Train-The-Trainers activities in Radiation Protection-TTT

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OBJECTIVE.

- To present the CIEMAT experiences in the Train the Trainers activities in RP:
  - For traditional training or Face-to-Face (FTF).
  - For e-learning

1.OVERVIEW

- The **training of competent professionals** in the design, management and evaluation of training programs in **RP**, providing the tools and technological knowledge necessary to assess the main needs in the area, **is part of a National sustainable E&T system**.

- Building competence through Education & Training is essential to guarantee **radiation safety**.

- Ciemat has integrated the TTT actions into their E&T standard activities:

  - First as **informal way**:
    - Meetings with the lecturers at the beginning of a new E&T activity.
    - The elaboration of training guides for authors and tutors;
    - Elaboration of templates for the lectures; etc.

  - In the last years has been done in a **formal way:**
    - Related with RP: the most of them with the IAEA and WP4 ENETRAP III.
    - Related with the energy: collaboration with international organizations: AECID, UNITED NATIONS,…

2. MATERIALS AND METHODS.

- The content for the first TTT course was developed in 2007 based on the CIEMAT experience of more than 40 years of teaching professionals and experts in Energies.
- The first TTT courses aimed to provide: teaching materials, resources and technical tools to design training actions according to the needs of each country in the area of energies.
- The main contextualized methodological training tools were exposed through practical cases.
- At the end of the course the participants **had acquired a series of skills** for the online and face-to-face activities, attending to the level of each of the designed training events.
- The participants are also expected to contribute to the training of other professionals in their respective countries.

Protección Radiológica

IAEA

- ✓ During the last years, **CIEMAT** has collaborated with the **IAEA** in several TTT-experiences
- ✓ due to the great experience delivering **E&T activities in RP**
- ✓ by the e-**learning** and the **Face-To-Face (FTF)** methodologies
- ✓ and with a special emphasis in the **Spanish-speaking countries**.

2.1 OBJECTIVES OF THE TTT PROGRAMS

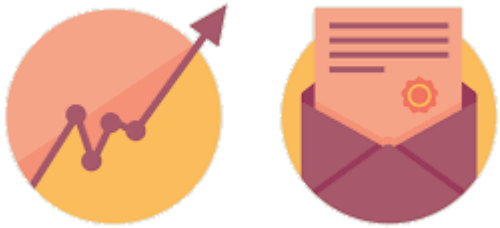
Practical TTT programs covers best practices and addresses such challenges as assessing and leveraging existing knowledge, establishing an environment of trust and engagement.

The objectives of the TTT courses are provide participants with everything they need to perform teaching duties.

3. RESULTS AND DISCUSSION.

At this communication will be described a summary of the most relevant ones and in deep the lasts actions performed, one for the Face-To-Face (FTF) training and two referred to the e-learning system.

1. Regional Course: Train- the- Trainers for RPO of medical and industrial facilities. Montevideo, Uruguay
2. E-learning system for radiation protection for the Argentine Nuclear Regulatory Authority. Buenos Aires, Argentina.
3. IAEA Fellowship at CIEMAT: Establishing an e-learning System for Training in Radiation Protection.
4. Other TTT related activities developed by CIEMAT.


3.1 IAEA Regional Course: Train- the- Trainers for RPO of medical and industrial facilities. Uruguay

One week, from 12th to 16th March 2018 in Montevideo, Uruguay

Objective:

- To ensure that the countries have enough RP trainers to support the establishment of **sustainable national safety infrastructure**.
- To create **pool of trainers** with the technical competence, practical experience and teaching skills to support a sustainable national training programme for RPO

The purpose of the course was to provide participants with:

(i) **Theoretical knowledge** of roles, duties and competence of a RPO of medical and industrial facilities;

(ii) **Practical skills** to design and deliver a training sequence on technical topics in order to act as trainer of RPO in their countries.

3.1 TTT for RPO of medical and industrial facilities. Uruguay

Learning Objectives RPO:

- Acquire the pedagogical and didactic competences necessary for the design, planning, management and implementation of a Training Plan
- Explain the role and duties of RPO
- Summarize the competences of RPO (IAEA syllabus)
- Perform a training needs analysis to prioritize activities and tailor a training session to your target audience
- Select/use interactive training methods for adult learners
- Enhance your presentation and communication skills
- Demonstrate your learning by designing/delivering a training sequence
- Use of CLP4NET
- Utilizing effective presentation and communication skills

3.1 TTT for RPO of medical and industrial facilities. Uruguay

Program:

Monday

- IAEA Key Requirements
- RPO (role, duties, competence)
- Introduction to learning
- Exercise 1 (Short talk)

Tuesday

- The IAEA syllabus for RPO
- IAEA Training Packages
- How adults learn
- Course design and lesson planning
- Exercise 2 (Planning training sequence)

Wednesday

- The Group Exercise
- Exercise 3 (Design of Group Exercises)
- Communicating with a group
- Teaching aids

Thursday

- Exercise 4 Designing and Delivering a Training Sequence (Preparation & Delivery)

Friday

- Exercise 4 (cont)
- Feedback Questionnaire
- Discussion/Review

3.1 TTT for RPO of medical and industrial facilities. Uruguay

Topics considered:

- The IAEA syllabus for RPO
- How adults learn (learning theories, application in Radiation Protection training);
- Course design and lesson planning;
- Communicating with a group (body language, using the space, creating the right atmosphere, questions and answers, listening, and feedback);
- Teaching aids;
- Course design and Course evaluation.

"I give master classes because I do not know how to use participatory learning techniques."

To help adults in the learning process

3.1 TTT for RPO of medical and industrial facilities. Uruguay

Summary of the main aspects of this training action:

- The course had a total of **21 participants** from the region (including 5 national participants).
- The program included:
  - Theoretical presentations.
  - Individual practical exercises and work groups.
- **Tests** were conducted before and at the end of the course whose **comparative results** allow us to affirm that the participants acquired the skills related to the delivery of courses.
- **As part of the technical discussions, there was a concern of the countries of the region:**

  to the existence of **national regulatory requirements** that require **tertiary level** of training of the RPO, which prevents people with inferior education from being appointed to this position.

3.1 TTT for RPO of medical and industrial facilities. Uruguay

Summary of the main aspects of this training action:

- It was also stated that: in several of the countries the **role and functions** assigned to **the RPO** are similar to those recognized by **the IAEA for the figure of the RPE,** which does not appear in several of the **national regulatory frameworks**.
- Was recommended **the revision of the national regulatory frameworks** in order to develop this figure properly as well as the necessary tools for the formal recognition of them.
- Likewise, attention was drawn to the need to have materials that allow for **distance training activities (e-learning courses),** especially for those countries where access to areas with a significant shortage of qualified personnel is insufficient to perform functions of the OPR.

3.2 IAEA workshop: E-learning system for radiation protection for the Argentine Nuclear Regulatory Authority.

One week, from 5th to 12th May 2018, in Buenos Aires, Argentina.

The objective

Develop and implement an E-learning system for radiation protection for the Argentine Nuclear Regulatory Authority, mainly for the PGEC in RP.

The purpose of the course:

Focused on the **Train-the-Trainers of RP** but also in the **establishment of a complete e-learning system for RP, including**:

- **creating instructional strategy and design;**
- transforming the FTF content to the suitable form for e-learning - including creation of storyboards, defining of the learning objectives, right sequencing of the modules;
- **working with Moodle platforms since the side of the coordinator/administrator, the teacher and the student;**
- **Train the coordinators to train the online trainers.**
- **taking full advantage of the tools included in the package and additional plugins;**
- working with authorizing software to produce SCORM packages, etc.

3.2 E-learning system for RP for the Argentine NRA.

Program:

Monday

- Opening Session and Introduction
- Objectives and Expectations of the Week
- IAEA E-learning Activities in Radiation, Transport and Waste Safety
- CIEMAT E&T programme and E-learning Activities in RP&NT
- Presentation and Status of the Current PGEC Programme.
- Discussion.

Tuesday

- Introduction to E-learning.
- The planning of elearning courses: from Face To Face to Online.
- E-learning Content Development
- The planning of elearning courses - from FTF to online: Case Study and Practical Session

Wednesday

- Introduction to Learning Management Systems
- IAEA Moodle Platform and Its Use in Radiation, Transport and Waste Safety
- CIEMAT Moodle Platform and Its Use in Radiation Protection and Nuclear Technology
- Learning Management System.
- Learning Management System. Creation of a course: Case Study and Practical Session

Thursday

- Introduction to the Authoring Software Tools. Integrating Interactive Elements
- Templates for E-learning Design.
- E-learning Design. Creation of contents with articulate. Case Study and Practical Session

Friday

- Setting Up the Development Plan for Argentina

3.2 E-learning system for RP for the Argentine NRA.

Summary of the main aspects of this training action:

- **14 Participants**: 12 from the Nuclear Regulatory Authority and 2 from the National Atomic Energy Commission.
  - Most of them had technical profiles participating as lecturers in several specialized courses.
  - A few people works on the E&T area at different positions.

The theoretical program was developed according to the established agenda and three practical sessions:

- **1st** Planning of e-learning courses - from FTF to online, through the discussion between all the participants
- **2nd** Each participant prepared his material **with the help of CIEMAT author guidelines**. To prepare the material to be transformed into e-learning using the selected author tool (Articulate Storyline).
- **3th practice, C**arried out in the Moodle platform of CIEMAT a training session to manage the platform at administrator and teacher level. A script of practices ,the materials and resources necessary for realization were made available.

3.2 E-learning system for RP for the Argentine NRA.

Summary of the main aspects of this training action II:

- In the **CIEMAT Virtual Classroom,** a repository of documentation was created and later was migrated to the **LANENT platform** for access by all participants.

- Finally, the Argentine "Nuclear Regulatory Authority" established the planning to implement the e-learning methodology and enhance the possibilities of their Moodle Platform.
- In the satisfaction surveys, the participants expressed **a high degree of satisfaction** and fulfilment of their expectations and **increased knowledge**.

3.3. IAEA Fellowship at CIEMAT: Establishing an e-learning System for Training in Radiation Protection.

One month, from 2nd to 30th of November, 2017, in Madrid, Spain.

The objective

To adapt the knowledge acquired during the fellowship to the framework of the national project LIT9016 for the establishment of an E-learning system for radiation protection training in Lithuania.

Description:

A professional from the Lithuania RB came to CIEMAT to perform a fellowship of mentoring on the job training to learn about how to establish an e-learning system in RP.

At this action, the trainee was instructed:

- **not only as a trainer** but also **to be capable to adapt the Lithuanian system of education and training in RP and waste safety to an e-learning system** in all the aspects involved,
- with emphasis in the **coordinator role** with competences not only **in E&T in RP** but also in the **technical domain** and in **pedagogical domain,**
- with the **capacity to train the future online trainers.**

3.3. Fellowship to Establishing an e-learning System for Training in RP.

The program:

1. The CIEMAT training program in Radiation Protection and Nuclear Technology.
2. Introduction to an e-learning system. CIEMAT experience.
3. Basis of e-learning.
4. Overview of e-learning software platforms.
5. Pedagogical methodology of the e-learning
6. Moodle platform installing.
7. Moodle management: as student, as lecturer and as manager.
8. E-learning training contents. Kind of contents. Author tools. Integration in the e-learning system.
9. The planning of e-learning training courses.
10. The training course development.

ESTABLISMENT OF AN ELEARNING SYSTEM FOR TRAINING IN RADIATION PROTECTION

5

Pedagogical methodology of the e-learning
The Psychology of e-Learning
Keys for learning succeed
Selection criteria for e-learning
Basis for an effective e-learning
Reusability, standards and learning objects
The hidden curricula of e-learning

9

The planning of e-learning training courses
Differences between a face-to-face and online training
The management of the calendar, human resources;
Duration of the e-learning training courses according to the field (medical, industry, RPO, workers);
The interim evaluation - is it foreseen, is it provided online or only at RB, are there any restrictions ;
Is there the time limit for how long the trainee has a right to do the final evaluation test after he finished the course
The re-evaluation,
The quality control system of e-learning system - the aspects of the management;

3.3. Fellowship to Establishing an e-learning System for Training in RP.

Main remarks of this training action:

- During the fellowship, the trainee had the opportunity to **observe and participate in the coordination** of:
  - "RP Expert Technician Course", delivered October 2017 to February 2018
  - and in the preparation of the 3th edition of the "Gamos/Geant4 For Medical Physics & Radiation Protection Simulations Course", which was delivered in English and in Spanish.
- Prepared the scheme of the organization and implementation of training courses for RPO and EW dealing with sources of ionizing radiation, state administrative persons working in the field of accident management, for state officers, RPC personnel, foreign specialists, students and public regarding RP and preparedness for radiological emergency as well refresh of qualification for the application of the system in Lithuania.
- He was introduced in the **virtualization of their own materials** and started to prepare their own **teaching guides to instruct their authors/tutors**.
- The experience was very productive for both parts, because there was a good exchange of ideas and experiences.

3.4. Other related activities developed by CIEMAT.

At the previous slide the most recent activities related with the **Train-The-Trainers** and the **establishment of RP e-learning systems** has been described but other experienced has been developed and can be summarized:

- CIEMAT- CEDDET FOUNDATION WORKSHOP: TRAIN THE TRAINERS IN RENEWABLE ENERGY. Spanish Cooperation Training Center. Santa Cruz de la Sierra. Bolivia 15th-19th October, 2007.
- CIEMAT-IAEA WORKSHOP: IMPLEMENTATION OF AN E-LEARNING SYSTEM. CIEMAT EXPERIENCE. Ciemat, Madrid, 15th -17th December, 2008.
- EDUCATIONAL STRATEGIES IN PR. COLLABORATION BETWEEN CIEMAT AND IAEA. Ciemat, Madrid, 17th-18th May, 2010.
- Work Package 4: Development of the train-the-trainers strategy and organization of a TTT training event. ENETRAP III project. 7PM. From 2014 to 2018.
- TRAINING OF TRAINERS FOR THE SAFE TRANSPORTATION OF RADIOACTIVE MATERIAL. CIEMAT, Madrid. 25th- 29th September, 2017
- CIEMAT-UNIDO ONLINE COURSE: Train the trainers. Delivering e-learning courses. First half year 2019
- CIEMAT-UNIDO ONLINE COURSE: Train the trainers. Moodle management. First half year 2019




4. CONCLUSIONS.

- TTT activities developed by CIEMAT are focussed on PARTICIPANTS developing of knowledge and skills to act as a trainer in RP activities.
- Highlight that CIEMAT started in the fifties its activities in E&T in the nuclear domain by the traditional way, broaden the to the e-learning methodology in 2005, with the creation of the Virtual Classroom, in parallel with the ENETRAP project (FP7).
- Ciemat has accumulated a big experience in Train-The-Trainers (TTT) matters, starting in the 2007 with the first TTT course in the energy domain to the present, collaborating with International organisms like the IAEA, United Nations Industrial Development Organization or AECID.
- Participants in TTT courses gain the **skills and knowledge** necessary to contribute effectively to the **RP safety** in many different situations. They have a better understanding of their potential roles and they are in a position to contribute to the training of other professionals acting as trainers of RPOs in their countries.

Thanks for your attention!!