1. Basic Information
1.1 CRIS Number: 2005/017-488.03.06
1.2 Title: Nuclear Safety and Radiological Protection
1.3 Sector: Nuclear safety
1.4 Location: POLAND

2. Objectives

2.1 Overall Objective(s):

The overall goal of the project is to build capacities to educate and train personnel of regulatory bodies and staff of existing and potential future nuclear installations in Poland in nuclear safety and radiological protection, to be in line with requirements of national regulations and recommendations of the International Atomic Energy Agency (IAEA TECDOC 1254) and the European Union according to Articles 2, 4, 174, 219 of the Treaty Establishing the European Atomic Energy Community and Medical Exposures Directive (MED) (97/43/Euratom).

2.2 Project purpose:

- Strengthening the Świerk Nuclear Centre by creation the framework for long – term training programme in the scope of implementation of the European Union regulations related to nuclear safety and recommendations of the International Atomic Energy Agency (IAEA).
- Improving the qualifications of the administration responsible for nuclear safety and radiological protection and therefore enhancing:
  - nuclear and radiation safety in operating nuclear and radioactive waste installations,
  - basic radiation safety in industrial and medical applications of ionizing radiation,
  - security of radioactive sources, including transportation of radioactive materials and border transport control.

2.3 Justification

According to the Chapter 14 of the EU report: “Comprehensive Monitoring Report on Poland’s Preparation for Membership” Poland should continue to pay attention to further strengthening the capacity of its nuclear regulatory authorities and the radioactive waste management plant (national agency for radioactive waste management).

3. Description

3.1 Background and justification:

The following nuclear installations are operated in Świerk Nuclear Centre: research reactor MARIA and two spent fuel storage facilities. Besides, there are also operated facilities related to nuclear waste management. In order to achieve and maintain high levels of safety and operation efficiency of nuclear installations, they have to be staffed with an adequate number of highly qualified and experienced personnel who are fully aware of the technical and administrative safety requirements and are motivated to adopt a positive attitude to safety, understood as an important element of safety culture.
Recently, the Polish government plans were announced on construction of nuclear power in Poland, which is a response to EU decision on increase of reduction of CO\textsubscript{2} emissions starting from 2012. In consequence, greater effort should be devoted to all aspects of nuclear safety and radiological protection. In particular it concerns education and training of new cadres. This project would have to be followed by further technical cooperation when those plans result in concrete deliverables.

At present education and training of the personnel responsible for nuclear safety and radiation protection is performed by organisations operating nuclear installations and organisations dealing with nuclear waste disposal, according to the program called “On the Job Training” (OJT), approved by the National Atomic Energy Agency. Qualifications of the personnel are verified during examinations organised by the Examining Commission of the National Atomic Energy Agency (NAEA) - Regulatory Body in Poland or by local Examining Commissions set up by the installation operator. Operational training is conducted on operated or supervised objects. Reactor accidents are analysed theoretically.

The Beneficiary - Ministry of Economy and Labour (MEL), as supervisor of the Świerk nuclear research centre and institution responsible for energy security and safety in Poland is responsible for implementing the EU standards in the field of nuclear and radiological safety in the Świerk Centre. In particular development of a clearly defined learning policy is an important task. Learning is a lifelong process. It should be allocated in a fair and equitable manner in the light of operational needs, employees’ career aspirations and financial constraints. Therefore the Beneficiary is also responsible for creating appropriate framework for personnel training for future activities in nuclear power in Poland. Appropriate capabilities and resources are required. The Training Centre will become an essential element of the training process in nuclear safety and radiological protection in Poland.

Institute of Atomic Energy (IAE), as the only institution operating nuclear installations in Poland and carrying out routine radiological monitoring of Świerk Centre is deeply interested in organising the education and training of operating staff according the rules of the Systematic Approach to Training (SAT), EU and IAEA standards.

The uncertainties about the future of nuclear power in many countries, including Poland, the aging of the existing work force, and the consequential lack of interest of new professionals to engage in the nuclear field represent developments of major current international concern. The situation is compounded by the great reduction in higher education opportunities in the field of nuclear engineering, the elimination of nuclear engineering departments and research reactors in many universities and the loss of nuclear research facilities generally. In Poland situation is aggravated because of lack of operating NPP resulting in low public interest in nuclear careers. Competence of regulatory staff and operational personnel is one of the prerequisites for the safety of nuclear facilities in the EU Member States. Recruitment of competent regulatory staff is difficult. Also, replacement of retiring staff members requires active efforts from the management of regulatory bodies for establishing staff qualification and training programs. International support is needed in this domain. The proposed project is a direct consequence of the EU recommendation and will be in line with the requirements concerning nuclear safety and radiation protection, which are subject of the following documents:

1. Directives and Commission Regulation (EURATOM):
   - Treaty Establishing the European Atomic Energy Community;
   - Medical Exposures Directive (MED) (97/43/Euratom);
   - Commission Regulation (Euratom) No 770/90 of 29 March 1990 laying down maximum permitted levels of radioactive contamination of feeding stuffs following a nuclear accident or any other case of radiological emergency.

2. International Conventions:
• Convention on Nuclear Safety.
3. IAEA Safety Series:
• Safety of Nuclear Installations IAEA Safety Series 110;
• Safety Assessment for Spent Fuel Storage Facility, IAEA Safety Series 118;
• Operations of Spent Fuel Storage Facility, IAEA Safety Series 117.
4. Polish Law “Nuclear Law” and following Government Decrees.
5. Training activity in the area of nuclear safety and radiological protection were outlined in a set of
IAEA Safety Standards Series and TECDOC documents:
• Recruitment, Qualification and Training of Personnel for Nuclear Power Plants IAEA NS G 2.8;
• Means of evaluating and improving the effectiveness of training of nuclear power plant
personnel, IAEA TECDOC 1358;
• Training the staff of the regulatory body for nuclear facilities: a competency framework. IAEA
TECDOC 1254.

As regards the particular case of the qualified expert as mentioned in the Basic Safety Standard
Directive, the European Commission provides, in the Communication on the application of the directive
(98/C133/03), four categories of qualified experts: those active in nuclear applications, in medical
applications, in industrial applications and in research. The training curricula will be based on these
recommendations.

3.2 Linked activities:
The Święrk Centre has ample experience in increasing nuclear safety and parameters of radiation
protection of nuclear facilities operated at Święrk.
The following projects were realised:
• Spent fuel assemblies conditioning at Święrk: feasibility study, Framatome ANP
• Development and implementation Real-Time On-line Decision Support System (RODOS) for
nuclear emergencies in Europe as a part of multi-institutional projects within the FP4-FP5 and
ECHO programmes

The following projects are being realised:
• National Training Course for Polish Border Guards and Customs Officers, within training
programme of IAEA, Nuclear Safety and Security Dep.
• Creation of a Central System of Radiological Monitoring and Radiation Safety of the Święrk
Nuclear Centre – CRIS Number 632.07.01
• Reduction of occupational exposure and radioactive isotopes arising from the operation of the
MARIA research reactor through actions taken at the source – CRIS Number PL 632.07.02;
• Upgrading of the heat exchangers and ion-exchangers at the MARIA research reactor in Poland
to reduce the possible radioactive releases into the environment – CRIS Number 5812.05.01
• Implementation EU approach to nuclear and radiological emergency management and
rehabilitation strategies, research project under the European Commission's 6th Framework
Programme, EURATOM Research and Training Programme on Nuclear Energy (2002-2007),
contract no. FI6R-CT-2004-508843.
• Organisation of national working team on safety assessment for medical applications of
radiation, work package under FP5 Contract: EVG1-CT-2002-8001 MANHAZ (Management of
Health and Environmental Hazards)

3.3 Results:
The results of the project are the following:
• R.1. Prepared long – term training programme embracing: Methodology and procedures of education, training, elaboration of technical expertise on the status and operation of the nuclear and radioactive wastes facilities and safe application of ionizing radiation in medicine;

• Training materials, including handbooks, guidelines, tutorials, dedicated training curricula for facilities dealing with ionizing radiation, lecture plans, lecture notes, practical workshop instructions and assignments, scenarios for exercises and drills, and training assessment tools such as examinations;

• Procedure for preparation of expertise, including computer programs aiding preparation of expert opinions.

R.2. Education staff qualified and licensed, prepared to deliver further training.

3.4 Activities:

Contract 1 (TA)

1. Preparation of a long – term training programme:

Preparation of an overall training program that takes into account the operational needs and the long term need for specialists and managers, including:

- a training plan for each group of employees, which is tailored to the employee’s needs and role in the regulatory body. The training requirements for regulatory personnel needs to be based on the functional areas and areas of specialization;

- procedures for periodic review and updating of the training program to take into account the changing needs of the organization and of the individual and scientific and technological development.

Preparation of training and expertise making procedures - all arrangements for the training, including theoretical and practical training in the form of lectures, workshops, tutorials, seminars or practical training exercises, and/or on the job training of appropriate duration.

Preparation of training materials, including lecture plan, lecture notes, practical workshop instructions and assignments, scenarios for exercises and drills, multi-media materials enabling distance learning, exercises connected with the usage of PC simulators, on the job exercises and training assessment tools such as examinations.

2. Staff training and preparing to deliver furthers.

Establishing a group of experts (“teaching the teachers”) for educating and training personnel of Regulatory Body, existing and potential new nuclear and radioactive waste facilities in the field of nuclear safety and radiological protection of nuclear, radioisotopes and radwaste installations, and safe application of ionizing radiation in medicine, by conducting training for:

- staff and operators of nuclear installations in Poland (20 persons),
  regulatory body inspectors (20 persons),
- personnel involved in emergency preparedness and response (20 persons),
- personnel involved in radiological protection relating to the industrial and medical applications of ionizing radiation (20 persons),
- personnel involved in maintaining of security of radioactive sources including border and radiological transportation control (20 persons).

The training will cover mainly:

- Training of staff and operators of nuclear installations and of regulatory body inspectors - nuclear reactor principles; radiation protection; nuclear safety; surveillance programmes; plant modifications and upgrades; operational safety; on-site accident management; emergency
preparedness and response to abnormalities in installation operation; waste management; safety culture; specific duties of inspectors in nuclear materials safety and nuclear waste safety;

- Training on “Emergency preparedness and response” - establishing emergency management and operations, law regulations; criteria for forecasting emergency situations and emergency countermeasures; assessment of an accident situation; emergency response;
- Training on “Radiological protection relating to the industrial and medical applications of ionizing radiation” - use of sealed and unsealed sources; medical applications;
- Training on “Security of radioactive sources including border and radiological transportation control” - Identifying, searching for, recovering and securing high-risk radioactive sources; Long-term control over radioactive sources; Illicit trafficking; planning the response to radiological emergencies arising from the malevolent use of radioactive sources.

The whole training programme should be approved by Polish Regulatory Body (NAEA), according to Polish regulation - Disposition of Ministry Council from August 6, 2002 OJ 145, 1217 §5 pas.3 and 4.

In general, the Systematic Approach to Training (SAT) will be implemented. SAT is a technique that provides a logical progression from the identification of the competencies required for performing a job to the design, development and implementation of training to achieve these competencies, and subsequent evaluation of this training.

Training will be provided by a variety of methods including classroom-based training, on the job training.

Training will cover four major functions of the regulatory body as authorization; review and assessment; inspection and enforcement; development of regulations and guides and supplementary functions, which include research and development; emergency preparedness; and international co-operation.

The contract will comprise all results.

3.5 Lessons learned:

During operation of the MARIA reactor and the spent fuel storage facilities the generation gap becomes visible. It is the crucial problem in Poland because of the relatively high average age of the personnel engaged in the nuclear safety and operation area. The proposed project is essential in transferring the knowledge and safety culture from the existing staff to new personnel. Further delay in educating and training of new staff may adversely affect nuclear safety in the near future.

4. Institutional Framework

The Ministry of Economic Affairs and Labour, Department of Innovation is the beneficiary of the project. The experts from Institute of Atomic Energy will ensure co-ordination of the project.

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05-400 Otwock – Świerk
Stefan Chwaszczewski
Deputy Director of Institute
Phone (+4822)7180004
Fax (+4822)8105960
E-mail: sch@cyf.gov.pl.
5. **Detailed Budget (in M€)**

<table>
<thead>
<tr>
<th>€M</th>
<th>Transition Facility support</th>
<th>Co-financing</th>
<th>Total cost (TF plus co-financing)</th>
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(*) National contribution: Ministry of Economy and Labour  
(**) private funds, FIs loans to private entities

Contract 1 is jointly co-financed.

*In the case of Joint Co-financing, where the final overall cost is lower than foreseen in the project fiche, the National Public and Transition Facility Co-financing are reduced proportionally so as to maintain the agreed rate of co-financing. In the case of Parallel Co-financing, where the final cost is lower than foreseen in the project fiche, it must be shown that the overall objectives of the project have been fully achieved.*

6. **Implementation Arrangements**

6.1. Implementing Agency:

PAO:  
Tadeusz Kozek  
Under Secretary of State  
Office of the Committee for European Integration  
Al. Ujazdowskie 9  
00-918 Warsaw Poland  
Phone: +48 (22) 455 52 41  
Fax: +48 (22) 455 52 43  
E-mail: tadeusz_kozek@mail.ukie.gov.pl

The CFCU is responsible for handling tendering, contacting and payments of contracts on behalf of the beneficiary.

Central Financing and Contracting Unit,  
Co-operation Fund Foundation  
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00 - 444 Warszawa  
CFCU Director  
tel. (+48 22) 450 99 00

Contact person for nuclear projects:  
Ms Izabella Nowakowska  
Project Manager  
tel (+48 22) 450 9916  
fax (+48 22) 622 7565  
e-mail: skorpion@cofund.org.pl

Beneficiary institution:  
Ministry of Economy and Labour
Department of Innovation
Director Krzysztof Gulda
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Project co-ordination in the Institute of Atomic Energy:
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Stefan Chwaszczewski
Deputy Director of Institute
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Fax (+4822)8105960
E-mail: sch@cyf.gov.pl.

6.2. Twining: n/a
6.3. Non-standard aspects: Public Procurement Law
6.4. Contracts:

6.4.1 Contract 1: Technical Assistance: 0,47 M€ gross value (0,4 M€ Transition Facility + 0.07 M€ Polish Joint co-financing)

7. Implementation Schedule
7.1 Start of tendering/call for proposals – 1 Q 2006 (the date when ToRs and/or project specifications will be ready)
7.2 Start of project activity – 4 Q 2006 (expected date of commencement of first contract)
7.3 Project Completion – 4 Q 2007 (expected date of last payment under last contract).

8. Sustainability
The nuclear and radiation safety training organisation will be used for initial and continuing training of Regulatory Body Inspectors, staff and operators of nuclear and radioactive waste installations, personnel and officials involved in the nuclear emergency preparedness and response, and expertise making for Regulatory Body and facilities operators. It also be used in university education and preparation of documents for social information in nuclear techniques.

Finance of training organisation – after completion of the project – will be covered by national budget and contracts for training.

Further technical cooperation would be needed if and when the recent plans for building new nuclear facilities result in concrete deliverables.

The Beneficiary will ensure adequate staffing and financial resources for supervision of the project development during its implementation phase.

9. Conditionality and sequencing
9.2 Sequecing:
Established training and expertise organisation, elaboration training and expertise procedures – 1 Q 2007
Approval by NAEA training and expertise procedures. – 2 Q 2007
Training of lecturer and expert staff – 3 Q 2007;
Annex 1: Logframe matrix

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Nuclear Safety and Radiological Protection</th>
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<tbody>
<tr>
<td>Programme name and number</td>
<td>NuCLEAR SAFETY PROJECT</td>
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<td>Disbursement period expires</td>
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<td>Total budget</td>
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<tr>
<th>Overall objective (1)</th>
<th>Objectively Verifiable Indicators (2)</th>
<th>Sources of Verification (3)</th>
</tr>
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<tr>
<td>The ultimate goal of the project is to build capacities to educate and train personnel of regulatory bodies and staff of existing and future nuclear installations in Poland in nuclear safety and radiological protection to be in line with requirements of national regulations and recommendations of the International Atomic Energy Agency (IAEA TECDOC 1254) and the European Union according to Articles 2, 4, 174, 219 of the Treaty Establishing the European Atomic Energy Community and Medical Exposures Directive (MED) (97/43/Euratom).</td>
<td>Training procedures consistent with the EU standards and recommendations of the International Atomic Energy Agency.</td>
<td>Studies and analyses.</td>
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<th>Objectively Verifiable Indicators (5)</th>
<th>Sources of Verification (6)</th>
<th>Assumptions (7)</th>
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Strengthening the Świerk Nuclear Centre by creating the framework for long-term training programme in the scope of implementation of the European Union regulations related to nuclear safety and recommendations of the International Atomic Energy Agency (IAEA). Improving the qualifications of the administration responsible for nuclear safety and radiological protection and therefore enhancing:
- nuclear and radiation safety in operating nuclear and radioactive waste installations,
- basic radiation safety in industrial and medical applications of ionizing radiation,
- security of radioactive sources, including transportation of radioactive materials and border transport control.

<table>
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<tr>
<th>Results (8)</th>
<th>Objectively Verifiable Indicators (9)</th>
<th>Sources of Verification (10)</th>
<th>Assumptions (11)</th>
</tr>
</thead>
</table>
| R.1. Prepared long-term training programme embracing:
  - Methodology and procedures of education, training, elaboration of technical expertise on the status and operation of the nuclear and radioactive wastes facilities and safe application of ionizing radiation in medicine;
  - Training materials, including handbooks, guidelines, tutorials, dedicated training curricula for facilities dealing with ionizing radiation, lecture plans, lecture notes, practical workshop instructions and assignments, scenarios for exercises and drills, and training assessment tools such as examinations;
  - Procedure for preparation of expertise, including computer programs aiding preparation of expert opinions. |
| A set of training programmes prepared by the end of the project. Procedure for preparation of expertise established by the end of the project. Staff of the Świerk Nuclear Centre and operators of nuclear installations in Poland, regulatory body inspectors, personnel involved in emergency preparedness and response, application of ionizing radiation in industry and medicine, maintaining security of radioactive sources (approx. 20 persons each) trained by the end of the project. Systematic Approach to Training (SAT) implemented in 2007. |
| Decision of NAEA on approval of training programme. Training materials available in Świerk Nuclear Centre. Lists of participants of training. |
| Lack of educated candidates; |

Lack of EU or national financial support; Lack of collaborating organisation with sufficient level of quality.
1. Preparation of a long-term training programme:

- Preparation of an overall training program that takes into account the operational needs and the long term need for specialists and managers.
- Preparation of training and expertise making procedures - all arrangements for the training, including theoretical and practical training in the form of lectures, workshops, tutorials, seminars or practical training exercises, and/or on the job training of appropriate duration.
- Preparation of training materials, including lecture plan, lecture notes, practical workshop instructions and assignments, scenarios for exercises and drills, multi-media materials enabling distance learning, exercises connected with the usage of PC simulators, on the job exercises and training assessment tools such as examinations.

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- personnel involved in maintaining of security of radioactive sources including border and radiological transportation control (20 persons).

<table>
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<th>Technical Assistance</th>
<th>Contracting documents</th>
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Annex 2-4: Implementation, contracting and disbursement schedules

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Legend:
D = design of sub-projects
C = tendering and contracting
I = contract implementation and payment