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VIRGINIA ELECTRIC AND POWER COMPANY

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Mr. James P. O'Reilly, Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Region II
101 Marietta Street, Suite 3100
Atlanta, Georgia 30303

Serial No. 552/070279
PSE&C/CGC:adw:mc

Docket Nos. 50-338
50-339
License No. NPF-4

Dear Mr. O'Reilly:

We have reviewed NRC IE Bulletin 79-14, including Rev. 1, concerning Seismic Analyses For As-Built Safety-Related Piping Systems. We interpret the objective of the Bulletin to be verification that the as-built configuration of safety-related piping systems adequately conforms to the design criteria and documents that were used as input to the seismic analysis.

Table 1 identifies the inspection elements required to verify that the seismic analysis input information, obtained from design documents, conforms adequately to the as-built configuration of safety-related systems. Safety-related systems are piping systems or portions of piping systems containing Class Q1, Q2, Q3 lines or some seismic (S) lines. The elements in Table 1 were developed by evaluating the seismic analysis design input information delineated in Table 2 and determining which input represents an as-built element requiring verification. This determination was additionally influenced by the inspection elements listed in item 2 of the Bulletin. Besides identifying the seismic analysis input information, Table 2 also identifies the documents which provide this information. Table 3 identifies each system containing safety-related piping and lists the design documents which were sources of input information for the seismic analysis. Table 3 also identifies the type of seismic analysis performed.

The Bulletin states that verification of the as-built configuration to the seismic analysis input information is not required if verification has been accomplished within the last 12 months. We are unable to rationalize the basis for the 12 month criteria for plants such as North Anna 1 and 2. These plants were constructed under rigid quality control and inspection requirements to assure conformance of as-built conditions to design conditions. Since Unit 2 is not operational, construction phase programs are still active in assuring design conformance to as-built. Unit 1 is a recently licensed plant that was constructed under the same construction phase quality assurance. Any minimal design changes made to date have been documented and controlled by station quality assurance procedures such that the as-built condition that was assured by the construction phase programs is still verified.

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Table 2 identifies the method by which the design input to the seismic analysis is verified. The Field Quality Control program as described in the Stone & Webster FQC Manual and the ASME Program as described in the Stone & Webster "Company Quality Assurance and Control Manual-ASME-Section III" (ASME Manual) assures that the as-built configuration of pipe run geometry and hanger installation conforms to the design documents.

The FQC procedure, QC-11.4, "Inspection of Pipe Hangers", requires 100 percent inspection of all Q1, Q2, Q3, and S pipe support installations to assure conformance to the design documents. A check list to document the inspection is completed for each hanger. Attributes on the check list include approved hanger design drawings and documents, location, clearance, base plate and bolt orientation, bolt embedment, system and line number, and visual inspection. The Nuclear Project Operating Procedure, POP-506, "Field Procedure for Design, Installation, Inspection and Acceptance of Pipe Hangers, and Ventilation and Air Conditioning Duct Support", establishes a program which documents the installation, inspection and final acceptance of all pipe hangers on safety-related pipes.

FQC procedure, QC-11.2, "Field Fabrication and Erection of Piping Control Program", verifies that the system run geometry is in accordance with applicable design documents and the system flow diagram. The ASME Manual, Section 9/NA, "Fabrication and Installation Control", requires preparation of Control Drawings which are isometric drawings of piping systems. The Control Drawings also identify pipe material by ASME/ASTM number. A Weld Traveler Package, attached to the Control Drawing, verifies wall thickness at welds. When installation is complete, the Control Drawings are up-dated to the as-built condition. The FQC inspector and the Authorized Nuclear Inspector (ANI) then perform a final inspection in accordance with ASME Manual, Section 13/NA, "Fabrication and Installation Inspection", to verify the system is installed in accordance with the appropriate design documents.

For Q1 pipe lines, the pipe run geometry input into the seismic analysis is verified by stress as-built (SAB) drawings which are required by the ASME Code (Section III, NA-3365). The SAB is used in the seismic analysis calculation and is also recorded in Appendix B of the Stress Report (SSR).

Q2, Q3 and S large bore piping (greater than 2 1/2 in.) is stress walked by field stress engineers using the latest issue of the MSK (stress analysis model) to assure that the pipe run geometry input to the seismic analysis is verified. Any variations in piping configuration and hanger location between the MSK and the installed condition are resolved.

Considering the FQC program, ASME program, SAB drawings and stress walks, we believe the only inspection element on Table 1 requiring re-verification to meet the intent of the Bulletin is valve and operator weight in computer analyzed, safety-related systems. This is based on the fact that the verification programs used at North Anna are very extensive and developed out of our on-site experience and provide complete control and documentation of piping system erection to assure conformance with the seismic analysis. These programs

essentially meet the requirements of the Bulletin and have been in effect for a number of years. These verification programs are now monitored by the resident NRC inspector. The great majority of the problems identified in Appendix A of the Bulletin are hanger related, and this aspect of the North Anna control, documentation, and verification program is very comprehensive and detailed. It was used and developed during the numerous hanger review programs (anchor bolt embedment, flexible baseplate, hanger as-builts, etc.). Therefore, we feel that North Anna 1 and 2 should not be required to adhere to the 12 month criteria because of the past implementation of procedures to ensure as-built configuration conformance to design documents.

The re-verification for valve and operator weight will be accomplished by determining weights used in computer analyzed seismic analyses and verifying from design documents that these valve and operator weights are correct. Any deviations will be reconciled as to the effect, if any, on the seismic analyses.

In accordance with the above, valve weight verification has commenced with a target completion date of 120 days from July 2, 1979. Within 60 days of July 2, 1979 a report on the progress of this verification will be submitted.

If you have any questions, please notify.

Very truly yours,

Sam C. Brown, Jr.
Senior Vice President-Power Station
Engineering and Construction.

cc: Mr. Victor Stello, Director
Office of Inspection & Enforcement

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation

TABLE 1

IE BULLETIN 79-14
NORTH ANNA UNITS 1 & 2
INSPECTION ELEMENTS

Inspection Element	Remarks
Valve Location	position along pipe
Valve Operator Orientation	excluding piping with simplified analysis (Note 2)
Valve and Operator Weight	excluding piping with simplified analysis (Note 2)
Pipe Run Geometry	function
Hangers	position along pipe
a. Type	clearance, pipe attachment,
b. Location	structural details, embedment
c. Design Details	

NOTE

1. Bulletin exempts lines 2" and smaller if it was analyzed by other than computer method.

2. Seismic qualification of these lines is assured by conservative support spacing and by conservatively high standard support design loads. These standards allow for various in-line components such as valves. The exact weight of a specific component is not required.

TABLE 2

IE BULLETIN 79-14
NORTH ANNA UNITS 1 & 2
SEISMIC ANALYSIS INPUT AND METHOD OF VERIFICATION

Design Input	Source of Input	Existing Method of Input Verification	Remarks
Pipe Diameter	FM Drawings (Note 1) FP Drawings (Note 1) FB Drawings (Note 1)	FQC Procedure QC-11.2 "Field Fabrication and Erection of Piping Control Program"	Re-verification not required because: 1. Existing method of verification is adequate. 2. Not intent of 79-14. Would require insulation removal.
Pipe Wall Thickness	"Piping Engineering & Design Instructions"-Specification NAS-290 "Yard Water and Fire Protection Systems" Specification NAS-74, ANSI 21.6 "Service Water Spray System" Specification NAS-318 FP Drawing (Note 1)	"Company Quality Assurance and Control Manual-ASME Section III" (Field ASME Program)	Re-verification not required because: 1. Existing method of verification is adequate. 2. Not intent of 79-14. Would require insulation removal and UT of pipe.
Pipe Material	"Piping Engineering & Design Instructions"-Specification NAS-290 "Yard Water and Fire Protection Systems" Specification NAS-74 "Service Water Spray System" Specification NAS-318	"Company Quality Assurance and Control Manual-ASME Section III" (Field ASME Program)	Re-verification not required because: 1. Existing method of verification is adequate. 2. Not intent of 79-14 Would require removal of insulation and visual inspection of material marking or stamping.

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TABLE 2 (cont'd)

Design Input	Source of Input	Existing Method of Input Verification	Remarks
Pipe Insulation	"Thermal Insulation" Specifications NAS-54, NAS-338 & NAS-338A	FQC Procedures QC-11.3 "Quality Control Program for Thermal Insulation".	Re-verification not required because: 1. Existing method of verification is adequate. 2. Variations in insulation have insignificant affect on analysis results. 3. Not intent of 79-14 Would require removing some insulation.
Pipe Run Geometry	FP Drawings (Note 1) FB Drawings (Note 1)	"Company Quality Assurance & Control Manual-ASME Section III", Section 9NA, (Field ASME Program) and FQC Procedure QC-11.2 "Field Fabrication and Erection of Piping Program". Stress As-Builts (SAB's) for Q1 computer analyzed piping. Stress Walks for Q2, Q3 and S piping, 2 1/2" and larger.	Re-verification not required because existing method of verification is adequate.
Hangers- Type Location Design	Hanger Sketches FP Drawings (Note 1) MSK Drawings (Stress Analysis Model)	FQC Procedure QC-11.4 "Inspection of Pipe Hangers" and Field Procedure POP-506 "Field Procedure for Design, Installation, Inspection and Acceptance of Pipe Hangers, Ventilation and Air Conditioning Duct Supports" for Q1, Q2, Q3, and S lines. Location verified by SAB for Q1 computer analyzed piping and by stress walks for Q2, Q3 and S piping, 2 1/2" and larger piping.	Re-verification not required because existing method of verification is adequate.

TABLE 2 (cont'd)

Design Input	Source of Input	Existing Method of Input Verification	Remarks
Valves Location Operator Orientation Weight (including operator if applicable)	Manufacturer Dwgs. or Data FP Drawings (Note 1)	Location and orientation verified by SAB for Q1 computer analyzed piping and stress walks for Q2, Q3, & S piping, 2 1/2" and larger piping.	Re-verification of location and orientation not required because existing method of verification is adequate. Weight requires re-verification for all computer analyzed valves excluding IE Bulletin 79-04 valves.

NOTE:

(1) Including applicable E&DCR's.

TABLE 3
IE BULLETIN 79-14
NORTH ANNA UNITS 1 & 2
SAFETY RELATED SYSTEMS UNIT 1 & 2

Safety-Related System	Pipe Class Computer Analysis (Note 2)	Pipe Class Simplified Analysis (Note 2)	Design Document (Note 1)
Instrument Compressed Air (ACC)	None	Q3, S	11715-FP-3,4,6,7,8,21,22,58 11715-FM-26 11715-FK-1 12050-FP-3,7 12050-FK-1 12050-FM-26
Condenser Air Removal Discharge (AJA)	None	Q2	11715-FP-7 11715-FM-16 12050-FP-3,7 12050-FM-16
Radiation Monitoring (ARC)	None	Q2,3	11715-FP-8,22 11715-FM-26 12050-FP-3 12050-FM-26
Air Compressor Suction (ASAC)	None	Q3	11715-FP-58
Service Compressed Air (ASC)	None	Q2,S	11715-FP-3,22,58 11715-FM-26 12050-FP-3 12050-FM-26
Boron Recovery (BR)	None	Q3	11715-FP-6,8,16,20,30 11715-FM-30

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TABLE 3 (cont'd)

Safety-Related System	Pipe Class Computer Analysis (Note 2)	Pipe Class Simplified Analysis (Note 2)	Design Document (Note 1)
Component Cooling Water (CC)	Q2, Q3	Q2, Q3	11715-FP-3,16,17,21,22,23,31 11715-FM-23 12050-FP-3,11 12050-FM-23
Chilled Component Cooling (CCV)	None	Q3	11715-FP-3 11715-FM-23 12050-FP-3 12050-FM-23
Chemical Feed (CFPD)	None	Q2	11715-FP-2,8,22 11715-FM-38 12050-FP-2 12050-FM-38
Chemical & Volume Control (CH)	Q1, Q2	Q2, Q3	11715-FP-3,7,8,9,11,20,21,22 11715-FM-40 12050-FP-3,7,11,21 12050-FM-40
Containment Vacuum (CV)	Q2, Q3	Q2, Q3	11715-FP-3,8,19,21,22 11715-FM-36 12050-FP-3 12050-FM-36
Aerated Drains (DA)	None	Q2	11715-FP-3,8,22 11715-FM-34 12050-FP-3 12050-FM-34

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TABLE 3 (cont'd.)

Safety-Related System	Pipe Class Computer Analysis (Note 2)	Pipe Class Simplified Analysis (Note 2)	Design Document (Note 1)
Primary Drains (DG)	None	Q2, Q3	11715-FP-3,8,9,11,13,22,32 11715-FM-34 12050-FP-3,9,10,11,13,32 12050-FM-34
Emergency Diesel Generator Air Start (EGSA)	None	Q3, S	11715-FP-46 11715-FM-59 12050-FM-59
Fire Protection (Note 3) (F)	None	S (Special Manual Calculation for Seismic Piping)	NAS-74 11715-FB-3,10,13,41,72
Fuel Pit Cooling (FC)	None	Q3	11715-FP-17 11715-FM-32
Fuel Oil (Note 3) (FO)	None	S	11715-FP-46 11715-FB-4

TABLE 3 (cont'd.)

Safety-Related System	Pipe Class Computer Analysis (Note 2)	Pipe Class Simplified Analysis (Note 2)	Design Document (Note 1)
Primary Plant Gas (GN)	None	Q3	11715-FP-8,21 11715-FM-49
Gaseous Waste (Note 3) (GW)	None	Q3	11715-FP-6,8,16,17,20,21,28 11715-FM-42
Containment Atmosphere Cleanup (HC)	None	Q2, Q3	11715-FP-3,8,21,22 11715-FM-57 12050-FP-3
Control Room Bottled Air (HV)	None	Q3	11715-FB-26 12050-FB-26
Leakage Monitoring (LM)	None	Q2	11715-FK-7 11715-FM-36 12050-FM-36
Liquid Waste (LW)	None	Q3	11715-FP-20 11715-FM-31

TABLE 3 (cont'd.)

Safety-Related System	Pipe Class Computer Analysis (Note 2)	Pipe Class Simplified Analysis (Note 2)	Design Document (Note 1)
Neutron Shield Tank Cooling Loops (NSL)	None	Q3	11715-FP-3 11715-FM-23 12050-FP-3 12050-FM-23
Primary Grade Water (PG)	None	Q2	11715-FP-3,8,22 11715-FM-30 12050-FP-3
Quench Spray (QS)	Q2	Q2, Q3	11715-FP-4,7,14 11715-FM-35 12050-FP-4,7,14 12050-FM-35
Reactor Coolant (RC)	Q1, Q2, Q3	Q2, Q3	11715-FP-3,8,9,10,11,12,19,22,32 11715-FM-37 12050-FP-3,9,10,11,12,13,32 12050-FM-37
Residual Heat Removal (RH)	Q1, Q2, Q3	Q2, Q3	11715-FP-3,4,7,9,10,11,12,13,18,19 11715-FM-39 12050-FP-3,4,7,9,10,12,13,19 12050-FM-39
Reactor Purification (RP)	None	Q2, Q3	11715-FP-3,8,11,17,21,22 12050-FP-3 11715-FM-32

TABLE 3 (cont'd.)

Safety-Related System	Pipe Class Computer Analysis (Note 2)	Pipe Class Simplified Analysis (Note 2)	Design Document (Note 1)
Recirculation Spray (Note 3) (RS)	Q2, Q3	Q2, Q3	11715-FP-3,4,6,7,14 11715-FM-35 12050-FP-4,6,7,14 12050-FM-35
Resin Waste (RW)	None	Q2	11715-FP-21 11715-FM-31
Decay Heat Release (SDHV)	None	Q2	11715-FP-1 11715-FM-14 12050-FP-1 12050-FM-14
Steam Generator Drains (SGD)	None	Q2, Q3, S	12050-FP-2 12050-FM-38
Main Steam (SHP)	Q2, Q3	Q2, Q3	11715-FP-1,7 11715-FM-14 12050-FP-1,7 12050-FM-14
Main Steam Drains (SHPD)	None	Q2, Q3	11715-FP-1,7 11715-FM-14 12050-FP-1,7 12050-FM-14
Safety Injection (SI)	Q1, Q2, Q3	Q2, Q3	11715-FP-3,4,7,8,11,12,13,19,21,22 11715-FM-41 12050-FP-3,4,7,10,11,12,22

TABLE 3 (cont'd.)

Safety-Related System	Pipe Class Computer Analysis (Note 2)	Pipe Class Simplified Analysis (Note 2)	Design Document (Note 1)
Steam Low Pressure Drains (SLPD)	None	Q3	11715-FP-7 11715-FM-14
Sampling (SS)	Q1	Q2, Q3	11715-FP-3,10,19 11715-FM-33 12050-FP-19 12050-FM-33
Areated Vents (VA)	None	Q2, Q3	11715-FP-3,8,21,22 11715-FM-34 12050-FP-3 12050-FM-34
Gaseous Vents (VG)	None	Q2, Q3	11715-FP-3,8,21,22 11715-FM-34 12050-FP-3 12050-FM-34
Auxiliary Feedwater (WAPD)	None	Q2, Q3	11715-FP-2,7 11715-FM-18 12050-FP-2,7 12050-FM-18
Condensate Make-up Water (WCMU)	Q3	Q3	11715-FP-2,5,7 11715-FM-18 12050-FP-2,7 12050-FM-18
Feedwater Pump Discharge (WFPD)	Q2	None	11715-FP-2 11715-FM-18 12050-FP-2 12050-FM-18

TABLE 3 (cont'd.)

Safety-Related System	Pipe Class Computer Analysis (Note 2)	Pipe Class Simplified Analysis (Note 2)	Design Document (Note 1)
Steam Generator Blowdown (WGCB)	None	Q2, Q3	11715-FP-3,15,21 11715-FM-43 12050-FP-3 12050-FM-43
Service Water (Note 3) (WS) North Anna Unit 3 & 4 Service Water Spray Piping (Note 4)	Q2, Q3	Q2, Q3,S (Special Manual Calculation For Some Piping)	11715-FP-5,7,8,18,22 11715-FM-22 12050-FM-22 NAS-318 12180-FP-19G, 19H 12180-FSK-42-1P, 1Q
Service Water Screen Wash (WSSW)	None	Q3	11715-FP-5 11715-FM-22
Screen Wash (WSW)	Q3	None	11715-FP-69 11715-FM-21 12050-FP-69

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TABLE 3

NOTES

1. Applicable E&DCR's, piping specification NAS-290, except as noted, and valve manufacturers drawings and data, are design inputs for all systems.

2. Computerized analysis performed for all Q1 lines greater than 1" IPS and Q2, Q3, and S lines greater than 6" IPS. Simplified analysis is performed on all other lines except in specific instances where more detailed analysis are used.

3. Portion of piping is buried, embedded, or submerged.

4. North Anna Units 3 & 4 Service Water spray piping was erected at the same time as the Unit 1 & 2 spray piping and under the same verification programs.