Central files

WISCONSIN PUBLIC SERVICE CORPORATION

P.O. Box 1200, Green Bay, Wisconsin 54305

August 29, 1979

Mr. James G. Keppler, Regional Director
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Glen Ellyn, IL 60137

Gentlemen:

Docket No. 50-305
Operating License DPR-43
IE Bulletin 79-17, Stagnant Borated Water Systems

We have received and reviewed the above referenced bulletin with respect to stagnant borated water systems at the Kewaunee Nuclear Power Plant. The following is our response to the specific items addressed in the bulletin.

1. A review of safety related stainless steel piping systems to identify those systems or portions of systems which contain stagnant oxygenated borated water has been completed. These systems include portions of high pressure and low pressure ECCS, accumulator discharge, residual heat removal system, containment spray system and the refueling water storage tank.

   (a) Those systems mentioned above are included in our Inservice Inspection Program per 10 CFR 50.55a(g). The attached table identifies the NDE performed, reference drawing, weld number, piping size and schedule. The NDE procedures consist of Ultrasonic Examination, Liquid Penetrant Examination and Visual Examination and are in accordance with IWA-2200 of ASME Section XI, 1974 with summer of 1975 addenda. The acceptance criteria are per ASME Section XI, IWA-3000.

   The sampling plan for Class I piping included in the systems identified above is per ASME Section XI, 1974 Edition, summer 1975 addenda, paragraphs IWB-2411 and IWB-5210. The sampling plan for Class II piping is per paragraphs IWC-2411 and IWC-2412.

   The results of the examinations performed to date have all been acceptable. No corrective action has been necessary.

(b) As we have previously stated in our December 30, 1976, response to IE Circular 70-06, we do not believe that pipe cracking in stagnant borated water systems is necessarily a generic problem. As stated in your previous Circular, the cause of cracking appears to be chloride stress corrosion due to residual chloride ion interaction in an oxygen environment with a state of stress probably due to welding or fabrication. The Kewaunee Plant's safety related stainless steel piping was cleaned to strict criteria requiring that the final flush exit water have a Chloride and Fluoride ion concentration of less than 0.15 ppm. This is the same criteria that we continue to use for our on line sampling program. We sample our ECCS systems bi-monthly with the Accumulators done monthly. The RWST is sampled bi-monthly but is continuously recirculated through ion exchangers with the exception of periods when the ion exchangers are lined up to clean the Spent Fuel Pool water. There are no acceptance criteria on boron; pH is dependent on boron concentration; and O_2 is at a saturated condition in most of these stagnant systems. No changes or actions have been taken to our initial established chemistry controls because of any problems discovered with water chemistry exceeding limits. Chlorides have never exceeded acceptance criteria.

Upon reviewing the Inservice Inspection examination results, it appears that our strict limiting of Chloride ions along with good welding practices has prevented the problem experienced by the facilities described in your bulletin.

(c) Preservice inspection was performed over the period of May 21, 1973, to September 9, 1973. The inspection was performed on Class I systems only in accordance with 1971 Edition of ASME Section XI, summer 1971 addenda. Three inch (3") and over welds were volumetric examined; two inch (2") socket welds were surface examined.

It should be noted that for construction testing, NDE was performed on all stagnant systems listed above. The containment spray and ECCS systems were radiographed in accordance with ASME Section VIII and also surface examined. The larger suction lines to the RHR pumps were surface examined only. The acceptance criteria were in accordance with B31.1 (1967) and ASME Section III and VIII.

(d) This is not applicable to Kewaunee since no cracking has been experienced or identified to the above referenced systems.

2. ISI examinations have been performed on the stagnant portions of the above referenced systems. Our 10 year ISI program consists of sampling approximately 25% of the welds in the stagnant portion of these systems. To date approximately 40 to 50% of this sampling has been completed. A review of the attached table shows that this sampling has included the complete spectrum of pipe sizes and wall thicknesses. All results of examinations have been acceptable. No further action is necessary.

3. Not applicable since Kewaunee is a single unit site.

4. No cracking has been identified.

Since no evidence of cracking in the above referenced systems has been observed, no augmented program is warranted at this time. We will continue to examine a representative portion of those systems which contain stagnant borated water through our normal Inservice Inspection Program.

Very truly yours,

E. R. Mathews

E. R. Mathews, Vice President
Power Supply & Engineering

snf

Attach.

cc - Director, Office of Inspection & Enforcement
US NRC, Washington, D. C. 20555

TABLE

Welds in Stagnant Borated Water Lines
Inservice Inspection Examination

1979 Refueling

PT-VT	ISI Iso. No. WPS 1-4103 - Weld #3	3" S/160
PT-VT	ISI Iso. No. WPS 2-2522 - Weld #28	6" S/160

1978 Refueling

UT-VT	ISI Iso. No. WPS 1-4101 - Weld #7	12" S/160
UT-VT	ISI Iso. No. WPS 1-4101 - Weld #9	12" S/160
UT-VT	ISI Iso. No. WPS 1-4203 - Weld #8	8" S/140
UT-VT	ISI Iso. No. WPS 1-4203 - Weld #9	8" S/140
UT-VT	ISI Iso. No. WPS 1-4203 - Weld #11	8" S/140
UT-VT	ISI Iso. No. WPS 1-4203 - Weld #12	8" S/140
UT-VT	ISI Iso. No. WPS 1-4105 - Weld #22	6" S/120
UT-VT	ISI Iso. No. WPS 1-4105 - Weld #24	6" S/120
UT-VT	ISI Iso. No. WPS 1-4103 - Weld #3	6" S/160
UT-VT	ISI Iso. No. WPS 1-4206 - Weld #5	6" S/160
UT-VT	ISI Iso. No. WPS 2-2521 - Weld #20	12" S/40
UT-VT	ISI Iso. No. WPS 2-2520 - Weld #21	12" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2521 - Weld #16	10" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2521 - Weld #17	10" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2522 - Weld #4	10" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2522 - Weld #5	10" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2522 - Weld #10	10" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2541 - Weld #28	8" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2541 - Weld #29	8" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2541 - Weld #38	8" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2541 - Weld #29	8" S/40
UT-VT	ISI Iso. No. WPS 2-2541 - Weld #28	6" S/160
UT-VT	ISI Iso. No. WPS 2-2541 - Weld #29	6" S/160
UT-PT-VT	ISI Iso. No. WPS 2-2540 - Weld #6	6" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2540 - Weld #7	6" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2542 - Weld #4	6" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2542 - Weld #5	6" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2542 - Weld #10	6" S/40
UT-PT-VT	ISI Iso. No. WPS 2-2542 - Weld #11	6" S/40

1976 Refueling

UT-VT	ISI Iso. No. WPS 131 - Weld #5	12" S/160
UT-VT	ISI Iso. No. WPS 131 - Weld #9	12" S/160
UT-VT	ISI Iso. No. WPS 132 - Weld #1	10" S/40
UT-VT	ISI Iso. No. WPS 132 - Weld #2	10" S/40
UT-VT	ISI Iso. No. WPS 115 - Weld #2	8" S/140
UT-VT	ISI Iso. No. WPS 115 - Weld #3	8" S/140
UT-VT	ISI Iso. No. WPS 115 - Weld #4	8" S/140
UT-VT	ISI Iso. No. WPS 115 - Weld #5	8" S/140
UT-VT	ISI Iso. No. WPS 121 - Weld #4	6" S/160
UT-VT	ISI Iso. No. WPS 120 - Weld #6	6" S/160
UT-VT	ISI Iso. No. WPS 120 - Weld #3	4" S/160

All found acceptable.