

## Regional Project Concept Template (Category A)

The information contained in this template should be uploaded to the PCMF IT platform by the Chair of the relevant regional cooperative agreement or the NLO of the Member State submitting the concept by **31 May 2014** at the latest. Based on this information the IAEA will assess whether this project concept is in line with the TC quality criteria and requirements. Concepts positively appraised will be further developed into full project documents during the design phase.

<b>Region:</b>	Asia and the Pacific region		
<b>Regional/Cooperative agreement</b> (if applicable)		<b>Priority no. given by regional/cooperative agreement</b> (for concepts proposed under the auspices of regional cooperative agreements)	
<b>Title</b>	Networking for Nuclear Education, Training, and Outreach Programmes in Nuclear Science and Technology in the framework of ANENT (Asian Network for Education in Nuclear Technology)		
<b>Field of activity</b>	Education, Training, and Outreach		
<b>Regional project category<sup>1</sup></b>	<input checked="" type="checkbox"/> <i>Transnational</i> <input type="checkbox"/> <i>Regional standard setting</i> <input type="checkbox"/> <i>Capacity building for developing countries</i> <input checked="" type="checkbox"/> <i>Joint TC activities with a regional or international entity</i>		
<b>Names and contact details of project counterparts and counterpart institutions (starting with the main counterpart)</b>	<p><b>Thailand:</b>  <b>Ms. Supitcha Chanyotha (supitcha.c@chula.ac.th)</b>  <b>Nuclear Engineering Department, Faculty of Engineering</b>  <b>Chulalongkorn University, Bangkok</b></p> <p><b>Republic of Korea:</b>  <b>Mr. Sipyo Rho (sprho@kaeri.re.kr)</b>  <b>Nuclear Training &amp; Education Center</b>  <b>Korea Atomic Energy Research Institute</b></p> <p><b>Indonesia:</b>  <b>Mr. Hendriyanto Haditjahyono (hendriyanto@batan.go.id)</b>  <b>Center for Education and Training</b>  <b>National Nuclear Energy Agency (BATAN)</b></p> <p><b>Other ANENT Representatives:</b></p> <p><b>Australia:</b>  Ms. Herma Buttner  Australia Nuclear Science and Technology Organization (ANSTO)</p> <p><b>Bangladesh:</b>  Mr Md Zahedul Hassan  Bangladesh Atomic Energy Commission (BAEC)</p> <p><b>China:</b>  Mr Ai Desheng  Institute of Nuclear and New Energy Technology (INET), Tsinghua University</p> <p><b>India:</b>  Mr M. Ramanamurthi  Bahabha Atomic Research Centre (BARC), Department of Atomic Energy</p> <p><b>Japan:</b>  Mr Hiroyuki Murakami  Japan Atomic Energy Agency</p> <p><b>Jordan:</b>  Mr Mahmoud Assaf  Jordan Atomic Energy Commission (JAEC)</p> <p><b>Lebanon:</b>  Ms Rola Bou Khozam</p>		

<sup>1</sup> See the document entitled "Policy and Procedures for TC Regional Projects" at:  
[http://pcmf.iaea.org/DesktopModules/PCMF/docs/2014\\_15\\_Docs/notes/Regional\\_TC\\_Project\\_Policy.pdf](http://pcmf.iaea.org/DesktopModules/PCMF/docs/2014_15_Docs/notes/Regional_TC_Project_Policy.pdf)

	<p>Lebanese Atomic Energy Commission (LAEC)</p> <p><b>Malaysia:</b> Mr Shafaai Bin Hassan Malaysian Nuclear Agency</p> <p><b>Mongolia;</b> Ms Tserendavaa Amartaivan Nuclear Research Center, National University of Mongolian</p> <p><b>Pakistan:</b> Mr Muhammad Aslam Pakistan Atomic Energy Commission (PAEC)</p> <p><b>Philippines</b> Ms Corazon Casenas Bernido Philippines Nuclear Research Institute (PNRI)</p> <p><b>Sri Lanka:</b> Ms Janitha Abeywickrema Liyanage University of Kelaniya</p> <p><b>Syrian Arab Republic:</b> Ms Azza Kashlan Atomic Energy Commission of Syria (AECS)</p> <p><b>United Arab Emirates:</b> Mr Philip Beeley Khalifa University of Science, Technology and Research (KUSTAR)</p> <p><b>Viet Nam</b> Ms Nguren Thi Yen Ninh Vietnam Atomic Energy Agency (VAEA), Ministry of Science and Technology (MOST)</p> <p><b>Yemen:</b> Mr Abdulaziz Mohammed Ahmed Al-Shehari National Atomic Energy Commission (NATEC)</p>
<p><b>Analysis of regional Gap/problems/needs</b></p>	<p><b>Gap:</b> Many developing countries in the Asia Pacific region have a strong intention to embark on a nuclear power program as the alternative mean to meet their energy (electricity) demand. The utilization of radioisotope technology for human health and industry are also rapidly increasing in these countries. Nevertheless, the number of qualified human resources necessary to support these on-going as well as the future activities is still inadequate. Education, training, and outreach programs to help mitigate this human resources problem are needed.</p> <p>In order to provide quality education and training on nuclear science and technology, three essential elements are required:</p> <ul style="list-style-type: none"> <li>- Qualified instructors to deliver knowledge and experience</li> <li>- Teaching materials which are accurate and updated</li> <li>- Learning/training facility, specially that could be joint-utilized by all member.</li> <li>- Learning tools capable of supporting various modes of learning (e.g. on-site learning, e-learning, and long distance learning)</li> </ul> <p>Many member states in the region still lack some or all of these elements, especially for the education and training to support the nuclear power program.</p> <p>After the Fukushima accident, nuclear science and technology education in the region has also experienced a decline in the number of students. At this rate, it will be difficult to maintain and sustain the nuclear science and technology programs in all areas, including the main areas of focus recommended for the RCA activities in 2012-2017.</p> <p><b>Problems:</b></p> <ul style="list-style-type: none"> <li>- Although the IAEA has been putting in a lot of effort and investment to provide education and training courses for the MSs in many areas, there are still many problems because their demands are so diverse and the subjects of interest also change rapidly. There is also no control tower in education and training, which reduces the efficiency of</li> </ul>

	<p>the IAEA effort.</p> <ul style="list-style-type: none"> <li>- The education and training facilities in each member countries are very differ in quality and quantity as well.</li> <li>- Geographical condition of the Asia and Pacific region is covering very wide area then it causes high transportation cost for attending conventional course or training</li> <li>- The information and communication technology now are developed very fast and become very efficient but its utilization in education and training purpose are still low especially in nuclear fields.</li> <li>- Research reactor could be used as a tool to support education and training on how to operate the NPP, for example to learn about neutronic aspects, thermo-hydraulics, etc. The problem is that very few RRs have appropriate capability to be utilized for teaching or training purposes or are operated on a more continuous basis to support other utilization programs and are therefore not available for education and training purposes. Also, in most cases the available RRs do not belong to the universities or training institutes and are located far away from the students who need the experiments. However, many of these RR facilities have flexible schedules of operation that allow them to provide services for education or training activities.</li> <li>- Promotion of nuclear science and technology to young scientists and the public is necessary to create better understanding and appreciation of its value. There are many best practise of outreach materials and activities that have been developed in the ANENT countries. However, they have not been effectively shared among the Member States.</li> </ul> <p><b>Needs:</b></p> <ul style="list-style-type: none"> <li>- By uploading the e-learning contents to the learning management system such as the ANENT regional LMS at <a href="https://ilms.kaeri.re.kr">https://ilms.kaeri.re.kr</a>, we can accomplish the cost-effective learning and training in the Asia Pacific region. Blended learning may be one of the most efficient ways to capture learner's interest. All course materials can be systematically organized by the SME and experts in various fields from various countries on the basis of the Member's demand.</li> <li>- A long-distant research reactor experiment that is conducted via a web based application can be setup. This kind of experiment can bring reactor to the students from a long distance using internet technology. Training can be conducted by utilizing the ANENT regional LMS.</li> <li>- Best practise of outreach materials and activities can be developed, collected, and disseminated among the ANENT countries via the ANENT web portal and the ANENT regional LMS.</li> </ul> <p>The <b>Problem Tree</b> is attached.</p>
<p><b>Why should it be a regional project?</b></p>	<ol style="list-style-type: none"> <li>1. Nineteen countries from the Asia and the Pacific region have had many practical experience in e-learning through the cooperative network of ANENT since 2004.</li> <li>2. Since many developing countries in Asia do not have research reactor or the existing research reactor is not accessible for students, an option to conduct research reactor experiment at a dedicated reactor facility from a long distance is a welcome development. This activity can be done regionally.</li> <li>3. Many information, best practice, learning materials, and virtual tools for nuclear education, training, and outreach are available for sharing within the region.</li> <li>4. The ANENT countries should be encouraged to use the ANENT regional LMS for education, training, and outreach.</li> </ol>
<p><b>Stakeholder analysis and partnerships</b></p>	<p><b>Affected parties:</b> 19 Member States of ANENT and any other future Member States of ANENT in the Asia and the Pacific region.</p> <p><b>Direct beneficiaries:</b> Universities, R&amp;D organizations and training institutes in the Member</p>

	<p>States</p> <p><b>Roles of each party:</b></p> <ul style="list-style-type: none"> <li>- Thailand: <ul style="list-style-type: none"> <li>o Coordinate the entire e-learning development of tools and materials</li> <li>o Facilitate further use of the ANENT e-learning modules by the ANENT Member States</li> </ul> </li> <li>- Korea: <ul style="list-style-type: none"> <li>o Host and operate the ANENT regional LMS</li> <li>o Provide assistance, including training, to member countries that request to use the LMS</li> </ul> </li> <li>- Indonesia: <ul style="list-style-type: none"> <li>o Create and provide the Internet Research Laboratory (IRL) as well as the training course that allows students to conduct experiment on the Kartini RR in Yogyakarta, Indonesia via internet.</li> <li>o Within this context the Kartini RR would act as the 'host reactor', and other institution joining the IRL project with the host reactor will be the 'guest institutions'.</li> <li>o The host reactor should install the necessary hardware and software for reactor data collection and broadcast the reactor experiments via internet. Video conference equipment is also necessary to be setup in the control room to enable direct communication between the main instructor of the host reactor and the students on the remote site at the guest institutions.</li> </ul> </li> <li>- All ANENT member countries: <ul style="list-style-type: none"> <li>o Create and provide e-learning contents</li> <li>o The users (guest institutions) of the IRL at the remote sites should install the appropriate video conference systems and have the appropriate computers that should allow them to receive the signals and communicate with the reactor staff at the host reactor.</li> </ul> </li> </ul>
<p><b>Overall objective (or developmental objective)</b></p>	<ol style="list-style-type: none"> <li>1. To develop the technology of self-learning tools and methods</li> <li>2. To expand the learning subjects which is wanted from the learner and trainee</li> <li>3. To increase benefit/cost by the blended learning, which mix face to face learning and e-learning through Web</li> <li>4. To contribute to the enhancement of human resources and capacity building by educating the new generation through access to RRs in the region. This objective will be achieved through the utilization of the available RR in Indonesia to conduct reactor experiments to be broadcasted to guest institutions in Asia and the Pacific region in order to complement educational programmes in these countries with 'practical' components.</li> <li>5. To enhance young nuclear scientists' and public understanding and appreciation of nuclear science and technology, and its value to the society.</li> </ol>
<p><b>Analysis of objectives</b></p>	<p>Since the establishment of ANENT (Asian Network for Education in Nuclear Technology) in 2004, basic framework and infrastructure of collaboration among universities, R&amp;D organizations and training institutes have been arranged and improved in the Asia and the Pacific region, in good support by the relevant governmental organizations.</p> <p>A new Web Portal of ANENT was opened in 2013 to share, exchange and disseminate information and experiences of interest for the educational community in the region, and a regional Learning Management System (LMS) was installed into the Korean server as a regional hub of the IAEA LMS (CLP4NET) as an innovative tool for facilitating and promoting e-learning, noting insufficient and inefficient promotion and education in nuclear science and technology in the region.</p> <p>In this new phase it is required to take further actions to consolidate and</p>

	<p>enlarge the efforts of each university, R&amp;D organizations and training institutes into a regional stage to achieve the bottom-up of the regional status by fostering cooperation using the existing framework, ANENT. Therefore the main objectives would focus on:</p> <ul style="list-style-type: none"> <li>• Young scientists and the public need to understand and appreciate the roles of nuclear science and technology as well as its value to the society enhanced;</li> <li>• E-learning material available for sharing among the Member States in the region;</li> <li>• More outreach activities are needed to be delivered to the educational community and society;</li> <li>• Sufficient collaboration among the education and training institutes in the Member States is critical; and</li> <li>• Improved interaction and sharing of best practices.</li> </ul> <p>The <b>Objective Tree</b> is attached.</p>
<b>Role of nuclear technology and the IAEA</b>	<p>The IAEA is expected to:</p> <ul style="list-style-type: none"> <li>- promote the participation of the Member States by providing travel and accommodation fees for those who want to participate in the consultancy meeting and workshop on e-learning, IRL, and other topics organized under this project;</li> <li>- provide materials for training and outreach that can be distributed to the Public.</li> <li>- provide advice and assistance to the host reactor and guest institutions on the structure of the laboratory experiments;</li> <li>- provide necessary technical equipment to the host reactor and the guest institutions;</li> <li>- provide legal consultation for establishing legal agreements between the host reactor and the participating guest institutions; and</li> <li>- provide the operating costs for broadcasting the IRL for a period of 3 years (estimated to broadcast 5 experiments a year).</li> </ul>
<b>Project duration</b>	2016-2018 (3 years)
<b>Requirements for participation</b>	<p>The members of ANENT are recommended to participated in the training courses organized under this regional project (at least one trainee per country). At the ending of each course, participants should make a report to improve the regional course.</p> <p>The educational and training institutions in the ANENT Member States who that wish to participate in the IRA should have an academic curriculum in place in nuclear engineering, nuclear physics, or related science in which the experimental laboratories could be incorporated.</p> <p>Some members of ANENT should participate in the consultancy meeting</p>
<b>Participating Member States</b>	<p><b>Member States:</b> All ANENT Member States (Australia, Bangladesh, China, India, Indonesia, Japan, Jordan, Korea, Lebanon, Malaysia, Mongolia, Pakistan, Philippines, Sri Lanka, Syria, Thailand, UAE, and Vietnam)</p> <p><b>Major Roles:</b> Korea: host of the ANENT web server Indonesia: host of internet research reactor laboratory Thailand: developing the outreach materials and activities Japan: developing the nuclear engineering e-learning material Other Member States: providing other e-learning contents and expertise as well</p>

<b>Funding and project budget</b>	Estimate of the total project costs and the funding expected from each stakeholder:			
		Euro	Comment	
	<i>Government cost-sharing</i>		(to be sent to the IAEA)	
	<i>Counterpart institution(s)</i>	100,000	In kind contributions	
	<i>Other partners</i>			
	<i>IAEA Technical Cooperation Fund (TCF):</i>	<i>Fellowships / Scientific visits / Training courses/ Workshops</i>	150,000 200,000 75,000 30,000	<i>3 training courses 4 workshops 6 consultancy meetings IRL Transmission fees x 3 years</i>
		<i>Experts</i>	<i>90,000</i>	<i>3 missions</i>
		<i>Equipment</i>	<i>200,000</i>	<i>Server systems (including maintenance activity) and IRL equipment</i>
	<b>TOTAL</b>		<b>845,000</b>	