7590-01

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the matter of	)	
	)	Docket Nos. 50-338
Virginia Electric and Power Company	)	and 50-339
	)	
(North Anna Power Station, Units No. 1 and No. 2)	)	

EXEMPTIONS

I.

Virginia Electric and Power Company (the licensee) is the holder of Facility Operating License Nos. NPF-4 and NPF-7 which authorize operation of North Anna Power Station, Units No. 1 and No. 2 (NA-1&2, the facility) at steady-state power levels not in excess of 2893 megawatts thermal. The licenses provide, among other things, that the facility is subject to all the rules, regulations, and orders of the Nuclear Regulatory Commission (the Commission) now or hereafter in effect.

The facility employs pressurized water reactors (PWRs) located at the licensee's site in Louisa County, Virginia.

The licensee is implementing a refurbishment and restoration program for the NA-1&2 service water system (SWS). The program is to be conducted in several stages. The Phase 1, Stage 1 efforts are to be conducted during the forthcoming NA-1 steam generator replacement program (SGRP) outage presently scheduled to commence on January 2, 1993. To support the Phase 1, Stage 1 SWS restoration program, the licensee has identified two exemptions required at this time. The two exemptions are specified below.

II.

10 CFR Part 50, Appendix A, General Design Criterion-2 (GDC-2) requires that structures, systems, and components important to safety be designed to withstand the effects of natural phenomena such as .....tornados,.....without loss of capability to perform their safety functions.

During the Phase I, Stage I effort, approximately 160 feet (4 parallel lines approximately 40 feet in length) of buried piping will be exposed and replaced. This buried piping is located in the alleyway between the service building and the quench spray pump house. The replacement of this section of buried piping requires the excavation for which the exemption from GDC-2 (tornado missiles) is needed. In addition to the buried SWS piping, the alleyway also contains two concrete-encased electrical duct banks, a concrete encasement which encloses the 4-inch SWS lines to the NA-1 control room chillers, and various nonsafety-related storm drains. Appropriate temporary supports will be used to maintain seismic qualification of critical components.

In order to accomplish these Stage I activities during the NA-1 SGRP outage, the buried portions of the SWS supply and return lines to the NA-1 containment recirculation spray heat exchangers must be excavated during a pre-outage period starting about 30 days prior to the scheduled outage. Likewise, the exposed piping will be recovered during a 30-day post-outage period. Therefore, the exemption is requested for the scheduled NA-1 SGRP outage period plus about 30 days prior to and 30 days after the scheduled

outage. This will result in an exemption time period from early December 1992 through June 30, 1993. The actual repair and replacement of the piping will not begin until NA-1 is shut down for the SGRP outage.

The licensee is providing contingency measures with compensatory actions to provide added assurance of safe operation of the facility during the exemption period. Although the exemption is requested only for missile protection, the risk to the plant due to construction mishaps is more significant than the risk due to natural phenomena. Therefore, the compensatory measures are geared toward preventing such mishaps in addition to minimizing the potential for missiles generated by severe weather. As stated in the enclosed Safety Evaluation, these compensatory actions include:

- Electronic scanning and nondestructive locating methods will be used to accurately determine underground locations of piping, duct banks, and other buried utilities prior to excavation.
- Machine excavation will be limited to near-surface depths. The bulk of the excavating will be by hand-operated power and manual tools.
- Physical barriers will be used to keep vehicles a safe distance from the excavation.
- All lifting and rigging will be inspected and load tested. Lifting of equipment or construction materials over the excavation will be prohibited while the piping is exposed and operable.

- Severe weather procedures will be used to provide notification to clear the area of vehicles and loose materials in the event of a tornado watch or other high wind conditions.
- Adequate wind protection and heating will be provided during freezing weather conditions.

In order to implement the SWS restoration project, the licensee will rely on the NA-1&2 Technical Specification (TS) 3/4.7.4.1 which permits removal of one SW header from service for up to 168 hours at a time in support of service water upgrade activities. When entering this 168-hour action statement, additional contingency and compensatory actions will be taken. As stated in the enclosed Safety Evaluation, these compensatory actions are:

- A temporary water supply from either the primary grade water or fire water systems will be available as a contingency to the charging pump coolers should the normal SWS supply be interrupted.
- Emergency pipe repair materials will be staged in key areas to reduce response time in the event of a leak or a rupture. Procedures for emergency pipe repair will be developed and plant personnel will be trained in the use of these procedures and materials.
- As required by the TS, three of the four SWS pumps and both of the auxiliary SWS pumps will be operable as a prerequisite for entry into the 168-hour action statement. There will be no planned maintenance on the SWS during an action statement period.

- Flood prevention and mitigation measures will be in place.

The excavation of the SWS piping will only affect the missile shield protection aspects of the GDC-2, with seismic support being retained. While producing some increase in missile interaction risk, excavation of the piping does not result in total vulnerability to missiles. The lines are substantially below grade and are surrounded on several sides by heavily reinforced concrete structures. This will provide some degree of protection from horizontally generated missiles from any source.

Considering the existing design features and compensatory measures proposed by the licensee, the likelihood of damage to the exposed SWS lines and safety-related electrical duct banks from postulated missiles generated by natural phenomena is minimal. Also, based on the compensatory measures provided, assurance exists that the ability to bring the plant to a safe shutdown will be maintained following any natural phenomena, including tornadoes or other severe weather which could result in airborne missiles. Therefore, there is reasonable assurance that the proposed GDC-2 exemption will present no undue risk to public health and safety.

III.

10 CFR 50.49 (50.49) requires (in part) that each holder of a license to operate a nuclear power plant shall establish a program for qualifying safety-related electric equipment that is relied upon to remain functional during and following design basis events that are defined as conditions

of normal operation, including operational events, and design basis accidents.

The requested exemption from 50.49 would permit temporary cooling of the NA-1 control room chillers from the common bearing cooling water system to provide normal control room temperatures and provide a reliable backup cooling system to the NA-2 air conditioning chillers. The period for the NA-1 chillers to be operating on bearing cooling water is projected to be between 90 and 120 days.

NA-1&2 each have three control room air conditioner chillers located in a missile-protected room of the service building off the respective unit's turbine building basement. Ventilation of each unit's chiller room is taken from and exhausted to the respective unit's turbine building basement. Hence, the chillers for each unit are located in the same environmental zone which is also common to the unit's turbine building basement. Therefore, as the result of an environmental qualification evaluation of the control room air conditioning systems, a station standing order requires at least one of the opposite unit's chillers to remain operable while that unit is in a shutdown condition and the other unit is operating. Specifically, the station standing order requires that at least one control room chiller on the unit in Mode 5 or 6 be maintained operable while the other unit is in Mode 4 or above. This measure assures that the air conditioning system serving the control room and emergency switchgear room of the operating unit would be available during a postulated main steam line break accident in the turbine building.

However, with bearing cooling water supplied to the NA-1 chillers instead of service water, the reliability of the NA-1 chillers is called into question because bearing cooling is not safety-related. Bearing cooling would not be available in the event of a loss of offsite power event or design basis earthquake coincident with the main steam line break accident in the turbine building. Therefore, an exemption from 10 CFR 50.49 for the NA-2 chillers is requested by the licensee for the period that the SWS is isolated from the NA-1 recirculation spray heat exchangers and the control room chillers.

While the shutdown unit's TS do not require the air conditioning systems to remain operable in Modes 5 and 6, the environmental qualification design basis for the operating unit's air conditioning systems requires at least one of the shutdown unit's chillers to be operable as a backup for the operating unit.

The design basis of concern results in an environmental condition in the NA-2 chiller room for which the NA-2 control room chillers are not qualified and may cease to function properly. The only postulated accident event that could cause this condition is the failure of a main steam line in the turbine building basement in proximity to the NA-2 chiller room. However, in order to have sufficient steam concentration in the area to disable the NA-2 chillers, the main steam trip valve on the line would also have to fail to a closed position. This is unlikely because the trip valves are essentially check valves reversed to the flow of steam with the check disk physically held out of the steam flow path. Failure to hold the disk out of the steam flow path

would cause the trip valve to slam shut. Failure of the valve caused by the disk sticking open is, therefore, unlikely. The likelihood of the above accident scenario during the time that the 50.49 exemption would be in effect is thus very low, and the exemption would not significantly affect the consequences of design basis accidents. The staff reviewed the risk associated with using bearing cooling water as a substitute for SWS cooling for a backup chiller and concluded the temporary change in environmental qualification is acceptable.

The required exemption period is technically from entry into the second 168-hour action statement through the clearing of the fifth 168-hour action statement for work activities associated with the Phase I, Stage 1 SWS restoration project and is projected to be between 90 and 120 days.

IV.

The exemptions, as noted above, involve special circumstances as set forth in 10 CFR 50.12(a)(2)(v). The exemptions would provide only temporary relief from the applicable regulations (GDC-2 and 50.49). The exemptions are requested for a specific time period after which the facility would again be in conformance with all the requirements of GDC-2 and 50.49. The licensee has made good faith efforts in considering alternatives to the exemption requests and has concluded that the SWS refurbishment and restoration program can only be conducted without the subject exemptions during a period when both NA-1&2 are shut down and defueled. The impact of scheduling such a dual-unit outage would have significant consequences in terms of power supply, fuel storage, capacity, and replacement power costs. Finally, the exemptions will

indirectly result in benefits to the public from increased reliability of the upgraded safety-related SWS.

V.

Based on the above and on review of the licensee's submittals, as summarized in the enclosed Safety Evaluation, the NRC staff concludes that the likelihood of unacceptable damage to the exposed SW headers due to tornado-borne missiles during the exemption period is low. Also, the staff concludes that the only postulated accident which could affect the normal environmental design basis for the NA-2 control room chillers is a highly unlikely event. Therefore, for the time that the 50.49 exemption would be in effect, the exemption would not significantly affect the probability or consequences of environmental design basis events.

Based on the low probability of unacceptable events, coupled with the comprehensive compensatory measures which the licensee has committed to, the NRC staff finds the proposed exemptions from GDC-2 and 50.49 acceptable. Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, the subject exemptions are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security. The Commission further determines that special circumstances, as provided in 10 CFR 50.12(a)(2)(v), are present justifying the exemptions, namely that the exemptions would provide only temporary relief from the applicable regulations and that the licensee has made good faith efforts to comply with the regulations.

Therefore, the Commission hereby approves the following exemptions: NA-1&2 may operate without conforming to the requirements of GDC-2 as they

apply to the buried portions of the SWS supply and return lines to the NA-1 containment recirculation spray heat exchangers, providing that compensatory measures as described herein are continued for the period of the exemption. This exemption shall become effective on its date of issuance and shall expire on June 30, 1993.

NA-2 may operate without conforming to the requirements of 50.49 as they apply to the normal environmental design basis for the NA-2 control room chillers. This exemption shall be in effect during the Phase 1, Stage 1 SWS restoration program from entry into the second 168-hour action statement through the clearing of the fifth 168-hour action statement.

Pursuant to 10 CFR 51.32, the Commission has determined that granting the above exemptions will have no significant effect on the quality of the human environment (August 27, 1992, 57 FR 38889; November 6, 1992, 57 FR 53146; and November 30, 1992, 57 FR 56606).

For further details with respect to this action, see the licensee's request dated July 16, 1992, as supplemented on September 11, 1992 and November 4, 1992, which are available for public inspection at the Commission's Public Document Room, Gelman Building, 2120 L Street, NW., Washington, DC 20555, and at the NA-1&2 Local Public Document Room, the Alderman Library, Special Collections Department, University of Virginia, Charlottesville, Virginia 22903-2498.

The GDC-2 exemption is effective from its date of issuance through June 30, 1993. The 50.49 exemption is effective during the Phase 1 Stage 1

SWS restoration program from entry into the second 168-hour action statement through the clearing of the fifth 168-hour action statement or June 30, 1993, whichever occurs first.

FOR THE NUCLEAR REGULATORY COMMISSION

Steven A. Varga, Director
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland
this 3rd day of December 1992.