May 12, 1992

Docket Nos. 50-338
and 50-339

DISTRIBUTION
See attached sheet

Mr. W. L. Stewart
Senior Vice President - Nuclear
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Dear Mr. Stewart:

SUBJECT: NORTH ANNA UNITS 1 AND 2 - ISSUANCE OF AMENDMENTS RE: COMPONENT COOLING WATER SYSTEM (TAC NOS. M82143 AND M82144)

The Commission has issued the enclosed Amendment Nos. 159 and 140 to Facility Operating License Nos. NPF-4 and NPF-7 for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2). The amendments revise the Technical Specifications (TS) in response to your letter dated November 7, 1991.

The amendments revise the current NA-1&2 TS to ensure that the design basis is met for the component cooling water system. Bases pages B 3/4 7-4a for both units were changed by Amendment Nos. 152 and 136, and therefore are not included with these amendments.

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

Sincerely,

(Original Signed By)

Leon B. Engle, Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 159 to NPF-4
2. Amendment No. 140 to NPF-7
3. Safety Evaluation

cc w/enclosures:
See next page

*See Previous Concurrence

OFC	:LA:PDII-2	:PM:PDII-2	:SPLB:NRR*	:C:SPLB*	:D:PDII-2	:OGC*
NAME	:DMiller	:LEngle:kdj:WLefave		:CMcCracken:	:HBerkow	:EHoller
DATE	:5/11/92	:5/12/92	:04/30/92	:04/30/92	:5/12/92	:05/06/92

OFFICIAL RECORD COPY
Document Name: NA82143.AMD

CP-1

NRC FILE CENTER COPY

9205270264 920512
PDR ADOCK 05000338
P PDR

DF01

Mr. W. L. Stewart
Virginia Electric & Power Company

North Anna Power Station
Units 1 and 2

cc:
Mr. William C. Porter, Jr.
County Administrator
Louisa County
P.O. Box 160
Louisa, Virginia 23093

Michael W. Maupin, Esq.
Hunton and Williams
P.O. Box 1535
Richmond, Virginia 23212

Dr. W. T. Lough
Virginia State Corporation Commission
Division of Energy Regulation
P.O. Box 1197
Richmond, Virginia 23209

Old Dominion Electric Cooperative
4201 Dominion Blvd.
Glen Allen, Virginia 23060

Mr. E. Wayne Harrell
Vice President - Nuclear Services
Virginia Electric and Power Co.
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Office of the Attorney General
Supreme Court Building
101 North 8th Street
Richmond, Virginia 23219

Senior Resident Inspector
North Anna Power Station
U.S. Nuclear Regulatory Commission
Route 2, Box 78
Mineral, Virginia 231172

C.M.G. Buttery, M.D., M.P.H.
State Health Commissioner
Office of the Commissioner
Virginia Department of Health
P.O. Box 2448
Richmond, Virginia 23218

Regional Administrator, RII
U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W., Suite 2900
Atlanta, Georgia 30323

Mr. G. E. Kane, Manager
North Anna Power Station
P.O. Box 402
Mineral, Virginia 23117

Mr. J. P. O'Hanlon
Vice President - Nuclear Operations
Virginia Electric and Power Company
5000 Dominion Blvd.
Glen Allen, Virginia 23060

Mr. Martin Bowling
Manager - Nuclear Licensing
Virginia Electric and Power Co.
5000 Dominion Blvd.
Glen Allen, Virginia 23060

DATED: May 12, 1992

AMENDMENT NO. 159 TO FACILITY OPERATING LICENSE NO. NPF-4-NORTH ANNA UNIT 1
AMENDMENT NO. 140 TO FACILITY OPERATING LICENSE NO. NPF-7-NORTH ANNA UNIT 2

Docket File
NRC & Local PDRs
PDII-2 Reading
S. Varga, 14/E/4
G. Lainas, 14/H/3
H. Berkow
D. Miller
L. Engle
W. Lefave
C. McCracken
OGC
D. Hagan, 3302 MNBB
G. Hill (8), P-137
Wanda Jones, MNBB-7103
C. Grimes, 11/F/23
ACRS (10)
OPA
OC/LFMB
M. Sinkule, R-II

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

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-338

NORTH ANNA POWER STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 159
License No. NPF-4

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company et al., (the licensee) dated November 7, 1991, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations 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;

   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 amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.D.(2) of Facility Operating License No. NPF-4 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 159 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 12, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 159

TO FACILITY OPERATING LICENSE NO. NPF-4

DOCKET NO. 50-338

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Remove Pages	Insert Pages
3/4 7-17	3/4 7-17
- -	3/4 7-17a
3/4 7-18*	3/4 7-18*
B 3/4 7-4	B 3/4 7-4

*There are no changes to this page. It is included to maintain document completeness.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

3/4.7.3.1 COMPONENT COOLING WATER SUBSYSTEM - OPERATING

LIMITING CONDITION FOR OPERATION

3.7.3.1 Three component cooling water subsystems (shared with Unit 2) shall be OPERABLE* with each subsystem consisting of:

a. One OPERABLE component cooling water pump and,
b. One OPERABLE component cooling water heat exchanger.

APPLICABILITY: Either Unit in MODES 1, 2, 3, or 4.

ACTION:

a. With one required component cooling water subsystem inoperable, return the component cooling subsystem to OPERABLE status within the next 7 days, or place both units in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 24 hours.

b. With two required component cooling water subsystems inoperable, place both units in HOT SHUTDOWN within the next 12 hours, and within the next hour, initiate actions to place both units in COLD SHUTDOWN and continue until COLD SHUTDOWN is achieved.

c. With no component cooling water available to supply the residual heat removal heat exchangers to cool the units, place both units in HOT SHUTDOWN within the next 12 hours and remain in HOT SHUTDOWN until alternate means of decay heat removal can be implemented. Continue actions until both units are in COLD SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.7.3.1 Three component cooling water subsystems shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing in the flow path of the residual heat removal system that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. Each component cooling water pump shall be tested in accordance with Specification 4.0.5.

* For the purpose of this Technical Specification, each subsystem is considered OPERABLE if it is operating or if it can be placed in service from a standby condition by manually unisolating a standby heat exchanger and/or manually starting a standby pump.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

3/4.7.3.2 COMPONENT COOLING WATER SUBSYSTEM - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.7.3.2 Two component cooling water subsystems (shared with Unit 2) shall be OPERABLE* with each subsystem consisting of:

a. One OPERABLE component cooling water pump and,
b. One OPERABLE component cooling water heat exchanger.

APPLICABILITY: Both Units in MODES 5 or 6.

ACTION: With one required component cooling water subsystem inoperable, immediately suspend all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the Reactor Coolant System.

SURVEILLANCE REQUIREMENTS

4.7.3.2 At least two component cooling water subsystems shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) the flow path of the residual heat removal system that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. Each component cooling water pump shall be tested in accordance with Specification 4.0.5.

* For the purposes of this Technical Specification, each subsystem is considered OPERABLE if it is operating or if it can be placed in service from a standby condition by manually unisolating a standby heat exchanger and/or manually starting a standby pump.

3/4.7.4 SERVICE WATER SYSTEM

3/4.7.4.1 SERVICE WATER SYSTEM - OPERATING

LIMITING CONDITION FOR OPERATION

3.7.4.1 Two service water loops (shared with Unit 2) shall be OPERABLE with each loop consisting of:

a. Two OPERABLE service water pumps (excluding auxiliary service water pumps) with their associated normal and emergency power supplies, and

b. An OPERABLE flow path capable of providing cooling for OPERABLE plant components and transferring heat to the service water reservoir.

APPLICABILITY: Either Unit in MODES 1, 2, 3, or 4.

ACTION:

a. With one service water pump inoperable, within 72 hours throttle component cooling water heat exchanger flows, in accordance with approved operating procedures, to ensure the remaining service water pumps are capable of providing adequate flow to the recirculation spray heat exchangers.

b. With two service water pumps inoperable, perform ACTION 3.7.4.1.a within 1 hour and restore at least one service water pump to OPERABLE status within 72 hours, or place both units in HOT STANDBY within the next six hours and in COLD SHUTDOWN within the following 30 hours.

c. With one service water loop inoperable, except as provided in ACTION 3.7.4.1.a, restore the inoperable loop to OPERABLE status within 72 hours or place both units in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

d. The allowable time that one of the two service water loops can be inoperable as specified in ACTION 3.7.4.1.c may be extended beyond 72 hours up to 168 hours as part of service water system upgrades* provided 3 out of 4 service water pumps (the third pump does not require auto start capability) and 2 out of 2 auxiliary service water pumps have been OPERABLE since initial entry into the action statement and remain OPERABLE during the extended action statement or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

* Isolation of one service water loop for up to 168 hours is permitted only as part of service water system upgrades. System upgrades include modification and maintenance activities associated with the installation of new discharge headers and spray arrays, mechanical and chemical cleaning of service water piping and valves, pipe repair and replacement, valve repair and replacement, installation of corrosion mitigation measures and inspections of and repairs to buried piping interior coatings and pump or valve house components.

available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the Residual Heat Removal System may be placed into operation.

3/4.7.1.3 EMERGENCY CONDENSATE STORAGE TANK

The OPERABILITY of the emergency condensate storage tank with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions for 8 hours with steam discharge to the atmosphere concurrent with total loss of off-site power. The contained water volume limit includes an allowance for water not usuable because of tank discharge line location or other physical characteristics.

3/4.7.1.4 ACTIVITY

The limitations on secondary system specific activity ensure that the resultant off-site radiation dose will be limited to a small fraction of 10 CFR Part 100 limits in the event of a steam line rupture. This dose also includes the effects of a coincident 1.0 GPM primary to secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the accident analyses.

3/4.7.1.5 MAIN STEAM TRIP VALVES

The OPERABILITY of the main steam trip valves ensures that no more than one steam generator will blowdown in the event of a steam line rupture. This restriction is required to 1) minimize the positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and 2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam trip valves within the closure times of the surveillance requirements are consistent with the assumptions used in the accident analyses.

3/4.7.1.6 and 3/4.7.1.7 STEAM TURBINE and OVERSPEED PROTECTION

The turbine generator at the North Anna facility is arranged in a nonpeninsular orientation. Analysis has shown that this arrangement is such that if a turbine failure occurs as a result of destructive overspeed, potentially damaging missles could impact the auxiliary building, containment, control room and other structures housing safety related equipment. The requirements of these two specifications provide additional assurance that the facility will not be operated with degraded valve performance and/or flawed turbine material which are the major contributors to turbine failures.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values at 10°F and are sufficient to prevent brittle fracture.

3/4.7.3.1 COMPONENT COOLING WATER SUBSYSTEM - OPERATING

The component cooling water system normally operates continuously to remove heat from various plant components and to transfer the heat to the service water system. The system consists of four subsystems shared between units, with each subsystem containing one pump and one heat exchanger.

The current design basis for the component cooling water system is a fast cooldown of one unit while maintaining normal loads on the other unit. Three component cooling water subsystems need to be OPERABLE to accomplish this function. The fourth subsystem is a spare and may be out of service indefinitely. With only two component cooling water subsystems a slow cooldown on one unit while maintaining normal loads on the opposite unit can be accomplished.

The component cooling water system is designed to reduce the temperature of the reactor coolant system from 350°F to 140°F within 16 hours during plant cooldown, based on a service water temperature of 95°F and on having two component cooling water pumps and two heat exchangers in service for the unit being cooled down. Therefore, to ensure cooldown of one unit within 16 hours and maintain the other unit in normal full power operation three of the four subsystems must be OPERABLE.

Because subsystems are placed in standby by shutting down pumps and isolating heat exchangers and this system serves no accident mitigation functions, the subsystem is considered OPERABLE in the standby conditions since it can be easily placed in service quickly by manual operator actions.

3/4.7.3.2 COMPONENT COOLING WATER SUBSYSTEM - SHUTDOWN

The OPERABILITY of the component cooling water system when both units are in COLD SHUTDOWN or REFUELING ensures that an adequate heat sink is maintained for the residual heat removal system.

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

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

DOCKET NO. 50-339

NORTH ANNA POWER STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 140
License No. NPF-7

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Virginia Electric and Power Company et al., (the licensee) dated November 7, 1991, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations 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;

   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 amended by 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-7 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 140 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

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

FOR THE NUCLEAR REGULATORY COMMISSION

Herbert N. Berkow, Director
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: May 12, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 140

TO FACILITY OPERATING LICENSE NO. NPF-7

DOCKET NO. 50-339

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages as indicated. The revised pages are identified by amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided to maintain document completeness.

Remove Pages	Insert Pages
3/4 7-14	3/4 7-14
- -	3/4 7-14a
B 3/4 7-4	B 3/4 7-4

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

LIMITING CONDITION FOR OPERATION

3.7.2.1 The temperatures of both the primary and secondary coolants in the steam generators shall be greater than 70°F when the pressure of either coolant in the steam generator is greater than 200 psig.

APPLICABILITY: At all times.

ACTION:

With the requirements of the above specification not satisfied:

a. Reduce the steam generator pressure of the applicable side to less than or equal to 200 psig within 30 minutes, and

b. Perform an engineering evaluation to determine the effect of the overpressurization on the structural integrity of the steam generator. Determine that the steam generator remains acceptable for continued operation prior to increasing its temperatures above 200°F.

SURVEILLANCE REQUIREMENTS

4.7.2.1 The pressure in each side of the steam generator shall be determined to be less than 200 psig at least once per hour when the temperature of either the primary or secondary coolant is less than 70°F.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

3/4.7.3.1 COMPONENT COOLING WATER SUBSYSTEM - OPERATING

LIMITING CONDITION FOR OPERATION

3.7.3.1 Three component cooling water subsystems (shared with Unit 1) shall be OPERABLE* with each subsystem consisting of:

a. One OPERABLE component cooling water pump and,
b. One OPERABLE component cooling water heat exchanger.

APPLICABILITY: Either Unit in MODES 1, 2, 3, or 4.

ACTION:

a. With one required component cooling water subsystem inoperable, return the component cooling subsystem to OPERABLE status within the next 7 days, or place both units in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 24 hours.

b. With two required component cooling water subsystems inoperable, place both units in HOT SHUTDOWN within the next 12 hours, and within the next hour, initiate actions to place both units in COLD SHUTDOWN and continue until COLD SHUTDOWN is achieved.

c. With no component cooling water available to supply the residual heat removal heat exchangers to cool the units, place both units in HOT SHUTDOWN within the next 12 hours and remain in HOT SHUTDOWN until alternate means of decay heat removal can be implemented. Continue actions until both units are in COLD SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.7.3.1 Three component cooling water subsystems shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing in the flow path of the residual heat removal system that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. Each component cooling water pump shall be tested in accordance with Specification 4.0.5.

* For the purpose of this Technical Specification, each subsystem is considered OPERABLE if it is operating or if it can be placed in service from a standby condition by manually unisolating a standby heat exchanger and/or manually starting a standby pump.

3/4.7.3 COMPONENT COOLING WATER SYSTEM

3/4.7.3.2 COMPONENT COOLING WATER SUBSYSTEM - SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.7.3.2 Two component cooling water subsystems (shared with Unit 1) shall be OPERABLE* with each subsystem consisting of:

a. One OPERABLE component cooling water pump and,
b. One OPERABLE component cooling water heat exchanger.

APPLICABILITY: Both Units in MODES 5 or 6.

ACTION: With one required component cooling water subsystem inoperable, immediately suspend all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the Reactor Coolant System.

SURVEILLANCE REQUIREMENTS

4.7.3.2 At least two component cooling water subsystems shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) servicing in the flow path of the residual heat removal system that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. Each component cooling water pump shall be tested in accordance with Specification 4.0.5.

* For the purposes of this Technical Specification, each subsystem is considered OPERABLE if it is operating or if it can be placed in service from a standby condition by manually unisolating a standby heat exchanger and/or manually starting a standby pump.

Each electric driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 340 gpm at a pressure of 1064 psig to the entrance of the steam generators. The steam driven auxiliary feedwater pump is capable of delivering a total feedwater flow of 700 gpm at a pressure of 1064 psig to the entrance of the steam generators. This capacity is sufficient to ensure that adequate feedwater flow is available to remove decay heat and reduce the Reactor Coolant System temperature to less than 350°F when the Residual Heat Removal System may be placed into operation.

3/4.7.1.3 EMERGENCY CONDENSATE STORAGE TANK

The OPERABILITY of the emergency condensate storage tank with the minimum water volume ensures that sufficient water is available to maintain the RCS at HOT STANDBY conditions for 8 hours with steam discharge to the atmosphere concurrent with total loss of off-site power. The contained water volume limit includes an allowance for water not usuable because of tank discharge line location or other physical characteristics.

3/4.7.1.4 ACTIVITY

The limitations on secondary system specific activity ensure that the resultant off-site radiation dose will be limited to a small fraction of 10 CFR Part 100 limits in the event of a steam line rupture. This dose also includes the effects of a coincident 1.0 GPM primary to secondary tube leak in the steam generator of the affected steam line. These values are consistent with the assumptions used in the accident analyses.

3/4.7.1.5 MAIN STEAM TRIP VALVES

The OPERABILITY of the main steam trip valves ensures that no more than one steam generator will blowdown in the event of a steam line rupture. This restriction is required to 1) minimize the positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and 2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam trip valves within the closure times of the surveillance requirements are consistent with the assumptions used in the accident analyses.

3/4.7.1.6 and 3/4.7.1.7 STEAM TURBINE and OVERSPEED PROTECTION

The turbine generator at the North Anna facility is arranged in a nonpeninsular orientation. Analysis has shown that this arrangement is such that if a turbine failure occurs as a result of destructive overspeed, potentially damaging missles could impact the auxiliary building, containment, control room and other structures housing safety related equipment. The requirements of these two specifications provide additional assurance that the facility will not be operated with degraded valve performance and/or flawed turbine material which are the major contributors to turbine failures.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on average steam generator impact values at 10°F and are sufficient to prevent brittle fracture.

3/4.7.3.1 COMPONENT COOLING WATER SUBSYSTEM - OPERATING

The component cooling water system normally operates continuously to remove heat from various plant components and to transfer the heat to the service water system. The system consists of four subsystems shared between units, with each subsystem containing one pump and one heat exchanger.

The current design basis for the component cooling water system is a fast cooldown of one unit while maintaining normal loads on the other unit. Three component cooling water subsystems need to be OPERABLE to accomplish this function. The fourth subsystem is a spare and may be out of service indefinitely. With only two component cooling water subsystems a slow cooldown on one unit while maintaining normal loads on the opposite unit can be accomplished.

The component cooling water system is designed to reduce the temperature of the reactor coolant system from 350°F to 140°F within 16 hours during plant cooldown, based on a service water temperature of 95°F and on having two component cooling water pumps and two heat exchangers in service for the unit being cooled down. Therefore, to ensure cooldown of one unit within 16 hours and maintain the other unit in normal full power operation three of the four subsystems must be OPERABLE.

Because subsystems are placed in standby by shutting down pumps and isolating heat exchangers and this system serves no accident mitigation functions, the subsystem is considered OPERABLE in the standby conditions since it can be easily placed in service quickly by manual operator actions.

3/4.7.3.2 COMPONENT COOLING WATER SUBSYSTEM - SHUTDOWN

The OPERABILITY of the component cooling water system when both units are in COLD SHUTDOWN or REFUELING ensures that an adequate heat sink is maintained for the residual heat removal system.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 159 AND 140 TO

FACILITY OPERATING LICENSE NOS. NPF-4 AND NPF-7

VIRGINIA ELECTRIC AND POWER COMPANY

OLD DOMINION ELECTRIC COOPERATIVE

NORTH ANNA POWER STATION, UNITS NO. 1 AND NO. 2

DOCKET NOS. 50-338 AND 50-339

1.0 INTRODUCTION

By letter dated November 7, 1991, the Virginia Electric and Power Company (the licensee) proposed changes to the Technical Specifications (TS) for the North Anna Power Station, Units No. 1 and No. 2 (NA-1&2). The proposed changes would revise the current NA-1&2 TS to ensure the design basis is met for the component cooling water system (CCWS).

The proposed changes are being made as a result of an NRC violation regarding the NA-1&2 service water system (SWS). In the Notice of Violation dated February 1, 1991, the NRC also observed that operation of the CCWS was different from that described in the NA-1&2 Updated Final Safety Analysis Report (UFSAR). In the licensee's response to the NRC Notice of Violation dated March 1, 1991, the licensee committed to changes in the NA-1&2 TS to clarify both the SWS and CCWS operability requirements and, in the interim, to provide adequate administrative controls to ensure the SWS and CCWS design bases are met. By letter dated October 3, 1991, the licensee proposed the appropriate changes to ensure the design basis is met for the SWS. On December 13, 1991, the NRC issued Amendment Nos. 152 and 136 for NA-1&2, respectively, which addressed the operability requirements for the SWS. A description of the NA-1&2 CCWS, a discussion of the CCWS TS changes as proposed in the licensee's letter of November 7, 1991, and the staff's evaluation are provided below.

2.0 CCWS BACKGROUND

The CCWS is a closed cycle system. Cool water is circulated through various components in the plant for cooling and returned to the heat exchangers for heat rejection to the SWS. The CCWS consists of four subsystems shared between NA-1&2, with each subsystem containing one pump and one heat exchanger. The major components in the CCWS are a surge tank, four pumps,

four heat exchangers, and a radiation monitor. CCW must be supplied to various components to accomplish the following functions:

a. Removal of residual heat from the reactor coolant system (RCS) through the residual heat removal (RHR) system during unit cooldown.

b. Cooling of letdown flow to the chemical and volume control system (CVCS) during power generation, and

c. Removal of heat from various nuclear steam supply system (NSSS) components during power generation and normal unit cooldown.

The CCWS ensures that sufficient cooling capacity is available for continued operation of various equipment during normal unit cooldown. The CCWS performs no design basis accident mitigation function. The CCWS is not a system which functions to mitigate the failure of or presents a challenge to the integrity of a fission product barrier.

Complete redundancy to meet single failure criteria is not a design basis feature of this system. The CCWS supports operation of the RHR system. The RHR system does not perform a design basis accident mitigation function. The current design basis for the CCWS is a fast cooldown of one unit while maintaining normal loads on the other unit. Three CCW subsystems need to be operable to accomplish this function. The fourth subsystem is a spare and may be out of service indefinitely. With only two CCW subsystems operable, a slow cooldown on one unit while maintaining normal loads on the opposite unit can be accomplished without reliance on the main steam system below 350°F.

The CCWS is designed so that when one unit is being cooled down, two component cooling pumps and two component cooling heat exchangers for that unit supply the RHR, reactor coolant pumps, and nonregenerative and seal water heat exchanger flow paths while the common loads header is supplied from the other unit. If only one component cooling pump and component cooling heat exchanger are operating, cooldown can be accomplished but requires more time.

3.0 DISCUSSION

The numbering of the TS would be changed from 3/4.7.3 to 3/4.7.3.1 to allow for the addition of a new CCW TS when both units are in modes 5 or 6 (which is numbered 3.7.3.2). In addition, the title of this TS would be changed to add the word "operating" to identify that this TS applies to whenever either unit is in modes 1 through 4.

The limiting condition for operation (LCO) would be changed to require three subsystems (shared between both units) to be operable and to define what an operable CCW subsystem consists of. Two CCW subsystems provide the minimum heat removal capability to accomplish a slow cooldown on one unit while

maintaining normal loads on the opposite unit. To ensure the design basis requirement of a fast cooldown on one unit and normal operational loads on the opposite unit is met, three subsystems of CCW must be operable. In addition, a footnote would be added to further clarify when a subsystem is considered operable. The applicability statement would be changed to clarify that this TS applies if either or both units are in modes 1 through 4. This change will ensure that sufficient cooling capacity is available for both units.

Action statement 3.7.3.1.a would be added to require that if one of the three required subsystems becomes inoperable, then the subsystem must be returned to an operable status within 7 days. If the required CCW subsystem cannot be restored in the required completion time, both units must be placed in a mode in which the risk to the unit is minimized. This would be done by placing both units in hot standby in 6 hours and in cold shutdown in the next 24 hours.

Action statement 3.7.3.1.b would be added to require that if two of the three required subsystems become inoperable, then both units must be placed in hot shutdown within the next 12 hours and that actions be initiated within the next hour to place both units in cold shutdown and continue to cold shutdown if CCW is available to supply the RHR exchangers to further cool the units. The units are first placed in a condition where decay heat can be removed by the steam generators. This can be achieved in hot shutdown.

Action statement 3.7.3.1.c would be added to require that with no CCW available to supply the RHR heat exchangers to further cool the units, both units must be placed in hot shutdown within 12 hours. The units may remain in hot shutdown until alternate means of decay heat removal can be implemented. If component cooling is available and a heat sink to further cool the units is available, unit cooldown would continue until cold shutdown is achieved under action statement 3.7.3.1.b.

Surveillance requirement 4.7.3.1.a would be modified to replace "safety related equipment" with "in the flow path of the residual heat removal systems." Also, Surveillance Requirement 4.7.3.1.b would be added to specify surveillance testing for operability determination of the CCW pumps in accordance with TS 4.0.5, the ASME Section XI program.

TS 3.7.3.2 would be added to support the current NA-1&2 UFSAR design bases when both units are in modes 5 or 6. When both units are in cold shutdown refueling, the design basis requires that the CCW system be operable. This is to ensure an adequate heat sink is maintained for the RHR system.

A new LCO would be established for modes 5 and 6. This new LCO differs from TS 3.7.3.1 by requiring that two of the four CCW subsystems be operable. CCW is required to provide a heat sink for the RHR system to remove decay heat from the reactor core. However, there is a significant reduction in potential

heat loading on CCW with the reduced operational requirements of the other systems that are cooled by CCW. The major reduction in heat loads is due to the fact that by mode 5 reactor decay heat has already dropped off significantly and that reactor coolant pumps and control rod drive mechanisms are not required to be operating in modes 5 and 6. Therefore, only two CCW subsystems are required to be operable.

If only one of the two required CCW subsystems is operable, action statement 3.7.3.2 would require all operations involving an increase in the reactor decay heat load or a reduction in boron concentration of the RCS must be immediately suspended. This is consistent with the action requirements for a total loss of RHR capability during shutdown conditions.

The surveillance requirements would be the same as those of TS 3.7.3.1 as noted above.

Finally, the existing Bases section (3/4.7.3) would be expanded to provide a more detailed description of the CCWS. This Bases section would also be split to provide a description for operating and shutdown conditions (3/4.7.3.1 and 3/4.7.3.2, respectively). Bases page B 3/4 7-4a for both units were changed by Amendment Nos. 152 and 136, and therefore are not included with these amendments.

4.0 EVALUATION

The proposed changes document the licensee's commitment to clarify the CCWS operability requirements. The proposed changes enhance the availability of the CCWS and ensure that sufficient cooling capacity is available for continued operation of various equipment during normal unit cooldown for both NA-1&2. The proposed changes further ensure the availability of a heat sink for the RHR system to remove decay heat from the reactor core by requiring that two of the four CCW subsystems be operable when NA-1&2 are in modes 5 and 6. Finally, the proposed changes to the NA-1&2 TS ensure consistency with the UFSAR design basis and result in additional limitations not currently specified in the NA-1&2 TS. Based on all of the above, the staff finds the proposed changes to be acceptable.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia State official was notified of the proposed issuance of the amendment. The State official had no comment.

6.0 ENVIRONMENTAL CONSIDERATION

These amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. 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 pubic comment on such finding (56 FR 64663). 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.

7.0 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 Contributor: Leon B. Engle

Date: May 12, 1992