PLANT SYSTEMS

3/4.7.4 SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

consisting of two service water pumps and associated strainers per loop

3.7.4 ~~At least~~ two independent service water loops shall be OPERABLE

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

REPLACE with "Action Insert"

With only one service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.4 At least two service water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) servicing safety-related equipment that is not locked, sealed, or otherwise secured in position is in its correct position; and

b. At least once each REFUELING INTERVAL by verifying that:

1) Each automatic valve servicing safety-related equipment actuates to its correct position on its associated Engineered Safety Feature actuation signal, and

2) Each Service Water System pump starts automatically on an SIS test signal.

ACTION Insert

a. With one service water pump and/or its associated strainer inoperable in any one loop, restore the inoperable pump/strainer to OPERABLE status within 14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one service water loop otherwise inoperable, restore the service water loop to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS (continued)

to Specification 4.0.4 would also allow the MSIVs to be cycled to demonstrate post repair OPERABILITY. Action requirements shall not apply until OPERABILITY has been verified. In addition, if the closure time of the MSIV is less than 10 seconds when verified in accordance with Specification 4.7.1.5.2, the OPERABILITY demonstration of the MSIV in MODES 1, 2, or 3 is not required per Specification 4.7.1.5.1.

4.7.1.5.2 This surveillance verifies that MSIV closure time is less than 120 seconds on an actual or simulated actuation signal in MODE 4 when tested pursuant to Specification 4.0.5. A simulated signal is defined as any of the following engineered safety features actuation system instrumentation functional units per Technical Specification Table 4.3-2: 4.a.1) manual initiation, individual, 4.a.2) manual initiation, system, 4.c. containment pressure high-2, 4.d. steam line pressure low, and 4.e. steam line pressure - negative rate high. This MSIV closure time is assumed in the analyses. This surveillance is normally performed upon returning the plant to operation following a refueling outage. The test is conducted in MODE 4 with the plant at suitable (appropriate) conditions (e.g., pressure and temperature). This surveillance requirement is modified by an exception which allows a delay of testing until MODE 4, to establish conditions consistent with those under which the acceptance criterion was generated. This exception to Specification 4.0.4 would also allow the MSIVs to be cycled to demonstrate post repair OPERABILITY. Action requirements shall not apply until OPERABILITY has been verified.

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

REPLACE WITH INSERT 'A'

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.

Insert A

The operability of the service water system ensures that adequate cooling water is provided for heat removal from the reactor plant auxiliary systems during all modes of operation and from the turbine plant auxiliary system during normal plant operation. Parts of the service water system operate in support of ESF systems acting to mitigate the consequences of accidents; therefore, such parts are safety related. Operability of the safety related parts of the service water system are governed by this limiting condition for operation (LCO). To meet the single failure criterion of GDC 44 the service water system contains two separate 100% capacity cooling water loops. Each loop contains two service water pumps, two service water self-cleaning strainers, and various booster pumps, piping and valves. The redundant SW loops are powered from separate emergency power sources and have separate controls.

One service water pump is capable of supplying the minimum required flow during a design basis accident with a loss of power or during COLD SHUTDOWN with a loss of power. However, two pumps per loop are considered to be required: one pump to provide cooling to all accident mitigating equipment and another pump to provide additional flow to supply the Reactor Plant Component Cooling Water heat exchanger for post LOCA cooling of the Spent Fuel Pool.

Docket No. 50-423
B17566

Attachment 2

Millstone Nuclear Power Station, Unit No. 3
Proposed Revision to Technical Specification
Service Water Pumps and Strainers-14 Day Allowed Outage Time (TSCR 3-2-98)

Retyped Pages

February 1999

RETYPE OF PROPOSED REVISION

Refer to the attached retype of the proposed revision to the Technical Specifications (TS). The attached retype reflects the incorporation of the proposed changes to the TS. Pending TS revisions are not reflected in the enclosed retype. The enclosed retype should be checked for continuity with recently issued TS amendments prior to issuance.

3/4.7.4 SERVICE WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4 Two independent service water loops, consisting of two service water pumps and associated strainers per loop, shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With one service water pump and/or its associated strainer inoperable in any one loop, restore the inoperable pump/strainer to OPERABLE status within 14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one service water loop otherwise inoperable, restore the service water loop to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.4 At least two service water loops shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) servicing safety-related equipment that is not locked, sealed, or otherwise secured in position is in its correct position; and

b. At least once each REFUELING INTERVAL by verifying that:

1) Each automatic valve servicing safety-related equipment actuates to its correct position on its associated Engineered Safety Feature actuation signal, and

2) Each Service Water System pump starts automatically on an SIS test signal.

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 adequate cooling water is provided for heat removal from the reactor plant auxiliary systems during all modes of operation and from the turbine plant auxiliary system during normal plant operation. Parts of the service water system operate in support of ESF systems acting to mitigate the consequences of accidents; therefore, such parts are safety related. OPERABILITY of the safety-related parts of the service water system are governed by this limiting condition for operation (LCO). To meet the single failure criterion of GDC 44, the service water system contains two separate 100% capacity cooling water loops. Each loop contains two service water pumps, two service water self-cleaning strainers, and various booster pumps, piping and valves. The redundant SW loops are powered from separate emergency power sources and have separate controls.

One service water pump is capable of supplying the minimum required flow during a design basis accident with a loss of power or during COLD SHUTDOWN with a loss of power. However, two pumps per loop are considered to be required: one pump to provide cooling to all accident mitigating equipment and another pump to provide additional flow to supply the Reactor Plan Component Cooling Water heat exchanger for post LOCA cooling of the Spent Fuel Pool.

Docket No. 50-423
B17566

Attachment 3

Millstone Nuclear Power Station, Unit No. 3
Proposed Revision to Technical Specification
Service Water Pumps and Strainers-14 Day Allowed Outage Time (TSCR 3-2-98)

Background and Safety Summary

February 1999

Background

This change adds an ACTION statement to Technical Specification (TS) Section 3/4.7.4, which controls one of four service water pumps/strainers to an Allowed Outage Time (AOT) of up to 14 days.

The Millstone Unit No. 3 (MP-3) Service Water System (SWS) has two loops with two pumps/strainers per loop. The current MP-3 TS for SWS states, "At least two independent service water loops shall be OPERABLE." The current SWS ACTION statement for this TS states, "With only one service water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours."

An OPERABLE SWS loop is not defined in the BASES for TS 3/4.7.4. The MP-3 definition of an OPERABLE loop has been that only one pump per train is required. This interpretation is supported by MP-3 Chapter 15 Safety Analysis Report and is consistent with the BASES discussion in NUREG-1431 "Standard Technical Specifications for Westinghouse Plants." NUREG-1431 identifies the design basis of the SWS as the capability to remove core decay heat following a design basis Loss of Coolant Accident (LOCA). Each SWS train consists of two 100% capacity pumps.

As a result of issues associated with Spent Fuel Pool (SFP) cooling, this interpretation was re-evaluated as documented in voluntary LER 97-041. In this LER, it was identified that when an individual service water pump was removed from service for maintenance, the SWS may have been placed in a condition where following a design basis LOCA, the SWS may not have been able to support the SFP heat loads several hours after the accident. This was not considered a TS violation and thus was not reported. However, in the LER a commitment was made to conservatively define an operable loop as two service water pumps per loop based on the Final Safety Analysis Report (FSAR) description that a second service water pump would be brought on line post LOCA to cool the SFP.

In this regard, in January 1998, administrative controls (Technical Requirements Manual Clarification) were approved which defined an OPERABLE service water loop as requiring two service water pumps and strainers. Efforts were then initiated to perform a TS change to define an appropriate AOT duration for the second pump. This TS change is necessary because the current AOT (72 hrs.) associated with an inoperable loop was based upon the significance associated with a complete loss of the ability to remove core decay heat following a design basis LOCA. The capability to perform this function can be accomplished through the use of only one service water pump as presented in the proposed TS change. The new AOT reflects the design basis requirement for Service Water (SW) to provide SFP cooling.

Thus, this proposed TS change includes additional requirements for the SWS to address SFP cooling while still preserving the current TS requirements for core decay heat removal following a design basis LOCA.

This proposed TS change defines an OPERABLE loop as two pumps/strainers per loop with the following ACTION required:

a) With one service water pump and/or it's associated strainer inoperable in any one loop, restore the inoperable pump/strainer to OPERABLE status within 14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b) With one service water loop otherwise inoperable, restore the service water loop to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

Justification

One service water pump is sufficient to provide core decay heat removal during and after all design basis accidents. FSAR Section 9.1.3.3, identifies that SFP cooling would not be available until approximately 4 hours after a design bases LOCA, including a Loss of Power (LOP). This requires that a second service water pump be started in an operating loop 4 hours after a LOCA, to provide cooling flow to the reactor plant Component Cooling Water (CCP) System which cools the SFP. The original and current plant design includes these times in the determination of the temperatures used in the piping stress analysis for the SFP cooling system.

The SWS is designed so that only one SW pump is required to mitigate the consequences of a design bases LOCA with a LOP and for LOP cold shutdown. Thus the AOT for two inoperable SW pumps in one loop remains the same as the current AOT for an inoperable loop (72 hr.). In this regard, the same level of conservatism with respect to an inoperable loop is maintained. The AOT associated with the proposed TS is based upon the condition where only one service water pump and/or strainer in no more than one loop is inoperable. The 14 day AOT for this condition has been selected based upon an evaluation of the impact of the loss of SFP cooling.

With one pump/strainer inoperable (due to failure or maintenance), the SWS will have at least 3 pumps available. The LCO and associated ACTION statements will improve the availability of the SWS and will help ensure that the SWS, including pumps/strainers, is kept in a condition which allows it to perform all its design functions including providing cooling to both the Emergency Core Cooling System (ECCS) and the SFP cooling systems.

If the current ACTION statement for an inoperable loop were to be applied to a loss of one SW pump or strainer, a plant shutdown would result if any SW pump and/or strainer was unable to be returned to operable status within 72 hours. Based on a review of historical system performance this is likely to increase the occurrence of unplanned plant shutdowns. Application of the 14 day ACTION statement for only one SW pump or strainer inoperable will reduce the likelihood of an unplanned shutdown due to a loss of a SW pump or strainer in a loop. Since core decay heat removal will still be assured, the 14 day ACTION statement is considered acceptable for this condition.

A comparison of the proposed LCO against the most current standard TS (NUREG-1431) confirms that the proposed TS change is more conservative as discussed below.

The SWS described in the NUREG is composed of two redundant, 100% capacity SW pumps per loop. The design bases of the system is "to remove core decay heat following a design basis LOCA..." The description of the system also includes a requirement to provide emergency make up to the spent fuel pool. The MP-3 SWS has a non redundant connection from the A train to the SFP via a normally removed spool piece. This connection is discussed in Section 9.1.3 of the MP-3 Safety Evaluation Report as a back up to the preferred make up supply from the primary grade water and fire water systems, or a gravity drain flow path from the Refueling Water Storage Tank (RWST). The MP-3 service water system is capable of providing make-up using only one service water pump, concurrent with providing core decay heat removal.

The NUREG-1431 LCO considers a SWS train to be operable whenever, "The pump is OPERABLE.", requiring only <u>one</u> OPERABLE pump per train.

The NUREG-1431 LCO applicability statement is described as follows: "In Modes 1,2,3, and 4, the SWS is a normally operating system that is required to support the OPERABILITY of the equipment serviced by the SWS and required to be OPERABLE in these MODES." The SFP cooling system is not a system that is contained in NUREG 1431 or controlled within the current MP-3 Technical Specifications.

As such, only a single service water pump would be required to be contained in a NUREG-1431 based Technical Specification.

Safety Summary

The change provides additional controls on the second service water pump/strainer to improve the availability of the Spent Fuel Pool Cooling System (SFC). The SFC system is not controlled by the TS. However, the new control provides additional assurance of the ability of the SWS to meet the design basis required return to service of the SFC system post LOCA.

With one pump/strainer inoperable (due to failure or maintenance), the core decay heat removal function following a Design Basis Accident (DBA) will still be met even in consideration of a single failure. As such, the ACTION statement duration of 14 days with one inoperable service water pump is justified and meets single failure criteria. The LCO and ACTION statements help ensure that the SWS, including pumps/strainers, are maintained in a condition which allows performance of its design basis functions including core decay heat removal and SFP cooling.

This TS change will not affect the probability of malfunction of equipment since additional controls are placed on the SWS outage time. The consequences of a malfunction are unchanged as the new controls assure that additional equipment is available to mitigate the consequences of any malfunction. No new malfunctions are created by this change since no new equipment is added to the plant and the existing system continues to operate as it does presently.

The addition of a new ACTION statement and AOT will not increase the probability of an accident since the SWS is an accident mitigating system. This TS change will not increase the consequences of an accident since it continues to protect the availability of equipment necessary to perform all design basis functions. The change will not create the possibility of a different type of accident as a loss of the SWS is not a design basis accident initiator.

The margin of safety is not reduced since the new LCO and AOT provide new controls on the SWS and existing controls are maintained. As such continued assurance that the BASES of the present Technical Specification is met exists.

The SW pumps have been modified since original plant construction. The materials for the impellers, shafts, bearings, and columns, have been upgraded. The reliability of SW pumps has been measurably improved. The likelihood for the need of removing an additional pump from service during the 14 day LCO has been greatly reduced.

In the event it is not possible to restore cooling to the SFP, there are compensatory measures which can be placed in effect. As described in FSAR Sections 9.1.3.2 and 9.1.3.3, water can be added to the pool to make up for any evaporative losses. This is available via the primary grade water or Fire Protection System or gravity flow from the

RWST. There is also a service water connection provided from the A train of the SWS to the SFP via a normally removed spool piece. These actions can be taken in the period after the LOCA and would ensure that the fuel remains covered.

The change provides additional controls to assure availability of the SFP cooling system which is not in the TS. Given the ability to supply makeup water to the pool from various sources, and the unlikely occurrence of a LOCA and a SW pump out of service due to improved material conditions, the change is judged to be safe. It has also been determined to not be an Unreviewed Safety Question.

Docket No. 50-423
B17566

Attachment 4

Millstone Nuclear Power Station, Unit No. 3
Service Water Pumps and Strainers-14 Day Allowed Outage Time (TSCR 3-2-98)

Significant Hazards Consideration and Environmental Considerations

February 1999

NNECO has reviewed the proposed revision in accordance with 10 CFR50.92 and has concluded that the revision does not involve any Significant Hazards Considerations (SHC). The basis for this conclusion is that the three criteria of 10CFR50.92(c) are not satisfied. The proposed Technical Specification revision does not involve an SHC because the revision would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed TS change adds an additional AOT for one of four of the service water pumps/strainers in the SWS. The capabilities of the SWS were evaluated in order to ensure that a significant increase in the probability or consequences of the following previously evaluated accidents, LOP, LOCA with concurrent LOP and secondary side piping break inside containment, are precluded by SWS mitigative functions. As the above DBA's are not caused by the failure of the SWS to operate, the SWS can not affect the probability of these accidents to occur.

   Since both pumps/strainers in each loop are covered by the ACTION statement in the TS when inoperable (due to failure or maintenance), and the proposed ACTION statement for two inoperable service water pumps in a single loop is consistent with the current ACTION statement, there is no impact on the capability to maintain core decay heat removal following a DBA. Further, the revised TS will improve availability of the SWS. The LCO and ACTION statements help ensure that the SWS, including pumps/strainers, are kept in a condition which allows it to perform all its design functions including providing core decay heat removal and the SFP cooling. As such, there is no affect on the consequences of previously evaluated accidents.

   Thus, it is concluded that the proposed revision does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated.

   The SWS is used to remove heat from the reactor plant auxiliary systems and other systems. Only one of four pumps is required to be operating during normal plant conditions. In addition, only one 100% capacity pump is required to provide the necessary flow to mitigate the consequences of a DBA. This change continues to require two pumps/strainers per loop to be operable and imposes strict controls on the AOT for the SWS pumps/strainers via the imposition of the LCO controls on the SWS. This assures that four service water pumps/strainers will always be available or the plant will be in an ACTION STATEMENT. The SWS is used to mitigate the consequences of an accident and will not cause an accident.

Thus, this proposed revision does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Involve a significant reduction on the margin of safety.

This change will have no impact on the performance of any safety related system covered by the TS. This change explicitly defines the number of pumps/strainers required for the SWS to be considered OPERABLE and the ACTION required which specifies the AOT for inoperable components. The required flow rate for accident mitigation continues to be available to all ECCS components and their support systems. As such, this change does not increase the peak clad temperature for a DBA-LOCA.

The proposed Technical Specification change adds an additional AOT for one of four of the service water pumps/strainers in the SWS. Two service water pumps/strainers are required to perform the design function of the SWS; one pump to mitigate the DBA and the other to reduce the potential of the SFP boiling which could occur if a service water pump is unavailable for SFP cooling after a design basis LOCA.

The existing TS Bases states that "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."

Since this change continues to control the availability of the SW pumps by placing the system in an ACTION statement with one loop out of service, then the change will continue to comply with the existing BASES requirements. Thus it is concluded that the proposed revision does not involve a significant reduction in the margin of safety.

In conclusion, based on the information provided, it is determined that the proposed revision does not involve a SHC.

Environmental Considerations

NNECO has reviewed the proposed license amendment against the criteria of 10CFR51.22 for environmental considerations. The proposed revision does not involve a SHC, does not significantly increase the type and amounts of effluents that may be released offsite, nor significantly increase individual or cumulative occupational radiation exposures. Based on the foregoing, NNECO concludes that the proposed revision meets the criteria delineated in 10CFR51.22(c)(9) for categorical exclusion from the requirements for environmental review.