SAI-186-029-21

TECHNICAL EVALUATION REPORT

IMPROVEMENTS IN TRAINING AND REQUALIFICATION PROGRAMS AS REQUIRED BY TMI ACTION ITEMS I.A.2.1 AND II.B.4

for the

Oconee Nuclear Station, Units 1, 2 and 3

(Dockets 50-269, 50-270 and 50-287)

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Prepared By:

Science Applications, Inc.
1710 Goodridge Drive
McLean, Virginia 22102

Prepared for:

U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

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I. INTRODUCTION

Science Applications, Inc. (SAI), as technical assistance contractor to the U.S. Nuclear Regulatory Commission, has evaluated the response by the Duke Power Company for the Oconee Nuclear Station, Units 1, 2 and 3 (Dockets 50-269, 50-270 and 50-287) to certain requirements contained in post-TMI Action Items I.A.2.1, Immediate Upgrading of Reactor Operator and Senior Reactor Operator Training and Qualifications, and II.B.4, Training for Mitigating Core Damage. These requirements were set forth in NUREG-0660 (Reference 1) and were subsequently clarified in NUREG-0737 (Reference 2).*

The purpose of the evaluation was to determine whether the licensee's operator training and requalification programs satisfy the requirements. The evaluation pertains to Technical Assignment Control (TAC) System numbers:

	I.A.2.1	II.B.4
Unit 1	44180	44530
Unit 2	44181	44531
Unit 3	44182	44532

As delineated below, the evaluation covers only some aspects of item I.A.2.1.4.

The detailed evaluation of the licensee's submittals is presented in Section IV; the conclusions are in Section V.

II. SCOPE AND CONTENT OF THE EVALUATION

A. I.A.2.1: Immediate Upgrading of RO and SRO Training and Qualifications

The clarification of TMI Action Item I.A.2.1 in NUREG-0737 incorporates a letter and four enclosures, dated March 28, 1980, from Harold R. Denton, Director, Office of Nuclear Reactor Regulation, USNRC, to all power reactor applicants and licensees, concerning qualifications of reactor operators (hereafter referred to as Denton's letter). This letter and enclosures imposes a number of training requirements on power reactor licensees. This evaluation specifically addressed a subset of the requirements stated in Enclosure 1 of Denton's letter, namely: Item A.2.c, which relates to operator training requirements; Item A.2.e, which concerns instructor requalification; and Section C, which addresses operator requalification. Some of these requirements are elaborated in Enclosures 2, 3, and 4 of Denton's letter. The training requirements under evaluation are summarized in Figure 1. The elaborations of these requirements in Enclosures 2, 3 and 4 of Denton's letter are shown respectively in Figures 2, 3 and 4.

*Enclosure 1 of NUREG-0737 and NRC's Technical Assistance Control System distinguish four sub-actions within I.A.2.1 and two sub-actions within II.B.4. These subdivisions are not carried forward to the actual presentation of the requirements in Enclosure 3 of NUREG-0737. If they had been, the items of concern here would be contained in I.A.2.1.4 and II.B.4.1.

Figure 1. Training Requirements from TMI Action Item I.A.2.1*

Program Element	NRC Requirements**
OPERATIONS PERSONNEL TRAINING	Enclosure 1, Item A.2.c(1) Training programs shall be modified, as necessary, to provide training in heat transfer, fluid flow and thermodynamics. (Enclosure 2 provides guidelines for the minimum content of such training.) Enclosure 1, Item A.2.c(2) Training programs shall be modified, as necessary to provide training in the use of installed plant systems to control or mitigate an accident in which the core is severely damaged. (Enclosure 3 provides guidelines for the minimum content of such training.) Enclosure 1, Item A.2.c.(3) Training programs shall be modified, as necessary to provide increased emphasis on reactor and plant transients.
INSTRUCTOR REQUALIFICATION	Enclosure 1, Item A.2.e Instructors shall be enrolled in appropriate requalification programs to assure they are cognizant of current operating history, problems, and changes to procedures and administrative limitations.
PERSONNEL REQUALIFICATION	Enclosure 1, Item C.1 Content of the licensed operator requalification programs shall be modified to include instruction in heat transfer, fluid flow, thermodynamics, and mitigation of accidents involving a degraded core. (Enclosures 2 and 3 provide guidelines for the minimum content of such training.) Enclosure 1, Item C.2 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: 80% overall and 70% each category. Enclosure 1, Item C.3 Programs should be modified to require the control manipulations listed in Enclosure 4. Normal control manipulations, such as plant or reactor startups, must be performed. Control manipulations during abnormal or emergency operations must be walked through with, and evaluated by, a member of the training staff at a minimum. An appropriate simulator may be used to satisfy the requirements for control manipulations.

*The requirements shown are a subset of those contained in Item I.A.2.1.
**References to Enclosures are to Denton's letter of March 28, 1980, which is contained in the clarification of Item I.A.2.1 in NUREG-0737.

Figure 2. Enclosure 2 from Denton's Letter

TRAINING IN HEAT TRANSFER, FLUID FLOW AND THERMODYNAMICS

1. Basic Properties of Fluids and Matter.

This section should cover a basic introduction to matter and its properties. This section should include such concepts as temperature measurements and effects, density and its effects, specific weight, buoyancy, viscosity and other properties of fluids. A working knowledge of steam tables should also be included. Energy movement should be discussed including such fundamentals as heat exchange, specific heat, latent heat of vaporization and sensible heat.

2. Fluid Statics.

This section should cover the pressure, temperature and volume effects on fluids. Example of these parametric changes should be illustrated by the instructor and related calculations should be performed by the students and discussed in the training sessions. Causes and effects of pressure and temperature changes in the various components and systems should be discussed in the training sessions. Causes and effects of pressure and temperature changes in the various components and systems should be discussed as applicable to the facility with particular emphasis on safety significant features. The characteristics of force and pressure, pressure in liquids at rest, principles of hydraulics, saturation pressure and temperature and subcooling should also be included.

3. Fluid Dynamics.

This section should cover the flow of fluids and such concepts as Bernoulli's principle, energy in moving fluids, flow measure theory and devices and pressure losses due to friction and orificing. Other concepts and terms to be discussed in this section are NPSH, carry over, carry under, kinetic energy, head-loss relationships and two phase flow fundamentals. Practical applications relating to the reactor coolant system and steam generators should also be included.

4. Heat Transfer by Conduction, Convection and Radiation.

This section should cover the fundamentals of heat transfer by conductions. This section should include discussions of such concepts and terms as specific heat, heat flux and atomic action. Heat transfer characteristics of fuel rods and heat exchangers should be included in this section.

This section should cover the fundamentals of heat transfer by convection. Natural and forced circulation should be discussed as applicable to the various systems at the facility. The convection current patterns created by expanding fluids in a confined area should be included in this section. Heat transport and fluid flow reductions or stoppage should be discussed due to steam and/or noncondensible gas formation during normal and accident conditions.

This section should cover the fundamentals of heat transfer by thermal radiation in the form of radiant energy. The electromagnetic energy emitted by a body as a result of its temperature should be discussed and illustrated by the use of equations and sample calculations. Comparisons should be made of a black body absorber and a white body emitter.

5. Change of Phase - Boiling.

This section should include descriptions of the state of matter, their inherent characteristics and thermodynamic properties such as enthalpy and entropy. Calculations should be performed involving steam quality and void fraction properties. The types of boiling should be discussed as applicable to the facility during normal evolutions and accident conditions.

6. Burnout and Flow Instability.

This section should cover descriptions and mechanisms for calculating such terms as critical flux, critical power, DNB ratio and hot channel factors. This section should also include instructions for preventing and monitoring for clad or fuel damage and flow instabilities. Sample calculations should be illustrated by the instructor and calculations should be performed by the students and discussed in the training sessions. Methods and procedures for using the plant computer to determine quantitative values of various factors during plant operation and plant heat balance determinations should also be covered in this section.

7. Reactor Heat Transfer Limits.

This section should include a discussion of heat transfer limits by examining fuel rod and reactor design and limitations. The basis for the limits should be covered in this section along with recommended methods to ensure that limits are not approached or exceeded. This section should cover discussions of peaking factors, radial and axial power distributions and changes of these factors due to the influence of other variables such as moderator temperature, xenon and control rod position.

Figure 3. Enclosure 3 from Denton's Letter

TRAINING CRITERIA FOR MITIGATING CORE DAMAGE

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.

3. Methods for calling up (printing) incore data from the plant computer.

B. Excore Nuclear Instrumentation (NIS)

1. Use of NIS for determination of void formation; 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 clad 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 (overranged 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, Ke); 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.

Figure 4. Control Manipulations Listed in Enclosure 4.

CONTROL MANIPULATIONS

*1. Plant or reactor startups to include a range that reactivity feedback from nuclear heat addition is noticeable and heatup rate is established.

2. Plant shutdown.

*3. Manual control of steam generators and/or feedwater during startup and shutdown.

4. Boration and or dilution during power operation.

*5. Any significant (greater than 10%) power changes in manual rod control or recirculation flow.

6. Any reactor power change of 10% or greater where load change is performed with load limit control or where flux, temperature, or speed control is on manual (for HTGR).

*7. Loss of coolant including:

1. significant PWR steam generator leaks

2. inside and outside primary containment

3. large and small, including leak-rate determination

4. saturated Reactor Coolant response (PWR).

8. Loss of instrument air (if simulated plant specific).

9. Loss of electrical power (and/or degraded power sources).

*10. Loss of core coolant flow/natural circulation.

11. Loss of condenser vacuum.

12. Loss of service water if required for safety.

13. Loss of shutdown cooling.

14. Loss of component cooling system or cooling to an individual component.

15. Loss of normal feedwater or normal feedwater system failure.

*16. Loss of all feedwater (normal and emergency).

17. Loss of protective system channel.

18. Misposition ed control rod or rods (or rod drops).

19. Inability to drive control rods.

20. Conditions requiring use of emergency boration or standby liquid control system.

21. Fuel cladding failure or high activity in reactor coolant or offgas.

22. Turbine or generator trip.

23. Malfunction of automatic control system(s) which affect reactivity.

24. Malfunction of reactor coolant pressure/volume control system.

25. Reactor trip.

26. Main steam line break (inside or outside containment).

27. Nuclear instrumentation failure(s).

* Starred items to be performed annually, all others biennially.

As noted in Figure 1, Enclosures 2 and 3 indicate minimum requirements concerning course content in their respective areas. In addition, the Operator Licensing Branch in NRC has taken the position (Reference 3) that the training in mitigating core damage and related subjects should consist of at least 80 contact hours* in both the initial training and the requalification programs. The NRC considers thermodynamics, fluid flow and heat transfer to be related subjects, so the 80-hour requirement applies to the combined subject areas of Enclosures 2 and 3. The 80 contact hour criterion is not intended to be applied rigidly; rather, its purpose is to provide greater assurance of adequate course content when the licensee's training courses are not described in detail.

Since the licensees generally have their own unique course outlines, adequacy of response to these requirements necessarily depends only on whether it is at a level of detail comparable to that specified in the enclosures (and consistent with the 80 contact hour requirement) and whether it can reasonably be concluded from the licensee's description of his training material that the items in the enclosures are covered.

The Institute of Nuclear Power Operations (INPO) has developed its own guidelines for training in the subject areas of Enclosures 2 and 3. These guidelines, given in References 4 and 5, were developed in response to the same requirements and are more than adequate, i.e., training programs based specifically on the complete INPO documents are expected to satisfy all the requirements pertaining to training material which are addressed in this evaluation.

The licensee's response concerning increased emphasis on transients is considered by SAI to be acceptable if it makes explicit reference to increased emphasis on transients and gives some indication of the nature of the increase, or, if it addresses both normal and abnormal transients (without necessarily indicating an increase in emphasis) and the requalification program satisfies the requirements for control manipulations, Enclosure 1, Item C.3. The latter requirement calls for all the manipulations listed in Enclosure 4 (Figure 4 in this report) to be performed, at the frequency indicated, unless they are specifically not applicable to the licensee's type of reactor(s). Some of these manipulations may be performed on a simulator. Personnel with senior licenses may be credited with these activities if they direct or evaluate control manipulations as they are performed by others. Although these manipulations are acceptable for meeting the reactivity control manipulations required by Appendix A paragraph 3.a of 10 CFR 55, the requirements of Enclosure 4 are more demanding. Enclosure 4 requires about 32 specific manipulations over a two-year cycle while 10 CFR 55 Appendix A requires only 10 manipulations over a two-year cycle.

*A contact hour is a one-hour period in which the course instructor is present or available for instructing or assisting students; lectures, seminars, discussions, problem-solving sessions, and examinations are considered contact periods. This definition is taken from Reference 4.

B. II.B.4: Training for Mitigating Core Damage

Item II.B.4 in NUREG-0737 requires that "shift technical advisors and operating personnel from the plant manager through the operations chain to the licensed operators" receive training on the use of installed systems to control or mitigate accidents in which the core is severely damaged. Enclosure 3 of Denton's letter provides guidance on the content of this training. "Plant Manager" is here taken to mean the highest ranking manager at the plant site.

For licensed personnel, this training would be redundant in that it is also required, by I.A.2.1, in the operator requalification program. However, II.B.4 applies also to operations personnel who are not licensed and are not candidates for licenses. This may include one or more of the highest levels of management at the plant. These non-licensed personnel are not explicitly required to have training in heat transfer, fluid flow and thermodynamics and are therefore not obligated for the full 80 contact hours of training in mitigating core damage and related subjects.

Some non-operating personnel, notably managers and technicians in instrumentation and control, health physics and chemistry departments, are supposed to receive those portions of the training which are commensurate with their responsibilities. Since this imposes no additional demands on the program itself, we do not address it in this evaluation. It would be appropriate for resident inspectors to verify that non-operating personnel receive the proper training.

* * * * *

The required implementation dates for all items have passed. Hence, this evaluation did not address the dates of implementation. Moreover, the evaluation does not cover training program modifications that might have been made for other reasons subsequent to the response to Denton's letter.

III. LICENSEE SUBMITTALS

The licensee, (the Duke Power Company) has submitted to NRC a number of items (letters and various attachments) which explain their training and requalification programs. These submittals, made in response to Denton's letter, form the information base for this evaluation. For the Oconee Nuclear Station, Units 1, 2 and 3, there were two submittals with attachments, for a total of twelve items, which are listed below.

1. Letter from W.O. Parker, Jr., Vice President Steam Production, Duke Power Co., to H.R. Denton, Director, Office of Nuclear Reactor Regulation, NRC. July 31, 1980. (1 pg, with enclosures: items 2 & 3). NRC Acc No: 8008110355. (re: Response to NRC letter dated March 28, 1980).

2. "Duke Power Co., OCONEE Nuclear Station, Operator Licensing Program" (Revised). July 14, 1980. (18 pp, attached to item 1). NRC Acc No: 8008110358

3. "Duke Power Co., OCONEE Nuclear Station, Requalification Program for NRC Licensed Personnel" (Revised). July 14, 1980. (8 pp, attached to item 1). NRC Acc No: 8008110360

4. Letter from W.O. Parker, Jr., Vice President, Steam Production, Duke Power Co., to H.R. Denton, Director of Office of Nuclear Reactor Regulation, NRC. May 25, 1982. (1 pg, with enclosures: items 5,6,7,8,9,10,11, & 12).(re: Response to NRC's RAI dated April 26, 1982).

5. "Upgraded SRO & RO Training and Training for Mitigating Core Damage - Request for Additional Information". Undated.(3 pp, attached to item 4).

6. "Thermodynamics, Heat Transfer, Fluid Flow; Course Outline", Attachment A. Undated. (3 pp, attached to item 4).

7. "Accident Mitigation", (Prog. OP-OC-SPS-PTR- AM), Attachment B. Undated. (15 pp, attached to item 4). (re: Course Outline, and Training Objectives).

8. "Operations Organization Chart", Attachment C. Undated. (1 pg, attached to item 4).

9. "Normal Transients, Prog. OP-OC-SPS-PTR-NT", Attachment D. Undated. (2 pp, attached to item 4). (re: Training Objectives).

10. "Safety Analysis, Prog. OP-OC-SPS-PTR-SA", Attachment D. Undated. (1 pg, attached to item 4). (re: Training Objectives).

11. "Incidents, Prog. OP-OC-SPS-PTR-I", Attachment D. Undated.(1 pg, attached to item 4). (re: Training Objectives).

12. "Abnormal Transients, Prog. OP-OC-SPS-PTR- AT", Attachment D. Undated. (1 pg, attached to item 4). (re: Training Objectives).

The last submittal and attachments thereto (8) were in response to the NRC request for additional information (Reference 6).

IV. EVALUATION

SAI's evaluation of the training programs at the Duke Power Company's Oconee Nuclear Station, Units 1, 2 and 3 is presented below. Section A addresses TMI Action Item I.A.2.1 and presents the assessment organized in the manner of Figure 1. Section B addresses TMI Action Item II.B.4.

A. I.A.2.1: Immediate Upgrading of Reactor Operator and Senior Reactor Operator Training and Qualification.

Enclosure 1, Item A.2.c(1)

The basic requirements are that the training programs given to reactor operator and senior reactor operator candidates cover the subjects of heat transfer, fluid flow and thermodynamics at the level of detail specified in Enclosure 2 of Denton's letter.

Submittal item 5, in response to the NRC request for additional information (Reference 6), states that the material presented in the Oconee Nuclear Station License Preparatory Program is at least as extensive as that identified in Enclosure 2 to Denton's letter and refers to Submittal Item 6, "Thermodynamics, Heat Transfer Course Outline". Examination of this document indicates the level of detail specified in Enclosure 2 of Denton's letter is substantially demonstrated and that the basic requirements of this Enclosure 1 item are met.

Enclosure 1, Item A.2.c(2)

The requirements are that the training programs for reactor and senior reactor operator candidates cover the subject of accident mitigation at the level of detail specified in Enclosure 3 of Denton's letter (see igure 3 of this report).

Submittal Item 5, in response to the NRC request for additional information (Reference 6), states that ten days (80 hours) are devoted to accident mitigation and related subjects. Submittal Item 7 consists of the "Accident Mitigation" lesson outline and a listing of the Accident Mitigation Training Objectives. Examination of the lesson outline indicates the level of detail specified in Enclosure 3 of Denton's letter is achieved. If the training objectives are, in fact, met the training program in accident mitigation is in much greater detail than provided for in Enclosure 3 to Denton's letter. The requirements of this Enclosure 1 item are fully satisfied.

Enclosure 1, Item A.2.c(3)

The requirement is that there be an increased emphasis in the training program on dealing with reactor transients.

Submittal Item 5 states: "An increase in emphasis on both normal and abnormal transients has been incorporated into the training program". Submittal Item 9 consists of the training objectives in regard to dealing with normal transients. To meet the listed objectives the trainee must be able to describe the overall plant response in 26 different transient scenarios. Submittal Item 12 lists the training objects in regard to dealing with abnormal reactor transients and consists of the following:

1. Be able to discuss incidents at your facility which have occurred within six months prior to license examination. Must be able to provide basic description, cause, corrective action and lessons learned.

2. Be able to discuss major incidents at your facility which have occurred greater than six months prior to license examination. Must be able to provide some information as above.

3. Be able to discuss major industry wide incidents which have occurred. Must be able to relate incident to your plant and how lessons learned will prevent occurrence at your facility. (LER's and I&E Bulletins from NRC will be source of information.)

4. Be able to discuss the incident of TMI-2.

5. Must be able to discuss any other incident related material such as operating experiences, etc. presented during this module.

It is presumed that these training objectives are met and it is therefore concluded that the requirement of this Enclosure 1 item is also met.

Enclosure 1, Item A.2.e

The requirement is that instructors for reactor operator training programs be enrolled in appropriate requalification programs to assure they are cognizant of current operating history, problems and changes to procedures and administrative limitations.

Submittal Item 3, Section 2.4 states: "Instructors shall be enrolled in appropriate portions of the requalification program to assure that they are cognizant of current operating history, problems and changes to procedures and administrative limitations. This policy statement demonstrates satisfaction of this Enclosure 1 item.

Enclosure 1, Item C.1

The primary requirement is that the requalification programs have instruction in the areas of heat transfer, fluid flow, thermodynamics and accident mitigation. The level of detail required in the requalification program is that of Enclosures 2 and 3 of Denton's letter. In addition, these instructions must involve an adequate number of contact hours.

Submittal Item 3, Section 3 indicates the following lecture series will be given on an annual basis consisting of six segments of three days duration. The lecture series will cover the following subjects.

1. Reactor Principles
2. Operating Characteristics
3. Radiation/Radiation Protection
4. Instruments and Controls
5. Safety and Emergency Systems
6. Design Characteristics
7. Procedures and Technical Specifications
8. Heat Transfer, Fluid Flow and Thermodynamics
9. Mitigation of Core Damage
10. Quality Assurance for Operations

The total annual contact training hours devoted to training in the requalification program appears to be 144. Submittal Item 5 states: "The

material presented in the Oconee Nuclear Station Requalification Program is at least as extensive as that identified in Enclosures 2 and 3 of the Denton, March 28, 1980 letter". Reference is then made to Submittal Items 6 and 7, "Thermodynamics, Heat Transfer, Fluid Flow Course Outline" and "Accident Mitigation Course Outline and Training Objectives", respectively, which have been evaluated as satisfactory in connection with Enclosure 1, Items A.2.c(1) and A.2.c(2). Submittal Item 5 further states that 80 hours are devoted to Accident Mitigation and the related subjects of Heat Transfer, Fluid Flow and Thermodynamics. The requirements of this Enclosure 1 Item are satisfied.

Enclosure 1, Item C.2

The requirement for licensed operators to participate in the accelerated requalification program must be based on passing scores of 80% overall, 70% in each category.

Submittal Item 3, Section 3 states: "Any operator who scores less than 80 percent overall or less than 70 percent on a category in the Annual Requalification Exam shall be removed from licensed duties and placed in an Accelerated Requalification Program". This policy meets the requirement of this Enclosure 1 item.

Enclosure 1, Item C.3

TMI Action Item I.A.2.1 calls for the licensed operator requalification program to include performance of control manipulations involving both normal and abnormal situations. The specific manipulations required and their performance frequency are identified in Enclosure 4 of the Denton letter (see Figure 4 of this report).

Submittal Item 3, Section 2.1 provides a list of reactivity control manipulations that corresponds to the list in Enclosure 4 of Denton's letter. Section 4.2 of this submittal item states: During the two-year license term, a minimum of ten such reactivity control manipulations shall be conducted or directed by each licensed Senior Operator, conducted by each licensed Operator, directed or evaluated by each Shift Technical Advisor and Senior Licensed members of the Instructor Training Staff. (The 10CFR55 requirement that any 10 reactivity manipulations be performed is superceded by Denton's letter, which requires that all 26 manipulations be performed, 6 of them annually.) Section 4.3 states that all licensed personnel will participate in a one-week (40 hours) simulator training course consisting of 20 hours of classroom and 20 hours at the simulator.

Submittal Item 5, in response to the NRC request for additional information (Reference 6), question 5, dealing with reactivity control manipulations, states: "Items a, c, e, f, i and o (items 1, 3, 5, 7, 10 and 16 of the Denton Enclosure 4) of Denton's letter of March 28, 1982 are not performed or simulated on an annual basis with all other items performed on a two year cycle". The licensee explains the reasons for not performing or simulating these six annually required manipulations is due to, 1) difficulty in simulator scheduling and 2) lack of applicability to training effectiveness because of simulator-to-plant differences. The licensee further states: "The reactivity changes are administered according to the

Oconee Nuclear Station Requalification Program for NRC Licensed Personnel, Revised July 14, 1980 Section 2.1, 4.2, 4.3 and 4.4 (referred to in the above paragraph). In addition to those requirements the STAs have been attending simulator training on an annual basis".

The foregoing paragraphs indicated that the six annually required reactivity control manipulations are simply not performed or simulated and that at least ten of the remaining listed control manipulations are done (in plant or on simulator) by all licensed personnel. This interpretation of the conduct of this portion (control manipulation) of the requalification program was verified via phone conversation with the NRC Oconee Project Manager (Reference 7).

The licensee says that an onsite, plant specific simulator is being installed and should be ready for use by mid-1982, and at that time they will conform with the requirements of Enclosure 4 of Denton's letter. At this time however, the simulator is not yet operational and the estimated time for its becoming operational is unclear. This later fact was also verified by the NRC Oconee Project Manager (Reference 7).

As matters stand, the requirements of Enclosure 1, Item C.3 are not met.

E. II.B.4 Training for Mitigating Core Damage

Item II.B.4 requires that training for mitigating core damage, as indicated in Enclosure 3 of Denton's letter, be given to shift technical advisors and operating personnel from the plant manager to the licensed operators. This includes both licensed and non-licensed personnel.

The following positions at the Oconee Nuclear Station have received training for mitigating core damage: Superintendent of Operations (SRO Licensed), Assistant Station Manager (RO Licensed SRO certified), Operating Engineers (SRO Licensed), Shift Technical Advisors (SRO Licensed), Shift Supervisors (SRO Licensed), Assistant Operating Engineers (SRO Licensed), Assistant Shift Supervisors (SRO Licensed), Nuclear Control Operators (RO Licensed) and Assistant Nuclear Control Operators (RO Licensed).

All licensed operations personnel also participate in the requalification program which meets the requirements of Enclosures 2 and 3 of Denton's letter. Therefore the requirements of II.B.4 are satisfied. As there are apparently no non-licensed personnel in the operations chain the criterion regarding training this personnel category does not apply.

V. CONCLUSIONS

The part IV evaluation of the Duke Power Company, Oconee Nuclear Station, Units 1, 2 and 3 training program leads SAI to conclude that the requirements of TMI Action Item I.A.2.1 are not fully met in that the requalification program does not satisfy the requirements of Enclosure 4 to Denton's letter relating to reactivity control manipulations, specifically, Enclosure 1, Item C.3.

The SAI evaluation also concludes that the requirements of Item II.B.4 are fulfilled.

V. REFERENCES

1. "NRC Action Plan Developed as a Result of the TMI-2 Accident." NUREG-0660, United States Nuclear Regulatory Commission. May 1980.

2. "Clarification of TMI Action Plan Requirements," NUREG-0737, United States Nuclear Regulatory Commission. November 1980.

3. The NRC requirement for 80 contact hours is an Operator Licensing Branch technical position. It was included with the acceptance criteria provided by NRC to SAI for use in the present evaluation. See letter, Harley Silver, Technical Assistance Program Management Group, Division of Licensing, USNRC to Bryce Johnson, Program Manager, Science Applications, Inc., Subject: Contract No. NRC-03-82-096, Final Work Assignment 2, December 23, 1981.

4. "Guidelines for Heat Transfer, Fluid Flow and Thermodynamics Instruction," STG-02, The Institute of Nuclear Power Operations. December 12, 1980.

5. "Guidelines for Training to Recognize and Mitigate the Consequences of Core Damage," STG-01, The Institute of Nuclear Power Operations. January 15, 1981.

6. Request for additional information by NRC sent to the Duke Power Company, dated April 26, 1982.

7. Phone conversation, regarding the details of the Oconee Nuclear Station Requalification Program related to requirements for reactivity control manipulations, between Philip Wagner, NRC Project Manager for the Oconee Nuclear Station and Ray Roland, SAI staff.