

Report of  
**The 3<sup>rd</sup> Coordination Meeting of the Baltic Research Reactor Network  
(BRRN)**  
under the IAEA Regional TC project RER4032

**Stockholm, Sweden  
2-4 February 2011**

Under the auspices of IAEA Technical Cooperation Project RER/4/032, titled “Enhancement of the Sustainability of Research Reactors and Their Safe Operation Through Regional Cooperation, Networking, and Coalitions”, 14 representatives of 9 Member States from the Baltic Region, namely:

1. Denmark RISOE-DTU (1)
2. Estonia, University of Tartu (1)
3. Finland, VTT (1)
4. Germany, HZB (1)
5. Latvia, LVGMC (2)
6. Lithuania, PI and LEI, (2)
7. Poland, IAE POLATOM (2)
8. Russian Federation, PNPI and I. Kant State University of Russia, (2)
9. Sweden, KTH (1)

constituting the Baltic Research Reactor Network (BRRN) held the 3<sup>rd</sup> plenary coordination meeting at KTH, Stockholm, Sweden on 2-4 February 2011. In addition a representative of IRSN, France attended, as an invited country not part of BRRN. The agenda of the meeting is attached in Annex I, the list of participants is attached in Annex II.

The purpose of the 3<sup>rd</sup> Coordination Meeting of BRRN was to:

- Present a status report on the goals set forth in the work plan during the previous meeting in February 2010;
- Discuss the aims and means for cooperation in the Network’s four focus areas, namely, education and training; irradiation services and radioisotope production; basic and applied research with neutron beams; and operation, waste management and decommissioning;
- Review suggested means for publicizing the BRRN and its capabilities, and identify further cooperative efforts that could allow the BRRN to more broadly reach potential stakeholders;
- Establish the work plan and action matrix of the BRRN for 2011.

## II. Work done

The meeting was opened by Ms Marta Ferrari, IAEA, RER/4/032 technical officer and included countries presentations that addressed the four topics, presenting capabilities and needs. The countries inputs were summarized by the Coordinators on current status of common activities and other possible areas for collaboration, with ensuing group discussion concerning how to pursue future work.

Finally Ms Ferrari made a presentation on strategic planning. Several participants mentioned that the topic was very relevant and are looking forward to the revised IAEA document on this topic. The IAEA is ready to offer expert assistance in case any RR wish to prepare or update a strategic plan.

There was extensive discussion on whether to continue having coordination meetings in this format or consider a different one. One issue that was observed is that very few BRRN participants have interest in the 4 topic areas, while a few are only interested in one or two. For example for neutron beam analysis and irradiation services, the network should identify more appropriate counterparts in several countries, especially looking at the users of such services. In the future, the possibility of having dedicated workshops by topic may be considered.

It was finally agreed to keep Baltic Network coordination meetings, but also organize enlarged meetings for specific activities and link with other networks. In the area of education of training, it was stressed that interaction with EERRI network would be beneficial as the Baltic Network do not have research reactors specifically dedicated to education and training.

In this context it was agreed that next coordination meeting should be regional, include also representatives from all Europe and include one day for discussion within the Baltic Network.

### 1) Education and training, coordinated by Sweden

Below are three tables summarizing the available information concerning BS and MS programmes in nuclear engineering and more generally courses in reactor physics.

<b>120 ECTS Masters programmes</b>				
<b>Country</b>	<b>Location</b>	<b>Students/year</b>	<b>Location</b>	<b>Students/year</b>
Sweden	KTH	15	Chalmers	20
Finland	Lappenranta	30	Helsinki	Starting
Estonia	Tartu	10	Tallin	10
Lithuania	Kaunas	10	Vilnius	Starting
Poland	Warsaw	?		
Germany	Kalsruhe	?	Dresden	?

<b>180 ECTS Bachelors programmes</b>				
<b>Country</b>	<b>Location</b>	<b>Students/year</b>	<b>Location</b>	<b>Students/year</b>
Sweden	Uppsala	25	KTH	starting
Lithuania	Kaunas	15	Vilnius	25

<b>Reactor physics course</b>				
<b>Country</b>	<b>Location</b>	<b>Students/year</b>	<b>Duration</b>	<b>2015</b>
Sweden	ISIS	100	2.5 days	200
Finland	FIR-1	120	1 day	165
Estonia				20
Lithuania				20
Poland	Maria	60	2 days	120

Within the Baltic Network, the RR in Finland provides one-day experimental courses for interested students. Doing longer courses would be difficult since 3 days per week reactor time is reserved for BNCT patients. Poland provides also training for master programmes in Polish. The institutes in the Russian Federation performs currently mainly training for Russian students, but are considering providing courses in English as well.

Sweden has an agreement with France and the government finances a student trip per year to attend 2.5 days experimental training at the ISIS reactor in France. The agreement expires in 2016 and Sweden may be interested in looking for other options, including in Central Europe.

Estonia and Lithuania are increasing the number of students involved in nuclear engineering and would like to find a suitable facility where the students could experience reactor operation and perform experiments. Both indicated that currently the university it has no budget to support this activity.

Sweden will look into the possibility of accepting a representative from Estonia and Lithuania to the course of reactor physics in Paris next Dec-Jan. Poland will look into the possibility to include in their training programmes fellows from other countries, if the institute starts to provide the course in English.

## **2) Irradiation services, coordinated by Denmark**

The presentations provided some information concerning capabilities and needs, as summarized in the table below.

<i>The following needs have been presented:</i>	
Denmark	Request for occasional irradiations of targets for non-standard isotope production, maybe NAA
Latvia	Irradiation of samples for fusion, NAA, irradiation of samples in general, for hospitals: I-131, Tc-99m, I-123, -125. (These RI are now supplied by several companies; hospitals may be interested in exploring more supply options)
Lithuania	NAA of samples of reactor constructions, Ir-192, Y-90, Sr-89, Tc-99m, I-123-125-131, PET isotopes (F-18)
<i>Capabilities: isotope production and irradiation services</i>	
Poland	MARIA reactor – isotope production / irradiations (POLATOM)
Norway	JEEP reactor – isotope production / irradiations
Russian Federation	WWR-M reactor, Mo-99, Ru-106, Ir-192, I-125

Finland	Br-82, Na-24, Ar-41 and La-140 through Indmeas Inc. + NAA
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It was agreed that a more detailed table on isotope production and irradiation services is needed; Denmark as the area coordinator will finalize the table containing information about the relevant RRs technical details, reactor schedules for 2011 as well as information on produced radioisotopes and other services. The table will be made available on the BRRN webpage and will serve as a source of information about on-going activities at the different RRs.

Most of the participants explained that surveying needs in their respective country is difficult as it involves contacting different stakeholders. A targeted workshop on this topic would be useful to reach out at the appropriate users and specific needs for radioisotopes in the region.

Additionally, several member states expressed a more undefined need for radioisotopes to be used at hospitals as well as requests for irradiation assistance in connection with the production of non-standard radioisotopes. It was emphasized that variable parts of the production of radioisotopes are coordinated by separate companies (POLATOM in Poland, Indmeas Inc. in Finland) and that these companies could fulfill requests for irradiation services.

Other capabilities and needs were mentioned, such as the use of radioactive isotopes in industry, where some of the countries within the BRRN have active users (Denmark and Finland). It was also discussed how other activities like neutron activation analysis and available irradiation services for NTD silicon doping could be promoted. It was agreed that these capabilities within the BRRN first of all should be advertised at the BRRN webpage.

### **3) Neutron beam applications, coordinated by Germany**

The Research Reactors in Munich and Berlin, Germany, are mainly used for neutron scattering experiments and are fully booked. There are furthermore two other small reactors in Germany, TRIGA at UNI-Mainz and a SUR at UNI Dresden, which are used for other experiments and for training and education respectively. The reactor in Berlin could offer time and assistance to interested users and scientists that would like to perform experiments there.

The group decided there was no need for compiling a table with information on available experimental facilities at the RR, as the information about instruments is described in the websites and constantly updated.

It was noted that at the present meeting, most of the participants were not involved in neutron beams. It may be considered the possibility to have a special workshop on neutron beams targeted to interested scientists and potential users.

### **4) Radioactive waste management and decommissioning, coordinated by Latvia**

Sweden, Germany, Denmark, Poland and Latvia have decommissioning experience. The network decided to prepare a database to summarize the experience and facilitate information exchange.

The coordinator presented a template that will be used to collect information. Countries with interesting experience include the current operators of research reactors – Finland,

Germany, Norway, Poland, Russian Federation – plus Denmark and Sweden, that have RR decommissioned. Estonia has some nuclear waste, legacy of past programmes and could also take part in the study.

The coordinator will send the template requesting feedback and an expression of interest from the countries, if they wish to take part in the report preparation. Once the material is collected, the IAEA will finalize the report in cooperation with the authors into a IAEA publication or TECDOC.

Once the decommissioning database is produced, similar activity could be performed to summarize the experience of the BRRN countries in radioactive waste management

### III) Action Items/Work plan agreed:

#### 1) Management, coordination & marketing

- a. **Web page to be revised.** IAEA will continue hosting the site and ensure the updates. All members and the 4 activity coordinators will provide input. The coordination meeting report will also be added to the website. New release by end of Feb 2011.
- b. **Next BRRN meeting** for one day during the full RER4032 coordination meeting Q4 2011 or Q1 2012 The 4 coordinators will present BRRN activities. IAEA will announce date and venue.
- c. **Promotion of BRRN** to advertise the services that the RR BRRN offer through the [web page](#). Conference/workshop presentations by all members are encouraged and will be reported to the coordinator of the specific area and to the IAEA.
- d. **Development of strategic plan for BRRN:** IAEA prepared and shared a draft document (example). BRRN participants interested in revising or updating their strategic plan may contact the IAEA to request expert advice. Whether to have a BRRN strategic plan will be considered at the next meeting.
- e. **Development of a brochure** to advertise BRRN may be considered in the future following the coordinator report on irradiation services.
- f. **Coordinators** may be contacted if any need arises in a specific area and provide a bridge with the institute who can offer the service required.
- g. The participants requested France representative to share the report and forward their capabilities and needs to **French stakeholders**, to widen the coalition outreach.

#### 2) Education and training, coordinated by Sweden

- a) BRRN will explore possible sources of funding to assist Estonia and Lithuania providing experimental training at a RR. The representative of **Finland** will take the opportunity of a meeting this week in Bruxelles to explore the possibility that the European Commission may support such activity and will report on the meeting outcome by **11<sup>th</sup> February**.
- b) **Lithuania and Estonia** will provide a short description of which kind of experimental training they require. This should include a 1 week programme to be forward to EERRI and a 1 day training to be forwarded to Finland. **By 28<sup>th</sup> Feb**
- c) **Poland** will inform the IAEA, the coordinator and the interested countries whether a training programme for post-grad could be organized in English. **By 28<sup>th</sup> Feb**
- d) The **IAEA** will consider the possibility of including in 2012 workplan a dedicated workshop on education.

**3) Irradiation services, coordinated by Denmark**

- a) **Denmark** will send out a template to finalize a table with available capabilities for isotope production at operating RR facilities, including available RR schedules and maximal specific activities for individual radioisotopes produced. **By 15<sup>th</sup> Feb.**
- b) **All countries** will provide the information. **By 15<sup>th</sup> March.**
- c) The IAEA will consider including a dedicated workshop on RI tracers services for the industry and the environment in next year workplan. The workshop should identify specific cases where collaboration could be started immediately **Finland and Denmark** will send to the IAEA a prospectus and a list of potential experts.. **By 15<sup>th</sup> March.**
- d) **Lithuania** will provide a description of the NAA samples required for Ignalina to Germany, that will look into the possibility of performing the analysis. **By 28<sup>th</sup> Feb.**

**4) Neutron beam applications, coordinated by Germany**

- a) The IAEA will look into the possibility of including a dedicated workshop on this topic into the new project workplan (2012-15). The workshop would identify potential areas of applications and examine actual needs of the above techniques in R&D of advanced technologies such as fuel cells, batteries, car industry, etc. The information gathering should be extended beyond the participating institutions.

**5) Radioactive waste management and decommissioning, coordinated by Latvia**

- a) Latvia will share the template on how the relevant data base could be designed and created. Reference is made to the IAEA guidelines on the contents for similar documents. **By 15<sup>th</sup> February.**
- b) All countries representatives will forward the request to the relevant institution and provide a reply with comments on the template and an expression of interest in taking part in the initiatives. **By 28<sup>th</sup> February.**
- c) A revised template will be sent by Latvia, if there is a need to make any change. **By 15<sup>th</sup> March.**
- d) **All countries** will send the data. **By 15<sup>th</sup> May.**

## Annex I: AGENDA

### Wednesday, February 2

09:00 – 09:30	Introduction, meeting objectives	<i>Marta Ferrari, IAEA</i>
09:30 – 11:00	Country presentation	<i>Denmark, Estonia, Finland</i>
11:00 – 11:30	<i>Coffee Break</i>	
11:30 – 12:30	Country presentation	<i>France, Germany</i>
12:30 – 13:30	<i>Lunch</i>	
13:30 – 15:00	Country presentation	<i>Latvia, Lithuania, Norway</i>
15:00 – 15:30	<i>Coffee Break</i>	
15:30 – 16:30	Country presentation	<i>Poland, Russian Federation</i>
16:30 – 17:00	Exchange of ideas, summary of the day	

### Thursday, February 3

09:00 – 09:30	Country presentation	<i>Sweden</i>
09:30 – 11:00	Coordinator reports and discussion: 1. nuclear education and training 2. basic and applied research with neutron beams	<i>Sweden, Germany</i>
11:00 – 11:30	<i>Coffee Break</i>	
11:30 – 12:30	Coordinator reports and discussion: 3. irradiation services and radioisotope production 4. waste management and decommissioning	<i>Denmark, Latvia</i>
12:30 – 13:30	<i>Lunch</i>	
13:30 – 15:30	Technical visit to the institute	<i>All</i>
15:30 – 16:00	<i>Coffee Break</i>	
16:00 – 17:00	Report from EERRI last meeting, summary of the day	<i>Poland, All</i>

### Friday, February 4

09:00 – 09:30	Strategic planning	<i>Marta Ferrari, IAEA</i>
09:30 – 11:00	Discussion on Marketing and Public Relations <ul style="list-style-type: none"><li>▪ status of the <a href="#">web page</a>, <a href="#">group portal</a>, brochure and other marketing information</li><li>▪ planning of trade shows and other similar events to reach out to new customers</li></ul>	<i>All</i>
11:00 – 11:30	<i>Coffee Break</i>	
11:30 – 12:30	Revisions of the Work Plan and Action Item List Conclusions and recommendations of the Meeting	<i>All</i>
12:30	<i>End of the meeting</i>	

**Annex II: LIST OF PARTICIPANTS**

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