

**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: Implementation of recommendations from the radioactivity survey
1.3 ELARG Statistical code: 03.64 - Nuclear safety
1.4 Location: Vinča Institute in Serbia

Implementing arrangements:

1.5 Contracting Authority:

The European Union represented by the European Commission for and on behalf of Serbia in joint management with the International Atomic Energy Agency (IAEA).

1.6 Implementing Agency:

The International Atomic Energy Agency (IAEA), Technical Co-operation Department

1.7 Beneficiary:

The Republic of Serbia
Institute of Nuclear Sciences
11001, Belgrade, P.O Box 522
Dr. Jovan Nedeljkovic, Director General

Financing:

- 1.8 Overall cost (VAT excluded)¹:** EUR 300 000
1.9 EC contribution: EUR 300 000
1.10 Final date for contracting: No later than 31 March 2013
1.11 Final date for execution of contracts: No later than 31 March 2015
1.12 Final date for disbursements: No later than 31 March 2016

2. Overall Objective

2.1 Overall Objective:

To eliminate environmental hazards and improve functionality, health and safety of previously contaminated areas with radionuclides at the Vinča Institute in line with best EU practices.

¹ 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

2.2 Project purpose:

To implement the recommendations of the Part 1 assessment report on the site-wide radioactivity survey of the Vinča Institute, developed under the 2008 IPA horizontal programme on nuclear safety and radiation protection.

2.3 Link with AP/NPAA/EP/SAA

Article 110 of the draft SAA with the Republic of Serbia explicitly mentions nuclear safety as one of the cooperation topics.

As short term priority for Serbia mentioned in Annex 2 of European Partnership with Serbia, continuation of dismantling of the Vinča research reactor is stated.

The Serbia 2008 progress report mentions that "Plans on management of sealed radioactive sources, environmental monitoring and radiation protection in the context of medical and industrial applications have to be further developed. An appropriate regulatory authority has still to be established. Serbia has not yet acceded to the Convention on Nuclear Safety and to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management".

2.4 Link with MIPD

The IPA Multi-beneficiary Multi-annual indicative Planning Document (MIPD) 2009-2011², *section 2.3.3.11 - Nuclear Safety and Radiation Protection*, mentions that "in Serbia [...], the operation, refurbishment and dismantling of nuclear research reactors constitute additional sources of radiation risks that would require investment, in particular for the management of spent nuclear fuel and radioactive waste".

2.5 Link with National/Sectoral Investment Plan

- Decision of the Serbian government to decommission the RA research reactor located at the Vinča Institute and approval of the Vinča Nuclear Institute Decommissioning (VIND) programme (2002 and 2004)
- Draft of the Serbian new Law on ionising radiation protection and on nuclear safety (2006) and existing Serbian Law on Protection against Ionising Radiation (1996)
- Activity framework in the field of nuclear safety and radiation protection for the period 2008-2010 decided by the government of Serbia.

3. Description of project

3.1 Background and justification:

Operation of the RA nuclear research reactor at Vinča until 1983 has generated spent nuclear fuel and many types of radioactive waste that need to be properly managed. This

² C(2009)4518 of 16 June 2009

is the main aim of the VIND programme that was established in 2002 based on a decision of the Serbian government to decommission the Vinča RA research reactor. The VIND programme comprises a number of successive phases of implementation that are covering the period 2006-2013 (see hereafter).

- Phase 1: Removal, characterisation and repackaging of spent nuclear fuel in store at the Vinča Institute (IAEA and other donors funding; IPA funding);
- Phase 2: Preparations for and transport of Russian-origin spent nuclear fuel from the Vinča Institute to the Russian Federation (only partly funded by IPA, complementary funding still lacking);
- Phase 3: Reprocessing and disposal of the Russian-origin spent nuclear fuel in the Russian Federation (IAEA and other donors funding);
- Phase 4: Design and construction of a waste processing and storage facility at the Vinča Institute for all types of radioactive waste to be generated during decommissioning operations of the RA nuclear research reactor (IAEA and other donors funding);
- Phase 5: Provisions of equipment for a waste processing facility at the Vinča Institute (IPA funding);
- Phase 6: Conditioning, packaging and storage of disused sealed radioactive sources (IAEA and other donors funding, IPA funding);
- Phase 7: Conditioning and processing of improperly stored and unconditioned radioactive waste (IAEA and other donors funding, IPA funding);
- Phase 8: Decommissioning of the old storage facilities for sources and radioactive waste (IAEA and other donors funding, IPA funding);
- Phase 9: Dismantling of the old piping system and tanks containing radioactive liquid waste (funding not yet determined), and
- Phase 10: Radioactivity survey of the Vinča site (IPA funding for the first investigations).

The 2008 IPA horizontal programme on nuclear safety and radiation protection already planned to start preliminary investigations on phase 10, in particular on the identification of places and buildings that would require remediation (e.g. Van der Graaf accelerator, material research facility that can possess certain radiological risks, possible orphan sources and a lot of contaminated surfaces or equipment. There is also a need for decontamination of a former open space used as a radioactive waste repository in the Institute). Therefore the aim of this project is to contribute to the implementation of phase 10 through practical remediation activities to be performed on a selection of contaminated places and buildings.

The project is supported by technical and safety expertise of IAEA under its Technical Cooperation programme. Being part of the VIND programme, the project is also supported by the Ministry of Science and Technological Development of the Government of the Republic of Serbia providing continuity of funding.

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

The project will reduce the radiological risks related to past nuclear activities performed at Vinča.

It has a catalytic effect in the sense that providing funding to phase 10 of the VIND programme will enable the whole sequence of operations leading to a safer and more secure Vinča nuclear site to become effective.

3.3 Results and measurable indicators:

The final result of the project is the implementation of the recommendations from the comprehensive site-wide radiological characterisation performed under IPA 2008. This shall include the following individual performance indicators:

- a) A conceptual project approach and implementation plan is completed and documented;
- b) All radioactive wastes generated as part of the implementation project are under the positive control of the responsible waste management organisation;
- c) A final project report on implementation of the recommendations from Part 1 of this project, including documenting any applicable recommendations for further actions, was submitted to the various stakeholders, including the EU.

3.4 Activities:

Implementation of recommendations from the Part 1 project report on a priority basis as agreed with the Serbian Regulatory Authority and as funding permits.

1. Assistance in establishing a prioritisation plan for implementing corrective action, decommissioning or remediation;
2. Assistance in planning to achieve implementation objectives;
3. Management of all radioactive wastes generated as part of the implementation project;
4. Post-implementation surveys and, as applicable, sample analyses;
5. Preparation of output report and recommendations (to Ministry of Science and Technological Development, Ministry of Environment and Spatial Planning, Vinča, EU, and other stakeholders) in particular on the drafting of new regulations on how to manage slightly contaminated materials.

3.5 Conditionality and sequencing:

The implementation of this project requires a functioning regulatory body in charge of nuclear issues in Serbia since part of the project will consist of drafting a comprehensive site characterisation plan to be reviewed and approved by this body. The possible drafting of new regulations on site decontamination/remediation would also require a fully operational regulatory body in Serbia.

3.6 Linked activities:

All the other phases of the VIND programme.

3.7 Lessons learned

Since 2004 the implementation of the VIND programme under the coordination of the IAEA is proceeding according to the time schedule. However, the latest developments of this programme showed that supplementary technical expertise would be required for the monitoring taking into account the increasing number of projects being implemented and their high technical complexity.

4. Indicative Budget (amounts in EUR)

			TOTAL EXP.RE	SOURCES OF FUNDING								
				IPA EU 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	300 000	300 000	100							-
Contribution Agreement with IAEA		x	300 000	300 000	100							-
TOTAL IB												
TOTAL INV			300 000	300 000	100							
TOTAL PROJECT			300 000	300 000	100							

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))

Additional Funding from Government, IAEA and Other Contributors

As discussed in preceding paragraphs, this project is intended to support the Vinča Institute Nuclear Decommissioning (VIND) programme, which is Serbia's priority nuclear safety and radiation protection support programme. For more than 40 years, Serbia was the central collection centre for all disused sealed sources and radioactive waste from the former Yugoslavia, including countries which are now EU Member States. These sealed sources and wastes are found in rooms and degraded storage facilities located all over Vinča. Only a few of the thousands of disused sealed sources and the thousands of waste containers have ever been conditioned, and the conditioning methods for those few items does not meet current international standards. Construction of proper waste processing facilities, secure storage facilities, and source conditioning facility, as well as conditioning and storage of the resultant wastes and sources, is estimated to cost more than EUR 8 million.

VIND is also intended to repatriate more than 8000 highly enriched and low enriched spent fuel elements to Russia from the RA Research Reactor. The total cost of the repackaging, transport, spent fuel reprocessing, and disposal of the resultant waste will exceed EUR 36 million.

Finally, decommissioning of the RA Research Reactor and degraded support facilities, including site-wide radiological characterization, remediation or resolution of identified sources of radiation and contamination, and upgrading the capabilities of the radiation protection programme, is estimated to cost an additional EUR 25 million or more.

The VIND programme has been in progress since 2004 and has received more than EUR16 million in contributions through 2008 from sources other than the EC; this includes nearly EUR 9 million in support from the Serbian Ministry of Science. An additional EUR 14 million is currently approved for 2009-11, including EUR 10 million from the Serbian Ministry of Science. The EC has committed to a EUR 5.46 million through a Contribution Agreement with IAEA (IPA 2008/149-555)

A summary of the VIND funding approvals is included in the following table. It should be noted that funding for decommissioning activities, sealed sources, and waste management decline sharply in 2009-11, as the government, IAEA, and other contributors are shifting their financial resources toward spent fuel repatriation. However, it is still anticipated that the Ministry of Science will contribute more than EUR 1 million annually to waste management and decommissioning activities, mostly in terms of local labour resources.

Existing VIND Funding Approvals

Spent Fuel Repatriation Project (EUR)/ Phases 1, 2 and 3 of the programme			
	2004-08 Funding	2009-11 Funding	Total
European Commission	885 000	3 545 000	4 430 000³
IAEA	1 910 152	526 667	2 436 819
Nuclear Threat Initiative (NGO)	2 578 820	-	2 578 820
USA	550 000	4 000 000	4 550 000
Czech Republic	250 000	500 000	750 000
Russia *	-	-	-
Total	6 173 972	8 571 667	14 745 639

* IAEA is negotiating with Russia additional funding of more than EUR 7 million.

Sealed Sources and Waste Management (including Nuclear Security) (EUR)/ Phases 4 to 7 of the programme			
	2004-08 Funding	2009-11 Funding	Total
European Commission	715 000	315 000	1 030 000⁴
IAEA	1 065 724	200 000	1 265 724
Nuclear Threat Initiative (NGO)	334 333	-	334 333
USA	566 667	300 000	866 667
UK	40 000	40 000	80 000
Slovenia	30 000	40 000	70 000
Total	2 751 724	895 000	3 646 724

Decommissioning (EUR)/ Phases 8 to 10 of the programme			
	2004-08 Funding	2009-11 Funding	Total
European Commission	-	-	-
Nuclear Threat Initiative (NGO)	125 671	-	125 671
IAEA	314 618	-	314 618
USA	6 833	-	6 833
Total	447 122	-	447 122

Serbia Funding from Ministry of Science (EUR)	
	2004-08 Funding
2004	500 000
2005	800 000
2006	1 100 000
2007	2 500 000
2008	4 000 000
Total	8 900 000

³ Under the 2007 IPA horizontal programme on nuclear safety and radiation protection

⁴ Idem

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

Contracts	Start of Tendering	Signature of contract	Project Completion
Contribution Agreement with IAEA	Not applicable	Q2 2012	Q2 2014

6. Cross cutting issues**6.1 Equal Opportunity:**

The project will benefit both women and men through improvements in environmental protection and safety. On all activities, both men and women will have equal opportunities to compete for contracts and to work on any related activities.

6.2 Environment

This project will improve radiological conditions within the Vinča site and the surrounding environments by reducing the potential for release of radioactivity via groundwater, airborne activity, or malicious intent. All radioactive materials, sources, etc. will be removed from areas of little control and placed in proper storage, including extensive radiological characterization and conditioning; this will ensure graded levels of security and radiological controls so as to reduce the impact on the environment, workers and the general public.

6.3 Minorities

On all activities, minorities will have equal opportunities to compete for contracts and to work on any related activities.

ANNEXES

- I- Log frame 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- Related laws, regulations and strategic documents
- V- Details per EC funded contract

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 – 2009/021-640	
Implementation of the recommendations from the IPA 2008 radioactivity survey of the Vinča site	Contracting period expires – No later than 31 March 2013	Disbursement period expires – No later than 31 march 2016
	Total budget: EUR 300 000	IPA budget: EUR 300 000

Overall objective	Objectively verifiable indicators	Sources of Verification	
To eliminate environmental hazards and improve functionality, health and safety of previously contaminated areas with radionuclides at the Vinča Institute in line with best EU practices.	Recommendations of Part 1 site-wide radioactivity survey implemented.	Final project report.	
Project purpose	Objectively verifiable indicators	Sources of Verification	Assumptions
To implement the recommendations of the Part 1 assessment report on the site-wide radioactivity survey of the Vinca Institute.	Recommendations implemented; acceptance of final report by Regulatory Body.	Final project report accepted.	Comprehensive radioactivity survey and radiological characterization of the Vinca site has been completed, and recommendations have been submitted to stakeholders for implementation.
Results	Objectively verifiable indicators	Sources of Verification	Assumptions
Prioritisation plan established for implementing corrective action, decommissioning or remediation, in accordance with the available funding	Projects prioritized and approved for implementation.	Project plan available for review.	
Assistance in planning to achieve implementation objectives	Plan completed.	Plan and final report available for review.	Sufficient Vinca labour resources available to work alongside contractors
Disposition of all radioactive wastes generated as part of the implementation project	All waste processed and properly stored	CWID waste inventory database	

Post-implementation surveys and, as applicable, sample analyses	All analyses and surveys complete	Survey reports and sample analysis reports	
Preparation of output report and recommendations (to Ministry of Science and Technological Development, Ministry of Environment and Spatial Planning, Vinča, EU, and other stakeholders)) in particular on the drafting of new regulations on how to manage slightly contaminated materials	Possible revision of the regulatory framework in force on site decontamination/remediation.	Report available and accepted by Regulatory Authority	
Activities	Means	Costs	Assumptions
All activities to be covered by the Contribution Agreement to be signed with IAEA	Contribution Agreement with IAEA	EUR 300 000	
1. Prioritisation of project activities; approval obtained from regulatory authority			
2. Plan each individual project for implementation			
3. Implement project/activity plan			
4. Perform radiation surveys and sample analyses as required			
5. Develop final report			

ANNEX II: Amounts (EUR) contracted and disbursed per quarter over the full duration of the project

Contracted	Q2 2012	Q3 2012	Q4 2012	Q1 2013	Q2 2013	Q3 2013	Q4 2013	Q2 2014	Q2 2014
Contribution Agreement with IAEA	300 000								
Cumulated	300 000	300 000	300 000	300 000	300 000	300 000	300 000	300 000	300 000
Disbursed									
Contribution Agreement with IAEA	150 000				100 000				50 000
Cumulated	150 000	150 000	150 000	150 000	250 000	250 000	250 000	250 000	300 000

ANNEX III: Description of Institutional Framework

The responsibilities for the fields related to the peaceful use of nuclear energy (health, the environment, science and technology, nuclear safety and radiation protection, agriculture, transport, etc) rest with several ministries.

The Ministry of Science and Technological Development (MSTD) is responsible for R&D in the nuclear sector, for nuclear safety, nuclear materials and radioactive waste management in the country. Under the Ministry's competence and financing are the R&D, including the Vinča Institute of Nuclear Sciences, the Institute of Technology of Nuclear and Other Mineral Raw Materials (ITNMS), the Institute of Geology, the Institute of Nuclear Energy Application in Agriculture (INEP) and others. The Ministry ensures that the law on the nuclear safety and the related regulations are carried out and provides the financial resources for the activities. The MSTD is responsible for bilateral and multilateral international scientific-technical co-operation of Serbia, including the cooperation with the IAEA.

The Ministry for Environment and Spatial Planning (MESP) is responsible and leading in radiation protection and monitoring of the environment, emergency planning etc.

In force is the Law on Protection against Ionizing Radiation that was enacted in 1996 (46/96). It establishes measures for the protection against ionising radiation, as well as nuclear safety measures, liability for nuclear damages, supervision and authorization, penalties. Based on the Law on Protection against Ionizing Radiation, there are 11 regulations related to protection against ionizing radiation and for the safety of radiation sources and 5 regulation related on nuclear safety and security.

Currently, there is no effectively independent Serbian regulatory body for radiation and nuclear safety. Law 46/96 does not make provision for the establishment of a regulatory body, although it makes reference to the 'competent Ministry'. Currently, in accordance with the *Law on Ministries*, the MSTD and MEPS are identified as the competent Ministries.

A temporary regulatory body called the 'Regulatory Commission on Radiation and Nuclear Safety' has been established by the MSTD to administer the decommissioning of the research

reactor at the Vinca Institute, the shipment of spent nuclear fuel to the original Russian supplier, and the treatment of radioactive waste.

The Vinca Institute of Nuclear Sciences was founded in 1948. It is the main institute involved in research and applications in nuclear science (since 1968 multidisciplinary, not only nuclear) and covers a wide range of scientific and engineering fields; 800 employees, out of which 400 is research staff, organized in 16 laboratories (actually departments) from Nuclear Physics, Theoretical Physics and Physics of Condensed Matter, Radiation and Environmental Protection, Nuclear Engineering to Multidisciplinary Research and Engineering which are, to a large extent, independent.

The Radiation and Environmental Protection Laboratory covers: environmental radioactivity control, ionization radiation dosimetry, metrology analyses, radiation protection, radioactive waste arrangement and decontamination, reactor dosimetry, instrumentation servicing and operative dosimetry. The Nuclear Engineering Laboratory covers: reactor physics, safety and control of nuclear reactors, nuclear engineering and radiation protection. Together with the Reactor Department, it is responsible for two research reactors: RA (shut down for decommissioning) and RB (zero power, requiring upgrading).

The RA research reactor went into operation in 1959 and has been shut down since 1984 due to fuel corrosion problems and for the refurbishment of the reactor control and safety system. Since the date, it stays with a partially loaded core containing 480 fuel slugs with 80% enriched uranium. In addition, 6656 spent fuel slugs with 2% enriched uranium and 884 slugs with 80% enrichment are located in a spent fuel storage pool containing about 200 tons of stagnant water of poor quality to minimize the corrosion process.

ANNEX IV: Related Laws, Regulations and Strategic Documents

Project-Specific Documents

- Decision of the Serbian government to decommission the RA research reactor located at the Vinča Institute and approval of the VIND programme (2002 and 2004)
- Draft of the Serbian new Law on ionising radiation protection and on nuclear safety (2006) and existing Serbian Law on Protection against Ionising Radiation (1996)
- Article 110 of the draft SAA
- Nuclear Safety and Radiation Protection action of the Multi-beneficiary MIPD 2009-2011

International Conventions and Treaties

Serbia is a party to the following instruments under the IAEA's auspices

- Agreement on the Privileges and Immunities of the IAEA
- Vienna Convention on Civil Liability for Nuclear Damage
- Convention on Physical Protection of Nuclear Material
- Convention on Early Notification of a Nuclear Accident
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency

Serbia has signed but has not yet ratified the Optional Protocol Concerning the Compulsory Settlement of Disputes to the Vienna Convention on Civil Liability for Nuclear Damage.

As a party to the Treaty on the Non-Proliferation of Nuclear Weapons, Serbia has a Comprehensive Safeguards Agreements with the IAEA for the Application of Safeguards in connection with the Treaty on Non-Proliferation of Nuclear Weapons.

ANNEX V: Details per EC funded contract

This project will be supported through a Contribution agreement with the IAEA to be concluded in Q2 2012.

The Contribution agreement will be concluded in accordance with the terms of the Financial and Administrative Framework Agreement (FAFA) between the European Community and the United Nations, signed on 29 April 2003, to which the IAEA has adhered on 17 September 2004.