

TC Project RER1007: Enhancing Use and Safety of Research Reactors through Networking,
Coalitions and Shared Best Practices

**Annual Meeting of the Commonwealth of Independent States Research Reactor Coalition
(CISRRC)**

Institute of Nuclear Physics, Tashkent, Uzbekistan

7–10 July 2015

MEETING REPORT

BACKGROUND

The International Atomic Energy Agency (IAEA) promotes networking, coalitions and regional collaboration to improve the safety, and efficient and sustainable utilization of research reactors (RRs). A number of RR coalitions and networks were developed with IAEA support as a new model to better utilise RRs and facilitate access for the Member States without such facilities. The coalition/network concept involves putting in place cooperative arrangements among RR operators, user entities and other stakeholders. Ideally, a strong partnership is formed leading to increased utilization of individual RRs through collective efforts, including improved self-sustainability and self-reliability.

In 2012 the IAEA invited all IAEA Member States that belong to the Commonwealth of Independent States (CIS) to take part in the initial planning meeting of the CIS Research Reactor Coalition (CISRRC) to facilitate education, training, research, and industrial applications of the region. The Coalition was established in December 2012 in Vienna and held its first Annual Meeting in June 2013 in Dimitrovgrad, Russian Federation, where the draft Memorandum of Understanding was signed, the areas of cooperation identified and the first work plan agreed upon. Since then, the CISRRC has been meeting regularly once a year to review and discuss the work plan and further areas of cooperation.

OBJECTIVE

Under regional project RER/1/007, the IAEA has invited all Member States of the Commonwealth of Independent States (CIS) to take part in the 4th annual meeting of the CIS Research Reactor Coalition (CISRRC). The main objective of the meeting was to develop work plans for each area of cooperation: research reactor safety, education and training and ageing management. Participants were expected to: develop a concrete 2015–2016 work plan with clearly defined roles, activities and timeline for coalition members and the IAEA; discuss other potential applications of CIS RRs where cooperative efforts might lead to regional coalitions/networks; identify and define future lines of activity where the IAEA's facilitation would have high impact and significance.

The meeting was attended by 21 participants from 5 Member States: Belarus, Kazakhstan, Russian Federation, Ukraine and Uzbekistan. The IAEA was represented by two staff members

from the Research Reactor Section, Department of Nuclear Energy and Research Reactor Safety Section, Department of Nuclear Safety. The full list of meeting participants is included in Annex 1. The meeting Agenda is included in Annex 2.

WORK DONE

The meeting was held in plenary and breakout sessions, comprising of participants presentations, open discussions, working group sessions to develop the next year's work plan and preparation of the final report and conclusions. The meeting was facilitated by the IAEA and chaired by Mr Fedulin from RIAR.

During the meeting the IAEA representatives and the CISRRC members gave presentations on the following topics:

1. Update on the RER1/007 TC project status and the Research Reactor Section Sub-programme activities - Anastasia Zhukova, (RRS/IAEA)
2. Feedback from IAEA Activities on Safety Reassessment of Research Reactors in light of the Fukushima-Daiichi NPP Accident - David Sears, (RRSS/IAEA)
3. Safe and effective utilization of WWR-SM research reactor - S.A. Baytelesov, F.R. Kungurov, U.S. Salikhbaev, D.D. Yusupov (INP, Uzbekistan)
4. Experience of WWR-SM research reactor of INP AS RU - R.A. Abdullaev, D.D. Yusupov (INP, Uzbekistan)
5. Activities of the CISRRC working group on Ageing Management of the research reactor facilities - Alexander V. Albul (Kurchatov Institute, Russia)
6. Operation disruptions of the Russian research reactor facilities during 2010-2014 - Viktor N. Fedulin (RIAR, Russia)
7. Report on safety conditions of the nuclear fuel cycle of the research reactor facilities and production at the JSC "SSC RIAR" - Alexey L. Petelin (RIAR, Russia)

PROGRESS REPORTS

The ageing management group coordinator, Mr Alexander Albul, reported on the results achieved. During the 2014–2015 cycle Mr Albul developed and distributed a questionnaire on the ageing status of the CIS research reactor facilities. Based on this questionnaire the most relevant information was collected and generated into a table which was shared with members of the coalition. Participants agreed to continue the practice of information exchange. As the next step it was decided to develop a database on equipment and materials used in systems important for safety at all RRs of the Coalition and also to create a database on methods of system investigation important for safety. Moreover, for systems that don't have life extension procedures the coalition recommends to develop procedures for periodic inspection in order to determine the source for operation extension of such systems. A detailed 2015-2016 plan is presented in Annex 3 of this report.

The research reactor safety group was represented by Mr Victor Fedulin. Progress was made on development of an annual information circular on safety-significant incidents at nuclear

research installations of CIS member states. In particular, the guidelines were developed on procedure, scope and data submission timeline on operation of the CIS nuclear research installations, including information on incidents. The data was collected, analysed and the electronic version of the circular is being finalized.

The book on *“Nuclear research installations of CIS member states is in progress”*. To date almost all information has been collected. The main issue is related to financing the publication of the book and translating it in to English. The CISRRC is seeking financial support from its members and the IAEA.

The research reactor education and training group was represented by Mr Alexey Petelin. During the meeting the education and training programmes of greatest interest to the CIS RRC members were identified. The programmes of methodological support and training courses were developed based on the wishes of the CISRRC organizations represented. The experience of creating functional and analytical simulators at the RIAR is of interest to members of the coalition, and can be used for training after the establishment of R&D simulator RBT (pool type). With the IAEA support the project on creation of a simulator for the WWR-SM, WWR-K, WWR-M can be implemented. Of particular interest is the knowledge exchange of long-term experience of maintaining water chemistry control of RR.

In 2014 three training programmes for specialists (6 persons) were successfully conducted (2 specialists from INP (Uzbekistan) were trained in RIAR (Russia); 2 specialists from RIAR were trained in INP; 2 specialists from RSE INP ME (Kazakhstan) were trained in RIAR).

Also as the result of the CISRRC activities the INP Republic of Uzbekistan has successfully received and used the software package for calculation of transmutations, developed by RIAR.

Moreover, the areas of greatest interest to the coalition members in R&D were defined, in particular: (1) - Methods and programmes for calculating the core, fuel burn (including plutonium isotope production); (2) -The study of perspectives and research to support the use of metallic uranium-molybdenum fuel for further use in WWR reactors.

It was noted that depending on the needs and agreements between organizations, scientific visits, fellowships and workshops can be organized between the CISRRC members, taking advantage of member facilities.

The CISRRC web-page <http://sng-atom.com/?q=node/399> is in operation and it was recommended to continue updating the web-page content to reflect the CISRRC work.

2015-2016 WORK PLAN

During the meeting participants worked in groups to review the 2014-2015 work plan and discussed activities that should be carried out during the next 2015-2016 cycle. A 2015-2016 work plan has been drafted accordingly for each focus areas: research reactor safety, education and training and ageing management. The detailed output from each working group is included in Annex 3.

CONCLUSION AND RECOMMENDATIONS

Good progress has been made during 2014–2015 years in achieving the work plan activities identified at the last meeting.

Participants agreed that the coalition is an effective tool to enhance safety, ageing management and education and training in RRs of the CIS, and unanimously agreed to continue the coalition activities.

The participants agreed to continue to work on accomplishing the work plan activities for 2015-2016 identified in the attached work plan, in particular to:

1. Study the possibility of signing a cooperation agreement (Practical Agreement) between the IAEA and the members of the CISRRC to facilitate IAEA endorsement of the upcoming conference on Safety of research reactors and other activities.
2. Consider the possibility of organizing a seminar for RRs safety professionals to analyze most significant deviations in CISRRC RRs.
3. Consider the possibility of carrying out in cooperation with the IAEA an International Conference on RR Safety 2017 on the site of the RIAR. At the same time to hold the next meeting of the CISRRC also on the site of RIAR.
4. In order to inform a wide range of potential users, including countries that do not have RRs, to study the possibility of providing technical and financial support from the side of the IAEA and the CISRRC members in order to prepare and publish of the book on "RR of the CIS member-states."
5. To continue the practice of providing trainings in the area of RR utilization and assurance of safety (radiation, nuclear, physical, etc.), including countries that do not have a RR.
6. Consider the possibility of holding the next annual meeting of the CISRRC in Azerbaijan, Tajikistan or Kyrgyzstan, pending confirmation from the host.

INTERNATIONAL ATOMIC ENERGY AGENCY

Technical Cooperation Project RER/1/007

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FINAL MEETING AGENDA

Tuesday, 7 July	
9:00 – 9:30	Arrival
9:30 – 10:15	<p>Meeting opening:</p> <p>Host Welcome Remarks Umar Salikhbaev (INP, Uzbekistan)</p> <p>Opening Remarks: Meeting Objectives and Expected Results David Sears (IAEA)</p> <p>Administrative Matters:</p> <ul style="list-style-type: none"> • Selection of Meeting Chairman and Rapporteurs; • Adjustment of the agenda. <p>Group introduction and regional update (5 min for each participant)</p>
10:15 – 10:45	<p>Feedback from IAEA Activities on Safety Reassessment of Research Reactors in light of the Fukushima-Daiichi NPP Accident</p> <p>David Sears (IAEA)</p>
10:45 – 11:15	<i>Coffee break</i>
11:15 – 11:45	<p>Safe and effective utilization of WWR-SM research reactor</p> <p>S.A. Baytelesov, F.R. Kungurov, U.S. Salikhbaev, D.D. Yusupov (INP, Uzbekistan)</p>
11:45 – 12:15	<p>Experience of WWR-SM research reactor of INP AS RU</p> <p>R.A. Abdullaev, D.D. Yusupov (INP, Uzbekistan)</p>
12:15 – 12:45	<p>Activities of the CISRRC Working Group on Safety of research reactors</p> <p>Viktor N. Fedulin (RIAR, Russia)</p>
12:45 – 14:00	<i>Lunch break</i>
14:00 – 14:30	<p>Activities of the CISRRC working group on Ageing Management of the research reactor facilities”</p> <p>Alexander V. Albul (Kurchatov Institute, Russia)</p>
14:30 – 15:00	<p>Operation disruptions of the Russian research reactor facilities during 2010-2014</p> <p>Viktor N. Fedulin (RIAR, Russia)</p>
15:00 – 15:30	<i>Coffee break</i>

15:30 – 16:00	Report on safety conditions of the nuclear fuel cycle of the research reactor facilities and production at the JSC “SSC RIAR” Alexey L. Petelin (RIAR, Russia)
16:00 – 16:30	Q&A
16:30 – 17:00	<i>Adjourn</i>
18:00 –	<i>Hospitality Event</i>
Wednesday, 8 July	
09:30 – 11:00	Break into Working Groups to draw up activities and draft work plan for each area of focus: <ul style="list-style-type: none">- Safety of Research Reactors- Education and Training- Ageing Management All Participants
11:00 – 11:30	<i>Coffee break</i>
11:30 – 12:30	Break into Working Groups to draw up activities and draft work plan for each area of focus (cont.) All Participants
12:30 – 14:00	<i>Lunch break</i>
14:00 – 14:30	Update on the RER1/007 TC project status and the Research Reactor Section Sub-programme activities Anastasia Zhukova (IAEA)
14:30 – 17:00	Break into Working Groups to draw up activities and draft work plan for each area of focus (cont.) All Participants
17:00 –	<i>Adjourn</i>
Thursday, 9 July	
9:30 – 12:30	Working Groups presentations of the 2015–2016 activities and work plan for each area of focus: <ul style="list-style-type: none">- Safety of Research Reactors <i>Discussion</i>- Education and Training <i>Discussion</i>- Ageing Management <i>Discussion</i> All Participants
12:30 – 14:00	<i>Lunch break</i>
14:00 – 17:00	Drafting of the meeting report All Participants

17:00 – 17:30	Final comments and recommendations All Participants
17:30 –	Closing of the Meeting Anastasia Zhukova (IAEA), David Sears (IAEA)

Friday, 10 July

10:00 – 12:30	Visit to WWR-SM research reactor at INP
12:30 – 11:30	<i>Coffee break</i>
11:30 – 13:00	Departure from INP

ANNEX 2**INTERNATIONAL ATOMIC ENERGY AGENCY**

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ANNEX 3

INTERNATIONAL ATOMIC ENERGY AGENCY

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CISRRC WORKING GROUPS

During the meeting participants have split into three working groups to discuss each area of focus, including safety of research reactors, education and training and ageing management. The main objective of each working group was to review the 2014-2015 work plan and to develop a 2015-2016 work plan. The achieved results can be seen below:

Working Group on Safety of Research Reactors

No	Description	Steps	Member Organizations	Responsible	Milestones
Task 1	Develop an information system on operation experience of the CIS Member States' RRs	1. Develop the terms of reference of the information system on operation experience of the CIS Member States' RRs	All CISRRC members	Fedulin V.N.	December 2015
		2. Set out the information system on operation experience of the CIS Member States' RRs	RIAR	Fedulin V.N.	March 2016
		3. Develop the software for the information system's database on operation experience of the CIS Member States' RRs	RIAR	Fedulin V.N.	September 2016
		4. Develop technical documentation (instructive note and User's Guide) of the information system on operation experience of the CIS Member States' RRs	RIAR	Fedulin V.N.	December 2016
		5. Gather information in accordance with the methodological recommendations on procedures, terms and timing of data provision on the operation experience of the CIS Member States' RRs, including information on destructions	RIAR	Fedulin V.N.	December 2016
Task 2	Publish the information circular on "Operation destructions at the CIS Member States' RRs"	1. Develop the electronic version of the information circular	RIAR	Fedulin V.N.	September 2015
		2. Release of the information circular	RIAR	Fedulin V.N.	November 2015
Task 3	Develop and release of the information circular on "2015 operation destructions at the CIS Member States' RRs"	1. Gather data for the information circular	All CISRRC members	Fedulin V.N.	March 2016
		2. Data analysis for the information circular	RIAR	Fedulin V.N.	June 2016
		3. Develop the electronic version of the information circular	RIAR	Fedulin V.N.	July 2016
		4. Develop and present during the next meeting of the information circular	RIAR	Fedulin V.N.	August 2016
		5. Release of the information circular	RIAR	Fedulin V.N.	November 2016
Task 4	Continue work on the release of the "Nuclear research	1. Finalise the data collection for the book	All CISRRC members	Fedulin V.N.	September 2015

	facilities in CIS Member States”	2. Identify the source of financing for editing and translation of the book into English language	RIAR	Fedulin V.N.	December 2015
		3. Format and prepare the electronic version of the book (pre-identify the source of financing according to bullet 2)	RIAR	Fedulin V.N.	July 2016
		4. Release of the book in Russian and English languages (in case of identification of the source of financing according to bullet 2)	RIAR	Fedulin V.N.	December 2016
Task 5	Prepare and submit during the next CISRRC meeting a report on the most serious (significant) disruptions that took place at the RRs of the CIS Member States		All CISRRC members	Fedulin V.N.	August 2016
Task 6	Prepare the material for release of guidance on assessment of the safety radiation of the CIS Member States	1. Overview of material on safety assessment at the CIS Member States’ RRs	All CISRRC members	Fedulin V.N.	December 2015
		2. Gather proposals from the CIS Member States in order to discuss the draft guidance	All CISRRC members	Fedulin V.N.	March 2016
		3. Analyse and prepare the draft guidance during the next CISRRC meeting	All CISRRC members	Fedulin V.N.	August 2016

Working Group on Ageing Management

№	Description	Steps	Member States	Responsibility	Milestones
Task 1	Upload on the web-site the collected and processed information on ageing management of the CIS Members States' RRs	Upload on the coalition's web-site the information on the existing problems and modernization experience of systems and equipment		Albul A.V. Fedulin V.N.	December 2015
Task 2	Create a database on equipment and materials that are used (or were in use) in safety important systems of all CIS facilities. Include information on real operating hours and causes of failure. Purpose: Prompt mutual assistance in equipment replacement and perhaps delivery of equipment to colleagues from the available supply	1. Develop the questioner and its distribution among the coalition members for review and comments	All CISRRC members	Albul A.V.	October 2015
		2. Distribution of the questioner to CISRRC coalition Members		Albul A.V.	December 2015
		3. Collect and process the received from Coalition members information	All CISRRC members	Albul A.V.	March 2016
		4. Distribution of the processed information for additions and corrections		Albul A.V.	April 2016
		5. Upload the information to the Coalition's web-site		Fedulin V.N.	December 2016
Task 3	Create an information database on methodologies of system inspections important for safety	1. Gather and process the received information from the Coalition members	All CISRRC members	Albul A.V.	December 2015
		2. Distribute the generated information to the Coalition members		Albul A.V.	March 2016
Task 4	Improve procedures for ageing management at the Coalition's facilities	For facilities that don't have a developed life extension procedures for equipment to recommend periodic inspections to determine the source for future designation of operational lifetime of systems	All CISRRC members		March 2016

Working Group on Education and Training of Nuclear Research Installation Staff

No	Description	Steps	Member Organizations	Responsibilities	Milestones
Task 1	Develop and implement the training programmes and further education for experts working at research reactors	1. Refer to the managing staff at MEPHI with a proposal to update the training programmes (to reduce the period of education) based on the proposal of the Coalition members and specify the price	NRNU MEPHI, RIAR	(Varlamov N.) Fedulin V.N.	August 2015
		2. Submit to the Coalition's web-page the updated information on courses and training programmes	NRNU MEPHI, RIAR	Fedulin V.N.	September 2015
		3. Update information on the staff training needs. Send to the IAEA a request with justification of the financial support.	Coalition, NRNU MEPHI, RIAR	Fedulin V.N.	November 2015
		4. Develop training for staff and specialists using the available programmes	Coalition, NRNU MEPHI, RIAR	Fedulin V.N.	At the agreed timeframe
Task 2	CISRRC staff training using the RIAR infrastructure	1. Develop a training programme to support the water-chemical regime of reactor contour	Coalition, NRNU MEPHI, RIAR	Fedulin V.N.	January 2016
		2. Provide trainings and fellowships for professionals	RIAR, NRNU MEPHI	Petelin A.L.	May 2016

		3. Prepare proposals for establishment of functional-analytical simulator for WWR reactor types	RIAR	Petelin A.L.	December 2015
Task 3	Conducting joint research	1. Prepare proposals of Coalition's members on a workshop for methods and programmes of fuel burnup calculations	Coalition, RIAR	Fedulin V.N.	October 2015
		2. Develop the workshop programme	Coalition, RIAR	Petelin A.L.	December 2015
		3. Hold a workshop on methods and programmes of fuel burnup calculations	RIAR	Fedulin V.N. Petelin A.L.	April 2016
		4. Prepare proposals for a research programme to study the use of metallic uranium-molybdenum fuel for further use in WWR reactors	Coalition, RIAR	Fedulin V.N.	March 2016