B019

REGULATOR INFORMATION DISTRIBUTION SYSTEM

DOCKET NBR: 50-397 WPPSS-2 DOC DATE: 781117

RECIPIENT: STRAND,N.O. ACCESSION NBR: 7811220195

ORIGINATOR: ENGELKEN,R.H. COPIES RECEIVED:

COMPANY: WI PUB PWR SUPPLY SYS LTR 1 ENCL 1

SUBJECT: SIZE: 1+2

Ack receipt of 781106 ltr reporting deficiency involving anchor/darling tilting disc check valves.

DISTRIBUTION CODE: B019 NOTARIZED

DISTRIBUTION TITLE:
CONSTRUCTION DEFICIENCY REPORT (10CFR50,55E)

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NOV 29 1978

NOTES: BILL PATTON (OELD) 1 CY ER AMDTS

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
SUITE 202, WALNUT CREEK PLAZA
1990 N. CALIFORNIA BOULEVARD
WALNUT CREEK, CALIFORNIA 94596

NOV 27 1978

Docket No. 50-397

Washington Public Power Supply System
P. O. Box 968
Richland, Washington 99352

Attention: Mr. N. O. Strand
Managing Director

Gentlemen:

Subject: Report on Deficiency Involving Anchor/Darling Tilting Disc Check Valves, Washington Nuclear Project, Unit 2 (your letter of November 6, 1978).

Thank you for your letter, referenced above, which forwarded an interim report pursuant to 10 CFR 50.55(e) regarding the subject matter.

Your report will be reviewed and evaluated and we are looking forward to receipt of your final report on this matter.

Your cooperation with us is appreciated.

Sincerely,

R. H. Engelken
Director

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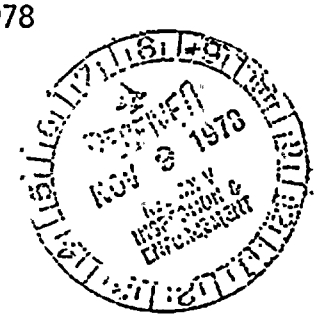
Washington Public Power Supply System
A JOINT OPERATING AGENCY

P. O. Box 968 3000 Geo. Washington Way Richland, Washington 99352 Phone (509) 375-5000

G02-78-245
November 6, 1978



Nuclear Regulatory Commission
Region V
Suite 202 Walnut Creek Plaza
1900 N. California Boulevard
Walnut Creek, California 94596

Attention: Mr. R. H. Engelken, Director

Subject: WPPSS NUCLEAR PROJECT NO. 2
DOCKET NUMBER 50-397, CPPR-93
REPORTABLE DEFICIENCY - 10CFR50.55(e)

Dear Mr. Engelken:

In accordance with the provisions of 10CFR50.55(e), your staff was informed by telephone on October10, 1978, of a reportable deficiency involving Anchor/Darling tilting disc check valves in the Residual Heat Removal System failing to close with gravity when installed in a vertical position which could potentially result in damage to the system or a delay in system response. This problem had been previously identified in IE Circular No. 78-15. Attached is our report on this deficiency.

If you require additional information, please feel free to contact us.

Very truly yours,

D L Renberger

D. L. RENBERGER
Assistant Director
Technology

DLR:JAO:cph

Attachment

cc: JJ Verderber, B&R
RC Root, B&R Site
JJ Byrnes, B&R
D. Roe, BPA
E. Volgenau, NRC, Washington, D.C.

REPORTED DEFICIENCY AND CORRECTIVE ACTION FOR TILTING DISC CHECK VALVES FAILURE TO CLOSE WITH GRAVITY IN VERTICAL POSITION

Nature of Deficiency:

Anchor/Darling informed Burns and Roe by letter, dated June 18, 1978, that their tilting disc check valves of a specific pressure class and size may not close by gravity alone once they are fully opened if mounted in a vertical pipe. The cause is that the disc center of gravity travels beyond or is directly above the disc pivot point when the valve is fully open.

This problem has been identified in IE Circular No. 78-15.

We have identified all these valves in safety-related systems, i.e. the Residual Heat Removal (RHR) pump discharge check valves (RHR-V-31A, B and C) and determined that RHR-V-31B will not close by gravity when fully opened.

Safety Implications

Failure of the pump discharge check valve to close will drain the RHR/Low Pressure Coolant Injection (LPCI) discharge piping into the suppression chamber. The water leg pump will not be able to maintain the piping full due to the flow path to the suppression chamber. Subsequent start of the RHR pump may result in water hammer which could disable the RHR/LPCI Loop. Also, the time required for LPCI to inject water into the reactor may be increased beyond the time assumed in the accident analyses, due to the extra time required to refill the discharge piping. An additional single failure would reduce the Emergency Core Cooling Systems below minimum requirements.

Corrective Action Taken and Planned

Anchor/Darling has been contacted by WPPSS about modifying the disc by adding a weld buildup or a lug to the disc counterweight so as not to allow the disc center of gravity to travel over the disc pivot point. The modification will be coordinated with Anchor/Darling and it is expected to be completed by March, 1979. The field Quality Assurance program will inspect and verify after the fix that this valve will close by gravity when fully opened.

CF

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
SUITE 202, WALNUT CREEK PLAZA
1990 N. CALIFORNIA BOULEVARD
WALNUT CREEK, CALIFORNIA 94596

APR 19 1978

Docket No. 50-397

Washington Public Power Supply System
P. O. Box 968
Richland, Washington 99352

Attention: Mr. D. L. Renberger
Assistant Director
Generation and Technology

Gentlemen:

Thank you for your letter dated April 10, 1978 which forwarded your final report under the provisions of 10 CFR 50.55(e) concerning cracks in the structural steel platform at the 541-foot elevation inside containment at WNP Unit No. 2. Your report will be reviewed and evaluated and should we require additional information concerning this matter, we will contact you.

Your cooperation is appreciated.

Sincerely,

R. H. Engelken
Director

MA 1
GD

Washington Public Power Supply System
A JOINT OPERATING AGENCY

P. O. Box 968 3000 Geo. Washington Way Richland, Washington 99352 Phone (509) 946-9681

April 10, 1978
G02-78-121

Nuclear Regulatory Commission
Region V
Suite 202, Walnut Creek Plaza
1900 N. California Boulevard
Walnut Creek, California 94596

Attention: Mr. R. H. Engleken, Director

Subject: WPPSS NUCLEAR PROJECT NO. 2
DOCKET NUMBER 50-397, CPPR-93
REPORTABLE EVENT - 10CFR50.55(e)

Reference: Letter, G02-77-504, same subject, dated 12/27/77

Dear Mr. Engleken:

The reference letter transmitted our interim report describing a reportable deficiency under the provisions of 10CFR50.55(e) concerning cracks in the structural steel platform at 541' elevation inside containment.

Attached is our final report on this matter.

Should you have any additional questions, please contact us.

Very truly yours,

D L Renberger

D. L. RENBERGER
Assistant Director
Generation and Technology

Attachment

DLR:RJS:df

cc: JJ Byrnes, B&R (New York)

MA 1
GD

ATTACHMENT

Reportable Deficiency and Corrective Action
WPPSS Nuclear Project No. 2
Cracks in Structural Steel Platform at 541'
Elevation Inside Containment

Washington Public Power Supply System
Docket No. 50-397
License No. CPPR-93

FINAL REPORT

Description of the Deficiency

Inspection results have identified cracks in field welds made to heavy structural beams which makeup the 541' elevation platform inside the containment drywell. This platform spans between the sacrificial shield and the containment vessel and is primarily designed to carry pipe whip restraint loads for large diameter and high energy piping systems including Main Steam and Reactor Feedwater lines. In addition, this platform is used for supporting secondary loads including air handling equipment, recirculating pump motors, pipe hangers and snubber supports as well as structural supports for other miscellaneous equipment in that vicinity. The cracks were identified as a result of extra inspection requirements imposed to resolve a nonconforming condition related to welding procedures.

Subsequently, magnetic particle examination has been expanded to include all field welds which affect the integrity of the pipe whip support structures throughout containment and in the main steam tunnel. Presently over 60 field welds on the 541' elevation platform have been repaired. As repair efforts at this elevation near completion, inspections and necessary repairs will commence at other pipe whip support locations.

Cause and Analysis

Several contributing factors are considered as having caused the cracks in the 541' elevation platform including deficient welding and fabrication sequence procedures, incomplete inprocess inspection and possible metallurgical conditions associated with hydrogen embrittlement and nil ductility transition temperatures.

Our consultant concluded that the most likely explanation for the major cracks is that they initiated as hydrogen induced cold cracks in the HAZ regions following weld cooldown. These hydrogen cracks were in turn enhanced by the weld shrinkage stresses associated with the restrained structural configurations and reduced toughness properties of the materials which were exposed to ambient temperatures below 32°F.

Safety Implication

The structural members, in which cracks were identified, are designed to carry the primary loads associated with the pipe whip restraints of high energy piping systems including Main Steam and Reactor Feedwater lines. Under pipe break loads, which constitutes a failed load condition, the members are designed for plastic deformation. The cracked welds could result in a local failure within the structure, thereby, reducing the effectiveness of a pipe whip restraint.

Corrective Action Taken and Planned

In response to the initial identification of cracks in the 541' platform, additional magnetic particle inspection was performed on all the field welds made to that platform structure.

In addition, magnetic particle examination is being performed on all field welds which are critical to the assembly or function of the pipe whip support structures within the dyrwell or in the main steam tunnel. Those field welds not yet completed shall be subject to magnetic particle examination of root pass, mid-point and final weld-out. All welds (including repairs) which require magnetic particle examination, shall be inspected 72 hours after cooldown.

Upon completion of repairs and cooldown of the 541' elevation platform, it shall be visually inspected to assure its acceptance.

A stringent repair program has been implemented and is being directed by WPPSS/Architect/Engineer. Included in this program are directions for sequencing weld repairs in such a manner as to minimize weld shrinkage stresses and associated distortion. The Supply System and our welding consultant concurs with this repair program.

To assure adherance to the repair procedures, the Architect/Engineer is performing second party inspection along with specific inprocess inspection hold points requiring A/E acceptance by an AWS QC I certified welding inspector.

All further structural welding will be performed in accordance with sequence procedures prepared by the Contractor and approved by the Architect/ Engineer.

To assure the pipe whip support members remain well above the nil-ductility transition temperature during cold weather, the minimum drywell temperature shall be maintained at 70°F for the duration of construction activities.

Additionally, review of the fracture toughness of the pipe whip support structures at the anticipated operating temperatures and design loads is now in progress. Many of the support structures have been fabricated from A516GR70 and A537CL2 materials with designated impact properties. However, a sampling of those supports which were fabricated from conventional A-36 materials are being further evaluated by WPPSS' consultants to determine their ability to resist brittle fracture at operating conditions. Should the results of this review indicate that a reportable condition exist, the NRC shall be so advised.