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July 21, 1980

Dr. Stephen H. Hanauer, Director  
Division of Human Factors Safety  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Dear Steve,

The purpose of this letter is to transmit the comments of the Nuclear Engineering Department Heads Organization (NEDHO), on the draft "STA Training Guidelines" which you sent to me on May 5, 1980. I am sorry that it has taken me so long to compile these comments. This delay was unavoidable because your documents were sent for review to virtually every Nuclear Engineering Department in the country. Thus, this letter represents a broad view from the engineering education community.

The best way to characterize our reaction to your draft document was one of disappointment. When a group of Nuclear Engineering (NE) Department Heads met with Mr. Denton and his staff on 4/4/80, we were told that the USNRC was working with competent university consultants to establish STA training criterion. However, the package which you sent to us for review was obviously lifted directly from the 12/79 Memphis State University STA program (enclosed)! This is hardly the well-thought-out, generic training document we had expected to see. Indeed, with all due respect to our colleagues in Tennessee, this program would certainly not be considered the equivalent of a BS degree at many of the better NE departments in the country.

Specific comments on your proposed program included:

- The program is too specific [e.g., if strictly applied, a B.S. graduate in N.E. (whom the utilities badly need to attract into operations) would not qualify as STAs]
- Mathematics coverage is too weak
- The proposed program apparently does not recognize the need for a knowledge of calculus and differential equations in basic courses in physics, etc.
- Too much material in many of the courses, coupled with an inadequate allocation of time for outside study (1:1 for outside study to class contact hours) insure superficial coverage and retention by the students

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- The coverage of reactor thermal-hydraulics is out-of-date and inadequate for the needs of reactor safety evaluation
- The coverage of reactor materials is inadequate

While there were many specific comments on individual course content and omissions, the general opinion of the respondents was that the proposed program is inadequate if the USNRC wishes to have STA program graduates who have a firm grasp of engineering fundamentals.

It appears to me that the recent INPO proposal (enclosed) is a better basis on which to proceed. It gives general areas in which coverage is required, rather than specific course content. This allows the flexibility which is necessary to build regional programs which optimize the use of local resources. As you may know, this is exactly how all university engineering programs have evolved (i.e., once generic programmatic content has been specified, each university evolves specific courses to meet the specified needs and audit requirements of ECPD/ABET). Needless to say, this procedure allows for considerable innovation and creativity, and works quite well if properly audited (ABET). I believe that the USNRC should view their proper role as one of program audit rather than program formulation. Leave program formulation to those professionals who do this type of thing for a living.

I believe that it is also important to draw a distinction between training and education. All operational personnel need both engineering education and training to do an adequate job. The university community has the expertise in engineering education. In contrast, it does not necessarily have comparable capabilities in the area of training (i.e., we do not have adequate simulators, and in many cases, adequate reactor operational background). It appears that what is needed is a synergistic relationship between industrial training personnel and university educators.

To date I have seen no real efforts put forth to weld this alliance nation-wide. Rather, what is apparent is a lot of local activity as some industrial and university organizations "jockey for position." I believe that the USNRC would be well advised to clearly state that they recognize the difference between training and education, and that they fully expect to see the STA educational requirements being met by the university community. Without this guidance to the utility industry, it is highly unlikely that the resources of the university community will be fully utilized, and even more unlikely that competent STA will be graduated.

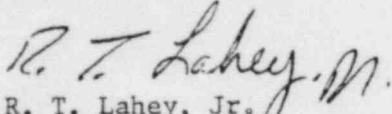
While the main purpose of this letter has been to supply comments on STA training (and education), it is important that you realize that the real problem is that, in the past, NE graduates from the better schools (which tend to have the best students) have rarely gone into operations. As a consequence, there are now too few reactor operators with degrees.

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The university community has recognized this problem for some time. It is largely a result of the fact that the utilities have not made operations an attractive career path. In order to rectify the situation, the utilities will need to make some long-overdue institutional changes. Specifically, they will have to make operational experience a recommended prerequisite for future cross-functional promotions and managerial aspirations. I believe that such changes, coupled with a more realistic pay scale, will entice many of our better students to go into operations. Naturally, once we have established a "pipeline" of qualified engineers going into operations, the STA "band-aid fix" will not be necessary.

We applaud the efforts of the USNRC to increase the qualifications of reactor operational personnel. In particular, your apparent desire to have operational personnel be degreed engineers should, in the long run, solve the current problems of industry. In the short term, the university community stands ready to assist in the education of STA and other plant managerial personnel. We represent a vital resource which is currently underutilized. I believe that it is clearly in the USNRC's best interest to insure that we are fully involved.

Sincerely yours,



Dr. R. T. Lahey, Jr.  
Chairman, Department of Nuclear Engineering

RTL:mb

Enclosure

cc: H. Denton (USNRC)  
D. Wilkinson (INPO)  
L. Weaver (GaTech)