ENCLOSURE

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CONVERSION TO IMPROVED TECHNICAL SPECIFICATIONS

IMPROVED TECHNICAL SPECIFICATIONS REVISED BASES PAGES

B 3.3 INSTRUMENTATION

B 3.3.6 Refueling Containment High Radiation (CHR) Instrumentation

BASES

BACKGROUND

This LCO addresses Refueling CHR actuation. When the Refueling CHR Monitors are enabled by their keylock switches, a CHR actuation may be automatically initiated by a signal from either of the Refueling CHR monitors or manually by actuation of either of the control room "CHR Manual Initiate" pushbuttons (pushing either Manual Initiate pushbutton will actuate both trains of CHR). A CHR signal initiates the following actions:

a. Control Room HVAC Emergency Mode;

b. Containment Isolation Valve Closure; and

c. Block automatic starting of Engineered Safeguards pump room sump pumps.

The Refueling CHR signal provides automatic containment isolation valve closure during refueling operations, using two radiation monitors located in the refueling area of the containment (elevation 649 ft). The monitors are part of the plant area monitoring system and employ one-out-of-two logic for isolation. During normal operation these monitors are disconnected from the CHR relays and will not initiate a CHR signal. A switch is provided to connect the Refueling CHR monitors into the CHR actuation circuit, so that CHR actuation can be initiated by these monitors during refueling .

BASES

BACKGROUND (continued)

Each monitor actuates one train of CHR logic when containment radiation exceeds the setpoint. Two separate keylock switches, one per train, enable the Refueling CHR input to the CHR logic when switched to the "Refueling" position. Each Refueling CHR channel, associated keylock switch, and initiation circuit input to the CHR logic thus forms a one-out-of-one logic input to its associated CHR actuation logic train. The Refueling CHR isolation instrumentation is separate from the CHR instrumentation addressed in LCO 3.3.3, "ESF Instrumentation." However, the Refueling CHR Instrumentation does operate the same CHR actuation relays as the two-out-of-four CHR logic addressed in LCO 3.3.4. This LCO is not included in LCOs 3.3.3 and 3.3.4 because of the differences in APPLICABILITY and the single channel nature of the Refueling CHR input. The Refueling CHR signal performs the automatic containment isolation valve closure Function during refueling operations required by LCO 3.9.3, "Containment Penetrations."

The Refueling CHR Instrumentation provides protection from release of radioactive gases and particulates from the containment in the event a fuel assembly should be severely damaged during handling.

The Refueling CHR Instrumentation will detect any abnormal radiation levels in the containment refueling area and will initiate purge valve closure to limit the release of radioactivity to the environment. The containment purge supply and exhaust valves are closed on a CHR signal when a high radiation level in containment is detected.

The Refueling CHR Instrumentation includes two independent, redundant actuation subsystems, as described above. Reference 1 describes the Refueling CHR circuitry.

Trip Setpoint

No required setpoint is specified because these instruments are not assumed to function by any of the safety analyses. Typically, the instruments are set at about 25 mR/hr above expected background for planned operations (including movement of the reactor vessel head or internals).

BASES

APPLICABLE SAFETY ANALYSES	The Refueling CHR Instrumentation isolates containment in the event that area radiation exceeds an established level following a fuel handling accident. This ensures the radioactive materials are not released directly to the environment and significantly reduces the offsite doses from those calculated by the safety analyses, which do not credit containment isolation (Ref. 2). Either way, i.e., with or without containment isolation, the offsite doses remain within the guidelines of 10 CFR 100. The Refueling CHR Instrumentation is not required by the fuel handling accident analyses to maintain offsite doses within the guidelines of 10 CFR 100, but containment isolation would provide a significant reduction of the resulting offsite doses. Therefore, the Refueling CHR Instrumentation satisfies the requirements of Criterion 4 of 10 CFR 50.36(c)(2).
LCO	The LCO for the Refueling CHR Instrumentation requires that two channels of refueling CHR instrumentation and two channels of CHR manual initiation be OPERABLE, including the logic components necessary to initiate Refueling CHR Isolation. The CHR setpoint is chosen to be high enough to avoid inadvertent actuation in the event of normal background radiation fluctuations during fuel handling and movement of the reactor internals, but low enough to alarm and isolate the containment in the event of a Design Basis fuel handling accident.
APPLICABILITY	In MODE 5 or 6, the Refueling CHR isolation of containment isolation valves is not normally required to be OPERABLE. However, during CORE ALTERATIONS or during movement of irradiated fuel within containment, there is the possibility of a fuel handling accident requiring containment isolation on high radiation in containment. Accordingly, the Refueling CHR Instrumentation must be OPERABLE during CORE ALTERATIONS and when moving any irradiated fuel in containment. In MODES 1, 2, 3 and 4, both the Containment High Pressure (CHP) and CHR signals provide containment isolation as discussed in the Bases for LCO 3.3.3 and LCO 3.3.4.

BASES

ACTIONS

A.1, A.2.1, and A.2.2

Condition A applies to the failure of one Refueling CHR monitor channel, one CHR Manual Initiate channel, or one of each. The Required Action allows either initiation of a CHR signal by placing the inoperable channel in trip (which accomplishes the safety function of the inoperable channel), or suspension of CORE ALTERATIONS and movement of irradiated fuel assemblies within containment (which places the plant in a condition where the LCO does not apply). The Completion Time of 4 hours is acceptable because one additional channel of each Function remains operable during that period and the probability of an additional failure occurring during this period is very small.

The suspension of CORE ALTERATIONS and fuel movement shall not preclude completion of movement of a component to a safe position.

B.1 and B.2

Condition B applies when either no automatic Refueling CHR or no Manual CHR (or neither) is available. The Required Action is to immediately suspend CORE ALTERATIONS and movement of irradiated fuel assemblies within containment. This places the plant in a condition where the LCO does not apply. The Completion Time is warranted on the basis that at least one containment isolation Function is completely lost.

The suspension of CORE ALTERATIONS and fuel movement shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1 (continued)

Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or actual differing radiation levels at the two detector locations. CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

The Frequency, about once every shift, is based on operating experience that demonstrates the rarity of channel failure. Since the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.

SR 3.3.6.2

A CHANNEL FUNCTIONAL TEST is performed on each Refueling CHR channel to ensure the entire channel will perform its intended function. A successful test of the required contact(s) of a channel relay may be performed by the verification of the change of state of a single contact of the relay. This clarifies what is an acceptable CHANNEL FUNCTIONAL TEST of a relay. This is acceptable because all of the other required contacts of the relay are verified by other Technical Specifications and non-Technical Specifications tests at least once per refueling interval with applicable extensions.

The Frequency of 31 days is based on plant operating experience with regard to channel OPERABILITY, which demonstrates that failure of more than one channel of a given Function in any 31 day interval is a rare event.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.3

A CHANNEL FUNCTIONAL TEST is performed on each CHR Manual Initiation channel to ensure it will perform its intended function.

The Frequency of 18 months is based on plant operating experience with regard to channel OPERABILITY, and is consistent with the testing of other manually actuated functions.

SR 3.3.6.4

A CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The Surveillance verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift between successive calibrations to ensure that the channel remains operational between successive tests.

No required setpoint is specified because these instruments are not assumed to function by any of the safety analyses. Typically, the instruments are set at about 25 mR/hr above expected background for planned operations (including movement of the reactor vessel head or internals).

The Frequency is based upon the assumption of an 18 month calibration interval in the setpoint determination.

REFERENCES

1. FSAR, Section 7.3
2. FSAR, Section 14.19

B 3.7 PLANT SYSTEMS

B 3.7.7 Component Cooling Water (CCW) System

BASES

BACKGROUND

The CCW System provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation, the CCW System also provides this function for various nonessential components, as well as the spent fuel pool. The CCW System serves as a barrier to the release of radioactive byproducts between potentially radioactive systems and the Service Water System (SWS), and thus to the environment.

The CCW System consists of three pumps connected in parallel to common suction and discharge headers. Any single CCW pump can provide one hundred percent of the required CCW post accident cooling capability. The discharge header splits into two parallel heat exchangers and then combines again into a common distribution header which supplies various heat loads. A common surge tank provides the necessary net positive suction head for the CCW pumps and a surge volume for the system. A train of CCW is considered to be that equipment electrically connected to a common safety bus necessary to transfer heat acquired from the various heat loads to the SWS. There are two CCW trains, each associated with a Safeguards Electrical Distribution Train which are described in Specification 3.8.9, "Distribution Systems - Operating."

1. The CCW train associated with the Left Safeguards Electrical Distribution Train consists of two CCW pumps (P-52A, P-52C), CCW heat exchanger E-54B, the CCW surge tank (T-3), associated piping, valves receiving an actuation signal from the right train (eg. CV-0911, CV-0938, & CV-0946), and controls for that equipment to perform their safety function.

2. The CCW train associated with the Right Safeguards Electrical Distribution Train consists of one CCW pump (P-52B), CCW heat exchanger E-54A, the CCW surge tank (T-3), associated piping, CCW control valves receiving an actuation signal from the right train (eg. CV-0937, CV-0940, & CV-0945, and controls for that equipment to perform their safety function.

3. The CCW system piping, CCW Surge Tank (T-3), and those CCW control valves which receive actuation signals from both right and left trains (eg. CV-0910, CV-0913, CV-0944, CV-0944A, CV-0950, & CV-0977B) controls for that equipment are common to both trains.

BASES

BACKGROUND (continued)

CCW system components receive three automatic actuation signals, a Safety Injection Signal (SIS), a Recirculation Actuation Signal (RAS), or a Containment High Pressure (CHP) signal:

1. SIS starts the CCW pumps, isolates non-essential CCW loads outside the containment, opens the CCW inlet valves to the Shutdown Heat Exchangers (SDHXs), and sends an open signal to the engineered safeguards pump cooler CCW inlet valves (which are normally open).
2. RAS sends an open signal to the CCW heat exchanger CCW inlet valves (which are normally open).
3. CHP isolates the CCW loads inside the containment.

The CCW System cools three groups of loads which are described in the FSAR (Ref. 1). The major loads are:

1. Safety related loads outside the containment,
   Shutdown Cooling Heat Exchangers
   Engineered Safeguards Pump Coolers
   Charging Pump Oil Coolers
2. Non-safety related loads outside the Containment, and
   Spent Fuel Cooling Heat Exchangers
   Waste Gas Compressors
   Rad Waste Evaporators
3. Non-safety related loads inside the Containment.
   Letdown Heat Exchanger
   Shield Cooling Heat Exchangers
   Primary Coolant Pump Leakoff and Oil Coolers
   CRDM Seal Coolers

Each of these groups of loads can be cooled by the flow from one CCW pump. During normal operation, when full flow is not being provided to the Shutdown Cooling and Letdown Heat Exchangers, one CCW pump can provide the required flow for all three groups of loads. Two pumps are normally operated to provide additional system flow and thermal stability.

During post accident conditions, with all CCW and related system components OPERABLE, one hundred percent of the required CCW post accident cooling capability can be provided by any one CCW pump with sufficient flow margin to allow manually restoring CCW flow to the Spent Fuel Pool Cooling Heat Exchangers. If CCW or related systems have components out of service, additional CCW pumps may be required to provide the required cooling capability.

BASES

BACKGROUND (continued)

For post accident cooling, the Engineered Safety Features signals reposition several valves to maximize containment cooling and conserve CCW flow. Initially, a safety injection signal will start the CCW pumps, and open the large CCW inlet valves to the Shutdown Cooling Heat Exchangers (CCW cools the Shutdown Cooling Heat Exchangers, which cool the containment spray flow). A safety injection signal will also isolate the non-safety related CCW loads outside the containment. A Containment High Pressure signal will isolate the non-safety related CCW loads inside the containment. The occurance of these automatic actions will provide the required CCW post accident cooling capability while limiting the CCW flow requirement to that which can be provided by one CCW pump.

The accident analyses assume that both CCW heat exchangers are available. To assure that both heat exchangers will be available even with a single active failure, the CCW inlet valves to the CCW heat exchangers are maintained in the full open position during plant operation. If either CCW Heat Exchanger is out of service, 100% of the required CCW post accident cooling capability cannot be assured.

One hundred percent of the required CCW post accident cooling capability can be provided by one CCW pump if both CCW heat exchangers are available and CCW flow to <u>both</u> non-safety related flow paths can be isolated. (Since one pump can supply the safety-related loads and the Spent Fuel Pool Cooling Heat Exchangers, isolation capability for that heat exchanger is not necessary.) The necessary isolation of each non-safety related CCW flow path may be accomplished by any one of three valves.

1. The capability to isolate CCW flow to the non-safety related loads in the containment requires one CCW Containment Isolation Valve, CV-0910, CV-0911, or CV-0940, to be OPERABLE.

2. The capability to isolate CCW flow to the non-safety related loads outside the containment requires one CCW header isolation valve in the non-safety related CCW header outside the containment, CV-0944, CV-0944A, or CV-0977B, to be OPERABLE.

One hundred percent of the required CCW post accident cooling capability can be provided by two CCW pumps if both CCW heat exchangers are available and CCW flow to <u>either</u> non-safety related flow path can be isolated.

BASES

BACKGROUND (continued)

One hundred percent of the required CCW post accident cooling capability can be provided by three CCW pumps if both CCW heat exchangers are available, even with CCW flow being provided to both the safety-related loads and the non-safety related loads both inside and outside the containment.

Additional information on the design and operation of the system, along with a list of the components served, is presented in the FSAR, Section 9.3 (Ref. 1). The principal safety related function of the CCW System is the removal of decay heat from the reactor via the Shutdown Cooling (SDC) System heat exchangers. This may utilize the SDC heat exchangers during a normal or post accident cooldown and shutdown in conjunction with the Containment Spray System during the recirculation phase following a LOCA.

APPLICABLE SAFETY ANALYSES

The design basis of the CCW System is for one CCW train in conjunction with the SWS and a 100% capacity Containment Cooling System (containment spray, containment coolers, or a combination) removing core decay heat between 20 to 40 minutes after a design basis LOCA. This prevents the containment sump fluid from increasing in temperature during the recirculation phase following a LOCA, and provides a gradual reduction in the temperature of this fluid as it is supplied to the Primary Coolant System (PCS) by the safety injection pumps. Any single CCW pump can provide one hundred percent of the required CCW post accident cooling capability if both CCW heat exchangers are available.

The CCW System is designed to perform its function with a single failure of any active component, assuming a loss of offsite power. The CCW System also functions to cool the plant from SDC entry conditions (T_{ave} < 300°F) to MODE 5 (T_{ave} < 200°F) during normal and post accident operations. The time required to cool from 300°F to 200°F is a function of the number of CCW and SDC trains operating. This assumes that the maximum Lake Michigan water temperature of LCO 3.7.9, "Ultimate Heat Sink (UHS)," occurs simultaneously with the maximum heat loads on the system.

The CCW System satisfies Criterion 3 of 10 CFR 50.36(c)(2).

BASES

LCO

The CCW trains are independent of each other to the degree that each has separate controls and power supplies. In the event of a DBA, one CCW train is required to provide the minimum heat removal capability assumed in the safety analysis for the systems to which it supplies cooling water. To ensure this requirement is met, two CCW trains must be OPERABLE. At least one CCW train will operate assuming the worst single active failure occurs coincident with the loss of offsite power.

The CCW train associated with the Left Safeguards Electrical Distribution Train is considered OPERABLE when:

a. CCW pumps P-52A and P-52C are OPERABLE;

b. CCW Surge Tank T-3 and other common components are OPERABLE;

c. CCW heat exchanger E-54B is OPERABLE; and

d. The associated piping, valves, and instrumentation and controls

The CCW train associated with the Right Safeguards Electrical Distribution Train is considered OPERABLE when:

a. CCW pump P-52B is OPERABLE;

b. CCW Surge tank T-3 and other common components are OPERABLE;

c. CCW heat exchanger E-54A is OPERABLE; and

d. The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE.

The isolation of CCW from other components or systems not required for safety may render those components or systems inoperable, but does not affect the OPERABILITY of the CCW System.

APPLICABILITY

In MODES 1, 2, 3, and 4, the CCW System is a normally operating system that must be prepared to perform its post accident safety functions, primarily PCS heat removal by cooling the SDC heat exchanger.

In MODES 5 and 6, the OPERABILITY requirements of the CCW System are determined by the systems it supports.

BASES

ACTIONS

A.1

With one or more trains of CCW inoperable, but at least 100% of the required CCW post accident cooling capability available, the inoperable components must be restored to OPERABLE status within 72 hours.

Any single CCW pump can provide one hundred percent of the required CCW post accident cooling capability. This condition allows for the loss of any two CCW pumps even if they are supplied from different electrical trains of power as long as one CCW pump is available. It also would allow for the inoperability of one or more of those valves, closed by Safety Injection, which isolate cooling to non-essential loads, provided there are sufficient CCW pumps available to supply the additional flow.

The Component Cooling System cools three groups of loads:

1. Safety related loads outside the containment,

2. Non-safety related loads outside the Containment, and

3. Non-safety related loads inside the Containment.

As discussed in the Background section of these bases, each of these groups of loads can be cooled by the flow from one CCW pump.

One hundred percent of the required CCW post accident cooling capability can be provided by one CCW pump if both CCW heat exchangers are available and if:

1. One CCW Containment Isolation Valve, CV-0910, CV-0911, or CV-0940, is OPERABLE, <u>and</u>

2. One CCW header isolation valve for the non-safety related loads outside the containment, CV-0944, CV-0944A, or CV-0977B, is OPERABLE.

One hundred percent of the required CCW post accident cooling capability can be provided by two CCW pumps if both CCW heat exchangers are available and if:

1. One CCW Containment Isolation Valve, CV-0910, CV-0911, or CV-0940, is OPERABLE, <u>or</u>

2. One CCW header isolation valve for the non-safety related loads outside the containment, CV-0944, CV-0944A, or CV-0977B, is OPERABLE.

BASES

ACTIONS

A.1 continued)

One hundred percent of the required CCW post accident cooling capability can be provided by three CCW pumps if both CCW heat exchangers are available, even with CCW flow being provided to both the safety-related loads, and the non-safety related loads inside and outside the containment.

The 72 hour Completion Time was developed taking into account the redundant heat removal capability afforded by the remaining CCW components and the low probability of a DBA occurring during this period.

B.1 and B.2

If the required CCW trains cannot be restored to OPERABLE status within the associated Completion Time, the plant must be placed in a MODE in which the LCO does not apply. To achieve this status, the plant must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

Verifying the correct alignment for manual, power operated, and automatic valves in the CCW flow path provides assurance that the proper flow paths exist for CCW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in their correct position.

This SR is modified by a Note indicating that the isolation of the CCW to components or systems may render those components inoperable but does not affect the OPERABILITY of the CCW System.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.2

This SR verifies proper automatic operation of the CCW valves on an actual or simulated actuation signal. Specific signals (e.g., safety injection, RAS) are tested under Section 3.3, "Instrumentation." This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. This SR is modified by a Note which states this SR is only required to be met in MODES 1, 2, and 3. The instrumentation providing the input signal is not required in MODE 4, therefore, to keep consistency with Section 3.3, "Instrumentation," the SR is not required to be met in this MODE. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.7.3

This SR verifies proper automatic operation of the CCW pumps on an actual or simulated actuation signal in the "with standby power available" mode which tests the starting of the pumps by the SIS-X relays. The starting of the pumps by the sequencer is performed in Section 3.8, "Electrical Power Systems." This SR is modified by a Note which states this SR is only required to be met in MODES 1, 2, and 3. The instrumentation providing the input signal is not required in MODE 4, therefore, to keep consistency with Section 3.3, "Instrumentation," the SR is not required to be met in this MODE. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section 9.3

B 3.7 PLANT SYSTEMS

B 3.7.8 Service Water System (SWS)

BASES

BACKGROUND

The SWS provides a heat sink for the removal of process and operating heat from safety related components during a Design Basis Accident (DBA) or transient. During normal operation or a normal shutdown, the SWS also provides this function for various safety related and nonsafety related components. The safety related function is covered by this LCO.

The SWS consists of three pumps connected in parallel taking suction from a common intake structure supplied by Lake Michigan. The discharge of the pumps flow into a common header before splitting into three headers (two critical headers for safety-related equipment and a single non-critical header for non safety-related equipment). The return piping from the three headers join into a common line and discharge to the cooling tower makeup basin. A train of SWS shall be that equipment electrically connected to a common safety bus necessary to remove heat from the various heat loads. There are two SWS trains, each associated with a Safeguards Electrical Train which are described in Specification 3.8.9, "Distribution Systems - Operating." The SWS train associated with the Left Safeguards Train consists of one SWS pump (P-7B), associated piping, valves, and controls for the equipment to perform their safety function. The SWS train associated with the Right Safeguards Train consists of two SWS pumps (P-7A, P-7C), associated piping, valves, and controls for the equipment to perform their safety function. The pumps and valves are remote manually aligned, except in the unlikely event of a Loss Of Coolant Accident (LOCA).

SWS components receive three automatic actuation signals, a Safety Injection Signal (SIS), a Recirculation Actuation Signal (RAS), or a Diesel Generator (DG) start signal:

1. SIS starts the SWS pumps, isolates the non-critical service water header, and realigns the Containment Air Cooler service water valves to the post accident cooling configuration.

2. RAS realigns the CCW heat exchanger service water outlet valves for maximum cooling.

3. A DG start signal opens the DG lube oil and jacket water cooler inlet valves.

BASES

BACKGROUND (continued)

The DG which powers two SWS pumps (P-7A, P-7C), also powers the fans associated with VHX-1, VHX-2, and VHX-3 (V-1A, V-2A and V-3). This is necessary because if reliance for containment cooling is placed solely on one spray pump and three CACs, at least two service water pumps must be OPERABLE to provide the necessary service water flow to assure OPERABILITY of the CACs. The Service Water System cools three groups of loads. The SWS loads are described in the FSAR (Ref. 1), the major loads are:

1. Critical loads inside the Containment,
   Containment Air Coolers VHX-1, VHX-2, VHX-3, (and VHX-4).

2. Critical loads outside the Containment, and
   Diesel Generators 1-1 and 1-2
   Component Cooling Heat Exchangers E-54A and E-54B
   Engineered Safeguards Room Coolers VHX-27A and VHX-27B
   Control Room HVAC Coolers VC-10 and VC 11
   Instrument Air Compressors C-2A and C-2C

3. Non-critical loads in the Turbine Building

Each of these groups of loads can be cooled by the flow from one SWS pump. During normal operation, when SWS flow from the containment air coolers and CCW heat exchangers is throttled by temperature control valves, two SWS pumps can provide the required flow for all three groups of loads.

During post accident conditions, with all SWS and related system components OPERABLE, one hundred percent of the required SWS post accident cooling capability can be provided by any one SWS pump. If SWS or related systems have components out of service, additional SWS pumps may be required to provide the required cooling capability.

For post accident cooling, the Engineered Safety Features signals reposition several valves to maximize containment cooling and conserve SWS flow. Initially, a safety injection signal will start the SWS pumps, realign the SWS valves for the CACs (which cool the containment atmosphere), and close the non-critical SWS header isolation valve. Subsequently, if the Safety Injection Refueling Water Tank has been emptied, a RAS will realign the SWS outlet valves on the CCW heat exchangers (CCW cools the Shutdown Cooling Heat Exchangers, which cool the containment spray flow). The occurance of these automatic actions will provide the required post accident SWS cooling requirement while limiting the SWS flow requirement to that which can be provided by two SWS pumps.

BASES

BACKGROUND (continued)

If two Containment Spray Pumps are available, the Containment Air Coolers are not needed for post accident containment cooling. SWS flow to the containment may then be isolated, further reducing the SWS post accident cooling requirement to that which can be provided by one SWS pump.

One hundred percent of the required SWS post accident cooling capability can be provided by any one SWS pump if SWS flow both to the non-critical header and to the critical loads inside the containment are capable of being isolated.

1. The capability to isolate SWS flow to the non-critical SWS header requires its isolation valve, CV-1359, to be OPERABLE.

2. The allowance to isolate SWS flow to the containment requires two Containment Spray pumps to be OPERABLE to provide containment heat removal.

   The capability to isolate SWS flow to the containment requires one SWS Containment Isolation Valve, CV-0824 or CV-0847, to be OPERABLE.

One hundred percent of the required SWS post accident cooling capability can be provided by any two SWS pumps if SWS flow either to the non-critical header or to the critical loads inside the containment are capable of being isolated.

One hundred percent of the required SWS post accident cooling capability can be provided by three SWS pumps even with SWS flow being provided to both the CACs and the Non-critical SWS header.

Additional information about the design and operation of the SWS, along with a list of the components served, is presented in the FSAR, Section 9.1 (Ref. 1). The principal safety related function of the SWS is the removal of decay heat from the reactor via the Component Cooling Water (CCW) System.

BASES

APPLICABLE SAFETY ANALYSES

The design basis of the SWS is for one SWS train, in conjunction with the CCW System and a 100% capacity containment cooling system (containment spray, containment coolers, or a combination), removing core decay heat between 20 to 40 minutes following a design basis LOCA. This prevents the containment sump fluid from increasing in temperature during the recirculation phase following a LOCA and provides for a gradual reduction in the temperature of this fluid as it is supplied to the Primary Coolant System by the safety injection pumps. The SWS is designed to perform its function with a single failure of any active component, assuming the loss of offsite power.

The SWS, in conjunction with the CCW System, also cools the plant from Shutdown Cooling (SDC) entry Condition, as discussed in the FSAR, Section 6.1 (Ref. 2) to MODE 5 during normal and post accident operations. The time required for this evolution is a function of the number of CCW and SDC System trains that are operating. This assumes that the maximum Lake Michigan water temperature of LCO 3.7.9, "Ultimate Heat Sink (UHS)," occurs simultaneously with maximum heat loads on the system.

The SWS satisfies Criterion 3 of 10 CFR 50.36(c)(2).

LCO

Two SWS trains are required to be OPERABLE to provide the required redundancy to ensure that the system functions to remove post accident heat loads, assuming the worst single active failure occurs coincident with the loss of offsite power.

The SWS train associated with the Left Safeguard Electrical Distribution Train is considered OPERABLE when:

a. SWS pump P-7B is OPERABLE; and

b. The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE.

The SWS train associated with the Right Safeguards Electrical Distribution Train is OPERABLE when:

a. SWS pumps P-7A and P-7C are OPERABLE; and

b. The associated piping, valves, and instrumentation and controls required to perform the safety related function are OPERABLE.

BASES

LCO (continued)	The isolation of SWS from other components or systems not required for safety may render those components or systems inoperable but does not affect the OPERABILITY of the SWS System.

APPLICABILITY

In MODES 1, 2, 3, and 4, the SWS System is a normally operating system, which is required to support the OPERABILITY of the equipment serviced by the SWS and required to be OPERABLE in these MODES.

In MODES 5 and 6, the OPERABILITY requirements of the SWS are determined by the systems it supports.

ACTIONS

A.1

With one or more trains of SWS inoperable, but at least 100% of the required SWS post accident cooling capability available, the inoperable components must be restored to OPERABLE status within 72 hours.

This condition allows for the loss of any two SWS pumps even if they are supplied from different electrical trains of power. If two SWS pumps are inoperable, then at least two containment spray pumps must be OPERABLE to provide the required post accident containment cooling without reliance on the CACs (which require more service water flow than can be provided by a single pump). This condition would also allow for the inoperability of one or more of those valves, closed by a Safety Injection Signal, which isolate cooling to non-essential loads, provided there are sufficient SWS pumps available to supply the additional flow.

The Service Water System cools three groups of loads:

1. Critical loads inside the Containment,
2. Critical loads outside the Containment, and
3. Non-critical loads in the Turbine Building.

As discussed in the Background section of these bases, each of these groups of loads can be cooled by the flow from one SWS pump.

BASES

ACTIONS

A.1 (continued)

One hundred percent of the required SWS post accident cooling capability can be provided by any one SWS pump if:

1. The non-critical SWS header isolation valve, CV-1359, is OPERABLE, and
2. Two Containment Spray pumps and one SWS Containment Isolation Valve, CV-0824 or CV-0847, are OPERABLE.

One hundred percent of the required SWS post accident cooling capability can be provided by any two SWS pumps if:

1. The non-critical SWS header isolation valve, CV-1359, is OPERABLE, or
2. Two Containment Spray pumps and one SWS Containment Isolation Valve, CV-0824 or CV-0847, are OPERABLE.

One hundred percent of the required SWS post accident cooling capability can be provided by three SWS pumps even with SWS flow being provided to both the CACs and the Non-critical SWS header.

The 72 hour Completion Time was developed taking into account the redundant heat removal capability afforded by the remaining SWS components and the low probability of a DBA occurring during this period.

B.1 and B.2

If the required SWS trains cannot be restored to OPERABLE status within the associated Completion Time, the plant must be placed in a MODE in which the LCO does not apply. To achieve this status, the plant must be placed in at least MODE 3 within 6 hours and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

Verifying the correct alignment for manual, power operated, and automatic valves in the SWS flow path ensures that the proper flow paths exist for SWS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR is modified by a Note indicating that the isolation of SWS to components or systems may render those components inoperable but does not affect the OPERABILITY of the SWS.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.8.2

This SR verifies proper automatic operation of the SWS valves on an actual or simulated actuation signal. Specific signals (e.g., safety injection) are tested under Section 3.3, "Instrumentation." This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls. This SR is modified by a Note which states this SR is only required to be met in MODES 1, 2, and 3. The instrumentation providing the input signal is not required in MODE 4, therefore, to keep consistency with Section 3.3, "Instrumentation," the SR is not required to be met in this MODE. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.3

The SR verifies proper automatic operation of the SWS pumps on an actual or simulated actuation signal in the "with standby power available" mode which tests the starting of the pumps by the SIS-X relays. The starting of the pumps by the sequencer is performed in Section 3.8, "Electrical Power Systems." This SR is modified by a Note which states this SR is not required to be met in MODE 4. The instrumentation providing the input signal is not required in MODE 4, therefore, to keep consistency with Section 3.3, "Instrumentation," the SR is not required to be met in this MODE. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section 9.1

2. FSAR, Section 6.1