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FPL
FLORIDA POWER & LIGHT COMPANY

DOCKET NUMBER
PROPOSED RULE PR misc notice Reg Guide

January 28, 1981
L-81-26

Mr. Samuel J. Chilk
Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Docketing and Service Branch

Dear Mr. Chilk:

Re: Second Proposed Revision to Reg. Guide 1.8
Personnel Qualification and Training

Attached you will find Florida Power & Light Company's comments on the referenced proposed Regulatory Guide.

We thank you for your attention to these comments.

Very truly yours,

Robert E. Uhrig
Vice President
Advanced Systems & Technology

REU/LFR/ah

Attachment

cc: Harold F. Reis, Esquire

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Comments on Second Proposed Revision 2 to Regulatory Guide 1.8
Personnel Qualification and Training

General Comments

Issuance of Revision 2 to Regulatory Guide 1.8 at this time is premature. The Institute of Nuclear Power Operations (INPO) is in the process of defining objective, research based, validated training and qualification standards based on job task analys es. Considerable duplication of effort and attendant administrative costs can be eliminated by delay of issuance. 10 CFR 55 and 50 revision preparation (SECY-80-491), criteria for onsite and offsite managerial and technical organizations development (NUREG-0731), NRC staff review of the INPO document "Nuclear Power Plant Shift Technical Advisor - Recommendations for Position Description, Qualifications, Education and Training", and ANS 3.1 revision completion, indicate the potential for a subsequent major revision of Regulatory Guide 1.8 if a revision is issued at the present time.

Specific Comments

1. 2.2.2.C, page 6, Recommended Revisions to Part 55 and 50

   There is no need for the NRC to conduct certification exams at the completion of the simulator tra ing portion of an operator's training program. The increased NRC sta f auditing of training programs should suffice to verify the quality of simulator training. The license candidate must still satisfactorily pass the NRC licensing exam which includes demonstration of operating skills during the oral phase.

2. 2.2.5, page 8, Shift Technical Advisor

   It is not practical to require Shift Technical Advisors to be fully trained by January 1, 1981 due to the length of time required to develop and administer a training program.

3. 2.2.6, page 4, Comparison of NRC, Commerical and Naval Procedures for Qualification of Personnel.

   The BETA study, NUREG/CR-1280 ignores many issues. Outdated standards and practices were used. No analysis of actual commercial practices was conducted.

   The report may have misinterpreted the significance of the degree. A typical unrestricted line officer has a baccalaureate. This has been a requirement established long before nuclear propulsion was introduced into the naval fleet. It is considered as an educational requirement for an experience stem leading to senior officer command assignments. That is, every line officer's career path is a preparation for flag rank. The only specific educational requirements for an officer to enter the nuclear program is one year of calculus and one year of physics.

A large percentage of naval officers in the nuclear program do not have engineering degrees or any of the other college level courses outlined in the Regulatory position 2.3.1. Often their first exposure to engineering oriented coursework occurs during the Nuclear Power Training Program. This does not meet the definition of "College Level Education" as defined in the Regulatory Position 1.3. Completion of a college degree program may be indicative of a person's knowledge or learning ability. These traits, particularly the later, are required to become a competent operator. However, having completed a degree program is merely an indirect measurement. Competency in the Navy nuclear program seems to result primarily from the training program and not the educational achievements of its officers. As stated in H. G. Rickover's letter Z = 810 of December 14, 1979 to Chairman John F. Aherne," ... I have judged that the best method for training operators in nuclear powered ships to react to real situations is to require them to operate a real reactor under actual steady state and transient operating conditions ..."

The recommended Shift Engineer position is not justified:

a. Qualifications of non-degreed Shift Supervisors will be improved by requiring additional education in the appropriate engineering disciplines and additional training in transient/accident analyses to improve analytical/diagnostic skills.

b. Engineering support is available from off-shift plant engineers who can report onsite within a short time when the need arises.

c. Improved response from offsite support groups can provide emergency engineering support when needed at the plant.

d. This requirement would further reduce the number of qualified engineers available to the industry for more meaningful and needed duties.

e. Would be an additional drain on the utilities human and financial resources. These resources could be better applied in other areas to improve nuclear safety.

4. 2.2.7, page 9, Requirements for Licensing of Operators

INPO is presently developing guidelines for qualifications of personnel in various plant positions including licensed operators. Issuance of Regulatory Guide 1.8 Revision 2 should await the results of this effort.

5. 1.2, Temporary Personnel Replacements

   a. 1.2.1, page 11, Field-Specific Experience

      We concur with ANS 3.1 in allowing a position to be filled up to three (3) continuous months by a subordinate who may not meet all requirements of the superior position. A continuous period of approximately this duration might be required to improve or meet position requirements for education or attend license or other training classes. In addition vacation and illnesses could create absences exceeding one month.

   b. 1.2.2, page 11, Training

      We do not agree with the "blanket application" of the requirement that temporary employees receive, as a minimum, general employee training as described in ANS 3.1, section 5.4. For example, a welder hired for three days, with escorted access and close supervision does not need training in all topics outlined. Each case should be reviewed by the responsible supervisor and training needed to perform his job function provided.

6. 1.3, page 23, Definition of "College Level Education"

   The example of satisfactorily completed (ie., 70% minimum grade) is not necessarily valid. College letter or number grades are quite often not based on percentages. In addition degree based programs allow a range of performance the totality of which is indicative of satisfactory completion.

7. 1.4, Interim Regulatory [illegible]itions Related to Anticipated Rules

   a., page 12, and d., page 13 - The requirement for one year of experience as a licensed operator prior to requesting a senior license is reasonable. However, one year of plant specific experience is not necessarily required. For example, a person with many years of operating experience would be precluded from licensing as a senior operator for up to fifteen months. Such a person could potentially be much more qualified to perform as a senior operator than another who meets the specified minimum qualifications. However, that individual could have a fraction of the total plant operating experience of the former.

   The total experience required to reach the shift supervisor level could significantly delay the licensing of degree holding engineers. As stated in NUREG 0737 page I.A.2.1-1, "In addition, in order to attract degree holding engineers to consider the shift supervisor's job as part of their career development, NRC should provide an alternate path to holding an operator license for 1 year."

c., page 13 - Upgrading the existing senior operator education to include the outlined 60 semester hours of college level technical subjects by the January 1, 1986 date is not possible for the industry as a whole. Our experience indicates that compliance will be impossible for at least five years and only if ideal staffing conditions exist (ie. very low turnover, no expansion in the industry wide total number of senior licenses, etc.). Any educational upgrading program must accomodate a variety of demands on an operator's work schedule such as rotating shifts, high workload periods, vacations, requalification, and off site simulator training.

8. 2.1, page 14, Limited Number of Exceptions to Required Qualifications

This section needs to be revised and the 5 percent removed. As indicated in 7. above exceptions may often be required for individuals with considerably more total experience than the sum of the minimums.

In some cases exceptions should be allowed for the Plant Manager, Operations Manager and Radiation Protection Manager as well as other positions. An additional criterion that should be considered, along with those criteria listed, is whether the subordinate positions meet the requirements of the superior position.

Situations could occur where many exceptions are needed in the lower classifications yet the upper classifications could far exceed the applicable minimum qualifications. Staffs in such conditions could violate the exception limits and yet be considerably more capable than other staffs that require no exceptions.

Application of other factors such as those listed in section 4.1 of ANS 3.1 should insure that personnel with adequate qualifications staff the plants.

9. 2.2.3, page 15, Radiation Protection: Training and Experience

a. Section 2.2.3.2 specifies that "an individual who is certified by the American Board of Health Physics in accordance with the Power Reactor Health Physics Certification Program" dated November 1978 is considered as having met the requirements of Section 4.4.4 of draft standard ANS 3.1 for the Radiation Protection Manager Position." Although certification does provide one method of determining technical knowledge and skills in specified areas, it should not be construed as the only method or the best method of demonstrating competency. Additionally, education and experience should not be the only method utilized to guarantee competency.

This section should be rewritten to specify two methods of meeting the requirements for Radiation Protection Manager (RPM) as outlined in ANS 3.1. The first method would be "Power Reactor Health Physics Certification". The second method would be a certification program based on the knowledge and skills required to satisfy all elements of the RPM job description. This certification would require formal education, proper experience, and job factors.

b. Section 4.5.2 of draft ANS 3.1 requires all technicians to have 3 years of working experience in their specialty. Numbers of years of experience is no guarantee that an individual will possess the requisite knowledge and skills to perform his/her job in a competent manner.

Rather than prescribing 3 years of experience for the Radiation Protection Technician, allow the industry to develop well-defined performance criteria and job factors examinations and reduce the experience requirement to 1 year.

10. 2.3.1, page 15, Shift Supervisor Education Requirements

We do not believe requiring the Shift Supervisor to have a degree will significantly improve performance of persons in this position within the industry. Indeed it may be counterproductive. Alternative 3, as described in Appendix A with some modification, appears to be the most practical approach to providing the educational needs of the position.

Approximately sixty semester hours or equivalent in engineering and science along with college level instruction in English Grammar/report writing, reading/comprehension, communication, applied psychology and selected management/supervisory topics may meet the needs of the position.

Additionally, a course in Advanced Reactor Transient/Accident Analysis designed to improve analytic and diagnostic skills is needed.

We believe the education described above, technical training currently required for licensing at the SRO level and the required nuclear plant experience, provide well-qualified Shift Supervisors.

Practical limitations as described in 7. above preclude upgrading the education of shift supervisors to meet the proposed degree requirement by January 1, 1986. Approximately 12 years would be required to accomplish such an industry wide upgrading.

The degree requirement seems to be a naive panacea to solve the complex problem of defining the qualifications of nuclear plant operators. This requirement is the antithesis of conclusions based on information found in NRC initiated research. The following extracts indicate that this regulatory position may be unfounded and could eventually have an industry wide deleterious effect on reactor safety:

a. NUREG/CR - 1764

"The effects of training on performance have a great deal to do with the relevance of the components of the training program to the tasks."

"In the absence of comprehensive task analysis data, it is difficult to evaluate if all of these additional qualification requirements will be effective in safeguarding against another TMI. (In reference to the post TMI NRC requirements for reactor operators and senior operators.) . . . More job relevant requirements . . . for multiple emergency situations would have the highest payoff for increasing the operational effectiveness of the control room teams."

" . . . Under highly stressed conditions, experience may provide the wherewithal to sustain high performance levels."

"A reduction in experience requirements for nuclear power plant operators is not a desirable option."

b. NUREG-CR-1482

"Systems approach to training . . . a basic element of the approach is a thorough task analysis . . ."

c. NUREG/CR - 1656

" . . . accepted principles of learning have not been applied to nuclear power plant training processes . . . without consensus or objectives, however, no framework exists for curriculum development, for evaluation of trainee learning, or for measuring the effectiveness of the training program as a total entity."

"At least 50% of all training will be devoted to operating under abnormal or emergency conditions."

d. NUREG/CR-1280

". . . The most serious deficiency lies in the area of training . . . not in the selection process."

e. Appendix A of the Regulatory Guide indicates that similar concerns have been a articulated by the Atomic Industrial Forum and the Advisory Committee on Reactor Safety.

f. H. G. Rickover

See 3. above.

11. 2.6, page 17, Simulator Instructor: Plant Specific Senior Operator License

Certainly the simulator instructors should be knowledgeable of equipment and procedural changes in the referenced plant in order to be fully aware of the capabilities and limitations of the simulator. However, just as important, if not more so, the simulator instructor needs skills in educational technology and an awareness of differences between the referenced plant and the specific plant for which operators or operator candidates are being trained. Instructor training should be oriented around sharpening these skills and knowledge levels. Participation in the referenced plant requalification program may have little effect on improving the quality of simulator training. A job task analysis based training and certification program should be more beneficial to overall reactor safety than the stated regulatory position.

12. 2.7, page 17, Shift Technical Advisor: Training There appears to be little conflict between ANS 3.1 and the NRR requirements for an STA. Section 4.4.8 of ANS 3.1 must be taken in context with the upgraded training requirements for Senior Operator. Only transient and accident analysis training is questionable and should be a Senior Operator requirement as indicated in Section 5.2.1.3 of ANS 3.1. Therefore, regulatory position 2.7 should be eliminated.

13. 3.2.2, page 20, Simulator and In-Plant Drills

Meaningful in-plant drills would require actual equipment operation and result in plant trips. Such drills are often conducted in the naval nuclear propulsion program. These are not feasible for commercial nuclear plants which operate in a different environment and would have a detrimental effect on reactor safety.

Due to the complexity of commercial nuclear plants, drills of a walk through nature could never be developed to provide viable training. Control manipulations in a training environment are only feasible through use of simulation. Any other alternatives represent misapplication of training resources having little benefit in improving reactor safety.

14., page 20, Implementation

Meeting the January 1, 1986 date for upgrading of shift supervisors is not possible. Over a decade would be required in order to preclude a reduction in overall experience with the attendant degradation in industry wide reactor safety.

15., page 26, Recommendations and Comments from other Groups.

a. NRC Special Inquiry Group (NUREG/ CR-1250). Reactor engineering and physics provide little basis for plant operation during steady state or accident situations.

b. Basic Energy Technology Associates, Inc. (NUREG/CR-1280). Refer to 3. above. This report defines the "Shift Engineer: position by comparison of the Engineering Officer of the Watch in a naval plant to the shift supervisor in a commercial plant. This is not a completely objective comparison and its conclusions are doubtful.

c. Teknekron Research, Inc. (NUREG/CR-1636). As indicated in 10.C. above, the conclusions of this report do not coincide with its basic problem definition.

16., page 30, Appendix A - Discussion of Alternative: 5

Completion of a degree does indicate a certain amount of self - discipline. This is one trait of a good leader. However, ther are many other traits that are even more significant to leadership effectiveness. There is little behavioral science based research documenting that completion of a college degree program necessarily indicates that an individual is an effective leader.

A Shift Supervisor's competence in direction of shift operations is his sole function. The well-rounded education produced by exposure to liberal arts courses has no effect on job performance or any benefit to improvement in reactor safety. This requirement should be eliminated.

A degree program is based on a well-thought-out curriculum and produces a generalist. Most of the course work is unrelated to reactor operation. A curriculum based on 60 hours (about 15 to 20 courses) planned as a "competency based education" curriculum is not meaningless and could be far superior to any specific degree program. Completion could occur sooner and the investment of training resources would produce the greatest return in reactor safety improvement. However, such a program need not necessarily meet ABET criteria for Accreditation as college level education required by regulatory position 1.3. INPO should be a more effective accrediting vehicle.

The discussion presented in this Appendix does not substantiate alternative 5 in an objective, research based manner. Only a thorough job task analysis based program can result in definition of the training and education required to supervise reactor operation.

17., page 32, Excerpt from NUREG/CR-1280, "Power Plant Staffing"

This document contains several errors. Section VI D. 4 indicates that an EOOW qualifies on all enlisted watch stations. An EOOW actually receives experience not qualification. Section VI D. 4 indicates that an EOOW stands his first qualified watch after about 2 years. In reality an EOOW stands his first qualified watch at prototype after about one year.

18., page 46, Industry Impact

The Draft Value/Impact Statement ignores the impact of not filling all of the required positions with appropriately qualified individuals which could lead to reactor shutdown due to inadequate manning. Raising salaries is not expected to significantly improve the ability to comply with the qualifications as stated.

19., page 55, Rationale for Regulatory Positions

Item 15 should be eliminated. The standard does not allow the chemistry and radiochemistry group leader position to be filled with a person not having had nuclear plant experience.

Item 20. indicates that "General Employee Training" should be provided to the "Engineer-in-Charge". A job task analysis would indicate that such training may not be required for that person to successfully perform assigned duties. Training in selected areas from time-to-time may be desirable but certainly not required (eg. the person could be escorted while on site, cognizant plant personnel could provide selected briefings, etc.)

Comments on ANS 3.1 Draft Revision

1. 3.1 - The paragraph concerning collective qualifications needs to be revised to consider the following concerns in application of the criterion:

   a. Does it apply to all positions in the plant, or is it limited to supervisory personnel?

   b. How much greater should the collective qualifications be? How should it be quantified?

   c. Does it apply plant wide or on a department by department basis?

2. 4.2.2.d. Change to read ". . . assigned to the site at least six months . . ."

3. 4.2.4.C. should be revised to include qualification levels on non-commercial nuclear plants. (eg. Engineering Office of the Watch, Prototype Shift Supervisor, etc.)

4. 4.2.4.d. should be revised to allow subordinate personnel to hold a senior operator license or equivalent. This should be similar to the Training Manager (Section 4.2.5.d.).

5. 4.3.1.1.a should specify the minimum requirements for a shift supervisor if an STA is present.

6. 4.3.1.1.d, 4.3.1.2.d, 4.5.1.2.d should be revised to require corporate management certification for initial license applications only.

7. 4.4.2.a and 4.4.2.d need clarification. The education requirements for an instrument and control supervisor temporary replacement should be consistent or less than those for the actual designated supervisor.

8. 4.5.1.2.b. should be revised to address alternative levels of experience to satisfy the six month requirment as a non-licensed operator. A well designed reactor operator training program could be considerably more effective in providing overall systems operational knowledge than merely a six month assignment in a non-licnesed operation position.

9. 5.5.1.3 should be revised to separately address STA and licensed operator annual examinations.

10. 5.5.2 needs to be clarified. As written insufficient guidance is provided.