



SECY-81-192

March 24, 1981

POLICY ISSUE

(Notation Vote)

FOR: The Commissioners

FROM: William J. Dircks, Executive Director for Operations

SUBJECT: PLAN FOR IMPROVING THE TECHNICAL CAPABILITY OF LICENSEE PERSONNEL

PURPOSE: To inform the Commission of our plans for improving the technical capability of licensee personnel.

DISCUSSION: Section 307(a) of the NRC Authorization of Appropriations for Fiscal Year 1980 authorized and directed the Commission to prepare a plan for improving the technical capability of licensee personnel to safely operate utilization facilities licensed under Section 103 or 104(b) of the Atomic Energy Act of 1954. Further, the Commission was directed to transmit to the Congress the plan required by this subsection within 6 months after the enactment of the Act.

Enclosed is a description of the subject plan showing each improvement. The elements of the plan are those addressed in Chapter I, Operation Safety of the TMI-2 Action Plan (NUREG-0660), a review of foreign operator practices requested by Commissioner Ahearne, and the Long Range Research Plan proposed by the Division of Human Factors Safety.

RECOMMENDATION: We recommend that the Commission:

1. Approve the letter and report as enclosure for transmittal to Congress.
2. Note that similar letters forwarding the reports will be sent to the appropriate Congressional Committees.

William J. Dircks
Executive Director for Operations

Enclosure:
Draft letters to President of
Senate and Speaker of House
transmitting subject report

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Commissioners' comments should be provided directly to the Office of the Secretary by c.o.b. Thursday, April 13, 1981.

Monday

Commission Staff Office comments, if any, , should be submitted to the Commissioners NLT April 6, 1981, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional time for analytical review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

DISTRIBUTION:

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The Honorable Thomas P. O'Neill, Jr.
Speaker of the United States House of Representatives
Washington, D. C. 20515

Dear Mr. Speaker:

Enclosed is a plan for improving the technical capability of licensee personnel to safely operate utilization facilities licensed under Section 103 or 104(b) of the Atomic Energy Act of 1954. The Nuclear Regulatory Commission was authorized and directed to prepare this plan and to transmit it to Congress by Section 307(a) of the NRC Authorization of Appropriations for Fiscal Year 1980. (Public Law 96-295).

Sincerely,

Joseph M. Hendrie
Chairman

Enclosure:
Plan for Improving the Technical
Capability of Operators and Senior
Operators

PLAN FOR IMPROVING THE TECHNICAL
CAPABILITY OF LICENSEE PERSONNEL

Section 307(a) of Public Law 96-295 directs the Commission to prepare a plan for improving the technical capability of licensee personnel to safely operate utilization facilities licensed under section 103 or 104(b) of the Atomic Energy Act of 1954. Based on the scope of the plan indicated in section 307(a) we have limited the scope of this plan to licensed operators and senior operators.

An important part of operational safety is the level of qualifications of operations personnel, including their education, training, experience, and fitness. A general technical education provides the basis for understanding the principles and operation of nuclear power plants. One objective of the actions in this plan is to increase the level of the education of senior operators to assure that they have appropriate technical backgrounds. To provide this additional technical capability onshift until the time that staffing and qualifications of operator and senior operators are upgraded, operating staffs are being required to have onshift a technical advisor with engineering expertise; training in details of design, function, arrangement and operation of plant systems; and special training in plant: dynamic response.

Besides educational background, training and experience of the operators and senior operators of nuclear power plants are being increased to improve their knowledge of plant design, response, and procedures. Actions in this area include requirements for additional onshift training for operators and senior operators,

additional nuclear power plant experience requirements prior to licensing, requirements for experience as a licensed operator before licensing as a senior operator, increased use and variety in simulator training, increased plant training during the initial test program, implant drills for shift operating personnel, and enhanced requalification programs.

The plan also addresses the improvement in the quality of training to be provided, including accreditation of training institutions. Training center and facility instructors who teach reactor systems, transient response of reactors, and simulator courses will be required to demonstrate their competence to the NRC by successful completion of a senior operator examination. These instructors will also be required to successfully participate in requalification programs to retain instructor status or possess instructor certification from the Institute for Nuclear Power Operations (INPO). Emphasis will be placed on the instructors' abilities to teach as well as their technical knowledge. The NRC will develop criteria and procedures to be used in auditing training programs and increase the amount of auditing. The audits to be conducted will assure that training is formalized and structured, including the use of lesson plans, qualified instructors, qualified supervision of instructors, and proper conduct of testing. The need for mandatory simulator training is discussed in the plan as well as the quality of the simulators to be used. Improvements in simulators will be required to improve the level of realism in the training and retraining of operators. Requirements and procedures for licensing and requalification of operating personnel are also addressed, both for initial issuance of licenses and for license renewals.

The licensing of additional operations personnel is also covered.

The plan recognizes the need to insure proper shift staffing and administration to deal with unusual situations. Such actions include requirements for the number and qualifications of people onshift, assurance of operator fitness, restrictions on the use of overtime, control of shift turnover, control of access to the control room, delineation of authority in the control room, and specification of shift supervisor responsibilities.

Human beings make errors no matter how qualified they are. Better systems of verifying correct performance of operating activities are needed to provide a means of detecting human errors, thus improving the quality of normal operations by reducing the frequency of occurrence of situations that could result in or contribute to accidents. Steps for more effective verification by licensees of correct performance of operating activities are addressed in the plan. Consideration is also given to actions to be taken by the NRC and facility licensee in the event of personnel errors that cause losses of a safety function.

As part of our response to the accident at Three Mile Island we published a multifaceted action plan, NUREG-0660 entitled, "NRC Action Plan Developed as a Result of the TMI-2 Accident". Chapter 1 of the plan addresses operational safety, including training and qualification of licensed operators. The plan consists of (1) short term actions where it was readily apparent that immediate improvements would result and could be accomplished without rule changes, and (2) long-

term improvements where further study is required to develop a position and/or rule changes will be necessary. Enclosure 1 contains the details of the applicable Tasks in the Action Plan and the long range research plan indicated below.

We are also conducting a review of practices in foreign countries regarding training and qualifications of licensed personnel. Details of this plan are addressed in Enclosure 2.

Finally, and most importantly, an effort is underway to develop and implement integrated, long-term, technical programs aimed at critically evaluating the generalization of results from related applications, e.g., military, space, aviation, and other civilian and commercial systems, to nuclear power plant issues. Where such data are incomplete, obsolete, and gaps exist, new empirical data must be generated to provide the scientific basis needed for regulations and requirements involving the total personnel subsystem in nuclear power plants - encompassing the entire selection, placement, training, and retraining cycle. The proposed research objectives will also identify problems raised by the short term requirements and recommend measures to correct any deficiencies.

Enclosure 3 is a table that indicates each specific action plan or research project, indicating the responsible NRC office, scheduled completion date, other organizations involved, professional staff year requirements and contractual assistance, if required.

Our plans for improving the technical competence of licensed personnel go beyond the specific concerns addressed in Public Law 96-295.

Listed below are the items of concern as enumerated in section 307(a) of Public Law 96-295 and a brief description of the portion of the plan that addresses the concern.

Section 307(a)

Item

Feasibility of requiring standard, mandatory training programs for nuclear facility operators, including classroom study, apprenticeships at the facility, and emergency simulator training.

Plan

NRR will require all utility management to provide specific improvements in training and to upgrade the qualifications of licensed reactor and senior reactor operators.

Qualifications

A rule change will be issued for public comment that will require a high school education for reactor operators and a college degree, with a minimum number of engineering credits, for senior reactor operators. (TMI Action Plan Task I.A.2.6)

Experience (Apprenticeships)

Operators are presently required to have two years of power plant experience, one of which must be nuclear to be eligible to sit for a license examination. We believe that this is a reasonable minimum amount of time to

prepare for the training programs leading to a license examination. Consequently, we have not changed this requirement.

Senior operators were previously required to have four years of power plant experience. We have changed this to four years of responsible experience; defining what is "responsible experience." As part of this experience, one year must be as a licensed operator. (TMI Action Plan Tasks I.A.2.1 and I.A.2.6)

Training

We have required training programs to be modified to include additional training on shift and additional classroom training in heat transfer, fluid flow and thermodynamics, mitigating an accident in which the core is severely damaged and increased emphasis on reactor and plant transients. In addition, the rule change will require mandatory simulator training. (TMI Action Plan Task I.A.2.6)

Section 307(a)

Item

Such plan shall include specific criteria for more intensive training and retraining of operator personnel licensed under section 107 of the Atomic Energy Act of 1954, and for the licensing of such personnel, to assure:

- 1) conformity with all conditions and requirements of the operating license;
- 2) early identification of accidents, events or event sequences which may significantly increase the likelihood of an accident; and
- 3) effective response to any such event or sequence.

Plan

The operator and senior operator examinations contain specific categories that address "conditions and requirements of the operating license". Prior to the accident at TMI, there was no minimum grade requirement for each category of the examination. We now require at least 70% in each category and 80% overall to pass written examinations. Hence, we have reasonable assurance that individuals who are licensed are knowledgeable regarding conditions and requirements of the operating license.

Approximately 25% of the operator and 33% of the senior operator written examinations contain questions that explore an applicant's knowledge and understanding regarding early identification of accidents, events or event sequences that may lead to accidents. In addition, about 35% of the oral portion of each examination explores an individual's knowledge and understanding of abnormal and emergency operating conditions and procedures. However, to assure better knowledge and understanding, we have revised the scope of the examinations to include categories dealing with heat transfer, fluid flow and thermodynamics.

Finally, the rule change will mandate administration of simulator examinations to enable us to observe an applicant's response to any such event or sequence. (TMI Action Plan Task I.A.3.1)

Section 307(a)

Item

Such plan shall include provision for Commission review and approval of the qualifications of personnel conducting any required training and retraining program.

Plan

We plan to establish procedures and criteria for the accreditation of training institutions. These procedures and criteria shall also address instructor qualifications to assure their technical competence and that they have successfully completed instructor educational programs. In the interim, we plan to administer senior operator examinations to individuals who teach systems, integrated plant response and simulator courses to assure their technical competence. (TMI Action Plan Tasks I.A.2.3 and I.A.2.7)

Section 307(a)

Item

The plan shall also include requirements for the renewal of operator licenses including, to the extent practicable, requirements that the operator -

- A) has been actively and extensively engaged in the duties listed in such license,
- B) has discharged such duties safely to the satisfaction of the Commission,
- C) is capable of continuing such duties, and
- D) has participated in a requalification training program.

Such plan shall include criteria for suspending or revoking operator licenses.

Plan

The present regulations and implementing procedures governing operator licensing require us to make the findings indicated above in (A), (B), (C) and (D) prior to renewing a license. The regulation also contains criteria for modifying, suspending or revoking an operator's license. However, the plan calls for more direct NRC involvement in the development of the requalification program content, mandatory simulator training and NRC administration of written, oral and simulator examinations to provide us with additional evidence of competence. The plan calls for suspension of licenses if the applicant fails the NRC examination. (TMI Action Plan Tasks I.A.2.6 and I.A.3.2)

Section 307(a)

Item

In addition, the Commission shall also consider the feasibility of requiring such licensed operators to pass a requalification test every six months including:

- i) written questions, and
- ii) emergency simulator exams.

Plan

Present requalification programs are continuous programs that require individuals to attend regularly scheduled lectures and take a facility

administered written quiz at the conclusion of each lecture. These programs also call for systematic evaluation of the individual's performance during normal and abnormal operations. Finally, the programs require facility-administered, annual written examinations.

The plan calls for the NRC to administer the annual examinations. These examinations will consist of written examinations, oral examinations at the plant and simulator examinations.

Based on our present methods of administering examinations and the number of individuals presently licensed, administration of annual examinations will require four visits a year for every site. The number of PSY required to accomplish the task is forecasted as 55 in FY'82, 59 in FY'83, and 64 in FY'84.

The operator licensing program is extremely labor-intensive. Based on our knowledge and understanding of the operator's duties and responsibilities and the mode of operation of the facilities and recommendations contained in a report prepared under contract NRC 80-117, we believe that examinations every six months would not be cost effective. (TMI Action Plan Tasks I.A.3.2)