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SEP 11 1980

MEMORANDUM FOR: A. Schwencer, Acting Chief, Licensing Branch No. 3, Division of Licensing, NRR

FROM: V. A. Moore, Acting Deputy Director, Division of Human Factors Safety, NRR

SUBJECT: TMI OUTSTANDING ISSUES, SALEM NUCLEAR GENERATING STATION, UNIT #2

The attached material regarding training is transmitted for enclosure in the Salem Nuclear Generating Station, Unit 2 SER for Full Power Operation. This review was performed by Kevin R. Mahan of the Operator Licensing Branch.

V. A. Moore, Acting Deputy Director
Division of Human Factors Safety
Office of Nuclear Reactor Regulation

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13.0 Conduct of Operations

13.2 Licensed Operator Training Program

The information contained in NUREG-0517, SER for the Salem Nuclear Generating Station, Unit 2, thru Supplement No. 4 remains valid.

Standard Review Plan 13.2, Training, was used in the review. Regulatory Guide 1.8, Selection and Training of Personnel and 10 CFR 55.20 through 55.23 and 55.25 were used to evaluate the programs.

II.B.4 TRAINING FOR MITIGATING CORE DAMAGE

POSITION

The staff requires that the applicant develop a program to ensure that all operating personnel are trained in the use of installed plant systems to control or mitigate an accident in which the core is severely damaged. The training program shall include the following topics:

A. Incore Instrumentation

1. Use of fixed or movable incore detectors to determine extent of core damage and geometry changes.

2. Use of thermocouples in determining peak temperatures; methods for extended range readings; methods for direct readings at terminal junctions.

B. Excore Nuclear Instrumentation (NIS)

1. Use of NIS for determination of void information; void location basis for NIS response as a function of core temperatures and density changes.

C. Vital Instrumentation

1. Instrumentation response in an accident environment; failure sequence (time to failure, method of failure); indication reliability (actual vs indicated level),

2. Alternative methods for measuring flows, pressures, levels, and temperatures.

   a. Determination of pressurizer level if all level transmitters fail.

   b. Determination of letdown flow with a clogged filter (low flow).

   c. Determination of other Reactor Coolant System parameters if the primary method of measurement has failed.

D. Primary Chemistry

1. Expected chemistry results with severe core damage; consequences of transferring small quantities of liquid outside containment; importance of using leak tight systems.

2. Expected isotopic breakdown for core damage; for cla[illegible] damage.

3. Corrosion effects of extended immersion in primary water; time to failure.

E. Radiation Monitoring

1. Response of Process and Area Monitors to severe damages; behavior of detectors when saturated; method for detecting radiation readings by direct measurement at detector output (overanged detector); expected accuracy of detectors at different locations; use of detectors to determine extent of core damage.

2. Methods of determining dose rate inside containment from measurements taken outside containment.

F. Gas Generation

1. Methods of H_2 generation during an accident; other sources of gas (Xe, Kr); techniques for venting or disposal of non-condensibles.

2. H_2 flammability and explosive limit, sources of O_2 in containment or Reactor Coolant System.

Discussion and Conclusions

Public Service Electric and Gas Company has commited to [illegible]gram as indicated in Supplement No. 4 to NUREG-0517 (TMI-2 Issues Related to Fuel Load and Low Power Test Program)

By letter dated April 1, 1980, Public Service submitted a summary of the training material for Mitigating Core Damage. A review of this material has indicated that all topics will be addressed and that training will be completed prior to full power operation.

Based on the foregoing, we have concluded that Salem Unit 2, has complied with NUREG-0694, Item II.4.B.

I.A.2.3 ADMINISTRATION OF TRAINING PROGRAMS FOR LICENSED OPERATORS

POSITION

Training instructors who teach systems, integrated responses, transients and simulator courses shall successfully complete a SRO examination.

Instructors shall attend appropriate retraining programs that address, as a minimum, current operating history, problems and changes to procedures and administrative limitations. In the event an instructor is a licensed SRO, his retraining shall be the SRO requalification program.

RESPONSE

All Salem instructors that teach systems, integrated responses, and transient courses presently hold valid SRO licenses. Instructors participate in the applicable portions of the requalifications program.

CONCLUSION

Based on the foregoing, we have concluded that Salem, Unit 2 has complied with NUREG-0694, Item I.A.2.3.

I.A.2.1 IMMEDIATE UPGRADING OF OPERATOR AND SENIOR OPERATOR TRAINING AND QUALIFICATION

POSITION

Applicants for SRO license shall have 4 years of responsible power plant experience, of which at least 2 years shall be nuclear power plant experience (including 6 months at the specific plant) and no more than 2 years shall be academic or related technical training.

Certifications that operator license applicants have learned to operate the controls shall be signed by the highest level of corporate management for plant operation.

Revise training programs to include training in heat transfer, fluid flow, thermodynamics, and plant transients.

RESPONSE

Applications received for a senior operator license on Salem Unit No. 2 have indicated that the required experience levels have been met.

Certifications that operator license applicants have learned to operate the controls will be signed by F. W. Schneider, Vice President - Production.

The Licensed Operator Training Programs have been revised to include training in heat transfer, fluid flow, thermodynamics, and plant transients.

CONCLUSION

Individuals who have received a Senior license on Salem Unit No. 2 meet all experience requirements.

Applications which have been recently submitted are signed by the Vice President-Production. Training programs have been revised as required. The staff (OLB) will review revised training programs in accordance with Item A.2.C of H. Denton's letter of March 28, 1980.

We conclude that Salem has satisfied the requirements of NUREG-0694, Item I.A.2.1.

I.A.3.1 REVISE SCOPE AND CRITERIA FOR LICENSING EXAMS

POSITION

Applicants for operator licenses will be required to grant permission to the NRC to inform their facility management regarding the results of examinations.

Contents of the licensed operator requalification program shall be modified to include instruction in heat transfer, fluid flow, thermodynamics, and mitigation of accidents involving a degraded core.

The criteria for requiring a licensed individual to participate in accelerated requalification shall be modified to be consistent with the new passing grade for issuance of a license.

Requalification programs shall be modified to require specific reactivity control manipulations. Normal control manipulations,

such as plant or reactor startups, must be performed. Control manipulations during abnormal or emergency operations shall be walked through and evaluated by a member of the training staff. An appropriate simulator may be used to satisfy the requirements for control manipulations.

RESPONSE

Applicants for operator licenses will grant permission to the NRC to inform plant management regarding the results of examination.

Content of the licensed operator requalification program has been modified to include instruction in heat transfer, fluid flow, thermodynamics, and mitigation of accidents involving a degraded core.

The criteria for requiring a licensed individual to participate in accelerated requalification have been modified to reflect the new passing grade for issuance of licenses.

The requalification program has been modified to require specific reactivity control manipulations as per Enclosure 4 to H. Denton's letter of March 28, 1980. One week of Simulator Training is scheduled for each licensed operator per year. Control manipulations during abnormal or emergency operations are evaluated by the Simulator training staff and provided to Public Service. As many reactivity manipulations as practical will be performed at Salem; those manipulations not performed at Salem will be performed on a simulator.

CONCLUSION

Based on the information submitted by Salem we conclude that Salem has satisfied all requirements of NUREG-0694, Item I.A.3.1.

[redacted] PDR

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FROM: V. A. Moore, Acting Deputy Director, Division of Human Factors Safety, NRR

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13.0 Conduct of Operations

13.2 Licensed Operator Training Program

The information contained in NUREG-0517, SER for the Salem Nuclear Generating Station, Unit 2, thru Supplement No. 4 remains valid.

Standard Review Plan 13.2, Training, was used in the review. Regulatory Guide 1.8, Selection and Training of Personnel and 10 CFR 55.20 through 55.23 and 55.25 were used to evaluate the programs.

Part I - Fuel-Loading and Low-Power Testing Requirements

II.B.4 TRAINING FOR MITIGATING CORE DAMAGE

POSITION

The staff requires that the applicant develop a program to ensure that all operating personnel are trained in the use of installed plant systems to control or mitigate an accident in which the core is severely damaged. The training program shall include the following topics:

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3. Corrosion effects of extended immersion in primary water; time to failure.

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1. Response of Process and Area Monitors to severe damages; behavior of detectors when saturated; method for detecting radiation readings by direct measurement at detector output (overanged detector); expected accuracy of detectors at different locations; use of detectors to determine extent of core damage.

2. Methods of determining dose rate inside containment from measurements taken outside containment.

F. Gas Generation

1. Methods of H_2 generation during an accident; other sources of gas (Xe, Kr); techniques for venting or disposal of non-condensibles.

2. H_2 flammability and explosive limit, sources of O_2 in containment or Reactor Coolant System.

Discussion and Conclusions

Public Service Electric and Gas Company has commited to this program as indicated in Supplement No. 4 to NUREG-0517 (TMI-2 Issues Related to Fuel Load and Low Power Test Program.)

By letter dated April 1, 1980, Public Service submitted a summary of the training material for Mitigating Core Damage. A review of this material has indicated that all topics will be addressed and that training will be completed prior to full power operation.

Based on the foregoing, we have concluded that Salem Unit 2, has complied with NUREG-0694, Item II.4.B.

I.A.2.3 ADMINISTRATION OF TRAINING PROGRAMS FOR LICENSED OPERATORS

POSITION

Training instructors who teach systems, integrated responses, transients and simulator courses shall successfully complete a SRO examination.

Instructors shall attend appropriate retraining programs that address, as a minimum, current operating history, problems and changes to procedures and administrative limitations. In the event an instructor is a licensed SRO, his retraining shall be the SRO requalification program.

RESPONSE

All Salem instructors that teach systems, integrated responses, and transient courses presently hold valid SRO licenses. Instructors participate in the applicable portions of the requalifications program.

CONCLUSION

Based on the foregoing, we have concluded that Salem, Unit 2 has complied with NUREG-0694, Item I.A.2.3.

I.A.2.1 IMMEDIATE UPGRADING OF OPERATOR AND SENIOR OPERATOR TRAINING AND QUALIFICATION

POSITION

Applicants for SRO license shall have 4 years of responsible power plant experience, of which at least 2 years shall be nuclear power plant experience (including 6 months at the specific plant) and no more than 2 years shall be academic or related technical training.

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RESPONSE

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CONCLUSION

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We conclude that Salem has satisfied the requirements of NUREG-0694, Item I.A.2.1.

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CONCLUSION

Based on the information submitted by Salem we conclude that Salem has satisfied all requirements of NUREG-0694, Item I.A.3.1.