Docket No. 50-245
B13614

Attachment 1

Millstone Nuclear Power Station, Unit No. 1

Proposed Revision to Technical Specifications
Reactor Coolant Leakage

December 1990

LIMITING CONDITION FOR OPERATION

3.6 PRIMARY SYSTEM BOUNDARY

D. Coolant Leakage

Whenever irradiated fuel is in the reactor vessel, reactor coolant leakage into the primary containment from unidentified sources shall not exceed 2.5 gpm. In addition, the total reactor coolant system leakage into the primary containment shall not exceed 25 gpm. If these conditions cannot be met, or if leak rate cannot be determined, initiate an orderly shutdown and have the reactor in the COLD SHUTDOWN or REFUEL CONDITION within 24 hours.

E. Safety and Relief Valves

1. During power operation or whenever the reactor coolant pressure is greater than 90 psig with irradiated fuel in the reactor vessel, the safety valve function of the six relief/safety valves shall be operable, except as specified in 3.6.E.5 below. (The solenoid activated relief function of the relief/safety valves shall be operable as required by Specification 3.5.D.).

SURVEILLANCE REQUIREMENT

4.6 PRIMARY SYSTEM BOUNDARY

D. Coolant Leakage

Reactor coolant system leakage into the primary containment shall be checked and recorded at least once every 8 hours, unless the reactor is in the COLD SHUTDOWN or REFUEL CONDITION.

E. Safety and Relief Valves

1. Three of the relief/safety valves top works shall be bench checked or replaced with a bench checked top works each refueling outage. All six valves top works shall be checked or replaced every two refueling outages. The set pressure shall be adjusted to correspond with a steam set pressure of:

No. of Valves	Set Point (psig)
1	1095 ± 1%
1	1110 ± 1%
4	1125 ± 1%

provide the operator with a warning mechanism so he can investigate and remedy the condition causing the change before limiting conditions, with respect to variables affecting the boundaries of the reactor coolant, are exceeded. Methods available to the operator for correcting the off-standard condition include operation of the reactor cleanup system, reducing the input of impurities and placing the reactor in the cold shutdown condition. The major benefit of cold shutdown is to reduce the temperature dependent corrosion rates and provide time for the cleanup system to re-establish the purity of the reactor coolant. During start-up periods and hot standby, which are in the category of less than 1% of full flow (80,000 pounds per hour), conductivity may exceed 2 mho/cm because of the initial evolution of gases and the initial addition of dissolved metals. During this period when the conductivity exceeds 2 mho (other than short-term spikes), samples will be taken to assure that the chloride concentration is less than 0.1 ppm.

The conductivity of the reactor coolant is continuously monitored. The samples of the coolant, which are taken every 96 hours, will serve as a reference for calibration of these monitors and is considered adequate to assure accurate readings of the monitors. If conductivity is within its normal range, chlorides and other impurities will also be within their normal ranges. The reactor coolant samples will also be used to determine the chlorides. Therefore the sampling frequency is considered adequate to detect long-term changes in the chloride ion content. While conductivity monitoring assures that pH is in the normal range, samples of reactor coolant are taken and tested for pH once a week as a check. Isotopic analyses to determine major contributors to activity can be performed by a gamma scan.

D. Coolant Leakage

The 2.5 gpm limit for leaks from unidentified sources was established by assuming the leakage was from the primary system. Tests demonstrate that a relationship exists between the size of a crack and the probability that a crack will propagate. For a crack size which gives a leakage rate of 2.5 gpm, the probability of rapid propagation is less than 10^{-5}. A leakage rate of 2.5 gpm is detectable and measurable.

During Cold Shutdown or Refueling, the probability of crack initiation and/or propagation is much less than 10^{-5}. Thus, there is no need to monitor for leakage when in these conditions.

The 25 gpm limit on total leakage to the containment was established by considering the removal capabilities of the pumps. The capacity of either of the drywell floor drain sump pumps is 50 gpm and the capacity of either of the drywell equipment drain sump pumps is also 50 gpm. Removal of 25 gpm from either of these sumps can be accomplished with considerable margin.

E. Safety and Relief Valves

Experience with the safety/relief valves indicates that testing of at least 50% of the safety valves per refueling outage is adequate to detect failures or deterioration. The tolerance value is specified in Section III of the ASME Boiler and Pressure Vessel Code as ±1% of design pressure. An analysis has been performed which shows that, with all safety valves set 1% higher, the reactor coolant pressure safety limit of 1375 psig is not exceeded.

The relief/safety valves have two functions: i.e., power relief or self-actuated by high pressure. The solenoid actuated function (automatic pressure relief) is that in which external instrumentation signals of coincident high drywell pressure and low-low water level initiate the valves to open. This function is discussed in Specification 3.5.D. In addition, the valves can be operated manually.

The safety function is performed by the same relief/safety valve with a pilot valve causing main valve operation.

It is understood that portions of the Valve Position Indication System cannot be repaired or replaced during operation, therefore, the plant must be shutdown to accomplish such repairs. The 30-day period to do this allows the operator the flexibility to choose his time for shutdown; meanwhile, because of the redundancy provided by the valve discharge temperature monitor and the continued monitoring of the remaining valves by both methods, the ability to detect the opening of a safety/relief valve would not be compromised. The valve operability is not affected by failure of the Valve Position Indication System.

When the setpoint is being bench checked, it is prudent to disassemble one of the relief/safety valves to examine for crud buildup, bending of certain actuator members or other signs of possible deterioration.

Testing at low reactor pressure is required during each operating cycle. It has been demonstrated that the blowdown of the valve to the torus causes a wave action that is detectable on the torus water level instrumentation. The discharge of a safety valve is audible to an individual located outside the torus in the vicinity of the line, as experienced at other BWR's.

BASES

F. Structural Integrity

See Bases Section 3.13 and 4.13.

G. Jet Pumps

Failure of a jet pump nozzle assembly holddown mechanism, nozzle assembly, and/or riser increases the cross sectional flow area for blowdown following the postulated design basis double-ended recirculation line break. Therefore, if a failure occurs, repairs must be made to assure the validity of the calculated consequences.

The following factors form the basis for the surveillance requirements:

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