3/4.9 REFUELING OPERATIONS

3/4.9.1 BORON CONCENTRATIONS

6

LIMITING CONDITION FOR OPERATION

3.9.1 With the reactor vessel head unbolted or removed, the boron concentration ~~of all filled portions~~ of the Reactor Coolant System** and the refueling canal shall be maintained ~~uniform and~~ sufficient to ensure that the more restrictive of following reactivity conditions is met:

a. Either a K_{eff} of 0.95 or less, or

b. A boron concentration of greater than or equal to 1720 ppm.

APPLICABILITY: MODE 6*.

ACTION:

With the requirements of the above specification not satisfied, within 15 minutes suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at greater than or equal to 40 gpm of boric acid solution at or greater than the required refueling water storage tank concentration (ppm) until K_{eff} is reduced to less than or equal to 0.95 or the boron concentration is restored to greater than or equal to 1720 ppm, whichever is the more restrictive. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full length CEA in excess of 3 feet from its fully inserted position within the reactor pressure vessel.

4.9.1.2 The boron concentration ~~of all filled portions~~ of the reactor coolant system** and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

4.9.1.3 The boron concentration in the cold leg side of the steam generators shall be determined to be greater than or equal to 1300 ppm prior to entering MODE 6. RWB 6/1

*The reactor shall be maintained in MODE 6 whenever the reactor vessel head is unbolted or removed and fuel is in the reactor vessel.

** For the Cycle 13 mid-cycle core offload activities, it is acceptable for the boron concentration of the water volumes in the steam generators and connecting piping to be as low as ~~1600~~ 1300 ppm. RWB 6/1/96

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3/4.9 REFUELING OPERATIONS

BASES

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) ~~uniform~~ sufficient boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the accident analyses.

INSERT Attachment "A"

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the source range neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel ensures that sufficient time has elapsed to allow the radioactive decay of the short-lived fission products. This decay time is consistent with the assumptions used in the accident analyses.

The requirement that the spent fuel pool bulk temperature be maintained below 140°F ensures that high water temperature will not degrade resin in the spent fuel pool demineralizers and that the temperature and humidity above the pool are compatible with personnel comfort and safety requirements. Additionally, the requirement ensures that the design temperature of the fuel pool cooling system, liner/building structures, and racks are not exceeded.

The requirement for the reactor to remain in MODE 5 or 6 until the most recent 1/3 core offload has decayed 504 hours ensures that alternate cooling is available during this time to cool the spent fuel pool should a failure occur in the spent fuel pool cooling system. The shutdown cooling (SDC) system is a high capacity system; that is, one train is sufficient to cool both the core and the spent fuel pool should a failure occur in the spent fuel pool cooling system within 504 hours from reactor shutdown.

3/4.9.4 CONTAINMENT PENETRATIONS

The requirements on containment penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive material release from a fuel element rupture based upon the lack of containment pressurization potential while in the REFUELING MODE.

3/4.9.5 COMMUNICATIONS

The requirement for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity condition during fuel or CEA movement within the reactor pressure vessel.

Attachment "A"

For the Cycle 13 mid-cycle core offload activities, the boron concentration of the water volumes in the steam generators and connecting piping may be as low as 1300 ppm. During REFUELING and/or CORE ALTERATIONS, the water volumes in the steam generators and connecting piping are stagnant and do not readily mix with the water in the reactor vessel. The water volumes in the pressurizer and connecting piping, shutdown cooling system (including reactor vessel and connecting piping), and refueling pool shall be maintained greater than 1820 ppm. | RWB 6/1/96 | RWB 6/1/96

A boron dilution calculation has been performed which accounts for dilution of the shutdown cooling system with the water volumes from the steam generators and connecting piping, and it was as low as 1300 ppm. This analysis demonstrates that, in the unlikely event in which all of the water in the steam generators and connecting piping mixes with the water in the shutdown cooling system, the resulting shutdown cooling system boron concentration will remain greater than the required refueling boron concentration.

The surveillance requirement to verify that the boron concentration in the steam generators is greater than 1300 ppm prior to entering MODE 6 is consistent with the assumptions of the boron dilution calculation. The sample points are only located on the cold leg side of the steam generators. These sample points are representative of the water volumes in the steam generators (both hot and cold legs) and their connecting piping, based on the fact that uniform mixing of these water volumes at a boron concentration of approximately 1320 ppm had occurred prior to shutting off the reactor coolant pumps. In March 1996, the reactor coolant system was drained and and subsequently refilled with water having a boron concentration greater than or equal to 1320 ppm. ~~It is therefore expected that~~ The boron concentration of the water in the steam generators and connecting piping is expected to be greater than 1300 ppm. ~~and cold legs samples at each steam generator are within X ppm of the SDC sample~~ RWB 6/1/96

Docket No. 50-336
B15738

Attachment 4

Millstone Nuclear Power Station, Unit No. 2

Proposed Revision to Technical Specifications

Refueling Boron Concentration

Marked-up Pages

3/4.9 REFUELING OPERATIONS

3/4.9.1 BORON CONCENTRATIONS

LIMITING CONDITION FOR OPERATION

3.9.1 With the reactor vessel head unbolted or removed, the boron concentration of the Reactor Coolant System** and the refueling canal shall be maintained sufficient to ensure that the more restrictive of following reactivity conditions is met:

a. Either a K_{eff} of 0.95 or less, or

b. A boron concentration of greater than or equal to 1720 ppm.

APPLICABILITY: MODE 6*.

ACTION:

With the requirements of the above specification not satisfied, within 15 minutes suspend all operations involving CORE ALTERATIONS or positive reactivity changes and initiate and continue boration at greater than or equal to 40 gpm of boric acid solution at or greater than the required refueling water storage tank concentration (ppm) until K_{eff} is reduced to less than or equal to 0.95 or the boron concentration is restored to greater than or equal to 1720 ppm, whichever is the more restrictive. The provisions of Specification 3.0.3 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.1.1 The more restrictive of the above two reactivity conditions shall be determined prior to:

a. Removing or unbolting the reactor vessel head, and

b. Withdrawal of any full length CEA in excess of 3 feet from its fully inserted position within the reactor pressure vessel.

4.9.1.2 The boron concentration of the reactor coolant system** and the refueling canal shall be determined by chemical analysis at least once per 72 hours.

4.9.1.3 The boron concentration in the cold leg side of the steam generators shall be determined to be greater than or equal to 1300 ppm prior to entering MODE 6.

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*The reactor shall be maintained in MODE 6 whenever the reactor vessel head is unbolted or removed and fuel is in the reactor vessel.

**For the Cycle 13 mid-cycle core offload activities, it is acceptable for the boron concentration of the water volumes in the steam generators and connecting piping to be as low as 1300 ppm.

3/4.9.1 BORON CONCENTRATION

The limitations on reactivity conditions during REFUELING ensure that: 1) the reactor will remain subcritical during CORE ALTERATIONS, and 2) sufficient boron concentration is maintained for reactivity control in the water volume having direct access to the reactor vessel. These limitations are consistent with the initial conditions assumed for the boron dilution incident in the accident analyses.

For the Cycle 13 mid-cycle core offload activities, the boron concentration of the water volumes in the steam generators and connecting piping may be as low as 1300 ppm. During REFUELING and/or CORE ALTERATIONS, the water volumes in the steam generators and connecting piping are stagnant and do not readily mix with the water in the reactor vessel. The water volumes in the pressurizer and connecting piping, shutdown cooling system (including reactor vessel and connecting piping), and refueling pool shall be maintained greater than 1820 ppm.

A boron dilution calculation has been performed which accounts for dilution of the shutdown cooling system with the water volumes from the steam generators and connecting piping. This analysis demonstrates that, in the unlikely event in which all of the water in the steam generators and connecting piping mixes with the water in the shutdown cooling system, and it was as low as 1300 ppm, the resulting shutdown cooling system boron concentration will remain greater than the required refueling boron concentration.

The surveillance requirement to verify that the boron concentration in the steam generators is greater than 1300 ppm prior to entering MODE 6 is consistent with the assumptions of the boron dilution calculation. The sample points are only located on the cold leg side of the steam generators. These sample points are representative of the water volumes in the steam generators (both hot and cold legs) and their connecting piping, based on the fact that uniform mixing of these water volumes at a boron concentration of approximately 1320 ppm had occurred prior to shutting off the reactor coolant pumps. In March 1996, the reactor coolant system was drained and subsequently refilled with water having a boron concentration greater than or equal to 1320 ppm. The boron concentration of the water in the steam generators and connecting piping is greater than 1300 ppm.

3/4.9.2 INSTRUMENTATION

The OPERABILITY of the source range neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

3/4.9.3 DECAY TIME

The minimum requirement for reactor subcriticality prior to movement of irradiated fuel ensures that sufficient time has elapsed to allow the radioactive decay of the short-lived fission products. This decay time is consistent with the assumptions used in the accident analyses.

The requirement that the spent fuel pool bulk temperature be maintained below 140°F ensures that high water temperature will not degrade resin in the spent fuel pool demineralizers and that the temperature and humidity above the pool are compatible with personnel comfort and safety requirements. Additionally, the requirement ensures that the design temperature of the fuel pool cooling system, liner/building structures, and racks are not exceeded.

The requirement for the reactor to remain in MODE 5 or 6 until the most recent 1/3 core offload has decayed 504 hours ensures that alternate cooling is available during this time to cool the spent fuel pool should a failure occur in the spent fuel pool cooling system. The shutdown cooling (SDC) system is a high capacity system; that is, one train is sufficient to cool both the core and the spent fuel pool should a failure occur in the spent fuel pool cooling system within 504 hours from reactor shutdown.

3/4.9.4 CONTAINMENT PENETRATIONS

The requirements on containment penetration closure and OPERABILITY ensure that a release of radioactive material within containment will be restricted from leakage to the environment. The OPERABILITY and closure restrictions are sufficient to restrict radioactive material release from a fuel element rupture based upon the lack of containment pressurization potential while in the REFUELING MODE.

3/4.9.5 COMMUNICATIONS

The requirement for communications capability ensures that refueling station personnel can be promptly informed of significant changes in the facility status or core reactivity condition during fuel or CEA movement within the reactor pressure vessel.