U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

13.2.1 REACTOR OPERATOR TRAINING

REVIEW RESPONSIBILITIES

Primary - Equipment and Human Performance Branch (IEHB)

Secondary - None

I. AREAS OF REVIEW

The applicant's licensed operator training program, as described in the safety analysis report (SAR), is reviewed. This section of the SAR should contain the description and scheduling of the training program for reactor operators and senior reactor operators. The licensed operator training program also includes the requalification program as required in 10 CFR 50.54(i)(i-1) and 55.59.

A. Construction Permit (CP) and Early Stage Combined License (COL)

The training program descriptions should contain the following elements:

1. A description of the proposed training program including the subject matter of each initial licensed operator training course, the duration of the course (approximate number of weeks personnel are in full time attendance), the organization teaching the course or supervising instruction, and the titles of the positions for which the course is given. The program descriptions should include a chart showing the proposed schedule for licensing personnel prior to criticality. The schedule should be relative to expected fuel loading and should display the preoperational test period. The submittal should contain a commitment to conduct formal licensed operator, on-the-job training, and simulator training before initial fuel load.

2. The subjects covered in the training programs should include, as a minimum, those contained in 10 CFR 55.31, 55.41, 55.43, 55.45, and Regulatory Guide 1.8 for reactor operators and senior reactor operators as appropriate. The training program should also include provisions for upgrading reactor operator licenses and for licensing senior reactor operators who have not been licensed as reactor operators per Regulatory Guide 1.8. The training should be based on use of the systems approach to training (SAT) as defined in 10 CFR 55.4

3. The licensed operator requalification program should include the content described in 10 CFR 55.59 or should be based on the use of a systems approach to training as defined in 10 CFR 55.4.

4. Applicants should describe their program for providing simulator capability for their plants as described in 10 CFR 55.31, 55.45, 55.46, 50.34(f)(2)(i), and Regulatory Guide 1.149. In addition, the applicant should describe how it will ensure that its proposed simulator will correctly model its control room. Applicants should submit, prior to issuance of construction permits or other submittals, a general discussion of how the requirements will be met. Sufficient details should be presented to provide reasonable assurance that the requirements will be implemented prior to the issuance of a license.

5. The means for evaluating training program effectiveness for all licensed operators, in accordance with a systems approach to training.

B. Operating License (OL) or Late Stage Combined License (COL)

The training program descriptions should include the following elements:

1. The licensed operator training program descriptions should delineate clearly the extent to which the training program was accomplished at the approximate time of submittal of the SAR. Contingency plans for additional training for individuals to be licensed prior to criticality should be described in the event fuel loading is subsequently delayed from the date indicated in the SAR.

2. Reactor operations training at nuclear power plant simulation facilities that comply with Regulatory Guide 1.149. The applicant should provide the details of the program for simulator training, including length of time (weeks) and a description of the simulation facility as required by 10 CFR 55.45(b) and 55.46. The applicant should also provide details of the program to meet experience requirements for applicants for operator and senior operator licenses as required by 10 CFR 55.31 and 55.46.

3. The SAR should describe the applicant's plans for requalification training for licensed operators and senior operators.

    a. The subject matter of each course, including a syllabus or equivalent course description, the duration of the course (approximate number of weeks personnel are in full-time attendance), the organization teaching the course or supervising instruction, and the titles of the positions for which the course is given. The program should distinguish between classroom, on-the-job, and simulator training, before and after the initial fuel loading. It should include provisions for training on modifications to plant systems or functions.

The organization teaching the course or supervising the instruction and the qualifications of the instructors in the training program should be provided.

The subjects covered should include, as a minimum, those contained in 10 CFR 55.41, 55.43, 55.45, and Regulatory Guide 1.8 for reactor operators and senior reactor operators as appropriate. The training program should also include provisions for upgrading reactor operator licenses and for licensing senior reactor operators who have not been licensed as reactor operators per Regulatory Guide 1.8. The training should be based on the use of SAT as defined in 10 CFR 55.4.

b. The licensed operator requalification program should include the content described in 10 CFR 55.59 or be based on the use of a systems approach to training as defined in 10 CFR 55.4.

c. The means for evaluating training program effectiveness for all licensed operators, in accordance with SAT as defined in 10 CFR 55.4.

II. ACCEPTANCE CRITERIA

A. General Guidance

The SAR should demonstrate that the training provided, or to be provided, for reactor operators and senior reactor operators will be adequate to provide assurance that all reactor operator qualification requirement items will be met at the time needed, i.e., prior to operator license examinations, prior to fuel loading, or prior to appointment or reappointment to the position.

Criteria for acceptability, as they relate to licensed operator training and retraining programs, are:

1. The training and qualification requirements and guidance set forth in the following regulations and regulatory guides should be met or acceptable alternatives should be presented:

   a. 10 CFR Part 50, Section 50.54, items i through m

   b. 10 CFR Part 55, Sections 55.4, 55.31, 55.41, 55.43, 55.45, 55.46 and 55.59

   c. 10 CFR 50.34(f)(2)(i)

   d. Regulatory Guide 1.8, “Qualification and Training of Personnel for Nuclear Power Plants”

   e. Regulatory Guide 1.149, “Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations”

   f. NUREG-0711, “Human Factors Engineering Program Review Model”

   g. NUREG-1021, “Operator Licensing Examination Standards for Power Reactors”

2. Training programs shall be developed, established, implemented, and maintained using a systems approach to training as defined by 10 CFR 55.4. Training program development will be evaluated by the staff using the guidance in NUREG-0711 and training program content, and effectiveness will evaluated using NUREG-1220.

3. Formal segments of the initial licensed operator training program should be substantially completed when the preoperational test program begins.

4. The number of persons trained in preparation for licensed operator and senior operator licensing examinations prior to criticality should be sufficient to ensure that applicable regulatory requirements with respect to shift staffing can be met from the time of initial fuel loading, with allowances for examination contingencies and the need to avoid planned overtime.

5. The licensed operator requalification training program should adequately implement the requirements of 10 CFR 55.59.

B. Technical Rationale

The technical rationale for application of these acceptance criteria to reviewing licensed operator training is discussed in the following paragraphs:

1. Compliance with the relevant requirements of 10 CFR 50.54 items i through m requires the licensee to have licensed operators or senior operators present at the controls and responsible for manipulation of the controls or directing the licensed activities of other licensed operators, as appropriate.

   The reactor operator and senior reactor operator training programs, including initial and requalification training, established by the applicant provide the means to train individuals in the knowledge, skills, and abilities needed to perform licensed operator duties.

   Meeting these requirements provides assurance that only trained and qualified individuals will be licensed and assigned to carry out or direct operational activities, including manipulation of the controls and other activities affecting reactivity or power level.

2. Compliance with the relevant requirements of 10 CFR 55.4, 55.31, 55.41, 55.43, 55.45, 55.46, and 55.59 requires that the applicant for an operator's license and for requalification successfully complete written and operating examinations which demonstrate that the applicant possesses the knowledge, skills, and abilities needed to perform licensed activities.

   The reactor operator and senior reactor operator training programs, including initial and requalification training, established by the applicant provide the means to train individuals in the knowledge, skills, and abilities needed to perform licensed operator duties.

   Meeting these requirements provides assurance that only trained and qualified licensed individuals possessing the required knowledge, skills, and abilities will be assigned to, and conduct, licensed activities.

III. REVIEW PROCEDURES

Preparation for the review of Section 13.2.1 of the SAR should include familiarization with 10 CFR 50.54 items i through m; 10 CFR Part 55, Sections 55.4, 55.31, 55.41, 55.43, 55.45, 55.46, and 55.59; 10 CFR 50.34(f)(2)(i); Regulatory Guides 1.8 and 1.149; and NUREGs-0711 and -1021.

The reviewer should ensure that whenever the applicant has committed to follow the position of a regulatory guide, industry standard, or other reference document, the specific revision being referred to is identified. Similarly, whenever the reviewer is using a position in a reference document as a basis for acceptability, the revision being used should be identified.

The reviewer then determines, based upon the foregoing, the overall acceptability of the applicant's licensed operator training plans.

For standard design certification reviews under 10 CFR Part 52, the procedures above should be followed, as modified by the procedures in SRP Section 14.3 (proposed), to verify that the design set forth in the standard safety analysis report, including inspections, tests, analyses, and acceptance criteria (ITAAC), site interface requirements, and combined license action items, meets the acceptance criteria given in Subsection II. SRP Section 14.3 (proposed) contains procedures for the review of certified design material (CDM) for the standard design, including the site parameters, interface criteria, and ITAAC.

IV. EVALUATION FINDINGS

The reviewer should verify that the information presented in the review supports an evaluation finding statement of the following type, to be used in the staff's safety evaluation report:

> The staff concludes that the training program for licensed operators and senior operators is acceptable and meets the requirements of 10 CFR 50.54 items i through m and 10 CFR Part 55, Sections 55.4, 55.31, 55.41, 55.43, 55.45, 55.46, and 55.59. This conclusion is based on the following:

For Construction Permit (CP) or Early Stage Combined License (COL)

The overall conduct and administration of the licensed operator training programs is the responsibility of the Plant Manager. The Training Manager is responsible for development, implementation, evaluation, and documentation of the licensed operator training programs.

The applicant states that a training program will be established to provide licensed operators with sufficient knowledge and operating experience to start up, operate, and maintain the plant in a safe manner. The licensed operator training program, derived from a systems approach to training, is to be developed by the applicant and will meet the regulatory guidance of Regulatory Guide 1.8. Licensed operators and senior operators will receive training in security procedures, radiological emergency plans, administrative procedures, and radiation protection. Simulation facilities used for licensed operator training program should meet the guidance of Regulatory Guide 1.149.

The information submitted relative to these subjects is satisfactory for the preoperational test program, for operator licensing, and for fuel loading.

For Operating License (OL) or Late Stage Combined License (COL)

The overall conduct and administration of the licensed operator training program is the responsibility of the Plant Manager. The Training Manager, reporting to the Plant Manager, is responsible for administering the licensed operator training program and monitoring program effectiveness. The applicant states that the licensed operator training program will provide reasonable assurance that decisions and actions by licensed operators and senior operators during all plant conditions will be made consistent with plant safety procedures and operational limits established to protect the public health and safety. The licensed operator training program has been designed to meet the individual needs of the participants, depending upon their backgrounds, previous training, and expected job assignment. The program will meet the guidelines of Regulatory Guide 1.8 and 10 CFR Part 55. Simulation facilities used in the training program shall meet the requirements of 10 CFR 55.31, 55.45(b), 55.46, and 50.34(f)(2)(1), and the guidelines of Regulatory Guide 1.149. Over [state specific number provided by the licensee] candidates will have completed the entire training program prior to the

fuel loading so that a sufficient number of licensed operators should be available to meet the requirements of 10 CFR 50.54.

The licensed operator requalification training program conforms to the requirements of 10 CFR Part 50 and 10 CFR 55.59 and follows the guidance given in Regulatory Guide 1.8.

For Design Certification Reviews

For design certification reviews, the findings will also summarize, to the extent that the review is not discussed in other safety evaluation report sections, the staff's evaluation of inspections, tests, analyses, and acceptance criteria (ITAAC), including design acceptance criteria (DAC), site interface requirements, and combined license action items that are relevant to this SRP section.

V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plans for using this SRP section.

This SRP section will be used by the staff when performing safety evaluations of license applications submitted by applicants pursuant to 10 CFR Part 50 or 10 CFR Part 52. Except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications docketed 6 months or more after the date of issuance of this SRP section.

Implementation schedules for conformance to parts of the review plan discussed herein are contained in the referenced regulatory guides and NUREGS.

VI. REFERENCES

1. 10 CFR Part 50, "Licensing of Production and Utilization Facilities."

2. 10 CFR Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

3. 10 CFR Part 55, "Operators' Licenses."

4. Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants."

5. Regulatory Guide 1.149, "Nuclear Power Plant Simulation Facilities for Use in Operator Training and License Examinations."

6. NUREG-0711, "Human Factors Engineering Program Review Model."

7. NUREG-1021, "Operator Licensing Examination Standards for Power Reactors."

8. NUREG-1220, "Training Review Criteria and Procedures."