

D950718

MEMORANDUM TO: Edward L. Jordan, Director
Office for Analysis and Evaluation
of Operational Data

/s/

FROM: John T. Larkins, Executive Director
Advisory Committee on Reactor Safeguards

SUBJECT: COMMENTS BY INDIVIDUAL MEMBERS AND AN ACRS
CONSULTANT

Attached for your consideration are comments by Drs. Apostolakis and Miller, ACRS Members, and some of the comments provided by Dr. Kerr, ACRS Consultant, on the NRC technical training programs in the areas of PRA and digital instrumentation and control systems. Please be advised that these comments represent the views of the individuals mentioned above and do not necessarily represent those of the ACRS full Committee.

Attachment:
As stated

cc: ACRS Members

COMMENTS BY ACRS MEMBER DR. APOSTOLAKIS

I am concerned about the lowest knowledge, skills, and abilities (KSA) level in the three general groups of skill levels that the program has adopted, i.e., basic, advanced, and expert practitioner levels. The depth of KSA associated with the basic level is not very clear. At the meeting, the staff said that this level trains the staff primarily on PRA results. Given that a PRA contains numerous assumptions and judgments, I question the wisdom of training at this "basic" level, where my understanding is that these assumptions and judgments are not addressed. Could someone who does not appreciate the limitations of inputs and models really utilize PRA results in an intelligent manner? Basic training in probability and statistics would be much more meaningful with the PRA applications reserved for advanced-level courses.

Too much emphasis is placed on Level 1 PRA methods for reactors. As the NRC moves toward risk-based regulation, I believe that it is both important and urgent to train the staff on the use of probabilistic models in connection with engineering models for various processes. Understanding how uncertainty analysis can

complement so-called deterministic models is a prerequisite to creating a culture within which risk-based regulation can become a reality. Issues requiring this approach are numerous, e.g., PRA Levels 2 and 3 for reactors, external-event analyses, and in performance assessments for nuclear waste repositories.

A course on external events is being developed. This includes earthquakes, fires, floods, tornadoes, hurricanes, transportation accidents, and others. I question whether a single course can do a good job covering events whose analyses require working knowledge of very diverse scientific disciplines, such as seismicity, ground motion resulting from a given earthquake, combustion, heat transfer in all its guises, and so on. Furthermore, these events, especially earthquakes and fires, are frequently found by PRAs to contribute significantly to risk. Even in an era of limited resources, these events deserve more attention, perhaps at the expense of the detailed courses that are now being offered on Level 1 PRA methods for reactors.

I find it odd that there is no material covering the basic elements of a performance assessment. This application is rather different from the PRA application of probabilities and attendant uncertainties with which most are familiar.

COMMENTS BY ACRS MEMBER DR. MILLER

The Digital I&C Working Group (DWG) is comprised of ten NRC staff members representing the Technical Training Division, NRR, and regional inspectors and was established in 1994 to develop a digital I&C training program targeted to three groups: region-based inspectors, headquarters I&C personnel, and resident inspectors. It was specifically noted that two members of the DWG are regional inspectors who have had extensive experience with complex digital upgrades completed over the past five years.

The DWG has met three times, since its formation, the most recent meeting being held in April 1995. The result of those meetings has been the development of a plan for a program. This plan has identified a topical outline of the broad areas of required training for each of the three groups and definition of the specific target audiences. The DWG also established priority among the three groups with the regional inspectors having the highest priority. Together these groups represent a relatively small target audience of 15 to 20 persons.

The plan developed by the DWG calls for extensive use of "commercial off the shelf" courses to meet the training requirements of the regional inspectors and the headquarters I&C staff and a Regulatory Perspectives Workshop directed toward improving the inspection processes related to digital I&C issues. I concur with the plan proposed by the DWG. Given the small total number in the target audience, use of commercially available courses is an excellent approach for meeting the generic training requirements. The Regulatory Perspectives workshop will provide needed opportunities for the staff to maintain and update its knowledge and to share experiences between individual regions and headquarters. However, I suggest

participation by members of industry in part of the workshop.

I believe there are several omissions in the list of topics developed by the DWG, most notably Electromagnetic and Radio Frequency Interference (EMI/RFI). Although the ACRS has in the past expressed concern regarding the staff's emphasis on this environmental stressor at the expense of other stressors, I found this omission surprising. I don't believe EMI/RFI should be considered as a major issue, but neither should be forgotten. Other less obvious omissions in the topical list will or have been discussed with members of the DWG on an individual basis.

My review of the course topics proposed by the DWG also raised questions of relevance to digital I&C since most appear to be directed to background or prerequisite topics. Review of a current catalog of courses offered by one commercial company reveals availability of more appropriate material. I, therefore, recommend the DWG complete a thorough review of currently available commercial courseware. I expect to provide further comments on this issue within the next few weeks.

In summary, I concur with the general approach proposed by the DWG but I am concerned by its execution and the rate of progress made to date. With the recent Generic Letter (GL-96-02) and other activities, the industry is positioned to make rapid progress in updating nuclear plant I&C, the regulatory process thus has an opportunity to play a leadership role, but only if there are capable and well-trained staff able to make competent reviews. I plan to contact members of the TTC staff to discuss ideas related to curriculum development.

REPORT BY DR. KERR, ACRS CONSULTANT, ON MEETING OF THE ACRS
SUBCOMMITTEE ON TECHNICAL TRAINING PROGRAMS

July 12, 1995

On July 12, 1995, I attended a meeting of the ACRS Subcommittee on Technical Training Programs. The meeting was held to continue a review of training programs that are being organized by the Office for Analysis and Evaluation of Operational Data (AEOD). One of these is concentrating on Probabilistic Risk Assessment (PRA) with the objective of providing knowledge and skills needed to implement the NRC's goal of moving toward a more nearly risk based regulatory system. Of particular interest is the implementation of the Maintenance Rule. The other is aimed to provide knowledge and skills required to inspect and regulate plant systems that use digitally based control.

Generally, the presentations were well organized and informative, and questions were dealt with effectively. Throughout the discussion of plans for future activities it was clear that significant uncertainty exists both because of the absence of a well-developed policy on how to deal with these areas, and because of uncertainties in the financial resources that will be available to the agency. These two sources of uncertainty are probably related, but of the two the lack of policy is more nearly under the control of the NRC. It will continue to hamper

the development of appropriate training until it is resolved.

I have the following comments:

- 1) The material presented in the PRA-related courses appears to be appropriate, and those involved in the presentations, based on vita previously provided to the Subcommittee, are well qualified as practitioners. However the material is extensive, much of it is probably new to many of those taking the courses, and it is packed into a very short period of time. Thus, at best, the course can be expected to provide novices with an idea of what the field is about. Before it can be used with discretion, considerable additional effort on the part of those who have taken the courses will be required. If sufficient enthusiasm is developed by the introduction to this new area, the course material can provide a foundation for further learning. However, additional individual effort will be necessary if this introduction is to be useful. It would be interesting, in the elicitation of student evaluations, if some indication of student enthusiasm for further study could be found.
- 2) Discussion indicated that although examinations are not yet used at the end of the courses, they will be developed. I recommend especially on the basis of the large amount of material covered in the course, that these be open book exams.
- 3) Discussion indicated that at present no organized method exists for getting feedback from the NRC Regional Offices on these courses. It might be useful to have this.
- 4) The approach used in developing inspection and regulation for digitally based control systems appears to have been ad hoc. Discussion indicated that there is now a relatively well-developed system, but that documentation that gathers together the requirements is not yet complete. This should be developed both for those who do not know where to look for the information that exists, and for those who do. Almost invariably when various disparate sources are mixed and the results are integrated, discrepancies are identified and improvement occurs.
- 5) At a previous meeting, Dr. Catton had requested an example of forthcoming AEOD reports on the reliability of individual components to demonstrate how the concept of reliability is being used. The document provided was NUREG-1275, Vol 10, "Operating Experience Feedback Report-Reliability of Safety-Related Steam Turbine-Driven Standby Pumps". I looked in vain, in this report, for a demonstration of how the concept of reliability is being used. Further, I looked for some indication of how much influence the observed performance of these systems had on risk. It is unfortunate that after the collection and

analysis of all these data, no comments were made on whether the observed performance contributes an unacceptable, or even a significant, level of risk.

William Kerr, Consultant
13 July, 1995

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