

Washington Public Power Supply System

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U. S. Nuclear Regulatory Commission, Region V
Office of Inspection and Enforcement
1450 Maria Lane, Suite 210
Walnut Creek, California 94596-5368

Attention: Mr. D. M. Sternberg, Chief
Reactor Projects Branch No. 1

Subject: 10CFR50.55(e) DEFICIENCY
CRACKED WELDS AND LOOSE PARTS IN
CE STEAM GENERATORS (D/N NO. 50)

On August 1, 1983 the Supply System notified your office (via the Resident Inspector, W. G. Albert) of a potential 10CFR50.55(e) deficiency concerning the subject condition. Based on a subsequent evaluation by Ebasco and the Supply System, it has been determined that the deficiency is significant and reportable per 10CFR50.55(e).

Attached is the Supply System approved final report for the subject deficiency. The report provides a description of the deficiency, corrective actions taken and analysis of the safety implications. Should you have any questions or require further information, please contact me directly.

for Roger N. Williams
A. D. Kohler (760)
Program Director, WNP-3

DRC:nj

Attachments

cc: J. Adams - NESCO
D. Smithpeter - BPA
Ebasco - New York
WNP-3 Files - Richland
R. D. Hill - Puget Sound Power & Light Company
P. Inman - Washington Water Power Company
B. D. Withers - Portland General Electric Company
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CRACKED WELDS AND LOOSE PARTS IN CE STEAM GENERATORS

Description of Deficiency

As a result of deficiencies found in the Steam Generators furnished to other nuclear projects by Combustion Engineering, Ebasco directed CE to perform a detailed inspection of the secondary side of the two (2) units installed at WNP-3. This inspection was conducted in July 1983 by QC Engineers of CE's Field Engineering Services. During their inspection, the QC Engineers observed cracked welds and loose parts in both Steam Generators, No. 1 and No. 2. The results of their inspection have been documented in two (2) NCR's and as described below.

Steam Generator No. 1

A. Dryer Region - Upper Side

1. Both seal welds around the fitting of the instrumentation tube into the steam outlet nozzle were cracked. One of the welds was incomplete.
2. Several nuts not lock-welded as required by the design drawing and some instances of lock washers being substituted for lock welds.
3. Arc strikes around the seal welds, the worst case being five (5) arc strikes in a 1" diameter circle with the largest arc strike being 1/8" diameter.
4. One (1) 6" length weld wire left on top of a steam separator. Also, two (2) approximately 5/32" size metal chips and light grinding metal dust found.

B. Dryer Region - Lower Side

1. Seven (7) missing lock washers.
2. Eight (8) loose bolts (not pulled down).
3. Two (2) missing lock welds.
4. Seven (7) cracked welds.
5. Ten (10) crater cracks.
6. Several lock washers needing to be rotated.
7. Four (4) short bolts (nuts recessed 3/16" max.).
8. Downcomer feedwater pipes - all tack welds on the unions were made on the bottom side rather than on top side.

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Steam Generator No. 1 (Continued)

B. Dryer Region - Lower Side (Continued)

9. Incomplete dryer weld (1/8").

C. Annulus Region

1. Sampling line manifold assembly weld cracked.
2. A steel spacer bar of approximately 7" x 2" x 2" left in place between downcomer feedwater pipe and vessel wall.

Steam Generator No. 2

A. Dryer Region - Upper Side

1. Both seal welds around the fitting of the instrumentation tube into the steam outlet nozzle were cracked.
2. Three (3) bolts with missing tack welds and six (6) lock washers being substituted for lock welds.
3. Presence of light grinding dust.

B. Dryer Region - Lower Side

1. Six (6) missing lock washers.
2. Six (6) loose bolts - not pulled down.
3. Four (4) cracked lock welds - crater cracks.
4. Sixteen (16) crater cracks.
5. Three (3) arc strikes on structural beam.
6. Two (2) arc strikes on dryers.
7. Several lock washers needing to be rotated.
8. Downcomer feedwater pipes - five (5) of the unions tack welds on the bottom rather than on top side.
9. Some slots have been enlarged for alignment causing an inadequate seating surface for the lock washers.
10. Presence of grinding dust, a sticky stain on the vessel wall, and tape residue on one (1) channel beam.

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C. Separator Can Deck

1. One (1) Marmon clamp with one (1) missing lock nut.
2. One (1) steam separator with approximately 1-1/4" long incomplete weld at top end plate to barrel.
3. Greasy grime on the surface of a steam separator on top and plate area.
4. Tube bundle access plate - locking plate does not have one corner bent over (the corner has been removed by grinding).

Corrective Action Taken

All documented missing parts were replaced, loose parts tightened, damaged or defective parts replaced with new parts, the parts which need to be aligned were properly realigned, foreign material removed, and metal dust and stains cleaned. Cracked and improper welds were ground out, liquid penetrant tested and rewelded where required.

An additional inspection was performed by CE, Ebasco and Supply System personnel on August 22, 1983 for any loose parts which may have been dropped to the top of the tube sheet. However, no loose parts were observed.

The cause of these deficiencies is ascribed to a breakdown in Combustion Engineering's QA Program.

Since these are the only Steam Generators required for WNP-3, the dispositions provided in the NCRs obviate the necessity for any further action to preclude recurrence at WNP-3. Any corrective action internally required by CE is beyond the control of the Supply System.

Analysis of the Safety Implication

Loose parts found in Steam Generator No. 1 which have potential to damage the tubes are one (1) 6" length weld wire, one (1) spacer bar of approximately 7" x 2" x 2", two (2) 5/32" size metal chips and grinding metal dust. Also, some of the loose nuts and bolts found in both Steam Generator No. 1 and No. 2 could become free sometime during plant life.

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Analysis of the Safety Implication (Continued)

If any of the parts were to enter the secondary side of the tube region, they have potential to cause wear and damage to the tubes. It can be postulated that such an occurrence could induce the rupture of one or more steam generator tubes, resulting in a primary to secondary leakage exceeding technical specification limits and violation of Steam Generator Tube Rupture Design Basic Accident Assumptions as referenced in WNP-3 FSAR Section 15.6.3.

Therefore, the defects found in the Steam Generators are judged to be significant and reportable per the criteria of 10CFR50.55(e).