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Training and Tutoring for experts of Nuclear Regulatory Authorities and their TSOs to strengthen regulatory and technical capabilities

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Introduction

The ITER-Consult Consortium is implementing the EU financed T&T activity to "enhance, develop or strengthen Technical and Regulatory capacities of the staff of Nuclear Regulatory Authorities (NRAs) and their TSOs of Partner Countries outside EU", since 2011. The 3rd Phase of the EU INSC MC3.01/13 project is in progress and will end in 2019.



Training & Tutoring activity

Fifty - two training courses on nuclear and radiation safety for different topics (about 30) have been implemented since 2015, each with a duration of one week:

- 28 of them developed and implemented as **dedicated training courses** held in EU and
- 17 of them developed and implemented as **dedicated Regional Training Courses in five regions** (Latin America, South-East Asia, East Europe-Central Asia, South Africa and North Africa) and 8 existing courses.



Eighteen tutoring modules (2 months duration) were carried out at NRAs/ TSOs headquarters in EU (ISPRA/ITER, NRG, TUV SUD, BNRA, HAEA, SNSA/JSI) for an overall duration of 33 months. Two selected staff from the PCs participated in each tutoring course (2 months duration) for a total of **34 persons** coming from NRA of Armenia, Belarus, Brazil, Indonesia, Iran, Jordan, Malaysia, Mexico, Mongolia, Nigeria, Philippines, South Africa, Thailand, Vietnam, Ukraine. A total of **62 man-month of tutoring** activity has been implemented up to now.

Summarizing up to July 2018 a total of **722 trainees** have been involved in T&T coming from NRA/TSO of 21 partner countries.

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|--------------|------------------|
| 1. Algeria | 12. Morocco |
| 2. Armenia | 13. Nigeria |
| 3. Belarus | 14. Philippines |
| 4. Brazil | 15. Serbia |
| 5. Egypt | 16. South Africa |
| 6. Indonesia | 17. Tajikistan |
| 7. Iraq | 18. Thailand |
| 8. Jordan | 19. Turkey |
| 9. Malaysia | 20. Ukraine |
| 10. Mexico | 21. Vietnam |
| 11. Mongolia | |

In addition **33 trainees** were registered for Existing Training Courses in EC and Russia.

From the **Contractor side about 175 senior experts** belonging to the consortium partners (NRAs, TSOs and research institutes) have contributed to the activity performed.

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T&T Needs

Capacity building for staff of nuclear regulators represents a key achievement to set up and ensure an effective nuclear infrastructure for nuclear and radiation safety. Nuclear Regulatory Authorities (NRA) and their Technical Support Organization (TSO) need to develop a wide range of professional capacities including: legal-regulatory framework; roles & responsibilities; safety objectives principles and requirements; licensing process for nuclear and radiation facilities; technological aspects of facilities (NPP, RW, radioactive sources); analytical tools for independent assessment, regulatory inspection; physical protection; emergency preparedness; public communication. Training and tutoring (T&T) on these topics need to be specifically planned and implemented by professionals having senior experience as regulators and TSO and with the view and perspective of the regulatory role. The tutoring modules envisaged by the EC project need to be carried out at NRA or TSO headquarter with progressive involvement in concrete activity to effectively transfer approach and working methods.

These basic elements have been adopted and implemented while carrying out the activities of the "INSC Project MC3.01/13: Training and Tutoring for experts of the NRAs and their TSOs to strengthen regulatory and technical capabilities -" financed by the European Commission.

Consortium members



Project objective and achieved results

Project objective:

The main objective is the enhancement of capacities of Nuclear Regulatory Authorities (NRA) of the Partner Countries, including their Technical Support Organizations (TSO), in order to allow the NRAs to become reasonably self-sufficient in terms of management and technical capacity.

Specific objective:

The specific objectives consist in enhancing the capability of Nuclear staff, and of their supporting TSOs, to conduct independent in depth assessment and review of safety cases, to conduct inspections, to issue regulations and guides and to manage the authorization process and related decision making. These specific objectives are ensured by the programming and implementation of training and tutoring (T&T) activities based on the needs of the partner countries.

Achieved results:

- Training and Tutoring (T&T) of staff of Nuclear Regulatory Authorities including their TSO;
- Developed a toolkit of T&T modules on the aspects of Nuclear and Radiation Safety;
- Promoted cooperation between the EU and NRA of partner countries.

More specifically :

- Transfer of EU best practices for regulating nuclear and radiation safety;
- Promote the nuclear regulator role, functions and its independence
- Create a dedicated Website servicing the partner countries for their training needs;
- Elaborate the "EU cooperation national training plan" for each partner country;
- Establish relations among partner countries and with EU member states ;
- Train the staff from NRAs and TSOs of partner countries;
- Enhance the institutional capacity in partner countries;
- Complement training with tutoring courses;
- Elaborate appropriate and comprehensive training material.



Conclusions

The project activities have been fully and effectively implemented according to planning, expected results and with optimization of use of the budget.

The effectiveness being referred to the transferred knowledge, approaches and capacity for the major functions of authorization, review and assessment, inspection and enforcement, issue of regulations and guides.

This transfer includes also the strengthening of the confidence of NRA staff in performing their function.

The constant relation of the Consultant with the PC's has shown to be a key aspect for the successful implementation of the project together with the extensive experience of our project team having the possibility to rely on a significant number of NRA-TSO organizations and in particular on 4 Regulators contributing not only to the training but primarily to the tutoring activity having the unique know-how and responsibility on regulatory licensing and inspections.

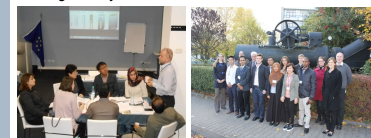
In partner countries entering a nuclear program it is of the utmost importance to transfer know-how and promote the correct interpretation of the role and function of the NRA and its independence from the other stakeholders.

Feedback from the PCs on how the attendance to the T&T activities has been effective in filling their gaps in competence and enhancing their capacity is expected to further improve this activity.



Being Effective

Key factor for the successful implementation of the project, has been the extensive experience of the consortium team relying on 4 Regulators (BNRA, ISPRA, SNSA, HAEA) and 6 TSOs organizations. They have contributed to ensure training and ad hoc tutoring activity .



The feedback from performed T&T activity has confirmed that:

A) Regarding organization and implementation:

- T&T courses for staff of NRA need to be developed mainly in a "dedicated" approach (it is hard to find trainings on the market meeting specific NRA/TSO needs);
- Training activity needs to be conducted by senior lecturers with long experience in NRA and TSO activity in particular for regulatory licensing and inspection activity;
- T&T activity needs to maintain continuous focus on the role and responsibilities of the NRA and its internal organization;
- It is important to have in the project team sufficient human resources (and facilities) as Regulators and TSO to face the T&T needs and offer the best contents and services;
- It is useful to complement, whenever possible, training with tutoring.



B) Regarding methods of T&T, the importance of:

- Setting clearly goal and objective for T&T courses tailored for NRA role and functions;
- Ensuring sufficient background and basic competence of the trainees;
- Adopting methods of delivery combining effectively training content and process;
- Promoting continuous interaction with the trainees;
- Presenting and analyzing case studies opportunely selected;
- Performing practical applications in subgroups;
- Promoting discussion and multilateral communication;
- Creating a positive atmosphere in which also the trainees take the responsibility for the training outcomes;
- Performing final evaluation of the T&T courses and feeding back the identified improvements;
- Complementing training with site visits.

Technical final questionnaires (40 - 60 questions) submitted to the trainees at the end of each course to check the learning level have shown correct answers ranging, as average, between 70 and 89 per cent with constant increase in effectiveness.

During the T&T activity the best international practices have been presented and discussed. The EU framework for nuclear and radiation safety has been promoted (Directives, ENSREG, WENRA) together with EU national approaches and practices for regulatory, licensing and technical support functions.

