

Developing Research Reactor Coalitions and Centres of Excellence

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Background

- ~250 operational RRs (IAEA RRDB), but many are underutilized, face sustainability issues.
- Challenges related to aging, fuel management, financial security, and income generation.
- Increased global non-proliferation and nuclear security concerns.
- Pressure to convert to LEU, enhance physical protection, improve safety
- Complex environment for RRs, underutilized and under-funded facilities raise particular concerns.

Benefits of Improving RR Sustainability

- Effectively utilized and sustainable RRs have more resources to conform to non-proliferation standards and to fulfill international guidelines for safety and security.
- A well-utilized facility will be motivated to protect its “investment.”
- Assisting RRs to improve sustainability would also demonstrate benefits of LEU conversion as well as provide incentive for others to convert.

Benefits of Enhanced RR Cooperation

- May be best prospect to improve sustainability for capable RRs:
 - Increased utilization will improve financial security
 - Better able to meet non-proliferation, safety, security standards
- Provide access to those countries without RRs for high-quality RR capabilities.
- Enhanced cooperation could improve access of potential customers to the international RR community, and expand the market for RR services.
- International science projects increasingly require multilateral support/funding (JHR, CERN, ITER)
- Not a “zero-sum” game – not “robbing Peter to pay Paul.”
- **BUT** need to overcome parochial and nationalistic attitudes and competitive behaviour

IAEA Role/Activities

- IAEA playing important role in effort to address RRs non-proliferation, nuclear security, safety, and utilization issues.
- Agency program activities expanding related to:
 1. Non-proliferation (reactor core conversion and fuel supply, fresh/spent fuel take back)
 2. Utilization (specific applications, strategic planning, and regional networking).
 3. Security (physical protection assessment and upgrades),
 4. Safety (Code of Conduct for RRs, etc.)

IAEA Role/Activities

- IAEA has been promoting the notion of increased regional cooperation and networking between research reactors.
- TC Regional Project on RR Spent Fuel Management in Latin America.
- Department of Nuclear Applications and Department of Technical Cooperation meetings/workshops on regional networking.
- DG's Standing Advisory Group on Nuclear Energy (SAGNE) has recommended additional activities be undertaken to promote regional cooperation between RRs.
- IAEA uniquely positioned to provide broad, integrated expertise as it relates to IAEA's mandate in non-proliferation, promotion of peaceful uses, safety, and security and to serve as "honest broker"

IAEA Role/Activities

- IAEA as “facilitator” - generate and coordinate formulation of ideas/proposals/ventures.
- IAEA promote information sharing and mutual support.
- IAEA provide support (thru studies/analyses, meetings, expert missions, fellowships, PR materials etc.) for development of coalitions.
- Will integrate existing IAEA cross-cutting RR activities, including extrabudgetary funds, ongoing regular program activities, and TC projects.

Project Concept/Goals

- Create voluntary, subscription-based, self-financed coalitions of RR operators (which may include other participants, sponsors, etc.) that will:
 - Encourage/incentivise best-practices on RR nuclear material security, safety and non-proliferation/threat reduction matters;
 - Encourage/reward/provide incentives to conversion to LEU;
 - Coordinate marketing and sales of RR services to increase the availability of RR to potential customers (similar to airline alliance);
 - Develop rational and sustainable costing and pricing strategies;
 - Develop the cooperative environment required to establish centres of excellence and rationalize RR activities;
 - Create economies of scale to give groups of reactors more powerful voices commercially and politically and facilitate both fuel supply and “back-end” solutions;

Project Concept/Goals

- Provide shared access to RR to countries without RRs;
- Provide some functions similar to a trade association (interact with national governments and other relevant organizations to represent the collective interests of the coalition);
- Provide guidance for, help develop, and peer review strategic plans for the RRs involved, both individually and collectively;
- Catalogue and publicize the scientific and technical capabilities of the RRs in the coalition;
- Offer market analysis and marketing expertise to RRs;

Project Concept/Goals

- Encourage adoption of a common Quality Assurance/Quality control standards and implement a system of accreditation;
- Encourage/facilitate formation of joint ventures between highly utilized facilities requiring new, lower cost, or regionally sited irradiation capacity with capable but underutilized reactors;
- Carry out collective procurements or negotiations with suppliers to receive cheaper prices; and
- Assist with acquisition of external funding for such items as irradiation services, human resource development, including succession planning, and operational experience.

Project Development and Plans

- August – September 2006, IAEA Consultancy meeting extensively discussed the initiative, revised concept paper.
- October 2006, NTI Board approved the IAEA RR Coalitions and Centres of Excellence Grant Request.
- November 2006, TC project RER/4/029 “Enhancement of the Sustainability of Research Reactors and their Safe Operation Through Regional Cooperation, Networking, and Coalitions” approved.

Project Development and Plans

- October-December 2006 - IAEA informal consultations and brainstorming, development of “notional proposals”
- January 2007 - IAEA Consultancy on Project Planning for RR Coalitions adopted work plan and prioritized notional proposals related to:
 1. Africa, East Asia, Europe, and Latin America (2)
 2. Research reactor planning
 3. Medical and industrial radioisotope production/r&d
 4. Fuel irradiation and testing
 5. Neutron sciences and experimentation
- IAEA will soon issue official public request for submission of proposals for research reactor coalitions.

Future Activities

- Consultations/side meetings at IAEA Workshop on Strategic Planning for Sustainability – Mediterranean region, 19-22 March 2007, Vienna.
- Medical radioisotope r&d coalition planning mission in Latin America (Spring 2007).
- Imperial College training course on managing isotope production for commercial customers (May/June 2007).
- Possible meetings/missions in Africa, Russia and elsewhere in 2nd/3rd quarters 2007 for discussions between potential partners.
- Present/announce coalition(s) at RERTR 2007 (Prague) and 2007 IAEA research reactor conference (Sydney, November).

Conclusion

- Intl research reactor community needs to be poised to meet emerging societal needs, “nuclear renaissance,” climate change, nuclear medicine/biological sciences, etc.
- Requires financially strong institutions operating under best practices of safety, security, consistent with non-p goals
- Strengthened international and regional cooperation is essential.