

DEC 14 1973

DOCKET NO. 50-247

LICENSEE: Consolidated Edison Company of New York, Inc.

FACILITY: Indian Point Unit No. 2

SUMMARY OF MEETING HELD DECEMBER 7, 1973, RE THE CONTAINMENT LINER

Representatives of Con Ed met with the Regulatory staff to discuss damage to the containment liner and action necessary to assure that the capability of the containment liner to perform its intended function is not impaired.

A list of attendees is enclosed.

Significant points discussed are summarized below:

1. Function of the Liner - The liner is a barrier to release of fission products from the reactor building. It is not a structural member.
2. Description of the Liner - The liner was fabricated by welding together Type 442 carbon steel plates. The weld seams are covered with channels which are normally pressurized. In the vicinity of the damage, the liner varies in thickness from 3/8-inch to 3/4-inch with the heavier plates used in the area of the piping penetrations and the lighter plates used at higher elevations. The liner was used as the interior form for the concrete reactor building and is attached to the concrete by studs. The studs were fabricated from 1/2-inch rods and are 7 inches long with a 2-inch hook. Prior to the feedwater line break, the liner in the general vicinity of the feedwater line was believed to be in good condition. Bulges in the liner which occurred during construction are located approximately 180° from the failed feedwater line and were reviewed previously. Leak tests have been satisfactory.
3. Description of Liner Damage - To the right of the feedwater line penetration and approximately 13 feet above the penetration, a band of bulges exists in the liner. The band is roughly 50 feet long (circumferential direction) and 3 feet wide (vertical direction). The most significant bulge is approximately 1-1/4 inches high and rises to that height in approximately 1-1/2 feet. In the band, nine studs are

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believed to be broken. The damage is located in a region where the plate is 3/8-inch thick and the studs are on 28-inch centers in the vertical direction and 24-inch centers in the circumferential direction.

4. Cause of Liner Damage - The feedwater line cracked circumferentially on the right side of the line near the containment penetration. Failure of the line released feedwater at less than 200°F and steam, due to backflow from the steam generator, initially at approximately 480°F. Steam from the failed line billowed upwards along the liner in the region of damage. Con Ed concludes that bulging resulted from thermal expansion of the liner.
5. Examination of Liner Damage - The liner was examined using the magnetic particle technique. The examination indicated that the liner is not cracked. The failed studs were found by use of the ultrasonic technique. A contour map of the region of damage was drawn, and based on the map, Con Ed estimates that the maximum bending fiber strain is 1.3%.
6. Analysis of the Damaged Liner - The bulges in the liner would not be significant unless the liner is not capable of performing its intended function assuming the occurrence of a design basis accident. If a DBA occurred, pressurization of containment would stress the bulged area by forcing the liner toward the concrete wall. Con Ed will perform an analysis to determine the capability of the material to withstand the stress without cracking and with strains below allowable levels. Con Ed's analysis will include the effect of fatigue caused by containment leak tests and an assumed safe shutdown earthquake together with the DBA.
7. Testing of Model Liner Plates - Con Ed has formed steel plates of identical type to simulate bulges in the liner and will load the plates once to straighten them. The material will then be examined in order to confirm their analytical results. Welded material will be included in this test.
8. Containment Leak Test - Con Ed was asked whether they intend to leak test containment (i.e., the shell as well as the welds) prior to restart and, if so, at what pressure the test will be performed. Con Ed stated that a test had not been scheduled but that they will consider performing one.
9. Suggested Acceptance Criteria - If the calculated maximum strains obtained from the analysis are less than 0.2% (membrane + bending) and 0.1% (membrane) with ϵ_u being the ultimate strain, the liner will

have adequate margin to withstand a DBA loading and perform its intended function. The liner will not be repaired if Con Ed can show that the acceptance criteria are satisfied.

10. Modifications - In any event, Con Ed will extend the thermal insulation upwards in the vicinity of piping penetrations to protect the liner from the effects of other possible steam leaks.

11. Conclusions - We concluded in the meeting that Con Ed's approach is satisfactory. Further, we informed Con Ed that they can conclude that their acceptance criteria are satisfactory unless we notify them to the contrary in the next few days. We will, however, review the applicant's analysis before final approval.

Roger W. Woodruff
 Operating Reactors Branch /1
 Directorate of Licensing

Enclosures:
 List of Attendees

- cc: Applicant
 Docket File
 AEC-PDR
 Local-PDR
 RP Reading File
 L Reading File
 Branch Reading File
 RP Assistant Directors
 RP Branch Chiefs
 T. J. Carter
 J. M. Hendle
 TR Assistant Directors
 TR Branch Chiefs
 R. W. Woodruff
 M. J. Oestmann
 M. Karman
 E. W. Lyle
 RO: (3)
 Principal Staff Participants
 R. P. Fraley, AGRS (16)

Mailed to Con Ed 12/14

SEE PREVIOUS YELLOW FOR OTHER CONCURRENCES

OFFICE	L:ORB/1	L:ORB/1	L:ORB/1	L:SEB	
SURNAME	RWoodruff	SATeets	RJSchemel	LCCShao	
DATE	12/13/73	12/12/73	12/12/73	12/13/73	

ATTENDANCE AT A MEETING RE

INDIAN POINT-2

ON DECEMBER 7, 1973

Con Ed:

W. J. Cahill
S. B. Barnes

Westinghouse:

J. D. Stevenson
E. U. Powell

United Engineers & Constructors:

J. R. Slotterback
A. M. Ebner
B. B. Scott

LaBoeuf, Lamb, Leiby & MacRae:

L. M. Trosten

Licensing:

L. C. Shao
A. L. Gluckmann
R. J. Schemel
R. W. Woodruff
K. Kneil

Regulatory Operations:

L. Beratan
J. Tillou

OFFICE						
SURNAME						
DATE						

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Roger W. Woodruff
Operating Reactors Branch #1
Directorate of Licensing

Enclosure:
List of Attendees

- cc: Docket File
- AEC PDR
- Local EDR
- RP Reading File
- L Reading File
- Branch Reading File
- RP Assistant Directors
- RP Branch Chiefs
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OFFICE	L:ORB/1	L:ORB/1	L:ORB/1	L:SEB		
SURNAME	RWoodruff:dc	SATeets	RJSchenel	ICCShao		
DATE	12/11/73	12/5/73	12/12/73	12/ /73		

REGION I PRESS RELEASE

The Atomic Energy Commission Regulatory Staff is examining the circumstances of a crack in an 18-inch cold water feedline to a steam generator at the Indian Point 2 Nuclear Generating Station of Consolidated Edison Co. of New York. The crack occurred on November 13, 1973, on a section of pipe which is not a part of the primary, or nuclear, cooling system but which is located inside the reactor containment building.

AEC inspectors at the site reported that there were no injuries and no other known damage to equipment and there was no release of radioactivity.

Cracking of the pipe and subsequent water leakage interrupted a testing and start-up procedure for returning the plant to commercial service after a shutdown for maintenance. It appears at least several weeks will be needed to put the plant back into service.

The damaged water line had served one of four steam generator units that make steam to drive the plant's electric turbines. The system is part of what is known as the plant's "secondary" water loop.

Consolidated Edison reported finding several inches of water on the floor of the reactor containment building when

workers entered that area, following indications of a water leak. Entry into the immediate area of the leak was delayed for several hours by the presence of steam and heat. No significant pressure buildup occurred in the containment.

Consolidated Edison said the steam generator had continued to produce steam after cracking of the pipe, and until it was shut down as part of a regular controlled cool-down procedure.

The State of New York was notified.

Indian Point 2, near Peekskill, New York, is designed to generate 873,000 kilowatts of electricity. The AEC issued a license for Indian Point 2 for full power operation on September 28, 1973.

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