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by Lawrence P. Crocker
U.S. Nuclear Regulatory Commission

SHIFT TECHNICAL ADVISORS: IN THE EYS OF THE NRC

ABSTRACT

Since January 1, 1980, the NRC has required that Shift Technical Advisors be on-shift at all operating nuclear power plants. The objective of the requirement is to assure that technical expertise is immediately available to each operating shift to assess off-normal events and to provide advice to control room personnel. Further, this advice and assistance is to be provided by an individual not responsible for control manipulations or for directing the activities of reactor operators. The long-term requirement for on-shift technical expertise is firm. However, the exact manner in which this expertise must be furnished has not been determined. Licensees have proposed various alternatives to meet this requirement. These proposals still are being reviewed by the NRC staff.



Among the lessons learned as a result of the TMI-2 accident is the necessity to have immediately available to each operating shift at a nuclear power plant the technical expertise to recognize, evaluate and diagnose unusual events. At some plants, the reactor operators and senior reactor operators already had considerable technical training. However, the NRC staff thought that additional technical capability was indicated.

This need for on-shift technical expertise was translated by the NRC into what was called a Shift Technical Advisor, who was to be available on-call to provide technical advice to the control room personnel. The Shift Technical Advisor was first identified in NUREG-0578, issued in July 1979. This report contained the short-term

recommendations of the Lessons Learned Task Force which had been formed within the NRC staff to review the TMI-2 accident. The Shift Technical Advisor was to have a bachelor's degree or equivalent in the field of engineering or science, was to be familiar with plant and control room operations, and was to have special training in the response to and analysis of accidents at the plant to which assigned.

As envisaged by the Lessons Learned Task Force, the primary function of the STA was to assess off-normal events and provide advice to the control room personnel. During periods of normal operation, the STA was to provide a mechanism for evaluation and feedback of operating experience to the plant staff. The STA was to be an advisor only and was not to assume any command or control function.

Clarification of the STA requirement was provided in an NRC letter to all operating facilities dated September 13, 1979, and another letter dated October 30, 1979. The October 30 letter set a date of January 1, 1980 as the date by which STAs were to be on duty at all operating plants, and January 1, 1981 as the date by which STAs were to be fully trained in accordance with guidance furnished in the September 13 letter. Additional clarification regarding STAs was most recently provided in NUREG-0737, "Clarification of TMI Action Plan Requirements," issued in November of 1980.

In practice, most utilities met the January 1980 requirement for having STAs on duty by either selecting graduate engineers and giving them special training in plant operations and accident analysis, or by selecting senior reactor operators and giving them some special academic work that could assist them in performing an accident assessment

function. To meet the fully trained STA requirement, some licensees have given extra training to the STAs who were initially designated. Others have trained entirely separate groups of STAs. The NRC is now in the process of reviewing licensee submittals which describe their STA training programs and status and which describe their long-range intentions regarding STAs.

During the summer of 1979, and confirmed by the September 13, 1979 letter, the NRC staff had determined that the requirement for STAs might be eliminated at such time as operator training and control room design had been sufficiently upgraded. However, as of this time, a determination has not been made as to just what constitutes sufficiency in either case.

In the meantime, there have been a number of other developments that have been or are being taken which have some bearing on the functions of STAs. For example, for those plants licensed during the last year, the staff has required that the licensee establish an Independent Safety Engineering Group charged with evaluating the safety of plant operations and providing a mechanism for feedback of operating experience from the industry to the plant staff. This operational safety assessment and feedback of operating experience was one of the two functions initially assigned to the STA, although later directives approved the splitting of these functions. A determination has not yet been made whether a requirement for such a group would be backfit to other operating plants.

During the same period, the staff has required new licensees to add a senior reactor operator to each shift to be stationed in the

control room, thereby assuring that additional help is immediately available in the control room beyond what was required before the TMI-2 accident. This requirement for the SRO in the control room will become effective for all operating plants not later than July 1, 1982. During the same period, the required training for licensed operators and senior operators has been increased and the passing grade levels for operator examinations have been increased. Requirements for simulator training have been increased. Reviews of operating and emergency procedures have been conducted to assure that they are both understandable and correct and to assure that the required procedures are available to the plant operators. On the hardware side, efforts are underway to improve the control rooms from the human factors aspect. All of these developments and undertakings have been aimed at improving the capability of the reactor operators to respond to transients and accidents.

Some licensees apparently are happy with the STA concept and intend to continue operations in this mode. I am aware of one utility that proposes to bring its new engineers on board by first training them as operators, using them for a fixed period of about two years as STAs and then moving them on to other positions within the company. The goal, of course, is to build up a cadre of engineers who are intimately familiar with operation of the nuclear plant and who are thus better able to support plant operations after they have moved to other positions within the company.

Other licensees have announced their intent to upgrade the academic training of their operators such that accident assessment capa-

bilities will be built into the normal shift complement without the necessity of having an STA available. There is a pitfall here, however, which should be recognized. One of the objectives of the STA was to have someone who could stand back from the actual control board manipulations, observe the system parameters and trends, analyze what was happening to the plant, and determine the actions necessary to terminate or mitigate the consequences of a transient. A regular shift member, with responsibility for control board manipulation or for directing the activities of operators at the controls, might not have the luxury of making a detached analysis of the situation. On the other hand, since all licensees will have a senior operator permanently stationed in the control room over and above the pre-TMI-2 accident requirements, perhaps credit can be given for having a shift member who can provide this detached advice. A decision on this matter has not yet been made.

The question of operator academic qualifications has become a major concern to most utilities and all licensed operators. The emphasis by many people, including my bosses and the Commissioners, seems to be pointed toward higher academic credentials for all operators, with a bachelor's degree as a logical final outcome, at least for senior reactor operators and shift supervisors. As a matter of fact, the proposed revision to Regulatory Guide 1.8, which was issued for comment in September 1980, mentions the interest of the NRC Commissioners in requiring that shift supervisors have a bachelor's degree. The question, of course, is does it imply that only graduate engineers can become senior operators and shift supervisors? Will we then have two classes of operators - those with and those without

degrees? How about a career ladder for the non-graduates who start off as auxiliary operators? These are all questions that must be answered as part of the final decision regarding the need for STAs.

I submit that, in the final analysis, what we really need are graduate engineers who have received special training in accident analysis, who are also licensed senior operators with many years of experience and an intimate knowledge of their plants, and who like to work shifts. With enough people with these credentials, our problems would be easily solved.

Since this is an imperfect world, however, and since I do not foresee many people coming forth with the ideal qualifications, we will have to work together, perhaps on a case-by-case basis, to arrive at an optimum staffing for each plant. In the meantime, utilities are gaining experience on using STAs. Feedback from this experience together with information gained from job task analyses that are now underway should enable us to provide improved guidance in the future.