



*The World Organisation for NDT*

# **Report on IAEA activities** in the NDT field

May 2010

## Introduction

The International Committee for NDT (ICNDT) has for more than thirty years supported and cooperated with the IAEA, assisting with the latter's activities in the field of non-destructive testing. This is recognised in the ICNDT Constitution, which includes:

“to promote international collaboration in all matters relating to NDT, including collaboration with international organisations with an interest in NDT, e.g. International Organisation for Standardisation (ISO), International Institute of Welding (IIW), International Atomic Energy Agency (IAEA), UNIDO, World Federation of NDT Centres, etc.”

Many of the experts utilised by the IAEA are closely involved with the ICNDT and its member societies.

Several of the member societies of ICNDT were, in fact, formed as a result of projects initiated by IAEA.

The support of IAEA for the development of NDT is of crucial importance in less developed countries in Asia (central and south east), Africa and Central and South America.

IAEA's publications such as its Training Guidelines are referenced in ICNDT's *Guide and Recommendations for Qualification and Certification of NDT Personnel according to ISO 9712 and Aligned Standards*.

There is a strong synergy between ICNDT's interests in training and qualification of NDT personnel and IAEA's activities in this field.

The ICNDT Executive is keen to engage with IAEA to work out a mutually beneficial strategy for the support of NDT development in less developed countries in order to promote safe and efficient use of NDT in the interests of maximising plant safety.

In order to understand the 'status quo', ICNDT members have drawn up a report summarising the current IAEA projects of which they have knowledge.

### Peter Trampus – 14 February 2010

<i>Project Name / Ref Number</i>	<b>HUN/4/017</b>
<i>Region / Geographical Area</i>	Europe / Hungary
<i>Scope of Work:</i> Renewing the licence for the Paks nuclear power plant.	
<i>Start Date:</i> 2009	<i>End Date:</i> 2011
<i>Objectives:</i> To contribute to the country's reliable and long-term power supply by means of safely operating the Paks nuclear power plant beyond its designed plant life and renewing the original (30 years) operational licence, in order to ensure public and environmental safety while adapting international good practices and requirements.	
<i>Current Status:</i> Ongoing.	
<i>Involvement of ICNDT Members:</i> Experts assigned from US, France, Czech Republic and EC JRC.	
<i>Comments:</i> ISI / NDT are just subjects of a dedicated workshop.	

**Matthias Purschke – 8 February 2010**

<i>Project Name / Ref Number</i>	<b>Information System on Occupational Exposure in Medicine, Industry and Research (ISEMIR)</b>
<i>Region / Geographical Area</i>	Worldwide
<p><i>Scope of Work:</i></p> <p>Mandate for the Working Group on Occupational Exposure in Industrial Radiography (WGIR). (The mandate was endorsed by the Advisory Group on 22 January 2010.)</p> <p>To draw an overview picture of the situation concerning occupational exposures and radiation protection of staff in industrial radiography (radiographers and other industry and client staff members) all over the world.</p> <p>To identify both good practices and shortcomings and define all types of actions (training, managerial, behavioural...) to be implemented for assisting the industry, clients and regulatory bodies in avoiding exposures to accidents and in implementing the ALARA principle.</p> <p>To propose recommendations for harmonising monitoring procedures.</p> <p>To set up a system for regularly collecting occupational doses for these individuals and for reporting incidents, and for dissemination of this information.</p>	
<i>Start Date:</i> 22 January 2010	<i>End Date:</i> Open
<p><i>Objectives:</i></p> <p>Helping operating companies (licensees) and operators (workers) to keep ALARA (As Low As Reasonably Achievable):</p> <ol style="list-style-type: none"> <li>1. the dose due to normal exposure (if normal exposure is justified); and</li> <li>2. the risk of exposure due to accidents.</li> </ol> <p>The members of the Working Group agreed that the aforementioned stakeholders will mostly benefit from sharing information to achieve objective 2. It was then asked which aspects/subjects would be the most important to share information on. This led to the following list (not in order of priority):</p> <ol style="list-style-type: none"> <li>a) Training and qualification of radiographers.</li> <li>b) Learning from incidents (deviations, near misses, accidents).</li> <li>c) System and procedures in place to assure safe operations.</li> <li>d) Individual and workplace monitoring.</li> <li>e) Systems and procedures for the control of radioactive sources.</li> <li>f) Systems and procedures for emergency preparedness and response.</li> </ol>	
<p><i>Current Status:</i></p> <p><b>Workplan</b></p> <p>Only work on Action 2 will be undertaken in the period until the next WGIR meeting in October 2010.</p> <p><b>Action 2 – Overview of occupational exposure in industrial radiography (IR)</b></p> <p><i>Step 1:</i> The three questionnaires will be finalised, ready for the pilot test and validation, at the end of the first week of February 2010.</p> <p><i>Step 2:</i> All WGIR members are to ask one or two (representatives of) licensees and one or two operators in their region to test the respective questionnaires – namely, the parties need to complete the questionnaire, indicate how long it took and make comments on the questions, both generic and on details, especially any ambiguities or lack of clarity in a question. The test questionnaires with remarks should be sent to John by the end of February. IAEA to do the same test with a few regulatory bodies and members of the Advisory Group. (John)</p>	

*Step 3:* If remarks are only 'cosmetic', they should be integrated by John and the final questionnaires sent to all WGIR members for the final distribution.

If they are more substantive, they should be sent to all WGIR members, and Matthias will modify the Operator questionnaire accordingly, Richard the Licensee questionnaire and Kamal the Regulatory Body one. The new questionnaires should be circulated to all WGIR members and the final versions should be available by the end of March.

*Step 4:* The distribution of the questionnaires will be done in April 2010; the IAEA will make use of its network for the regulatory bodies. Each WGIR member will explore as many options as possible to distribute the Licensee and Operator questionnaires as widely as possible in their regions. In addition, all national professional organisations will receive these two questionnaires through Matthias. The ISOE network will be contacted, for these two questionnaires, by Gonzague. Richard will contact the Oil and Gas Associations. IAEA will check with Technical Officers with a view to distribution via the NDT national contact points. Some coordination will be needed – for example, if you are making contact with a person or organisation that is in another person's region, please inform them.

*Step 5:* The completed questionnaires should be sent by those answering by the end of June directly to John.

*Step 6:* Analysis to be performed by the IAEA during the summer, hopefully with the help of an intern or similar.

*Step 7:* The results will be discussed at the second meeting, 6-7 October 2010, with a view to moving towards the regular collection of dose data, as well as a way for collecting and spreading lessons learned from incidents.

*Involvement of ICNDT Members:*

M Purschke will use the networks of ICNDT and EFNDT.

*Comments:*

Working Group Members:	R Van Sonsbeek (The Netherlands), Chairman	<i>(Operating Company)</i>
	M Purschke (Germany)	<i>(NDT Society)</i>
	G Abela (France)	<i>(Client)</i>
	A Razak Hamzah (Malaysia)	<i>(Technical Service Organisation)</i>
	F Da Silva (Brazil)	<i>(Regulatory Authority)</i>
	K Sahaimi (Morocco)	<i>(Training Organisation)</i>
	T Levey (Canada) (via telecom)	<i>(Operating Company)</i>

IAEA Staff Members:	J Le Heron	<i>(Scientific Secretary)</i>
	R Czarwinski	
	J Hunt	
	R Cruz Suarez	
	J Wheatley	
	H Mansoux	

	C Lefaure (France)	<i>(IAEA consultant)</i>
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**John Thompson – 8 February 2010**

<i>Project Name / Ref Number</i>	<b>QA and Accreditation of RT and NDT in Industry 333-F2-05CT06249, I.2.03/Task 2</b>
<i>Region / Geographical Area</i>	–
<p><i>Scope of Work:</i>                  Consultant's meeting 18-21 July 2005 at IAEA, Vienna, with subsequent work progressed by email. Expected outputs:</p> <ol style="list-style-type: none"> <li>Identification of problems related to certification and harmonisation.</li> <li>Preparation of a draft copy of 'TECDOC'.</li> <li>Identification of possible future NDT projects.</li> <li>Meeting report.</li> </ol>	
<i>Start Date:</i> 18 July 2005	<i>End Date:</i> December 2005
<p><i>Objectives:</i></p> <ol style="list-style-type: none"> <li>To review the current status of NDT certification schemes in different countries (and regions) for compliance to ISO 9712.</li> <li>To recommend model regulations to national certification bodies with a view to achieving harmonisation at the regional level.</li> <li>To identify problems and shortcomings related to the development of national certification bodies at the national scale.</li> <li>To propose recommendations for preparation of model regulations for certification and harmonisation of certifications to ISO 9712:2005 in developing countries.</li> <li>To discuss the future directions of NDT programmes in view of the development of harmonisation of certification and to make relevant recommendations.</li> </ol>	
<p><i>Current Status:</i>                  Completed; IAEA Tecdoc issued.</p>	
<p><i>Involvement of ICNDT Members:</i>                  No, contributors were engaged as consultants.</p>	

### Kwaku Aboagye Danso – 8 February 2010

<i>Project Name / Ref Number</i>	<b>Promoting Sustainability of Non-Destructive Testing Facilities – RAF/8/043</b>
<i>Region / Geographical Area</i>	Africa
<p><i>Scope of Work:</i></p> <ol style="list-style-type: none"> <li>1. Development and implementation of a regional training and certification strategy for Level I, II and III NDT personnel.</li> <li>2. Enhanced competitiveness of NDT inspection service facilities through good managerial practices including quality management, financial management, marketing and strategic planning.</li> <li>3. Strengthened sustainability of NDT facilities through promotion of income generating activities.</li> </ol>	
<i>Start Date: 2007</i>	<i>End Date: 2011</i>
<p><i>Objectives:</i></p> <p>To promote sustainability of non-destructive testing facilities in the African region.</p> <p>Programme Management Officer: Michel M R Warnau, Africa Section 1.</p>	
<p><i>Current Status:</i></p> <p>The increased application of NDT techniques in industrial quality control in developing countries has compelled (17) African countries to form the African Regional Cooperation Agreement (AFRA) for NDT.</p> <p>The IAEA has supported the establishment and optimisation of the utilisation of NDT facilities in the African region. Under the AFRA programme, support has been provided from 2002 to 2006 under project RAF/8/032 'Strengthening Regional Training Capability in Non-Destructive Testing'.</p> <p>Under this RAF/8/043, the following are some of the achievements made:</p> <ol style="list-style-type: none"> <li>1. Two Regional Designated Centres have been established, one in Tunisia (CETIME) and one in South Africa (SAIW), for francophone and anglophone countries, respectively. The two centres have been conducting training and certification examination for NDT personnel for Level III certification.</li> <li>2. Basic infrastructure and equipment are in place in the majority of the participating countries.</li> <li>3. Increased availability of trained and qualified persons in Levels I and II.</li> <li>4. Increase in provision of NDT inspection services to industry.</li> <li>5. Establishment of a network of National NDT Project Coordinators.</li> <li>6. Participation in Coordinated Research Programmes (CRP) of the IAEA.</li> <li>7. Availability of training materials as per ISO 9712 requirements.</li> <li>8. Availability of a core group of NDT experts in the region.</li> <li>9. Establishment of the African Federation for NDT (AFNDT).</li> <li>10. Incorporation of NDT in higher education in some countries.</li> </ol>	
<p><i>Involvement of ICNDT Members:</i></p> <p>Doug Marshall (Past ICNDT President) has been providing expert services on behalf of IAEA for a number of African countries that are members of AFRA.</p> <p>Countries involved: Algeria, Angola, Cameroon, Democratic Rep of the Congo, Egypt, Ethiopia, Ghana, Kenya, Libyan Arab Jamahiriya, Mauritius, Morocco, Nigeria, South Africa, Sudan, Tunisia, United Republic of Tanzania, Zimbabwe.</p>	
<p><i>Comments:</i></p> <p>It is hoped that IAEA and ICNDT will continue to support Africa in its quest for enhanced capabilities in NDT.</p>	

**Silvia Infanzon / Douglas Marshall – 9 February 2010**

<i>Project Name / Ref Number</i>	<b>Establishing Regional Harmonisation in the Qualification and Certification of Personnel and in the Infrastructure used in the Non-Destructive Testing of Systems, Structures and Components (ARCAL CXVII)</b> <b>RLA/8/044</b>
<i>Region / Geographical Area</i>	Latin America
<i>Scope of Work:</i> Regional harmonisation in qualification and certification of personnel and in the infrastructure used in the non-destructive testing of systems, structures and components (ARCAL).	
<i>Start Date:</i> 01.01.2009	<i>End Date:</i> 31.12.2011
<i>Objectives:</i> To establish a national scheme and harmonised regional qualification and certification for non-destructive testing personnel and the infrastructure used to evaluate structures, systems and components as a way of guaranteeing the future requirement for certified personnel to assist in stable cost-benefit development and maintenance of nuclear facilities. Programme Management Officer: Jose Antonio Lozada, Latin America Section 2.	
<i>Current Status:</i> Ongoing.	
<i>Involvement of ICNDT Members:</i> Argentina, Bolivia, Brazil, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Haiti, Mexico, Paraguay, Peru, Uruguay, Venezuela.	

<i>Project Name / Ref Number</i>	<b>Coordinated Research Project 14138</b>
<i>Region / Geographical Area</i>	–
<i>Scope of Work:</i> Optimisation of digital industrial radiology (DIR) techniques for special applications and development of procedures and protocols.	
<i>Start Date:</i> 2007	<i>End Date:</i> 2010
<i>Objectives:</i> The overall objective of the project is to develop the methodologies based on simple, low-cost and affordable digital radiography techniques for selected material and defect investigations by non-destructive testing (NDT). Fluoroscopes were constructed and are being tested.	
<i>Current Status:</i> Ongoing.	
<i>Involvement of ICNDT Members:</i> Algeria, Argentina, Brazil, Canada, Germany, India, Malaysia, Pakistan, Romania, Syrian Arab Republic, Uruguay, Uzbekistan.	

### Douglas Marshall – February 2010

<i>Project Name / Ref Number</i>	<b>Applying Advanced Digital Industrial Radiology and Computed Tomography in Industry and Civil Engineering RAS 8110</b>
<i>Region / Geographical Area</i>	RCA member states
<i>Start Date: 2007</i>	<i>End Date: –</i>
<p><i>Objectives:</i></p> <p>The overall objective of the project is to improve the capability of RCA member states to apply and routinely use advanced industrial radiography and tomography techniques to improve production quality and safety. The specific objectives are:</p> <ol style="list-style-type: none"> <li>1) to extend the utilisation of portable digital industrial radiography (DIR) systems;</li> <li>2) to establish quality management systems (QMS) in accordance with ISO standards;</li> <li>3) to extend the application of portable gamma tomography systems for <i>in situ</i> applications in process and petrochemical industries; and</li> <li>4) to facilitate the implementation of harmonisation schemes for non-destructive testing (NDT) certification in accordance with ISO 17024.</li> </ol> <p>Programme Management Officer: Prinath Dias, RCA Focal Person, Division for Asia and the Pacific, Department of Technical Cooperation, International Atomic Energy Agency. Tel: +431 2600 22313; Email: m.p.dias@iaea.org</p>	
<p><i>Current Status:</i></p> <p>Mid-Term Progress Review Meeting in Hanoi, Vietnam, 2-7 August 2010. The meeting will also discuss the constraints faced by the MSs in achieving the project objectives and discuss the possible solutions to ensure successful completion of the project and to ensure its sustainability. Subject to the decision of the Regional Meeting of the National RCA Representatives to be held in April 2010, the Mid-Term Progress Review Meeting will also provide an opportunity for the participants to discuss the scope of a possible project for implementation under the 2012-2013 TC Cycle.</p>	
<p><i>Involvement of ICNDT Members:</i></p> <p>Countries involved: Australia, Bangladesh, China, India, Indonesia, Republic of Korea, Malaysia, Mongolia, Myanmar, New Zealand, Pakistan, Philippines, Singapore, Sri Lanka, Thailand, Vietnam.</p>	

## Conclusions and Recommendations

1. There is a great deal of synergy between the current activities of IAEA and the wishes and ambitions of the ICNDT (as reflected in the ICNDT's Strategic Plan).
2. ICNDT Executive members should meet with senior IAEA personnel to work out a mutually beneficial strategy for the support of NDT development in less developed countries in order to promote correct and efficient use of NDT in the interests of maximising plant and personnel safety.



Published on behalf of ICNDT by the Publishing Department, The British Institute of Non-Destructive Testing,  
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