

POOR ORIGINAL

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
230 PEACHTREE STREET, N. W. SUITE 818
ATLANTA, GEORGIA 30303

SEP 25 1975

H. D. Thornburg
IE: HQ
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→ a) *Smith*
→ b) *IE: File*

AP&L
8/25/75

G. L. Madsen, Chief, Reactor Operations and Construction Branch, IE:IV
THRU: L. L. Beratan, Senior Inspector, Facilities Construction Branch, IE:II

ARKANSAS POWER AND LIGHT COMPANY - ARKANSAS NUCLEAR ONE - UNIT 1 - DOCKET NO. 50-313, LICENSE NO. DPR-51

This memo is forwarded to summarize the review of the "Investigation of Pipe Leakage, Reactor Building Spray System Piping, Arkansas Nuclear One, Unit 1 Final Report" dated August 15, 1975, forwarded by Arkansas Power and Light Company (AP&L) letter dated August 29, 1975. This final report included the metallurgical investigation performed by Bechtel Corporation as well as the independent third party work performed by Southwest Research Institute.

This review consisted of analyzing both of these metallurgical investigations as well as the Battelle Columbus Laboratory. The conclusion reached by all three studies are metallurgically similar and are as follows:

1. The mode of failure of the Type 304 stainless steel was found to be stress-assisted corrosion cracking propagating intergranularly through the sensitized microstructure of the heat-affected zone adjacent to the circumferential welds.
2. The sources of the stress were residual stresses associated with welding; sensitization in the heat-affected zones near welds produced by welding heat, possibly high heat input; and chloride ions and/or sulfur oxide ions as a corrodent.
3. Other factors in the stress assisted corrosion cracking failure were: high carbon content of the piping material at the maximum permitted by the specification, and partial sensitization of the piping material (HT 800201, Swepco).

In summary, the metallurgical reports are in agreement as to the piping failure mode. With regard to the metallurgy, there are no major questions or additional metallurgical suggested work required. The major area of concern is the corrective action proposed by AP&L: periodic surveillance for leaks in pipe containing sensitized structure (HT 800201 and 2P-3352); whether the piping will be eventually replaced; and the licensee's overall corrective action program.

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G. L. Madsen

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Forwarded with this memorandum are twenty (20) copies of Battelle Columbus Laboratories Report for your action and distribution. Per telephone call with you on September 23, 1975, we will attend your intended meeting with AP&L to assist in resolving questions concerning the corrective action phase of this report.

A. R. Herdt

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Metallurgical Engineer