

LICENSEE EVENT REPORT

CONTROL BLOCK: _____ (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1 | N | J | S | G | S | 1 | 2 | 0 | 0 | - | 0 | 0 | 0 | 0 | - | 0 | 0 | 3 | 4 | 1 | 1 | 1 | 1 | 4 | 5
7 8 9 14 15 25 26 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49

CON'T
0 1 | L | 6 | 0 | 5 | 0 | 0 | 0 | 2 | 7 | 2 | 7 | 0 | 8 | 1 | 0 | 7 | 9 | 8 | 0 | 5 | 3 | 0 | 8 | 0 | 9
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 | During the Refueling Outage, a sample of stress calculations for safety
0 3 | related pipe was found acceptable. Upon review of the supports within those
0 4 | calculations, an unacceptable rejection rate was found. A three phase program
0 5 | was developed to identify and correct pipe support discrepancies. The results
0 6 | of the evaluation using the NRC required three dimensional square root sum of
0 7 | the squares (3D SRSS) method shows that pipe stresses are within the acceptance
0 8 | criteria.

0 9 | Z | Z | 11 | B | 12 | A | 13 | S | U | P | O | R | T | 14 | B | 15 | Z | 16
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 | The cause of this occurrence was due to using a computer code which calculated
1 1 | piping response by use of the algebraic summation method. The pipe stress
1 2 | calculations were reanalyzed using NRC required (3D SRSS) earthquake response
1 3 | summation technique. Pipe support discrepancies within these calculations have
1 4 | been identified and corrected in accordance with properly documented work packages.

1 5 | D | 28 | 0 | 0 | 0 | 29 | N/A | 30 | D | 31 | NRC IE Bulletin 79-07 | 32
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 6 | Z | 33 | Z | 34 | N/A | 35 | N/A | 36
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 7 | 0 | 0 | 0 | 37 | Z | 38 | N/A | 39
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 8 | 0 | 0 | 0 | 40 | N/A | 41
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1 9 | Z | 42 | N/A | 43
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

2 0 | Z | 44 | N/A | 45
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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ANALYSIS OF OCCURRENCE:

We have reviewed the pipe stress analysis calculations on safety related systems using the new three dimensional square root sum of the squares method (3D SRSS) for combining seismic loads. The results of the evaluation are based on this methodology and show that the pipe stresses are still within the acceptance criteria.

CORRECTIVE ACTION:

The pipe stress calculations were reanalyzed using NRC required (3D SRSS) earthquake response summation technique. This technique consists of utilization of the individual X, Y and Z earthquake responses which were previously computer calculated using PIPDYN II and the hand calculation of the square root-sum of the squares of intramodal responses due to the three components of earthquake loading.

All identified deficiencies have been corrected. No further corrective action is required.

FAILURE DATA:

Not Applicable

Prepared By A. W. Kapple

SORC Meeting No. 27-80

H. J. Refilum
Manager - Salem Generating Station

Report Number: 79-53/01X-2
Report Date: 5/30/80
Occurrence Date: 8/10/79
Facility: Salem Generating Station
Public Service Electric & Gas Company
Hancock's Bridge, New Jersey 08038

IDENTIFICATION OF OCCURRENCE:

Pipe Support/Stress Calculations

CONDITIONS PRIOR TO OCCURRENCE:

Operational Mode 5

DESCRIPTION OF OCCURRENCE:

In August, PSE&G evaluated a sample of the pipe stress calculations of the safety related piping in accordance with the requirements of NRC Bulletin 79-07 and found them to be acceptable. However, upon review of the pipe supports within those sample calculations, the rejection rate did not fall within normal limits of statistical sampling techniques. Since our initial report on August 23, 1979, several responses have been submitted to Bulletin 79-07. Meetings between the NRC staff and PSE&G have developed a three phase approach to resolution of the pipe support problem at Salem. Phase 1 was associated with work to be done prior to entry into Modes 3 and 4 and Phase 2 accomplished work required prior to entry into Modes 1 and 2. Phase 3 required that within 60 days of entering Mode 2, re-evaluation and field modifications as appropriate, of supports, nozzles, and penetrations remaining to be evaluated in accordance with IE Bulletin 79-07 will be accomplished. Required modifications have been made within the time constraints of the Action Statements of the Technical Specifications when re-evaluation showed that system operability was affected.

The unit entered Mode 2 on December 1, 1979. The Phase 3 re-evaluation identified 245 pipe hangers requiring modification. The supports, nozzles and penetration evaluation and the pipe stress analysis required as a result of unacceptable supports were completed by January 21, 1980. Field modifications for a total of 845 pipe hangers identified during the three phase program were completed by February 6, 1980. Therefore, all requirements of IE Bulletin 79-07 have been met.

DESIGNATION OF APPARENT CAUSE OF OCCURRENCE:

PSE&G has used PIPDYN II computer code for pipe stress analyses. The computer analysis involved calculation of piping responses to X-component earthquake, Y-component earthquake, Z-component earthquake, X plus Y earthquake, and Y plus Z earthquake. During the X plus Y and Y plus Z earthquake evaluation, the intramodal piping responses were calculated by use of the algebraic summation method. This methodology is now considered unacceptable as it may predict non-conservative results.