VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

W. L. STEWART
VICE PRESIDENT
NUCLEAR OPERATIONS

July 12, 1983

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
Attn: Mr. Robert A. Clark, Chief
Operating Reactors Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Serial No. 323
PSE/TLG:cdk:0571C
Docket Nos.: 50-338
50-339
License Nos.: NPF-4
NPF-7

Gentlemen:

NUREG-0612-CONTROL OF HEAVY LOADS
PHASE I
NORTH ANNA POWER STATION
UNITS 1 AND 2

As requested via your letter, dated May 17, 1983, the following is provided for final resolution of the open items as stated in the North Anna Power Station Units 1 and 2 Draft TER, dated February 22, 1983 for demonstrating North Anna Power Station Units 1 and 2 Conformance to NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants", Phase I.

TER 2.1.2 Safe Load Paths [Guideline 1, NUREG-0612, Section 5.1.1(1)]

Safe Load Paths have been developed for the overhead handling systems and the appropriate information forwarded to the NRC (Reference Vepco's letter Serial No. 709 dated December 15, 1982) and as stated in the TER they do comply with Guideline 1. As for the duties of the load handling supervisor and the crane signalman, they are clearly defined in the appropriate Maintenance and Administrative Procedures.

TER 2.1.3 Load Handling Procedures [Guideline 2, NUREG-0612, Section 5.1.1(2)]

Load handling procedures have been developed as stated in earlier correspondence. These procedures have been reviewed, approved by the Station Nuclear Safety and Operating Committee (SNSOC) and have also been implemented in accordance with this guideline.

TER 2.1.4 Crane Operator Training [Guideline 3, NUREG-0612, Section 5.1.1(3)]

North Anna Power Station Units 1 and 2 comply with this guideline by having the crane operators trained and qualified in accordance with ANSI B30.2-1976, as well as having operator conduct monitored on a continuing basis.

A033
1/0

TER 2.1.5 Special Lifting Devices [Guideline 4, NUREG-0612, Section 5.1.1(4)]

The special lifting devices used for the reactor vessel heads, reactor internals, and reactor coolant pump motors are standard lifting devices designed and supplied by Westinghouse for these specific functions. Analyses have been performed by Westinghouse to determine the acceptability of these devices to meet requirements of this guideline 4.

The special lifting devices designed by Westinghouse used the design criteria that the resulting stress in the load carrying members, when subjected to the total combined lifting weight, should not exceed one fifth (1/5) of the ultimate material strength. The design, fabrication and quality assurance requirements were defined by Westinghouse on the detailed manufacturing drawings and purchase order documents. Field assembly instructions for the reactor vessel head and internals lift rigs which included an initial load test followed by non-destructive surface examination of critical welds were also issued. All of the tensile and stear stresses meet the design criteria of ANSI N14.6 Section 3.2.1.1; requiring application of stress design factor of three and five with the accompanying allowable stress limits of yield and ultimate strength, respectively.

The Westinghouse comparison shows that the special lifting devices mentioned above meet the intent of ANSI N14.6 for design, fabrication and quality assurance. However, they are not in strict compliance with all the ANSI N14.6 requirements for acceptance testing, maintenance and verification of continuing compliance as noted in the following:

A) ANSI N14.6 Section 5.2.1 requires an initial acceptance load test prior to use equal to 150 percent of maximum load, however, all three special lifting devices were subject to a 100 percent load test followed by the appropriate non-destructive testing after site assembly and prior to initial use within the plant.

B) ANSI N14.6 Section 5.3 requires annually, either a 150 percent maximum load test or dimensional visual and non-destructive testing of major load carrying welds and critical areas. A 150 percent load test is impractical in that these special lifting devices are in the containment. However, procedures do require that each device, its welds and any bolted joints be visually inspected prior to use. The load is then raised and held for 10 minutes while additional visual inspections are performed. A load cell is used with the reactor vessel head and internals lift rigs for continued monitoring during all lifting and lowering.

In conclusion, the following can be stated:

1. The ANSI N14.6 requirements for design, fabrication and quality assurance are generally in agreement with those used for the special lift devices.

2. The ANSI N14.6 criteria for stress limits associated with certain stress design factors for tensile and shear stresses are adequately satisfied.

3. The special lift devices may not be in strict compliance only with the ANSI N14.6 requirements for acceptance testing, maintenance and verification of continuing compliance. However, the load and non-destructive tests performed following fabrication and assembly adequately demonstrates the acceptability of these devices. Also the present station Maintenance and Administrative Procedures address the concerns of the maintenance and verification of continuing compliance with the intent of ANSI N14.6.

4. All tensile and shear stresses meet the ANSI N14.6 design criteria for stress design factors of three (3) and five (5).

TER 2.1.6 Lifting Device (Not Specially Designed) [Guideline 5, NUREG-0612, Section 5.1.1(5)]

The significance of dynamic loads in determining the capacity of slings used at North Anna Power Station has been evaluated. As noted in previous correspondence (Reference Vepco's letters Serial No. 598, dated October 18, 1982 and Serial No. 709A, dated February 4, 1983) the dynamic load constitutes a small

percentage of total load imposed on the slings and the rating of the slings can safely be expressed in terms of maximum static load only. The slings have been clearly marked to reflect their loading capacities and use restrictions.

TER 2.1.7 Crane (Inspection, Testing, and Maintenance) [Guideline 6, NUREG-0612, Section 5.1.1(6)]

North Anna Power Station Units 1 and 2 comply with this guideline for ANSI requirements for crane inspections, testing, and maintenance.

TER 2.1.8 Crane Design [Guideline 7, NUREG-0612, Section 5.1.1 (7)]

Verification that the polar cranes meet all 14 requirements of CMAA-70 was completed and the documentation forwarded to the NRC via previous correspondence (Reference Vepco's letters Serial No. 709B, dated March 1, 1983 and Serial No. 709C, dated March 23, 1982).

If you have any questions or require further clarification or information concerning the resolutions provided, please advise.

Very truly yours,

W. L. Stewart

cc: Mr. James P. O'Reilly
Regional Administrator
Region II

Mr. M. B. Shymlock
NRC Resident Inspector
North Anna Power Station