Docket No. 50-423
B16309

Attachment 2

Millstone Nuclear Power Station Unit No. 3
Marked Up Bases Pages

March 1997

3/4.7.1.5 MAIN STEAM LINE ISOLATION VALVES

The OPERABILITY of the main steam line isolation valves ensures that no more than one steam generator will blow down in the event of a steam line rupture. This restriction is required to: (1) minimize the positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and (2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam isolation valves within the closure times of the Surveillance Requirements are consistent with the assumptions used in the safety analyses.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure-induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on a steam generator RT_{NDT} of 60°F and are sufficient to prevent brittle fracture.

3/4.7.3 REACTOR PLANT COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the Reactor Plant Component Cooling Water System ensures that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the safety analyses.

3/4.7.4 SERVICE WATER SYSTEM

The OPERABILITY of the Service Water System ensures that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the safety analyses.

3/4.7.5 ULTIMATE HEAT SINK

Background

The ultimate heat sink (UHS) for Millstone Unit No. 3 is Long Island Sound. It serves as a heat sink for both safety and nonsafety-related cooling systems. Sensible heat is discharged to the UHS via the service water and circulating water systems.

Limiting Condition for Operation

The UHS is required to be OPERABLE and is considered OPERABLE if the average water temperature is less than or equal to 75°F. The limitation on the UHS temperature ensures that cooling water at less than the design temperature (75°F)

(or)

Limiting Condition for Operation (Continued)

is available to either (1) provide normal cooldown of the facility or (2) mitigate the effects of accident conditions within acceptable limits. It is based on providing a 30-day cooling water supply to safety-related equipment without exceeding its design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants," March 1974.

Insert A

~~The UHS temperature is measured at the six circulating water system inlet waterboxes. The plant process computer samples the operating waterbox temperature measurements, excludes the highest and lowest measurements, and averages the remaining temperatures. An evaluation has determined that measuring at this location is representative of the UHS temperature. The only exception to this would be when a condenser thermal backwashing evolution is being conducted. During this evolution, there is a potential for significant intake structure temperature stratification. Therefore, during condenser thermal backwashing evolutions, the UHS temperature should be monitored by temperature instruments in the service water system to assure OPERABILITY of the UHS.~~

Applicability

In MODES 1, 2, 3, AND 4, the UHS is required to support the OPERABILITY of the equipment serviced by the UHS and required to be OPERABLE in these MODES.

Action Statement

When the UHS temperature is above 75°F, the Action Statement for the LCO requires that the UHS temperature be monitored for 12 hours, and the plant be placed in at least HOT STANDBY within the next six hours and in COLD SHUTDOWN within the following 30 hours in the event the UHS temperature does not drop below 75°F during the 12-hour monitoring period.

The 12-hour interval is based on operating experience related to trending of the parameter variations during the applicable modes. During this period, the UHS temperature will be monitored on an increased frequency. If the trend shows improvement, and if the trend of the UHS temperature gives reasonable expectations that the temperature will decrease below 75°F during the 12 hour monitoring period, the UHS temperature will be continued to be monitored during the remaining portion of the 12-hour period. However, if it becomes apparent that the UHS temperature will remain above 75°F throughout the 12-hour monitoring period, conservative action regarding compliance with the Action Statement should be taken.

An evaluation was conducted to qualify the risk significance of various Chapter 15 initiating events and earthquakes during periods of elevated UHS temperature. It concluded that a seismic event was not credible for the time periods with elevated UHS temperature. ~~Additionally, the risk significance of a Condition IV accident occurring during a period of elevated UHS temperature is considered to be negligibly small when compared to the risk significance of Chapter 15 events that are more likely to occur.~~

Action Statement (Continued)

With respect to the service water loads, the limiting Condition II and III Chapter 15 event initiators are those that add additional heat loads to the service water system. A loss of offsite power event is limiting because of the added loads due to the diesel generator and the residual heat removal heat exchanger. A steam generator tube rupture event is limiting because of the addition of the safety injection and diesel generator loads without isolation of the turbine plant component cooling water loads (no loss of offsite power or containment depressurization actuation signal). ~~Both of these~~ scenarios have been evaluated with the additional consideration of a single failure. The evaluation investigated whether or not these events could be resolved with an elevated UHS temperature. It was determined that Millstone Unit No. 3 could recover from these events, even with an elevated temperature of 77°F.

Insert B

This evaluation provides the basis for the action statement requirement to place the plant in HOT STANDBY with six hours and in COLD SHUTDOWN within the next 30 hours, if the UHS temperature goes above 77°F during the 12-hour monitoring period.

Surveillance Requirements

For the surveillance requirements, the UHS temperature is measured at the locations described in the LCO write-up provided in this section.

Surveillance Requirement 4.7.5.a verifies that the UHS is capable of providing a 30-day cooling water supply to safety-related equipment without exceeding its design basis temperature. The 24-hour frequency is based on operating experience related to trending of the parameter variations during the applicable modes. This surveillance requirement verifies that the average water temperature of the UHS is less than or equal to 75°F.

Surveillance Requirement 4.7.5.b requires that the UHS temperature be monitored on an increased frequency whenever the UHS temperature is greater than 70°F during the applicable modes. The intent of this Surveillance Requirement is to increase the awareness of plant personnel regarding UHS temperature trends above 70°F. The frequency is based on operating experience related to trending of the parameter variations during the applicable modes.

Insert A

The Circulating Water System has six condenser inlet waterboxes, each contains a temperature measurement device. The average UHS temperature is normally obtained from the plant process computer by averaging the six Circulating Water System condenser inlet waterbox temperature measurements. Given potential condenser waterbox temperature instrumentation failure(s), or that a waterbox is not operating, or a process computer failure, other methods may be used to determine the average UHS temperature. For example, if one condenser waterbox instrument has failed, the average UHS temperature may be based on five condenser inlet waterbox temperature measurements. For the purposes of determining average UHS temperature, if condenser waterbox inlet temperature is used, the average should be based on no less than 3 measurements. If the process computer condenser waterbox inlet temperature average is based on less than three measurements, the average is automatically flagged to users as potentially in error. Using local Service Water System temperature instruments (two or more) is an acceptable alternative for determining average UHS temperature.

It has been concluded that using the average of multiple condenser waterbox inlet temperature measurements is sufficiently representative of the UHS temperature to assure OPERABILITY of the UHS. The only exception to this conclusion is when a condenser thermal backwash evolution is being conducted. During this evolution, there is a potential for significant intake structure temperature stratification. Therefore, during condenser thermal backwashing evolutions, the average UHS temperature shall be monitored by temperature instruments in the service water system to assure OPERABILITY of the UHS.

Insert B

Although the risk significance of a Condition IV accident occurring during the period of elevated UHS temperature is considered to be negligibly small compared to that of Condition II and III events, Loss of Coolant Accident with or without a LOP was also evaluated. These . . .

Docket No. 50-423
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Attachment 3

Millstone Nuclear Power Station Unit No. 3
Retyped Bases Pages

March 1997

3/4.7.1.5 MAIN STEAM LINE ISOLATION VALVES

The OPERABILITY of the main steam line isolation valves ensures that no more than one steam generator will blow down in the event of a steam line rupture. This restriction is required to: (1) minimize the positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and (2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam isolation valves within the closure times of the Surveillance Requirements are consistent with the assumptions used in the safety analyses.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator pressure and temperature ensures that the pressure-induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitations of 70°F and 200 psig are based on a steam generator RT_{NDT} of 60°F and are sufficient to prevent brittle fracture.

3/4.7.3 REACTOR PLANT COMPONENT COOLING WATER SYSTEM

The OPERABILITY of the Reactor Plant Component Cooling Water System ensures that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the safety analyses.

3/4.7.4 SERVICE WATER SYSTEM

The OPERABILITY of the Service Water System ensures that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the safety analyses.

3/4.7.5 ULTIMATE HEAT SINK

Background

The ultimate heat sink (UHS) for Millstone Unit No. 3 is Long Island Sound. It serves as a heat sink for both safety and nonsafety-related cooling systems. Sensible heat is discharged to the UHS via the service water and circulating water systems.

Limiting Condition for Operation

The UHS is required to be OPERABLE and is considered OPERABLE if the average water temperature is less than or equal to 75°F. The limitation on the UHS temperature ensures that cooling water at or less than the design temperature

Limiting Condition for Operation (Continued)

(75°F) is available to either (1) provide normal cooldown of the facility or (2) mitigate the effects of accident conditions within acceptable limits. It is based on providing a 30-day cooling water supply to safety-related equipment without exceeding its design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants," March 1974.

The Circulating Water System has six condenser inlet waterboxes, each contains a temperature measurement device. The average UHS temperature is normally obtained from the plant process computer by averaging the six Circulating Water System condenser inlet waterbox temperature measurements. Given potential condenser waterbox temperature instrumentation failure(s), or that a waterbox is not operating or a process computer failure, other methods may be used to determine the average UHS temperature. For example, if one condenser waterbox instrument has failed, the average UHS temperature may be based on five condenser inlet waterbox temperature measurements. For the purposes of determining average UHS temperature, if condenser waterbox inlet temperature is used, the average should be based on no less than 3 measurements. If the process computer condenser waterbox inlet temperature average is based on less than three measurements, the average is automatically flagged to users as potentially in error. Using local Service Water System temperature instruments (two or more) is an acceptable alternative for determining average UHS temperature.

It has been concluded that using the average of multiple condenser waterbox inlet temperature measurements is sufficiently representative of the UHS temperature to assure OPERABILITY of the UHS. The only exception to this conclusion is when a condenser thermal backwash evolution is being conducted. During this evolution, there is a potential for significant intake structure temperature stratification. Therefore, during condenser thermal backwashing evolutions, the average UHS temperature shall be monitored by temperature instruments in the service water system to assure OPERABILITY of the UHS.

Applicability

In MODES 1, 2, 3, AND 4, the UHS is required to support the OPERABILITY of the equipment serviced by the UHS and required to be OPERABLE in these MODES.

Action Statement

When the UHS temperature is above 75°F, the Action Statement for the LCO requires that the UHS temperature be monitored for 12 hours, and the plant be placed in at least HOT STANDBY within the next six hours and in COLD SHUTDOWN within the following 30 hours in the event the UHS temperature does not drop below 75°F during the 12-hour monitoring period.

The 12-hour interval is based on operating experience related to trending of the parameter variations during the applicable modes. During this period, the UHS temperature will be monitored on an increased frequency. If the trend shows improvement, and if the trend of the UHS temperature gives reasonable expectations that the temperature will decrease below 75°F during the 12 hour

Action Statement (Continued)

monitoring period, the UHS temperature will be continued to be monitored during the remaining portion of the 12-hour period. However, if it becomes apparent that the UHS temperature will remain above 75°F throughout the 12-hour monitoring period, conservative action regarding compliance with the Action Statement should be taken.

An evaluation was conducted to qualify the risk significance of various Chapter 15 initiating events and earthquakes during periods of elevated UHS temperature. It concluded that a seismic event was not credible for the time periods with elevated UHS temperature.

With respect to the service water loads, the limiting Condition II and III Chapter 15 event initiators are those that add additional heat loads to the service water system. A loss of offsite power event is limiting because of the added loads due to the diesel generator and the residual heat removal heat exchanger. A steam generator tube rupture event is limiting because of the addition of the safety injection and diesel generator loads without isolation of the turbine plant component cooling water loads (no loss of offsite power or containment depressurization actuation signal). Although the risk significance of a Condition IV accident occurring during the period of elevated UHS temperature is considered to be negligibly small compared to that of Condition II and III events, a Loss of Coolant Accident with or without a LOP was also evaluated. These scenarios have been evaluated with the additional consideration of a single failure. The evaluation investigated whether or not these events could be resolved with an elevated UHS temperature. It was determined that Millstone Unit No. 3 could recover from these events, even with an elevated temperature of 77°F.

This evaluation provides the basis for the action statement requirement to place the plant in HOT STANDBY with six hours and in COLD SHUTDOWN within the next 30 hours, if the UHS temperature goes above 77°F during the 12-hour monitoring period.

Surveillance Requirements

For the surveillance requirements, the UHS temperature is measured at the locations described in the LCO write-up provided in this section.

Surveillance Requirement 4.7.5.a verifies that the UHS is capable of providing a 30-day cooling water supply to safety-related equipment without exceeding its design basis temperature. The 24-hour frequency is based on operating experience related to trending of the parameter variations during the applicable modes. This surveillance requirement verifies that the average water temperature of the UHS is less than or equal to 75°F.

Surveillance Requirement 4.7.5.b requires that the UHS temperature be monitored on an increased frequency whenever the UHS temperature is greater than 70°F during the applicable modes. The intent of this Surveillance Requirement is to increase the awareness of plant personnel regarding UHS temperature trends above 70°F. The frequency is based on operating experience related to trending of the parameter variations during the applicable modes.