



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY-EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

EVALUATION OF NRC GENERIC LETTER 88-01 RESPONSE

NIAGARA MOHAWK POWER CORPORATION

NINE-MILE-POINT NUCLEAR STATION UNIT NO. 2

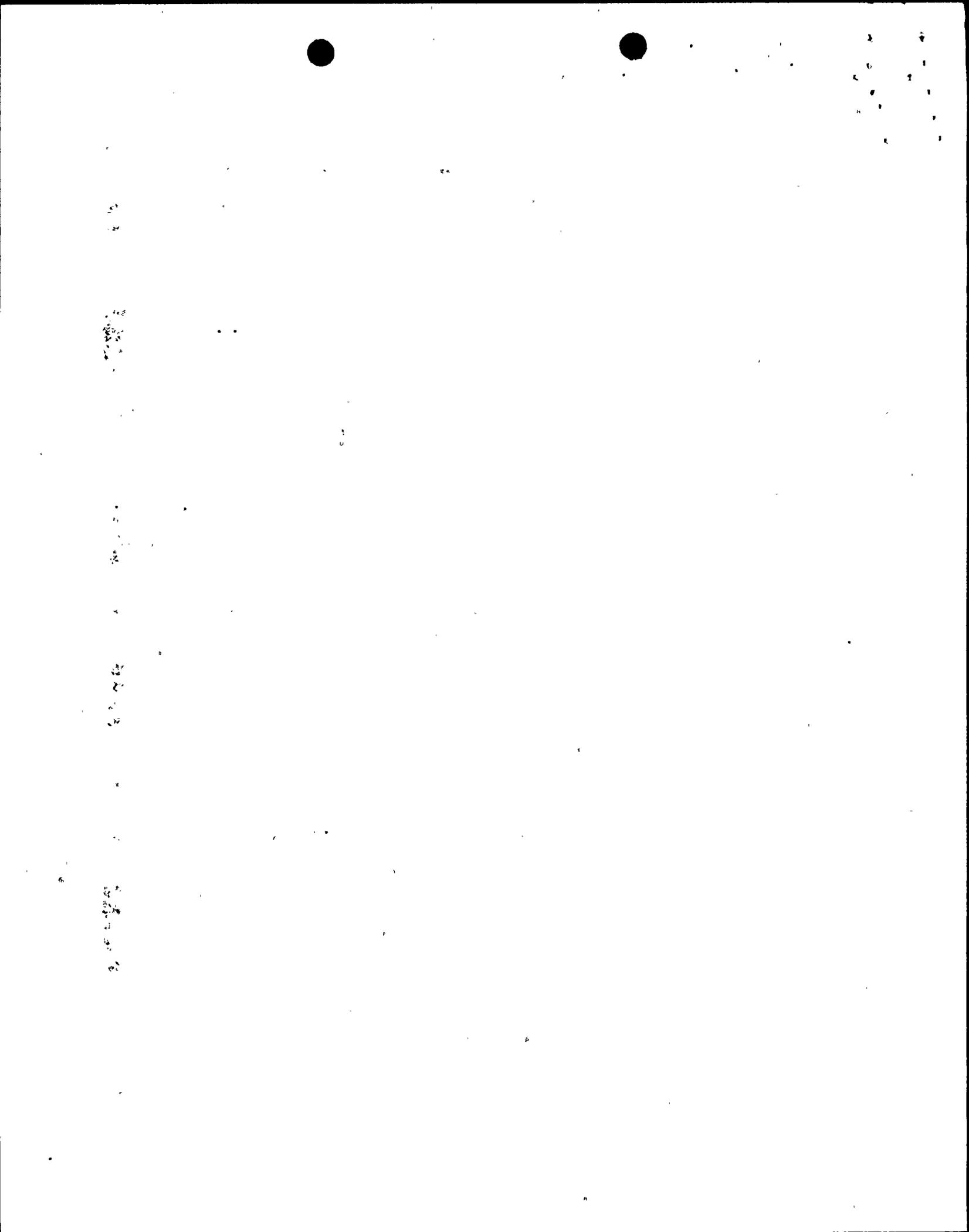
DOCKET NO. 50-410

1.0 INTRODUCTION

Niagara Mohawk Power Corporation, the licensee, submitted its response to NRC Generic Letter (GL) 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping" for Nine Mile Point, Unit 2 by letter dated July 28, 1988, and additional information requested by the staff was provided by letters dated November 1, 1989 and December 14, 1989. GL 88-01 requested licensees and construction permit holders to resolve the IGSCC issue for BWR piping made of austenitic stainless steel that is 4 inches or larger in nominal diameter and contains reactor coolant at a temperature above 200 degrees Fahrenheit during power operation regardless of Code classification. The licensee was requested to address the following:

1. The current plans regarding pipe replacement and/or other measures taken to mitigate IGSCC and provide assurance of continued long-term integrity and reliability.
2. The Inservice Inspection (ISI) Program to be implemented at the next refueling outage for austenitic stainless steel piping covered under the scope of this letter that conforms to the staff positions on inspection schedules, methods and personnel, and sample expansion included in GL 88-01.
3. The Technical Specification change to include a statement in the section on ISI that the ISI Program for piping covered by the scope of this letter will be in conformance with staff positions on schedules, methods and personnel, and sample expansion included in GL 88-01 (See model BWR Standard Technical Specification enclosed in GL 88-01). It is recognized that the Inservice Inspection and Testing Sections may be removed from the Technical Specifications in the future in line with the Technical Specification Improvement Program. In this case, this requirement shall remain with the ISI Section when it is included in an alternative document.
4. The confirmation of your plans to ensure that the Technical Specifications related to leakage detection will be in conformance with the staff positions on leak detection included in GL 88-01.

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5. The plans to notify the NRC in accordance with 10 CFR 50.55a(g) of any flaws identified that do not meet IWB-3500 criteria of Section XI of the Code for continued operation without evaluation, or a change found in the condition of the welds previously known to be cracked and your evaluation of the flaws for continued operation and/or your repair plans.

2.0 DISCUSSION

The licensee's response to NRC GL 88-01 has been reviewed by the staff with the assistance of its contractor, Viking Systems International (VSI). The attached Technical Evaluation Report (TER) is VSI's evaluation of the licensee's response to NRC GL 88-01. The staff has reviewed the TER and concurs with the evaluations, conclusions, and recommendations contained in the TER with the exceptions as discussed below and as follows: TER Section 2.6 and recommendation No. 5 in Section 4.0 of the TER are not applicable to Nine Mile Point 2 as the current Technical Specifications (TS) Amendment No. 8 issued June 14, 1989, has already incorporated the requirements of GL 88-01 regarding TS change to include an ISI statement in the TS. This TS amendment was not part of the documents reviewed by VSI. Additionally, the staff takes exception to the TER recommendation and finds acceptable the licensee's position concerning conformance with Position C of Regulatory Guide 1.45. In the review of the licensee's GL 88-01 submittal, the staff has found the following positions to be unacceptable:

1. The licensee's position concerning GL 88-01 leakage detection requirements:
 - (1) Plant shutdown within 24 hour period or less when the rate of increase of unidentified leakage is 2 gpm; the licensee is requested to propose an amendment to the Technical Specifications to include an additional Limiting Condition for Operation (LCO) that specifies reactor coolant system leakage shall be limited to a 2 gpm increase in unidentified leakage within any 24 hour period. Pertinent sections of the model BWR Technical Specifications are enclosed as an example of acceptable positions.
 - (2) Frequency of leakage monitoring; the staff has reevaluated the frequency of leakage monitoring. After discussions with several BWR operators the NRC staff concluded that monitoring every four hours creates an unnecessary administrative hardship to the plant operators. Thus, RCS leakage measurements may be taken every eight hours instead of every four hours as required in GL 88-01. Therefore, the frequency of leakage monitoring as discussed in section 3.2 of the TER should be modified from once per twelve hours to once per eight hours in order to be in agreement with the NRC staff position.

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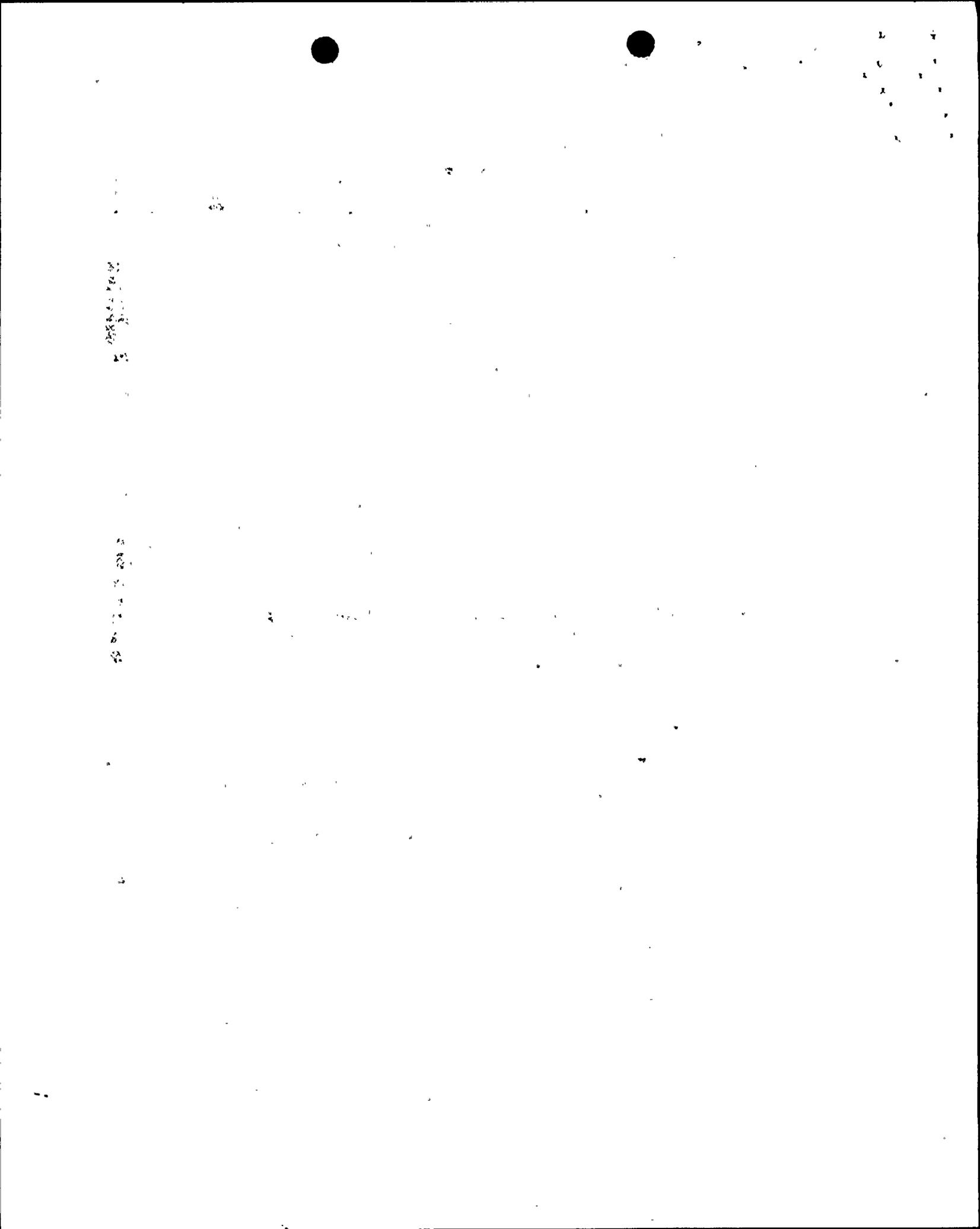
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- (3) Operability of leakage measurement instruments; the licensee is requested to propose an amendment to the Technical Specifications to include an LCO on operability of sump monitoring instruments. Since your plant has IGSCC weld category D, E, F, or G weldments, Generic Letter 88-01 provides an allowed outage time of 24 hours for repairing the drywell floor drain sump monitoring system, or an orderly shutdown should be initiated. As an alternative, the staff recommends that when the drywell sump monitoring system is inoperable, the operator should use a demonstrated manual method for determining leak rate, such as measuring the time to manually pump the sump at a fixed interval. The staff considers manual measurement a viable sump monitoring method without hardship to the operator; therefore, this method could be added to the appropriate LCO section. With the manual method operable, the outage time for the drywell sump monitoring system could be extended to 30 days. However, if the sump pump and drywell sump monitoring systems are inoperable concurrently, then either system has to be repaired within 24 hours or an orderly shutdown should be initiated.
2. The licensee's classification of welds in the Reactor Recirculation System, Residual Heat Removal System, and Reactor Pressure Vessel which have been classified as IGSCC Category A even though non-resistant materials (Type 316 stainless steel and Inconel 182) were used.
3. The licensee's inspection plans for welds that have been incorrectly classified as IGSCC Category A based on non-resistant materials and the omission of inspection plans for welds in the Reactor Water Cleanup System (WCS) piping outboard of the isolation valves. The licensee's position to exclude from the scope of applicability of GL 88-01, the welds in that portion of the RWCU system piping outboard of the isolation valves is not acceptable as it does not comply with the requirements of GL 88-01. A minimum of 10% of the RWCU system piping outboard of the isolation valves should be inspected at each refueling outage. If cracks are found, the licensee should discuss sample expansion and mitigation methods with the staff.
4. The staff takes exception to the TER recommendation to accept the licensee's position concerning inspection of appurtenances to components; e.g., vents and drains. The licensee indicated, that such welds do not require Inservice Inspection under ASME XI, except for a possible visual inspection of the component internal surfaces or system pressure test and are not considered within the scope of GL 88-01. However, the licensee did not indicate that the piping in question is less than 4 inches in nominal diameter. GL 88-01 applies to all BWR piping made of austenitic stainless steel that is four inches or larger in nominal diameter and contains reactor coolant at a temperature above 200°F during power operation regardless of Code classification. It also applies to reactor vessel attachments and appurtenances such as jet pump instrumentation



penetration assemblies and head spray and vent components. The licensee is requested to revise the inspection plans to include the referenced appurtenances or verify that the piping in question is less than 4 inches in nominal diameter.

5. The staff takes exception to the TER recommendation to accept the licensee's position concerning the classification of the solution treated, Type 316L welds in the WCS. These welds can be classified as Category A only after the material has satisfactorily passed the test for resistance to sensitization in accordance with ASTM A262-A or -EI of equivalent standard. The licensee is requested to reevaluate the IGSCC weld classification of the 316L grade stainless steel portions of the WCS, where the material was not subject to a sensitization test.

For a detailed discussion of the above items, refer to the TER attached to the Safety Evaluation.

As a reminder, GL 88-01 requires that if any cracks are identified that do not meet the criteria for continued operation without evaluation given in Section XI of the Code, NRC approval of flaw evaluations and/or repairs in accordance with IWB-3640 and IWA-4130 is required before resumption of operation. Please note that weld overlay repair is considered as a non-Code repair, which requires NRC approval. ASME Code, Section XI, IWB-3640 states that piping containing a flaw exceeding the allowable flaw standards of IWB-3514.3 may be evaluated to determine its acceptability for continued service in accordance with the evaluation procedures and acceptance criteria of IWB-3641 or IWB-3642. The evaluation procedures and acceptance criteria are subject to approval by the NRC.

3.0 CONCLUSION

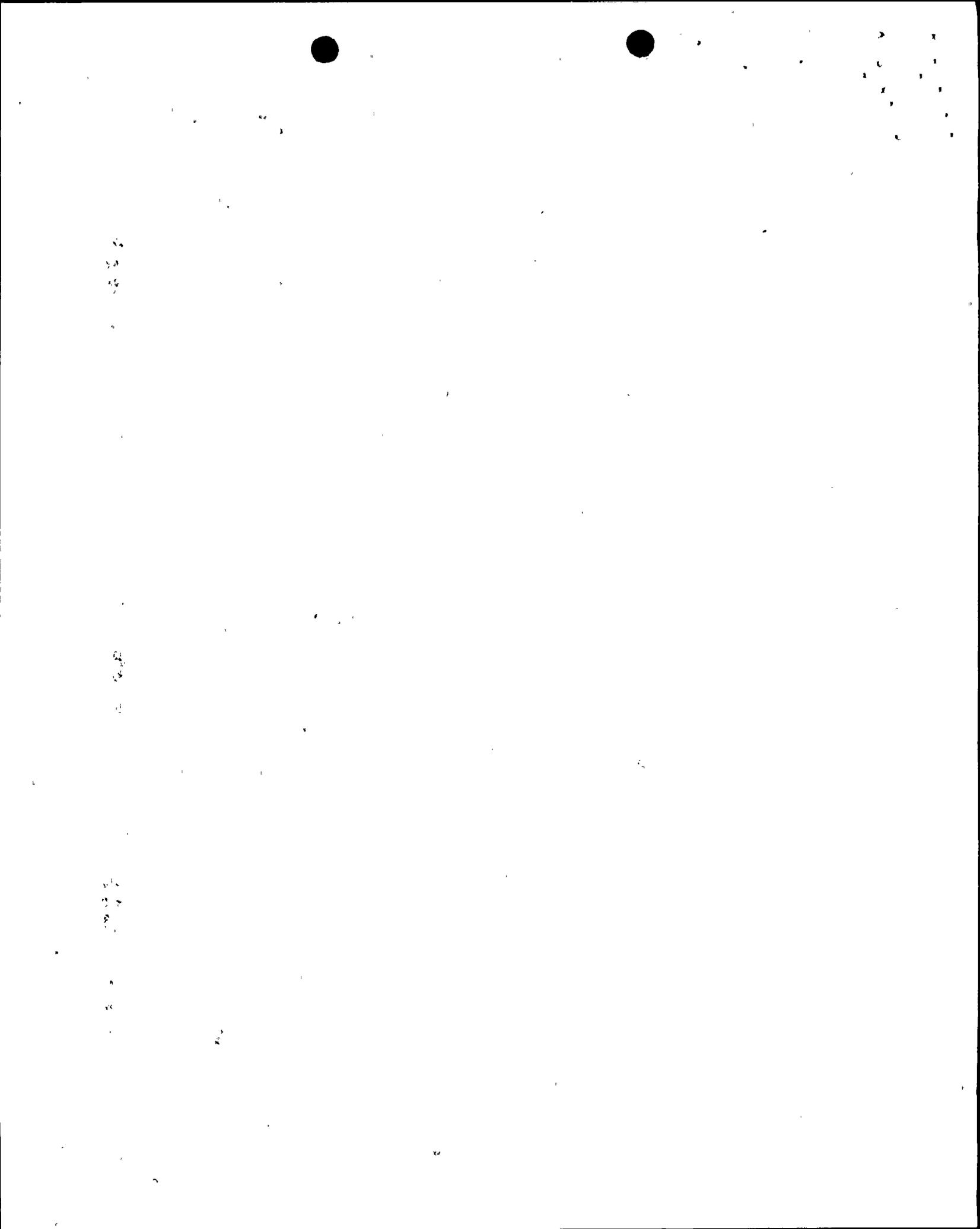
Based on the review of the licensee's NRC GL 88-01 response, the staff concludes that the response as evaluated is acceptable with the exception of the licensee's positions as identified above. The licensee is requested to resubmit inspection plans as discussed above.

The staff also concludes that the proposed IGSCC inspection and mitigation program will provide reasonable assurance of maintaining the long-term structural integrity of austenitic stainless steel piping in the Nine Mile Point, Unit 2.

Dated: August 17, 1990

PRINCIPAL CONTRIBUTORS:

T. McLellan
W. Koo



MODEL BWR TECHNICAL SPECIFICATIONS

REACTOR COOLANT SYSTEM

OPERATIONAL LEAKAGE

LIMITING CONDITION FOR OPERATION

3.4.3.2 Reactor coolant system leakage shall be limited to:

- a. No PRESSURE BOUNDARY LEAKAGE.
- b. 5 gpm UNIDENTIFIED LEAKAGE.
- c. 25 gpm total leakage averaged over any 24-hour period.
- d. 1 gpm leakage from any reactor coolant system pressure isolation valve specified in Table 3.4.3.2-1.
- (e. 2 gpm increase in UNIDENTIFIED LEAKAGE within any 24-hour period.)

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2 and 3.

ACTION:

- a. With any PRESSURE BOUNDARY LEAKAGE, be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.
- b. With any reactor coolant system leakage greater than the limits in b and/or c, above, reduce the leakage rate to within the limits within 4 hours or be in at least HOT SHUTDOWN WITHIN THE NEXT 12 hours and in COLD SHUTDOWN within the following 24 hours.
- c. With any reactor coolant system pressure isolation valve leakage greater than the above limit, isolate the high pressure portion of the affected system from the low pressure portion within 4 hours by use of at least two closed manual or deactivated automatic valves, or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.
- d. With any reactor coolant system leakage greater than the limit in e above, identify the source of leakage within 4 hours or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.)

SURVEILLANCE REQUIREMENTS

4.4.3.2.1 The reactor coolant system leakage shall be demonstrated to be within each of the above limits by:

- a. Monitoring the primary containment atmospheric particulate (and/or gaseous) radioactivity at least once per (4 or 12 as applicable to plant) hours,
- b. Monitoring the primary containment sump flow rate at least once per eight (8) hours,



REACTOR COOLANT SYSTEM

SURVEILLANCE REQUIREMENTS (Continued)

- c. Monitoring the primary containment air coolers condensate flow rate at least once per (4 or 12 as applicable to plant) hours, and
- d. Monitoring the reactor vessel head flange leak detection system at least once per 24 hours.

4.4.3.2.2 Each reactor coolant system pressure isolation valve specified in Table 3.4.3.2-1 shall be demonstrated OPERABLE pursuant to Specification 4.0.5, except that in lieu of any leakage testing required by Specification 4.0.5, each valve shall be demonstrated OPERABLE by verifying leakage to be within its limit:

- a. At least once per 18 months.
- b. Prior to entering HOT SHUTDOWN whenever the plant has been in COLD SHUTDOWN for 72 hours or more and if leakage testing has not been performed in the previous 9 months.
- c. Prior to returning the valve to service following maintenance, repair or replacement work on the valve.
- d. Within 24 hours following valve actuation due to automatic or manual action or flow through the valve.



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