TOWARDS A NEW REGULATORY REGIME FOR NUCLEAR OPERATOR CERTIFICATION

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Like all of the Atomic Energy Control Board's [AECB] staff activities connected with power reactor regulation, the ones addressing the training and competence of nuclear operations personnel began as part of the preparations for licensing the Nuclear Power Demonstration Reactor located at Rolphton, Ontario. "NPD", as it quickly came to be called, was Canada's first power reactor and, as many of you know, it achieved first criticality in April 1962. In 1961, on a recommendation from it's staff, the AECB established an advisory "Examination Committee" whose job it was to define for the Board, the nature and substance of suitable regulatory examinations that each candidate senior operator and shift supervisor would have to succeed in passing in order to take up duties in the NPD control room. In addition, the Committee would also "advise the AECB whether or not, in their judgement, the individuals of the staff at NPD have sufficient training and experience to operate the station safely". The scheme decided upon was to be implemented by a Committee member who was also a member of the AECB staff which at the time was quite small.

The Examination Committee reached the conclusion that the approach to assuring nuclear operations personnel initial competence should be modelled on the long-standing arrangements that were already in place in each province for Stationary Engineers. Such people were, and still are, formally examined by a government agency with a statutory mandate to confirm their competence before they receive their "tickets". Thus, the Committee decided to establish a system of written examinations for candidate operations personnel that would parallel, in effect, the written examinations that would-be Stationary Engineers had to take to become licensed. The examinations would be set in the context of operating the NPD reactor. And so it was done. The first, and all subsequent senior operators and shift supervisors at the NPD generating station were subject to a series of written examinations administered by the Board staff. Essentially that same regulatory system for assuring initial competence is still in place now, 30 years later. People today who complete long-duration utility training programs to become either senior operators or shift supervisors must pass a total of five written examinations set by the AECB's Operator Certification Division [OCD] before they may initially take up their duties. As you might imagine, these written examinations are no longer the same in scope and substance as those faced by the first crop of candidates intent on operating NPD. The

regulatory examinations have necessarily become more complex mirroring the nature of the larger-scale, more complex stations that have followed NPD. Not all of the complexity of the post-NPD written examinations can be explained this way, however. Some of it for example, has resulted from the presence of questions on topics that utility training programs were not apparently addressing well enough. Which brings me to the subject of "problems", because when candidates are confronting training program insufficiencies in regulatory examinations that take place at the end of their training programs, that is a problem!

The five written examinations that constitute the system in its present form, represent a substantial challenge to candidates. Only very good people succeed in getting through, which is of course, the way it should be. However, the system needs to be changed for a number of reasons. For one thing there is the written examination/training program problem to which I just referred. The examination process needs to be supported and complemented by regulatory review of each of the lengthy training programs that candidates move through. OCD staff need systematically and as a regular activity, to monitor and assess the implementation of each training program and to meet periodically with training department officials to discuss program effectiveness. At the same time, training programs must concentrate fully on ensuring to the maximum extent that candidates know and understand "their" station and must not be oriented to getting candidates through the regulatory examinations.

Another problem is the partial artificiality of the written examination approach. Somewhere around 30% of each of two of the five examinations is made up of questions designed to determine how candidates would respond when faced with complex, fast-moving upsets that could have a unit-wide or station-wide impact. The actions and checks that would have to be carried out by a fully-qualified operator faced in real-life with such an event are numerous and often complicated. The AECB has been frequently criticized by utilities for posing such questions, the main complaint being that they force candidates to memorize long and complicated Control Room operating procedures. While that was never our intent, it does appear the questions have had that effect. Memorizing operating procedures that are available in the Control Room is a wasteful way to spend valuable training time. Both we and the utilities agree that checking the capabilities of candidates to handle major upsets via written questions is artificial.

Documentation - or the lack of it in some areas - is another problem. The tasks that operations personnel are expected to perform are not always clearly enough recorded. Also,the criteria and methods employed by OCD in its regulatory practices are either scattered among letters that have been written on

various matters over the years or are deemed, based on tacit acknowledgement of utility activities, to be understood. The programs for updating some utility operations and training-related documentation are protracted with the result that the quality of the documents currently in use may be less than desired.

I will not go on. These are certainly not all the problems as we see them, but they are among the most important and they served to cause us to establish an "Initiatives Program" that will take us, and therefore the nuclear industry,into a new regulatory regime for nuclear operator certification, by spring 1993.

But before I tell you about the program, I want to spend a little time talking about the Standing Inter-Utility/Regulatory Working Group. This Working Group plays a crucially important role in the process we are following to create the new regime. The Group, as I shall refer to it, was established following informal discussions between OCD staff and senior representatives from each of the three nuclear utilities. It comprises representatives from all four organisations. Put simply, the purpose of the Group is to serve as a forum for the discussion and resolution of problems or issues of a general nature that have to do with the initial and continuing training and demonstrated competence of nuclear operations personnel. The Group, which held it's first meeting at the beginning of September 1990, provides the AECB with the opportunity to consult with the nuclear utility industry in an orderly,organized way. A most important aspect of the Group's modus operandi is its creation of ad hoc Sub-Groups which are established to address in a detailed fashion, specific issues identified by the senior Group. Three such Sub-Groups[1] have been formed so far.

The existence of the Group and its Sub-Groups permits the AECB, in setting up the new regime, to make sure each step of the way that the arrangements are based on a clear and complete understanding of the current state of the training and testing activities of the industry. For their part, the industry representatives, working through the Group, are kept abreast of the emerging regulatory activities and plans and are thus able to prepare themselves for the full-scale introduction of the new regime. Hardly less important, the industry representatives have the opportunity to present their individual, and sometimes collective, views and advice on how things should be done. This might be a good point at which to stress an all-important aspect of nuclear operator training, and competence and its verification: it is the responsibility of each of the nuclear

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1 Sub-Group on "guidelines for the control of non-station-specific training material."
Sub-Group on "simulator-based examinations prerequisites and implementation strategy".
Sub-Group on "generic objectives for station-specific systems training."

utilities to ensure that its operations personnel are both well-trained and competent to assume their duties and also to ensure that through continuing training and testing their competence is not unduly diminished with time. The AECB's responsibility is to assure by whatever means it judges appropriate, that this responsibility is being properly discharged. I emphasize the importance of the different responsibilities of the parties for two reasons: first, they can become temporarily obscured as both sides - regulatory and non-regulatory - immerse themselves in the many details of their activities, and second, the consultations the AECB holds within the Group permit inter-alia, both sides to confirm the appropriate "location" of the "line" that delineates their respective responsibilities. Keeping the line in focus helps to ensure that each side does its job properly, clearly recognising - and respecting - what the other side is doing. This is very much in the interest of operational nuclear safety and therefore also in the public interest.

Now to the "Initiatives Program" that we have underway at the Board. It was first described by OCD staff at a meeting of the Group held at the Point Lepreau Generating Station in July 1991. Formal letters confirming the details were sent by the OCD to each of the three nuclear utilities the following month.

The program will accomplish the following four principal goals:

- Establishment and maintenance of a body of regulatory documents termed "Position Statements", that will make clear the criteria and methods the AECB employs in the assessment of operations personnel competence, their training and related matters. The first two documents in this series have already been completed and are presently in a preliminary 90-day comment period. This developing body of documents will be gradually incorporated into the OCD staff Operations Manual and copies will be available to utility training departments and trainees. The AECB's expectations vis-à-vis operator training and competence will no longer be difficult to determine or access.

- Systematic evaluation of utility initial and continuing training programs for operations personnel including review of policies, curricula and training documentation, and field audits of the implementation of the programs. This activity is already underway. Training programs that are considered to be complete, under proper control and effective will be accredited. Where it is demonstrated that a training program's effectiveness is high and is being reliably maintained, a review of the scope and nature of the regulatory examinations being imposed upon graduates from that program will be carried out. Based upon the results of this review, consideration will be given to reducing the extent of direct regulatory examination of individual candidates coming from the program. Although it may not at first appear to be the case, this part of the new regulatory

regime is probably the most important for the long term. It should strongly encourage the establishment and maintenance of training programs of excellence.

- Establishment of routine simulator-based testing of candidate senior operators and shift supervisors to check their initial competence beginning spring 1993. Candidates will be subject to evaluation by AECB examiners to determine their capability to handle safely, major plant upsets complicated by additional malfunctions that could quickly have a serious impact on the generating unit or station if they are not arrested in time. These tests will be dynamic and will probe the diagnostic ability and understanding of each candidate as well as his/her ability to manage the control panels skillfully and coordinate the actions of the rest of the shift crew. Unlike their counterparts at single unit stations, candidate shift supervisors intending to work at multi-unit stations are not presently required to operate the plant control panels directly. The simulator-based testing of these people will take account of their actual duties. Through the process of full-scope simulator-based testing, candidates will for the first time be placed in a test environment that will very closely resemble the one at the station where they propose to take up their duties. As a result, the tests should reveal clearly the all-round capabilities they may be required to call upon later.

- Establishment of special written examinations to check initial competence that relate to the specific nature of each plant. These examinations will complement the simulator-based testing and will also begin in spring 1993. "Joining" these examinations to the simulator-based testing means that they will no longer contain questions relating to the fast-moving, major upsets mentioned earlier. The knowledge and capabilities of candidates in this respect will be checked during the simulator-based testing. Instead, the papers will carry questions designed to confirm the level of knowledge and understanding of station systems and operating procedures.

When all of these goals - position statements, training program evaluation, simulator-based testing, and new written "specific" exams - are operational they will represent the major portion of the new regulatory regime. Because these activities are partly new their implementation will be subject to particularly close scrutiny during an initial two-year "Introductory Phase" when "fine-tuning" of the arrangements will be done. When the two-year period is finished the system will enter a "Maintenance Phase" during which its implementation will be monitored regularly to ensure that it continues to be effective. There will be two other parts to the new system. One of these will be regulatory monitoring of the utilities' activities connected with the continuing training and testing of already-qualified operations personnel. Finally, completing the regime there will be three

written examinations, which will carry over essentially without change from the present system. They will address candidates' general knowledge related to the nuclear and conventional parts of a large CANDU station, and finally, knowledge in the important area of radiation protection.

Returning again to the AECB Initiatives Program and the four goals that it has, I wish once more to emphasize strongly the major importance of a few working rules that we at the AECB are following in its development:

- Consultation: We are proceeding with the Program in close consultation with the responsible training department officials in each of the nuclear utilities, both bilaterally and through the Standing Inter-Utility Regulatory Working Group and its Sub-Groups.

- Communication: We have held meetings with the Vice-Presidents responsible for operations and their senior-level associates directly to ensure they are aware of and understand the Program. We have also given presentations to candidate operators and shift supervisors. We will be doing more of this and shall be visiting each utility training department well before spring 1993 to speak to trainees. We will make sure that they understand who we are, what our role is and how we shall be implementing the new regime. We expect soon to brief union officials representing operations personnel on the Program and the new regime.

When spring 1993 arrives there should be no surprises. The organizations and individuals who will be affected by the new approach to operator certification will all have been made aware of its nature well beforehand.

We will continue to consult and communicate once the new regime becomes fully operational. As an ongoing routine practice we intend periodically visiting utility training departments to speak directly to trainees to explain our activities and our role in the overall process of nuclear operator training and qualification. Again as a routine practice, we shall continue, following spring 1993, to consult with the Group on matters of mutual interest. The long-term need to do this was recognized when the Group's terms of reference were drafted and it was identified as a "Standing" Working Group.

In this fashion, we expect to be able to maintain the new regime to ensure that if problems arise they can be both quickly identified and addressed. We will continue to keep regular contact with our colleagues in other countries and in some instances, their licensees, as well as with the International Atomic Energy Agency, to make sure that we keep up-to-date with developments elsewhere. We will share all that we find with the Group and will use it as we monitor and tune our own regulatory approach into the future.

Let me summarize:

- Since July 1991, the AECB has been engaged in a program aimed at putting in place by spring 1993 a new regulatory regime for nuclear operator certification.

- Implementation of the program is taking place in close consultation with the members of the Standing Inter-Utility/Regulatory Working Group and its Sub-Groups.

- The AECB is communicating with all of the parties who will be affected by the new regime.

- There will be a scheduled two-year "Introductory Phase" established for the new regime beginning spring 1993 during which the regulatory criteria and methods being followed will be subject to unusually close scrutiny and "fine-tuned" as necessary.

- At the close of the "Introductory Phase", the regime will move into a long-term "Maintenance Phase". The Group will continue to serve its important consultative role during this period. Through these consultations and its contacts in other countries, the AECB will be able to ensure that it employs only most appropriate and up-to-date regulatory practices.

Although I did not specifically say it earlier, my message was "it's time for a change". Through our Initiatives Program, our consultative approach with the Standing Inter-Utility/Regulatory Working Group, our open communications with those affected, the two-year initial "Introductory Phase" and our plans for its long-term maintenance we believe that the new regulatory regime coming into full effect by spring 1993, is the right change.