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REGULATORY ACTIVITIES IN GAINING ASSURANCE OF TRAINING PROGRAM EFFECTIVENESS IN CANADA

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I will be presenting a regulator's point of view on evaluating training program effectiveness. First, I will give you a bit of background on the Canadian Nuclear Industry, then on how we regulate to verify Nuclear Power Plant personnel performance. Secondly, I will propose ideas and practices to consider when drafting the IAEA guideline on the evaluation of training program effectiveness.

First, I promised the big picture. The federal agency responsible for the regulation of the nuclear industry in Canada is the Atomic Energy Control Board (AECB). The AECB is soon to be called the CNSC (Canadian Nuclear Safety Commission). Its mission is to provide assurance that the use of nuclear energy in Canada will not cause undue risk to health, safety, security or the environment. Canada possesses 22 CANDU type reactors, most of them located in the province of Ontario. The head office is in Ottawa, the capital, but there are 8 small site offices with "resident" inspectors or project officers. The AECB includes a whole division who looks after assessing personnel qualification. Here is how it operates. (I know you may be tired to look at conventional organizational charts with boxes, so I tried to innovate and use triangles instead!) The largest section, Examination and Certification, administers direct examination of the control room operators and shift supervisors. The Methodology and Standards Section establishes the standards, policies and procedures on which to base our activities. (Some of you may know Mr. Piero Pianarosa, and I promise I will give him your salutations). Finally, the Training Program Evaluation Section, where I belong, performs audits of Nuclear Power Plants training programs. This section is comprised of 7 staff members, all possessing training program evaluation expertise coupled with a subject matter expertise relating to the operations and safety of Nuclear Power Plants.

The mission of the Training Program Evaluation Section is to "Obtain and document assurance that the training of Nuclear Generating Station operations personnel is effective in providing them with the knowledge and skills needed to become and remain competent". Please note that we assess both initial and continuing training.

Our audits used documented (Systematic Approach to Training) SAT-based objectives and criteria. I do not have to convince this audience that SAT provides assurance that the programs are effective and meet the needs of the workers. I am happy to report that all utilities have now endorsed SAT. One utility has initiated self-assessments.

The procedure we use to perform the audits is as follows:

- Identify the program to evaluate (based on issues such as importance on safety, significant event reports, requests from the project office, or re-licensing needs).
- Identify and check the adequacy of utility Requirements/Guidance for training programs,
- Review the supporting training documentation,
- Determine if training is implemented in accordance with the documented process. The first two steps are completed at the AECB office. The last one is performed at site and involves interviews with staff and management and observation of training delivery. I believe it is critical to observe the training in all settings, classroom, laboratory and on-the-job. Basically, we go where the trainees go.

Since the audit usually lasts one week and the training program may be longer, we look at various cross-sections, slices, of the program. As an example, for a typical course, a few tasks would be chosen for which the learning objectives, training material, lesson plans, course notes, facilities, delivery and practice sessions, feedback, as well as the associated areas of the written and field tests for this task would be reviewed.

The last element of the training process is follow up. It is essential to track the actions requested of the utilities. To this end, I designed a data base to allow us to accurately and timely follow up on our training program evaluations findings.

Let's now have a look at possible performance indicators. As you know, various performance indicators were mentioned during the week, and many speakers realized the difficulties associated with their use. This applies as well at the AECB. A working group was formed to derive performance indicators that could be used as first indication of possible training program deficiencies. Although agreement was reached for performance indicators in other areas of plant operations, no consensus as yet been reached for training. The following is a list of current performance indicators under discussion, for your consideration:

- number of courses planned vs completed;
- percentage of certification completed;
- percentage of actual attendance vs percentage of scheduled attendance;
- number of hours of training delivered vs number of hours of training planned;
- number of "significant Event reports" with human factors based root causes, with skills or knowledge deficiencies;
- number of examination failed.

I would now like to go to the second part of my presentation where I present ideas and re-emphasize basic principles of training. I have observed, from many years of auditing and attending training sessions, that the importance of the use of participant-centered (adult learning principles) in training and delivery is underrated. Adult learning principles require the application of the “Experiential Learning Cycle” (fig.1). Basically, this means a training session on a specific topic must start by an activity involving the learner, in which the trainee can relate to a previous experience or perform an activity which will form the basis of the training material to follow. Theory or practice of the new knowledge or skill are then facilitated. To close the cycle, an exercise must follow in which the trainee can apply the newly learned skills or knowledge.

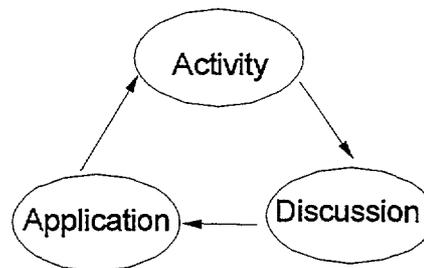


Figure 1. Experiential Learning Cycle

An example on how to apply this concept is the law of exponential decay, as presented by Mr. Ron Bruno earlier this week. The “activity” was ‘estimating the number of times one could fold a piece of 8 x 11 paper and then verifying the estimate by folding the paper’. A discussion of the law of exponential decay then followed, ending with a discussion on how this law can be applied to training, to complete the cycle. Also important to remember is that adult learners come with their own significant amount of experience which can be referred to in the activities.

The second adult learning principle critical to ensure that learning occurs is the relevance of the training. To make this point, a picture of a radio antenna, tuned to the station WII-FM is used. This stands for “What’s In It For Me”. The point to be made here is that training directed to adults needs to be very specific and relevant to their needs or they will “tune out”, become disinterested in the material being presented and no significant learning will occur. Therefore, it is necessary to involve the trainee in the needs assessment.

The last slides raises the question: “Can addition of nice to know material vs need to know material be impeding effectiveness?”. My answer is definitely yes. A training program including too much indirectly relevant material in fear of missing some information will focus the learner away from the true objectives of the course. To avoid this common pitfall, one needs to ensure that the needs assessment is focussed on the job performance requirements.

This concludes my presentation. Thank you for your attention and participation.

ANNEX I

Presentation transparencies

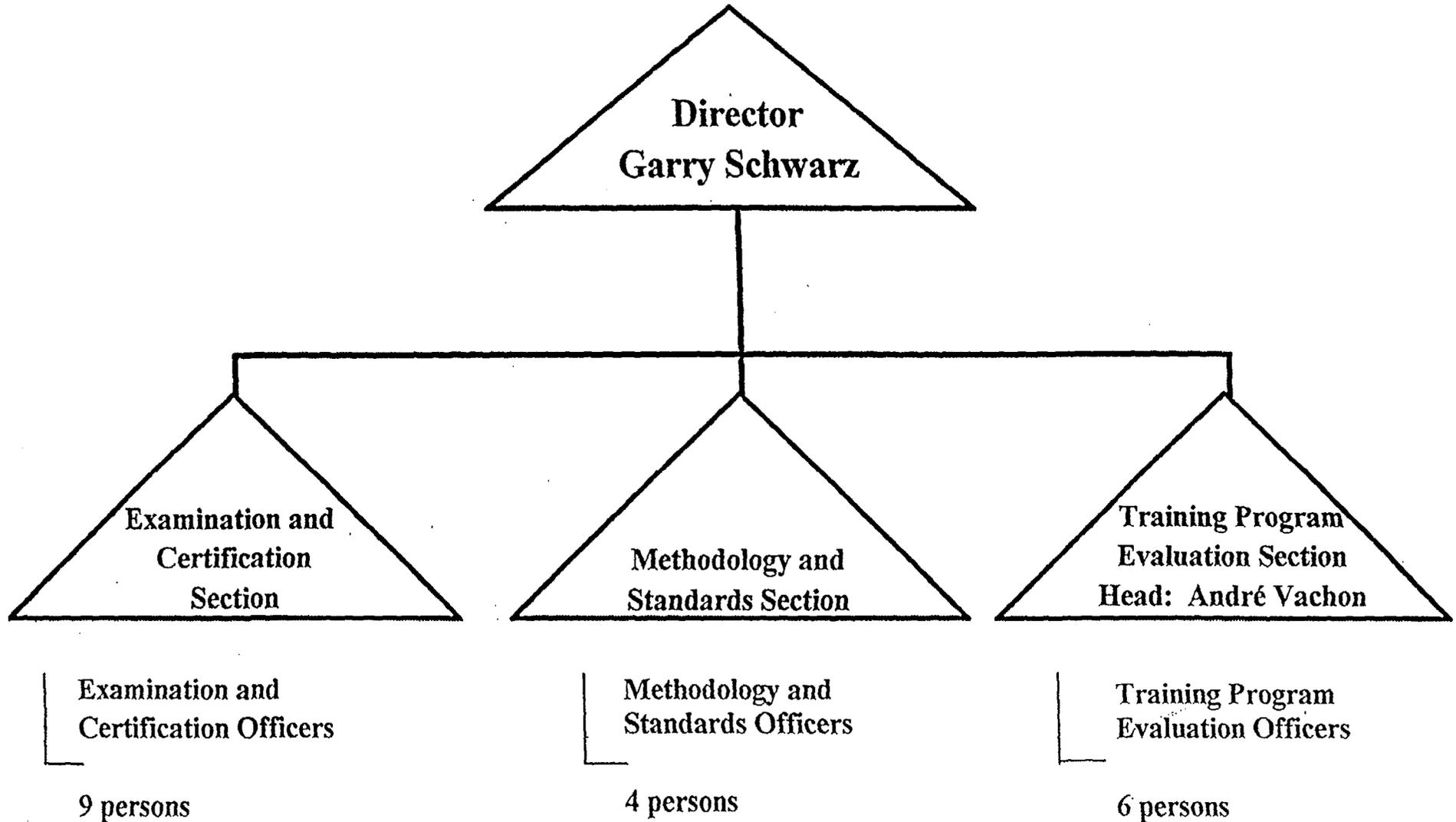
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PERSONNEL QUALIFICATION ASSESSMENT DIVISION



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YOURS TRULY!

THE REGULATOR APPROACH

TPES: Mission Statement

"To obtain and document assurance that the training of NGS operations personnel is effective in providing them with the knowledge and skills needed to become and remain competent"

1. Audits used SAT-based Objectives and Criteria.
2. SAT provides assurance that the programs are effective.
3. All utilities have now endorsed SAT.
4. One utility has initiated self-assessment (first indication of an observed training effectiveness problem).
5. Interviews, Documentation Review (SERs, policies, procedures, training material).
Observation of Training Delivery (all settings) and Work.
6. Importance of Tracking

PERFORMANCE INDICATORS

of courses planned vs completed;

% of certification completed;

% of actual attendance vs % scheduled attendance;

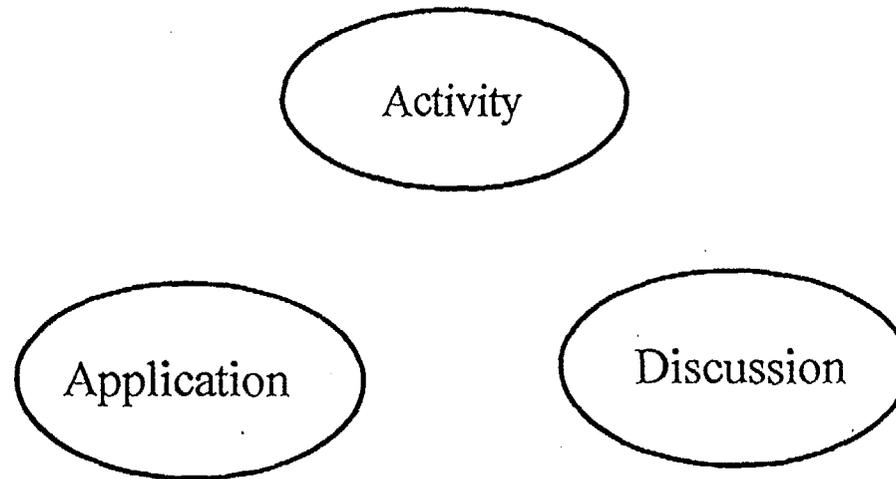
of hours training delivered vs # hours training planned;

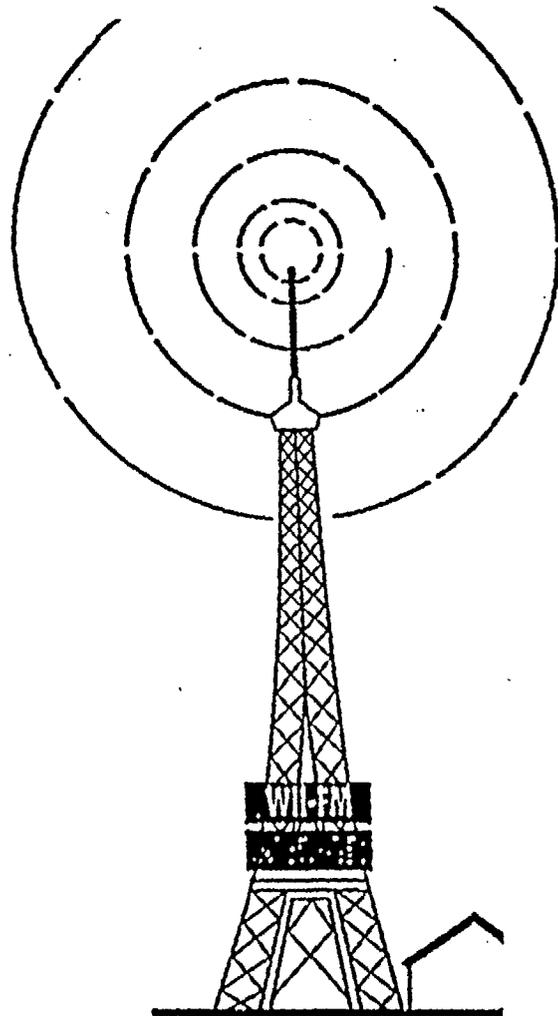
of SERs with human factors based root causes with skills or knowledge deficiency;

of examinations failed.

OBSERVATIONS FROM YEARS OF AUDITING AND ATTENDING TRAINING SESSIONS

Importance of the use of participant-centered (adult learning principles) in training design and delivery is underrated.





Radio Station WII-FM: What's In It For Me?

CONCLUSION

Other question: can addition of nice to know vs need to know material be impeding effectiveness?

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