

**Project Fiche - 2009 IPA Horizontal Programme  
on Nuclear Safety and Radiation Protection**

**1. Basic information**

- 1.1 CRIS Number:** 2009/021-640  
**1.2 Title:** Strengthening the capacities of the radiation protection training centre in Banja Luka  
**1.3 ELARG Statistical code:** 03.64 - Nuclear safety  
**1.4 Location:** Bosnia and Herzegovina

**Implementing arrangements:**

**1.5 Contracting Authority:**

The European Community represented by the Commission of the European Communities for and on behalf of Bosnia and Herzegovina.

**1.6 Implementing Agency:**

Not applicable.

**1.7 Beneficiary:**

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Other beneficiaries:

State Regulatory Agency for Radiation and Nuclear Safety of Bosnia and Herzegovina  
 Ministry of Health of the Republic of Srpska, Ministry of Health of the Federation of Bosnia and Herzegovina.

**Financing:**

- 1.8 Overall cost (VAT excluded)<sup>1</sup>:** EUR 340 000  
**1.9 EC contribution:** EUR 280 000  
**1.10 Final date for contracting:** 2 years following the date of conclusion of the financing agreement  
**1.11 Final date for execution of contracts:** 2 years following the end date for contracting  
**1.12 Final date for disbursement:** 1 year following the end date for execution of contracts

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<sup>1</sup> The total cost of the project should be net of VAT and/or other taxes. Should this not be the case, the amount of VAT and the reasons why it should be considered eligible should be clearly indicated

## 2. Overall Objective and Project Purpose

### 2.1 Overall Objective:

To contribute to enhancement of the technical capacity of workers exposed to ionising radiation through the definition of training and licensing procedures in Bosnia and Herzegovina in line with the Council Directives 96/29 and 97/43 Euratom and Guidelines 116.

### 2.2 Project purpose:

To upgrade and license a regional training centre on radiation protection in order to transform it into a national training centre.

### 2.3 Link with AP/NPAA/EP/SAA

The sectoral policies of the European/Accession Partnerships with Bosnia and Herzegovina (2006/55/EC) in the field of environment mention the strengthening of the administrative capacity and alignment to the *acquis*.

The Stabilisation and Association Agreement Between Bosnia and Herzegovina, and the European Communities and their Member States stipulates under Article 107 that "Cooperation shall focus on priority areas related to the Community *acquis* in the field of energy, including, as appropriate, nuclear safety aspects...".

### 2.4 Link with MIPD

The IPA Multi-beneficiary Multi-annual indicative Planning Document (MIPD) 2009-2011<sup>2</sup>, *section 2.3.3.11 - Nuclear Safety and Radiation Protection*, mentions that "all IPA eligible beneficiaries are facing radiological issues that are connected with the use of radionuclides for industrial and medical applications". It concludes that "radiological issues in the IPA beneficiaries should be addressed with the view to eventually transposing the *acquis* in the nuclear domain, including the international conventions to which the European Community is a party. This transposition would require a number of legislative and regulatory actions and would affect current management practices of radionuclides and radioactive materials". In this context, the establishment of a radiation protection training centre would constitute an important tool to improve radiation protection in this country.

### 2.5 Link with National Development Plan

Not applicable.

### 2.6 Link with national/ sectoral investment plans

Not applicable.

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<sup>2</sup> Include reference

### 3. Description of project

#### 3.1 Background and justification:

Currently, there is a regional training centre at the Public Health Institute of the Republic of Srpska (RS), which covers professionally exposed persons. The training centre is under the responsibility of the Ministry of Health of the Republic of Srpska. This centre performs activities based on “Regulations on required qualifications and health conditions for the occupational exposed persons” issued by the Ministry of Health of the RS in 2005. There are six different programmes developed for different areas like: radiology, nuclear medicine, radiotherapy, industrial radiography, measuring technique and for radiation protection officers. Lecturers are coming from the Public Health Institute of the RS, Faculty of Physics, University of Banja Luka, Clinical Centre of Banja Luka, Institute of Nuclear Science of Vinca near Belgrade and the State Office for Radiation Protection in Croatia. The theoretical part of the training is performed in an amphitheatre in the Institute. One part of practical exercises is performed in laboratories in the Institute but there is also a contract with the Clinical Centre of Banja Luka for practical exercise regarding radiology and nuclear medicine.

The existing regional training centre should become a national radiation protection training centre as the services offered would be centralized and the proposed training programmes provided to the staff would be managed in a coherent and effective. Hence this would facilitate licensing at a national level.

This national radiation protection training centre should update existing programmes on the basic concepts, practices, and regulatory aspects of radiation protection for scientists and occupationally exposed workers. It should also provide appropriate training to custom officers to combat illicit trafficking of nuclear materials and radiation sources and to protect themselves in case of incidents with radioactive materials. Training should consist of training courses, lectures, laboratory exercises, and seminars. The following groups of potentially exposed workers to ionising radiation could be trained in such a centre:

- Radiation Protection Officers (RPO)
- Radiology specialists
- Nuclear medicine specialists
- Radiotherapy specialists
- Cardiologists
- Other medical doctors using X-ray systems (specially fluoroscopy systems)
- Dentists
- Podiatrists
- Radiographers and radiological technologists
- Nurses (especially oncological nurses)
- Technicians performing quality control in radiology installations
- Medical physicists
- Industrial radiographers
- Technicians in industrial use of radiation
- Maintenance engineers and maintenance technicians
- Lawyers

- Custom officers
- Fire brigade

Training courses are expected to cover the following topics:

a) General Requirements:

Fundamentals of radiation physics, radiation sources, radiation quantities and units, measurement of radiation, biological effects of radiation, radiation risks, fundamental principles of radiation protection, radiation protection legislation, organisational arrangements in the use of ionising radiation, regulatory control of radiation practices, operational radiation protection at the workplace, monitoring of radiation exposure, principles of reckoning radiation doses, medical surveillance of workers engaged in radiation work, warning signs for radiation sources.

b) Special requirements:

- X-ray practices in health care, medical X-ray examination methods, medical X-ray appliances and their use, protecting the patient, radiation protection of workers;
- Nuclear medicine, use of radionuclides for diagnostic and therapy, safe management of radionuclides, inventories and storage of radioactive substances, decontamination, radioactive waste and discharges, application of the concepts of exclusion, exemption and clearance, reduction of the medical exposure for workers and patients;
- Radiotherapy, biology of radiotherapy, radiotherapy appliances and their use, risks of radiotherapy, reference levels for radiotherapy, radiotherapy dosimetry, dose planning and implementation of treatment, radiation safety arrangements for radiotherapy appliances and facilities, radiation protection of workers;
- Dental X-ray practices, dental X-ray appliances and their use;
- General use of ionising radiation in the medical sector;
- Installation, repair and servicing of radiation appliances in health care, radiation appliances and their use, radiation protection of workers, patient radiation safety, measures to be taken in case of abnormal incidents or radiation accidents, practical exercises in the installation, repair and servicing of radiation appliances;
- Veterinary X-ray practices, X-ray examination methods and appliances in veterinary science, diagnostic reference levels for X-ray examination, radiation safety arrangements in X-ray rooms, radiation protection of workers;
- Use of unsealed sources in industry, research and education, handling of unsealed sources, exemption from the safety license and notification obligation, radiation safety arrangements in radionuclide laboratories, inventories and storage of radiation sources, decontamination;
- Use of sealed sources and X-ray appliances in industry, research and education; sealed sources and X-ray appliances and their use, exemption from the safety license and notification obligation, radiation safety arrangements in X-ray rooms and sealed source handling facilities;
- Industrial radiography appliances and their use, radiation safety arrangements in radiography facilities, radiation safety arrangements in open imaging, radiation protection of workers, factors to be considered in the installation, repair and servicing of appliances measures to be taken in case of abnormal incidents or radiation accidents, practical exercises with industrial radiography appliances;
- Trade of radioactive substances, responsibilities, duties, transport of sealed and unsealed radioactive sources, handling, exemption from the safety license and

notification obligation, radioactive waste and discharges, radiation protection of workers, measures to be taken in case of abnormal incidents or radiation accidents.

### **3.2 Assessment of project impact, catalytic effect, sustainability and cross border impact**

As a result of a proper functioning of the national radiation protection centre in Bosnia and Herzegovina, occupational exposure should be decreased and incidents or even accidents involving radioactive materials should be avoided. It has a catalytic effect in the sense that it will increase awareness of workers on the radiological risks induced from the operation of devices generating ionising radiation in a wide range of activities.

Since this radiation protection centre will be licensed by the Bosnia and Herzegovina nuclear regulatory body, it will be able to deliver certificates on the ability to work in an environment where radioactive substances are managed. The sustainability of such a centre should be guaranteed from the ever-growing number of requests for training that are resulting from the application of radionuclides in the medical and industrial sectors. The centre will also contribute to train future trainers in the field of radiation protection. In this way the activity should become fully sustainable. It has no direct cross-border impact.

### **3.3 Results and measurable indicators:**

#### Results in relation with activity 1:

- Database on needs for training established;
- A training programme for different users identified;
- A pool of trainers established and pre-tests and final tests and quantification of knowledge for trainees introduced in practice;
- Curricula for training programmes developed;
- Scope of initial PR campaign defined
- A licensing model established (If participants passed final test they will get certificate necessary for getting licence from the State Agency for Radiation and Nuclear Safety for their work)
- Technical specifications of the equipment for training laboratories drafted.

#### Measurable indicators in relation with activity 1:

- Data available on the State Agency for Radiation Protection and Nuclear Safety website
- Number of training programmes
- Number of curricula
- Number of students
- Number of trainers
- Number of PR campaigns
- MoU between relevant institutions of certification

#### Results in relation with activity 2:

- The premises for theoretical and practical work adequate for the training centre reconstructed.

#### Measurable indicators in relation with activity 2:

- Reconstructed facilities

Results in relation with activity 3:

- Installed equipment in operation

Measurable indicators in relation with activity 3:

- Delivery of the equipment

**3.4 Activities:**Activity 1 (Technical assistance)

To develop a questionnaire for the identification of potential trainees

1. To collect initial data about potential trainees and trainers;
2. To develop training programmes and curricula;
3. To conduct consultation activities regarding certification and draft recommendations for introduction of the system in practice;
4. To organise a visit of two Bosnia and Herzegovina experts into some similar training centres in the EU;
5. To prepare training programmes for radiation protection for all levels;
6. To prepare control pre-tests and final tests for students;
7. To educate a first group of students and evaluate the overall programme;
8. To draft technical specifications of the equipment required to strengthen the existing laboratory for practical exercises

Activity 2 (works)

1. To reconstruct the existing classroom and computer room for theoretical exercises.

Activity 3 (supply)

Based on the results of activity 1, the following equipment might be purchased and installed:

1. Dedicated radiography lecture suite – including a practical room, computing facilities and other learning materials, and areas for students to display their work;
2. Two X-ray sets with processing facilities – which enable students to gain simulated practical experience under safe conditions and to undertake radiographic demonstrations, equipment tests and research projects;
3. Anatomical models and other educational materials for supporting the biological sciences;
4. A comprehensive image library with viewing arrangements and computer support for digital image processing and radiotherapy planning;
5. An extensive library that supports the centre.

A laboratory will be equipped with high quality equipment. All equipment in the laboratory will be used by the students.

- High purity germanium detector systems with permanent shielding
- 3" x 3" NaI(Tl) in situ gamma-ray spectroscopy detector systems
- Liquid scintillation counter alpha spectrometry system
- Air sampler and air flow calibrator
- Numerous radiation survey meters, phantoms...

### **3.5 Conditionality and sequencing:**

The implementation of this project requires the establishment and functioning of the State Agency for Radiation and Nuclear Safety as a regulatory body in charge of radiological issues in Bosnia and Herzegovina. The involvement of a regulatory body in the project is mandatory since the national radiation protection centre needs to be licensed before it becomes operational.

The project will start with the implementation of the service contract and then, based on the results achieved, should proceed with the reconstruction works and the supply of equipment.

### **3.6 Linked activities:**

This project is linked to two 2008 IPA-funded projects that are dealing with radiation protection issues, namely:

- "Establishment of a calibration laboratory for ionising radiation (Secondary Standard Dosimetry Laboratory) in Bosnia and Herzegovina";
- "Management of unsealed radionuclides in medical establishments – Bosnia and Herzegovina".

This project will be closely coordinated with the IAEA activities in similar areas in Bosnia and Herzegovina e.g. IAEA project BOH/6/011 entitled "Upgrading Medical Physics Capacity in Diagnostic Radiology" and IAEA project BOH/6/012 entitled "Establishing a Medical Radiation Physics Centre". Whenever relevant, synergies between the IAEA and IPA projects will be looked for in order to optimise the support provided.

### **3.7 Lessons learned**

Previous experience in implementation of technical assistance projects in Bosnia and Herzegovina has shown that the process of consultation with all relevant stakeholders in the country is needed at the initial stage of the project in order to provide adequate support from all actors involved in the project. It is also important to involve relevant authorities in the project activities through regular meetings with them in order to get political support as well.

For already several years, the International Atomic Energy Agency has been providing support to the Bosnian organisations dealing with radiation protection. This support mainly consists in technical assistance and supply of equipment. One of the main difficulties encountered lies in the absence of a national regulatory body and as a result in the absence of a clear national strategy on radiation protection.

**4. Indicative Budget (amounts in EUR)**

			SOURCES OF FUNDING									
			TOTAL EXP.RE	IPA COMMUNITY CONTRIBUTION		NATIONAL CONTRIBUTION					PRIVATE CONTRIBUTION	
ACTIVITIES	IB (1)	INV (1)	EUR (a)=(b)+(c)+(d)	EUR (b)	%(2)	Total EUR (c)=(x)+(y)+(z)	% (2)	Central EUR (x)	Regional/ Local EUR (y)	IFIs EUR (z)	EUR (d)	% (2)
Activity 1	X		80 000	80 000	100							
Contract 1 - Service	x		80 000	80 000	100							
Activity 2		X	60 000			60 000	100					
Contract 2 - Works		x				60 000	100					
Activity 3		X	200 000	200 000	100							
Contract 3 - Supply		x	200 000	200 000	100							
TOTAL IB			80 000	80 000	100							
TOTAL INV			260 000	200 000	77	60 000	23					
<b>TOTAL PROJECT</b>			<b>340 000</b>	<b>280 000</b>	<b>82</b>	<b>60 000</b>	<b>18</b>					

Amounts net of VAT

- (1) In the Activity row use "X" to identify whether IB or INV
- (2) Expressed in % of the **Total** Expenditure (column (a))

## 5. Indicative Implementation Schedule (periods broken down per quarter)

Contracts	Start of Tendering	Signature of Contract	Project Completion
Contract 1 - Service	Q2 2010	Q3 2010	Q3 2011
Contract 2 - Works	Q2 2010	Q4 2010	Q3 2011
Contract 3 - Supply	Q4 2010	Q1 2011	Q3 2011

## 6. Cross cutting issues

### 6.1 Equal Opportunity

The design of the project at a territorial level allows for a more targeted equal opportunity framework for addressing different institutions in need for trained staff, private/public sectors, as well as specific groups that can ensure that the demand for training is met with a more equitably distributed supply.

### 6.2 Environment

The training programmes are focusing on individual and environmental protection from radiation and will therefore contribute to improvement of environmental security on personal and general level in the country.

### 6.3 Minorities

Considering that the project will contribute to the overall development of society to deal adequately with sources of radiation through training it is expected that access of disabled and minorities groups (including Roma) to education and training in this particular topic would be improved.

**ANNEXES**

- I- Logical framework matrix in standard format
- II- Amounts (in EUR) contracted and disbursed per quarter over the full duration of the project
- III- Description of Institutional Framework
- IV - Reference to laws, regulations and strategic documents:
- V- Details per EC funded contract (where applicable)

**ANNEX I: Logical framework matrix in standard format**

LOGFRAME PLANNING MATRIX FOR Project Fiche		Programme name and number: 2009 IPA Horizontal Programme on Nuclear Safety and Radiation Protection	
Strengthening of the capacities of the radiation protection training centre in Banja Luka		Contracting period expires: 2 years following the date of conclusion of the financing agreement	Disbursement period expires: 1 year following the end date for execution of contracts
		Total budget : EUR 340 000	IPA budget: EUR 280 000
<b>Overall objective</b>	<b>Objectively verifiable indicators</b>	<b>Sources of Verification</b>	
Enhancement of capacity of professionals exposed to radiation through training and licencing procedures in practice in Bosnia and Herzegovina in line with the Council Directives 96/29 and 97/43 Euratom and Guidelines 116	State Agency for Radiation Protection and Nuclear Safety annually reports about number of trainings delivered by the Training Centre and number of licences awarded to the Beneficiaries	Annual reports of the State Agency for Radiation Protection and Nuclear Safety Bosnis and Herzegovina reports s to IAEA	
<b>Project purpose</b>	<b>Objectively verifiable indicators</b>	<b>Sources of Verification</b>	<b>Assumptions</b>
To upgrade and license a regional training centre on radiation protection in order to transform it into a national training centre.	Training Centre provides trainings to different Beneficiaries and reports the State Agency for Radiation Protection and Nuclear Safety on regular basis	Annual reports of the State Agency for Radiation Protection and Nuclear Safety	Fully operational State Agency for Radiation Protection and Nuclear Safety
<b>Results</b>	<b>Objectively verifiable indicators</b>	<b>Sources of Verification</b>	<b>Assumptions</b>
Activity 1: <ul style="list-style-type: none"> <li>Data base on needs for training established</li> <li>Training programme for different users identified a pool of trainers established and pre tests and final tests and quantification of knowledge for trainees introduced in practice.</li> <li>Curricula for training programs developed</li> <li>Scope of initial PR campaign defined</li> <li>A licensing model established (If participants passed final test they will get certificate necessary for getting licence from State Agency for Radiation</li> </ul>	Data available on the State Agency for Radiation Protection and Nuclear Safety website  Number of training programmes  Number of curricula  Number of students	Reports of the State Agency for Radiation Protection and Nuclear Safety Report on design of the National training programme with State Agency for Radiation Protection and Nuclear Safety  Work programme of the Training Centre  Annual report of the Training Centre	Fully operational State Agency for Radiation Protection and Nuclear Safety

<ul style="list-style-type: none"> <li>and Nuclear Safety for their work)</li> <li>• Technical specifications of the equipment for training laboratories drafted.</li> </ul> <p>Activity 2:</p> <ul style="list-style-type: none"> <li>• The premises for theoretical and practical work adequate for training centre reconstructed.</li> </ul> <p>Activity 3:</p> <ul style="list-style-type: none"> <li>• Installed equipment in operation</li> </ul>	<p>Number of trainers</p> <p>Number of PR campaigns</p> <p>MoU between relevant institutions of certification</p> <p>Reconstructed facilities</p> <p>Equipment for practical work</p>	<p>PR material</p> <p>MoU</p> <p>Report on the reconstruction of classroom and computer room</p> <p>Provisional acceptance certificated for the equipment signed</p>	
<b>Activities</b>	<b>Means</b>	<b>Costs</b>	<b>Assumptions</b>
<p>Activity 1 (Contract 1)</p> <ol style="list-style-type: none"> <li>1. Develop a questionnaire for identification of potential trainees</li> <li>2. Collect initial data about potential trainees and trainers</li> <li>3. Develop training programmes and curricula</li> <li>4. Conduct consultation activities regarding certification and draft recommendations for introduction of the system in practice</li> <li>5. Visit of two our experts to some similar training centre in EU.</li> <li>6. To Prepare training programmes for radiation protection for all levels.</li> <li>7. Preparation of control pre-tests and final tests for students.</li> <li>8. Educate first group of students and evaluate the overall program</li> <li>9. Draft technical specifications of the equipment required to strengthen the existing laboratory for practical exercise</li> </ol>	<p>Technical assistance</p>	<p><b>EUR 80 000</b></p>	
<p>Activity 2 (Contract 2)</p> <p>Reconstruction of existing classroom and computer room for theoretical exercise</p>		<p><b>EUR 60 000</b></p>	

Activity 3 (Contract 3)	Supply	<b>EUR 200 000</b>	
1. Dedicated radiography lecture suite – including a practical room, computing facilities and other learning materials, and areas for students to display their work;			
2. Two X-ray sets with processing facilities – which enable students to gain simulated practical experience under safe conditions and to undertake radiographic demonstrations, equipment tests and research projects;			
3. Anatomical models and other educational materials for supporting the biological sciences;			
4. A comprehensive image library with viewing arrangements and computer support for digital image processing and radiotherapy planning;			
5. An extensive library that supports the centre.			

**ANNEX II: Amounts (in €) Contracted and disbursed by quarter for the project**

<b>Contracted</b>	<b>Q3 2010</b>	<b>Q4 2010</b>	<b>Q1 2011</b>	<b>Q2 2011</b>	<b>Q3 2011</b>
Contract 1 - Service	80 000				
Contract 3 - Supply			200 000		
<b>Cumulated</b>	<b>80 000</b>	<b>80 000</b>	<b>280 000</b>		
<b>Disbursed</b>					
Contract 1 - Service	70 000				10 000
Contract 3 - Supply			150 000	30 000	20 000
<b>Cumulated</b>	<b>70 000</b>	<b>70 000</b>	<b>220 000</b>	<b>250 000</b>	<b>280 000</b>

**Annex III Description of Institutional Framework**

The new Law on Radiation Protection and Nuclear Safety in Bosnia and Herzegovina plans the establishment of a "state regulatory agency for radiation protection and nuclear safety with appropriate set of functions and responsibilities, and resources required for the establishment of regulatory control". According to article 26 of this Law, "within six months after this Act enters into force, the regulatory agency shall issue the regulations on radiation safety and nuclear safety, radioactive waste management, and on safe transportation of radioactive substances". This scope of the Law should cover both political entities, i.e. the Federation of Bosnia and Herzegovina and the Republic of Srpska of Bosnia and Herzegovina. This agency should therefore be fully operational when the project starts, i.e. during the 3<sup>rd</sup> Q of 2010. Under Article 2, it is stated that the purpose of the Law is to: "establish and maintain a regulatory programme for ionising radiation sources, and thereby ensure compatibility with international standards on safety of radiation sources and for protection against ionising radiation".

**Annex IV Reference to laws, regulations and strategic documents:**

Law on Radiation Protection and Nuclear Safety in Bosnia and Herzegovina

**Annex V Details per EU funded contract**

Contract 1: A service contract for an amount of EUR 80 000 will be concluded following a tender that will be launched in Q2 2010. The Contractor is expected to fulfil all the activities listed in section 3.4 for activity 1 with the support of local partners established in Bosnia and Herzegovina. Technical specification for the equipment to be purchased under the supply contract will be drafted through technical assistance component.

Contract 3: A supply contract for an amount of EUR 200 000 will be concluded following a tender that will be launched in Q4 2010.

Activities 1 and 3 of the project will be tendered, awarded and implemented in accordance with the PRAG.

Contract 2: A works contract for an estimated amount of EUR 60 000, fully financed by the beneficiary organisation will be launched in Q2 2010 (parallel co-financing).