

# **Report of the Technical Meeting on Training for Regulatory Bodies in Member States with Nuclear Power Plants (NPPs)**

**17 – 19 December 2007**

## **1. Introduction**

The Technical Meeting was convened following a Consultant Group<sup>1</sup> in March 2007 to help advise IAEA on ways in which it might improve the training available for Regulatory Bodies in Member States (MSs) with NPPs. The Consultant Group had proposed a number of possible actions, but the Agency wished to test whether there was broader support amongst MSs for the ideas that had been proposed, or whether there were any other ways in which the Agency could provide better assistance to the Regulatory Bodies within MSs.

## **2. Method of working**

After introductory welcoming remarks<sup>2</sup>, the meeting started with a number of presentations from Agency staff<sup>3</sup> in a number of Divisions on the work they did in training and the provision of training material for the personnel in MSs, including within the Regulatory Bodies, the staff of operating NPPs and other places of work with ionising radiation.

Delegates then split into four groups<sup>4</sup> to discuss the approach used for the training of regulators in each of the MSs, including the training policies, examples of good practise, current challenges and needs, and how the Agency might support the training programmes of MSs.

In a subsequent plenary session, the Chairperson of each country group summarised the group's findings. These have been detailed in Appendix 3. Following the presentations, there were further questions and discussions for clarification. In particular, the recommendations on how the Agency might better support the training of the Regulatory Bodies in MSs were captured<sup>5</sup> and fed back to the MSs' delegates on the final day in plenary session.

There followed a wide ranging discussion, in which delegates were able to expand on their initial ideas and suggestions, and the Scientific Secretary for the meeting, Maria Moracho, was able to clarify what the Agency was already doing, and what might be done in the future. This discussion led to the formulation of a number of Actions, shown in Section 3 of this summary report.

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<sup>1</sup> The IAEA invited a Consultant Group to advise it on ways to improve the training materials it provides to assist in the training of Regulatory Bodies in MSs with NPPs. The Consultant Group met on 19 – 23 March 2007, and consisted of Kaisa Koskinen, STUK, Alfred Kraut, GRS, and Jim Furness, Consultant (formerly NII). The Group's final report was made available to the delegates attending the Technical Meeting.

<sup>2</sup> An Agenda for the meeting and a List of Participants are attached as Appendix 1 and 2.

<sup>3</sup> Presentations were made by Maria Moracho, NSNI, Adriana Nicic, NSNI, Stéphane Calpena, NSNI, Gita Sadogapan, NSRW, Mike Modro, NSNI, and Kersten Dahlgren Persson, NE.

<sup>4</sup> Group 1 consisted of India, Iran and Pakistan, Group 2 consisted of Bulgaria, Finland, Hungary, Lithuania, Romania and Slovakia, Group 3 consisted of Canada, Spain and USA, and Group 4 consisted of Belgium, France, Germany and the Netherlands.

<sup>5</sup> Viewgraphs of the recommendations are attached as Appendix 4.

### 3. Plan of Action

On the basis of the summary of recommendations to the Agency, the way forward proposed by the Technical Meeting is as follows:

- An Advisory Group (AG) should be formed to advise the Agency on the best strategy to adopt in support of the education and training activities of the Regulatory Bodies. The AG would provide advice on:
  - How the Agency's education and training would support the implementation of the IAEA Safety Requirements and Guides.
  - How the training programmes for regulators would enable them to better comply with the requirements of the Nuclear Safety Convention and in meeting the expectations of IRRS missions.

The AG would also facilitate:

- The identification and sharing of best practice for the training of regulators.
  - The identification of training needs which might be best met through shared specific training projects.
  - The promotion of co-operation, knowledge sharing and transfer amongst the participant countries, possibly through cooperation at a regional level.
- Working Group members strongly supported the concept of training as part of an integrated Knowledge Management system. Indeed, members felt that there was little point in training unless there was a proper system within the recipient organisation for retaining and transferring the learning from the initial trainees to their successors within the recipient organisation.
  - The Agency should continue to work to improve the access through its website to existing documents and training materials. For those not fully familiar with the detailed structure of the Agency's documentation, this can present a significant obstacle. For example:
    - The search engine is not always capable of linking directly from search field within the Agency's main home page to any specific document, or a listing of all the documents in a given series, even if the specific IAEA document reference number is entered. It is necessary to successfully navigate a pathway through several sub-pages before the required reference can be found.
    - The Technical Meeting delegates strongly recommended that the Agency should remove any obstacles that currently prevent the addition of links that would assist the users in MSs to directly and quickly locate documents for which they are searching. It would greatly assist if there could be a web page for sharing training issues, with the necessary links to outside organisations which make suitable training material available for open use.
  - The Agency should provide a document listing useful safety assessment codes that would be of interest to MSs. This could form the start of a database of information to which MSs could contribute by supplying the Agency with links to training material that is freely available. During the meeting, Canada in particular pointed

to the fact that much of the CNSC material used in the training of regulatory staff was freely available on its website<sup>6</sup>.

- Such a database would help MSs to search for useful material, and save MSs or the Agency having to develop material that already exists.
  - It is suggested that the database could be structured around the Four Quadrant model<sup>7</sup> used in IAEA-TECDOC-1254. It could also be linked to the ‘Thematic Areas or Facilities and Activities’ current structure<sup>8</sup> of IAEA’s documentation. One further idea is that the database could be linked to the WENRA Reference Levels that have been derived from IAEA’s documentation, and that are likely to become the framework used for the harmonisation of regulation in a number of MSs.
  - The database could include the references, including ISBN numbers, to useful textbooks that are available through libraries.
- The Agency should continue its present policy of improving existing training materials.
    - A number of MSs continue to make good use of the Basic Professional Training Course (BPTC). The BPTC textbook was still useful, but some of the lectures on CDs used on the BPTC and a number of other training courses now look very dated: they were regarded as boring by many delegates.
    - Delegates considered that one of the best forms of distance learning was by the use of interactive CDs or DVDs, which test the student on each module to determine whether the knowledge has been absorbed, requiring students who do not achieve the required test score to repeat the training until they obtain a satisfactory score, before allowing them to progress to the next module.
    - It was recognised that such training materials are inevitably more expensive to produce, so the rate at which training materials could be converted and issued in this form would inevitably depend on the availability of resources.
  - It was considered that the Agency could also support the MSs to do more to help themselves through improved collaboration between regulators in groups, based either on regions or on reactor types, e.g. WWER, PWR, BWR and CANDU.
    - It was noted that there is good cooperation between the operators of reactors of the types mentioned above, but that this cooperation is less developed between the corresponding regulatory bodies.
    - Most regulatory bodies currently seem to prefer to hold discussions with their peers on a bilateral basis, one exception being the cooperation between regulators in the MSs that are either contemplating the design certification or who are already constructing NPPs based on the EPR design.

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<sup>6</sup> For a portal to the training documentation available from the Canadian Regulatory Body, CNSC, can be found at: <http://canteach.candu.org/> Clicking on the ‘Documents Library’ opens a page listing relevant documents from many sources, then clicking on ‘CNSC’ opens the page listing training documents prepared by CNSC.

<sup>7</sup> See IAEA-TECDOC-1254, page 15 and the following pages. This TECDOC can be found at: [http://www-pub.iaea.org/MTCD/publications/PDF/te\\_1254\\_prn.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/te_1254_prn.pdf)

<sup>8</sup> See the IAEA document structure shown on the Agency’s website at: <http://www-ns.iaea.org/standards/>

- One good practice noted was the help that the Agency is able to provide to the regulatory bodies in MSs to help them cope with temporary peaks in their workload. The example quoted was the work that the Agency is doing to help the UK to assess the generic designs of the four types of reactor whose vendors have applied for generic design acceptance<sup>9</sup>.

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<sup>9</sup> Details of this process can be found at: <http://www.hse.gov.uk/nuclear/reactors/design.pdf>

## Appendix 1

### Agenda proposal for Technical Meeting “Training for Regulatory bodies with NPPs“

	Monday, Dec 17, 2007	Tuesday, Dec. 18, 2007	Wednesday, Dec.19, 2007.
09:30	Introductory remarks <b>(Mr. Jamet and Mr Viktorsson)</b>	Working Groups  Preparation of Conclusion papers	Training in the Safety Assessment Area <b>(M Modro)</b>
09:45	Presentation and Adoption of the Agenda <b>(Chairman, Scientific Secretary)</b>		Training in Management Systems <b>(K Dahgren Persson)</b>
10:00	NSNI Training Activities <b>(M J Moracho)</b>		Sum up of and conclusions from Wednesday <b>(Jim Furness)</b>
10:30	Conclusions of a consultants meeting on Training for Regulators <b>(Jim Furness)</b>		Sum-up of discussion <b>(Chairman, Scientific Secretary))</b>
11:00	Coffee Break	Presentation of working groups conclusions <b>(Facilitators)</b>	Group discussion: how could the IAEA support the training programs of regulators in the Member States
11:30	Training and the Management Systems of the Regulator <b>(A. Nacic)</b>		Proposal of an advisory group to the IAEA on training for Regulators <b>(M. J Moracho)</b>
12:00	Licensing of new build: Needs of regulatory competencies and training <b>(S. Calpena)</b>		Discussion
12:30	Training for regulatory bodies on radiation safety <b>(G Sadagopan)</b>		
13:00	Lunch Break	Lunch Break	Lunch Break
14:30	Presentation of Working Groups: <b>(M.J. Moracho)</b>	Presentation of working groups conclusions <b>(Facilitators)</b>	Future actions
15:00 -	Break up into of working groups	Discussion of working groups' conclusions	
17:00	Close of the day	Close of the day	Wrap up Closing of the meeting

## Appendix 2: List of Participants

	Title	First Name	Surname	Company	Address	Country	Tel:	Fax:	Email
1	Mr.	Pierre	Mignot	Association Vincotte Nucleaire	Rue Walcourt 148 B-1070 Brussels Belgium	Belgium	00 32 2 5280234	00 32 2 5280102	pim@avn.be
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**Appendix 3: “Training for Regulatory bodies with NPPs“  
Vienna 17-19 Dec 2007  
Summary of WG conclusions**

**Working groups discussed and drew the following conclusions:**

**Good practices & success stories**

- Establishment of R&D institutes.
- R & D work is initiated quite early in the emerging technologies.
- Successful co-operation amongst regulators.
- Use of the IAEA Basic Professional Training Course.
- Refreshers' courses.
- Emphasis is on Knowledge Storage, Easy Retrieval and Integration in the Organization.
- IAEA TC projects.
- Implementation of a training system embedded in a QMS, leading to the application of SAT in a structured way.
- Optimised combination of training courses (external and internal), self-study and OJT, with assistance of a dedicated coach or mentor, is a good approach for implementation of the induction training.

Examples of good cooperation at all levels are:

- If language allows, training courses organised in one country can be attended by trainees of another country, releasing the RB of the need to develop its own training material.
- Exchange of experts or inspectors was initiated by France with the neighbouring countries (UK, Belgium).
- Beside the cooperation among Western European countries there was also cooperation with Eastern European countries (e. g. in TACIS projects).
- Practices that worked out well for recruiting and training:
- Canada and US have entry-level programs for new university graduates that include classroom training, self-study, and on-the-job training. All have job specific training/qualification programs for experienced nuclear and other industry technical personnel.
- UK hires exclusively from industry.
- Spain hires university graduates and experienced personnel, but requires testing of all applicants.

**Recommendations for IAEA support**

- IAEA Meetings organized regularly. However, each regulatory body should make their presentations and share their experiences with each other.
- IAEA can sponsor senior experts from some of the countries as faculty members in countries where training program is in initial stage of development.
- IAEA can provide structured course materials and suggest the references that can be followed in the training program.

- If required, IAEA can sponsor experts at the time of critical activities like commissioning if the concerned country so desires, or organize the training before such activities on the request of MSs.
- Textbooks to be developed and/or optimized for training purposes.
- Development of a more user-friendly interface for access to the textbooks.
- Establishment of a Task Force for listing and collecting useful national training material (in particular in electronic form).
- successful cooperation with licensees on training of newcomers - simulator training
- cooperation with other regulators on developing training programmes and material.
- international co-operation has been fruitful.
- computer aided training could be used for some parts on induction training - time consuming, does not dependent on time or place.
- IAEA can institute a scheme on qualification improvement program (like M.Tech. or Ph.D. on different topics in coordination with MSs).
- IAEA may arrange workshop on “Train the Trainer in a manner to certify the trainers through conducting examination after the workshop.
- IAEA may facilitate or provide support to Member States for mutual cooperation in the area of Education and Training.
- IAEA assistance is needed to share the knowledge/expertise between Member States in specialized courses like:
  - Inspections and Enforcement.
  - Periodic safety review.
  - Ageing management, etc.
- to arrange annual workshops for changing information on training policies and practices - to change information of training needs.
- to train the trainers.
- to make competence tools available for all MS (microsimulators).
- to assist on competence analysis.
- to put all training material available.
- to create interactive training material on some areas
- to arrange technical meeting to discuss the content of training seminars (regional) - too much focus on basic level.
- to promote scientific visits.
- to rationalize TECDOCs.
- IAEA needs to better market the existing training material. We are unsure of what is available and how to get it. What’s the process for having IAEA provide training to requesting countries.
- Recommend continuing technical meetings on training and KM for regulatory bodies.

### **Current challenges**

- Both US and Canada face challenges to acquire and train staff to support new builds and new training requirements for new build.
- US determining how to provide simulator training on new designs.
- Canada may select technology other than CANDU.
- Spain is starting to change their training model into a competency framework following TECDOC-1254.
- UK considering need to hire university graduates.
- Knowledge needs - new reactor designs.

- Insufficiently covered areas for training of RB and TSO staff:
  - industrial/ labour safety.
  - digital I&C.
  - review of licensee's organisation by RB.
- a challenging task to carry out induction training for each newcomer - a possibility to increasing cooperation.
- competencies needed are depending on life cycle.
- deregulation - can cause a special need for training in some countries.
- the main challenge is staff retention - training can be perfect but if a RB cannot retain its staff and turnover is high a lot of efforts are wasted.
- good HRM.
- the fluctuating nature of regulatory work - a huge amount of tasks have to be carry out at the same.
- retirement / ageing of staff / tacit knowledge.
- how to motivate young people to start nuclear studies.
- Spain challenged to maintain staff and currency in new technologies in light of nuclear being frozen by government.
- All challenged to transfer knowledge from experience to lesser experienced staff.
- Knowledge capture of retiring staff.

**Training for Regulatory Bodies with  
NPPs**

17-19 December 2007

**IAEA**

**Summary of WG Discussions, 18 Dec 2007,  
Main Recommendations to IAEA**

These are grouped under the following headings:

1. Systematic Approach to Training.
2. Existing Training Materials.
3. Improved Knowledge Transfer.
4. Better Marketing of IAEA Training.
5. Training Advisory Group.

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## **Summary of WG Discussions, 18 Dec 2007, Main Recommendations to IAEA**

### **1. Systematic Approach to Training (SAT).**

- Strong support for the use of SAT.
- Considerable interest in the Training Needs Analysis (TNA) Matrix tool for detailing competence requirements and training needs of individual post holders.
- Interest in the provision by IAEA of tools to assess the Effectiveness of Training.

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## **Summary of WG Discussions, 18 Dec 2007, Main Recommendations to IAEA**

### **2. Existing Training Materials (slide 1).**

- The BPTC continues to be used by some countries, but some material now looks out of date.
- The BPTC Textbook should be retained, but a number of the lectures on CDs are boring and need to be updated, possibly using interactive CDs which test the absorption of the training.
- TECDOCs and INSAG documents are a useful source of training material. They should be retained, but placed under Thematic Areas or Facilities and Activities.

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## **Summary of WG Discussions, 18 Dec 2007, Main Recommendations to IAEA**

### **2. Existing Training Materials (slide 2).**

- Training materials should cross-reference TECDOCs and INSAG documents, not just Requirements and Guides.
- The IAEA should provide a database of useful textbooks, open access computer codes, and any training material produced by MSs which might be useful to other countries. This database should be arranged by Thematic Areas or Facilities and Activities.
- IAEA should systematically check through the KSAs shown in TECDOC-1254 to identify areas for which there is either inadequate or no existing training material, and devise a plan to fill the gaps.

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## **Summary of WG Discussions, 18 Dec 2007, Main Recommendations to IAEA**

### **3. Improved Knowledge Transfer.**

- IAEA should ensure that when it provides training, this becomes part of a comprehensive Knowledge Management (KM) system within the recipient MS, not simply the handing over of information.
- IAEA should provide MSs with guidance that enables them to set up comprehensive KM systems, both within licensees and regulatory bodies.

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## **Summary of WG Discussions, 18 Dec 2007, Main Recommendations to IAEA**

### **4. Better Marketing of IAEA Training.**

- There is an impression among some Western MSs that the marketing of IAEA training is skewed towards Eastern Europe, the Middle East and Asian countries.
- The need for training new recruits affects all MSs.
- It may now be appropriate to re-assess whether enough effort is devoted to informing all MSs exactly what is available and how they should set about accessing this training material. Much of the training sought could be made available from existing documents, or other training materials, without detracting from the IAEA staff effort devoted to training in those MSs with a shorter background in the use of nuclear technology and radiation sources.

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## **Summary of WG Discussions, 18 Dec 2007, Main Recommendations to IAEA**

### **5. Setting up an Advisory Group (AG) on Training for Regulatory Bodies.**

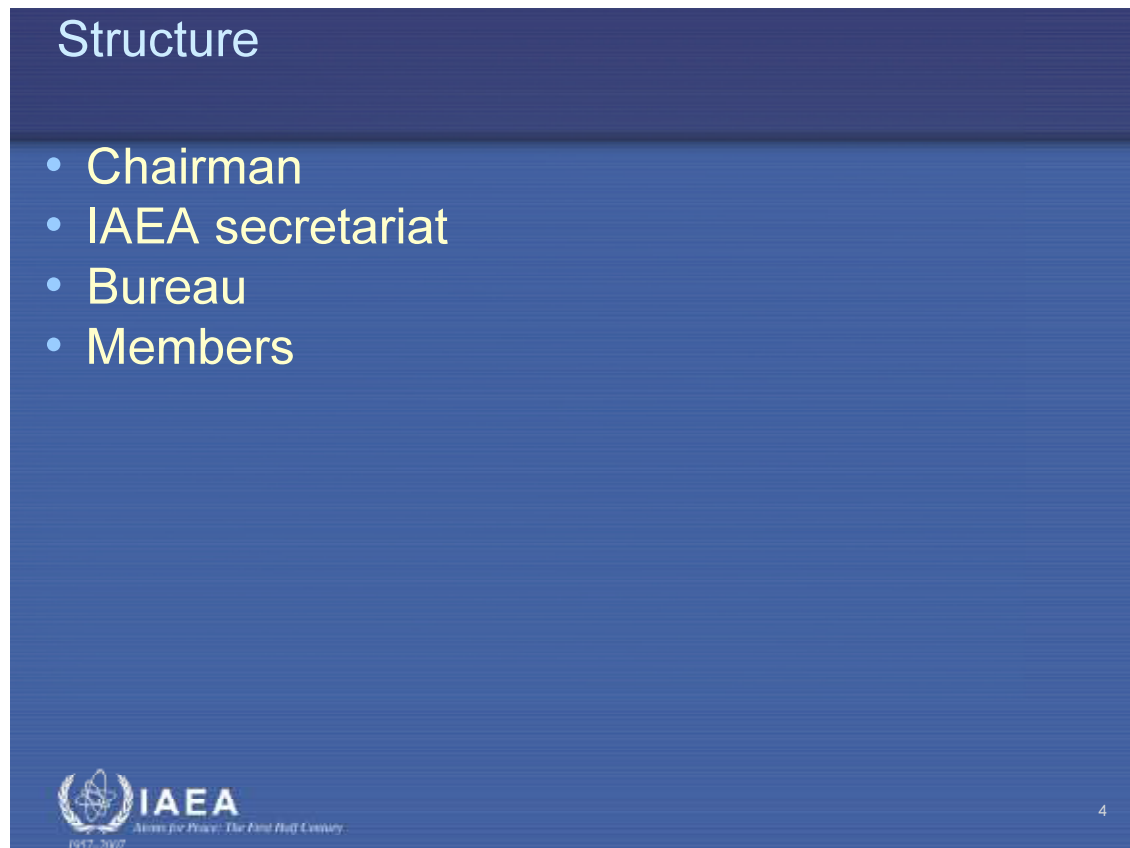
- Delegates at the Technical Meeting supported the idea of setting up an AG on Training for Regulatory Bodies.
- The AG could greatly assist the Agency in identifying the best strategy to support the training programmes for regulators in MSs.
- The AG could assist in the identification of area in which additional or improved training materials and activities provided by the Agency could benefit MSs.
- The AG could also provide a forum for the exchange of best practice and encourage the development of a harmonised approach to training for the regulators in MSs.

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