



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

September 11, 2000

Mr. J. B. Beasley, Jr.
Vice President
Southern Nuclear Operating
Company, Inc.
Post Office Box 1295
Birmingham, Alabama 35201-1295

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2 RE: ISSUANCE
OF AMENDMENTS (TAC NOS. MA8501 AND MA8502)

Dear Mr. Beasley:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 115 to Facility Operating License NPF-68 and Amendment No. 93 to Facility Operating License NPF-81 for the Vogtle Electric Generating Plant, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TS) and associated Bases in response to your application dated March 6, 2000, as supplemented by letter dated July 7, 2000.

The amendments revise TS 3.9.4, "Containment Penetration," by allowing the equipment hatch to be open during core alteration and/or during movement of irradiated fuel within the containment, provided the capability for closure is maintained.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

Ramin Assa, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-424 and 50-425

Enclosures:

1. Amendment No. 115 to NPF-68
2. Amendment No. 93 to NPF-81
3. Safety Evaluation

cc w/encls: See next page

September 11, 2000

Mr. J. B. Beasley, Jr.
Vice President
Southern Nuclear Operating
Company, Inc.
Post Office Box 1295
Birmingham, Alabama 35201

DISTRIBUTION: JLehning
RidsRgn2MailCenter RLabel
PUBLIC GHill(4) T-5 C3 (paper copies)
PDII-1 R/F RidsNrrDripRtsb (WBeckner)
RidsOgcRp RidsAcrsAcnwMailCenter
KCampe

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: (TAC NOS. MA8501 AND MA8502)

Dear Mr. Beasley:

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 115 to Facility Operating License NPF-68 and Amendment No. 93 to Facility Operating License NPF-81 for the Vogtle Electric Generating Plant, Units 1 and 2. The amendments consist of changes to the Technical Specifications (TS) and associated Bases in response to your application dated March 6, 2000, as supplemented by letter dated July 7, 2000.

The amendments revise technical specification (TS) 3.9.4, "Containment Penetration," by allowing the equipment hatch to be open during core alteration and/or during movement of irradiated fuel within the containment, provided the capability for closure is maintained.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Ramin Assa, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-424 and 50-425

Enclosures:

1. Amendment No. 115 to NPF-68
2. Amendment No. 93 to NPF-81
3. Safety Evaluation

cc w/encls: See next page

DOCUMENT NAME: G:\PDII-1\VOGTLE\MA8502_AMD.wpd

OFFICE	PDII-1/PM	PDII-1/LA	OGC <i>who</i>	PDII-1/SC
NAME	RAssa:cn <i>RA</i>	CHawes <i>CMN</i>	APT <i>APT</i>	REmch <i>RZE</i>
DATE	8/31/00	8/31/00	9/6/00	9/11/00

OFFICIAL RECORD COPY

Vogtle Electric Generating Plant

cc:

Mr. J. A. Bailey
Manager, Licensing
Southern Nuclear Operating
Company, Inc.
P. O. Box 1295
Birmingham, Alabama 35201-1295

Mr. J. Gasser
General Manager, Vogtle Electric
Generating Plant
Southern Nuclear Operating
Company, Inc.
P. O. Box 1600
Waynesboro, Georgia 30830

Office of Planning and Budget
Room 615B
270 Washington Street, SW.
Atlanta, Georgia 30334

Mr. J. D. Woodard
Executive Vice President
Southern Nuclear Operating
Company, Inc.
P. O. Box 1295
Birmingham, Alabama 35201-1295

Steven M. Jackson
Senior Engineer - Power Supply
Municipal Electric Authority
of Georgia
1470 Riveredge Parkway, NW.
Atlanta, Georgia 30328-4684

Harold Reheis, Director
Department of Natural Resources
205 Butler Street, SE. Suite 1252
Atlanta, Georgia 30334

Attorney General
Law Department
132 Judicial Building
Atlanta, Georgia 30334

Mr. J. D. Sharpe
Resident Manager
Oglethorpe Power Corporation
Alvin W. Vogtle Nuclear Plant
P. O. Box 1600
Waynesboro, Georgia 30830

Charles A. Patrizia, Esquire
Paul, Hastings, Janofsky & Walker
10th Floor
1299 Pennsylvania Avenue
Washington, DC 20004-9500

Arthur H. Dombay, Esquire
Troutman Sanders
NationsBank Plaza
600 Peachtree Street, NE.
Suite 5200
Atlanta, Georgia 30308-2216

Resident Inspector
Vogtle Plant
8805 River Road
Waynesboro, Georgia 30830

Office of the County Commissioner
Burke County Commission
Waynesboro, Georgia 30830



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

GEORGIA POWER COMPANY

OGLETHORPE POWER CORPORATION

MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA

CITY OF DALTON, GEORGIA

VOGTLE ELECTRIC GENERATING PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 115
License No. NPF-68

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Vogtle Electric Generating Plant, Unit 1 (the facility) Facility Operating License No. NPF-68 filed by the Southern Nuclear Operating Company, Inc. (Southern Nuclear), acting for itself, Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia (the licensees), dated March 6, 2000, as supplemented by letter dated July 7, 2000, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-68 is hereby amended to read as follows:

Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 115 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard L. Emch, Jr., Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: September 11, 2000



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

GEORGIA POWER COMPANY

OGLETHORPE POWER CORPORATION

MUNICIPAL ELECTRIC AUTHORITY OF GEORGIA

CITY OF DALTON, GEORGIA

VOGTLE ELECTRIC GENERATING PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 93
License No. NPF-81

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment to the Vogtle Electric Generating Plant, Unit 2 (the facility) Facility Operating License No. NPF-81 filed by the Southern Nuclear Operating Company, Inc. (Southern Nuclear), acting for itself, Georgia Power Company, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and City of Dalton, Georgia (the licensees), dated March 6, 2000, as supplemented by letter dated July 7, 2000, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations as set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations set forth in 10 CFR Chapter I;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is hereby amended by page changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. NPF-81 is hereby amended to read as follows:

Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 93 , and the Environmental Protection Plan contained in Appendix B, both of which are attached hereto, are hereby incorporated into this license. Southern Nuclear shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Richard L. Emch, Jr., Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment:
Technical Specification
Changes

Date of Issuance: September 11, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 115

FACILITY OPERATING LICENSE NO. NPF-68

DOCKET NO. 50-424

AND

TO LICENSE AMENDMENT NO. 93

FACILITY OPERATING LICENSE NO. NPF-81

DOCKET NO. 50-425

Replace the following pages of the Appendix A Technical Specifications and associated Bases with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove

3.9.4-1
3.9.4-2
B 3.9.4-1
B 3.9.4-3
B 3.9.4-4
B 3.9.4-5
B 3.9.4-7

Insert

3.9.4-1
3.9.4-2
B 3.9.4-1
B 3.9.4-3
B 3.9.4-4
B 3.9.4-5
B 3.9.4-7

3.9 REFUELING OPERATIONS

3.9.4 Containment Penetrations

- LCO 3.9.4 The containment penetrations shall be in the following status:
- a. The equipment hatch is capable of being closed and held in place by four bolts;
 - b. The emergency and personnel air locks are isolated by at least one air lock door, or if open, the emergency and personnel air locks are isolable by at least one air lock door with a designated individual available to close the open air lock door(s); and
 - c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:
 - 1. closed by a manual or automatic isolation valve, blind flange, or equivalent, or
 - 2. capable of being closed by at least two OPERABLE Containment Ventilation Isolation valves

APPLICABILITY: During CORE ALTERATIONS,
 During movement of irradiated fuel assemblies within containment.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more containment penetrations not in required status.	A.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u> A.2 Suspend movement of irradiated fuel assemblies within containment.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	Verify each required containment penetration is in the required status.	7 days
SR 3.9.4.2	<p>-----NOTE----- Only required for unisolated penetrations. -----</p> <p>Verify at least two containment ventilation valves in each open containment ventilation penetration providing direct access from the containment atmosphere to the outside atmosphere are capable of being closed from the control room.</p>	18 months
SR 3.9.4.3	<p>-----NOTE----- Only required for an open equipment hatch. -----</p> <p>Verify the capability to install the equipment hatch.</p>	7 days

B 3.9 REFUELING OPERATIONS

B 3.9.4 Containment Penetrations

BASES

BACKGROUND

During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, a release of fission product radioactivity within containment will be restricted from escaping to the environment when the LCO requirements are met. In MODES 1, 2, 3, and 4, this is accomplished by maintaining containment OPERABLE as described in LCO 3.6.1, "Containment." In MODE 6, the potential for containment pressurization as a result of an accident is not likely; therefore, requirements to isolate the containment from the outside atmosphere can be less stringent. The LCO requirements are referred to as "containment closure" rather than "containment OPERABILITY." Containment closure means that all potential escape paths are closed or capable of being closed. Since there is no potential for containment pressurization, the 10 CFR 50, Appendix J leakage criteria and tests are not required.

The containment serves to contain fission product radioactivity that may be released from the reactor core following an accident, such that offsite radiation exposures are maintained well within the requirements of 10 CFR 100. Additionally, the containment provides radiation shielding from the fission products that may be present in the containment atmosphere following accident conditions.

The containment equipment hatch, which is part of the containment pressure boundary, provides a means for moving large equipment and components into and out of containment. If closed, the equipment hatch must be held in place by at least four bolts. Good engineering practice dictates that the bolts required by this LCO be approximately equally spaced. Alternatively, the equipment hatch can be open provided it can be installed with a minimum of four bolts holding it in place.

The containment air locks, which are also part of the containment pressure boundary, provide a means for personnel access during MODES 1, 2, 3, and 4 in accordance with LCO 3.6.2, "Containment Air Locks." Each air lock has a door at both ends. The doors are normally interlocked to prevent simultaneous opening when containment OPERABILITY is

(continued)

BASES

BACKGROUND
(continued)

In MODE 6, the 24 inch main or shutdown purge and exhaust valves are used to exchange large volumes of containment air to support refueling operations or other maintenance activities. During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment any open 24 inch valves are capable of being closed (LCO 3.3.6). The 14 inch mini-purge and exhaust valves, though typically not opened during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, if opened are also capable of being closed (LCO 3.3.6).

The other containment penetrations that provide direct access from containment atmosphere to outside atmosphere must be isolated on at least one side. Isolation may be achieved by a closed automatic isolation valve, a manual isolation valve, blind flange, or equivalent. Equivalent isolation methods allowed under the provisions of 10 CFR 50.59 may include use of a material that can provide a temporary, atmospheric pressure, ventilation barrier for the other containment penetrations during CORE ALTERATIONS or movement of irradiated fuel assemblies within containment (Ref. 1).

APPLICABLE
SAFETY ANALYSES

During CORE ALTERATIONS or movement of irradiated fuel assemblies within containment, the most severe radiological consequences result from a fuel handling accident. The fuel handling accident is a postulated event that involves damage to irradiated fuel (Ref. 2). Fuel handling accidents, analyzed in Reference 3, include dropping a single irradiated fuel assembly onto another irradiated fuel assembly.

To support the plant configuration of both air lock doors open (personnel and/or emergency air locks), and to further minimize an unmonitored, untreated release, the designated individual for closure of the air lock will have the air lock closed within 15 minutes of the fuel handling accident. The 15 minute duration was chosen as the limit for the response capability for the person who is designated for closing the air lock door. The NRC

(continued)

BASES

APPLICABLE
SAFETY ANALYSES
(continued)

acceptance of this specification was based on doses for a 2 hour release as well as a licensee commitment for a person designated to close the door quickly.

The requirements of LCO 3.9.7, "Refueling Cavity Water Level," and the minimum decay time of 100 hours prior to CORE ALTERATIONS ensure that the release of fission product radioactivity, subsequent to a fuel handling accident, results in doses that are well within the guideline values specified in 10 CFR 100. Standard Review Plan, Section 15.7.4, Rev. 1 (Ref. 3), defines "well within" 10 CFR 100 to be 25% or less of the 10 CFR 100 values. The acceptance limits for offsite radiation exposure will be 25% of 10 CFR 100 values or the NRC staff approved licensing basis (e.g., a specified fraction of 10 CFR 100 limits). The radiological consequences of a fuel handling accident in containment have been evaluated assuming that the containment is open to the outside atmosphere. All airborne activity reaching the containment atmosphere is assumed to be exhausted to the environment within 2 hours of the accident. The calculated offsite and control room operator doses are within the acceptance criteria of Standard Review Plan 15.7.4 and GDC 19. Therefore, although the containment penetrations do not satisfy any of the NRC Policy Statement criteria, LCO 3.9.4 provides containment closure capability to minimize potential offsite doses.

LCO

This LCO limits the consequences of a fuel handling accident in containment by limiting the potential escape paths for fission product radioactivity released within containment. The LCO requires the equipment hatch, the air locks, and any penetration providing direct access to the outside atmosphere to be closed or capable of being closed. Personnel air lock closure capability is provided by the availability of at least one door and a designated individual to close it. Emergency air lock closure capability is provided by the availability of at least one door and a designated individual to close it. Equipment hatch closure capability is provided by a designated trained hatch closure crew and the necessary equipment. For the OPERABLE containment ventilation penetrations, this LCO ensures that each penetration is isolable by the Containment Ventilation Isolation valves. The OPERABILITY requirements for LCO 3.3.6, Containment Ventilation Isolation Instrumentation ensure that radiation monitor inputs to the control room alarm exist so that operators can take timely

(continued)

BASES

LCO
(continued)

action to close containment penetrations to minimize potential offsite doses. The LCO requirements for penetration closure may also be met by the automatic isolation capability of the CVI system.

Item b of this LCO includes requirements for both the emergency air lock and the personnel air lock. The personnel and emergency air locks are required by Item b of this LCO to be isolable by at least one air lock door in each air lock. Both containment personnel and emergency air lock doors may be open during movement of irradiated fuel in the containment and during CORE ALTERATIONS provided at least one air lock door is isolable in each air lock. An air lock is isolable when the following criteria are satisfied:

1. one air lock door is OPERABLE,
2. at least 23 feet of water shall be maintained over the top of the reactor vessel flange in accordance with Specification 3.9.7,
3. a designated individual is available to close the door.

OPERABILITY of a containment air lock door requires that the door seal protectors are easily removed, that no cables or hoses are being run through the air lock, and that the air lock door is capable of being quickly closed.

The equipment hatch is considered isolable when the following criteria are satisfied:

1. the necessary equipment required to close the hatch is available.
2. at least 23 feet of water is maintained over the top of the reactor vessel flange in accordance with Specification 3.9.7,
3. a designated trained hatch closure crew is available.

Similar to the air locks, the equipment hatch opening must be capable of being cleared of any obstruction so that closure can be achieved as soon as possible.

(continued)

BASES

SURVEILLANCE
REQUIREMENTS

SR 3.9.4.1 (continued)

product radioactivity within the containment will not result in a release of fission product radioactivity to the environment.

SR 3.9.4.2

This Surveillance demonstrates that each containment ventilation isolation valve in each open containment ventilation penetration actuates to its isolation position. The 18 month Frequency maintains consistency with other similar testing requirements. Also, SR 3.6.3.5 demonstrates that the isolation time of each valve is in accordance with the Inservice Testing Program requirements. These Surveillances Performed during MODE 6 will ensure that the valves are capable of closing after a postulated fuel handling accident to limit a release of fission product radioactivity from the containment.

SR 3.9.4.3

The equipment hatch is provided with a set of hardware, tools, and equipment for moving the hatch from its storage location and installing it in the opening. The required set of hardware, tools, and equipment shall be inspected to ensure that they can perform the required functions.

The 7 day frequency is adequate considering that the hardware, tools, and equipment are dedicated to the equipment hatch and not used for any other functions.

The SR is modified by a Note which only requires that the surveillance be met for an open equipment hatch. If the equipment hatch is installed in its opening, the availability of the means to install the hatch is not required.

REFERENCES

1. GPU Nuclear Safety Evaluation SE-0002000-001, Rev. 0, May 20, 1988.
2. FSAR, Subsection 15.7.4.
3. NUREG-0800, Section 15.7.4, Rev. 1, July 1981.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 115 TO FACILITY OPERATING LICENSE NPF-68
AND AMENDMENT NO. 93 TO FACILITY OPERATING LICENSE NPF-81
SOUTHERN NUCLEAR OPERATING COMPANY, INC., ET AL.
VOGTLE ELECTRIC GENERATING PLANT, UNITS 1 AND 2
DOCKET NOS. 50-424 AND 50-425

1.0 INTRODUCTION

The Vogtle Electric Generating Plant (VEGP) consists of two 3565 megawatt-thermal Westinghouse pressurized-water reactors, Unit 1 and Unit 2, situated 26 miles southeast of Augusta, Georgia. The containment for each unit is a steel-lined, reinforced, prestressed concrete cylinder with a net free volume of 2.75×10^6 ft³ and a design pressure of 52 psig. The containment structure, in conjunction with other fission product barriers and accident mitigation systems, limits the radiological dose consequences of design-basis accidents to less than the criteria defined by Title 10 of the *Code of Federal Regulations* (10 CFR) Part 100.

By letter dated March 6, 2000, as supplemented by letter dated July 7, 2000, Southern Nuclear Operating Company, Inc., et al. (the licensee) proposed license amendments to change the Technical Specifications (TS) for VEGP, Units 1 and 2. The proposed changes would revise TS 3.9.4, "Containment Penetration," to allow the licensee to perform core alteration and/or movement of irradiated fuel within the containment while the equipment hatch is open, provided that its capability for closure is maintained. Prior to this proposed change, the Vogtle TS specified that the containment equipment hatch must have been closed and held in place by four bolts during fuel handling and core alterations.

The supplemental letter dated July 7, 2000, provided clarifying information that did not change the scope of the March 6, 2000, application and the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

2.1 Regulatory Background

Historic development of regulatory requirements for nuclear power plant operation was based on the premise that most potential risk was due to operation at power, and consequently, protection of the public could be ensured by designs and operations that conservatively

bounded all conditions by achieving defense-in-depth for power operation. Fuel movement was recognized as a situation for which there was no corresponding power operation scenario and was judged as an area where additional regulatory protection was necessary. This is reflected in the TS in that there are many containment requirements during power operation, but few requirements apply during the Cold Shutdown and Refueling Modes outside of fuel handling and core alterations.

During the late 1980s and early 1990s, the staff and industry realized that significant risk reductions could be achieved during shutdown operation. The staff responded with a rulemaking effort, and industry implemented voluntary initiatives to realize risk improvements. In recognition of these efforts, work to improve TS was concentrated on power operation specifications, with the intention to address shutdown once a rule was in place. The Commission, however, subsequently declined to issue a shutdown rule for comment. In SECY-97-168, dated July 30, 1997, the industry's voluntary actions were credited with helping achieve the acceptable level of risk from shutdown operations that now exists at U.S. nuclear power plants. Rather than implementing a new rule only to maintain this acceptable level of risk, in a staff requirements memorandum regarding SECY-97-168 dated December 11, 1997, the Commission instructed the staff to monitor licensee performance during shutdown operations through inspections and other means.

In summary, for the above reasons, TS for shutdown operations are not always consistent with the amount of risk involved with certain plant configurations.

2.2 Relevant Precedents

The proposed change reviewed in this safety evaluation is almost identical to an earlier proposed change included in a submittal from the licensee dated June 26, 1998. Though the other TS changes in that previous submittal were found acceptable, the proposed change that would have allowed an open equipment hatch during fuel handling and core alterations, while maintaining its capability of closure, was denied in the NRC's letter of January 29, 1999.

Since that time, however, in response to industry proposals, the staff has had the opportunity to reexamine its policy on the need for containment closure during shutdown operations such as fuel handling. During a public meeting on September 8, 1998, it was agreed that the Perry Nuclear Power Plant (Perry) would be the lead plant for this generic issue. In NRC's letter dated March 11, 1999, the Perry licensee's request was approved, and subsequently, similar license amendments have been approved for nuclear facilities of various designs. The VEGP licensee has noted these recent regulatory developments concerning containment closure during shutdown operations and, while accounting for design differences, has supported its proposed TS change with logic similar to that used by the staff in its approval of the amendment requested by the Perry licensee.

2.3 Licensee Rationale for TS Change

The licensee states that this proposed change would be beneficial from a cost savings point-of-view. Outages would proceed more efficiently because load-in/load-out activities could be

performed as necessary, and the containment equipment hatch would only need to be opened and closed once, rather than the three times mandated by existing TS. This savings in time would result in a cost savings.

The licensee further states that this proposal will provide an overall risk savings by reducing the need to maintain the equipment hatch open during periods when the chance of severe core damage is increased. By allowing load-in/load-out activities to proceed during times of low risk, such as while the reactor is defueled or the reactor vessel is fueled, open, and covered by 23 feet of water, the licensee states that there is less need to maintain an open containment equipment hatch during times of greater risk, such as mid-loop operation.

3.0 EVALUATION

To ensure that the current acceptable level of safety is maintained, the evaluation of the VEGP licensee's proposed Technical Specification change focused on three main issues:

- (1) dose calculations
- (2) administrative controls
- (3) risk significance

3.1 Dose Calculations

The dose calculations supporting this proposed TS change were originally done to justify License Amendment 92 (Unit 1) and License Amendment 70 (Unit 2), which allowed both personnel air lock doors to be open during core alterations or movement of irradiated fuel assemblies inside containment. Additionally, these same dose calculations for the personnel air lock doors were also used to support License Amendment 105 (Unit 1) and License Amendment 83 (Unit 2), which allowed both emergency air lock doors to be open and deleted the requirement for automatic system level initiation of containment ventilation isolation during fuel handling or core alterations.

Given a fuel handling accident inside containment, the resulting offsite dose consequences with both personnel air lock doors open was calculated to be 65.6 rem to the thyroid and 0.28 rem to the whole body at the exclusion area boundary. A fuel handling accident in the spent fuel pool in the fuel handling building results in offsite doses of 73 rem to the thyroid and 0.29 rem to the whole body, with no credit taken for the fuel handling building emergency filtration system charcoal filters. These results are less than 25 percent of the 10 CFR Part 100 limits, the Standard Review Plan (SRP) Section 6.4 acceptance criteria for the fuel handling accident.

The control room dose associated with a fuel handling accident inside containment with the personnel air lock doors open was found to remain below 30 rem thyroid if one of the four emergency control room filtration units is operating within seven minutes of the accident. These results are within the requirements of General Design Criterion (GDC) 19 of Appendix A to 10 CFR Part 50 as specified in SRP Section 6.4.

The control room dose for the fuel handling accident inside containment would bound that for the accident in the fuel handling building because of the shorter release path by way of the personnel airlock doors. Similarly, the control room dose by way of the personnel air lock would bound that for the equipment hatch because the equipment hatch is on the opposite

side of the containment. The offsite dose calculation for a fuel handling accident inside containment is essentially the same whether the airlock door and/or the equipment hatch are open, and the analysis is bounded by the analysis for the fuel handling building. Since the equipment hatch release pathway is bounded for both control room and offsite dose consequences by doses that meet the acceptance criteria, its results must therefore also meet the acceptance criteria for both cases.

The dose calculations performed by the licensee were independently verified by the NRC staff in its review of License Amendment 92 and License Amendment 70. The staff's analysis used the accident source term given in Regulatory Guide (RG) 1.4, the assumptions contained in RG 1.25, and the review procedures specified in SRP Sections 15.7.4 and 6.4. The staff assumed an instantaneous puff release of noble gases and radioiodines from the gap and plenum of the broken fuel rods. These gas bubbles were then assumed to pass through at least 23 feet of water covering the fuel prior to reaching the containment atmosphere. All airborne activity reaching the containment atmosphere was assumed to exhaust to the environment within two hours. The gap activity was assumed to have decayed for a period of 100 hours. This decay period is consistent with the VEGP Technical Requirements Manual, Section 13.9.1, which requires that the reactor be subcritical for ≥ 100 hours prior to movement of irradiated fuel in the reactor vessel. Using these assumptions, the offsite doses calculated by the staff were 37.0 rem thyroid, and 0.18 rem whole body. The control room operator doses calculated by the staff were 1.38 rem thyroid and 0.29 rem to the whole body.

After reviewing the conservative dose calculations and licensee analysis, the staff has concluded that the radiological consequences associated with the proposed TS change remain within the acceptance criteria set forth in the applicable regulations without credit being taken for the closure of the equipment hatch.

3.2 Administrative Controls

The licensee's administrative controls regarding an open containment equipment hatch were emphasized in this review. Such things as actual dose and actual risk significantly depend on the scope and effectiveness of licensee-implemented controls. The administrative controls most important to this review were the capability to close the equipment hatch promptly and the ability to monitor possible radioactive releases.

During fuel handling or core alterations, the licensee must be able to effect prompt closure of the containment equipment hatch. The licensee states that approximately one-half hour would be a sufficient period to complete closure of the hatch, including assembly of the hatch closure personnel. In order to maintain this prompt closure time, the licensee has several important procedures or practices:

- Obstructions interfering with the equipment hatch closure are permitted only when objects are in the process of being moved into or out of containment. Obstructions are not staged in a manner that interferes with hatch closure.
- As a standard practice, cables or hoses are not run through the equipment hatch opening; if an exception becomes necessary, quick-disconnect capability is maintained for that hose or cable.

- All tools and equipment required to close the equipment hatch are on hand and dedicated to that purpose.
- Before each refueling outage, personnel responsible for equipment hatch closure are properly trained on the procedure for closing the hatch. This includes a review of the step-by-step procedure for equipment hatch closure, as well as a viewing of a training video illustrating the step-by-step closure procedure. An effort is made to schedule at least one member of the crew who has had hands-on experience closing equipment hatch on each shift.
- Personnel responsible for equipment hatch closure are readily available in the event that an unanticipated closure is required. The normal crew size consists of four persons who typically will be on duty in the general vicinity of the containment equipment hatch. The crew leader can be contacted directly from the control room if a prompt equipment hatch closure becomes necessary.

At VEGP, when the containment equipment hatch is open, the equipment hatch cover hangs directly above the opening. Normally, when equipment hatch closure is necessary, an electrically powered winch is used to lower the hatch cover into closure position. However, in the event of a station blackout, compressed nitrogen gas is available as a backup source of power for hatch closure.

Licensee compliance with GDC-64 will ensure adequate monitoring of effluents from the open equipment hatch.

Having reviewed the licensee's administrative controls, the staff has found them to be acceptable and has concluded that they are an adequate means for supporting the proposed TS change.

3.3 Risk Significance

There have been several occurrences in the history of the nuclear power industry in which fuel bundles have actually been dropped in the course of fuel handling activities. In each of these instances, the actual releases from the fuel have been minimal or nonexistent (reference Nuclear Safety Analysis Center (NSAC)/129 and other subsequent plant operating event reports). This evidence shows that the assumptions used in the radiological dose calculations for a fuel handling accident are conservative.

Though a fuel handling accident does contribute to overall risk, the dominant contributor to overall risk, due to its more severe consequences, is core damage. While fuel is being handled, the reactor vessel head is removed, and the water level above the reactor vessel flange is required by Technical Specifications to be 23 feet. Should a loss of residual heat removal (RHR) occur, the operator has approximately 48 hours to recover RHR before core damage begins, as long as failure of RHR was not caused by a significant loss of reactor cavity inventory. As long as the equipment hatch can be closed in sufficient time to prevent fission product release, allowing an open equipment hatch will have relatively small risk implications.

As described in Section 3.2 above, the licensee has proposed a set of administrative controls for providing reasonable assurance that hatch closure can be achieved within 30 minutes. In addition, the licensee has provided an alternate means of hatch closure using compressed nitrogen gas and must comply with GDC-64. The staff finds these measures to be effective in ensuring low risk.

The licensee also notes that, if an open equipment hatch is permitted during plant configurations with increased risk (such as mid-loop), there is no compelling justification supporting a requirement for its closure during periods of decreased risk. In addition, the licensee states that the need to maintain an open equipment hatch during periods of increased risk (such as mid-loop) may be reduced if the licensee is permitted to open the containment equipment hatch during a period of relatively lower risk.

In response to SECY 97-168, the Commission did not proceed with the proposed shutdown rule because it felt the rule was not needed given current industry performance. The staff risk estimates presented to the Commission in SECY 97-168 credited the industry with implementing the Nuclear Management and Resources Council (NUMARC) Guidelines for Industry Actions to Assess Shutdown Management (NUMARC 91-06) and Generic Letter (GL) 88-17, which provides recommendations to improve reduced inventory operation. In the staff's estimate of industry shutdown risk for the proposed shutdown rule, the staff credited the licensees' being able to close containment by remote or local manual actions before containment conditions become intolerable during high risk periods. The staff credited the licensees with this capability on the basis of guidelines in NUMARC 91-06. These guidelines call for licensees to ensure that containment closure can be obtained in sufficient time before the release of fission products. In addition, GL 88-17 recommends procedures and administrative controls designed to give reasonable assurance that the containment will be closed prior to core uncover following a loss of decay heat removal. As directed by the Commission in the staff requirements memorandum to SECY 97-168, the staff is monitoring industry performance to ensure that the current level safety is being maintained. The Commission has also stated that it may take further action if any adverse trends are identified.

On the basis of the above, the NRC staff has concluded that the risk of permitting the licensee to open the equipment hatch during core alterations and fuel handling is small. This conclusion is supported by the licensee's procedures and practices listed in this safety evaluation that allow the licensee to close the equipment hatch within 30 minutes. The licensee also has contingency plans to close the hatch using compressed nitrogen gas in the event that alternating power current is unavailable. In addition, closure time is much less than the time that it would take the reactor coolant to boil considering that the refueling cavity is flooded. Therefore, the staff believes that the licensee can ensure that the containment will be closed prior to the potential release of fission products.

Accordingly, the staff has concluded that risk-informed considerations support the licensee's proposed Technical Specification change.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Georgia State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (65 FR 39961). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: R. Lobel
J. Lehning
K. Campe

Date: September 11, 2000