



# **TECHNICAL WORKING GROUP ON RESEARCH REACTORS (TWGRR)**

## **Project D.2.0.3**

### **Addressing RR Fuel Cycle Issues**

#### **2009 Activities**

**P. ADELFI**

**Research Reactors Group**

**Division of Nuclear Fuel Cycle and Waste Technology**

**IAEA**

**Second Meeting of the TWGRR**



**IAEA Vienna, Austria, February 9-11, 2009**

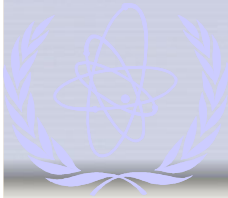


## Project D.2.0.3: Addressing RR Fuel Cycle Issues

### Objectives

- Strengthen capability of interested MS to deal with all fuel cycle issues:
  - ☞ Fuel development;
  - ☞ Fuel fabrication;
  - ☞ Fuel qualification; and
  - ☞ Spent fuel management
- To promote:
  - ☞ Conversion from HEU to LEU;
  - ☞ Return spent and fresh fuel to the country of origin; and
  - ☞ Regional solutions to the back end of the fuel cycle.





## Project D.2.0.3: Addressing RR Fuel Cycle Issues

### Activities

- Assistance to RRs with degraded spent fuel
- Support conversion of RRs and return of spent and fresh fuel to the country of origin
- Support development of high density U-Mo fuels
- Promote good practices for the management of RR spent fuel



## Project D.2.0.3: Addressing RR Fuel Cycle Issues

### Activities

- Studies on economic aspects of the RR nuclear fuel cycle
- Support use of LEU in accelerator driven subcritical assemblies
- Coordinate an International Technical Working Group on RRs
- Support small-scale, indigenous production of Mo-99 using LEU or neutron activation

## Project D.2.0.3: Addressing RR Fuel Cycle Issues

<b><u>Regular budget activities</u></b>		
1.	Support RR database	Since merging in D.2.0.2
2.	TWGRR meeting organisation and implementation	Vienna, February 9-11
3.	“Specific considerations and milestones in the development of a Research Reactor” document.	A consultancy meeting May 20-22, 2009
4.	Economic Aspects of the RR Fuel Cycle	Progress the document
5.	OIOS Evaluation of the Crosscutting area RRs	General coordination
6.	Document on “Guidelines of good practice for the management and storage of research reactor spent fuel”	TM in Vienna, Austria or Dounreay, U.K., June, 2009
7.	13th International Topical Meeting on Research Reactor Fuel Management (RRFM’ 2009)	Coordination role, member of the PC committee. In cooperation with ENS and the Atom Institute. Vienna, March 22 -25, 2009
8.	31st “RETR International Meeting on Reduced Enrichment for Research and Test Reactors”	Beijing, China, TBD (end of October, beginning of November) organization and awarding of grants.
9.	Assist in implementation of IRT-Sofia Research Reactor Project	Mission to Sofia in January 2009. Coordination of different expert activities.
10.	Report of the CRP on Corrosion of Al- Clad Spent RR Fuel in Water - Phase II	To be published in 2009
11.	Document on “Water Quality Management in RRs and RRSNF storage facilities”, NE series	To be published in 2009
12.	“Good practices for qualification of high density low enriched uranium (LEU) research reactor fuels”, NE series	Approved by everybody in the house. It is “in press”, issuance expected early in 2009.



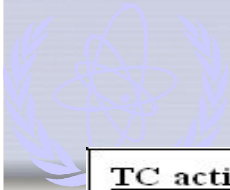
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<u>Extrabudgetary activities</u>		
1.	CRP on Mo-99	a) NEA Workshop on security of isotope supply, Paris, Jan. 29-30  b) Possible workshop on neutron activation production of Mo-99 (including enriched Mo-98; and gel generators), Tashkent or Almaty, date TBD (late spring/early summer). In cooperation with NAFPC
2.	CRP on MNSR Conversion	a) Mission to China January 12 to 14, 2009  b) Possible workshop on safety analysis reports, OLCs and other documentation for conversion and preparation for spent fuel shipments, Vienna, date TBD (late spring/early summer)
3.	International collaborative work on use of LEU in accelerator driven sub-critical assemblies (ADS)	3 <sup>rd</sup> Meeting (RCM - like) on the "Use of LEU in accelerator driven subcritical assemblies", January 26 - 30, 2008

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## TC activities

1.	ARG4092 [2007] Irradiation and Post-Irradiation Examination of Low-Enriched Uranium Very High Density Fuel Assembly in a High-Flux Reactor	Provided funding is received from the counterpart, the fuel irradiation will commence in 2009 - 2010
2.	AZB4002 NEW Conducting a Feasibility Study for Planning and Establishing a Research Reactor	Facts Finding Mission planned in 2009
3.	BRA3012 [2007] Nuclear Fuel for Research Reactors: Improving Fabrication and Performance Evaluation in Brazil	Expected to continue into 2009.
4.	BRA4059 NEW Modernizing and Refurbishing the IEA-R1 Research Reactor to Secure Safe and Sustainable Operation and Produce Radioisotopes for Medical Applications	Progress the project work-plan.
5.	COL/1/010 Integral Use and Safety of the IAN-R1 Research Reactor	Arrange expert missions, SV/Fellowships, training events in Neutron Activation Analysis and isotope production to support Caribbean R.R. Coalition activities and objectives
6.	JAM6010 Nutritional Status and Exposure to Toxic Elements of Jamaican Children	It is used to do the reshimming of the Slowpoke reactor
7.	JOR4007 NEW Establishing a Research Reactor	A mission is planned in 2009
8.	KAZ9010 NEW Supporting Upgrades and Conversion of WWR-K Reactor to Low Enriched Uranium Fuel	NSNI is the lead TO organisation. New I&C system.
9.	LIB4011 NEW Utilizing the Research Reactor	NAPC is the lead TO organisation.
10.	PER4023 NEW Modernizing and Improving the Utilization of the RP10 Reactor	A mission would be necessary in 2009
11.	POL4017 [2006] Full Conversion of the Maria Research Reactor Core from Highly Enriched Uranium to Low Enriched Uranium	Progress work-plan
12.	POR4016 [2005] Core Conversion of the Portuguese Research Reactor to Low-Enriched Uranium Fuel	This project should be closed
13.	RAF4020 Nutritional and Health-related Studies Using Research Reactors (AFRA IV-12)	Will finalize at the end of 2008
14.	RAF4022 NEW Enhancing Research Reactor Utilization and Safety (AFRA)	In cooperation with NSNI and NAPC. A mission is planned in 2009



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<b>TC activities</b>		
1.	RAS4030 Developing a Regional Nuclear Training Centre for Capacity Building and Research	This is the Gulf countries project. A mission might be necessary in 2009
2.	RER3006 NEW Supporting the Repatriation, Management and Disposal of Fresh and/or Spent Nuclear Fuel from Research Reactors	This project has been developed to replace RER4028. Workshop "Lessons Learned from Shipments of Research Reactor Spent Fuel to Russian Federation", 22-25 June, Varna, Bulgaria".
3.	RER4028 [2005] Repatriation, Management and Disposition of Fresh and/or Spent Nuclear Fuel from Research Reactors	This project will be closed (see RER3006 above).
4.	RER4032 NEW Enhancing the Sustainability of Research Reactors and Their Safe Operation Through Regional Cooperation, Networking and Coalitions	Progress the work-plan
5.	RLA0037 NEW Supporting a Sustainable Increase in the Use of Research Reactors in the Latin American and Caribbean Region through Networking, Exchange of Experiences, Knowledge Preservation and Training of Human Resources (ARCAL CXIX)	Progress the work-plan. A mission is planned in 2009 (Coordination Meeting)
6.	RLA3007 NEW Developing Novel Cost-Effective Conversion Coatings for Long-Term Safe Wet Storage of Spent Aluminium-Clad Research Reactor Fuels (ARCAL XCVIII)	This project is unfunded. No implementation is expected.
7.	RLA3008 NEW Engineering Casks for the Transport of Spent Fuel from Research Reactors (Phase II)	Progress the work-plan
8.	RLA4020 [2007] Engineering of Casks for the Transport of Spent Fuel from Research Reactors	This project will be closed and replaced with RLA3008 above
9.	ROM4024 [1999] Ongoing Full Conversion of TRIGA 14-MW Core from HEU to LEU Fuel	Will be closed when supply of the new I&C system is completed (early in 2009).
10.	SRB4002 [2007] Safe Removal of Spent Fuel of the Vinca RA Research Reactor	Larger TC project ever
11.	UZB9004 [2003] Improving Operational Safety of the Research Reactor at the Institute of Nuclear Physics	NSNI is the lead TO organisation. New I&C system.
12.	UZB9005 NEW Improving Operational Safety of the Research Reactor at the Institute of Nuclear Physics (Phase II)	This project will replace UZB9004 above.
13.	VIE9012 NEW Ensuring Safe Operation of the Dalat Research Reactor and Improving Its Utilization for Research, Application and Training after Fuel Conversion	Progress the work-plan



THANK YOU FOR YOUR  
ATTENTION!

RESEARCH REACTORS

CROSS-CUTTING  
COORDINATION GROUP

(NEFW, NAPC, NSNI, TC)