Member of Chemistry and the Environment Division, IUPAC (International Union of Pure and Applied Chemists).

Partner 3 University College Dublin (UCD)

University College Dublin is the largest university in Ireland with over 20,000 students. Research and teaching in disciplines related to radiological protection and radioecology are promulgated within the School of Physics. This has a long history of research participation within EU FP's and trains most Irish nuclear physics, radiochemistry and radioecology professionals. It also has long-standing education provision links with other EU countries – principally Spain.

Prof. P. Mitchell is the former Head of the School of Physics and is presently Director of the Radiation Physics Research Laboratory and a specialist in the field of radiochemistry and radiological protection. He is a member of EURATOM (Article 37) Group of Experts and is an

advisor to the Radiological Protection Institute of Ireland. He is heavily involved in the management of taught Masters and PhD programmes, has co-ordinated / participated in many FP projects and has encouraged educational links with universities in other EU members.

Dr. L. León Vintró is a senior lecturer within the UCD School of Physics with a strong involvement in post-graduate programmes. He teaches nuclear physics and has supervised several Irish and other European PhD students. He specialises in radiation physics, analytical radiochemistry and radioecology.

Partner 4 Norwegian University of Life Sciences (UMB)

The Norwegian University of Life Sciences comprises seven departments covering different aspects of agriculture and environmental sciences. UMB houses about 2,500 students, providing Master of Sciences degrees and PhD diplomas. The Isotope Laboratory is responsible for the education at UMB within radiological protection, radioecology and radiochemistry. In 2003, UMB/Isotope Laboratory organised a successful co-ordinated intensive course in radioecology for masters and PhD students from the Nordic and Baltic countries with highly competent teachers from across Scandinavia.

Prof. B. Salbu is head of the Isotope Laboratory within the Department of Plant and Environmental Sciences. She has more than 20 years of experience in radiochemistry, radioecology and environmental impact assessment. Is a member of six national and international research committees and the co-ordinator of the Nordic and Baltic intensive course on radioecology. In 2005 she was appointed Fellow of the Royal Society of Chemistry.

Dr. L. Skipperud is vice-head of the Isotope Laboratory within the Department of Plant and Environmental Sciences. She has 10 years of experience within the fields of environmental chemistry, radiochemistry and radioecology. She is responsible for the laboratory training at the Isotope Laboratory and is substantially involved in post-graduate education including the Nordic course in radioecology. She is a member of the International Union of Radioecologist (IUR). Within the EURAC-II project, Acc. Prof. Skipperud will be responsible for the implementation of different course modules held at UMB especially within the EU Masters of radiochemistry and radioecology.

Partner 5 Westlakes Research Institute (WEST)

Westlakes Research Institute is an independent organisation within the University of Central Lancashire group. It is based in the Westlakes Science and Technology Park, which is close to the BNFL Sellafield plant. This institute specialises in the provision of post-graduate training courses for the nuclear industry, the provision and supervision of university-based, post-graduate research projects and has extensive academic links with three British universities and strong industrial links with the nuclear industry and its regulators. It has good teaching, laboratory and library facilities and accommodation for students.

Dr Jordi Vives-Batlle has substantial research and academic experience acquired over 17 years working in university and for governments and industries both in the UK and internationally. His research currently focuses on biokinetic modelling, biological uptake laboratory experiments (including radiochemistry & nuclear detection) and biota dosimetry.

Partner 6 Institute for Radiological Protection and Nuclear Safety (IRSN)

The Institute for Radiological Protection and Nuclear Saftey, France, is a public establishment on an industrial and commercial nature under the joint auspices of the Ministers of Defence, the Environment, Industry Research and Health. IRSN carries out research, analysis and work within the fields of nuclear safety and protection against ionising radiation. The institute provides support for educational courses.

Prof. C. Tamponnet is employed at the IRSN/DEI/SECRE based at CEA Cadarache, St Paul lez Durance, France and is Professor at the Institut National des Sciences et Techniques Nucléaires (National Institute of Nuclear Sciences and Engineering). He has a particular interest in the provision of post-graduate and in-house radiological protection training and brings to the consortium his considerable experience of nuclear technology educational provision in France - which compared with many other national programmes is healthy.

Partner 7 Lund University (ULUND)

Lund University was established in 1668 and is the largest university in the Nordic countries with 34,000 students. The Department of Radiation Physics employs 40 persons, including PhD students. Teaching is undertaken at masters and doctorate levels. The department has a long history in radioecology, radiochemistry, nuclear measurement techniques and radiation dosimetry for protection. The department has developed international links in the areas of research and training with the Risoe National Laboratory and University of Copenhagen in Denmark.

Prof. E. Holm is Head of the Department of Radiation Physics, Professor at Risoe, Denmark and Professor II at Svalbard, Norway. Previously he was head of radiogeochemistry at the IAEA Marine Laboratory in Monaco. He is European editor of the International Journal of Environmental Radioactivity and co-ordinator of the low-level group of the International Committee for Radionuclide Metrology.

Partner 8 European Underground Research Infrastructure for Disposal of Nuclear Waste in a Clay Environment (EURIDICE)

ESV EURIDICE GIE (The European Underground Research Infrastructure for Disposal of Nuclear Waste in Clay Environment) is an Economic Interest Grouping between NIRAS/ONDRAF and SCK.CEN (the Belgian Nuclear Research Centre). ESV EURIDICE GIE is in charge of the management and the operation of the HADES Underground Research Facilities located in Mol and of the realisation of demonstration tests at surface and in-situ. The HADES Underground Research Laboratory in operation since 1984 has given a very long scientific experience and technical know-how. ESV EURIDICE GIE participates in the CLIPEX project (EC contract FI4W-CT96-0028) and in SELFRAC project (EC FIKW-CT-2001-00182) as co-ordinator and in the FEBEX II project (FIKW-CT-2000-0016) and ESDRED project as contractor.

Partner 9 Consorzio Interuniversitario per la Ricerca Tecnologica Nucleare (CIRTEN)

The CIRTEN Consortium was constituted in 1994 by the Polytechnics of Milano and Torino and the Universities of Padova, Palermo, Pisa and Roma to promote the scientific and technological research and to co-ordinate the Universities participation to the knowledge development and collaboration with national and international Research Institutions and Industries in the study and practical

solution of problems characterizing technological sectors like energy production, energetic-environmental systems, nuclear energy power and fuel cycle plants, industrial/sanitary applications of nuclear radiation, safety, physical and environmental protection problems.

The CIRTEN operational structure is articulated on experienced research task groups appropriately set up and selected for the specific studies in a pool of more than 150 University Professors and Researchers in collaboration, if necessary, with external Professionals.
Such a structure results also economically efficient allowing to reduce general costs as the operative staffs are not permanent but have appropriate dimensions and can operate with logistic supports already existing, in the Universities.

The Researchers documented experience, update analysis and calculation methods, available laboratories supported by advanced analytical, numerical and experimental means, allow CIRTEN to perform, in particular complex systems analyses, multi-phase/dimensions thermo fluid dynamics calculations, components and systems thermal and structural analyses, studies and calculations of multiplying system, shielding and radiation protection, safety analyses, probalistic risk assessment, environmental impact evaluation, etc.

Prof. Bruno Panella graduated in Nuclear Engineering in 1966 at Politecnico di Torino, where he worked as assistant professor until 1970, professor of heat and mass transfer until 1980 and full professor of nuclear power plant thermal hydraulics up to now. He was in charge of the Nuclear Engineering courses Board from 1987 to 1991 and was head of the Energy Department from 1991 to 1995. At present he is director of the post graduate course in Energy Engineering and head of the PhD in Energy Engineering. He is also head of the Politecnico di Torino Quality assurance Centre. He is in the Board of the UIT (Italian Heat Transfer Association) and is member of ENS and ANS. He is in the Board of the CIRTEN (Intel-university Consortium for Technological Nuclear Research). He works since thirty years on thermal hydraulic phenomena in nuclear reactors, accelerator driven systems, themonuclear plasma facing components and heat pipes. He has collaborated with national and international research centres (ENEL, ENEA, Ansaldo, CEA Cadarache, and UCL). He is author of more than a hundred scientific papers and of two books for the students. He was author of the Distant Learning lesson on the Design Basis Accidents within the UNESCO Postgraduate Course on Energy Engineering (Module Nuclear Power Plant). He chaired several national and international Conference sessions; in 1997, he was the chairperson of the National Heat Transfer Conference.

Partner 10 Institut National Polytechnique de Lorraine (INPL)

Partner 11 Agence Nationale pour la Gestion des Déchets Radioactifs (ANDRA)

Partner 12 Technische Universität Clausthal (TUC)

Partner 13 Ecole Polytechnique (EP)

Partner 14 Radioactive Waste Repository Authority (RAWRA)

Partner 15 Universidade da Corunia (UDC)

Partner 16 Posiva (POSIVA)

Partner 17 Gesellschaft für Nuklear Service (GNS)

Partner 18 Deutsche Gesellschaft zum Bau und Betrieb von Endlagern für Abfallstoffe (DBE)

Partner 19 CEA-INSTN- Institut National des Sciences et Techniques Nucléaires (CEA-INSTN)

The National Institute for Nuclear Science and Technology ("Institut National des Sciences et Techniques Nucléaires" (INSTN) is a higher education institution created within the French Atomic Energy Commission ("Commissariat a 1'Energie Atomique", CEA) in 1956 and placed under the joint supervision of the Ministry of National Education, Research and Technology and the Ministry of Industry.

The INSTN provides students with high scientific qualifications or professional engineers specialised education in all disciplines related to nuclear energy applications and has in charge the co-ordination of PhD programmes in CEA laboratories. Furthermore, an international co-operation has been set up through specific programmes.

The INSTN has various equipment, training tools and different laboratories with a sophisticated instrumentation. For instance: an experimental reactor Ulysse (power 100 kW), a 2 MV Van de Graaff accelerator, new generation PWR simulators (SIREP for normal operation; SIPACT for post accidental situations), scanning and transmission electron microscopes fitted with an energy dispersive X-ray analyser, simulation work sites for radiation protection..., and nuclear physics, metallurgy, radiochemistry and biology laboratories where INSTN students, along with top French engineering school students, acquire experience every year.

The Institute has an in-house academic and administrative staff of around 100, plus the backing of some 1,300 collaborators. Its 2005 budget was approximately 33 million Euros.

The different curricula are designed to put students in direct contact with specialists of each discipline immediately involved in their daily activity. The INSTN relies on the CEA's vast research potential. Intensive interaction with specialists from different professional and scientific backgrounds is essential to the INSTN's learning approach. Professors and lecturers come from the University, CEA centres, EDF (French Public Utility) and from French nuclear companies, particularly from AREVA.

The curricula are divided into two categories: academic courses and training sessions.
Academic courses, mainly intended for graduate students, academic courses include a specialisation in Nuclear Engineering, Master programmes, medical studies and training for technicians. Every year, around 800 students attend the lectures.

Training sessions (continuous training) are short-term training programmes (lasting a few days to a few weeks) designed for professional engineers and researchers to up-date knowledge for those who already have a strong background in the applied field and to initiate a discipline to those who have specialised in other fields.
In 2005, the INSTN thus hosted about 8 000 specialists for some 30 000 man-days of training in various fields : Nuclear power plants. Materials - Fuel cycle, Environment - Health physics, Security - Safety, Immunoassay - Radioisotopes use in biology - Molecular biology. Chemistry Analysis, Radiation Protection, etc.

The INSTN co-ordinates various PhD programmes at the CEA, which hosts approximately 600 young scientists preparing doctoral theses in its laboratories. Research topics include all CEA areas of expertise: physical sciences, life sciences, advanced technologies, nuclear reactors, fuel cycle, defence activities, protection and nuclear safety, scientific and technical information, etc.

Every year, about one hundred foreign students register for the different courses offered by the INSTN. They are admitted under the same conditions as French students, if they have received sufficient basic training (assessed by the equivalence of diplomas or by a prior examination) and if they are fluent enough in French. In parallel, the INSTN also organises, in French or in English, courses of four to six weeks for high- level experts from developing countries, jointly with the International Atomic Energy Agency (IAEA). Furthermore, specific seminars in English, are organised by the INSTN within the framework of the ENEN Association to meet the needs of foreign Institutions.

Finally, apart the various bilateral programmes with different foreign countries, the INSTN has participated and is still participating in Tempus programmes for the improvement of the educational system in Romania.

Joseph Safieh : PhD in Physics, Engineer in Genie Atomique. Present Position : Head of the Nuclear Education Department of INSTN. Contractor in ENEN project. Representative of INSTN at ANS. Cofounder and current President of the ENEN Association.

Partner 20 Helsinki University of Technology (TKK)

Helsinki University of Technology (TKK) is the oldest and largest university of technology in Finland, dating back to the nineteenth century. In 1849 the Helsinki Technical School was founded, marking the beginning of organized technical education in Finland. In 1872 the school became Helsinki Polytechnic School and in 1879 Helsinki Polytechnical Institute. In 1908 it was changed to Helsinki University of Technology and thus began the teaching of technology at university level in Finland. In the 1950's and 60's new premises were built to house the University of Technology in Otaniemi and the university moved from Helsinki to the neighboring city of Espoo. TKK is twelve faculties, ten separate institutes, 17 degree programmes, 246 professors, 14 763 under- and postgraduate students (2002) , 940 Masters´ degrees awarded and 195 doctorates (2002), Total funding from state and other sources Euros 189 million euros (2002).

In Finland MSc-level nuclear engineering education is provided by two, roughly equally sized units: Helsinki University of Technology, Department of Engineering Physics and Mathematics, Advanced Energy Systems (AES) and Nuclear Engineering Laboratory of Lappeenranta University of Technology (NEL/LUT). AES focuses on reactor physics, radiation topics, and environmental assessments whereas NEL/LUT has its strongest expertise in thermohydraulics. Strong collaboration between AES and NEL/LUT exists. AES gives basic nuclear engineering education to about 30 3' year students of TKK (study programmes of engineering physics, electrical engineering, mechanical engineering) and to about 10 more advanced students within the study program of Engineering Physics AES is also involved in research and education on wind, solar, and renewable, novel energy storage methods, and fusion research. The strategy is to provide the students a strong physics and mathematics background and a "researchers" attitude applicable to tackle the multifaceted problems in energy problems. For more details, see our web-site http://www.hut.fi/Units/AES/.

The research activities of AES all take place in tight collaboration with Technical Research Centre of Finland, Finnish Nuclear Safety Authority, and Power Utilities. Nuclear Energy related projects include development of verification methods for CTBT, NPP simulators, nuclear waste issues, reactor safety studies, and fusion reactor studies. International "ENEN-like" activities have included collaboration with Kaunas University of Technology (Phare), Budapest University of Technology (TEMPUS), and participation in the fusion researcher training within Euratom. The AES group has participated in the evaluation of the energy engineering education in Lithuania and in IAEA NE education working groups. Particular assets, with respect to ENEN-activities, include Triga, advanced status of nuclear waste research in Finland, excellent computational facilities and NPP safety codes, and possible usage of PACTEL-thermohydraulic test bench.

Rainer Salomaa: born 1947, DrSc(Eng.) in 1973 at Helsinki University of Technology. Appointed by Helsinki University 1972-74, Technical Research Centre of Finland 1974-82, New York University 1980-81, Max Planck Institute fur Quantenoptik 82-83; professor at Helsinki University of Technology (nuclear engineering) 1982 - present. About 250 publications, supervised about 120 MSc-theses and ca. 30 DrSc(Eng)-theses. Member of Finnish Nuclear Safety Commission and several other nuclear committees in Finland, president of the Finnish Nuclear Society 1991-1993 Participant in SILASI TMR-project 1996-2000 and a subcontractor in Euratom-Tekes Association since 1995. Main research interests: application of lasers and radiation, fusion reactor physics.

Partner 21 University Politehnica Bucharest (UPB)

The "Politehnica" University of Bucharest (UPB) is the only higher education institution in Romania that provides education in the Nuclear Power Engineering field. The Faculty of Power Engineering of "Politehnica" University of Bucharest has a tradition of over 50 years in power engineering education, from which more than 30 years in high education for Nuclear Power Engineering. Every year the Power Engineering Faculty yields more than 250 graduated students from which over 50 are Nuclear Power Engineers. The last five years brought an accelerated updating of nuclear high education according to similar activities in EU countries- transferable credit system, the option of a major and a minor, master studies, post-graduated studies, training for nuclear specialists and open courses. The co-operation with European countries in several TEMPUS programs helped to develop a modern Radiation Protection Laboratory and to establish master studies in Nuclear Safety and Radiation Protection. This made now possible that Nuclear Power Engineering high education in "Politehnica" University to be competitive and compatible to any EU country or USA.

Professor **Petre Ghitescu:** born 1947. Diploma engineer at "Politehnica" University of Bucharest in 1969 PhD at the Energetic Institute of Moscow in 1973. Present position: professor at the Nuclear Power Department, •Politehnica" University, Power Engineering Faculty. August 1990 Brotje Company Germany; 1996 - 1998 INSTN France; 2000 CIEMAT Madrid, Spain. Author of 8 books, 5 courses, 25 papers.

Partner 22 Universidad Politecnica de Madrid (UPM)

The UPM has 37,500 students and 3,300 lecturers, and cover all technical specialities and has the highest incomes for research in comparison with the rest of Spanish universities.It has a very active program of student mobility under Erasmus, Erasmus Mundus and now under the Magallaes Program with Sud- American Universities. UPM has signed collaborative agreements with US and China universities, to exchange students and professors. UPM recognizes titles of the ENEN Association Universities, so mobility between ENEN institutions is an added value for our students.

The Nuclear Engineering Department (DIN) of the UPM is engaged in the nuclear studies curricula as a part of Energy Engineering. Experience on teaching nuclear subjects lasts for most than forty years. Members of the DIN participate in the organization of Eurocourses, international conferences and in the organization of Advanced Courses in collaboration with nuclear companies and the Spanish nuclear regulatory body. Members of the DIN have been involved and also are involved in responsible state positions for nuclear research, both in EU Euratom and Spanish Administration . DIN is composed of one chair in Nuclear Engineering and two chairs in Nuclear Physics, and there are several associate professors and assistant professors, to provide subjects in both the curricula for graduate students and for the master level.

Teaching and research experience of DIN cover all areas related with Nuclear Technology for Fission and Fusion Reactors. Professors of DIN have participated actively in Research Programs for the 5th and 6th Framework Program of EU.

Emilio Minguez : born 1949. Professor Chair of Nuclear Engineering in the College of Industrial Engineering. Head of the Nuclear Engineering Department of the UPM (1999- 2000). Associate Dean of the College of Industrial Engineering (2000- 2004) and now Vicerrector of the UPM.
Research activities are now in Nuclear Transmutation, Nuclear Power Plants of GEN-IV and in Nuclear Technology Fusion.
Professional relevant activities: Member of the Board of the Spanish Nuclear Society (1985-1989); member of the European Panel of the Laboratoire pour 1'utilisation des Lasers Intenses de l'Ecole Polytechnique (1992-2002); co-editor of the book: Advances in Laser Interaction with Matter and Inertial Fusion World Scientific (1997); guest editor of Laser and Particle Beams (1996 and 1998); member of the Expert Group related to Art.31 of the Euratom Treaty (1998-2000) and member of the Expert Group related to Art.37 of the Euratom Treaty (2000-). He has published over 100 papers in international journals, has over 80 papers in international conference proceedings and wrote three books in Spanish.

Partner 23 Jozef Stefan Institute (JSI)

The mission of the Jozef Stefan Institute is the accumulation - and dissemination - of knowledge at the frontiers of natural science and technology to the benefit of society at large through the pursuit of education, learning, research, and development of high technology at the highest international levels of excellence. The JSI, founded in 1949, is the largest research institute in Slovenia, closely connected with Slovenian universities, and covers all levels of research ranging from fundamental core sciences to industry-sponsored development of high technology, with emphasis on interdisciplinary research.

The Reactor Engineering Department (RED) staff engages in basic and applied research in nuclear engineering and safety, including thermal-hydrodynamic phenomena, thermal-hydraulic safety analyses of design-basis and severe accidents, structural safety analyses, uncertainty evaluation of code predictions, and probabilistic safety assessment. RED also acts as consultant to the utility and as technical support organization to the regulatory body.

Participation in the community FP6 and FP6 projects include WAHALoads, LISSAC, THERFAT, FENET, ENEN, SARNET, SAFERELNET, NURESIM and NEPTUNO.

Leon Cizelj: 1993 PhD in Physics, University of Ljubljana, Slovenia; M. Sc. Nucl. Eng., University of Ljubljana; 1986 B.Sc. Mech.Eng., University of Maribor, Slovenia. Since 1986 with Jožef Stefan Institute, Reactor Engineering Division. Part-time associate professor of Nucl. Eng., University of

Ljubljana. Experience: Structural safety analyses of nuclear power plants. Main focus in of probabilistic methods/structural reliability. Coordinator of two international research projects, research project sponsored by the Slovene government and several projects sponsored by the industry. Member ASME, ENS and several local societies. More than 100 published and unpublished documents. Awards in 1986 and 1994.

The Jožef Stefan International Postgraduate School (JSL) is an institute that aims to create knowledge and support industrial development by master and doctoral programmes of advanced study and research. The School is located in central Ljubljana, Slovenia and offers training in fields including physics, chemistry, nuclear and reactor technology and environmental sciences. The school is international in outlook and has bilateral cooperation agreements with organisations in 26 nations, including most EU members. The courses provided are Bologna compliant.

Prof. P. Stegnar is Deputy Director of the postgraduate school. His specialism is radiological sciences and he was formerly employed by the IAEA in Vienna. He currently supervises a small research team in Ljubljana concerned with environmental radioactivity and radiological protection. He is involved in radiological protection training and is actively investigating the creation of Bologna compliant, radiological protection Masters-level courses.

Partner 24 Czech Technical University (CTU)

The Czech Technical University educates future experts in technical fields. The University supports scientific work, educates new scientists and is a center for scientific and educational activities in technical fields. The University develops scientific and educational research, creative and technical activities in accordance with the social requirements, worldwide trends and the principles of freedom of intellectual activities. Among other priorities is a continuous and wide-ranging development of international cooperation and further improvements in external relations and the university position in the Czech Republic and abroad.

Prof. Karel Matejka, PhD. Born June 17, 1943. Education : Czech Technical University, Prague, Faculty of Nuclear Sciences and Physical Engineering (FNSPE), M. Sc. In Nuclear Engineering (1969), Ph. D. in Applications Physics (1978), Prof. In Nuclear Engineering (1993). Head of the Department of Nuclear reactors Specialisation: Nuclear reactor physics and technology, experimental reacto physics, nuclear safety, operation in research nuclear installations. Thirty years of experience in experimental reactor physics, research nuclear installations, wide pedagogical activity at the University, quality assurance of software and hardware, experimental reactor authorisation, construction and operation of the VR1 training reactor, preparation of the VR1 educational system, publications for education. He took part in construction studies of the training reactor VR1 located in the Nuclear Engineering faculty. His pedagogical activity cover supervision, consultation and assessment of many diploma work, exercises in several subjects, seminars, specila lectures, since 1990 he has taught several subjects (experimental neutron physics, experimental reactor physics, a course of operators) at the Faculty and also he has taught students and other course participants to know and understand behavior of the VR1 reactor. He was ebnngaged in preparation of syllabus of a new subject (nuclear energy and environment), nuclear installation BSc. study. He co-operates mainly with the Nuclear Research Institute in REZ (NRI), State Office for Nuclear Safety, Nuclear Power Plant Dukovany, Nuclear Power Plant Temelin and educational centre of nuclear operators in Brno, many faculties of various universities (education on the VR1 reactor) and many grammar and professional scholls. He has had also very good contact with many institutions abroad (e.g. TU Budapest, TU Vienna, Imperial College London, Queen Mary and Westfild College London, IKE Stuttgart, TU Delft, Fachhoschule Aachen, Industriele Hogeschool Mol Belgium, JINR Dubna (formely also TU Moscow, IAE Moscow, etc.) He supervised several PhD students . He is an

author or he co-operated on more than 100 publications (original topics, textbools, research reports, studies, design).

Partner 25 Studiecentrum voor Kernenergie – Centre d'Etude de l'Energie Nucléaire (SCK-CEN)

The Belgium Nuclear Research Centre SCK-CEN is a public utility establishment with a legal statute according to private law. SCK-CEN is the owner of the assets, built up by its activities or acquired by funding from the public authorities SCK-CEN has no shareholders.

With a staff of 600, the Centre has a lot of R&D activities of high relevance for nuclear engineering education:

- the VENUS facility for experiments of reactor physics with new types of fuel
- the operation of the BR2 reactor for testing materials
- the MYRRHA project, a small accelerator driven system
- EURIDICE, the first European underground laboratory to study the long term storage of high activity level waste in clay
- The dismantling of the BR3 reactor, the first PWR built in Europe and also the first PWR to be dismantling in Europe
- The radiation protection and safeguards division covering radiobiology, radioecology, nuclear measurements and assessments and decision methodologies
- Research projects on the interaction between Science-technology and Society.

The Centre participates in many international and European research programmes. It has a special programme for PhD students in co-operation with Belgian Universities and offers grants on an international basis to post-docs. The Centre has an extensive specialised library and organises advanced courses, seminars and practical training. Food and lodging are available within walking distance.

Peter Paul De Regge obtained a PhD at the State University of Gent, Belgium with a Doctoral Thesis on the Study of (n,p), (n, α) en (n, 2n) reactions in a fission neutron flux spectrum in 1970. He has been in charge for more than 20 years of planning, managing, co-ordinating and supervising scientific services and research activities at the Nuclear Research Centre SCK·CEN in Mol, Belgium. The department of Nuclear Chemistry and Services, which he has been leading for more than 10 years, has long-term commitments to provide analytical and radiochemical services to the Belgian nuclear industry, to the power plant operators and to the Belgian authorities. From 1997 to 2004, he joined the International Atomic Energy Agency in the capacity of Head of the Agency's Physics, Chemistry and Instrumentation Laboratory in Seibersdorf. Starting in May 2004, Peter Paul De Regge is serving the European Nuclear Education Network Association in the capacity of Secretary General. He was co-coordinator of the FP6 NEPTUNO project and is the focal point for the participation of fifteen European universities in the FP6 project IP EUROTRANS.

Partner 26 University of Ljubljana (UL)

The University of Ljubljana is an institution with a very rich tradition. With its 56,000 undergraduate and post-graduate students participating in more than 130 undergraduate and 110 post-graduate programs, it ranks among the biggest universities in the world scale. A total of 20 faculties, 3 art academies and 3 university colleges employ approx. 1,700 full- time university teaching staff, assisted by nearly 600 technical and administrative staff.

The University of Ljubljana was established in 1919 on the foundations of a long- established pedagogical tradition. For almost half a century it remained the only Slovenian university until it was joined, about 20 years ago, by the University of Maribor. The establishment of the third Slovenian University on the coast of Slovenia is foreseen in the near future.

The university has its seat in Ljubljana, the capital of Slovenia. Ljubljana is a relatively large central European city with approx. 300,000 inhabitants. Nearly one tenth of its inhabitants are students, which gives Ljubljana a young and lively character.

The university was founded in the centre of Ljubljana where the central university building and the majority of its faculties are located. Later on, some new, modern buildings were constructed in the suburbs of the city.

The University of Ljubljana is famous for the quality of its study courses both in the humanities, and in scientific and technological fields, as well as in medicine, dentistry and veterinary science.

On a domestic and international level, the study courses run at the University of Ljubljana and its projects follow the latest world discoveries and trends in the field of art, science and technology, to which the contribution of numerous Slovenian professors and researchers is of great importance.

Borut Mavko (BS, 1967 anf MS 1971, electrical engineering, University of Ljubljana, Slovenia, MS nuclear engineering Georgia Institute of Technology USA, 1972; PhD electrical engineering University of Maribor, Slovenia, 1979) is head of the Reactor Engineering Division of the JSI in Ljubljana and professor of nuclear engineering at the University of Ljubljana (Faculty of Mathematics and Physics). His research interests include nulcear safety, transient and accident analusis, probabilistic safety analysis, and thermal hydraulics. He participated to many International Atomic Energy Agency research co-ordination meetings and technical meetings, expert missions etc. He is member of ASME, ENS, and many local socities. He has more hundreds of published or unpublished documents.

Partner 27 HMS SULTAN, Nuclear Department (ND), Defence College of Electro-mechanical Engineering (HMS SULTAN)

The primary role of the Nuclear Department (ND) is to deliver nuclear education and training to all service and civilian personnel appointed to the Naval Nuclear Propulsion Programme (NNPP) and to deliver nuclear accident procedure courses to service and civilian and emergency services personnel associated with the transportation of nuclear material. The Nuclear Department is an Associated Institution of the University of Surrey and offers a modular MSc degree in Nuclear Technology and Safety Management as well as Post Graduate Diplomas and Certificates in Nuclear Engineering, Health Physics/Radiological Protection and Materials/Radiochemistry. In addition, some 45 NNPP specific career courses are offered to support design and build, run and maintain (systems engineering), safety and decommissioning/disposal. The ND is also tasked with providing specialist advice, consultancy and research assistance to both Service and MOD civilian authorities in NNPP and nuclear safety related areas. Research areas include reactor physics, thermal hydraulics, radiation metrology, material and chemistry, accident and dispersion analysis, nuclear safety and decommissioning and a number of PhD students conduct their research in these areas. The ND has strong international collaborations with Ecole des Applications Militaires de l'Energie Atomique, Cherbourg, France and the TRAC Users Group at Penn State University, USA.

Philip Beeley: Obtained his PhD in nuclear chemistry and physics at McGill University, Canada in 1981 and after three years as a postdoctoral fellow he worked for Atomic Energy of Canada

supporting the CANDU programme. He then returned to academia as an assistant professor at Queen's University and Senior Operator of the SLOWPOKE research reactor at the Royal Military College of Canada. In 1990 he returned to the UK as Senior Lecturer Reactor Physics in the Department of Nuclear Science and Technology, the Royal Naval College, Greenwich. After serving as Deputy Manager, Physics and Computing Division and Deputy Director of the Department he became Professor and Director of the Department in 1999 after it moved to HMS SULTAN. He obtained an MBA from Imperial College, University of London in 1995. He is President of the Institution of Nuclear Engineers, European Nuclear Society Board Member representing the British Nuclear Energy Society, UK representative on the American Nuclear Society International Committee, Member of Court of the University of Surrey, Board member of the UK Nuclear Training Education Network (NTEC) and Visiting Professor at the University of Southampton. His research interests are in reactor physics, neutron metrology and decommissioning.

Appendix A – A.2 Sub-contracting

No sub-contracting is foreseen in the project.

Appendix A – A.3 Third Parties

The work carried out by the partners 1, the ENEN Association, and 9, the Consorzio Interuniversitario per la Ricerca Tecnologica Nucleare (CIRTEN), is carried out by their members, which they represent in the project.

The description of the third parties is provided together with the description of the Consortium under Appendix A – A.1. The tasks to be accomplished by the third parties, their resources and budget and the estimated EC funding are provided under section 8.3 Management level description of resources and budget.

The third parties represented by the CIRTEN Consortium participating to the project are

- Universita di Pisa – University of Pisa – Italy , whose registered office is at Lungarno Pacinotti 43, I- 56100 Pisa, Italy

and

- Università degli Studi di Torino - University of Torino – Italy, whose registered office is at Via Verdi 8, I-10124 Torino, Italy

The third parties represented by the ENEN Association with their reference ENEN member number and acronym are listed hereafter.

1-2 KatholiekeUniversiteit Leuven – Belgium, referred to as KUL, whose registered office is at Oude Markt 13, B-3000 Leuven - Belgium

1-3 Université Catholique de Louvain – Belgium referred to as UCL, whose registered office is at Place de l'Université 1, B-1348 Louvain-la-Neuve- Belgium

1-4 Atominstitut de Österreichischen Universitäten – Austria, referred to as ATI, whose registered office is at A-1020 Vienna Stadion Allee 2 - Austria

1-6 Technische Universiteit Delft – Delft University of Technology – The Netherlands, referred to as DUT, whose registered office is at Julianalaan 134, 2600 AA Delft - The Netherlands

1-7 Ecole Polytechnique Fédérale de Lausanne - Swiss Federal Institute of Technology Lausanne, referred to as EPFL, whose registered office is at Ecublens CH-1015 Lausanne - Switzerland

1-11 Kungl Tekniska Högskolan – Sweden, referred to as KTH, whose registered office is at Droltning Kristin Vag 33A S-10044 Stockholm - Sweden

1-13 České Vysoké Učení Technické v Praze - Czech Technical University in Prague – Czech Republic, referred to as CTU, whose registered office is at V Holešovičkách 2 --180 00 Praha 8 - Czech Republic

1-14 Budapesti Műszaki és Gazdaságtudományi Egyetem - Budapest University of Technology and Economics- Hungary, hereinafter referred to as BUTE, whose registered office is at Műegyetem rkp. 3-9. H-1521, Budapest- Hungary

1-16 Slovenská Technická Univerzita v Bratislave - Slovak University of Technology in Bratislava - Slovakia, referred to as SUTB,whose registered office is at Ilkovičova 3 SK-812 19, Bratislava - Slovak Republic

1-18 Institute for Safety and Reliability – Germany, referred to as ISaR,whose registered office is at Walter-Melssner Str. 2, D-85748 Garching - Germany

1-22 Universität Stuttgart - University of Stuttgart – Germany, referred to as IKE, registered office is at Keplerstrasse. 7, D-70147 Stuttgart – Germany

1-24 Ustav jaderného vyzkumu Rez -- Czech Republic, referred to as REZ whose registered office is at 250 68 ŘEŽ –Praha Czech Republic

1-33 Université de Liège - Belgium, referred to as ULG, whose registered office is at Place du XX août 1, B-4000 Liège – Belgium

1-36 Universidad de Sevilla - Spain, referred to as USE, whose registered office is at Calle San Fernando 4, E-41004 Sevilla, Spain

1-40 Universitat Politecnica de Catalunya - Spain, referred to as UPC, whose registered office is at Calle Jordi Girona 31, E-08034 Barcelona – Spain

Appendix A – A.4 Funding of Third Country Participants

Funding of third country participants the Ecole Polytechnique Fédérale de Lausanne, Switzerland and the Norwegian University of Life Sciences, Norway will be granted by their respective national institutions.

No funding from FP6 sources is foreseen for third country participants in the project.

Appendix B – Statutes of the European Nuclear Education Network Association

STATUTES
EUROPEAN NUCLEAR EDUCATION NETWORK ASSOCIATION

ARTICLE 1 - NAME – REGISTERED OFFICE

In accordance with the French law, the Members, named at article 3, have agreed to set up, for an unlimited period, a non-profit-making association pursuing a pedagogic and scientific aim, under the name of the "European Nuclear Education Network" also called "ENEN Association".
The registered office of the ENEN Association is established at :
Atomic Energy Commission - CEA
National Institute for Nuclear Sciences and Technology (CEA-INSTN)
F-91191- Gif-Sur-Yvette Cedex
France.
The address of the ENEN Association may be changed by a decision taken by the Board of Governors.

ARTICLE 2 - AIMS AND STRATEGIES

2.1 The main objective of the ENEN Association is the preservation and the further development of a higher nuclear education and expertise. This objective should be realized through the co-operation between European universities involved in education and research in the nuclear engineering field, research centres and the nuclear industry.

To meet with this objective, the ENEN Association has to:
- Promote and further develop the collaboration in nuclear engineering education of engineers and researchers needed by the nuclear industry and the regulatory bodies,
- Ensure the quality of nuclear academic engineering education and training,
- Increase the attractiveness for engagement in the nuclear field for students and young academics.

The basic objectives of the ENEN Association shall be to:
- Deliver a European Master of Science Degree in Nuclear Engineering and promote PhD studies,
- Promote exchange of students and teachers participating in the frame of this network,
- Increase the number of students by providing incentives,
- Establish a framework for mutual recognition,
- Foster and strengthen the relationship with research laboratories and networks, industry and regulatory bodies, by involving them in (or association them with) nuclear academic education and by offering continuous training.

2.2 The aims of the ENEN Association shall be achieved by:
- Discussion on educational objectives, methods and course contents among the members and with external partners, particularly national and European industries.

- Organisation of internal audits on the quality of nuclear engineering curricula.
- Awarding the label of "European Master degree of Science in Nuclear Engineering" to the curricula satisfying the criteria set up by the ENEN Association.
- Cooperation between the members, and with the research centres and the nuclear industry for enhancement of mobility of teachers and students, organisation of training and advanced courses, use of large research and teaching facilities or infrastructures.
- Cooperation with international and national governmental institutions, agencies and universities.
- Identification and development of solutions to specific problems and deficiencies which hinder the attainment of the aims of the Network.
- Facilitating the exchange of information between the Members of the ENEN Association - on course objectives, content, modes of presentation and other matters.

ARTICLE 3 - THE MEMBERS

There are two types of Members : Effective Members and Associated Members. Effective and Associated Members are institutions or corporate bodies.

Article 3.1 – Effective Members

The Effective Members are academic institutions or clusters of such institutions having a legal status and meeting all following criteria:

- Provide high-level scientific education in the nuclear field -as full time teaching and providing the bases for doctorate studies- based on internationally recognized research in nuclear engineering and/or nuclear sciences carried out jointly by the teaching staff, the students, doctoral and post-doctoral researchers in the same geographic location or in association with a nuclear research centre.
- Use selective admission criteria conforming with legal provisions and/or national practices.
- Be based in the European Union or in one of its candidate member countries. The Board of Governors shall have new applications for Effective Membership evaluated according to the criteria defined above, after which evaluation the Board can provisionally accept the new member until the new Effective Membership has been confirmed by the General Assembly, by a majority of two-thirds of the votes cast.

Article 3.2 - Associated Members

The Associated Members are corporate bodies having a legal status and meeting the following criteria :

- nuclear research organisations,
- government institutions,
- nuclear companies,
- regulatory bodies and
- nuclear learning societies.

who:

- commit themselves to support the ENEN Association and
- have a firmly established tradition of relations with some of the members in the fields of education, research and training, and
- are based in the European Union or in one of its candidate member countries.

The Associated Members are members of the Scientific Advisory Committee following the Internal Rules. They can be consulted by the Board of Governors on relevant subjects under discussion and shall be convened to the General Assembly but having no voting rights.

The Board of Governors shall have new applications for Associated Membership evaluated according to the criteria defined above, after which evaluation the Board can provisionally accept the new member until the new Associated Membership has been confirmed by the General Assembly, by a majority of two-thirds of the votes cast.

ARTICLE 4 - RESIGNATION, EXCLUSION

The Effective and Associated Members are free to withdraw from the ENEN Association by sending their written resignation to the President of the Board of Governors, according to the provisions of the Internal Rules.

Effective or Associated Members may only be excluded by the General Assembly with a majority of two-thirds of the votes cast, once the Member concerned has been heard by the General Assembly.

ARTICLE 5 – MEMBERS SUBSCRIPTION AND OTHER INCOMES

The income of the ENEN Association is made up of:
1. Contributions by the Members. The amount shall be determined every year by a resolution of the General Assembly.
2. Grants.

The non-payment of the contribution fee for two consecutive years shall be considered equivalent to resignation and the defaulting Member shall be automatically excluded by the Board of Governors, after a last written reminder requesting payment has not been followed by a payment.

ARTICLE 6 - ASSETS

Effective Members and Associated Members, even if out-going, do not have any rights to the assets of the ENEN Association.

ARTICLE 7 - THE GENERAL ASSEMBLY

Article 7.1 - General Assembly Composition

The General Assembly is made up of all Effective and Associated Members. The Members are legally represented by the legal representative of the Member or their mandatories.

The President and the Vice-President of the Board of Governors shall act respectively as the President and the Vice-President of the General Assembly.
Effective Members have one vote by country. In case of a country having more than one Effective Member, they decide among themselves the designation of one representative who will represent them and have the voting rights for a full calendar year. Effective Members shall not be entitled to vote at the General Assembly until they reach to an agreement on the voting representative per country. Effective

Members who have voting rights are called “Voting Members”.

Article 7.2 – Meetings. Quorum requirements

The General Assembly is convened at least once a year during the first Friday of March. It is convened and presided by its President or, should he or she be prevented from attending by the Vice-President

The General Assembly shall also be convened upon written request of 20 % of the Voting Members addressed to this effect to the Board of Governors .
Taking into account the necessary grouping to one vote for countries with more than one Effective Members, each Voting Member may be represented by another Voting Member, bearing a written mandate. No Voting Member may represent more than two votes.
The General Assembly may only validly deliberate if 50% of its Voting Members are present or validly represented.
Resolutions shall be taken upon a majority of 2/3 of the present or represented Voting Members.
Resolutions adopted by the General Assembly are recorded in a Register signed by the President and the General Secretary and kept at the registered office of the ENEN Association where it is available to be consulted by the Members.

Article 7.3 – The Role of the General Assembly

The General Assembly has the power to discuss the general policy of the ENEN Association according to the aims described in Art. 2, to take the required measures to implement the decisions, and to establish sub-groups and committees, whenever required.

The General Assembly elects the members of the Board of Governors for a period of four years, the General Secretary as well as the President and Vice-President, for a period of two years.

Moreover it possesses the following specific powers to:
- approve the annual report of activities;
- approve the annual budget and the accounts;
- approve the affiliation of new Effective and Associated Member;
- fix the amount of the subscription as laid down in Article 5;
- appoint and dismiss any Member of the Board of Governors;
- appoint the General Secretary;
- exclude any Member;
- modify the Statutes of ENEN Association (Art. 13);
- dissolve the ENEN Association (Art. 14).

Honorary Members are individuals having accomplished distinguished work in the field of nuclear engineering or research.

The General Assembly may appoint as Honorary Member any such person by a majority of two-thirds of the present or represented Voting Members.

Honorary Members can be invited to participate to the meetings organised by the Board of Governors and be consulted on relevant subjects under discussion but having no voting rights.

Article 8 - THE BOARD OF GOVERNORS

Article 8.1 - Board of Governors - Composition/vote

The Board of Governors is made up of six Voting Members and two Associated Members elected by the General Assembly for a period of four years. A President, and a Vice-President are elected by the General Assembly from among these eight persons, the President being necessarily an Effective Member.
As an exception, at the end of the first period of four years four Members shall vacate their seats. The other four shall remain for a further two years so that from then on, half of the seats will be vacated every two years.
Board membership must be such as to give a reasonable geographical representation across the ENEN membership countries.
Each Member of the Board of Governors has one vote and decisions shall be taken upon a simple majority of Members present or represented. In case of equality the President has a double vote.
Each Member may represent another Member, but not more than one.
The President of the Board convenes the Board of Governors at least two times a year. The Board may validly meet if 5 of its Members are present or duly represented.

Article 8.2 – The Role of the Board of Governors

The Board of Governors has the widest powers for the administration and management of the ENEN Association, insofar as these are not reserved for the General Assembly by Article 7.

In particular, the Board is responsible for :

- defining the powers and missions of the General Secretary,
- establishing sub-committees, drafting their terms of reference, nominating their members, and supervising their activities.

The Board of Governors appoints every two years, from amongst its members, a Treasurer who ensures the financial management of the ENEN Association. He also administers the ENEN Association's bank accounts and in particular the subscription account provided for in Art. 5 of the Statutes.

Article 9 - MANAGEMENT COMMITTEE

The Management Committee is constituted by the chairman of each sub-committee and the General Secretary designated by the General Assembly.

This Management Committee is headed by the General Secretary who is responsible for the day to day management and who reports to the Board of Governors about his activities.

The Management Committee is responsible for the co-ordination of the activities of the sub-committees and for the preparation and implementation of the decisions taken by the Board of Governors.

The Management Committee examines the affiliation of a new Member to the ENEN Association in accordance with the criteria defined in the Statutes. The final decision is to be taken by the General Assembly.

ARTICLE 10 - REPRESENTATION

The ENEN Association is legally bound vis-à-vis of third parties by the signature of the President of the Board of Governors together with that of the General Secretary.

Concerning day-to-day activities, the ENEN Association shall be represented by the General Secretary as defined in the Internal Rules.

In the event that the above-mentioned are prevented from exercising their powers, the Board of Governors, chaired by the eldest Member present, shall take the required measures.

All lawsuits, whether the ENEN Association appears as the plaintiff or as the defendant, shall be pursued and followed through on behalf of the Board of Governors by the President or by any governor appointed by the Board for this purpose.

ARTICLE 11 - BUDGET AND ACCOUNTS

The ENEN Association has the legal capability to own the means and goods necessary to pursue its aim, and to receive grants provided they are used for the realisation of its goals. The financial year of the ENEN Association runs from January 1 until December 31.

The Board of Governors submits the accounts for the past year and the budget for the current year for the approval of the General Assembly.

ARTICLE 12 – INTERNAL RULES

The Board of Governors shall draw up Internal Rules to govern the functioning of the General Assembly, the Board of Governors, the Management Committee, the General Secretary of the Management Committee and the sub-committees.

ARTICLE 13 - MODIFICATION OF THE STATUTES OF THE ENEN ASSOCIATION

Only the General Assembly has the authority to deliberate on a modification of the Statutes of the ENEN Association.

The General Assembly may be convened for this purpose, in accordance with the procedures laid down in Article 8, in an extraordinary meeting. The proposed modification must be explicitly indicated in the convening notice.

Any modification of the Statutes can be decided by the General Assembly provided that two thirds of its Voting Members are present or duly represented, by a unanimous vote, excluding abstentions.

ARTICLE 14 - DISSOLUTION

The General Assembly shall only pronounce the dissolution of the ENEN Association by a unanimous vote taken by the Voting Members present or duly represented. This point should be clearly mentioned on the agenda.
In the event that no activity is carried out during a period of five consecutive years, the dissolution of the ENEN Association shall be pronounced by an ordinary majority of the present or duly represented Voting Members during a General Assembly specially convened for this purpose.

In the event of the dissolution of the ENEN Association, the net assets shall be allocated to one or several similar associations, to be designated by the General Assembly.

ARTICLE 15 - GENERAL PROVISIONS

Anything not expressly provided for in the present statutes is governed by the French law.

The statutes are made out in English and French. The French version, as registered at the French legal authority, shall prevail over any translation there of.

Appendix C – Composition of the ENEN Board, Management Committee and Working Committees

ENEN Board of Governors

Institut National des Sciences et Techniques Nucléaires CEA-INSTN (F)
J. Safieh, President

HMS Sultan, Defence College of Electromechanical Engineering (UK)
Ph. Beeley, Vice-President

Studiecentrum voor Kernenergie – Centre d'Etudes de l'Energie Nucléaire SCKCEN (B)
M. Giot (Treasurer)

Royal Technical Institute Stockholm KTH (SW)
T. Lefvert

Consortium Interuniversitario CIRTEN (I)
B. Panella

Budapest University of Technology and Economics BME (HU)
C. Sükösd

University of Ljubljana UL-FMF (SI)
B. Mavko

Institute for Safety and Reliability ISaR (D)
A. Schaefer

ENEN Management Committee

Secretary General	P. De Regge
TAAC - Katholieke Universiteit Leuven	W. D'haeseleer
AC&RC - Universidad Politecnica de Madrid	E. Minguez
T&IPC - Jozef Stefan Institute	L. Cizelj
QAC - Helsinki University of Technology	R. Salomaa
KMC - Slovak University of Technology in Bratislava	M. Miglierini

ENEN Working Committees

- Teaching and Academic Affairs Committee, TAAC
  - Katholieke Universiteit Leuven, KUL – Chair (B)
  - Swiss Federal Institute of Technology, EPFL (CH)
  - University Polytechnica Bucharest, UPB (RO)
  - Institute for Safety and Reliability, ISaR (D)
  - HMS Sultan, HMS (UK)
  - University of Ljubljana, UL-FMF, (SI)

- Advanced Courses and Research Committee AC&RC
  - Universidad Politecnica de Madrid, UPM – Chair (E)
  - Royal Technical Institute Stockholm, KTH (SW)
  - HMS Sultan, HMS (UK)
  - Studiecentrum voor Kernenergie, SCKCEN (B)
  - Consortium Interuniversitario, CIRTEN (I)

- Training and Industrial Projects Committee T&IPC
  - Jozef Stefan Institute, JSI – Chair (SLO)
  - Institute for safety and Reliability, ISaR (D)
  - Institut National des Sciences et Techniques Nucléaires, CEA-INSTN (F)
  - Ustav Jaderneho Vyzkumu, REZ (CZ)
  - Vacant

- Quality Assurance Committee QAC
  - Helsinki University of Technology, TKK – Chair (FIN)
  - Université Catholique de Louvain, UCL (B)
  - Institut national des Sciences et Techniques Nucléaires, CEA-INSTN (F)
  - Budapest University of Technology and Economics, BME (HU)
  - Center of Technology and Engineering for Nuclear Projects, CITON (RO)

- Knowledge Management Committee (KMC)
  - Slovak University of Technology Bratislava, SUTB – Chair (SK)
  - Atominstitut der Österreichischen Universitäten, ATI (A)
  - Interfacultair Reactor Institute – TU Delft, TUD (NL)
  - Studiecentrum voor Kernenergie, SCKCEN (B)
  - University of Stuttgart, IKE (D)

Appendix D – Contractual Documents and Reporting under FP 6

Reporting Procedures for a Coordination Action

1. Introduction

The Contract and its Annexes set out the main reporting requirements of the Consortium towards the Commission. These are summarised here to provide a readily accessible check list for both the Consortium and the Commission services. In addition, a number of other reports/documents are identified which should be furnished at the times indicated to enable effective and timely monitoring of project progress by the Commission services. A brief description of the nature of the respective reports/documents is also provided.

Report/Document	Deadline
Agendas of meetings concerned with management of the project[32]	2 weeks in advance of meeting
Minutes of meetings concerned with management of the project[1]	1 month after meeting
Statement on signature of the Consortium Agreement	Ideally before contract start and not later than 3 months thereafter
Project Presentation	Within 3 months of contract start
Communication Action Plan	Within 6 months of contract start
Periodic Management / Activity Report, including - plan for using and disseminating of knowledge	Every 12 months after contract start (ie, at 12, 24…. months)[2]
Interim Management Report	Every 6 months after contract start (ie, 6, 18, 30…. months)[2]
Mid Term Assessment Report	At mid-point of the contract (ie, at 18 months)[2]
Final Reports - final management report - final activity report - impact of gender action plan	At end of project (ie, at 36 months)[2]
Financial statements	Every 12 months after contract start (ie, at 12, 24 and 36 months)
Publications/conferences/press Releases[3]	1 months before publication

[32] To be strictly limited to meetings concerned with management of the project, eg, meetings of the project management team, meetings of the co-ordinator with work package leaders, meetings of advisory/steering committees, meetings for evaluation/selection of contractors after open calls, etc

[2] Report to be delivered within 45 days of the end of the respective reporting period

[3] Limited to those which may have social, economic and/or political impact or could trigger significant media interest

2. Brief Description of the Documents and Reports

2.1 Agendas and minutes of meetings concerned with management of the project

In order to enable timely and effective monitoring of the project, the Commission services need to be informed of any significant meetings concerned with the management of the project and of their outcomes. Meetings which fall within this category include those of the project management team/group, of the coordinator and work package leaders, of an advisory/steering committee, of committees established to evaluate responses to open calls, etc. Agendas of these meetings should be provided to the Commission services at least 2 weeks in advance and minutes within one month after each meeting. The Commission services may wish to participate in these meetings, generally in an observational capacity.

2.2 Statement on signature of a Consortium Agreement

A 'Consortium Agreement' should be concluded for this project. On behalf of the Consortium, the Co-ordinator must inform the Commission in writing that a "Consortium Agreement" has been concluded and signed by all contractors (see Article 1.4 of the contract).

This statement should ideally be provided before contract start and not later than 3 months thereafter.

2.3 Project Presentation

A brief presentation of the project should be prepared of approximately 2-3 pages in English and other language versions if so desired. It should be written in a style which is comprehensible to the non-specialist, avoiding technical language, mathematical formulae and acronyms as far as possible. The inclusion of photos, diagrams and other illustrative material is encouraged. The presentation may freely use material included in Annex I. Publication should be via the World Wide Web and any other media agreed in consultation with the Commission services. The Commission services may also publish the project presentation among others on their website. Periodic updates of the project presentation may be requested.

The project presentation should be provided not later than 3 months after contract start.

2.4 Communication Action Plan

In addition to the provisions of Art. 10, 11 and 12 of Annex II, and in the context of raising public participation and awareness, the Consortium will prepare a realistic, coherent and consistent Communication Action Plan to be implemented by the Consortium during the lifetime of the project. Where appropriate, the project should aim to communicate with actors beyond the research community in order to help spread awareness, in particular where the research and its outcomes may have broader socio-economic or political implications.

The Communication Action Plan should be delivered within 6 months of contract start. A summary of activities carried out as part of the Communication Action Plan, together with their impact, should be included in the project's Final Report.

3. Management Reports

Management reports are essential documents for the internal project management, planning and control. Note that all management reports are deemed to be confidential.There are two types of reports required as identified below:

3.1 Periodic Management Reports

In line with the provisions of Art. 7.2 (b) of Annex II, at the end of each 12-month period (also including the last one), a Periodic Management Report should be prepared by the Consortium. This should, inter alia, provide (i) Justification of resources deployed by each contractor, linking them to activities implemented and justifying their necessity, (ii) Financial statement by activity for the contractual reporting period, (iii) Summary financial report etc. and constitute a basis for the payments to be made by the Commission.. It should address the specific objectives for the period and the extent to which they have been achieved; in addition, it should provide further comments and information on project co-ordination activities such as communication between partners, meetings, conference attendance, possible co-operation with other projects/programmes, publications made or notified, etc.

These reports are due within 45 days of each reporting period.

3.2 Interim Management Reports

This report is requested to be submitted at 6-months intervals (at 12-months interval to be integrated into the Periodic Management Report) and its typical size is about 2-3 pages in A4 format. The report provides information essentially from the scientific management and planning point of view concerning the relevant 6-month period and the report may outline issues such as: major scientific results achieved, milestones reached, status of deliverables, follow-up of the Gantt chart, activities on critical path, resource utilisation, communication aspects, administrative matters and any other points of relevance.

These reports are due within 45 days of the relevant 6-month period.

3.3 Periodic Activity Report

In line with the provisions of Art. 7.2 (a) of Annex II, at the end of each 12-month period (also including the last one), a Periodic Activity Report should be provided. This report provides the main basis for an evaluation of progress made during the period against the objectives and milestones set out in Annex I. It should contain an overview of the activities carried out by the Consortium during that period, a description of progress towards the objectives of the project, a description of progress towards the milestones and deliverables foreseen, and the identification of problems encountered and corrective action taken.

The **Plan for using and disseminating knowledge** and how it is being implemented should be included as a separate item in each Periodic Activity Report. This Plan should be drafted at the beginning of the project and updated periodically. The Final Plan at the end of the contract should describe the participants' actual achievements in dissemination and their plans for further exploitation of their results - for the Consortium as a whole and/or for individual participants or groups of participants. It will, where appropriate, refer back to interim versions of the Plan identifying which of the foreseen activities took place, which were modified in the light of the circumstances, or where other actions were introduced.

These reports are due within 45 days of each reporting period.

3.4 Mid-Term Assessment Report

At the mid point of the project a Mid Term Assessment Report should be prepared. This should evaluate progress against what was planned and identify any need for change in the work foreseen for the remainder of the project in order for it to achieve its objectives in a timely and effective manner. The report will be reviewed by the Commission services and, in consultation with the consortium, any necessary revision of Annex I will be agreed.

In those cases where a Periodic Management Report, an Interim Management Report or a Periodic Activity Report coincides with the Mid-Term Assessment Report, the latter shall be deemed to replace the former.

This report should be produced at the mid point of the project.

3.5 Final reports

In addition to the Periodic Management Report and the Periodic Activity Reports corresponding to the last reporting period of the project, the Consortium shall, in line with the provisions of Art. 7.4 of the Annex II, submit to the Commission the following two reports:

- a Final Management Report covering the full duration of the project, and
- a Final Activity Report covering the totality of coordination action carried out

The Final Activity Report also includes the final plan for using and disseminating knowledge and its implementation. The impact of the Gender Action Plan should also be discussed. The Consortium should describe the results of implementing the Gender Action Plan, present an analysis of its impact and relevance, and make recommendations for further action. The general conclusions of the outcome of the Gender Action Plan will be made publicly available by the Commission.

These reports are due within 45 days of the end of the contract.

4. Publications/Conferences/Press Releases

The Commission services should be informed, one month in advance, of any publications or initiatives (eg, articles in Journals, press releases, conference papers, etc) by the Consortium which may have social, economic and/or political impact or could trigger significant media interest.

Project contributions could also be requested for specific official EC conferences where the co-sponsored projects (results, achievements, etc.) are presented to the international radiation protection community.

4.1 Guidance on Report Preparation

Additional guidance on the preparation of the reports identified above (eg, format, structure, outline content, etc) will be developed by the Commission services in **"Guidelines for Reporting FP-6 / Nuclear Fission"** and are available on the programme web site (http://www.cordis.lu/fp6/find-doc.htm#reporting)

5. Financial Statements

Form C, as set out in Annex VI of the contract should be used for submitting financial statements by each contractor for each reporting period. The coordinator should also provide the summary financial report consolidating the claimed costs of all the contractors in an aggregate form.

6. Mode of Delivery of Reports

Periodic Management Reports, Periodic Activity Reports and all Final Reports should be submitted by electronic means together with one paper copy (delivery by registered mail). Statement on signature of Consortium Agreement and all Financial Statements should be submitted with original signatures on paper (delivery by registered mail). Other reports including deliverables and technical reports can be submitted by electronic means only

6.1 Document unique numbering

A document numbering system will be used so that all project documents will have a unique number and the type of document can be identified, e.g. contractual deliverables from the consortium or project documents to be issued to the Commission. The system proposed is as follows:

- ENEN-II-S/T-WP n-m for contractual deliverables of scientific/technical interest (where “n” means the WP number and “m” follows simply the chronological order within WP n)
- ENEN-II -A/F-m for contractual deliverables of administrative/financial interest as indicated in the Table page 1 (where “m” follows simply the chronological order)