

DEVELOPMENT OF A TRAINING REGULATION¹ FOR NUCLEAR POWER PLANT PERSONNEL

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Abstract

The intent of this presentation is to describe both the development and content of a training regulation for nuclear power plant personnel and the process required to promulgate regulations. The need to develop the regulation was mandated by the U.S. Congress as Section 306 of the Nuclear Waste Policy Act of 1982 (Public Law 97-425). The regulation is a relatively simple requirement which will be added to Title 10 of the Code of Federal Regulations as Section 50.200 of Part 50, i.e., 10 CFR 50.200. The rule requires that all utilities develop training programs using a Systems Approach to Training (SAT). The training programs impacted are those which are developed for individual nuclear power plant operators, supervisors, technicians and other appropriate operating staff. The paper describes the effects of this rule on other regulatory documents, such as, other parts of the Code of Federal Regulations and several regulatory guides which relate to training, qualifications and examinations.

Also, the process required to promulgate the rule is described. The process includes: review by oversight committees, internal committees, other offices in the agency, the public and the industry. The necessary justification and documentation procedures, including Regulatory Analysis (Value/Impact), is discussed.

INTRODUCTION

In December of 1982, the 97th Congress passed House Resolution 3809, the Nuclear Waste Policy Act of 1982, which became Public Law 97-425 when signed by the President on January 7, 1983. That law included Section 306 the Nuclear Regulatory Commission Training Authorization which directed the U.S. Nuclear Regulatory Commission (NRC) to promulgate regulations or other appropriate guidance for the training and qualifications of civilian nuclear power plant operators, supervisors, technicians and other appropriate operating personnel. In addition, P.L. 97-425 required NRC to establish:

- ° simulator training requirements for applicants for operator licenses and for operator requalification programs
- ° requirements governing NRC administration of requalification examinations,

¹This paper was prepared by an employee of the U. S. Nuclear Regulatory Commission. It presents information that does not currently represent an agreed-upon staff position. NRC has neither approved nor disapproved its content.

- ° requirements for operating tests at civilian nuclear power plant simulators,
- ° instructional requirements for licensee personnel training programs

Further, the law required promulgation of the rule within one year.

In January 1983, the Division of Human Factors Safety of the NRC established a Task Force of Human Factors professionals, instructional technologists, simulator experts and nuclear power subject matter experts. I was appointed Chair of this Task Force. One of the first tasks of that group was to establish a schedule to meet the one year requirement to promulgate the rule although a review of the requirements for promulgation of a rule showed that rulemaking normally takes a minimum of two years. The intent of this paper is to describe both the proposed rule and the rulemaking process.

BACKGROUND

Much has been said about over regulation by the Federal Government. One might think that the process of developing a new rule is easy and quickly implemented. I have spent over three years with the NRC and have been involved with the development, promulgation and implementation of three Human Factors rules. From my experience I can attest to the fact that the process is not easy nor is it quick. The proposed rule discussed herein is offered as an example of the process followed at the NRC.

When Congress passed Section 306 they required that the regulation or guidance be promulgated within twelve months of the signing of the Law. At the time of this writing, it is just over 13 months since the law was signed. The proposal has not yet been published for public comment. This means that almost a year will be needed before the rule will be finally promulgated. This is not necessarily bad; it is presented only as an example of the process, its components, and the depth of review.

✓ Once a decision is made that a rule is needed - which generally is based on external factors, such as operating experience, petition from the public, or, as in this case, Congressional mandate - the process of developing a technical basis and preparing documents in support of the rule begins. Following preparation of the documents, the internal review and revision process is initiated. After the Commissioners have approved the proposed rule, it is published in the Federal Register for public comment. A period of 30 to 90 days is typical for the receipt of public comments. Sixty days has been selected as the public comment period for this rule. After the comment period has expired, the staff must review and resolve the comments, prepare the final rule and supporting documents, and initiate the review process again before the rule is finally promulgated.

The Rule

In order to meet all the requirements of Public Law 97-425, Section 306, the NRC selected an approach that would integrate the training, qualifications and examination processes, content and outputs, i.e., the Systems Approach to Training (SAT). SAT is currently in use in technological environments where human performance and safety concerns are primary. Noteworthy examples include the military, the NASA space program and the field of aviation. This approach is consistent with the training program evaluation method being used by the Institute of Nuclear Power Operations (INPO) in its recently initiated accreditation process. The Systems Approach to Training is an orderly, iterative process based on job performance requirements.

The proposed rule includes a broad description of the key elements of the systems approach to training. At a minimum, licensees and applicants for operating licenses must include the following key elements in the development of their training programs:

1. Analysis: perform a systematic analysis to determine job performance requirements, trainee qualifications, and training needs;
2. Derivation of Learning Objectives: where the analysis has indicated the need for training, derive learning objectives from the analysis that describe desired job performance at the end of training;
3. Design and Implementation: design and conduct training programs to meet the specified objectives selected for training;
4. Trainee Evaluation: evaluate trainee mastery of training objectives; and,
5. Program Evaluation: revise and upgrade training based on analysis of actual job performance after training.

An important output of the systematic analysis phase is a determination of the qualifications needed to be fulfilled by individuals to better ensure successful job performance after training. Equally important outputs are the content and performance criteria outlined in the training objectives that can be used for the NRC operator licensing examination process.

To further assess license candidates in a realistic setting, 10 CFR Part 55, "Operator's Licenses," is being revised to require that operating tests for license candidates include oral-walkthroughs of the plant and its control room, and a simulation facility. This facility, which may include the plant, a plant-referenced simulator, or another simulation device, alone or in combination, will be used to demonstrate a candidate's understanding of, and the ability to perform essential job tasks. When implemented, the training and qualifications rule will enhance the NRC licensing examination process. The systematic job analysis performed for that nuclear power plant and the learning objectives derived from the SAT will be used as a basis for

developing examinations. License candidate evaluations will, therefore, be based in part upon performance standards and evaluation criteria delineated in the learning objectives. Once licensed, individuals will participate in requalification programs which are also based upon the SAT learning objectives. The NRC will use information developed under the training rule to evaluate utility requalification programs.

Since the actual Training and Qualification rule is quite broad, the NRC has developed a Regulatory Guide on the application of the SAT to qualifications and training. Regulatory Guides typically provide guidance on one approach to the implementation of a rule and often endorse voluntary industry standards developed by the American Nuclear Society. Three other Regulatory Guides related to training, qualifications, and examination were also developed. The four Regulatory Guides are:

- ° "Regulatory Guide on the Application of the Systems Approach to Qualifications and Training at Nuclear Power Plants" - which describes the characteristics of a method acceptable to the NRC staff for systematic development, implementation and evaluation of training and qualifications programs addressed by the Training and Qualifications rule.
- ° Regulatory Guide 1.8, "Personnel Qualifications and Training for Nuclear Power Plants" endorsing, with exceptions, ANS 3.1-1981, "Selection, Qualification and Training of Personnel for Nuclear Power Plants" subject to completion of the utility's own analysis of training and qualifications.
- ° Regulatory Guide 1.149, "Nuclear Power Plant Simulators for Use in Operator License Examinations" describing guidelines for certification of a Simulation Facility, endorsing ANSI/ANS 3.5-1981, with exceptions.
- ° Regulatory Guide 1.134, "Medical Evaluation of Nuclear Power Plant Personnel Requiring Operator Licenses" endorsing ANSI/ANS 3.4-1983, with exceptions, which describes information to be provided to the NRC for its evaluation of the medical qualification of applicants for operator licenses or for notification of the disability and subsequent recovery of a licensed operator.

The Process

Table 1 is an outline of the steps of the typical review process. After staff development of a draft rule and guidance, supporting documentation must be developed. Of primary importance is the Regulatory Analysis. Through executive Order 12291 (February 17, 1981), the Administration formalized its intent to reduce the burden of future regulations, increase government accountability for regulatory actions, and ensure well-reasoned regulations by requiring the preparation of a Regulatory Impact Analysis for all new rules. A Regulatory Impact Analysis must demonstrate that: a) there is adequate information concerning the need for and consequences of the proposed actions; b) the potential benefit to society outweighs the potential costs; and c) of

all the alternatives approaches, the given regulatory objective will maximize net benefit to society. The regulatory analysis is in fact a value/impact analysis in which value -- in terms of person-rem reduction -- is compared with dollar costs, both to the industry and government. However, impact on other regulations and constraints on implementation must also be considered. Other supporting documents include: environmental impact analysis, regulatory flexibility analysis (impact on small business), and Paperwork Reduction Act of 1980 (44 U.S.C. 3501) submittal to the Office of Management and Budget.

Once all supporting documents are prepared they are submitted for "Office Review" which includes the four NRC Offices, five Divisions within the initiating Office and the five Regional Administrations. A sufficient period of time must be allowed for review and response (2-4 weeks). Evaluation of any comments must be included in a revision which is then sent to the initiating Office Directors. Again a review and revision is completed prior to sending the package to the Committee to Review Generic Requirements (CRGR). The CRGR has the responsibility to review and recommend to the Executive Director for Operations (EDO) approval or disapproval of requirements to be imposed on one or more classes of reactors. This committee is charged with the responsibility of implementing Executive Order 12291 on Regulatory Impact Analysis. The CRGR is made up of six NRC Managers appointed by the EDO, plus the Chairperson, the Deputy Executive Director for Regional Operations and Generic Requirements.

Parallel with the above described review, the proposed rule is also reviewed by the Advisory Committee on Reactor Safeguards (ACRS). The ACRS is a statutory committee established to advise the Commission on the safety aspects of proposed and existing nuclear facilities and the adequacy of proposed reactor safety standards and rules. There are 14 members of the ACRS comprised of individuals from universities, national laboratories and industry. There is also a subcommittee on Human Factors consisting of a subset of the full Committee with consultation from Human Factors professionals.

Each of the above reviews generally results in some changes to the various elements of the rule, guidance, or supporting documents. These suggestions must be considered by the initiating office and appropriate modifications made before the package is forwarded to the EDO. The EDO then reviews the documents, recommends further changes, or forwards it on to the five Commissioners.

When it arrives at the Commissioners' offices, it is reviewed by the Office of Policy Evaluation, Office of the General Council and the Commissioners' technical assistants. Finally after all these reviews the Commissioners vote as to whether or not to publish it for public comment. After the public comment period is complete, the staff redrafts the rule and the process is repeated. During the review, the staff generally has to present and defend the action to: The ACRS subcommittee, the full ACRS, the

Director of the initiating Office and staff, the CRGR, and the Commissioners. The ACRS and Commission meetings are held in open forum with the public and industry invited to attend and comment.

SUMMARY

This paper described a proposed rule on the Training and Qualifications of Nuclear Power Plant Operating Staff. The paper also details the process of developing a rule for promulgation. The purpose was to describe how a relatively simple requirement, determined to be necessary by the Congress, is reviewed so that unnecessary and burdensome regulations are not imposed on the nuclear industry, while maintaining the health and safety of the public.