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) hours,

b. Monitoring the primary containment sump flow rate at least once per (4) hours,

SURVEILLANCE REQUIREMENTS (Continued)

c. Monitoring the primary containment air coolers condensate flow rate at least once per (4) 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.

APPLICABILITY

SURVEILLANCE REQUIREMENTS

4.0.1 Surveillance Requirements shall be met during the OPERATIONAL CONDITIONS or other conditions specified for individual Limiting Conditions for Operation unless otherwise stated in an individual Surveillance Requirements.

4.0.2 Each Surveillance Requirement shall be performed within the specified time interval with:

a. A maximum allowable extension not to exceed 25% of the surveillance interval, but

b. The combined time interval for any 3 consecutive surveillance intervals shall not exceed 3.25 times the specified surveillance interval.

4.0.3 Failure to perform a Surveillance Requirement within the specified time interval shall constitute a failure to meet the OPERABILITY requirements for a Limiting Condition for Operation. Exceptions to these requirements are stated in the individual Specificatons. Surveillance requirements do not have to be performed on inoperable equipment.

4.0.4 Entry into an OPERATIONAL CONDITION or other specified applicable condition shall not be made unless the Surveillance Requirement(s) associated with the Limiting Condition for Operation have been performed within the applicable surveillance interval or as otherwise specified.

4.0.5 Surveillance Requirements for inservice inspection and testing of ASME Code Class 1, 2, & 3 components shall be applicable as follows:

a. Inservice inspection of ASME Code Class 1, 2, and 3 components and inservice testing of ASME Code Class 1, 2, and 3 pumps and valves shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50, Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50, Section 50.55a(g)(6)(i).

b. Surveillance intervals specified in Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda for the inservice inspection and testing activities required by the ASME Boiler and Pressure Vessel Code and applicable Addenda shall be applicable as follows in these Technical Specifications:

ASME Boiler and Pressure Vessel Code and applicable Addenda terminology for inservice inspection and testing activities	Required frequencies for performing inservice inspection and testing activities
Weekly	At least once per 7 days
Monthly	At least once per 31 days
Quarterly or every 3 months	At least once per 92 days
Semiannually or every 6 months	At least once per 184 days
Every 9 months	At least once per 276 days
Yearly or annually	At least once per 366 days

SURVEILLANCE REQUIREMENTS (Continued)

c. The provisions of Specification 4.0.2 are applicable to the above required frequencies for performing inservice inspection and testing activities.

d. Performance of the above inservice inspection and testing activities shall be in addition to other specified Surveillance Requirements.

e. Nothing in the ASME Boiler and Pressure Vessel Code shall be construed to supersede the requirements of any Technical Specification.

4.0.6 All ASME Code Class 1, 2, and 3 lines shall conform to the guidelines stated in the NUREG-0313, Rev. 1, "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping," July 1980. *

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

TO PROVISIONAL OPERATING LICENSE NO. DPR-45

DAIRYLAND POWER COOPERATIVE

LA CROSSE BOILING WATER REACTOR

DOCKET NO. 50-409

1.0 BACKGROUND

In January 1975, a Pipe Crack Study Group was formed to investigate the occurrence of cracking in austenitic stainless steel piping of Boiling Water Reactors (BWR). The Study Group report, NUREG-75/067, indicated that, "although the probability is extremely low that the presence of cracks and leaks could result in a significant safety hazard to the public, the presence of such conditions is not consistent with the Design Criteria in 10 CFR 50." The Study Group recommended, "steps should be taken to minimize (intergranular) stress-corrosion cracking in BWR piping systems to eliminate this condition and also improve plant reliability."

Intergranular stress corrosion cracking (IGSCC) in austenitic stainless steel material is caused by a combination of high tensile stresses, sensitized material and a corrosive environment. The BWR reactor coolant which operates with a high oxygen content, is a corrosive environment capable of causing IGSCC in sensitized austenitic stainless steel piping.

The NRC through NUREG-0313 implemented an augmented inservice inspection (ISI) and leak detection program in BWR ASME Code Class I and II pressure boundary austenitic stainless steel piping which could be susceptible to IGSCC. Susceptible materials were identified as "non-conforming". The degree of augmented ISI depends upon whether the non-conforming lines had been identified as "service sensitive." Service sensitive lines are defined as the BWR Class I and II pressure boundary piping which experienced cracking in service or are considered to be particularly susceptible because of high stress and relatively stagnant, intermittent, or low coolant flow conditions". Non-service sensitive lines are all BWR Class I and II pressure boundary non-conforming lines not classified as service sensitive.

NUREG-0313 requires non-conforming, non-service sensitive lines be examined to the schedule specified in the ASME Code, Section XI-Subsection IWB, with the exception that the examination be completed within 80 months instead of 120 months. If the examination conducted during the first 80 months period reveals no instances of IGSCC, the examination thereafter would revert to the 120 month schedule prescribed in ASME Section XI.

NUREG-0313 requires that non-conforming, service sensitive lines in the by-pass piping, in the main recirculation loop, and in the core spray piping be examined at each reactor refueling outage or other plant shutdown. In the event these examinations reveal no IGSCC for three successive examinations, the examination schedule would be extended to 36 month periods (plus or minus by a much as 12 months coninciding with a refueling outage) and the examination would be limited to one by-pass pipe run and one reactor core spray pipe run.

NUREG-0313 requires all other non-conforming service snesitive lines be examined on a sampling basis with the period of examination required for the core spray piping and by-pass piping in the recirculation loop. In the event three successive examinations at each reactor refueling outage or other plant shutdown and three successive examinations during 36 month periods reveal no IGSCC the examination schedule could revert to ASME Section XI with the exception that the examination be completed within 80 months.

In a letter dated July 10, 1980, the Dairyland Power Cooperative summarized their operating and inspection experience with non-conforming lines during 10 years of operation from 1969 to 1979. Examination of non-service sensitive lines had been completed according to the accelerated examination requirements of NUREG-0313. Non-conforming, service sensitive lines had been examined at least once during 1969-1979 and some had been examined more than once from 1969 to 1979. No unacceptable indications were observed during examinations of the non-conforming service sensitive lines. In addition, LACBWR completed ten years of operation form 1969-1979 without having any welds in the reactor coolant system (RCS) pressure boundary piping develop a leak.

Based upon the successful operating and inspection experienced by LACBWR, the Dairyland Power Cooperative stated that the scheduled examinations of non-conforming non-service sensitive lines would be in accordance with ASME Code Section XI as modified by Technical Specifications and the schedules examination of non-conforming service sensitive lines would be conducted in 80 month periods.

2.0 EVALUATION

a. Non-conforming, Service Sensitive Lines

The LACBWR non-conforming, service sensitive lines were not examined during three successive outages as required by NUREG-0313. The intent of examining service sensitive lines during three successive outages was to determine whether an operating BWR had a generic IGSCC problem similar to those identified in NUREG-75/067. Since there have been no leaks identified in the RCS pressure boundary piping and no unacceptable indications have been found during the inservice inspection subsequent to 10 years of operation, the LACBWR non-conforming service sensitive lines do not appear to have a potential for IGSCC that is as severe as those lines identified in NUREG-75/067. However, non-conforming, service sensitive lines in the LACBWR are still considered to have potential for IGSCC because of the likely presence of sufficiently high residual tensile stresses , sensitized material, and high oxygen, low flow coolant in these lines during plant operation.

b. Non-conforming, Non-Service Sensitive Lines

The inspections performed on the LACBWR non-conforming, non-service sensitive lines satisfy the accelerated examinations required by NUREG-0313.

3.0 CONCLUSIONS

1) Although non-conforming, service sensitive lines were not examined during three successive outages, the operation without leaks and non-destructive examinations during 10 years of service indicate these lines do not have an IGSCC problem as extensive as BWR's identified in NUREG-75/067.

2) Augmented ISI of LACBWR Non-conforming service sensitive lines is necessary because these lines operate in an environment and with conditions that have the potential to be susceptible to IGSCC.

3) Accelerated augmented ISI required by NUREG-0313 for non-conforming non-service snesitive lines has been completed on the LACBWR.

4.0 RECOMMENDATIONS

1) Non-conforming, non-service sensitive lines may be inspected in accordance with ASME Section XI schedule as modified by LACBWR Technical Specifications.

2) The LACBWR Technical Specifications should require that all non-conforming service sensitive lines be examined per NUREG-0313 at 36 month intervals (plus or minus by as much as 12 months) coinciding with a refueling outage. In the event these examinations reveal no unacceptableindications iwthin three successive inspections, the schedule may revert to the ASME Boiler and Pressure Vessel Code, Section XI, Inservice Insection of Nuclear Power Plant Components with the exception that the required examinations should be completed during each 80 month period (two-thirds the time prescribed in the scheduled in the ASME Code Section XI).

3) Non-conforming lines should be volumetrically inspected using ultrasonic procedures or other advanced non-destructive examination techniques which have been demonstrated to reliably detect and evaluate IGSCC in austenitic stainless steel piping.

4) The LACBWR Technical Specifications should incorporate the equivalent leak detection requirements of NUREG-0313, Rev. 1, July 1980, (Model T. S. attached for information).