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U S Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

PRAIRIE ISLAND NUCLEAR GENERATING PLANT
Docket Nos. 50-282 License Nos. DPR-42
50-306 DPR-60

Request for Temporary Relief from the Requirements for
Code Repair of a Degraded Cooling Water System Pipe

Piping flaws have been identified in the Cooling Water System by ultrasonic inspections. Due to the length of time required to repair the pipe and the Technical Specification Limiting Condition for Operation Action Statement, we cannot perform repairs without a two unit shutdown. The pipe flaws present no problem to the safe operation of the plant as shown by analyses which demonstrate that the structural integrity of the piping is sound. Therefore, per the guidance in Generic Letter 90-05, we request Temporary Relief from the ASME Section XI requirements for code repair.

We found the first of the indications on March 17, 1992 and communicated to Armand Masciantonio of the NRC staff on March 19, 1992. Further inspections performed per Generic Letter 90-05 revealed additional flaws which we communicated to Bill Long and Jim Davis of the NRC staff on April 8, 1992. We completed our inspections and analyses and discussed these with Long onsite on April 22, 1992.

Our request for relief is attached to this letter. Please contact us if you require additional information related to this request.

Thomas M Parker
Manager
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c: Regional Administrator - Region III, NRC
Senior Resident Inspector, NRC
NRR Project Manager, NRC
J E Silberg

Attachments:
1. Request for Relief
2. Figure 1 - Isometric of the cooling water system, showing inspected areas

REQUEST for RELIEF

Cooling Water System
Indications Below Code Minimum Wall

FLAW DETECTION and IMPRACTICALITY OF REPAIR

On March 17, 1992, three indications below ASNI B31.1 Code minimum wall thickness were identified by ultrasonic inspection (UT). On March 18, 1992, the size of each indication was determined, and a stress evaluation was completed. UT of the piping characterized the flaws as microbiologically influenced corrosion (MIC). MIC typically occurs in stagnant or low flow areas. This portion of the cooling water system has been a low flow area for much of plant operation. The MIC is a localized attack, evidenced by a conical depression down to a pinhole-type defect.

Per the guidance of Generic Letter 90-05, the indications identified on March 17, 1992 required augmented inspection of additional sections of piping. Five additional similar areas were inspected and additional flaws were identified. These flaws were physically similar to the previously identified flaws. The initial scope of the UT inspections, even prior to detection of flaws, was 100% inspection of the 24" pipe at each branch connection. This scope satisfies the augmented inspection requirements.

The scope of the inspections was broadened to non-similar areas, since all similar areas had been inspected. Areas with high flows were inspected and flaws were identified. Since MIC attack is influenced by many interacting factors, it is important to note that the attack in these higher flow areas differed significantly from lower flow areas. In the areas of higher flow (e.g., between CL-36-1 and G wall, see Figure 1), no conical depressions were found. The flaws were characterized as individual "worm holes", originating at the interior surface of the pipe. The pipe surrounding the flaw was near nominal thickness. Additional inspection, using tangential radiography, supported the UT findings. Due to the difficulty in specifically defining these flaws, the flaw was very conservatively estimated as occupying all of the 1/4" by 1/4" square in which a single indication was found.

The size of all flaws was determined and a structural evaluation performed per the guidance provided in Generic Letter 90-05. All flaws satisfied the acceptance criteria of the "Through Wall Approach". Therefore, the piping associated with the flaws is considered operable.

At this time, code repair is impractical. In order to perform the necessary code repairs, both units need to be removed from operation. Train A supply header serves Unit 1 and Unit 2 safeguards components. Train B supply header also serves Unit 1 and Unit 2 safeguards components. A Technical Specifications (TS) Limiting Condition for Operation (LCO) allowed out-of-service time of 72 hours

is in effect if either header is removed from service. A work plan has been outlined to determine if the scope of the code repair could reasonably be completed within the allowed out-of-service time. Our conclusion is that there is not adequate time to perform the code repair within the allowed out-of-service time period. Therefore, the repairs must be done during a two unit outage.

A two unit outage is planned for the Fall of 1992. Since the piping is structurally sound and considered operable, we request relief from the ASME Section XI requirements for code repair to delay the cooling water piping repairs until the two unit outage scheduled for this fall.

The locations of the inspected areas are shown on Figure 1. This piping was designed and constructed to ANSI B31.1 and later classified ASME Code Class 3 for Section XI inspection purposes. Design temperature is 100 °F and design pressure is 150 psig. Therefore, this piping is considered moderate energy piping per Generic Letter 90-05.

ROOT CAUSE DETERMINATION AND FLAW CHARACTERIZATION

The flaws were identified by UT inspection. The inspection was being performed as part of the continuing inspection program set forth by commitments in Generic Letter 89-13. The scope of this inspection was to evaluate the 24" headers. The 24" header was to be inspected 12" either side of each branch connection.

The UT examiner characterized the flaws as resulting from MIC. The flaws were localized indications, surrounded by structurally sound pipe. The UT examiners have determined MIC attack in the past and are familiar with its appearance. The flaws were mapped by location, and evaluated to determine the affected area. The size of the flaw was used to perform the stress evaluation.

The UT technique used was a basic pulse-echo procedure, in accordance with ASTM E-797. Examiners are certified in accordance with a program that meets the requirements of ASNT-TC-1A.

FLAW EVALUATION

The inspection results are summarized in Table 1. This evaluation concludes that the flaws identified do not exceed the limitations of Generic Letter 90-05. The evaluation methodology was the "Through Wall Crack" approach in Generic Letter 90-05. The pipe minimum wall thickness (t-min) in the equations was replaced by adjusted wall thickness (t-adj), as suggested in the draft Code Case transmitted to us by Mr DiIanni of the NRC staff on November 15, 1990.

The length of the flaw was determined by either direct mapping of the flaw (using the longest dimension) or bounding the flaw axially and circumferentially and using the diagonal measurement. The allowable stress is 35 ksi$\sqrt{in}$. All indications are below the allowable limit.

AUGMENTED INSPECTION

1) The structural integrity of the pipe was verified by analysis. No through wall leakage was identified.

2) A qualitative assessment of the piping will be performed weekly by a walkdown. The integrity of the pipe will be verified once per three months by NDE (typically UT), in accordance with Generic Letter 90-05.

3) Five additional areas were initially inspected to comply with Generic Letter 90-05. Both Loop A and B were inspected at each branch connection as part of the original scope of inspection. This constitutes 100% inspection of similar areas.

TABLE 1

1. Cooling Water Pipe Data

24" Diameter	
Mean radius	11.8125"
Nominal wall thickness	0.375"
B31.1 minimum wall	0.120"
Design temperature	100 °F
Design pressure	150 psig
TOTAL STRESS	10242 psig
30" Diameter	
Mean radius	14.8125"
Nominal wall thickness	0.375"
B31.1 minimum wall	0.149"
Design temperature	100 °F
Design pressure	150 psig
TOTAL STRESS	13027 psi underground 13283 psi turbine building (limiting) 2893 psi locally near hanger CWH-108A

TABLE 1 (continued)

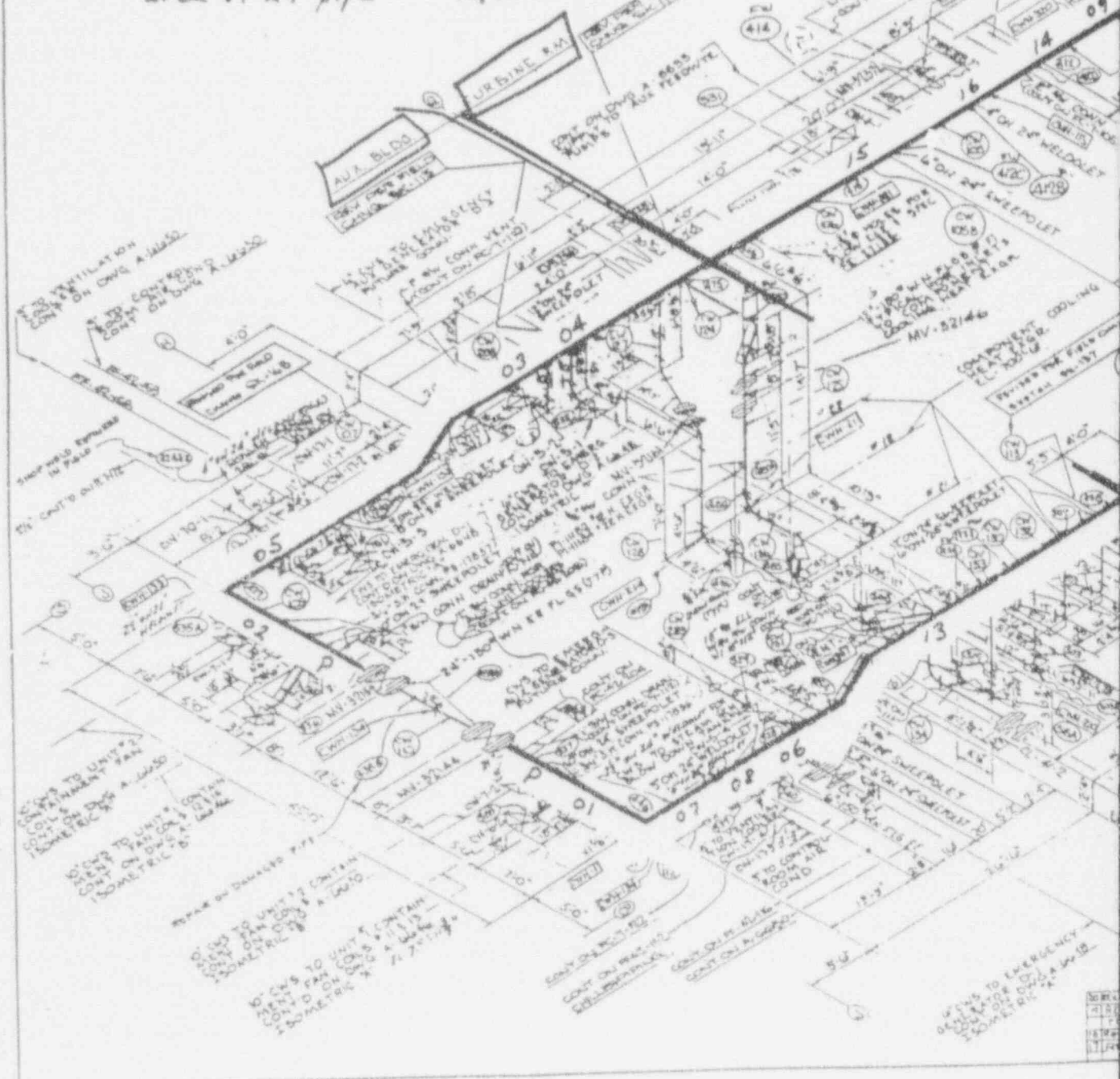
2. Flaw Evaluation Summary

Report #	# of flaws	acceptable ≤35 ksi	Comments
P92-0001	none		
P92-0002	3	yes	
P92-0003	none		
P92-0004	none		
P92-0005	none		
P92-0006	1	yes	
P92-0007	1	yes	
P92-0008	9	yes	
P92-0009	13	yes	worm hole type
P92-0010	18	yes	worm hole type
P92-0011	1	yes	worm hole type
P92-0012	2	yes	worm hole type
P92-0013	2	yes	
P92-0014	2	yes	worm hole type
P92-0015	3	yes	worm hole type
P92-0016	1	yes	worm hole type
P92-0017	11	yes	worm hole type
P92-0018	5	yes	worm hole type
P92-0019	6	yes	worm hole type
P92-0020	none		
P92-0021	1	yes	worm hole type
P92-0022	7	yes	worm hole type

AREAS INSPECTED

eg. P92-00 ± ±

NOTE: P indicates a previously inspected area of 24" pipe



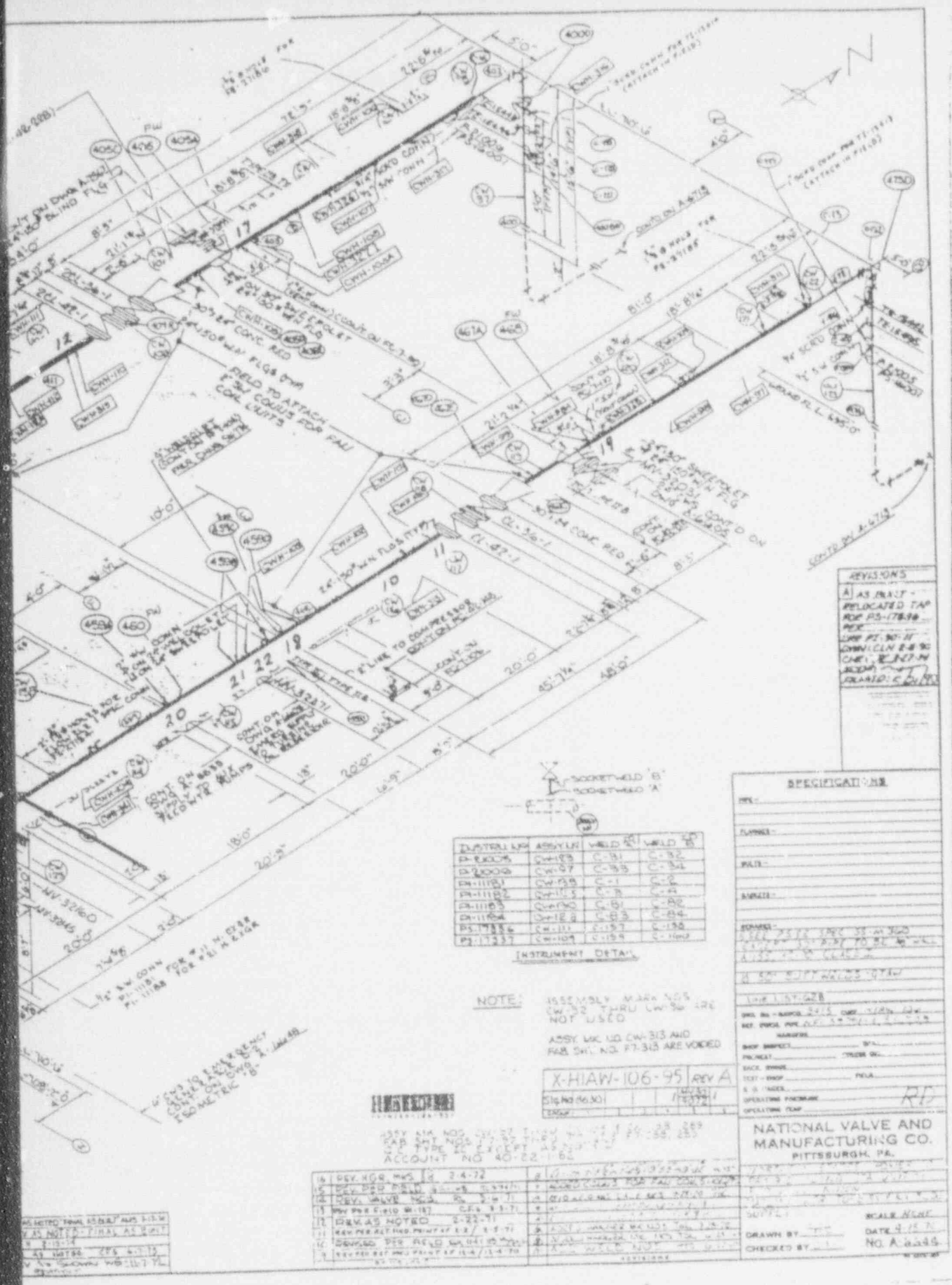


FIGURE 1

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