REVISION 5
08/30/84

SSER

Task: Allegation A-242

Reference Number: 4-84-A-06-128

Characterization: The allegation is that hydrostatic tests were performed without the use of highpoint vents. This allegation raised additional concerns about the adequacy of instrument tubing installations relative to sloping requirements.

Assessment of Allegation: The NRC staff's review of LP&L's Final Safety Analysis Report (FSAR) and applicable procedures revealed that all hydrostatic tests were to conform to the requirements of ASME III, Classes 2 and 3, 1974 Edition, Summer 1976 Addenda, Article NC-6000, "Testing," which requires that "vents shall be provided at all highpoints of the component or system in the position in which the test is to be conducted, to purge air pockets while the component or system is filling." This requirement is restated in EBASCO Procedure ASP-IV-63 Section 7.4.4. The use of highpoint vents during hydrostatic testing was indeed a requirement, based upon an FSAR commitment to the applicable testing section of the ASME Code. It should be noted that a later revision to this section of the code on "Testing," deleted the specific requirement for high point vents and was revised to state that "The component or system in which the test is to be conducted shall be vented during the fill operation to minimize air pocketing.

The NRC staff examination of 27 hydrostatic document test packages, including the applicable valve lineup sheets and isometrics, revealed that for each of the corresponding hydrostatic tests, highpoint vents had not been used. The staff also reviewed Field Change Request FCR-1CP-19, Rev. 2. This document, issued August 6, 1980, did not mention the use of highpoint vents. An examination of the hydrostatic test index reveals that all Waterford Unit 3 hydrostatic tests had been performed on dates subsequent to the issuance of the field change request (FCR), and would therefore have been performed in accordance with its requirements.

During the NRC examination of the hydrostatic test packages, it was observed that each of the 27 packages contained a "Test Instructions" sheet, which instructs workers to "Fill lines with root valve open until you can hear water running into the process pipe, then close the root valve." This instruction was found only on the test instructions sheet, and not as part of the approved procedures for performance of hydrostatic test. Discussions with LP&L revealed that this instruction was their preferred method of venting the system to be tested, and that this was an appropriate means of assuring that the system under test is full.

Although LP&L failed to implement the requirement for use of highpoint vents during hydrostatic tests, NRC considers the alternate method of venting systems through the root valve to the process line sufficient to preclude an invalidation of hydrostatic tests. Since a primary function of any hydrostatic test is to assure the integrity of the system tested, the verification of test parameters, such as pressure and time, and the required physical inspection of components comprising the system, are essential keys to providing assurance of successful completion. The staff examination of the test data reports indicated that quality verification of these parameters had been accomplished. However, the staff was concerned about the effects an improperly vented system may have on the instruments performing an operational function. In particular, the affects of air entrapment upon instrument time response characteristics. This matter was discussed with LP&L personnel, who indicated that LP&L Maintenance Procedure MI-4-315, "Blowdown and Backfilling Instrument Impulse Lines," had been developed to alleviate any problems in this area, and that if, during operation, installations are identified which are susceptible to air entrapment, they will be reworked to correct the problem. A review of Sections 8.1 through 8.3 of this procedure revealed that appropriate controls had been established to minimize air entrapment.

A related issue of this allegation concerns the adequacy of instrument tubing installations in view of the elimination of slope requirements by engineering analysis. A staff review of EBASCO letter LW3-1191-82 revealed that in general it was LP&L's position that slope deviations have no effect on instrument function.

This documented position could be interpreted to be a generic acceptance of slope deviations. However, the NRC staff review of the applicable specification and procedures revealed that slope requirements of one-fourth inch per foot were consistently specified, and the review of an EBASCO memorandum of September 28, 1982, indicated that ESSE will continue to review each nonconformance report that identified a questionable slope in tubing installations. To confirm this, the staff examined 54 Mercury nonconformance reports. Each NCR examined that cited slope deviations was initiated between August 30, 1982, and May 31, 1983. The staff observed that disposition of slope deviations had been performed on a case-by-case basis. Dispositions included rework, use-as-is, or a combination of these categories. Many slope deviations were those which involve inadequate slope; that is, a slope which was less than the specific one-fourth-inch per foot, or no slope, indicating a level line.

In some instances, however, slope deviations exhibited negative or reverse configurations. NRC reviewed the dispositions for these conditions. Several installations were required to be reworked; however, a significant number were dispositioned use-as-is. The technical justification for this disposition was based on case-specific analysis. Consideration of variables, such as operating pressure, line configuration and instrument

function, were evaluated by the engineer in determining the acceptability of each installation. In summary, NRC observed that deviations in instrument tubing slope requirements had been consistently documented and evaluated by the applicant.

The NRC staff found that the applicant had failed to comply with FSAR and procedural commitments for the use of highpoint vents during the performance of hydrostatic test. However, the alternative method employed by the applicant is considered satisfactory to the NRC staff and its effect upon the adequacy of hydrostatic testing is not considered significant. These findings were discussed with the alleger.

In addition, NRC finds no evidence that would indicate that slope requirements had been generically eliminated from design, construction, or inspection processes.

This allegation had neither safety significance nor generic implications.

Potential Violations: Contrary to 10 CFR 50, Appendix B, Criterion XI, EBASCO Procedure ASP-IV-63, and ASME III Class 2 and 3 Article NC-6211, hydrostatic tests were not performed in accordance with written test procedures which incorporate the requirements and acceptable limits contained in applicable design documents.

Actions Required: None.

References:

1. Waterford Unit 3 - Final Safety Analysis Report

2. EBASCO Procedure - ASP-IV-63, "H" Draft, July 24, 1982, "Guidelines for Hydrostatic and Pneumatic Integrity Test"

3. Mercury Quality Control Procedure - MCP-2170, Rev. 7, February 20, 1983, "Hydrostatic or Pneumatic Testing Procedure"

4. ASME III 1974 Edition, Summer 1976 Addenda, Article NC-6000, "Testing," ASME III 1983 Edition, Article NC-6000, "Testing."

5. EBASCO Field Change Request - No. FCR-1CP-19, March 21, 1980; FCR-1CP-19, Rev. 1, April 28, 1980; FCR-1CP-19, Rev. 2, August 6, 1980

6. (27) Hydrostatic Document Test Packages

7. LP&L Maintenance Procedure - MI-4-315, Rev. 0, "Blowdown and Backfilling Instrument Impulse Lines," April 25, 1983

8. Hydrostatic Test Index, Final Issue, August 31, 1983

9. (54) Mercury Nonconformance Reports, detailing Tubing Slope Violations

10. EBASCO Letter No. LW3-1191-82, from R. K. Stampley to George B. Rogers dated September 17, 1982

11. EBASCO Interoffice Correspondence, File #ES-6369-82 from J. Debruin to J. Gutierrez dated September 28, 1982

12. LP&L Letter W3P84-0468 from R. W. Naylor to File #Q3-A17.02.04 dated February 24, 1984

13. Hydrostatic Test Package Sample

Prepared By:

_____ _____
Dan Ford Date

_____ _____
Dale Thatcher Date

Reviewed By:

_____ _____
Team Leader Date

Reviewed By:

_____ _____
Site Team Leader(s) Date

Approved By:

_____ _____
Task Management Date

REFERENCE 13

HYDROSTATIC TEST PACKAGES — ALLEGATION SSER A-128

Pck. No.	System	TDS Date	ASME Class	Comments
M65-36-3	Component Cooling	12/2/81	III, P-3	
M67-36-3	Component Cooling	12/4/81	III, P-3	
M113-36-3	Component Cooling	3/15/82	III, P-3	
M115-36-3	Component Cooling	2/1/82	III, P-3	
M739-66	Plant Protection	6/14/82	III, P-3	
M-231-59	Containment Sp.	6/7/82	III, P-3	
M-540-59	Containment Sp.	3/10/82	III, P-3	
M-541-59	Containment Sp.	4/25/83	III, P-3	
M-542-59	Containment Sp.	3/9/83	III, P-3	
M-543-59	Containment Sp.	3/14/83	III, P-3	
M-717-59	Containment Sp.	3/9/83	III, P-3	
M-808-59	Containment Sp.	5/6/83	III, P-3	
M-256-52A-1	Reactor Coolant Pp	4/24/82	III, P-2	
M-262-52A-1	Reactor Coolant Pp	5/19/83	III, P-2	
M-207-76	Steam Generators	5/31/83	III, P-2	
M-211-76	Steam Generators	5/4/83	III, P-2	
M-865-52A-2	Reactor Vessel Loop Note: Valve Lineup indicates vent used.	8/13/83	III, P-2	
M-868-52A-2	Reactor Vessel Loop	7/29/83	III, P-2	
M-860-52A-2	Reactor Vessel Loop Note: Valve lineup indicates vent used.	8/25/83	III, P-2	

Pck. No.	System	TDS Date	ASME Class	Comments
M336-52B	Pressurizer & Quench Tank	6/26/83	III, P-2	
M858-52A-2	Reactor Vessel & Loop	8/22/83	III, P-2	
M394-73	Emergency Feed-water	8/10/83	III, P-3	
M395-73	Emergency Feed-water	1/8/83	III, P-3	
M737-73	Emergency Feed-water	5/18/83	III, P-3	
M738-73	Emergency Feed-water	5/20/83	III, P-3	
M533-60C	Safety Injection tank	6/25/83	III, P-2	
M531-60-C	Safety Injection Tanks	6/25/83	III, P-2	

REFERENCE 9

Nonconformance Reports Mercury No./EBASCO No.	Slope Deviations Date	Disposition
1237/4692	11/22/82	Accept-as-is
2299/5708 A, B	2/17/83	
1311/4881	2/17/83	Accept-as-is
1675/5286	12/1/83	Accept-as-is
1849/5336	11/4/82	Rework
1392/5016	11/4/82	Accept-as-is
1319/5017	11/4/82	(Not a slope issue)
1388/5019	11/4/82	Accept-as-is
1401/5045	11/8/82	Accept-as-is
1427/5108	11/11/82	Accept-as-is
1428/5109	11/11/82	Accept-as-is
1532/5137	11/14/82	Accept-as-is
1536/5153	11/15/82	Accept-as-is
1539/5155	11/15/82	Accept-as-is
1540/5156	11/15/82	Accept-as-is
1541/5157	11/15/82	Accept-as-is
1542/5158	11/15/82	Accept-as-is & Rework
1543/5159	11/15/82	Accept-as-is
1517/5176	11/18/82	Accept-as-is
1518/5177	11/18/82	Accept-as-is & Rework
1519/5178	11/18/82	Accept-as-is & Rework
1522/5180	11/18/82	Accept-as-is
1618/5209	11/23/82	Accept-as-is & Rework
1648/5220	11/27/82	Accept-as-is
1627/5240	11/26/82	Accept-as-is
2195/5700		Rework
1601/5241	11/27/82	Rework
1607/5325 A, B	12/13/82	Accept-as-is
1049/4696	10/6/82	Accept-as-is
0759/4437	8/30/82	Accept-as-is
0984/4652	9/29/82	Accept-as-is
1056/4692	10/6/82	Accept-as-is
1050/4695	10/6/82	Accept-as-is
0981/4811	10/19/82	Accept-as-is
1772/5330	12/4/82	Accept-as-is
1422/5131	11/13/82	Accept-as-is
1193/5280	12/8/82	Rework/Accept-as-is
2826/5921	3/18/83	Rework
3305/6329	5/31/83	Rework
3643/6569	5/31/83	Rework
0986/4720	10/4/82	Accept-as-is
0988/4722	10/2/82	Accept-as-is
1036/4760	10/11/82	Accept-as-is
1109/4784	10/15/82	Accept-as-is

1045/5410	12/29/82	Rework
2855/5940	3/22/83	Rework
1322/5104		Accept-as-is
2120/5619		Rework
2298/5714		Rework
0613/4218		Accept-as-is
1616/5207		Accept-as-is
1629/5219		Accept-as-is
0753/4445		

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