

January 23, 2008

Mr. David A. Christian
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: SURRY POWER STATION, UNIT NOS. 1 AND 2, ISSUANCE OF AMENDMENTS REGARDING REPLACEMENT OF MAIN CONTROL ROOM AND EMERGENCY SWITCHGEAR ROOM AIR-CONDITIONING SYSTEM CHILLED WATER PIPING (TAC NOS. MD4622 AND MD4623)

Dear Mr. Christian:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 258 to Renewed Facility Operating License No. DPR-32 and Amendment No. 257 to Renewed Facility Operating License No. DPR-37 for the Surry Power Station, Unit Nos. 1 and 2, respectively. The amendments change the Technical Specifications (TSs) in response to your application dated February 26, 2007, as supplemented by letters dated April 5, May 31, July 13, July 20, September 25, and November 28, 2007, and January 14, 2008.

These amendments add an operating license condition and revise the TSs to permit the replacement of main control room and emergency switchgear room air-conditioning system chilled water piping by using temporary 45-day and 14-day allowed outage times four times in a 24-month time span.

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,

/RA/

Siva P. Lingam, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-280 and 50-281

Enclosures:

1. Amendment No. 258 to DPR-32
2. Amendment No. 257 to DPR-37
3. Safety Evaluation

cc w/encls: See next page

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VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-280

SURRY POWER STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 258
Renewed License No. DPR-32

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Virginia Electric and Power Company (the licensee) dated February 26, 2007, as supplemented by letters dated April 5, May 31, July 13, July 20, September 25, and November 28, 2007, and January 14, 2008, 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 3.B of Renewed Facility Operating License No. DPR-32 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 258, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. Further, Facility Operating License No. DPR-32 will be amended to add license condition 3.R., to read as follows:

3.R. As discussed in the footnote to Technical Specifications 3.23.C.2.a.1 and 3.23.C.2.b.1, the use of temporary 45-day and 14-day allowed outage time extensions to permit replacement of the Main Control Room and Emergency Switchgear Room Air Conditioning System chilled water piping shall be in accordance with the basis, risk evaluation, equipment unavailability restrictions, and compensatory actions provided in the licensee's submittal dated February 26, 2007 (Serial No. 07-0109) and in the associated supplemental transmittals, as approved by the NRC Safety Evaluation.

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

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

John Stang, Chief (Acting)
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to License No. DPR-32
and the Technical Specifications

Date of Issuance: January 23, 2008

VIRGINIA ELECTRIC AND POWER COMPANY

DOCKET NO. 50-281

SURRY POWER STATION, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 257
Renewed License No. DPR-37

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Virginia Electric and Power Company (the licensee) dated February 26, 2007, as supplemented by letters dated April 5, May 31, July 13, July 20, September 25, and November 28, 2007, and January 14, 2008, 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 3.B of Renewed Facility Operating License No. DPR-37 is hereby amended to read as follows:

(B) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 257, are hereby incorporated in the renewed license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. Further, Facility Operating License No. DPR-37 will be amended to add license condition 3.R., to read as follows:

3.R. As discussed in the footnote to Technical Specifications 3.23.C.2.a.1 and 3.23.C.2.b.1, the use of temporary 45-day and 14-day allowed outage time extensions to permit replacement of the Main Control Room and Emergency Switchgear Room Air Conditioning System chilled water piping shall be in accordance with the basis, risk evaluation, equipment unavailability restrictions, and compensatory actions provided in the licensee's submittal dated February 26, 2007 (Serial No. 07-0109) and in the associated supplemental transmittals, as approved by the NRC Safety Evaluation.

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

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

John Stang, Chief (Acting)
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes License No. DPR-37
and the Technical Specifications

Date of Issuance: January 23, 2008

ATTACHMENT

TO LICENSE AMENDMENT NO. 258

RENEWED FACILITY OPERATING LICENSE NO. DPR-32

DOCKET NO. 50-280

AND

TO LICENSE AMENDMENT NO. 257

RENEWED FACILITY OPERATING LICENSE NO. DPR-37

DOCKET NO. 50-281

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

Remove Pages

License

License No. DPR-32, page 3
License No. DPR-32, page 6
License No. DPR-37, page 3
License No. DPR-37, page 6

TSs

1.0-2
3.23-2
3.23-6

Insert Pages

License

License No. DPR-32, page 3
License No. DPR-32, page 6
License No. DPR-37, page 3
License No. DPR-37, page 6

TSs

1.0-2
3.23-2
3.23-6

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 258 TO

RENEWED FACILITY OPERATING LICENSE NO. DPR-37

AND

AMENDMENT NO. 257 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-37

VIRGINIA ELECTRIC AND POWER COMPANY

SURRY POWER STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-280 AND 50-281

1.0 INTRODUCTION

By application dated February 26, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML070650524), as supplemented by letters dated April 5, 2007 (ADAMS Accession No. ML070960037), May 31, 2007 (ADAMS Accession No. ML071550202), July 13, 2007 (ADAMS Accession No. ML071970183), July 20, 2007 (ADAMS Accession No. ML072060022), September 25, 2007 (ADAMS Accession No. ML072681171), November 28, 2007 (ADAMS Accession No. ML073321271), and January 14, 2008 (ADAMS Accession No. ML080150544), Virginia Electric and Power Company (the licensee) submitted a request for changes to the Surry Power Station, Unit Nos. 1 and 2 (Surry 1 and 2), Technical Specifications (TSs). The requested changes would permit the use of temporary 45-day and 14-day allowed outage items (AOTs) to allow replacement of main control room (MCR) and emergency switchgear room (ESGR) air-conditioning system (ACS) chilled water piping. The supplements dated April 5, May 31, July 13, July 20, September 25 and November 28, 2007, provided additional information that clarified the application, did not expand the scope of the application as originally noticed and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* (FR) on March 27, 2007 (72 FR 14308).

The proposed changes would add an Operating License Condition for each unit regarding use of temporary 45-day and 14-day AOTs to permit replacement of the MCR and ESGR ACS chilled water piping. The proposed change also revises TS 3.23-2 to include a footnote that permits the use of the temporary 45-day and 14-day AOTs for the piping replacement. Four entries into the temporary AOTs will be permitted in a 24-month time span per footnote of TS 3.23-2. The change has been requested in order to permit replacement of degraded piping while both Surry 1 and 2 remain operating.

1.3 Background

The Surry 1 and 2 MCR/ESGR ACS consists of two loops of four air handling units (AHUs),

designated as loop A and loop C, shared between Surry 1 and 2. Each loop includes four separate AHUs for each unit's MCR and ESGR cooling requirements. Chilled water is supplied to the two loops from any of five chillers and associated chilled water pumps, designated as A through E. The active components (i.e., chillers, pumps, and AHUs) are powered from four emergency busses.

The existing TSs require both loops to be operable when either unit is operating above cold shutdown conditions; operability requirements are explicitly described for the operable chiller refrigeration units (C.1) and AHUs (C.2). The TSs require: 1) two operable chilled water loops; 2) three operable chillers powered from three of the four emergency busses, and at least one chiller capable of being powered from the fourth emergency bus; and 3) all AHUs operable for each operating unit.

A 7-day completion time (CT) to restore the inoperable equipment to comply with the specification is applicable when: 1) only one chilled water loop is operable; 2) only two chillers are operable, or the power requirements are not satisfied; or 3) one AHU is inoperable (unit-specific).

In order to support planned one-time repair and modification activities, four extended CTs are required over a 2-year period. Each loop is required to be inoperable for one 14-day period and one 45-day period to permit piping replacement and modifications.

2.0 REGULATORY EVALUATION

The design basis of the MCR and ESGR ACS is described in Updated Final Safety Analysis Report (UFSAR), Section 9.13, "Auxiliary Ventilation Systems." The Surry 1 and 2 UFSAR, Revision 39, Section 9.13.3.6, "Main Control Room and Emergency Switchgear and Relay Room Ventilation," describes the cooling for the MCR and the ESGR as follows:

The air-conditioning equipment for the MCR and emergency switchgear and relay room area is located within tornado-protected and missile-protected structures to ensure cooling during both normal and accident conditions.

Each MCR and emergency switchgear and relay room area is air conditioned by one of two AHUs installed within the space served. The eight AHUs are arranged in two separate chilled water loops (4 AHUs on each loop), and either one or both chilled water loops are operated, as necessary, to maintain space temperatures. With only one loop in operation, one chiller provides chilled water to all operating AHUs. With both loops in service, two chillers provide chilled water separately to each loop, but only two AHUs are operating on each loop.

Three chillers are located in Mechanical Equipment Room No. 3 (MER-3), and two chillers are located in Mechanical Equipment Room No. 5 (MER-5). This arrangement prevents full loss of cooling in the event of a fire in either MER-3 or MER-5. Three of the five chillers are powered from either of two buses, enabling maximum system flexibility in aligning the chillers as required. Additional equipment includes control panels and isolation switches for affected AHUs and cables routed to provide the required separation. The additional equipment is seismically and environmentally qualified, as applicable. Control of the ACS is remote manual from the control room. Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix R power feed is available to power one chiller in MER-5 from

MCC 1A2-3 (which can be supplied from the alternate AC) in the event of 10 CFR, Part 50, Appendix R fire in Surry 2 ESGR.

The MCR and emergency switchgear and relay rooms supply and exhaust air is provided by other systems. These systems are balanced to provide a positive pressure within the MCR and emergency switchgear and relay rooms with the boundary doors closed. Tight, redundant, Seismic Category I isolation dampers (remote manually or automatically operated closures in the ducts) and weather-stripped doors permit pressurization of the control room area with bottled compressed air during an accident. Redundant bottled air banks provide a minimum of 33,000 scf each of free air, and each bank is sufficient for approximately one hour of pressurization. Emergency ventilation is provided for each space. Emergency ventilation takes suction from the turbine building through roughing particulate filters, high efficiency particulate air (HEPA) filters, and charcoal adsorbers to remove airborne radioactivity. Following a design basis accident, the emergency ventilation system is assumed to operate after one hour and prior to the depletion of the bottled air banks. The emergency ventilation system will indefinitely extend control and relay room area pressurization and the supply of breathing air upon depletion of the bottled compressed air.

The following rules and regulations apply:

The licensee states that “[t]he MCR and ESGR ACS satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii)(C) which require: A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.”

Surry 1 and 2 were designed in accordance with the draft general design criteria (GDC) proposed (32 FR 10213) for Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50. Draft GDC 2 requires that systems and components that are essential to the prevention of accidents that could affect public health or safety or to mitigate their consequences are designed and constructed to withstand the effects imposed by natural phenomena such as earthquakes, tornadoes, flooding conditions, winds, ice, and other local site effects.

Draft GDC 4 requires that reactor facilities do not share systems or components unless it is shown that safety is not impaired by the sharing. The chilled water cooling system is a system that is shared between Surry 1 and 2.

Draft GDC 11, “Control Room,” requires that a control room be provided from which actions to maintain safe operational status of the plant can be controlled.

The requested change only affects the systems and equipment that remove heat from the ESGR and the MCR. Equipment required to maintain Control Room Habitability for radiologic or toxic gas releases are not affected.

The regulatory guidelines (RGs) for probabilistic risk assessment (PRA) review are:

- RG 1.174, “An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis,” describes a risk-informed approach, acceptable to the NRC, for assessing the nature and impact of proposed permanent licensing-basis changes by considering engineering issues and applying risk insights. This regulatory guide also provides risk acceptance guidelines for evaluating the results of such evaluations.
- RG 1.177, “An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,” describes an acceptable risk-informed approach specifically for assessing proposed permanent TS changes in allowed outage times. This regulatory guide also provides risk acceptance guidelines for evaluating the results of such assessments. RG 1.177 identifies a three-tiered approach for the licensee’s evaluation of the risk associated with a proposed CT TS change, as discussed below.
 - Tier 1 assesses the risk impact of the proposed change in accordance with acceptance guidelines consistent with the Commission’s Safety Goal Policy Statement, as documented in RG 1.174 and RG 1.177. The first tier assesses the impact on operational plant risk based on the change in core damage frequency (Δ CDF) and change in large early release frequency (Δ LERF). It also evaluates plant risk while equipment covered by the proposed CT is out-of-service, as represented by incremental conditional core damage probability (ICCDP) and incremental conditional large early release probability (ICLERP). Tier 1 also addresses PRA quality, including the technical adequacy of the licensee’s plant-specific PRA for the subject application. Cumulative risk of the present TS change in light of past related applications or additional applications under review are also considered along with uncertainty/sensitivity analysis with respect to the assumptions related to the proposed TS change.
 - Tier 2 identifies and evaluates any potential risk-significant plant equipment outage configurations that could result if equipment, in addition to that associated with the proposed license amendment, is taken out-of-service simultaneously, or if other risk-significant operational factors, such as concurrent system or equipment testing, are also involved. The purpose of this evaluation is to ensure that there are appropriate restrictions in place such that risk-significant plant equipment outage configurations will not occur when equipment associated with the proposed CT is implemented.
 - Tier 3 addresses the licensee’s overall configuration risk management program (CRMP) to ensure that adequate programs and procedures are in place for identifying risk-significant plant configurations resulting from maintenance or other operational activities and appropriate compensatory measures are taken to avoid risk significant configurations that may not have been considered when the Tier 2 evaluation was performed. Compared with Tier 2, Tier 3 provides additional coverage to ensure risk-significant plant equipment outage configurations are identified in a timely manner and that the risk impact of out-of-service equipment is appropriately evaluated prior to performing any maintenance activity over extended periods of plant operation. Tier 3 guidance can be satisfied by the Maintenance Rule (10 CFR 50.65(a)(4)), which requires a licensee to assess and manage the increase in risk that may result from activities such as surveillance testing and corrective and preventive maintenance, subject to the guidance provided in RG 1.177, Section 2.3.7.1, and the adequacy of the licensee’s program and PRA model for this

application. The CRMP is to ensure that equipment removed from service prior to or during the proposed extended CT will be appropriately assessed from a risk perspective.

Because these RGs address permanent changes to the TSs, they are not directly applicable to the temporary, one-time changes proposed by the licensee. However, the NRC staff has used the guidance to characterize the significance of the proposed changes as an input to its decisionmaking with regards to this amendment request.

General guidance for evaluating the technical basis for proposed risk-informed changes is provided in Section 19.2, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance," of the NRC Standard Review Plan (SRP), NUREG-0800 (Ref. 7). More specific guidance related to risk-informed TS changes is provided in SRP Section 16.1, "Risk-Informed Decisionmaking: Technical Specifications," which includes CT changes as part of risk-informed decisionmaking.

Section 19.2 of the SRP states that a risk-informed application should be evaluated to ensure that the proposed changes meet the following key principles:

- The proposed change meets the current regulations, unless it explicitly relates to a requested exemption.
- The proposed change is consistent with the defense-in-depth philosophy.
- The proposed change maintains sufficient safety margins.
- When proposed changes increase core damage frequency or risk, the increase(s) should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.
- The impact of the proposed change should be monitored using performance measurement strategies.

3.0 TECHNICAL EVALUATION

The licensee states that the replacement of the MCR and ESGR ACS chilled water piping in the ESGR, the MCR, and MER-3 is necessary because the exterior surface of the piping is exhibiting general corrosion. This is being done as a preventive measure to reduce the risk of the chilled water piping failure.

3.1 Detailed Description of the Proposed Change

The proposed TS change would modify the Surry 1 and 2 licenses by adding condition R which states:

- R. As discussed in the footnote to Technical Specifications 3.23.C.2.a.1 and 3.23.C.2.b.1, the use of temporary 45-day and 14-day allowed outage time extensions to permit replacement of the Main Control Room and Emergency Switchgear Room Air Conditioning System chilled water piping shall be in accordance with the basis, risk evaluation, equipment unavailability restrictions, and compensatory actions provided in the licensee's submittal dated February 26, 2007 (Serial No.*

07-0109) and in the associated supplemental transmittals, as approved by the NRC Safety Evaluation.

TS 3.23.C.2.a.1 (Unit 1 AHUs) and 3.23.C.2.b.1 (Unit 2 AHUs) would be modified by a footnote to permit the required four extensions of the 7-day CT:

The requirements of TS 3.23.C.2.a.1 and TS 3.23.C.2.b.1 may be temporarily suspended according to the limitations noted in items 1, 2, 3 and 4 below for the purpose of replacement of the Main Control Room (MCR) and Emergency Switchgear Room (ESGR) Air Conditioning System (ACS) chilled water piping. The allowed outage time extensions specified in items 1, 2, 3 and 4 of this footnote shall not exceed 24 months beginning with entry into the first temporary extension. Each extension shall be limited to a one-time use which ends when the affected MCR and ESGR ACS components are returned to OPERABLE status. Concurrent use of more than one allowed outage time extension is not permitted.

- 1) The time period to accommodate replacement of the chilled water loop C piping in the MCR and the ESGR shall not exceed 45 days.*
- 2) The time period to accommodate replacement of the chilled water loop A piping in the MCR and the ESGR shall not exceed 45 days.*
- 3) The time period to accommodate replacement of the chilled water piping in the Mechanical Equipment Room # 3 (MER-3) associated with chiller 1-VS-E-4A shall not exceed 14 days.*
- 4) The time period to accommodate replacement of the chilled water piping in the MER-3 associated with chiller 1-VS-E-4C shall not exceed 14 days.*

3.2 Engineering Evaluation

The NRC staff reviewed the assumptions and compensatory measures to be implemented when the work is performed. By letter dated May 31, 2007, the NRC staff requested additional information to clarify some of the compensatory actions.

When the plant enters one of the temporary AOTs for the replacement of the chilled water piping the licensee states that compensatory actions are planned and will be in place during the chilled water piping replacement activities. The licensee evaluated these planned compensatory actions and determined them to be sufficient to minimize the potential for a construction-related failure of the operating chilled water loop, as well as to provide backup cooling should an unexpected loss of chilled water occur during piping replacement activities.

The licensee stated that they will have the following compensatory measures in place during the piping replacement:

- While two AHUs per unit on a chilled water loop are out of service during the replacement activities, the two AHUs per unit on the operating chilled water loop will be identified as protected equipment in accordance with the Operations Department's Protected Equipment Program. This program is used to protect equipment from inadvertent operation or maintenance when the redundant equipment is removed from service or becomes inoperable. The purpose of the program is to prevent entry into a 72-hour or less TS clock, to prevent entry into a more limiting TS clock, to prevent significant reduction in power, to prevent a loss of nuclear fuel decay heat removal, and to prevent the loss of equipment required to ensure safe shutdown. The program identifies the following four methods that can be used to protect equipment as appropriate:

- a. Protected Equipment magnetic placards used on affected circuit breakers/components.
- b. Protected Equipment placards mounted on stands at the entrance to affected rooms or areas.
- c. Protected Equipment placards, stands, and red plastic chain used to create a boundary around the protected equipment.
- d. Protected Equipment magnets/signs on control switches in the field (magnets are not required on control switches in the MCR).

In response to a request for additional information the licensee responded that the Protected Equipment Program does not include support equipment (such as an associated train of emergency power) required for the protected equipment or support functions associated with the protected equipment. Requirements associated with support equipment or support functions are specified elsewhere, such as in the TSs, Technical Requirements Manual, procedures, etc.

- Existing procedures and practices will be used with respect to the use of combustible materials, control of transient combustibles, and control of ignition sources, including grinding, cutting, and welding.
- In addition to the Protected Equipment designation and protection by Operations, Nuclear Site Services (NSS), which is the station organization performing the piping replacement, will take measures to physically protect the operating chilled water loop in the work area. Depending on the specific pipe configuration and location, materials such as sheet metal, fire retardant plywood, rubber, and fire blankets will be used to provide protection from impact, grinding, arc strikes, etc. In addition, welding, grinding, and chipping screens will be erected, as needed, to protect personnel and equipment (particularly in the ESGR) from welding flash, dust from grinding, debris from concrete chipping, etc. These screens will also provide equipment protection from water spray due to a postulated rupture of the in-service chilled water loop. Work area cleanup will be ongoing during the replacement activities to maintain housekeeping standards. Furthermore, to permit required access and egress, walkways will be maintained around the work area, and temporary trench covers will be provided, as required.

Additional information was requested to ascertain if portable equipment and material located near the protected equipment is secured to prevent damage to the protected equipment or its piping during a seismic event. The licensee responded that existing Administrative Procedures for Seismic Housekeeping provides guidelines to reduce the risk to safety-related and safe-shutdown equipment from impact by portable items, which have the potential to roll, fall, slide, overturn or otherwise cause an impact leading to a hazardous effect during an earthquake. The guidelines in this Administrative Procedure will be used during replacement activities.

- The licensee also indicated that in the event of severe weather in the area they will review the status of the chilled water piping replacement activities to determine what actions may be needed, including suspension of replacement activities, to assure that cooling remains available to the MCR and the ESGR.

The NRC staff finds that the actions to protect the operating train of cooling for the ESGR and the MCR from damage during the replacement of the chilled water piping on the alternate train are acceptable to provide a reasonable assurance that cooling will be maintained. The requirements of draft GDC 2 are addressed by these actions.

Prior to initiating chilled water piping replacement activities, actions will be taken to provide a high level of confidence that AHU operability will be maintained. Specifically, it will be verified that there is no outstanding required maintenance on the MCR and ESGR ACS AHUs that could affect AHU operability. Additionally, availability of AHU spare parts (i.e., routine stock items) will be confirmed. Similar actions for the chillers and chilled water pumps located in MER-3 and MER-5 are not deemed necessary due to the redundancy of these components.

1. Prior to initiating Phases III through VI of the chilled water piping replacement activities, it will be verified that there is no outstanding required maintenance on chillers 1-VS-E-3A and 1-VS-E-3B that could affect the ability of the chillers to provide the backup supply.

Additional information was requested regarding the Maintenance Rule status of the Air Handling Units and the chillers. The licensee responded that all of the safety-related AHUs and all but two chillers are classified as Maintenance Rule Category of 10 CFR 50.65(a)(2) and have demonstrated that the performance or condition of a structure, system, or component is being effectively controlled through the performance of appropriate preventive maintenance, such that the structure, system, or component remains capable of performing its intended function. Two of the chillers are Maintenance Rule Category of 10 CFR 50.65(a)(1) (equipment that has not met performance goals) due to service water flow-induced erosion. Corrective actions to address the erosion are ongoing.

The NRC staff finds the licensee has reasonable measures to assure the reliability of the operating train of cooling while the alternate train is out-of-service for piping replacement.

2. A Chilled Water System Piping Contingency Plan is currently in place to provide guidance in the event of a chilled water piping leak. This guidance addresses inspections, evaluations, operability assessments, and repairs that may be required in the event of such leakage. As part of this response readiness initiative, responsible station organizations are cognizant of the elements of the Contingency Plan and the necessary actions in the event of a chilled water piping leak. The Contingency Plan will remain in place until the chilled water piping replacement is complete.
3. No flood-related compensatory action related to a postulated rupture of the in-service chilled water loop is needed. The postulated rupture of the in-service chilled water loop was evaluated and determined not to be an ESGR flooding concern. The volume of water in the in-service chilled water loop is significantly less than the volume of water required to impact the emergency busses, which are the most risk-significant components in the ESGR.
4. During replacement activities, if a penetration or barrier is breached, provisions will be in place to maintain an adequate barrier against flood, fire, and smoke, or a fire or flood watch will be established, as required by existing procedures and requirements.

The NRC staff finds that the licensee plans to take reasonable measures to assure the maintenance activities do not place other plant equipment at risk from fire or flooding.

During Phases III through VI of the chilled water replacement activities, a chilled water backup supply will be available. This backup supply will be provided by the nonsafety-related Service Building chillers 1-VS-E-3A and 1-VS-E-3B located in MER-1. As discussed in Phases III through

VI in the Replacement Plan, the backup supply will provide MCR and/or ESGR cooling. This backup supply either will be provided via the existing piping to chilled water loop A or will use temporary hoses (with prefabricated hose connection assemblies) that will be staged and available to be connected, if the backup supply is needed. Procedural direction will be developed to reflect the installation of valves/hose connections being added to accommodate hook up of the chilled water backup supply.

- I. In Phases II, III, and IV of the Replacement Plan, there is a period of time during these phases where ESGR and/or MCR backup cooling would be provided by fans or other portable temporary means. Procedural direction will be developed to include these contingency actions to address ESGR and MCR cooling (by use of fans or other portable means).
- II. The licensee has performed a room heatup analysis using the GOTHIC computer code. Without chilled water flow to the in-service train of MCR coolers, MCR temperatures will remain within the equipment design limits for up to 24 hours with no compensatory measures needed.
- III. Procedures are in place (Attachment 1 of procedure 0-AP-13.02) to provide operator instructions for compensatory actions upon a loss of cooling to the ESGR.

The licensee will make provisions for backup cooling. The non-safety MER-1 chilled water source will be available as a backup supply while in the temporary 45-day AOT for implementation of Phase III of the replacement project.

In the licensee's letter of July 13, 2007 (ADAMS Accession No. ML071970183), the licensee has completed a calculation to verify the capability of the nonsafety-related MER-1 chillers 1-VS-E-3A and 1-VS-E-3B to provide backup chilled water to the MCR and the ESGR air handling units through existing piping to chilled water loop A and through valves and hose connections being added to supply chilled water loop C. "The calculation shows that one MER-1 Chiller can supply approximately 190 gpm to chilled water loop C, which bounds the chilled water loop A configuration. Normal flow to the loop is in the range of 200 - 230 gpm. Thus, the calculated chilled water flow from an MER-1 chiller is approximately 15 percent less than the normal flow. With approximately 85 percent of normal chilled water flow, the MCR and ESGR space temperatures are projected to rise several degrees above normal, but remain well within the design limits for the safety-related equipment housed in the MCR and the ESGR."

The NRC staff finds that the above actions are acceptable to provide reasonable assurance that equipment located in the ESGR and in the MCR needed to perform safety functions or to monitor and access the reactor, reactor cooling system, and containment will not be affected by high ambient temperatures following a loss of the safety-related ESGR and MCR cooling systems.

The MCR post-accident ventilation system is independent from the air-conditioning system. Post-accident radiological protection for the Control Room operators is not affected by this change. The change is not removing any cooling capacity for the ESGR or for the MCR. Compensatory actions are being used to minimize the risk to the protected train of cooling equipment when the alternate train of chilled water piping is being replaced. Technical Specifications are in place to require the shutdown of both units if both trains of safety-related cooling are not operable.

Therefore, the NRC staff finds the proposed temporary increase of AOT for cooling to the ESGR and MCR for the purpose of replacing existing piping to be acceptable.

3.3 Emergency Diesel Generators

Currently, Surry's 1 and 2 operability definition requires that both normal and emergency electrical power sources be capable of performing their related support functions.

Initially, the licensee requested that the modified operability definition applies to the air handling units on the operating chilled water loop as well as the emergency diesel generators for corrective maintenance purposes. In its November 28, 2007, letter, the licensee revised its initial TS change request by deleting the emergency diesel generator corrective maintenance option from the proposed modified operability definition. This change was a result of NRC staff comments that were provided to the licensee on October 12, 2007.

The proposed modified operability definition for the normal and emergency power sources for the air handling units would allow the licensee to perform TS-required surveillances that render an emergency diesel generator inoperable. The NRC staff informed the licensee that if an emergent emergency diesel generator corrective maintenance is required during a required surveillance, the affected AHUs must be declared inoperable due to the inoperability of their emergency power source, and the applicable air handling unit TS actions must be taken. In its November 28, 2007, letter, the licensee stated that procedures are being developed to include direction that, in the event that emergent emergency diesel generator corrective maintenance is identified during a required surveillance, the affected air handling units will be declared inoperable due to the inoperability of their emergency power source, and the applicable air handling TS actions will be followed.

Furthermore, the NRC staff requested that the licensee provide details of what would happen if an actual start signal such as a loss of offsite power or safety injection signal is received during testing, when the auto start circuit is bypassed. In its November 28, 2007, letter, the licensee stated that procedures direct that, during performance of testing, the emergency diesel generator contingency actions must be performed if the emergency diesel generator is required to function as the sole supply of the emergency bus. Thus, the necessary actions to be taken if a start signal is received during surveillance testing are proceduralized. The licensee further stated that these procedures, including contingency actions, are included in Surry 1 and 2 job performance measure program. Additionally, the licensee conducts a pre-job brief prior to performance of the emergency diesel generator monthly combined monthly/quarterly surveillances that includes a review of the aforementioned procedures, including contingency actions.

The licensee also noted that during temporary 45-day and 14-day allowed outage time entries, equipment availability restrictions would restrict or limit out-of-service time of risk significant plant equipment due to surveillance testing, preventive maintenance, and elective maintenance. The licensee will also implement compensatory measures to ensure the availability of chilled water or to provide backup cooling. The NRC staff finds that these actions provide assurance that the MCR and ESGR ACS will continue to perform its required function.

3.4 Adverse Weather Conditions

Currently, the Surry 1 and 2 Main Control Room (MCR) receives telephone notification from the

Dominion System Operations Center (SOC) of severe thunderstorm activity, tornado watch or tornado warning, projected hurricane conditions, high winds, and high temperatures in the Surry 1 and 2 area. The SOC provides immediate notification to the Surry 1 and 2 MCR upon receipt of the information by the SOC from any of the following sources: a private weather service, the Dominion Weather Center, and monitoring of weather conditions in the SOC. The licensee has stated that, since the SOC and the Surry 1 and 2 MCR are both staffed at all times, notification of severe weather to the Surry 1 and 2 MCR occurs promptly and without delay. Upon receipt of notification from the SOC, the existing Abnormal Procedure for Abnormal Environmental Conditions and/or the existing Severe Weather Operations Checklist are/is initiated immediately. Two of the entry conditions for the existing Abnormal Procedure are: 1) notification of severe weather for the area, and 2) tornado watch or warning declared for Surry County. The Operations Checklist includes actions to be taken to prepare for expected high winds and/or heavy rain.

With regard to possible adverse weather while in a temporary 45-day or 14-day AOT permitted by the current license amendment request, the licensee made the following commitment in a letter dated April 5, 2007.

In order to address a severe weather concern while in a temporary 45-day or 14-day AOT, chilled water piping replacement activities during Phases III through VI will be suspended, if the conditions detailed below exist, in order to minimize the possibility of a concurrent loss of the operating chilled water loop due to a construction-related or other failure. Suspension of the replacement activities eliminates the need to rely on the backup cooling supply as a compensatory action during specific severe weather conditions. The existing procedure addressing abnormal environmental conditions already directs actions to be taken based on specific weather conditions. The directed actions will be augmented to suspend Phases III through VI piping replacement activities based on the following weather conditions:

- Declaration of a tornado warning for Surry County.
- Hurricane force winds (greater than 73 mph) expected in Surry County within 24 hours.

By a letter dated June 28, 2007, the licensee made an additional commitment to include provisions to proactively assess readiness and the possible need to suspend replacement activities.

The existing Abnormal Procedure for Abnormal Environmental Conditions and the existing Severe Weather Operations Checklist will be revised to include the following actions while in the temporary 45-day and 14-day AOTs for Phases III through VI piping replacement activities:

- Upon MCR notification of severe thunderstorms for the area, an assessment will be conducted to review the status of the chilled water piping replacement activities, to initiate evaluation of potential suspension of replacement activities, and to monitor the severe weather.
- Upon MCR notification of a tornado watch in Surry County, additional assessment will be conducted to review the status of the replacement activities and to evaluate the need for suspension of replacement activities.

The NRC staff finds these commitments to monitor for adverse weather conditions, to evaluate readiness and the potential need to suspend activities, and to suspend replacement activities in the event of certain weather conditions acceptable.

The licensee stated that suspension of replacement activities would include work stoppage and placement of replacement activities into a safe condition. The licensee expects that the piping replacement work would be stopped immediately upon contact from the MCR. The amount of time required to place the work activity into a safe condition would be contingent upon the status of the replacement activities; however, this effort would be prompt and without delay. With the assessments and reviews planned in the event of severe weather during the replacement activities, the licensee anticipates that sufficient time would be available to make necessary decisions and take appropriate actions.

3.5 PRA Evaluation

The evaluation presented below addresses the NRC staff's philosophy of risk-informed decisionmaking, that when the proposed changes result in a change in CDF or risk, the increase should be small and consistent with the intent of the Commission's Safety Goal Policy Statement.

Per SRP Section 19.2 and Section 16.1, the NRC staff reviewed the submittal using the three-tiered approach and the five key principles of risk-informed decisionmaking presented in RG 1.174 and RG 1.177 for guidance. The APLA review scope and findings are limited to the evaluation of the risk impacts and did not evaluate the traditional engineering analysis, which is the responsibility of another division.

The key information used in the NRC staff's review is contained in Section 4.3 of Attachment 1, Attachment 5, and Attachment 6 of the licensee's submittal dated February 26, 2007, as modified by RAIs responses dated May 31, 2007 and July 20, 2007.

The NRC staff's evaluation of the licensee's proposed changes to TS using the three-tiered approach and the five key principles outlined in RGs 1.174 and 1.177, are presented in the following sections.

The engineering evaluation addressed key principles 1, 2, 3, and partially 5 of the NRC staff's philosophy of risk-informed decisionmaking, which concerns compliance with current regulations, evaluation of defense-in-depth, evaluation of safety margins, and performance monitoring strategies.

3.5.1 PRA Technical Evaluation

The evaluation presented below addresses the NRC staff's philosophy of risk-informed decisionmaking, that when the proposed changes result in a change in CDF or risk, the increase should be small and consistent with the intent of the Commission's Safety Goal Policy Statement (Key Principle 4).

3.5.1.1 Tier 1: PRA Capability and Insights

The first tier evaluates the impact of the proposed changes on plant operational risk. The Tier 1 NRC staff review involves two aspects: (1) evaluation of the validity of the Surry 1 and 2 PRA models and their application to the proposed changes, and (2) evaluation of the PRA results and insights based on the licensee's proposed application.

PRA Quality:

The objective of the PRA quality review is to determine whether the Surry 1 and 2 PRA used in evaluating the proposed temporary changes to TS 3.23 AOTs is of sufficient scope, level of detail, and technical adequacy for this application. The NRC staff's review evaluated the PRA quality information provided by the licensee in their submittal, including industry peer reviews results.

The Surry 1 and 2 S105Aa PRA model, which includes internal events, internal fires, and seismic events, provides the necessary and sufficient scope and level of detail to allow the calculation of CDF and LERF changes due to the proposed configuration. The model includes the MCR/ESGR AC system and an initiating event involving the failure of the system.

The licensee identified the data sources and use of plant-specific data used in their PRA models, including initiating event data, component failure data, maintenance unavailability data, and common cause data. Further, the licensee identified the assumed plant response to a loss of chilled water cooling to the emergency switchgear rooms or to the main control room. Failure of the ESGR cooling is assumed to result in unavailability of electrical busses in the switchgear rooms, which is the most-limiting potential failure, and, therefore, acceptably conservative for this application. For the MCR cooling, the PRA model assumes the control room becomes unavailable requiring a shutdown from outside the control room. This is conservative, since room heatup evaluations performed by the licensee demonstrate that the control room temperature only reaches 105 °F after 24 hours assuming no mitigative actions. Safety-related instrumentation in the MCR is qualified to 120 °F, so no adverse consequences would result due to the room heatup to 105 °F. Further, procedures direct the operators to establish alternate cooling, including the use of nonsafety-related chillers, which were not credited in the risk analyses supporting this proposed amendment. Therefore, the PRA model conservatively estimates the risk impact of a loss of either ESGR or MCR room cooling.

The internal events PRA model has been maintained since its original development to support the individual plant examination (IPE) in 1991, and the work has been peer reviewed. The licensee identified configuration controls for the Surry 1 and 2 PRA models, data, and software, as well as administrative controls which assure plant changes, including modifications, procedure changes, calculations, operator training, and system operation changes are screened, dispositioned and scheduled for incorporation into the PRA model. These processes assure the Surry 1 and 2 PRA reflects the as-built, as-operated plant. The licensee stated that there were no unincorporated changes which would have any significant impact on the results and conclusions of the risk analysis supporting this proposed request.

In 1998, the Westinghouse Owners Group performed a peer review of the Surry 1 and 2 internal events PRA model. The peer review identified 23 facts and observations (F&Os) of significance level B. The licensee stated that all level B F&Os have been addressed and resolved, and provided specific details regarding each of these F&Os. In addition, the licensee has considered F&Os which were generated from a similar review of their North Anna PRA model. The licensee identified those North Anna PRA model F&Os applicable to Surry 1 and 2 which are not yet addressed and resolved, which included updating the anticipated transient without scram (ATWS) model, consideration of manual operation of steam generator power-operated relief valves upon a loss of instrument air, and documentation issues. The licensee stated that resolution of these items would not change the conclusions of the risk analysis supporting this proposed request. The NRC staff agrees that these items are not directly relevant to the proposed changes being

evaluated, and concurs that their impact to the results and conclusions of the risk analysis would be minimal.

A focused independent industry peer review was completed in 2004 to address methodology changes to human reliability analyses implemented subsequent to the 1998 peer review. The licensee stated that all significant F&Os from this focused review have been addressed in the PRA model.

In 2004, a self-assessment of the Surry 1 and 2 internal events PRA model against the requirements of the ASME standard (ASME RA-Sa-2003, "Addendum to ASME RA-S-2002, Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications") and using the guidance of RG 1.200 (RG 1.200 Rev. 0 for Trial Use, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities") was completed by the licensee as part of a pilot of RG 1.200. The licensee identified potential areas for improvement and stated that many of these have been incorporated into the PRA model. Additional areas not yet addressed were reviewed, and the licensee stated that their resolution would not change the conclusions of the risk analysis supporting this proposed request.

The external event analyses from the individual plant examination of external events (IPEEE) for internal fires and seismic events was incorporated into the Surry 1 and 2 PRA model in 2006. Other external events were determined to have no impact on this application and were not included. The NRC staff notes that the core damage risk from tornado and high wind generated missiles, external flooding, and transportation and industrial facility accidents were dispositioned in NUREG/CR-4550, Vol. 3, Part 1, "Analysis of Core Damage Frequency: Surry Power Station, Unit 1," as negligibly small. The NRC staff concurs that the unavailability of one of two chiller loops would not change these conclusions.

The fire analysis of the IPEEE was based on the Electric Power Research Institute (EPRI) Fire-Induced Vulnerability Evaluation (FIVE) methodology, with the unscreened fire risk contributors being quantified to calculate CDF. The licensee reviewed screened fire scenarios which were not incorporated into the PRA model to determine if any would not screen if one chilled water loop was unavailable. Six additional scenarios were identified which contributed $1.3E-7$ to the ICCDP. This additional contribution was included in the risk analyses supporting this application.

The seismic analysis in the IPEEE was a seismic PRA per the guidance of NUREG-1407.

The licensee stated that no significant changes were made to the IPEEE fire and seismic models. However, the updated internal events system models were used in the analysis of fires and seismic events to analyze random faults unrelated to the initiating event. The resulting changes to the IPEEE results were then reviewed to ensure consistent or explainable results.

The licensee evaluated the risk impact associated with construction activities planned during the chilled water piping replacement, including the risk impact of pipe welding, fire and flood penetration impairment, and physical damage to the redundant operating chilled water loop. Compensatory measures were established and defined by the licensee and described in the submittal.

Based on review of the above information, the NRC staff finds that the licensee has satisfied the

intent of RG 1.177 (Sections 2.3.1, 2.3.2, and 2.3.3), RG 1.174 (Sections 2.2.3 and 2.5), and SRP Section 19.2, and that the quality of the Surry 1 and 2 PRA models is sufficient to support the risk evaluation provided by the licensee in support of the proposed license amendment.

PRA Results and Insights:

The Δ CDF and Δ LERF were determined by increasing the assumed unavailability of each chilled water loop to account for the additional 14-day and 45-day extended CT over the next 2 years. The licensee conservatively assumed that there would be two 45-day extended CTs per year (i.e., the 14-day CT was also assumed to be 45 days). This resulted in a new unavailability applicable to each chilled water loop of 1.23E-1, which corresponds to 45 days per year for each of the two loops. For determination of ICCDP and ICLERP, the licensee identified that the PRA model was evaluated assuming an unavailability of 1.0 for the out-of-service loop, and 0.0 for the in-service loop. The licensee’s results include the contribution from seismic and fire risk, and demonstrate that the total CDF and total LERF are reasonably expected not to exceed 1E-4/year and 1E-5/year, respectively.

The licensee’s methodology is consistent with the guidance of RG 1.177, Section 2.3.4 and Section 2.4, and is, therefore, acceptable to the NRC staff.

The results of the licensee’s analyses is shown in Table 1.

Table 1: Results of Tier 1 Analyses

	Core Damage Risk	Large Early Release Risk
Baseline risk	CDF = 4.5E-5/year	LERF = 8.9E-7/year
Expected annual risk (next 2 years)	CDF = 4.6E-5/year Δ CDF = 1.7E-6/year	LERF = 9.2E-7/year Δ LERF = 3.4E-8/year
RG 1.174 Acceptance Guidance (permanent changes)	Small: 1E-6/year - 1E-5/year	Very Small: 1E-8/year - 1E-7/year
Single loop outage (loop A)	ICCDP = 3.1E-7	ICLERP = 8.9E-9
Single loop outage (loop C)	ICCDP = 4.7E-7	ICLERP = 1.2E-8
RG 1.177 Acceptance Guidance (permanent changes)	Small: < 5E-7	Small: < 5E-8

The risk impacts for the proposed temporary change to TS 3.23 were found to be within the RG 1.177 acceptance guideline of less than 5E-7 for ICCDP, and 5E-8 for ICLERP, and within the RG 1.174 acceptance guidelines of less than 1E-5/year for Δ CDF representing a small change, and less than 1E-7/year for Δ LERF, representing a very small change. These guidelines are applicable for permanent changes to the TSs. The licensee’s planned repairs and modifications would result in these risk increases occurring over a 2-year period, after which the overall plant risk would return to the nominal baseline risk. Since the risk increases calculated would be acceptable on a permanent basis, the same risk increases are acceptable on a one-time, temporary basis for a 2-year period.

Therefore, the NRC staff finds that the licensee has satisfied the intent of RG 1.177 (Sections 2.4), RG 1.174 (Section 2.2.4 and 2.2.5), and SRP Section 19.2.

External Events:

The licensee's risk analyses include contributions from the significant external events, including fire and seismic. Other potential sources of risk from external events were reviewed and dispositioned as not significant for this application.

Based on the quantitative analysis results of external events discussed above, the NRC staff finds that the licensee has satisfied the intent of RG 1.177 (Section 2.3.2), RG 1.174 (Section 2.2.3), and SRP Section 19.2.

Shutdown and Transition Risk:

The licensee did not provide an assessment of shutdown or transition risk. Because the proposed changes to TS 3.23 are intended to support continued power operation, shutdown risk is not relevant to the proposed change.

Uncertainty Analyses:

The licensee provided their assessment of both parametric uncertainties and uncertainties related to key assumptions used in their analysis. The impact of uncertainties is minimal for this application due to the conservative assumptions employed for the impact of loss of ESGR/MCR cooling, as discussed under PRA quality. The licensee further identified conservatism in the quantitative fire analyses for not crediting any suppression systems, and identified that seismic risk is a minor overall contributor to the total risk. This minimizes the impact of uncertainties in these portions of the risk analysis.

Based on the licensee's evaluation of uncertainty impacts relevant to this proposed change, the NRC staff finds that the licensee has satisfied the intent of RG 1.177 (Section 2.3.5), RG 1.174 (Section 2.2.5), and SRP Section 19.2.

3.5.1.2 Tier 2 - Avoidance of Risk-Significant Plant Configurations

The second tier requires a licensee to provide reasonable assurance that risk-significant plant equipment outage configurations will not occur when specific plant equipment is taken out-of-service in accordance with the proposed TS change.

The licensee evaluated the impact of having other equipment unavailable concurrent with a chilled water loop. The criteria used to identify potentially risk significant configurations were the ICCDP and ICLERP limits in RG 1.177 (i.e., 5E-7 ICCDP and 5E-8 ICLERP). The assessment only considered a single system train out-of-service concurrent with a chilled water loop. Since combinations of multiple system trains out-of-service concurrent with a chilled water loop were not evaluated, the licensee stated that such combinations will not be permitted.

The licensee identified (Section 4.3.2 of their submittal) administrative controls applicable upon entry into plant conditions which use an extended CT for chilled water. The controls apply to surveillance testing, preventive maintenance, and elective maintenance. Corrective maintenance will be performed within the applicable TS constraints and managed per the licensee's tier 3 program.

In addition, the licensee has identified additional restrictions to be imposed during a temporary chilled water loop extended CT:

- The piping and valves in the auxiliary feedwater and charging cross-connects between the units will not be removed from service for surveillance testing, preventive maintenance, and elective maintenance during a chilled water loop outage.
- Since the risk assessment only considered a single train out-of-service concurrent with a chilled water loop, combinations of multiple system trains out-of-service concurrent were not evaluated, and, therefore, will not be permitted.
- As described in Attachment 4 (of the licensee's submittal), measures will be taken to protect the operating chilled water loop from physical damage during construction. Measures will also be taken to ensure fire and flood risks are mitigated by either provisions to maintain adequate barrier or penetration closure or by establishment of fire or flood watches, as required by existing procedures and requirements.
- Attachment 4 (of the licensee's submittal) includes discussion of additional compensatory actions planned during the chilled water replacement activities, including provisions for backup cooling.

The license condition proposed by the licensee requires implementation of the administrative controls and compensatory measures identified in their submittal.

Based on the above, and considering the small risk increase noted for the proposed TS change, the NRC staff finds the licensee's Tier 2 evaluation of potential risk significant configurations and the proposed tier 2 restrictions support the implementation of a temporary change to TS 3.23 to extend the CT of an inoperable chilled water loop, and is acceptable to the NRC staff.

3.45.1.3 Tier 3 - Risk-Informed Configuration Risk Management

The third tier requires a licensee to develop a program that ensures that the risk impact of out-of-service equipment is appropriately evaluated prior to performing any maintenance activity.

The licensee identified the CRMP required by 10 CFR 50.65 (a) (4), which is governed by station procedures and ensures the risk impact of out-of-service equipment is appropriately evaluated prior to performing any maintenance activity. The licensee stated that the risk is reassessed if an equipment failure or malfunction, or other emergent condition occurs which results in a plant configuration not previously assessed. The licensee further stated that the PRA model used to support the tier 3 CRMP during the chilled water outages will include external events (i.e., fire and seismic), and that the risk assessment includes consideration of both core damage and large early release impacts.

Based on the licensee's conformance to the requirements of the guidelines of RG 1.177, the NRC staff finds the licensee's Tier 3 program acceptable and supports the proposed changes to TS 3.8.1.

3.6 Comparison With Regulatory Guidance

The proposed temporary change to TS 3.23 to extend the CT for one inoperable MCR/ESGR AC

train meets the acceptance guidance of RGs 1.174 and 1.177 applicable for permanent changes to the TSs, and meets the guidance outlined in Section 19.2, "Review of Risk Information Used to Support Permanent Plant-Specific Changes to the Licensing Basis: General Guidance," and Section 16.1, "Risk-Informed Decisionmaking: Technical Specifications," of the NRC's SRP, NUREG-0800.

3.7 NRC Staff's Findings and Conditions

The risk impacts for Δ CDF, Δ LERF, ICCDP, and ICLERP, as estimated by the licensee are within the acceptance guidelines for RGs 1.174 and 1.177 for the proposed changes to TS 3.23 to extend the CT for one inoperable MCR/ESGR AC train. The licensee's Tier 2 analysis and commitments provide reasonable assurance that risk-significant plant equipment outage configurations will not occur when specific plant equipment is taken out-of-service in accordance with the proposed TS change. The licensee's Tier 3 CRMP was found to be consistent with the RG 1.177 CRMP guidelines.

REGULATORY COMMITMENTS

The licensee has made the following regulatory commitments which are imposed during any temporary chilled water loop outage using the revised TS:

1. The piping and valves in the auxiliary feedwater and charging cross-connects between the units will not be removed from surveillance for surveillance testing, preventive maintenance, and elective maintenance during a chilled water loop outage.
2. Since the risk assessment only considered a single train out-of-service concurrent with a chilled water loop, combinations of multiple system trains out-of-service concurrent were not evaluated, and, therefore, will not be permitted.
3. Planned unavailability due to surveillance testing and scheduled maintenance (i.e., preventive and elective) will be restricted or limited during a chilled water loop outage per Tables 5 and 6 of Attachment 1 of the licensee's February 26, 2007, submittal.

The Tier 1 risk impacts for the proposed temporary changes to TS 3.23 to extend the CT for one inoperable MCR/ESGR AC train is within RG 1.174 and RG 1.177 acceptance guidelines for Δ CDF, Δ LERF, ICCDP, and ICLERP applicable to permanent TS change, and is acceptable to apply for the proposed temporary changes. The Tier 2 analysis provides reasonable assurance that risk-significant plant equipment outage configurations will not occur when specific plant equipment is taken out of service in accordance with the proposed TS change. The licensee's Tier 3 CRMP is consistent with the RG 1.177 CRMP guidelines. The proposed change to TS 3.23 to extend the CT for one inoperable MCR/ESGR AC train satisfies the fourth key principle of risk-informed decisionmaking identified in RG 1.174 and RG 1.177, and is, therefore, acceptable within the review scope for implementing risk-informed decisionmaking.

Key Principle 5: Performance Measurement Strategies - Implementation and Monitoring Program

RG 1.174 and RG 1.177 establish the need for an implementation and monitoring program to ensure that extensions to TS CTs do not degrade operational safety over time and that no

adverse degradation occurs due to unanticipated degradation or common cause mechanisms. An implementation and monitoring program is intended to ensure that the impact of the proposed TS change continues to reflect the reliability and availability of systems, subsystems, and components (SSCs) impacted by the change. RG 1.174 states that monitoring performed in conformance with the Maintenance Rule of 10 CFR 50.65, can be used when the monitoring performed is sufficient for the SSCs affected by the risk-informed application.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Virginia 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 (72 FR 14308). 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: B. Heida
A. Howe
L. Brown

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Surry Power Station, Units 1 & 2

cc:

Mr. David A. Christian
President and Chief Nuclear Officer
Virginia Electrical and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

Ms. Lillian M. Cuoco, Esq.
Senior Counsel
Dominion Resources Services, Inc.
Building 475, 5th Floor
Rope Ferry Road
Waterford, Connecticut 06385

Mr. Donald E. Jernigan
Site Vice President
Surry Power Station
Virginia Electric and Power Company
5570 Hog Island Road
Surry, Virginia 23883-0315

Senior Resident Inspector
Surry Power Station
U. S. Nuclear Regulatory Commission
5850 Hog Island Road
Surry, Virginia 23883

Chairman
Board of Supervisors of Surry County
Surry County Courthouse
Surry, Virginia 23683

Dr. W. T. Lough
Virginia State Corporation Commission
Division of Energy Regulation
Post Office Box 1197
Richmond, Virginia 23218

Dr. Robert B. Stroube, MD, MPH
State Health Commissioner
Office of the Commissioner
Virginia Department of Health
Post Office Box 2448
Richmond, Virginia 23218

Office of the Attorney General
Commonwealth of Virginia
900 East Main Street
Richmond, Virginia 23219

Mr. Chris L. Funderburk, Director
Nuclear Licensing & Operations Support
Dominion Resources Services, Inc.
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, Virginia 23060-6711