

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
ELECTRO-MECHANICAL DIVISION
CHESWICK, PENNSYLVANIA

REPORT NO.: 99900033/83-01	INSPECTION DATE(S): 9/27-28 and 10/17-21/83	INSPECTION ON-SITE HOURS: 55
CORRESPONDENCE ADDRESS: Westinghouse Electric Corporation Electro-Mechanical Division ATTN: Mr. H. D. Ruppel, General Manager Cheswick Avenue Cheswick, Pennsylvania 15204		
ORGANIZATIONAL CONTACT: Mr. C. E. Owens, Product Assurance Manager TELEPHONE NUMBER: (412) 963-5326		
PRINCIPAL PRODUCT: Reactor coolant pumps, control rod drives, and valves. NUCLEAR INDUSTRY ACTIVITY: Approximately 40 percent of sales.		
ASSIGNED INSPECTOR:	<u>W. M. McNeill</u> W. M. McNeill, Special Projects Section	<u>11/25/83</u> Date
OTHER INSPECTOR:	L. E. Eilershaw, Reactive Inspection Section (RIS)	
APPROVED BY:	<u>I. Barnes</u> I. Barnes, Chief, RIS	<u>11/29/83</u> Date
INSPECTION BASES AND SCOPE:		
A. <u>BASES</u> : 10 CFR Part 21 and Westinghouse Topical Report WCAP-8370.		
B. <u>SCOPE</u> : This inspection was made as a result of Nuclear Regulatory Commission concerns regarding reactor coolant pump (RCP) seal performance under loss of all seal cooling conditions; i.e., seal survival and maintenance of RCP pressure boundary integrity subsequent to a loss of both seal injection and seal cooling flow. This inspection (cont. on next page)		
PLANT SITE APPLICABILITY: RCP seal performance: 50-424/425, 50-334/412; 50-456/457, 50-454/455, 50-483, 50-413/414, 50-445/446, 50-275/323, 50-213, 50-261, 50-247/286, 50-348/364, 50-305, 50-546/547, 50-423, 50-338/339, 50-266/301, 50-282/306, 50-244, 50-272/311, 50-206, 50-443/444, 50-327/328, (cont. on next page)		

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REPORT

NO.: 99900033/83-01

INSPECTION
RESULTS:

PAGE 2 of 15

SCOPE: (cont.) was additionally made to follow up on 10 CFR Part 50.55(e) notifications by various sites and 10 CFR Part 21 reports by Westinghouse concerning: (1) a potential failure of valves to close under high differential pressure, (2) a potential for valves to indicate closure prior to actual closure, (3) failures of motor pinion keys in valve actuators, (4) failures of spring compensator housing in valve actuators, and (5) failures of control rod drive (CRD) couplings. The inspection also addressed verification of the adequacy of valve bolting torque.

PLANT SITE APPLICABILITY: (cont.)

50-400/401, 50-498/499, 50-280/281, 50-344, 50-250/251, 50-395, 50-390/391, 50-369/370, 50-482, 50-029, 50-295/304. Potential valve closure failure: 50-424/425, 50-412, 50-456/457, 50-454/455, 50-483, 50-445/446, 50-546/547, 50-443/444, 50-400/401, 50-498/499, 50-395, 50-390/391 and 50-482. Potential failure to indicate closure: (same as above). Pinion key failures: 50-390/391, 50-443/444, and 50-412. Spring compensator housing failures: same as above for potential valve closure failure except 50-400/401, 50-443/444 and 50-424/425 plus 50-329/330, 50-335/389, 50-269/270/287. CRD coupling failures: 50-206, 50-213.

A. VIOLATIONS:

1. Contrary to Section 21.31 of 10 CFR Part 21, Westinghouse Electric Corporation Electro-Mechanical Division (W-EMD) did not include in procurement documents to a RCP seal manufacturer that 10 CFR Part 21 was applicable.
2. Contrary to Section 21.21(b)(3) of 10 CFR Part 21, the written 10 CFR Part 21 report of August 6, 1982 (NS-EPR-2637) and its addenda dated September 29, 1982 (NS-EPR-2665) and March 16, 1983 (NS-EPR-2728) failed to identify the number and location of the basic components which contained a defect.

B. NONCONFORMANCES:

1. Contrary to Section 17.0 of the Westinghouse Electric Topical Report No. WCAP-8370, W-EMD did not pass on the applicable requirements of 10 CFR Part 50, Appendix B in Purchase Order (PO) No. 541-S-38845 to Stein Seal Company for 20 safety-related No. 2 seal housings.

REPORT
NO.:

99900033/83-01

INSPECTION
RESULTS:

PAGE 3 of 15

2. Contrary to Section 3.0 of the Westinghouse report, "Reactor Coolant Pump Seal Performance," dated April 1983, all Westinghouse RCP models do not use the same style seal package as described in the report. RCP Model 63 uses a seal package not designed and built in accordance with ASME Code rules. Models 93 and 93A (nonspool) use a seal package in which only part, the first seal housing, is designed and built in accordance with ASME Code requirements.
3. Contrary to the "Policy and Scope," of W-EMD Procedure WRD-OPR-19.0, the potential for safety-related valves to indicate closure prior to actual closure was not referred to certain direct sales customers for disposition.
4. Contrary to a Westinghouse letter (NS-EPR-2728) dated March 16, 1983, the review of the Limitorque QA Program did not address controls of SB-0 actuator keys but rather SMB-3, SMB-4, and SMB-5 keys. These latter keys are of a different material, failed at a different time, and had different corrective actions applied by Limitorque. In addition, the scope of customer notification and modifications was not the SB-0 series but the more limited class of SB-0-25 actuators (operators).
5. Contrary to Section 17.1.15 of the Westinghouse Topical Report, nonconforming CRD couplings which were found at the Haddam Neck facility in March 1983 were not reported and dispositioned on field deficiency reports (FDRs).

C. UNRESOLVED ITEMS:

1. 10 CFR Part 50.55(e) reports and W-EMD site reports differ on identity of valves to be modified and the type of modification to be performed.
2. Determination of whether Westinghouse has supplied valves other than those manufactured by W-EMD which have utilized the generic wiring specification and SB-001-15 actuators.

D. STATUS OF PREVIOUS INSPECTION FINDINGS:

1. (Closed) Nonconformance (82-01, Item A): A formal analytical report was not sufficiently detailed to allow verification.

The Engineering Memorandum EM 5672 has been revised and clearly identifies the "Valve Factors" used in the site reports for Watts Bar, Unit 1, and all other sites. A review of a sample of seven site

REPORT
NO.:

99900033/83-01

INSPECTION
RESULTS:

PAGE 4 of 15

reports verified the above. In addition, a review was made of the engineering section meeting minutes which documented training of personnel that was performed as preventive action.

2. (Closed) Nonconformance (82-01, Item B): Material reidentification was not performed as soon as operations permitted.

A reaudit of material on the shop floor found no further problems in this area.

3. (Closed) Nonconformance (82-01, Item C): Manufacturing proceeded after first piece acceptance without routing being marked.

The revised routing was reviewed which clarified first piece acceptance requirements. Routing found in process on the shop floor was reviewed and no further problem was identified in this area.

4. (Closed) Nonconformance (82-01, Item D): Bypassing of operations was not indicated on instructions.

The Supervisors Meeting Minutes were reviewed which established the preventive action. A review of shop routing found in process indicated no further problem in this area.

E. OTHER FINDINGS OR COMMENTS:

1. Inspection of Westinghouse, Cheswick, Pennsylvania, and Stein Seal, Philadelphia, Pennsylvania, on September 27-29, 1983 (L. E. Ellershaw):

This inspection was performed in order to acquire information regarding specific dimensions and other data pertaining to various seal assembly components. This information was considered necessary in order for NRC to conduct an independent verification testing program. Accompanying the NRC inspector were NRC personnel from the office of Nuclear Regulatory Research and the Office of Nuclear Reactor Regulation.

Under consideration for conducting the NRC verification testing was the Idaho National Engineering Laboratory which is operated by EG&G, Idaho under contract to the Department of Energy. W-EMD and their seal manufacturer, Stein Seal Company, were appraised of NRC's intentions. Stein notified W-EMD that EG&G owned EG&G SEALOL, Inc., a competitor of Stein. As a result, the information sought by the NRC was deemed proprietary with respect to having the tests performed by EG&G, Idaho. An attempt to resolve this situation is continuing.

ORGANIZATION: WESTINGHOUSE ELECTRIC CORPORATION
ELECTRO-MECHANICAL DIVISION
CHESWICK, PENNSYLVANIA

REPORT

NO.: 99900033/83-01

INSPECTION

RESULTS:

PAGE 5 of 15

While at W-EMD, the NRC inspector reviewed POs for RCPs placed with W-EMD by their customer, Westinghouse Electric Corporation, Nuclear Energy Services (W-NES). Typically, W-NES POs impose the provisions of 10 CFR Part 21. Page 1 of the PO contains a box with the question, "10 CFR 21 Applies to This Order?" The response is typed "Yes." In addition, there is a PO section titled "Special Contract Requirements-Applicability of 10 CFR Part 21," which states, in part, "The equipment and/or services to be furnished under the provisions of this order are subject to the requirements of 10 CFR Part 21"

Further, W-EMD Purchasing Department Manual Policy No. 355, "Implementation of 10 CFR 21," Revision 1, dated January 29, 1982, states, in part, "The statement, '10 CFR 21 applies' will be a purchase order and selected change notice requirement for raw material suppliers, suppliers performing machining and suppliers performing NDE and consulting services on parts identified on the attached list. All purchase orders for parts and services per the attached list will contain the '10 CFR 21 applies' statement on and after 1-6-78" The attached list, identified as "Attachment 1 - Policy No. 355," includes the No. 1 and No. 2 Seal Housing and parts.

A review of W-EMD PO No. 541-S-38845 dated November 12, 1980, placed with Stein Seal Company for 20 No. 2 seal housings revealed that W-EMD did not pass on the requirements of 10 CFR Part 21 and 10 CFR Part 50, Appendix B.

Additionally, W-NES Equipment Specification No. 953115, classifies the No. 2 Seal Housing as being safety-related; i.e., ANS Class 2 and ASME Code Section III, Class 1.

As a result of this PO review, one violation and one nonconformance were identified (see A.1 and B.1 above).

The NRC inspector, accompanied by the two other NRC personnel, departed W-EMD on September 28, 1983, and proceeded to Stein Seal Company, Philadelphia, Pennsylvania, where a management meeting was conducted on September 29, 1983. Stein Seal informed the NRC that the requested information (previously discussed) could not be released without W-EMD concurrence. Stein Seal also informed the NRC that a joint patent on the seal designs was held by W-EMD and Stein Seal.

REPORT
NO.:

99900033/83-01

INSPECTION
RESULTS:

PAGE 6 of 15

While at Stein Seal, the NRC inspector reviewed the Quality Control Manual (QCM) and their procurement practices with respect to the 20 No. 2 seal housings provided to W-EMD. It was established during review of the QCM that it does not meet the intent of subarticle NCA-3800 in Section III of the ASME Code or Appendix B to 10 CFR Part 50 nor does Stein Seal state or imply that it does. Stein Seal stated that their quality program has been audited and approved by W-EMD but not to NCA-3800 requirements.

Stein Seal placed PO No. A 38772 dated February 15, 1981, with Stainless Steel Products, Inc., for 22 pieces with specified dimensions and an ASME material designation with heat treatment. Stainless Steel Products, in turn, placed PO No. 5144 with the Dayton Forging & Heat Treating Company for the rough forgings. Dayton Forging had purchased the original billet stock for these forgings from Carpenter Technology Corporation.

Stein Seal Company had copies of certified material test reports (CMTRs) from Carpenter Technology and Dayton Forging on file. The CMTR from Carpenter showed the chemistry (ladle analysis) and the mechanical capabilities. The CMTR from Dayton Forging showed the same chemistry as was shown on Carpenter's CMTR and, in addition, included Charpy impact test results and the results of one mechanical test performed on each heat.

In addition to Stein Seal Company not having a quality program approved to NCA-3800 requirements, Stein Seal did not audit and approve their subcontractors to NCA-3800 requirements. There was also no evidence on file at Stein Seal Company which would show that the ultimate product testing permitted by NCA 3867.4(e) had been performed.

This item required followup inspection at W-EMD.

2. Inspection of Westinghouse, Cheswick, Pennsylvania, on October 17-21, 1983 (W. M. McNeill):

- a. Seal Performance - After the above inspection of Stein Seal, an additional inspection was performed at W-EMD. It was established that there have been four basic seal configurations. The first seal configuration is associated with the Model 63 RCP and was designed prior to inclusion of pumps in Section III of the ASME Code. In the second seal configuration, only the first seal housing was pressure boundary and thereby falling under ASME Code design and

REPORT
NO.:

99900033/83-01

INSPECTION
RESULTS:

PAGE 7 of 15

manufacturing requirements. This was associated with Models 93 and 93A nonspool RCPs. The third and fourth configurations had first and second seal housings which were pressure boundary and subject to ASME Code requirements. These seal configurations were associated with the 93A spool, 93A-1, and 100 models of RCPs. A review of the drawings and specifications established that the drawings for the second seal configuration referred, however, to the second seal as a housing rather than as a nonpressure boundary insert within the first seal housing. Specification E-677188, which also identified the second seal housing to be pressure boundary and was applicable to the third and fourth seal configurations, was erroneously applied to the second seal configuration.

A report by Westinghouse to the NRC transmitted on May 5, 1983, by Rahe to Denton, Letter No. NS-EPR-2761, also contains the following statement, "All models use the same style seal package as described in this report." This was identified as a nonconformance (see B.2. above).

- b. Potential Failure of Valves to Close Under High Differential Pressures - Office of Inspection and Enforcement Bulletin 81-02 identified that W-EMD manufactured gate valves of all sizes have a potential for not closing against differential pressure because of a design underprediction of required closing loads. All hardware modifications have been performed with very minor exceptions. Site reports have been completed but not issued formally. Field Change Notices (FCNs) are open presently with a few exceptions and re-release of the affected valves has yet to be performed. A comparison of site reports with the 10 CFR Part 50.55(e) reports from a sample of sites established some differences and a resultant unresolved item (see C.1. above). The Shearon Harris W-EMD site report differed with the 10 CFR Part 50.55(e) report with respect to 16 valves in a total of 45. Two actuators were identified to be repaired in the W-EMD site report but not in the 10 CFR Part 50.55(e) report. An additional 2 were identified as not requiring repair in the W-EMD site report but requiring repair in the 10 CFR Part 50.55(e) report. Twelve were identified in the W-EMD site report to require only a torque switch adjustment but the 10 CFR Part 50.55(e) report identifies a required gear change to actuators. The W-EMD site report and 10 CFR part 50.55(e) report for Seabrook differed in

REPORT NO.:	99900033/83-01	INSPECTION RESULTS:	PAGE 8 of 15
-------------	----------------	---------------------	--------------

requirements with respect to 1 valve in a total of 41. Three differences were noted for Beaver Valley, Unit 2, in a total of 37 valves and South Texas, Units 1 and 2, had no differences between the reports. This item is considered unresolved. Table 1 identifies the valve locations, site and differences.

Site	Valve Location	Modification	
		W-EMD	55(e)
Harris (CRL & CQL)	8801A,B*	Switch	Gear
	8803A,B	Switch	Gear
	8884	Switch	None
	8885	Switch	Gear
	8886	Switch	None
	LCV115D	Switch	Gear
	8130A,B	Switch	Gear
	8887A,B	None	Switch
	8701A,B	Switch	Gear
	8702A,B	Switch	Gear
Seabrook (NAH & NCH)	8807A,B	Switch	None
Beaver Valley (DMW)	Unknown	Unknown	Unknown**

Table 1 - Sites and valve locations with differences in required modifications.

c. Potential for Valves to Indicate Closure Prior to Actual Closure -

In December 1982 and January 1983, Westinghouse notified sites such as Bryon, Braidwood, Callaway, Comanche Peak, Seabrook, South Texas, St. Lucie, and Watts Bar that indicator lights could indicate closure slightly before the flow is completely shut off. Gear limit switches are preset by the actuator manufacturer including the torque bypass switch and the STILL-OPEN limit switch for an indicator light. Both switches are operated by the same actuator rotor. Setting of the rotor to provide a bypass of the torque switch at the beginning of the opening stroke resulted in the closing set point for the indicator light being in error.

* denotes two locations

**10 CFR Part 50.55(e) report identified that 37 valves were modified but did not include specific valve location and nature of modification. W-EMD reports show 34 valves were modified.

REPORT
 NO.: 99900033/83-01

INSPECTION
 RESULTS:

PAGE 9 of 15

The corrective action, repair procedure 732RP002, is to use an alternate rotor for the STILL-OPEN by a wiring change and, thus, obtain an independent closure signal. This corrective action is required for safety-related valves in applications without backup valves and where partially open valves could result in an incorrect event analysis and a delay in operator correction of the problem.

This potential failure was identified by Westinghouse during a design review of the cold shutdown system in March 1981. Later, during the design review of the valve closure problem (see b. above) this potential failure was reidentified. W-EMD reviewed the potential failure in light of 10 CFR Part 21 and referred the problem to the Safety Review Committee for resolution. Customer letters were then mailed (December 1982) to utilities notifying them of the potential failure and the affected valves. The scope of the potential failure depends upon valve application and affects all sizes and models of W-EMD supplied valves. This potential failure was the result of a design error by Westinghouse in preparation of a generic wiring specification which identified to utilities how actuators are to be wired. Table 2 identifies the valves which require rewiring because of the potential for failure. Additional valves may be rewired which do not have a safety function. Additional review by the NRC inspector established that W-EMD had direct sale orders with sites such as Duane Arnold, Oconee, Oyster Creek and Zion which are operating facilities. The NRC and the above direct sale order customers were not notified in regard to this potential failure. This was identified as a nonconformance (see B.3. above).

An unresolved item to be addressed at a Westinghouse Nuclear Technology Division (W-NTD) inspection is whether the deficient generic wiring specification referred to above was applied to other Westinghouse valves from suppliers other than W-EMD. FCNs have been issued to identify the corrective action at sites with the exceptions noted above in the nonconformance. These FCNs are presently open.

Site	Location	Valve Model
Byron 1 & 2 (CAE/CBE)	8802A,B	4GM78FN
Braidwood 1 & 2 (CCE/CDE)	8835	4GM78FN
	8809A,B	8GM78FN
	8840	12GN78FN

REPORT
 NO.: 99900033/83-01

INSPECTION
 RESULTS:

PAGE 10 of 15

Table 2 (continued)

Site	Location	Valve Model
Summer (CGE)	8884	3GM78FN
	8885	3GM78FN
	8886	3GM78FN
	8888A,B	10GM78FN
	8889	10GM78FN
Harris 1 & 2 (CQL/CRL)	8884	3GM78FN
	8885	3GM78FN
	8886	3GM78FN
	8889	10GM78FN
	8888A,B	10GM78FN
Beaver Valley 2 (DMW)	8814	3GM78FN
	8816	3GM78FN
	8885	3GM78FN
	8889	10GM78FN
	8888A,B	10BM78FN
Vogle 1 & 2 (GAE/GBE)	8802A,B	4GM78FN
	8835	4GM78FN
	8809A,B	8GM78FN
	8840	12GM78FN
Seabrook 1 & 2 (NAH/NCH)	8802A,B	4GM78FN
	8835	4GM78FN
	8840A,B	8GM78SE
	8809A,B	8GM78FN
Marble Hill 1 & 2 (PBS/PCJ)	8802A,B	4GM78FN
	8835	4GM78FN
	8809A,B	4GM78FN
	8840	12GM78FN
Wolf Creek (SAP) Calloway (SCP)	8802A,B	4GM78FNC
	8835	4GM78FNC
	8809A,B	10GM78FNC
	8840	10GM78FNC

REPORT
 NO.: 99900033/83-01

INSPECTION
 RESULTS:

PAGE 11 of 15

Table 2 (continued)

Site	Location	Valve Model
Comanche Peak 1 & 2 (TBX/TCX)	8802A,B	4GM78FN
	8835	4GM78FN
	8809A,B	10GM78FN
	8840	10GM78FN
South Texas 1 & 2 (TGX/THX)	8806A,B,C	6GM78FN8
	8808A,B,C	6GM78FNB
	8819A,B,C	8GM78FNB
	8901A,B,C	8GM78GNB
Watts Bar 1 & 2 (WAT/WBT)	8802A,B	4GM73FN
	8835	4GM78FN
	8809A,B	8GM78FN
	8840	12GM78SE

Table 2 - Sites and valve locations requiring rewiring of actuators to correct the potential position indication failure.

- d. Failure of Motor Pinion Keys in Valve Actuators - During field modifications at Beaver Valley Power Station in June 1982, six of nine Model No. SB-0-25 actuators were found with failed motor pinion gear keys. Limitorque, the actuator supplier, and Westinghouse have determined that the failures were peculiar to the SB-0-25 actuators and resulted from the use of resulfurized carbon steel (1100 series) in lieu of 1018 carbon steel. Westinghouse notified the NRC of this problem in a 10 CFR Part 21 report on August 6, 1982. FCNs have been issued by W-EMD for key replacement. Table 3 identifies the site, quantities and valve locations. Two of the five have been closed, meaning Westinghouse has verified replacement of the keys.

A followup memo from Rahe to DeYoung dated March 16, 1983, on the 10 CFR Part 21 report identified two items of particular interest. First, it identified that SB-0 series actuators would have keys replaced, not just SB-0-25 actuators. Review by the NRC inspector established, however, that FCNs had not been issued for key replacement in SB-0-15 actuators at Vogtle, Units 1 and 2. This change from the March 6, 1983, commitments had not been identified to the NRC. Second, the memo stated

REPORT NO.:	99900033/83-01	INSPECTION RESULTS:	PAGE 12 of 15
-------------	----------------	---------------------	---------------

that Westinghouse has reviewed the Limitorque Quality Assurance Program to ensure that pinion key material is subjected to appropriate controls. A review of the audit performed by W-NTD found that it was only a followup audit to closeout items identified in a 1981 audit of Limitorque. One of the findings dealt with keys, but only with respect to IE Information Notice 81-08; i.e., actuators SM3-3, -4, and -5. In summary, the audit addressed different failures, a different time frame, and different material substitutions (i.e., 1010 steel for 4140 steel) for which different corrective actions were applied by Limitorque. The above was identified as a nonconformance (see B.4 above). In addition, it was noted that the 10 CFR Part 21 report failed to identify the sites and valve locations affected. This information was identified in the W-EMD FCNs dated January 26, 1983. This was identified as a violation (see A.2. above).

Site	Quantity	Valve Location
Watts Bar 1 (WAT)	6	9001A,B
2 (WBT)	6	9017A,B 9020A,B
Seabrook 1 (NAH)	2	282306,282307
2 (NCH)	2	282308,282309
Beaver Valley 2 (DMW)	6	8809A,B 8811A,B 8887A,B

Table 3 - Sites with SB-0-25 Limitorque actuators and their valve locations.

- e. Failure of Valve Actuator Spring Compensator Housing - From 1980 to 1982 Westinghouse encountered six failures of actuator spring compensator housings at three different sites. The spring compensator housing restrains belleville springs in the axial direction. The belleville springs are utilized to restrain a floating drive sleeve. The housing receives the motor torque after the springs are compressed. Housing failures have resulted in a significant personnel hazard and an inoperable valve. The first failure was found at a foreign site in October 1980. In October 1981, two failures were found at Oconee, Unit 1, which had obtained valves from W-EMD by direct sales. In

REPORT
NO.:

999000033/83-01

INSPECTION
RESULTS:

PAGE 13 of 15

April and November 1981 and January 1982, three failures were found at the Watts Bar site. These later events resulted in the issuance of a Field Deficiency Report in February 1982 and Nuclear Service Division Data Letter 82-08 in April 1982. The failed housings were made of gray cast iron.

Limatorque, the actuator supplier for Westinghouse, changed in 1974 from use of gray iron to ductile iron. Westinghouse and Limatorque report that these failures are associated with misuse, either excessive stall loads or manual overtightening. Sites, in particular Watts Bar, have not concurred with this conclusion. One gray iron housing was found in the W-EMD stock room and was tested by Limatorque. It was found to fail only in excess of the normal stall loads (35,000 lbs). Gray iron is more susceptible to brittle failures than cast steel or ductile iron. W-EMD has reviewed these failures in light of 10 CFR Part 21 and referred this problem to the Nuclear Safety Department of W-NTD.

The potential for failure is limited to the Limatorque Model SB-001-15 actuator with gray iron housings. Table 4 identifies the 20 sites with 153 SB-001-15 actuators. Limatorque cannot identify the exact serial numbers of actuators with gray iron housings. Limatorque has reportedly established a range of serial numbers of actuators which would scope the problem. Westinghouse has yet to verify the accuracy of the above Limatorque range of serial numbers.

Review of the evaluation by the Safety Review Committee will be performed during a subsequent inspection at W-NTD. The use of SB-001-15 actuators (see C.2. above) on Westinghouse furnished valves, other than those manufactured by W-EMD, will also be reviewed during that inspection.

<u>Site</u>	<u>Quantity</u>
Midland 1 & 2 (Direct Sale)	3
St. Lucie (Direct Sale)	1
Oconee (Direct Sale)	3
Byron 1 (CAE)	17
Byron 2 (CBE)	11
Braidwood 1 (CCE)	11
Braidwood 2 (CDE)	5

REPORT
 NO.: 99900033/83-01

INSPECTION
 RESULTS:

PAGE 14 of 15

Site	Quantity
Summer (CGE)	12
Beaver Valley 2 (DMW)	5
Marble Hill 1 (PBT)	3
Marble Hill 2 (PCJ)	4
Wolf Creek (SAP)	4
Callaway (SCP)	3
Comanche Peak 1 (TBX)	8
Comanche Peak 2 (TCX)	6
South Texas 1 (TGX)	2
South Texas 2 (THX)	3
Watts Bar 1 (WAT)	25
Watts Bar 2 (WBT)	23

Table 4 - Sites with SB-001-15 Limitorque actuators.

- f. Verification of Adequacy of Valve Bolting Torque - Because of the discovery at sites of undertorqued bolting in ASME Section III valves, the Vendor Program Branch has instituted inspections to review the adequacy of control of bolting torque by valve manufacturers. It was found that torque requirements (sequence, levels, etc.) were identified on drawings and in a procedure. Bonnet to body bolts were overtorqued and then retorqued to the design requirements. The torque of an inspected valve at final assembly was verified by the NRC inspector by checking of minimum and break away torque of the bonnet to body bolts.
- g. Failure of CRD Couplings - On June 22, 1983, Northeast Utilities filed a 10 CFR Part 21 report with the NRC pertaining to deformation of CRD coupling fingers. At the Haddam Neck plant, four couplings were found to be deformed in March of 1983. Previously deformed couplings were found in February 1981 and October 1983. Westinghouse reported to the NRC inspector that failures were also previously found at San Onofre, Unit 1, in November 1971 and June 1973. All of the above failures were of one coupling except for the most recent.

The 10 CFR part 21 report identifies the scope of potential failure to be, except for one, all Westinghouse commercial power reactors. The NRC inspector found, however, that Haddam Neck and San Onofre, Unit 1, designs had significantly greater CRD guide tube radial gaps (about 0.2 inches) than subsequent designs and which would allow the coupling to straddle the hub

REPORT
NO.:

99900033/83-01

INSPECTION
RESULTS:

PAGE 15 of 15

of the control rod assembly. If a hub was straddled, then an unlatched inserted control rod assembly would result which could be unknown. The resulting safety hazard would be a loss of safe shutdown margin because the inserted rods would not be available for scram. Westinghouse trip reports identify that the source of failure is the result of minor handling damage coupled with a guide tube design with excessive radial gap.

Discussion with the engineering personnel responsible for the repair/rework of the failed coupling found that there were no Operating Plant Deficiency Reports (ODRs) issued on the problems encountered. The Westinghouse Topical Report requires that ODRs are to be used to report and disposition nonconforming equipment discovered at the site. ODRs are also to be reviewed for quality requirements and concurred with by Product Assurance. The failure to issue ODRs for Haddam Neck was identified as a nonconformance (see B.5. above).

INSPECTOR Mcwill
 SCOPE Reactive

DOCKET NO. 79900033
 REPORT NO. 83-01
 PAGE 4 OF 6

DOCUMENTS EXAMINED

TYPE OF DOCUMENT	DOCUMENT NO.	REV.	DATE	TITLE / SUBJECT
INM	83/210 V/S RDM/	-	Sept 16 83	Eng. Sect. Meeting Minutes
	EM-5672	1	4/21/83	Motor Operated Gate Valve Closure Problem - How Testing Program
	WANG 3771E	2	9/25/83	Master Summary of valve software
	EM-5748	-	-	WAT site report draft
	EM-5739	-	-	SAP site report draft
	EM-5744	-	-	TGX "
	EM-5711	-	-	DMW "
	EM-5712	-	-	CAL "
	EM-5713	-	-	CRL "
	EM-5732	-	-	NAH "
	CQLM-10545 FCN-	A	3/11/82	CQL Field Change Notice
	82-43	-	-	CQL/CRL TRIP Report
	CRLM-10557	-	12/22/81	CRL FCN
	NAMM-10576	A	3/19/82	NAH FCN
	NCHM-10512	A	5/19/82	NCH FCN

TYPE OF DOC.:

- DWG - DRAWING
- SPEC - SPECIFICATION
- PRO - PROCEDURE
- QA - QA MANUAL
- QC - QC DOCUMENT
- P.O. - PURCHASE ORDER
- INT - INTERNAL FIELD

LTR - LETTER

- _____
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- _____

DOCKET No. 999000 33
 REPORT No. 83 - 01
 PAGE 5 OF 6

INSPECTOR _____
 SCOPE _____
 DOCUMENTS EXAMINED _____

TYPE OF DOCUMENT	DOCUMENT NO.	REV.	DATE	TITLE / SUBJECT
	82-35	-	-	Trip Report NAH/NCW
	EM-5733	-	12/10/82	NCW Site Report
LTR			Jan 11, '83	Customer letter EMD Gate Valve Position Indication
DWG	D934D253	5	-	Wiring Diagram for Zimitorgue Operators
	EM-5824	-	Oct 20 '82	EMD Motor Operated Gate Valve Closing Problem Final Design Review
				FCN's various for Positive Close Light
				Direct sales order log -
	WATM 10646		1/20/83	FCN's key replacement
	WBT 10621		1/26/83	"
	NAMM 10523		1/24/83	"
	NEHM 10518		1/26/83	"
	DMW 10514	6	4/4/83	"
	1153 145			Computer listing - SB-0 search
	PC 1DA-83		1/27/83	Zimitorgue Corp. NTD Audit Follow up -

TYPE OF DOC.:
 DWG - DRAWING
 SPEC - SPECIFICATION
 PRO - PROCEDURE
 QAM - QA MANUAL
 QCD - Q.C. DOCUMENT
 P.O. - PURCHASE ORDER
 LTR - LETTER HEAD

LTR - LETTER

DOCUMENTS EXAMINED

INSPECTOR
 SCOPE

TYPE OF DOCUMENT	DOCUMENT NO.	REV.	DATE	TITLE / SUBJECT
DWG	115E261	7	-	General Assembly Dwg - Shaft Seal Pump
"	115E641	8	"	"
"	5054D30	12	"	Cartridge Seal Assy (sump)
"	676510	2	"	Espec General Control Leakage Pump Assembly
"	676213	1	"	"
"	677188	4	"	" Reactor Coolant Pump
"	953115	0	"	" Model 93A-1
"	-	-	10/07/83	Computer List Vendor Sorted by Vendor
"	-	-	6/11/81	Mfg Inst. for 5059D 93-7 S.O. H164 26M88
"	DWG	7	-	GATE VALVE Gen Assy
"	PROC	E	-	Check Valve Main Flange Bolt Tightening Procedure
"	"	-	June 28 82	RCP Components Subject to ASME Code
"	"	-	June 22 82	Potential Safety Issue Concerning the failure of Spring Compensator Housing
"	"	-	June 28 82	CB-00 Compensator Housing Test
"	"	-	2-3-82	FDR on Spring Comp. Housing

TYPE OF DOC:
 DWG - DRAWING
 SPEC - SPECIFICATION
 PROC - PROCEDURE
 QM - QA MANUAL
 QCD - Q.C. DOCUMENT
 P.O. - PURCHASE ORDER
 LTR - LETTER

DOCUMENTS EXAMINED

Inspector L Ellenshaw
 Scope/Module 292705B

1	2	TITLE/SUBJECT	3	4
1	5	W-EMP PO # 541-V-47061	7-12-82	-
2	1	MOD 4127A58	7-7-81	05
3	5	W-NES PO # 546-MRK-421123 BN	8-28-80	00
4	2	Equipment Spec. B-953115	10- 20 ¹⁵ -75	0
5	2	Quality Procurement Spec. QPS-125-1	4-6-78	2
6	8	WCRP-8370 (Topical Report)		9A
7	1	Drawing 115E577 - Seal Hsg, No.1	9-20-83	13
8	4	Stein Seal Co. QC Manual	8-20-83	M
9	8	Internal Audits for 1982 & 1983 (Stein Seal Co.)	-	-
10	8	Stein Seal WDE Personnel qualifications	-	-
11	3	Stein Seal UT Procedure VTP #13	2-12-82	A
12	3	Stein Seal MT Procedure MPP #8	3-24-82	B
13	8	Stein Seal Vendor CMTRs regarding #2 Seal Housing	-	-
14	1	MOD 4935A88	6-18-80	2
15	5	W-EMD PO 541-S-38845	11-12-80 5-18-82	

Columns:
 1. Sequential Item Number
 2. Type of Document
 3. Date of Document
 4. Revision (If applicable)

Document Types:
 1. Drawing
 2. Specification
 3. Procedure
 4. QA Manual
 5. Purchase Order
 6. Internal Memo
 7. Letter
 8. Other (Specify if necessary)