U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGION IV

Report No. 99900033/81-01 Program No. 51300

Company: Westinghouse Electric Corporation
Electro Mechanical Division
Cheswick Avenue
Cheswick, Pennsylvania 15024

Inspection Conducted: February 5, 1981

Inspector: W. M. McNeill 3/4/81
W. M. McNeill, Contractor Inspector Date
Components Section I
Vendor Inspection Branch

Approved by: D. E. Whitesell 3/4/81
D. E. Whitesell, Chief Date
Components Section I
Vendor Inspection Branch

Summary

Inspection conducted February 5, 1981 (99900033/81-01)

Areas Inspected: Implementation of Topical Report including the review of pressurizer relief line block valve failures, and action on previous inspection findings. The inspection involved eight inspector-hours on site by one NRC inspector.

Results: In the two areas inspected, no apparent nonconformances or unresolved items were identified.

DETAILS SECTION

A. Persons Contacted

*F. R. Bakos, General Manager
J. A. Drake, Value Engineering Manager
D. M. Kitch, Nuclear Safety Engineer (Nuclear Technology Division)
J. E. Koskinsky, Planning Engineer
*A. Phillips, Value Manufacturing Manager
*J. F. Phillips, Product Assurance Manager
D. L. Ross, QA Engineering Manager
E. J. Rusnica, Auxiliary Equipment Manager
A. L. Schlemmer, Valve Design Engineer
W. F. Van Dyke, Valve Contract Engineer

*Denotes those attending the exit interview.

B. Action on Previous Inspection Findings

(Closed) Deviation (Report No. 80-02): Part 21 was not identified on Purchase Orders for safety-related items. A review of purchase orders found Part 21 added. Closed purchase orders had a certification by the vendor that Part 21 would be followed. The Purchasing Department Manual, Policy Number 355, has been revised to identify stems, packings. operators, yokes and etc. as Part 21 components.

C. Pressurizer Relief Line Block Valve Failures

1. Background Information

The background information is detailed in Inspection Report No. 99900033/80-02, together with the results of the Safety Review Committee's review and evaluation of the safety significance and reportability of malfunctions experienced in the field with certain 3 inch motor operated gate valves.

2. Objectives

The objectives of this area of the inspection were to follow up on the analysis of test data, and the corrective action proposed or initiated by Westinghouse, and the action taken or to be taken to prevent recurrence.

3. Method of Accomplishment

a. Review of the problem with design and manufacturing personnel to ascertain whether additional information was available relating to the reported valve malfunctions.

b. Utilities and A-E corresponse concerning spare parts, test data, and a draft report relating to the testing performed at Pacific Pump were reviewed. The inventory and order data for spare parts and NSSS valves were also reviewed.

4. Findings

a. Test Status

The testing programs at Pacific Pump, South Carolina Gas and Electric, and a foreign site have been completed. At Pacific Pump, three valves were cycled 100 times each. At South Carolina one valve was cycled 50 times and at a foreign site 10 valves were cycled 10 times each. As a result of these tests the predication of closing loads necessary could be more accurately modeled.

b. Corrective Action

The corrective action for the 3GM88 valves will be to remove the torque sensor used to control the closing loads and replace that with a spring loaded limit swtich. These changes have been made at two foreign sites and are under way at one domestic site, South Carolina Gas and Electric. The corrective action for the 3GM99 valve will be the same as for the 3GM88, except a new operator is necessary to obtain greater output. Both the 3GM88 and 3GM99 require gear ration changes. Modified valves have been tested at Pacific Pump and South Carolina Gas and Electric. These modified valves have been tested and found successful in closing at a high differential pressure.

c. Action to Prevent Recurrence

Drawings have been revised to reflect these changes. A new formula has been developed based on the test data. The new formula will provide a more accurate prediction of the closing loads.

d. Comments

The experimental data has demonstrated that failures will occur only in excess of 1800 psi differential pressure for the 3GM88 and 750 psi for the 3GM99. Westinghouse valves used in such an application of high differential pressure are limited to 3" and 4" valves. Some 4" valve testing has indicated that a 4" valve will fail under the same conditions. The failure problem is the result of use of a formula which underpredicted the loads. This engineering error is limited only to high

differential applications. This engineering error does not appear to be associated with failure of the QA program nor does it appear to be a generic problem to the Westinghouse design effort. There is no indication that the engineering/ quality assurance effort at the time of the original design, early seventies, was less than standard engineering practices. Additional testing is being conducted on 4" valves. Also testing is continuing to identify further the source of closing loads in a high differential pressure application. The distribution and status of the valves, three inch only, is reported in the attached tables. Table 1 reports the project location etc., of valves in the NSSS scope of supply. Table 2 reports the same for valves ordered spares. Note eight of the 27 spare parts valves are not accounted for as of February 5, 1981. These are two valves at the Farley Unit 2 site. It is not known how these valves were procured. The NRC site inspector has reported that these valves are installed in the RHR recirculation line. This is a low differential pressure and nonactive mode application. Only spare valves have been shipped to operating sites. Table 3 is an summary of the total number of valves order, shipped, domestic, etc.

F. Exit Interview

The inspector met with management representatives (denoted in paragraph A) at the conclusion of the inspection on February 5, 1981. The inspector summarized the scope and findings of the inspection. The management representatives had no comment in response to each item discussed by the inspector.

TABLE 1

MATRIX OF PROJECTS, VALVE AND
LOCATION WITHIN NSSS SAFETY-RELATED & ACTIVE

Projects	Valve	Drawing/Revision	Location
CAE CBE CCE CDE PBJ PCJ	3GM88	115E422/5	CVCS 8105 8106
CGE	3GM88	115E071/5	CVCS 8106 8107 8108 SIS 8801 A, B 8803 A, B 8884 8885 8886
CQL CRL CSL CTL	3GM99	8318038/1	CVCS 8106 8107 8108 SIS 8801 A, B 8803 A, B 8804 8805 8806
DMW	3GM88	115E071/5	CVCS 8106 8107 SIS 8801 A, B 8803 A, B 8814 8816 8885
GAE GBE	3GM99	8377D73/5	CVCS 8105 8106
LLP LMP	3GM99	8378D09/4	8105 8106
NAH	3GM99	8377013/3	CVCS 8105 8106 8085 8151

Projects	Valve	Drawing/Revision	Location
SNUPPS (2 plants)	3GM88FNB	8374D34/3	CVCS 8105 8106
TBX TCX	3GM88FNB	8372D26/1	CVCS 8105 8106
TWP	3GM99FNB	8378D07/4	SIS 8801 A, B 8803 8884 8885 8886
WAT WBT	3GM88FNB	115E09/6	CVCS 8105 8106

Total 99 Valves

TABLE 2

Spares and their known Usage

Site	Number of Valves	Description
Oconee	3	3-Block valves between pressurizer and power operational relief valve (PORV). Nonactive function therefore nonsafety significant.
Haddam Neck	6	4-Block valves for isolation of the low pressure relief valve. Low pressure therefore nonsignificant identified PR-MOV-596, 7, 8, and 9.
		2-Valves used for isolation of loop 2 charging line. Nonactive function. Identified CH-MOV-292B, C.
Indian Point	2	2-Valves no report
North Anna	2	1-Block valve between pressurizer and PORV non-active. Identified MOV 2531.
		1-Valve no report
Surry	4	4-Valves no report.
Beaver Valley	2	2-Boron injection tank isolation valves. Non-active identified MOV-SI-867 A, B.
San Onofre 1	3	1-Installed 2-not installed Turbine drive of the auxiliary feedwater pump active mode.
San Onofre 2	2	2-Containment isolation and let down. Active mode identiifed 342 TV9267.
Kenwanee	2	2-Deaerated drains tanks emergency pump discharge line, nonactive.

Site	Number of Valves	Description
SNUPPS	1	1-No report
Farley	2	

8 not received
19 reports received concerning application

TABLE 3

SPARES

27 Shipped Foreign Test
4 Shipped Domestic
5 Hold
36 Total Ordered Spares

NSSS

86 Shipped Foreign
125 Shipped Domestic
132 Hold
343* Total ordered NSSS (including 108 PORV-block valves)

*Unknown error of 2 valves exists in the total count.