

VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

November 14, 1990

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

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Docket No. 50-280
License No. DPR-32

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNIT 1
10 CFR 50 APPENDIX R INTERIM EXEMPTION REQUEST

In accordance with 10 CFR 50.12, we are requesting a one time exemption from 10 CFR 50, Appendix R, Section III, Paragraph O, for Operating License DPR-32 Surry Unit 1. Paragraph O requires that the Reactor Coolant Pumps (RCP) be equipped with an oil collection system if the containment is not inerted. In addition, paragraph O requires that the oil collection system be capable of collecting oil from potential pressurized and non-pressurized leakage sites. This leakage shall be collected and drained to a vented closed container that can hold the entire lube oil system inventory. Surry's existing RCP motor oil collection systems satisfy the requirements of Appendix R, paragraph O. However, a recently procured replacement RCP motor is of a slightly different configuration and only a portion of the existing oil collection system can be used on this motor. Therefore, we are requesting an interim exemption from the requirement to collect and drain the lube oil to a closed container for the Unit 1 'C' RCP motor. This exemption would apply for Cycle 11 operation for Unit 1.

An interim method of oil collection for the replacement RCP motor has been developed. A description of the interim collection system, fire hazards analysis, compensatory measures, and the exemption justification are included in the Attachment.

This exemption request has been reviewed and approved by the Station Nuclear Safety and Operating Committee. It has been determined that the proposed exemption does not involve an unreviewed safety question as defined in 10 CFR 50.59.

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If you have additional questions or require additional information to process this request, please contact us.

Very truly yours,



W. L. Stewart
Senior Vice President - Nuclear

Attachment

cc: U. S. Nuclear Regulatory Commission
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Mr. W. E. Holland
NRC Senior Resident Inspector
Surry Power Station

ATTACHMENT 1

**SURRY POWER STATION UNIT 1
10 CFR 50 APPENDIX R
INTERIM EXEMPTION REQUEST**

Surry Power Station Unit No. 1
Utilization of a Spare RCP Motor

BACKGROUND

The Unit 1 "C" Reactor Coolant Pump (RCP) motor requires a routine, five-year refurbishment at the end of Operating Cycle 10. This requires shipment of the RCP motor to an off-site facility. However, the motor can not be returned on a schedule which supports the planned return of Unit 1 to power. For this and other reasons, a decision was made to purchase a spare RCP motor and install the spare motor on the "C" RCP. The spare motor was expected to be physically identical to the old motor; however, minor physical differences were discovered upon delivery to the station.

Because certain components of the new RCP motor are of a different physical configuration than the existing "C" motor, the RCP oil collection system from the "C" motor cannot be fitted to the new motor without extensive modifications which cannot be accomplished within the outage schedule. A design modification to install a new oil collection system for the new RCP motor is not feasible because the modification also cannot be completed in time to support return to power operations. The lower bearing drip pan assembly is interchangeable and is being fitted to the new motor. It is our intent to measure the new RCP motor and fabricate the remainder of the new oil collection system for installation during the next Unit 1 refueling outage. A new lower bearing drip pan assembly will be fabricated for the old Unit 1 "C" RCP motor and will be maintained with that motor along with the rest of its existing oil collection system.

We have evaluated the consequences of a possible oil leak from a RCP motor lube oil system without the installed oil collection system in place. We have concluded that the proposed interim oil leak collection arrangement and associated compensatory measures provide a comparable level of safety to that afforded by the normal leak collection system. Our evaluation of the consequences of such an event and the compensatory actions we will take to mitigate those consequences are further discussed below.

EVALUATION

System Description

Each RCP Motor has its own oil collection system including a collection tank. The system was installed in fulfillment of License Condition 3.I, issued on September 19, 1979, as Amendment No. 54 to Facility Operating License No. DPR-32. The installed oil collection system also meets the intent of 10 CFR Part 50, Appendix R, Section III.0, Reactor Coolant Pump Oil Collection System.

The collection system collects and temporarily stores any lube oil which leaks out of the RCP motor lube oil system. The collection system consists of leak-proof pans under and around oil bearing components that may leak, with covers to contain oil from leaks in pressurized lines and to keep foreign matter out of the drain. Each oil collection enclosure is connected to a header which drains the oil to a tank below the enclosures. The tank is equipped with a flame arrestor. Each oil collection tank has a 265 gallon capacity. The approximate oil capacity of each RCP motor is 250 gallons.

Area Description

The primary containment has three separate cubicles that contain a steam generator and a reactor coolant pump and motor. These cubicles are arranged around the reactor vessel. The cubicle of concern is the "C" cubicle located to the southeast of the reactor vessel. The cubicles have a concrete base at the minus 3 ft. 6 in. elevation. The cubicle walls, constructed of reinforced concrete, extend up to the 47 ft. 4 in. elevation. There are piping penetrations in the cubicle walls as well as the floor. There are access doors to the cubicles at the minus 3 ft. 6 in. and the 18 ft. 6 in. elevations. These doors are somewhat shielded from the rest of the cubicle by a vestibule arrangement.

The "C" cubicle is located adjacent to the cable penetrations from the Cable Vault/Tunnel.

Fire Hazards Analysis

The primary combustible in the Reactor Coolant Pump (RCP) cubicle is approximately 250 gallons of lubrication oil for the RCP motor. With a partial oil collection system in place for the "C" reactor coolant pump, a rupture of the "C" RCP motor lube oil system is postulated to release approximately 175 gallons into the cubicle. However, for the fire hazards analysis, the entire RCP lube oil inventory is conservatively assumed to discharge up to 250 gallons of lube oil into the "C" RCP cubicle.

The worst case scenario for the cubicle is a total loss of the lube oil and a resulting fire. The following factors, including the interim oil leak collection arrangement of the cubicle as described below, will mitigate the effects of this fire scenario:

- 1) The floor of the cubicle (minus 3 ft. 6 in. elevation) is constructed of reinforced concrete. There are some pipe penetrations through the floor; however, there are steel sleeves forming each penetration that extend approximately 4 inches above the floor. Based on the floor area of the cubicle and 250 gallons of oil, the depth of the oil would be 0.5 inches, well below the level of the sleeve lip. Four inch dikes will be installed at the doors to prevent oil flow out of the cubicle doors.

- 2) Where pipes do penetrate the floor, spray covers will be installed on the pipes extending beyond the penetration sleeves described above. As an alternative, certain penetrations may be filled with fire retardant foam. This will prevent spray through the openings as well as stopping oil flow down the outside of the pipe.
- 3) The concrete walls of the cubicle extend up to the 47 ft. 4 in. elevation from the minus 3 ft. 6 in. elevation. There is a distance of approximately 15 feet from the top of the RCP motor to the top of the cubicle. This distance will prevent spray out of the cubicle. In addition, oil will collect on the walls or pipes and flow to the concrete base at the minus 3 ft. 6 in. elevation.
- 4) Heat from a fire will rise in the cubicle to the operating floor (elevation 47 ft. 4 in) After leaving the cubicle the heat will continue to rise to the top of the containment structure where there are no safe shutdown exposures. In addition, as heat leaves the cubicle it will entrain air, resulting in a cooling effect on the hot gases.
- 5) Internal obstructions within the cubicle such as walkway grating at the 18 ft. 4 in. elevation, the steam generator, and the approximately 50 ft. distance from the base to the top of the cubicle will prevent flames from leaving the cubicle.
- 6) Motor problems that could result in a loss of oil can be detected by several existing means: bearing temperature, motor vibration, and motor running current. In the event of a RCP oil leak, a lube oil high/low level alarm is annunciated in the Control Room. In addition, if the oil were to ignite, the following instrumentation would give operators warning of the fire: RCP heat detection equipment, ambient air temperature monitors, and RCP motor stator temperature alarms.

Finally, additional indication of a fire will be provided by installation of a heat detector in the cubicle in the area above the RCP motor. This detector will annunciate in the Control Room.

- 7) Dry standpipes are located within containment. While the Unit is operating, a fire hose is stored just outside the containment at the access hatch along with additional firefighting equipment. The equipment required to extinguish a fire by foam will also be stored near the containment access hatch. Foam will provide a rapid knockdown of an oil fire and is effective for an indirect attack (i.e. applying the foam from the top of the cubicle and allowing it to flow down the walls and blanket the oil).
- 8) The "C" cubicle is separated from the cable penetration area by the crane wall. In order to assure that a fire in the "C" cubicle will not affect safe shutdown cables in the cable penetration area going to the Cable Vault and Tunnel, the crane wall will be inspected and any open penetrations in the wall will be sealed with silicon foam.

- 9) The cable routing in the containment assures that a fire in the "C" cubicle will not affect indications required for safe shutdown. Loop "A" and Loop "B" will provide indication to the Remote Monitoring Panel in the Service Building and to the Control Room via the Cable Vault Penetration. Cable for other instrumentation required for safe shutdown is routed outside of the "C" cubicle and will provide indication to the Remote Monitoring Panel and the the Control Room (i.e. pressurizer level, neutron flux, RCS pressure).

Safe Shutdown Capability

The primary safe shutdown equipment required for hot shutdown in the containment is instrumentation cabling. The primary equipment required for cold shutdown are the RHR pumps and cables. A fire in the "C" RCP cubicle has the potential to disable the "C" instrumentation. However, it would not affect the redundant "A" and "B" loop instrumentation to the Service Building Remote Monitoring Panel to the Cable Vault/Tunnel penetration leading to the Control Room. Therefore, even with a total loss of the "C" instrumentation, redundant instrumentation indication will be available in the Control Room and at the Remote Monitoring Panel. Thus, a fire in the "C" cubicle would not significantly affect the ability to achieve safe shutdown.

Compensatory Measures

Although our evaluation has determined that the Unit can be brought to a safe shutdown condition in the event of a lube oil fire in the "C" cubicle, there are several measures that we will take prior to restart of Unit 1 to provide additional assurance to detect or mitigate a lube oil leak/fire:

- Increased surveillance of temperature related parameters will be conducted. Increasing motor temperature indicates a possible oil leak.
- Existing heat detection instrumentation in the affected cubicle will be maintained. Additional heat detection instrumentation, in the area above the RCP motor, will be provided. This instrumentation will provide prompt detection in the event of a lube oil fire in the cubicle.
- Procedures will be revised to address operator actions in the event of an adverse trend in motor temperature. Such actions will include: immediate containment entry to identify the reason for increasing temperatures, shutdown of the affected pump, or response by the fire brigade.
- Fire brigade members will be briefed on the potential for a fire in the "C" cubicle and on the means to mitigate a fire in the area.
- Fire suppression equipment will be maintained outside containment to be used by the fire brigade in the event of lube oil fire. This includes placement of foam equipment at the containment access hatch.

- Spray covers will be added above the floor penetrations in the concrete floor on the minus 3 ft. 6 in. elevation and a 4 in. lip will be added to the cubicle entranceway. As a result of these modifications the concrete floor will function as an oil reservoir to contain any oil which leaks into the cubicle.
- Shields will be installed as an additional protective measure to assist in keeping high pressure oil spray from directly impinging on hot reactor coolant piping.
- Seals will be provided as required in any penetrations in the crane wall between the cable penetration area and cubicle "C", from the minus 3 ft. 6 in. elevation to the 47 ft. 4 in. elevation

CONCLUSION

We believe that the operation of Surry Unit No. 1 using the interim RCP oil leak collection arrangement and associated compensatory measures in its upcoming cycle of operation is justified. We believe, based on Surry's operating history, that the probability of a lube oil fire is extremely low. Even in the event of a fire, we have demonstrated that the plant can be brought to a safe shutdown condition. We have taken additional measures to further mitigate the consequences of this event. We conclude that the interim oil leak collection arrangement and associated compensatory measures meet the intent of Appendix R in that our ability to safely shutdown the plant in the event of a fire is not impaired.

EXEMPTION JUSTIFICATION

10 CFR 50.12 states that the Commission may grant exemptions from the requirements of the regulations contained in the 10 CFR 50 provided that: (1) the exemption is authorized by law, (2) the exemption will not present an undue risk to the public health and safety, (3) the exemption is consistent with the common defense and security, and (4) special circumstances as defined in 10 CFR 50.12(a)(2) are present.

1. The Requested Exemption is Authorized by Law

No law exists which would preclude the activities covered by this exemption request, thus the Commission is authorized to grant this exemption.

2. The Requested Exemption Does Not Present an Undue Risk to the Public Health and Safety

10 CFR 50 Appendix R, Section III, Paragraph O requires a system for collection of oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems. The collection of oil assures that oil leakage does not result in a fire during normal or design basis accident conditions. Although the requested interim oil leak collection arrangement and associated compensatory measures do not meet the specific requirements of the oil collection system, they provide a comparable level of safety to that afforded by the normal leak collection system.

Even with a loss of the "C" loop instrumentation required for hot shutdown, redundant loop "A" and "B" instrumentation indication will be available in the Control Room and at the Remote Monitoring Panel. Thus, a fire in the "C" cubicle would not adversely affect the ability to achieve safe shutdown. This demonstrates the requested exemption does not present an undue risk to the public health and safety.

3. The Requested Exemption Will Not Endanger the Common Defense and Security

The common defense and security are not an issue in this exemption request.

4. Special Circumstances are Present Which Necessitate the Request for an Exemption to the Regulations of 10 CFR 50 Appendix R, Section III.O

Per 10 CFR 50.12(a)(2), the following special circumstances are present:

- a. Application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. The intent of the regulation is to prevent fire damage in containment that could impact safe shutdown of the plant. The proposed alternative and compensatory measures will assure safe shutdown capability.

- b. Compliance with the regulation would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted. To acquire a RCP motor that had an oil collection system to precisely fit or to modify the existing oil collection system can not be accomplished in time to support the restart of Unit 1. This would result in undue hardship and excessive costs associated with lost revenues due to plant shutdown.
- c. The exemption would provide only temporary relief from the applicable regulation and we have made a good faith effort to strictly comply with the regulation. The exemption being requested is a one-time exemption from the requirement to collect and drain the lube oil to a closed container for the Unit 1 "C" RCP. We intend to install a complete oil collection system on the new RCP motor at the end of Operating Cycle 11 for Unit 1.

SAFETY IMPACT

Virginia Electric and Power Company has reviewed this exemption and determined that the requested interim oil leak collection arrangement and associated compensatory measures will not impact nuclear safety. This exemption request provides a one-time waiver of compliance from 10 CFR 50 Section III Paragraph O. Thus, operation of the Surry Power Station in accordance with the proposed changes will not:

1. Involve a significant increase in the probability or consequences of any accident previously evaluated. Inacting the interim oil leak collection arrangement does not affect the probability of occurrence of accidents, nor will projected degradation of equipment occur that would change the consequences of an accident. The exemption request is consistent with the intent of the regulation.
2. Create the possibility of a new or different type of accident from those previously evaluated. The function and operation of the reactor coolant pumps are not affected by the interim measures being taken. Consequently the ability of the reactor coolant system to perform its intended function will be maintained, no new accident precursors are being generated and therefore no new or different kind of accident is created.
3. Involve a significant reduction in a margin of safety. Accident analysis assumptions are not being modified or exceeded by this change. The interim oil leak collection system or the associated compensatory measures will not result in significant degradation of equipment. Therefore, the accident analysis assumptions remain bounding and safety margins remain unchanged.