

The Role of IAEA/AFRA on the Promotion of NDT in Africa

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Abstract

The important role that the International Atomic Energy Agency (IAEA) and the African Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology (AFRA) are playing in promoting the use of Non-destructive Testing (NDT) in Africa is presented. The IAEA under its various programmes such as individual country Technical Co-operation (TC) projects and Regional Projects have enabled many countries in the region to acquire basic infrastructure and NDT equipment.

The IAEA/AFRA programmes have contributed to the establishment of two Regional Designated Centres (RDCs), which are providing training leading to internationally accepted qualification and certification of NDT personnel.

Introduction

It is recognized that industrial development must be closely related to the application of quality and safety controls. The development of accepted quality and safety standards in manufacturing and engineering is a long term process requiring well-qualified manpower. One of the most important conditions of successful industrial development is the proper practice of Non-Destructive Testing (NDT).

Realizing the importance of NDT in the promotion of economic growth, fifteen African states are participating in the African Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology (AFRA) Project in Non-Destructive Testing.

Through the assistance of the International Atomic Energy Agency (IAEA) and AFRA, majority of the participating countries have basic infrastructure and equipment in place.

Also, through IAEA fellowships, and group training courses, a number of NDT practitioners have been certified to level I, II or III in the four basic methods of radiographic testing (RT), ultrasonic testing (UT), magnetic particle testing (MT) and liquid penetrant testing (PT).

IAEA/AFRA Assistance for the Promotion of NDT in Africa

The International Atomic Energy Agency (IAEA) continues to support the establishment and optimization of the utilization of NDT facilities in the Africa region. Under different AFRA Programmes, support has been and is being provided under the following projects:

- RAF/8/017 - Non-Destructive Testing Techniques (1991 - 1996)
- RAF/8/025 - Non-Destructive Testing in Industry (1997 – 2001)
- RAF/8/032 - Strengthening Regional Training Capability in Non-Destructive Testing (2002 – 2006)
- RAF/8/043 - Promoting Sustainability of Non-Destructive Testing Facilities (2007 – 2011)

Since 1979, the IAEA has provided NDT expertise, equipment, training and consultations on certification to numerous countries in the region, through its own Regular Programme or by executing bilateral assistance for UNDP and other donors.

AFRA has since 1993 been assisting its member states in the field of NDT methods with particular emphasis on capacity building for certification and qualification of NDT personnel, upgrading of available infrastructure as well as bridging the gap between the advanced countries and the others where the expertise is still needed. This has resulted in the introduction and partial establishment of NDT technology in most of the countries.

Achievements

The main achievements of all the above previous and on-going assistance are the following:

- Establishment of Project Co-coordinators and counterpart institutions in each of the member states.
- Adoption of ISO 9712 as the basis for training and certification of NDT personnel
- Establishment of AFRA Designated NDT Centres in Tunisia (CETIME) and South Africa (SAIW)

- Training of core group of personnel from each of the member states.
- Provision of some essentially needed equipment to supplement the existing NDT facilities in some of the member states.
- Introduction of specific areas of NDT applications such as NDT of Concrete, NDT in Railways, NDT for In-Service-Inspection etc.
- Production of some essentially needed training materials.
- Establishment of well-equipped NDT laboratories and NDT Societies in twelve (12) member states.
- The formation of African Federation of Non-Destructive Testing (AFNDT).
- Increase in provision of NDT inspection services to industry.
- Participation in Coordinated Research Programmes (CRP) of the IAEA.
- Availability of core group of NDT experts in the region.
- Incorporation of NDT methods in higher education in some countries.
- In terms of promoting good managerial practices, the projects have encouraged the development of strategic plans for facilities in participating member states.

Regional Designated Centres

The increased application of non-destructive testing techniques in industrial quality control in developing countries call for standardization of training, qualification and certification of NDT personnel throughout Africa. The fifteen member states participating in the AFRA project have opted for a regional approach to maximize scarce resources and avoid proliferating facilities with low national demand. Currently the majority rely on training and certification of NDT personnel at two Regional Designated Centres (RDCs), as recognized by all member states of AFRA. The Centres are Southern Africa Institute of Welding (SAIW, South Africa) and Centre Technique des Industries Mecanique et Electriques (CETIME, Tunisia).

Until recently none of the AFRA countries had acquired the necessary capability for certifying NDT personnel at Level III, which represents the expertise that is needed to establish a sustainable NDT capacity for training and promoting NDT techniques at national level. Therefore only few personnel in Africa have been certified for level III in foreign countries according to their standards and until now, opportunities to be examined within the region have been practically non-existent. To enhance regional self-reliance in

NDT training, the first Level III examinations were held in Africa under Project RAF/8/032. During 2003 and 2004, three regional training courses followed by examinations for Level III were supported by the Agency at the two AFRA Regional Designated Centres, candidates were screened according to the access conditions laid down by ISO 9712. By the end of 2007, four Anglophone and three Francophone training courses leading to examinations have been held. NDT practitioners from fourteen (14) member states have benefited from this initiative and over hundred NDT personnel have obtained Level III from the two RDCs. About 50% of the candidates presented for the examinations passed. This is within the range of internationally observed limits and it can therefore be concluded that the capability to train and certify NDT personnel to Level III has been firmly established within the region.

Promoting Sustainability of Non-Destructive Testing Facilities

The previous AFRA projects have made significant achievements as reported above. There are, however, outstanding constraints which need to be addressed. These relate to the sustainability of the NDT facilities to provide services in training and /or inspection.

The present five year project, AFRA/8/043, "Promoting Sustainability of Non-Destructive Testing Facilities" seeks to address these constraints.

The main issues that are being addressed in this project are:

- Development and implementation of a regional training and certification strategy for Level I, II, and III NDT personnel.
- Enhanced competitiveness of NDT inspection service facilities through good managerial practices including quality management, financial, marketing and strategic planning.
- Strengthened sustainability of NDT facilities through promotion of income generation activities.

Conclusion

The impact of the IAEA/AFRA projects in Member States is significant. The interaction, which takes place in fellowship training, scientific visits and expert missions, is invaluable exposure to the standards and capabilities of the region. This makes a substantial contribution to increased regional self-reliance as members of AFRA learn about the resource capabilities and capacities of each country.

The availability in the region of certified NDT practitioners and equipment have made companies in member states to rely on local personnel to carry out non-destructive testing work which would have been done by resources outside the region.