

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

1. Basic information

- 1.1 CRIS Number:** 2007/019-038
- 1.2 Title:** Preparation for and transportation of spent nuclear fuel from the Vinča institute to the Russian Federation (project No 1)
- 1.3 Sector:** 06.64 - Nuclear Safety
- 1.4 Location:** Belgrade, Serbia

Implementing arrangements:

1.5 Contracting Authority: The European Community represented by the Commission of the European Communities for and on behalf of the Republic of Serbia in joint management with the IAEA.

1.6 Implementing Agency: The International Atomic Energy Agency (IAEA), Technical Cooperation Department

1.7 Beneficiary: The Republic of Serbia.

1.8 Overall cost: €4,430,000

1.9 EU contribution: €4,430,000

1.10 Final date for contracting: Two years following the date of conclusion of the Financing Agreement

1.11 Final date for execution of contracts: Two years following the end date for contracting

1.12 Final date for disbursements: Three years following the end date for contracting

2 Overall Objective and Project Purpose**2.1 Overall Objective:**

To remove the nuclear security threat and improve environmental protection at the Vinča institute near Belgrade.

2.2 Project purpose:

To contribute to the implementation of the Vinča Nuclear Institute Decommissioning Project (VIND) that is coordinated and partly supported by the IAEA through the support to preparations for and transportation of Russian-origin spent nuclear fuel from the Vinča institute near Belgrade to the Russian Federation

2.3 Link with SAA

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

2.4 Link with MIPD

The MIPD action entitled "Nuclear Safety and Radiation Protection" mentions that there are "specific problems posed by the management of radioactive waste and spent nuclear fuel in Serbia". In this context, the MIPD intends to support "further alignment of the management practices of radioactive materials with EU best practices".

2.6 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 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).

3. Description of project

3.1 Background and justification:

At present the spent nuclear fuel and radioactive waste storage situation at the Vinča Institute in Serbia represents a nuclear security, proliferation, environmental and human health hazard. The facility contains substantial quantities of high and low enriched uranium fuel elements refined yellow cake of uranium, more than 1200 sealed radioactive sources, unprocessed radioactive liquid waste tanks, and thousands of unconditioned radioactive waste containers.

The nuclear security and proliferation aspects are far from being negligible since there are 13 kg of highly enriched uranium and 2,350 kg of low enriched uranium and 4.7 kg of plutonium present in the irradiated nuclear fuel currently in store in a pond at the Vinča Institute. The fuel can be easily transported since each of the 8030 fuel elements weighs only a few hundred grammes.

The security measures at the Vinča Institute are not adequate and certain features are degrading with time due to age (e.g., fencing is deteriorating). Despite recent and on-going physical protection upgrades at the site, these measures may not be sufficient to prevent a serious terrorist attack from removing irradiated fuel from the facility.

Finally, it must be pointed out that more than half of the nuclear fuel elements in store in a pond at the Vinča Institute are currently leaking fission products. The pond is not designed to contain leaking fuel for an extended period of time. Any crack in pond wall could contribute to leaking of contaminated water to the environment. Air is continuously exchanged between the interior of the building and the outdoors meaning that any increase in the interior radioactive contaminants could leak outside the building into the environment.

The international Community is well aware of the radiological risks that are posed by the presence of highly enriched uranium in spent nuclear fuel currently in store in Serbia as well as by the poor management of radioactive waste in this country. Therefore under the coordination of the International Atomic Energy Agency (IAEA), several donor countries organisations and notably the USA are providing funding in order to contribute to solving these issues. In this context the Vinča Institute Nuclear Decommissioning (VIND) programme has been established in 2002 based on a decision by the Serbian government to decommission the Vinča RA research reactor and

ancillary facilities, including processing and storage of radioactive waste as well as repatriation of all new and spent nuclear fuel to the Russian Federation.

At present the VIND programme comprises five main phases:

- Phase 1: Removal, characterisation and repackaging of spent nuclear fuel in store at the Vinča Institute
- Phase 2: Preparations for and transport of Russian-origin spent nuclear fuel from the Vinča Institute to the Russian Federation
- Phase 3: Reprocessing and disposal of the Russian-origin spent nuclear fuel in the Russian Federation
- 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
- Phase 5: Provisions of equipment for a waste processing facility at the Vinča Institute

The total cost of the five phases of this programme would amount to €28,000,000. Donor organisations and countries (mainly the USA and Serbia) have already committed approximately €23,000,000 to support the VIND programme. In other words, funding is already provided or committed for phases 1, 3 and 4. Conversely phases 2 and 5 are not yet funded.

However it is worth noting that following an international tender launched by the IAEA a contract has already been bid and awarded to a consortium of Russian companies, consisting of: the Research and Development Company “Sosny”, the Federal State Unitary Enterprise PA "Mayak", and the TENEX Joint Stock Company. This contract covers theoretically phases 1 & 2, but its implementation is currently limited to phase 1 since phase 2 is not yet funded.

The implementation of project 1 will commence after signature of the contribution agreement with the IAEA, and the latter will not cover procurement costs that occurred before its entry into force.

Therefore the aim of this project is to contribute to the VIND programme via the support to phase 2: "preparations for and transport of Russian-origin spent nuclear fuel from the Vinča Institute to the Russian Federation".

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

This project will contribute to transport all spent nuclear fuel currently in store in Serbia to the Russian Federation and thereby will significantly decrease the nuclear security and proliferation threat in this Western Balkan country. In addition the project will reduce the risks of radioactive pollution of the environment since the spent nuclear fuel elements currently in store at the Vinča Institute are leaking radioactive fission products.

It has a catalytic effect in the sense that providing funding to phase 2 of the VIND programme will enable the whole sequence of operations leading to the transport and disposal of spent nuclear fuel in the Russian Federation to become effective.

3.3 Results and measurable indicators:

- Unified Project documents (including environmental impact assessments/EIA) obtained for transport of spent fuel;
- Authorization obtained for transport package design and transport through transit countries;
- Repackaged spent fuel prepared for transport and loaded into transport casks; and
- Spent fuel transported to the Russian Federation (country of origin).

3.4 Activities:

- Design of baskets for transport packages;
- Fabrication of baskets for transport packages;
- Delivery of baskets for transport casks to the Vinča Institute;
- Certificates for transport package design and shipment;
- Preparation of Unified Project Documents (including EIA);
- Authorisation for spent nuclear fuel transport through transit countries;
- Authorisation for transport package design and shipment in the Republic of Serbia, transit countries and the Russian Federation;
- Loading of canisters into transport packages and delivery of casks to the carrier;
- Transport/transfer of spent nuclear fuel packages to the Russian Federation.

This project specifically excludes funding for any portion of the spent fuel reprocessing in the Russian Federation.

3.5 Conditionality:

The implementation of this project is subject to the following prerequisites:

- that a Foreign Trade Agreement is concluded between the Serbian government and the Russian Federation, allowing the implementation of phase 3 of the VIND programme;
- that Serbia or other donors are committed to cover all expenses for phase 3 of the VIND programme.

3.6 Linked activities

The "Unified Project documents" to be obtained for the transport of spent nuclear fuel - which is part of the tasks assigned to this project - should play a role in the finalisation of the Foreign Trade Agreement with the Russian Federation that has to be signed by the Serbian authorities.

The project entitled "Equipment for waste processing facility at the Vinča Institute" (project No 2) that is covering phase 5 is closely related to this project.

3.7 Lessons learned

Lessons learned from the Paks repackaging effort in Hungary and the Uzbekistan spent fuel shipments indicate that considerable time is required to complete both the regulatory approvals of the safety documents as well as any required transit agreements across national boundaries. Since this shipment will require transport of the fuel across four national boundaries (i.e. Serbia, Hungary, Ukraine, and Russia), it is essential that this process of acquiring the transit agreement be started immediately. Delays in this process translate ultimately in delays to the shipment date, since licensing of the casks across the national boundaries can only occur once the four-country agreement is in place and signed.

Considerable time is required also to complete the Ecological Expertise documents within Russia as evidenced by the Uzbekistan shipment. Three years time was needed to finish all stages of the regulatory documents making up both the Unified Project and Foreign Trade Agreements for Uzbek spent fuel transport. In addition, shipment of the Vinča spent fuel will be the largest single shipment ever of Russian research reactor fuel transported back to Mayak. The fuel will be re-encapsulated since it is leaking. It is logical to assume that based on the Uzbek shipment, the process and time necessary to complete the Environmental Impact Assessment stage of the Unified Projects documentation preparation will require considerable review time on behalf of all regulatory bodies within the four countries of transport path.

4. Indicative Budget (amounts in €)

Activities	TOTAL COST	SOURCES OF FUNDING										
		EU CONTRIBUTION			NATIONAL PUBLIC CONTRIBUTION					PRIVATE		
		Total	% *	IB	INV	Total	% *	Central	Regional	IFIs	Total	% *
Activity 1												
contract 1.1	4,300,000	4,300,000	100									
contingencies	130,000	130,000										
TOTAL	4,430,000	4,430,000	100									

* expressed in % of the Total Cost

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

Contracts	Start of Tendering	Signature of Contribution agreement	Project Completion
Contract 1.1	N/A	September 15, 2007	November 30 2011

6. Cross cutting issues

6.1 Environment:

There are substantial environmental gains to Serbia by accomplishment of this project. Two-one-half tons of leaking spent nuclear fuel will be removed once and for all from Serbia. Once removed, the water that is contaminated in the spent fuel pool can be drained, processed, and contaminants removed, thereby removing most of the environmental threat of the spent fuel to the local environment. The potential therefore for and consequence from a large scale spillage event or environmental spill would be greatly reduced.

ANNEXES

- 1- Log frame in Standard Format
- 2- Amounts Contracted and Disbursed per Quarter over the full duration of Programme
- 3 - Reference to laws, regulations and strategic documents
- 4- Details per EU funded contract

ANNEXES

ANNEX 1: Logical framework matrix in standard format

LOGFRAME PLANNING MATRIX FOR Project Fiche	Programme name and number Part I of the horizontal programme on nuclear safety and radiation protection - 2007/019-038	
Preparation for and transportation of spent nuclear fuel from the Vinča institute to the Russian Federation	Contracting period expires : Two years following the date of conclusion of the Financing Agreement	Disbursement period expires: Two years following the end date for contracting
	Total budget including 3% contingencies: €4.43 million	IPA budget: € 4.43 million

Overall objective	Objectively verifiable indicators	Sources of Verification	
Transport spent fuel from Vinca, Serbia to Mayak, Russia	Fuel shipped	Shipment records	
Project purpose To Remove the environmental and proliferation threat from Serbia of leaking spent fuel	Objectively verifiable indicators Threat no longer present in Serbia	Sources of Verification Shipment records	Assumptions Contract assumes that Serbian or donor funding will cover all other necessary expenses in order to ship the fuel back to Russia
Results	Objectively verifiable indicators	Sources of Verification	Assumptions
Unified Project documents (including environmental impact assessments) obtained for transport of spent fuel	Documentation prepared in order to get the authorisations for the transport	Reports available at the Serbian Ministry of Science and Environmental Protection, and at the IAEA	Foreign Trade Agreement is in place Transit agreements of all transit countries the shipment will cross are in place and approved
Authorization obtained for transport package design and transport through transit countries	Regulator approvals for each transit country	Reports available at the Serbian Ministry of Science and Environmental Protection, and at the IAEA	Money is secured from either donors or Serbia to fund the Foreign Trade Agreement
Repackaged spent fuel prepared for transport and loaded into transport casks	Regulator approvals for each transit country	Reports available at the Serbian Ministry of Science and Environmental Protection, and at the IAEA	Regulator approvals are given to receive the fuel in Mayak and ship the fuel from Serbia

Spent fuel transported to the Russian Federation	Fuel shipped from Serbia and received in Russia at Mayak	Exchange of correspondence with the Russian consignee of the spent fuel. Visit at Mayak. Press releases	
Activities	Means	Costs	Assumptions
<p>Design of baskets for transport packages;</p> <p>Fabrication of baskets for transport packages;</p> <p>Delivery of baskets for transport casks to the Vinča Institute;</p> <p>Certificates for transport package design and shipment;</p> <p>Preparation of Unified Project Documents (including EIA);</p> <p>Authorisation for spent nuclear fuel transport through transit countries;</p> <p>Authorisation for transport package design and shipment in the Republic of Serbia, transit countries and the Russian Federation;</p> <p>Loading of canisters into transport packages and delivery of casks to the</p>	<p>Service, works and supply contracts to be established by the IAEA within the framework of the Contribution Agreement with the European Community.</p>	<p>The total cost for all the activities is estimated to € 4,430,000 including 3% contingencies</p>	<p>Assumes that transit countries (Hungary, Ukraine), and Russia are agreeable to transport path.</p> <p>Assumes regulatory authorities will issue authorizations once certificates for transport are obtained</p> <p>Assumes country-country agreement is obtained for shipment and that sufficient funding is in place to make Foreign Trade Agreement Contract.</p> <p>Assumes 16 SKODA casks and 16 TUK-19 casks are used; assumes they are available when needed.</p> <p>Assumes that Mayak is able to accept the packages as scheduled.</p>

carrier; Transport/transfer of spent nuclear fuel packages to the Russian Federation.			
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ANNEX II: Amounts (in €) Contracted and disbursed by quarter for the project

Contracted	Q3 2007	Q4 2007	Q1 2008	Q2 2008	Q3 2008	Q4 2008	Q1 2009	Q2 2009	Q3 2009	Q4 2009
Contract 1.1	4,430,000 (including 3% contingencies)									
Cumulated	4,430,000 (including 3% contingencies)									
Disbursed										
Contract 1.1	800,000				1,300,000				2,000,000	
Cumulated	800,000	800,000	800,000	800,000	2,100,000	2,100,000	2,100,000	2,100,000	4,100,000	4,100,000

Contracted	Q1 2010	Q2 2010	Q3 2010	Q4 2010	Q1 2011	Q2 2011	Q3 2011	Q4 2011
Contract 1.1								
Cumulated								
Disbursed								
Contract 1.1			330,000					
Cumulated	4,100,000	4,100,000	4,430,000	4,430,000	4,430,000	4,430,000	4,430,000	4,430,000

Annex III: Reference to laws, regulations and strategic 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-country MIPD programme

Annexe IV: Details per EU funded contract

This project as well as project entitled "Equipment for waste processing facility at the Vinča Institute" that are corresponding to phases 2 and 5 of the VIND programme will be supported through a European Community Contribution Agreement with the IAEA.

The specific 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.