WOLF CREEK
NUCLEAR OPERATING CORPORATION

Steven R. Koenig
Manager Regulatory Affairs

March 11, 2015

RA 15-0023

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Docket No. 50-482: Wolf Creek Generating Station Changes to Technical Specification Bases – Revisions 61 through 66

Gentlemen:

The Wolf Creek Generating Station (WCGS) Unit 1 Technical Specifications (TS), Section 5.5.14, "Technical Specifications (TS) Bases Control Program," provide the means for making changes to the Bases without prior Nuclear Regulatory Commission (NRC) approval. In addition, TS Section 5.5.14 requires that changes made without NRC approval be provided to the NRC on a frequency consistent with 10 CFR 50.71(e). The Enclosure provides those changes made to the WCGS TS Bases (Revisions 61 through 66) under the provisions to TS Section 5.5.14 and a List of Effective Pages. This submittal reflects changes from January 1, 2014 through December 31, 2014.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4041.

Sincerely,

Steven R. Koenig

SRK/rlt

Enclosure

cc: M. L. Dapas (NRC), w/e
C. F. Lyon (NRC), w/e
N. F. O'Keefe (NRC), w/e
Senior Resident Inspector (NRC), w/e

A001
NRR

Enclosure to RA 15-0015

Wolf Creek Generating Station
Changes to the Technical Specification Bases
(28 pages)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

12. Undervoltage Reactor Coolant Pumps (continued)

connected in parallel with the 13.8 kV power supply to each RCP motor at the motor side of the supply breaker. Each PT secondary side is connected to an undervoltage relay and time delay relay, as well as a separate underfrequency relay. The undervoltage relays provide output signals to the SSPS which trips the reactor, if permissive P-7 is satisfied (i.e. greater than 10% of rated thermal power), when the voltage at one out of two RCP motors on both buses drops below 10578 Vac. The time delay relay prevents spurious trips caused by transient voltage perturbations. This trip Function will generate a reactor trip before the Reactor Coolant Flow - Low Trip Setpoint is reached.

The LCO requires two Undervoltage RCP channels per bus to be OPERABLE, for a total of four channels. The Trip Setpoint is ≥ 10,578 Vac.

In MODE 1 above the P-7 setpoint, the Undervoltage RCP trip must be OPERABLE. Below the P-7 setpoint, all reactor trips on loss of RCP due to undervoltage are automatically blocked since the core is not producing sufficient power to generate DNB conditions. Above the P-7 setpoint, the reactor trip on Undervoltage RCPs is automatically enabled.

13. Underfrequency Reactor Coolant Pumps

The Underfrequency RCP reactor trip Function ensures that protection is provided against violating the DNBR limit due to a loss of flow in two or more RCS loops from a major network frequency disturbance. An underfrequency condition will slow down the pumps, thereby reducing their coastdown time following a pump trip. An adequate coastdown time is required so that reactor heat can be removed immediately after reactor trip. There is one potential transformer (PT), with a primary to secondary ratio of 14400:120, connected in parallel with the 13.8 kV power supply to each RCP motor at the motor side of the supply breaker. Each PT secondary side is connected to an undervoltage relay and time delay relay, as well as a separate underfrequency relay. The underfrequency relays provide output signals to the SSPS which trips the reactor, if permissive P-7 is satisfied (i.e. of greater than 10% of rated thermal power), when the frequency of one out of two RCP motors on both buses drops below 57.15 Hz. The time delay set on the underfrequency relay prevents spurious trips

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

13. Underfrequency Reactor Coolant Pumps (continued)

caused by transient frequency perturbations. This trip Function will generate a reactor trip before the Reactor Coolant Flow - Low Trip Setpoint is reached.

The LCO requires two Underfrequency RCP channels per bus to be OPERABLE, for a total of four channels. The Trip Setpoint is ≥ 57.15 Hz.

In MODE 1 above the P-7 setpoint, the Underfrequency RCP trip must be OPERABLE. Below the P-7 setpoint, all reactor trips on loss of RCP due to underfrequency are automatically blocked since the core is not producing sufficient power to generate DNB conditions. Above the P-7 setpoint, the reactor trip on Underfrequency RCPs is automatically enabled.

14. Steam Generator Water Level - Low Low

The SG Water Level - Low Low trip Function ensures that protection is provided against a loss of heat sink and actuates the AFW System prior to uncovering the SG tubes. The SGs are the heat sink for the reactor. In order to act as a heat sink, the SGs must contain a minimum amount of water. A narrow range low low level in any SG is indicative of a loss of heat sink for the reactor. The level transmitters provide input to the SG Level Control System. Therefore, the actuation logic must be able to withstand an input failure to the control system, which may then require the protection function actuation, and a single failure in the other channels providing the protection function actuation. This Function also performs the ESFAS function of starting the AFW pumps on low low SG level.

The LCO requires four channels of SG Water Level - Low Low per SG to be OPERABLE because these channels are shared between protection and control. The Trip Setpoint for the SG Water Level Low - Low is ≥ 23.5% of narrow range instrument span.

In MODE 1 or 2, when the reactor requires a heat sink, the SG Water Level - Low Low trip must be OPERABLE. The normal source of water for the SGs is provided by the Main Feedwater (MFW) pumps (not safety related). The MFW pumps are only in operation in MODE 1 or 2 above the point of adding heat. The

BASES

LCO (continued)

b. Core outlet temperature is maintained at least 10°F below saturation temperature, so that no vapor bubble may form and possibly cause a natural circulation flow obstruction.

Note 2 allows one RHR loop to be inoperable for a period of up to 2 hours, provided that the other RHR loop is OPERABLE and in operation. This permits periodic surveillance tests to be performed on the inoperable loop during the only time when such testing is safe and possible.

Note 3 requires that the secondary side water temperature of each SG be ≤ 50°F above each of the RCS cold leg temperatures before the start of a reactor coolant pump (RCP) with any RCS cold leg temperature ≤ 368°F. This restriction is to prevent a low temperature overpressure event due to a thermal transient when an RCP is started.

Note 4 provides for an orderly transition from MODE 5 to MODE 4 during a planned heatup by permitting removal of RHR loops from operation when at least one RCS loop is in operation. This Note provides for the transition to MODE 4 where an RCS loop is permitted to be in operation and replaces the RCS circulation function provided by the RHR loops.

RHR pumps are OPERABLE if they are capable of being powered and are able to provide forced flow if required. When both RHR loops (or trains) are required to be OPERABLE, the associated Component Cooling Water (CCW) train is required to be capable of performing its related support function(s). The heat sink for the CCW System is normally provided by the Service Water System or Essential Service Water (ESW) System, as determined by system availability. In MODES 5 and 6, one Diesel Generator (DG) is required to be OPERABLE per LCO 3.8.2, "AC Sources – Shutdown." The same ESW train is required to be capable of performing its related support function(s) to support DG OPERABILITY. A Service Water train can be utilized to support RHR OPERABILITY if the associated ESW train is not capable of performing its related support function(s). A SG can perform as a heat sink via natural circulation when it has an adequate water level and is OPERABLE.

APPLICABILITY

In MODE 5 with RCS loops filled, this LCO requires forced circulation of the reactor coolant to remove decay heat from the core and to provide proper boron mixing. One loop of RHR provides sufficient circulation for these purposes. However, one additional RHR loop is required to be OPERABLE, or the secondary side wide range water level of at least two SGs is required to be ≥ 66%.

Operation in other MODES is covered by:

LCO 3.4.4, "RCS Loops - MODES 1 and 2";

BASES

APPLICABILITY (continued)

LCO 3.4.5, "RCS Loops - MODE 3";
LCO 3.4.6, "RCS Loops - MODE 4";
LCO 3.4.8, "RCS Loops - MODE 5, Loops Not Filled";
LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level" (MODE 6); and
LCO 3.9.6, "Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level" (MODE 6).

ACTIONS

A.1 and A.2

If one RHR loop is inoperable and the required SGs have secondary side wide range water levels < 66%, redundancy for heat removal is lost. Action must be initiated immediately to restore a second RHR loop to OPERABLE status or to restore the required SG secondary side water levels. Either Required Action A.1 or Required Action A.2 will restore redundant heat removal paths. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1 and B.2

If no RHR loop is in operation, except during conditions permitted by Notes 1 and 4, or if no loop is OPERABLE, all operations involving introduction into the RCS, coolant with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 must be suspended and action to restore one RHR loop to OPERABLE status and operation must be initiated. To prevent inadvertent criticality during a boron dilution, forced circulation from at least one RCP is required to provide proper mixing. Suspending the introduction into the RCS, coolant with boron concentration less than required to meet the minimum SDM of LCO 3.1.1 is required to assure continued safe operation. With coolant added without forced circulation, unmixed coolant could be introduced to the core, however coolant added with boron concentration meeting the minimum SDM maintains acceptable margin to subcritical operations. The immediate Completion Times reflect the importance of maintaining operation for heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This SR requires verification every 12 hours that the required loop is in operation. Verification may include flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Frequency of 12 hours is sufficient considering other indications and alarms available to the operator in the control room to monitor RHR loop performance.

B 3.4 REACTOR COOLANT SYSTEM (RCS)

B 3.4.12 Low Temperature Overpressure Protection (LTOP) System

BASES

BACKGROUND

The LTOP System controls RCS pressure at low temperatures so the integrity of the reactor coolant pressure boundary (RCPB) is not compromised by violating the pressure and temperature (P/T) limits of 10 CFR 50, Appendix G (Ref. 1). The reactor vessel is the limiting RCPB component for demonstrating such protection. The PTLR provides the maximum allowable actuation logic setpoints for the power operated relief valves (PORVs) and the maximum RCS pressure for the existing RCS cold leg temperature during cooldown, shutdown, and heatup to meet the Reference 1 requirements during the LTOP MODES.

The reactor vessel material is less tough at low temperatures than at normal operating temperature. As the vessel neutron exposure accumulates, the material toughness decreases and becomes less resistant to pressure stress at low temperatures (Ref. 2). RCS pressure, therefore, is maintained low at low temperatures and is increased only as temperature is increased.

The potential for vessel overpressurization is most acute when the RCS is water solid, occurring only while shutdown; a pressure fluctuation can occur more quickly than an operator can react to relieve the condition. Exceeding the RCS P/T limits by a significant amount could cause brittle cracking of the reactor vessel. LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," requires administrative control of RCS pressure and temperature during heatup and cooldown to prevent exceeding the PTLR limits.

This LCO provides RCS overpressure protection by having a minimum coolant input capability and having adequate pressure relief capacity. Limiting coolant input capability requires both safety injection pumps and one Emergency Core Cooling System (ECCS) centrifugal charging pump to be incapable of injection into the RCS and isolating the accumulators. The normal charging pump (NCP), in addition to one ECCS centrifugal charging pump flow, has been included in the analysis of design basis mass input overpressure transient. The pressure relief capacity requires either two redundant RCS relief valves or a depressurized RCS and an RCS vent of sufficient size. One RCS relief valve or the open RCS vent is the overpressure protection device that acts to terminate an increasing pressure event.

BASES

BACKGROUND (continued)

With minimum coolant input capability, the ability to provide core coolant addition is restricted. The LCO does not require the makeup control system deactivated or the safety injection (SI) actuation circuits blocked.

Due to the lower pressures in the LTOP MODES and the expected core decay heat levels, the makeup system can provide adequate flow via the makeup control valve. If conditions require the use of more than one ECCS centrifugal charging pump for makeup in the event of loss of inventory, either the NCP or other ECCS pumps can be made available through manual actions.

The LTOP System for pressure relief consists of two PORVs with reduced lift settings, or two residual heat removal (RHR) suction relief valves, or one PORV and one RHR suction relief valve, or a depressurized RCS and an RCS vent of sufficient size. Two RCS relief valves are required for redundancy. One RCS relief valve has adequate relieving capability to prevent overpressurization for the required coolant input capability.

PORV Requirements

As designed for the LTOP System, each PORV is signaled to open if the RCS pressure approaches a limit determined by the LTOP actuation logic. The LTOP actuation logic monitors both RCS temperature and RCS pressure and determines when a condition not acceptable with respect to the PTLR limits is approached. The wide range RCS temperature indications are auctioneered to select the lowest temperature signal.

The lowest temperature signal is processed through a function generator that calculates a pressure limit for that temperature. The calculated pressure limit is then compared with the indicated RCS pressure from a wide range pressure channel. If the indicated pressure meets or exceeds the calculated value, a PORV is signaled to open.

The PTLR presents the PORV setpoints for LTOP. The setpoints are normally staggered so only one valve opens during a low temperature overpressure transient. Having the setpoints of both valves within the limits in the PTLR ensures that the Reference 1 limits will not be exceeded in any analyzed event.

When a PORV is opened in an increasing pressure transient, the release of coolant will cause the pressure increase to slow and reverse. As the PORV releases coolant, the RCS pressure decreases until a reset pressure is reached and the valve is signaled to close. The pressure continues to decrease below the reset pressure as the valve closes.

BASES

BACKGROUND (continued)

RHR Suction Relief Valve Requirements

During LTOP MODES, the RHR System is operated for decay heat removal and low pressure letdown control. Therefore, the RHR suction isolation valves are open in the piping from the RCS hot legs to the inlets of the RHR pumps. While these valves are open the RHR suction relief valves are exposed to the RCS and are able to relieve pressure transients in the RCS.

The RHR suction isolation valves must be open to make the RHR suction relief valves OPERABLE for RCS overpressure mitigation. The RHR suction relief valves are spring loaded, bellows type water relief valves with pressure tolerances and accumulation limits established by Section III of the American Society of Mechanical Engineers (ASME) Code (Ref. 3) for Class 2 relief valves.

RCS Vent Requirements

Once the RCS is depressurized, a vent exposed to the containment atmosphere will maintain the RCS at containment ambient pressure in an RCS overpressure transient, if the relieving requirements of the transient do not exceed the capabilities of the vent. Thus, the vent path must be capable of relieving the flow resulting from the limiting LTOP mass or heat input transient, and maintaining pressure below the P/T limits. The required vent capacity may be provided by one or more vent paths.

APPLICABLE SAFETY ANALYSES

Safety analyses (Ref. 4) demonstrate that the reactor vessel is adequately protected against exceeding the Reference 1 P/T limits. In MODES 1, 2, and 3, the pressurizer safety valves will prevent RCS pressure from exceeding the Reference 1 limits. In MODE 3 (with any RCS cold leg temperature ≤ 368°F) and below, overpressure prevention falls to two OPERABLE RCS relief valves or to a depressurized RCS and a sufficient sized RCS vent. Each of these means has a limited overpressure relief capability.

The actual temperature at which the pressure in the P/T limit curve falls below the pressurizer safety valve setpoint increases as the reactor vessel material toughness decreases due to neutron embrittlement. Each time the PTLR curves are revised, the LTOP System must be re-evaluated to ensure its functional requirements can still be met using the RCS relief valve method or the depressurized and vented RCS condition.

BASES

APPLICABLE SAFETY ANALYSES (continued)

The PTLR contains the acceptance limits that define the LTOP requirements. Any change to the RCS must be evaluated against the Reference 9 analyses to determine the impact of the change on the LTOP acceptance limits.

Transients that are capable of overpressurizing the RCS are categorized as either mass or heat input transients, examples of which follow:

Mass Input Type Transients

a. Inadvertent safety injection; or

b. Charging/letdown flow mismatch.

Heat Input Type Transients

a. Inadvertent actuation of pressurizer heaters;

b. Loss of RHR cooling; or

c. Reactor coolant pump (RCP) startup with temperature asymmetry within the RCS or between the RCS and steam generators.

The following are required with exception described below during the LTOP MODES to ensure that mass and heat input transients do not occur, which either of the LTOP overpressure protection means cannot handle:

a. Rendering both safety injection pumps and one ECCS centrifugal charging pump incapable of injection (there are no limitations on the use of the NCP during the LTOP MODES);

b. Deactivating the accumulator discharge isolation valves in their closed positions or by venting the affected accumulator; and

c. Precluding start of an RCP if secondary temperature is more than 50°F above primary temperature in any one loop. LCO 3.4.5, "RCS Loops - MODE 3," LCO 3.4.6, "RCS Loops - MODE 4," and LCO 3.4.7, "RCS Loops - MODE 5, Loops Filled," provide this protection.

Operation below 350°F but greater than 325°F with all ECCS centrifugal charging and safety injection pumps OPERABLE is allowed for up to 4 hours. During low pressure, low temperature operation all automatic safety injection actuation signals except Containment Pressure – High are

BASES

APPLICABLE SAFETY ANALYSES (continued)

blocked. In normal conditions a single failure of the ESF actuation circuitry will result in the starting of at most one train of safety injection (one centrifugal charging pump, and one safety injection pump). For temperatures above 325°F, an overpressure event occurring as a result of starting two pumps can be successfully mitigated by operation of both PORV's without exceeding Appendix G limit. Given the short time duration that this condition is allowed and the low probability of a single failure causing an overpressure event during this time, the single failure of a PORV is not assumed. Initiation of both trains of safety injection during this 4-hour time frame due to operator error or a single failure occurring during testing of a redundant channel are not considered to be credible accidents.

Although LTOP is required to be OPERABLE when RCS temperature is less than 368°F, operation with all ECCS centrifugal charging pumps and both safety injection pumps OPERABLE is acceptable when RCS temperature is greater than 350°F. Should an inadvertent safety injection occur above 350°F, a single PORV has sufficient capacity to relieve the combined flow rate of all ECCS pumps and the NCP. Above 350°F, two RCPs and all pressurizer safety valves are required to be OPERABLE. Operation of an RCP eliminates the possibility of a 50°F difference existing between indicated and actual RCS temperature as a result of heat transport effects. Considering instrument uncertainties only, an indicated RCS temperature of 350°F is sufficiently high to allow full RCS pressurization in accordance with Appendix G limitations. Should an overpressure event occur in these conditions, the pressurizer safety valves provide acceptable and redundant overpressure protection.

The Reference 9 analyses demonstrate that either one RCS relief valve or the depressurized RCS and RCS vent can maintain RCS pressure below limits when only one ECCS centrifugal charging pump (in addition to the NCP) is actuated. However, the LCO allows only one ECCS centrifugal charging pump OPERABLE and the NCP functional during the LTOP MODES. Since neither one RCS relief valve nor the RCS vent can handle the pressure transient caused by accumulator injection, when RCS temperature is low, the LCO also requires accumulator isolation when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed in the PTLR.

The isolated accumulators must have their discharge valves closed and the valve power supply breakers fixed in their open positions.

Fracture mechanics analyses established the temperature of LTOP Applicability at 368°F.

BASES

APPLICABLE SAFETY ANALYSES (continued)

PORV Performance

The fracture mechanics analyses show that the vessel is protected when the PORVs are set to open at or below the limit shown in the PTLR. The setpoints are derived by analyses that model the performance of the LTOP System, assuming the mass injection transient of one ECCS centrifugal charging pump and the NCP injecting into the RCS and the heat injection transient of starting an RCP with the RCS 50°F colder than the secondary coolant. These analyses consider pressure overshoot and undershoot beyond the PORV opening and closing, resulting from signal processing and valve stroke times. The PORV setpoints at or below the derived limit ensures the Reference 1 P/T limits will be met.

The PORV setpoints in the PTLR will be updated when the revised P/T limits conflict with the LTOP analysis limits. The P/T limits are periodically modified as the reactor vessel material toughness decreases due to neutron embrittlement caused by neutron irradiation. Revised limits are determined using neutron fluence projections and the results of examinations of the reactor vessel material irradiation surveillance specimens. The Bases for LCO 3.4.3, "RCS Pressure and Temperature (P/T) Limits," discuss these examinations.

The PORVs are considered active components. Thus, the failure of one PORV is assumed to represent the worst case, single active failure.

RHR Suction Relief Valve Performance

The RHR suction relief valves do not have variable pressure and temperature lift setpoints like the PORVs. Analyses show that one RHR suction relief valve with a setpoint at or between 436.5 psig and 463.5 psig will pass flow greater than that required for the limiting LTOP transient while maintaining RCS pressure less than the P/T limit curve.

As the RCS P/T limits are decreased to reflect the loss of toughness in the reactor vessel materials due to neutron embrittlement, the RHR suction relief valves must be analyzed to still accommodate the design basis transients for LTOP.

The RHR suction relief valves are considered active components. Thus, the failure of one valve is assumed to represent the worst case single active failure.

BASES

APPLICABLE SAFETY ANALYSIS (continued)

RCS Vent Performance

With the RCS depressurized, analyses show a vent size of 2.0 square inches is capable of mitigating the limiting LTOP transient. The capacity of a vent this size is greater than the flow of the limiting transient for the LTOP configuration, one ECCS centrifugal charging pump and the NCP injecting into the RCS, maintaining RCS pressure less than the maximum pressure on the P/T limit curve.

The RCS vent size will be re-evaluated for compliance each time the P/T limit curves are revised based on the results of the vessel material surveillance.

The RCS vent is passive and is not subject to active failure.

The LTOP System satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO requires that the LTOP System is OPERABLE. The LTOP System is OPERABLE when the maximum coolant input or heat input bounded by that assumed in the analyses and required pressure relief capabilities are OPERABLE. Violation of this LCO could lead to the loss of low temperature overpressure mitigation and violation of the Reference 1 limits as a result of an operational transient.

To limit the coolant input capability, the LCO requires that a maximum of zero safety injection pumps, one ECCS centrifugal charging pump and the NCP be capable of injecting into the RCS, and all accumulator discharge isolation valves be closed and immobilized (when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed in the PTLR).

The LCO is modified by four Notes. Note 1 allows two ECCS centrifugal charging pumps to be made capable of injecting into the RCS for < 1 hour for pump swap operations. One hour provides sufficient time to safely complete the actual transfer and to complete the administrative controls and surveillance requirements associated with the swap. The intent is to minimize the actual time that more than one ECCS centrifugal charging pump is physically capable of injection. This is accomplished by racking out the breaker for one pump or employing two independent means to prevent a pump start in accordance with SR 3.4.12.2.

Note 2 recognizes the Applicability overlap between LCO's 3.4.12 and 3.5.2 and states that two safety injection pumps and two ECCS centrifugal charging pumps may be made capable of injecting into the RCS:

BASES

LCO (continued)

(a) In MODE 3 with any RCS cold leg temperature < 368°F and ECCS pumps OPERABLE pursuant to LCO 3.5.2, "ECCS-Operating", and

(b) For up to 4 hours after entering MODE 4 from MODE 3 or the temperature of one or more RCS cold legs decreases below 325°F, whichever comes first.

Note 3 states that one or more safety injection pumps may be made capable of injecting into the RCS in MODES 5 and 6 when the RCS water level is below the top of the reactor vessel flange for the purpose of protecting the decay heat removal function.

Note 4 states that the accumulator may be unisolated when the accumulator pressure is less than the maximum RCS pressure for the existing RCS cold leg temperature as allowed by the P/T limit curves provided in the PTLR. The accumulator discharge isolation valve Surveillance is not required under these pressure and temperature conditions.

The elements of the LCO that provide low temperature overpressure mitigation through pressure relief are:

a. Two OPERABLE PORVs; or

A PORV is OPERABLE for LTOP when its block valve is open, its lift setpoint is set to the limit required by the PTLR and testing proves its ability to open at this setpoint, and motive power is available to the two valves and their control circuits.

b. Two OPERABLE RHR suction relief valves; or

An RHR suction relief valve is OPERABLE for LTOP when its RHR suction isolation valves are open, its setpoint is at or between 436.5 psig and 463.5 psig, and testing has proven its ability to open at this setpoint.

c. One OPERABLE PORV and one OPERABLE RHR suction relief valve; or

d. A depressurized RCS and an RCS vent.

An RCS vent is OPERABLE when open with an area of ≥ 2.0 square inches.

BASES

ACTIONS (continued)

G.1

The RCS must be depressurized and a vent must be established within 8 hours when:

a. Both required RCS relief valves are inoperable; or

b. A Required Action and associated Completion Time of Condition A, B, D, E, or F is not met; or

c. The LTOP System is inoperable for any reason other than Condition A, B, C, D, E, or F.

The vent must be sized ≥ 2.0 square inches to ensure that the flow capacity is greater than that required for the worst case mass input transient reasonable during the applicable MODES. This action is needed to protect the RCPB from a low temperature overpressure event and a possible brittle failure of the reactor vessel.

The Completion Time considers the time required to place the plant in this Condition and the relatively low probability of an overpressure event during this time period due to increased operator awareness of administrative control requirements.

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1, SR 3.4.12.2, and SR 3.4.12.3

To minimize the potential for a low temperature overpressure event by limiting the mass input capability, a maximum of zero safety injection pumps, one ECCS centrifugal charging pump and the NCP are verified to be capable of injecting into the RCS and the accumulator discharge isolation valves are verified closed and with power removed from the valve operator.

Verification that each accumulator is isolated is only required when accumulator pressure is greater than or equal to the maximum RCS pressure for the existing RCS cold leg temperature allowed by the P/T limit curves provided in the PTLR.

The safety injection pumps and one ECCS centrifugal charging pump are rendered incapable of injecting into the RCS through removing the power from the pumps by racking the breakers out under administrative control. An alternate method of cold overpressure protection may be employed using at least two independent means to render a pump incapable of injecting into the RCS such that a single failure or single action will not

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1, SR 3.4.12.2, and SR 3.4.12.3 (continued)

result in an injection into the RCS. This may be accomplished by placing the pump control switch in pull to lock and closing at least one valve in the discharge flow path, or by closing at least one valve in the discharge flow path and removing power from the valve operator, or by closing at least one manual valve in the discharge flow path under administrative control. Providing pumps are rendered incapable of injecting into the RCS, they may be energized for purposes such as testing or for filling accumulators.

The Frequency of 12 hours is sufficient, considering other indications and alarms available to the operator in the control room, to verify the required status of the equipment.

SR 3.4.12.4

Each required RHR suction relief valve shall be demonstrated OPERABLE by verifying its RHR suction isolation valves are open and by testing it in accordance with the Inservice Testing Program. This Surveillance is only required to be performed if the RHR suction relief valve is being used to meet this LCO.

The RHR suction isolation valves are verified to be opened every 72 hours. The Frequency is considered adequate in view of other administrative controls such as valve status indications available to the operator in the control room that verify the RHR suction isolation valves remain open.

The ASME Code (Ref. 8), test per Inservice Testing Program verifies OPERABILITY by proving proper relief valve mechanical motion and by measuring and, if required, adjusting the lift setpoint.

SR 3.4.12.5

The RCS vent of ≥ 2.0 square inches is proven OPERABLE by verifying its open condition either:

a. Once every 12 hours for a valve that is not locked, sealed, or otherwise secured in the open position.

BASES

ACTIONS

A.1 and A.2 (continued)

With the required Containment Sump Level and Flow Monitoring System inoperable, no other form of sampling can provide the equivalent information; however, the containment atmosphere particulate radioactivity monitor will provide indications of changes in leakage. Together with the atmosphere monitor, the periodic surveillance for RCS water inventory balance, SR 3.4.13.1, must be performed at an increased frequency of 24 hours to provide information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank level, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.

Restoration of the required Containment Sump Level and Flow Monitoring System to OPERABLE status within a Completion Time of 30 days is required to regain the function after the system's failure. This time is acceptable, considering the Frequency and adequacy of the RCS water inventory balance required by Required Action A.1. The Completion Time is modified by a Note indicating that the 30 days is extended until startup from a plant shutdown or startup from Refueling Outage 20.

B.1.1, B.1.2, B.2.1 and B.2.2

With the containment atmosphere particulate radioactivity monitoring instrumentation channel inoperable, alternative action is required. Either samples of the containment atmosphere must be taken and analyzed for particulate radioactivity or water inventory balances, in accordance with SR 3.4.13.1, must be performed to provide alternate periodic information. Alternatively, continued operation is allowed if the containment air cooler condensate monitoring system is OPERABLE, provided grab samples are taken or water inventory balances are performed every 24 hours.
With a sample obtained and analyzed or water inventory balance performed every 24 hours, the reactor may be operated for up to 30 days to allow restoration of the required containment atmosphere particulate radioactivity monitor.

The 24 hour interval provides periodic information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank level, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established. The 30 day Completion Time recognizes at least one other form of leakage detection is available.

BASES

ACTIONS (continued)

C.1 and C.2

With the required containment cooler condensate monitoring system inoperable, alternative action is again required. Either SR 3.4.15.1 must be performed or water inventory balances, in accordance with SR 3.4.13.1, must be performed to provide alternate periodic information. Provided a CHANNEL CHECK is performed every 8 hours or a water inventory balance is performed every 24 hours, reactor operation may continue while awaiting restoration of the containment cooler condensate monitoring system to OPERABLE status.

The 24 hour interval provides periodic information that is adequate to detect RCS LEAKAGE. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after establishing steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank level, makeup and letdown, and RCP seal injection and return flows.) The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established.

D.1 and D.2

With the required containment atmosphere particulate radioactivity monitor and the required Containment Cooler Condensate Monitoring System inoperable, the means of detecting leakage is the Containment Sump Level and Flow Monitoring System. This Condition does not provide all the required diverse means of leakage detection. The Required Action is to restore either of the inoperable required monitoring methods to OPERABLE status within 30 days to regain the intended leakage detection diversity. The 30 day Completion Time ensures that the plant will not be operated in a reduced configuration for a lengthy time period.

Refer to LCO 3.3.6, "Containment Purge Isolation Instrumentation," upon a loss of the required containment atmosphere radioactivity monitor to ensure LCO requirements are met.

E.1 and E.2

If a Required Action of Condition A, B, C or D cannot be met, the plant must be brought to a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to 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.

B 3.6 CONTAINMENT SYSTEMS

B 3.6.6 Containment Spray and Cooling Systems

BASES

BACKGROUND

The Containment Spray and Containment Cooling system provides containment atmosphere cooling to limit post accident pressure and temperature in containment to less than the design values. Reduction of containment pressure and the iodine removal capability of the spray reduces the release of fission product radioactivity from containment to the environment, in the event of a Design Basis Accident (DBA), to within limits. The Containment Spray and Containment Cooling system is designed to meet the requirements of 10 CFR 50, Appendix A, GDC 38, "Containment Heat Removal," GDC 39, "Inspection of Containment Heat Removal Systems," GDC 40, "Testing of Containment Heat Removal Systems," GDC 41, "Containment Atmosphere Cleanup," GDC 42, "Inspection of Containment Atmosphere Cleanup Systems," and GDC 43, "Testing of Containment Atmosphere Cleanup Systems," and GDC 50, "Containment Design Bases" (Ref. 1).

The Containment Cooling System and Containment Spray System are Engineered Safety Feature (ESF) systems. They are designed to ensure that the heat removal capability required during the post accident period can be attained. The Containment Spray System and the Containment Cooling System provides a redundant method to limit and maintain post accident conditions to less than the containment design values.

Containment Spray System

The Containment Spray System consists of two separate trains of equal capacity, each capable of meeting the design bases. Each train includes a containment spray pump, spray headers, nozzles, valves, and piping. Each train is powered from a separate ESF bus. The refueling water storage tank (RWST) supplies borated water to the Containment Spray System during the injection phase of operation. In the recirculation mode of operation, containment spray pump suction is transferred from the RWST to the containment recirculation sumps.

The Containment Spray System provides a spray of borated water mixed with sodium hydroxide (NaOH) from the Spray Additive System into the upper regions of containment to reduce the containment pressure and temperature and to reduce fission products from the containment atmosphere during a DBA. The RWST solution temperature is an important factor in determining the heat removal capability of the Containment Spray System during the injection phase. In the recirculation mode of operation, heat is removed from the containment recirculation sump water by the residual heat removal heat exchangers. Each train of the Containment Spray System provides adequate spray

BASES

BACKGROUND

Containment Spray System (continued)

coverage to meet the system design requirements for containment heat removal. The Spray Additive System injects an NaOH solution into the spray. The resulting alkaline pH of the spray enhances the ability of the spray to scavenge fission products from the containment atmosphere. The NaOH added in the spray also ensures an alkaline pH for the solution recirculated in the containment recirculation sump. The alkaline pH of the containment sump water minimizes the evolution of iodine and minimizes the occurrence of chloride and caustic stress corrosion on mechanical systems and components exposed to the fluid.

The Containment Spray System is actuated either automatically by a containment High-3 pressure signal or manually. An automatic actuation opens the containment spray pump discharge valves, starts the two containment spray pumps and begins the injection phase. A manual actuation of the Containment Spray System requires the operator to simultaneously actuate two separate switches on the main control board to begin the same sequence. The injection phase continues until an RWST level Low-Low alarm is received. The Low-Low level alarm for the RWST signals the operator to manually align the system to the recirculation mode. The Containment Spray System in the recirculation mode maintains an equilibrium temperature between the containment atmosphere and the recirculated sump water. Operation of the Containment Spray System in the recirculation mode is controlled by the operator in accordance with the emergency operating procedures.

Containment Cooling System

Two trains of containment cooling, each of sufficient capacity to supply 100% of the design cooling requirement, are provided. Each train of two fan units is supplied with cooling water from a separate train of essential service water (ESW). Air is drawn into the coolers through the fan and discharged to the steam generator compartments, pressurizer compartment, and instrument tunnel, and outside the secondary shield in the lower areas of containment.

During normal operation, all four fan units are normally operating. The fans are normally operated at high speed with Service Water supplied to the cooling coils. The Containment Cooling System, operating in conjunction with the Containment Ventilation and Air Conditioning systems, is designed to limit the ambient containment air temperature during normal unit operation to less than the limit specified in LCO 3.6.5, "Containment Air Temperature." This temperature limitation ensures that the containment temperature does not exceed the initial temperature conditions assumed for the DBAs.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.3.1

This SR verifies that the closure time of each MFIV, MFRV, and MFRV bypass valve is within limits (Figure B 3.7.3-1 for the MFIVs and ≤ 15 seconds for the MFRV and MFRV bypass valves) when tested pursuant to the Inservice Testing Program. The MFIV, MFRV, and MFRV bypass valve closure time is assumed in the accident and containment analyses.

For the MFRVs, this Surveillance is normally performed upon returning the unit to operation following a refueling outage. The Surveillance may be performed as required for post-maintenance testing of the MFRVs under appropriate conditions during applicable MODES. In particular, the MFRVs should normally not be tested at power since even a partial stroke exercise increases the risk of a valve closure with the unit generating power. However, when the plant is operating using the MFRV bypass valves (at low power levels during MODE 1), the surveillance for the MFRVs may be performed for post-maintenance testing during such conditions without increasing plant risk.

For the MFRV bypass valves, this Surveillance is performed routinely during plant operation (or as required for post-maintenance testing), but it may also be required to be performed upon returning the unit to operation following a refueling outage.

If it is necessary to adjust stem packing to stop packing leakage and if a required stroke test is not practical in the current plant MODE, it should be shown by analysis that the packing adjustment is within torque limits specified by the manufacturer for the existing configuration of packing, and that the performance parameters of the valve are not adversely affected. A confirmatory test must be performed at the first available opportunity when plant conditions allow testing. Packing adjustments beyond the manufacturer's limits may not be performed without (1) an engineering analysis and (2) input from the manufacturer, unless tests can be performed after the adjustments. (Reference 3)

The Frequency for this SR is in accordance with the Inservice Testing Program. Operating experience has shown that these components usually pass the Surveillance when performed at the Inservice Testing Program Frequency. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated. Test conditions are with the unit at normal operating temperature and pressure, as discussed in Reference 2.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.3.2

This SR verifies that each actuator train can close its respective MFIV on an actual or simulated actuation signal. The manual close hand switch in the control room provides an acceptable actuation signal. This Surveillance is normally performed upon returning the plant to operation following a refueling outage in conjunction with SR 3.7.3.1. However, it is acceptable to perform this Surveillance individually. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated

The Frequency of MFIV testing is every 18 months. The 18 month Frequency for testing is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, this Frequency is acceptable from a reliability standpoint.

SR 3.7.3.3

This SR verifies that each MFRV and MFRV bypass valve is capable of closure on an actual or simulated actuation signal. The actuation of solenoids locally at the MFRVs and MFRV bypass valves constitutes an acceptable simulated actuation signal. This Surveillance is normally performed upon returning the unit to operation following a refueling outage in conjunction with SR 3.7.3.1. However, it is acceptable to perform this Surveillance individually.

The Frequency of MFRV and MFRV bypass valve testing is every 18 months. The 18 month Frequency for testing is based on the refueling cycle. This Frequency is acceptable from a reliability standpoint. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows a delay of testing until MODE 3, to establish conditions consistent with those under which the acceptance criterion was generated.

REFERENCES

1. USAR, Section 10.4.7.

2. ASME Code for Operation and Maintenance of Nuclear Power Plants.

3. NUREG-1482, Revision 1, "Guidelines for Inservice Testing at Nuclear Power Plants."

B 3.7 PLANT SYSTEMS

B 3.7.10 Control Room Emergency Ventilation System (CREVS)

BASES

BACKGROUND

The CREVS provides a protected, controlled temperature environment from which occupants can control the unit following an uncontrolled release of radioactivity, hazardous chemicals, or smoke.

The CREVS consists of two independent, redundant trains that recirculate, cool, pressurize, and filter the air in the control room envelope (CRE) and control building envelope (CBE) that limits the inleakage of unfiltered air. Each CREVS train consists of a recirculation system train and a pressurization system train. The air conditioning portion of each train consists of a fan, a self-contained refrigeration system, and a prefilter. The filtration portion of each system consists of a high efficiency particulate air (HEPA) filter, an activated charcoal absorber section for removal of gaseous activity (principally iodines), and a second HEPA follows the absorber section to collect carbon fines. Each pressurization system train consists of ductwork to bring air from outside the building, a moisture separator, an electric heater, a HEPA, an activated charcoal adsorber, and a second HEPA. Ductwork, valves or dampers, doors, barriers, and instrumentation also form part of the system.

The CREVS is an emergency system which may also operate during normal unit operations. Upon receipt of the actuating signal, normal air supply and exhaust to the CRE is isolated, and a portion of the ventilation air is recirculated through the filtration system train(s), and the pressurization system is started. The filtration system prefilters remove any large particles in the air, and the pressurization system moisture separator removes any entrained water droplets present, to prevent excessive loading of the HEPA filters and charcoal adsorbers. Continuous operation of each pressurization train for at least 15 minutes per month, with the heaters functioning, reduces moisture buildup on the HEPA filters and adsorbers. The heaters are important to the effectiveness of the charcoal adsorbers.

Actuation of the CREVS by a Control Room Ventilation Isolation Signal (CRVIS), places the system in the emergency mode of operation. Actuation of the system to the emergency mode of operation closes the unfiltered outside air intake and unfiltered exhaust dampers, and aligns the system for recirculation. A portion of the recirculation of the air within the CRE flows through the redundant filtration system trains of HEPA and the charcoal adsorbers. The CRVIS also initiates pressurization and filtered ventilation of the air supply to the CRE.

BASES

BACKGROUND (continued)

Outside air is filtered, diluted with air from the electrical equipment and cable spreading rooms, and added to the air being recirculated from the CRE. Pressurization of the CRE prevents infiltration of unfiltered air from the surrounding areas of the building.

The air entering the CBE during normal operation is continuously monitored by radiation and smoke detectors. A high radiation signal initiates the CRVIS; the smoke detectors provide an alarm in the control room. A CRVIS is initiated by the radiation monitors (GKRE0004 and GKRE0005), fuel building ventilation isolation signal, containment isolation phase A, containment atmosphere radiation monitors (GTRE0031 and GTRE0032), containment purge exhaust radiation monitors (GTRE0022 and GTRE0033), or manually.

A single CREVS train operating in the CREVS alignment established by surveillance procedures will pressurize the control room to ≥ 0.25 inches water gauge. The CREVS operation in maintaining the CRE habitable is discussed in the USAR, Section 6.4 and 9.4 (Ref. 1).

Either of the pressurization and recirculation trains provide the required filtration and pressurization to the CRE. Normally open isolation dampers are arranged in series pairs so that the failure of one damper to shut will not result in a breach of isolation. The CREVS is designed in accordance with Seismic Category I requirements.

The CREVS is designed to maintain a habitable environment in the CRE for 30 days of continuous occupancy after a Design Basis Accident (DBA) without exceeding a 5 rem whole body dose or its equivalent to any part of the body (Ref. 2).

By operation of the control room pressurization trains and the control room filtration units, the CREVS pressurizes, recirculates and filters air within the CRE as well as the CBE that generally surrounds the CRE. The boundaries of these two distinct but related volumes are credited in the analysis of record for limiting the inleakage of unfiltered outside air.

The station CRE design is unique. The Control Building by and large surrounds the CRE. The Control Building is also designed to be at a positive pressure with respect to its surrounding environment although not positive with respect to the CRE. In the emergency pressurization and filtration mode, the control room air volume receives air through a filtration system that takes a suction on the Control Building. The Control Building in turn receives filtered air from the outside environment.

BASES

ACTIONS

D.1, D.2.1, and D.2.2 (continued)

An alternative to Required Action D.1 is to immediately suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

E.1 and E.2

During movement of irradiated fuel assemblies, with two CREVS trains inoperable or with one or more CREVS trains inoperable due to an inoperable CRE or CBE boundary, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the CRE. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

F.1

If both CREVS trains are inoperable in MODE 1, 2, 3, or 4, for reasons other than an inoperable CRE and CBE boundary (i.e., Condition B), the CREVS may not be capable of performing the intended function and the unit is in a condition outside the accident analyses. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.10.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, testing each train once every month, by initiating from the control room, flow through the HEPA filters and charcoal adsorber of both the filtration and pressurization systems, provides an adequate check of this system. Monthly heater operations dry out any moisture accumulated in the charcoal from humidity in the ambient air. Each pressurization system train must be operated for ≥ 15 continuous minutes with the heaters energized. Each filtration system train need only be operated for ≥ 15 minutes continuously to demonstrate the function of the system. The 15-minute run time is based on Position C.6.1 of Reference 9. The 31 day Frequency is based on the reliability of the equipment and the two train redundancy.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.10.2

This SR verifies that the required CREVS testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CREVS filter tests use the procedure guidance in Regulatory Guide 1.52, Rev. 2 (Ref. 3) in accordance with the VFTP. The VFTP includes testing the performance of the HEPA filter, charcoal absorber efficiency, minimum flow rate, and the physical properties of the activated charcoal. Specific test Frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.10.3

This SR verifies that each CREVS train starts and operates on an actual or simulated CRVIS. The actuation signal includes Control Room Ventilation or High Gaseous Radioactivity. The CREVS train automatically switches on an actual or simulated CRVIS into a CRVIS mode of operation with flow through the HEPA filters and charcoal adsorber banks. The Frequency of 18 months is consistent with a typical operating cycle. 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 3.7.10.4

This SR verifies the OPERABILITY of the CRE and CBE boundaries credited in the accident analysis by testing for unfiltered air inleakage past the credited envelope boundaries and into the CRE. The details of the testing are specified in the Control Room Envelope Habitability Program.

The CRE is considered habitable when the radiological dose to CRE occupants calculated in the licensing basis analyses of DBA consequences is no more than 5 rem whole body or its equivalent to any part of the body and the CRE occupants are protected from hazardous chemicals and smoke. For WCGS, there is no CREVS actuation for hazardous chemical releases or smoke and there are no Surveillance Requirements that verify OPERABILITY for hazardous chemicals or smoke. This SR verifies that the unfiltered air inleakage into the CRE and CBE boundaries is no greater than the flow rate assumed in the licensing basis analyses of DBA consequences. When unfiltered air inleakage is greater than the assumed flow rate, Condition B must be entered. Required Action B.3 allows time to restore the CRE or CBE

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.10.4 (continued)

boundary to OPERABLE status provided mitigating actions can ensure that the CRE remains within the licensing basis habitability limits for the occupants following an accident. Compensatory measures are discussed in Regulatory Guide 1.196, Section C.2.7.3, (Ref. 4) which endorses, with exceptions, NEI 99-03, Section 8.4 and Appendix F (Ref. 5). These compensatory measures may also be used as mitigating actions as required by Required Action B.2. Temporary analytical methods may also be used as compensatory measures to restore OPERABILITY (Ref. 6). Options for restoring the CRE or CBE boundary to OPERABLE status include changing the licensing basis DBA consequence analysis, repairing the boundary, or a combination of these actions. Depending upon the nature of the problem and the corrective action, a full scope inleakage test may not be necessary to establish that the envelope boundary has been restored to OPERABLE status.

REFERENCES

1. USAR, Section 6.4 and 9.4.
2. USAR, Chapter 15, Appendix 15A.
3. Regulatory Guide 1.52, Rev. 2.
4. Regulatory Guide 1.196.
5. NEI 99-03, "Control Room Habitability Assessment," June 2001.
6. Letter from Eric J. Leeds (NRC) to James W. Davis (NEI) dated January 30, 2004, "NEI Draft White Paper, Use of Generic Letter 91-18 Process and Alternative Source Terms in the Context of Control Room Habitability." (ADAMS Accession No. ML040300694).
7. USAR Section 2.2.
8. Regulatory Guide 1.78, Rev. 0.
9. Regulatory Guide 1.52, Rev. 3.

BASES

ACTIONS

C.1, C.2.1, and C.2.2 (continued)

operation immediately. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that active failures will be readily detected.

An alternative to Required Action C.1 is to immediately suspend activities that present a potential for releasing radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes accident risk. This does not preclude the movement of fuel to a safe position.

D.1 and D.2

In MODE 5 or 6, or during movement of irradiated fuel assemblies, with two CRACS trains inoperable, action must be taken immediately to suspend activities that could result in a release of radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes risk. This does not preclude the movement of fuel to a safe position.

E.1

If both CRACS trains are inoperable in MODE 1, 2, 3, or 4, the CRACS may not be capable of performing its intended function. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

Testing of the CRACS condenser heat exchangers under design conditions is impractical. This SR verifies that the heat removal capability of the CRACS air conditioning units is adequate to remove the heat load assumed in the control room during design basis accidents. This SR consists of verifying the heat removal capability of the condenser heat exchanger (either through performance testing or inspection), ensuring the proper operation of major components in the refrigeration cycle, verification of unit air flow capacity, and water flow measurement (Reference 2). The 18 month Frequency is appropriate since significant degradation of the CRACS is slow and is not expected over this time period.

BASES

REFERENCES

1. USAR, Section 9.4.1.

2. NRC letter dated May 28, 2014, "Wolf Creek Generating Station – Interpretation of Technical Specification Surveillance Requirement 3.7.11.1, "Verify each CRACS train has the capability to remove the assumed heat load" (TAC NO. MF3665)."

BASES

ACTIONS

D.1 and D.2

When Required Action A.1 cannot be completed within the associated Completion Time during movement of irradiated fuel assemblies in the fuel building, the OPERABLE Emergency Exhaust System train must be started in the FBVIS mode immediately or fuel movement suspended. This action ensures that the remaining train is OPERABLE, that no undetected failures preventing system operation will occur, and that any active failure will be readily detected.

If the system is not placed in operation, this action requires suspension of fuel movement, which precludes a fuel handling accident. This does not preclude the movement of fuel assemblies to a safe position.

E.1

If the fuel building boundary is inoperable such that a train of the Emergency Exhaust System operating in the FBVIS mode cannot establish or maintain the required negative pressure, action must be taken to restore an OPERABLE fuel building boundary within 24 hours. The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period and the availability of the Emergency Exhaust System to provide a filtered release (albeit with potential for some unfiltered fuel building leakage).

F.1

During movement of irradiated fuel assemblies in the fuel building, when two trains of the Emergency Exhaust System are inoperable for reasons other than an inoperable fuel building boundary (i.e., Condition E), or if Required Action E.1 cannot be completed within the associated Completion Time action must be taken to place the unit in a condition in which the LCO does not apply. Action must be taken immediately to suspend movement of irradiated fuel assemblies in the fuel building. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.13.1

Standby systems should be checked periodically to ensure that they function properly. As the environmental and normal operating conditions on this system are not severe, testing each train once every month, by initiating from the control room flow through the HEPA filters and charcoal adsorbers, provides an adequate check on this system.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.13.1 (continued)

Monthly heater operation dries out any moisture accumulated in the charcoal from humidity in the ambient air. Systems with heaters must be operated for ≥ 15 continuous minutes with the heaters energized. Operating heaters would not necessarily have the heating elements energized continuously for 15 minutes, but will cycle depending on the temperature. The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy available. This SR can be satisfied with the Emergency Exhaust System in the SIS or FBVIS lineup during testing. The 15-minute run time is based on Position C.6.1 of Reference 10.

SR 3.7.13.2

This SR verifies that the required Emergency Exhaust System filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The Emergency Exhaust System filter tests are based on the guidance in References 6 and 7 in accordance with the VFTP. The VFTP includes testing HEPA filter performance, charcoal absorber efficiency, minimum system flow rate, and the physical properties of the activated charcoal. Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.13.3

This SR verifies that each Emergency Exhaust System train starts and operates on an actual or simulated actuation signal. The 18 month Frequency is consistent with References 6 and 7. Proper completion of this SR requires testing the system in both the SIS (auxiliary building exhaust) and the FBVIS (fuel building exhaust) modes of operation.

During emergency operations the Emergency Exhaust System will automatically start in either the SIS or FBVIS lineup depending on the initiating signal. In the SIS lineup, the fans operate with dampers aligned to exhaust from the auxiliary building and prevent unfiltered leakage. In this SIS lineup, each train is capable of maintaining the auxiliary building at a negative pressure at least 0.25 inches water gauge relative to the outside atmosphere. In the FBVIS lineup, which is initiated upon detection of high radioactivity by the fuel building exhaust gaseous radioactivity monitors, the fans operate with the dampers aligned to exhaust from the fuel building to prevent unfiltered leakage. In the FBVIS lineup, each train is capable of maintaining the fuel building at a negative pressure at least 0.25 inches water gauge relative to the outside atmosphere. Normal exhaust air from the fuel building is continuously

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.13.3 (continued)

monitored by radiation detectors. One detector output will automatically align the Emergency Exhaust System in the FBVIS mode of operation.

This surveillance requirement demonstrates that each Emergency Exhaust System unit can be automatically started and properly configured to the FBVIS or SIS alignment, as applicable, upon receipt of an actual or simulated SIS signal and an FBVIS signal. It is not required that each Emergency Exhaust System unit be started from both actuation signals during the same surveillance test provided each actuation signal is tested independently within the 18 month test frequency.

SR 3.7.13.4

This SR verifies the integrity of the auxiliary building enclosure. The ability of the auxiliary building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the Emergency Exhaust System. During the SIS mode of operation, the Emergency Exhaust System is designed to maintain a slight negative pressure in the auxiliary building, to prevent unfiltered leakage. The Emergency Exhaust System is designed to maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure at a flow rate specified in the VFTP. The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref.8).

An 18 month Frequency (on a STAGGERED TEST BASIS) is consistent with Reference 9.

SR 3.7.13.5

This SR verifies the integrity of the fuel building enclosure. The ability of the fuel building to maintain negative pressure with respect to potentially uncontaminated adjacent areas is periodically tested to verify proper function of the Emergency Exhaust System. During the FBVIS mode of operation, the Emergency Exhaust System is designed to maintain a slight negative pressure in the fuel building, to prevent unfiltered leakage. The Emergency Exhaust System is designed to maintain a negative pressure ≥ 0.25 inches water gauge with respect to atmospheric pressure at a flow rate specified in the VFTP. The Frequency of 18 months is consistent with the guidance provided in NUREG-0800, Section 6.5.1 (Ref.8).

An 18 month Frequency (on a STAGGERED TEST BASIS) is consistent with Reference 9.

BASES

REFERENCES

1. USAR, Section 6.5.1.
2. USAR, Section 9.4.2 and 9.4.3.
3. USAR, Section 15.7.4.
4. Regulatory Guide 1.25, Rev. 0 (Safety Guide 25).
5. 10 CFR 100.
6. ASTM D 3803-1989.
7. ANSI N510-1980.
8. NUREG-0800, Section 6.5.1, Rev. 2, July 1981.
9. Regulatory Guide 1.52, Rev. 2.
10. Regulatory Guide 1.52, Rev. 3.

BASES

BACKROUND (continued)

For each or any of the four feedwater lines, a positive displacement metering pump delivers the chemicals from a supply tank into the associated feedwater line via an injection flow path that includes an automatic air-operated globe isolation valve, a check valve, and a manual valve prior to entering into the feedwater system.

The Steam Generator Chemical Injection System is used to maintain proper system pH and scavenge oxygen present in the steam generators to minimize corrosion during plant shutdown conditions. The system adds hydrazine and amine mixture to the steam generator and is normally not in use during plant power operation, except during plant conditions in hot standby or cold layup. The Steam Generator Chemical Injection System is infrequently used during the Applicability of this Specification.

The manual valve located in each chemical injection flow path is maintained locked closed until the system is used. When the system is used, the manual valve is opened under administrative controls. The controls include the presence of a dedicated operator who has constant communication with the control room while the flow path is open. Therefore, crediting the locked closed manual valve in the chemical injection flow path for isolation is warranted when it is only opened under administrative controls.

The main steam and related secondary side lines are automatically isolated upon receipt of an SLIS or feedwater isolation signal (FWIS). The diverse parameters sensed to initiate an SLIS are low steam line pressure, high negative steam pressure rate, and high containment pressure (Hi-2).

A FWIS is generated by a safety injection signal (SIS), reactor trip with low Tave, steam generator water level high-high, or steam generator water level low-low. The diverse parameters sensed to initiate an SIS are low steam line pressure, low pressurizer pressure, and high containment pressure (Hi-1).

The steam generator blowdown and sample isolation (AFAS) isolates the steam generator blowdown and sample lines. A steam generator blowdown and sample isolation (AFAS) is generated by a SIS, motor-driven AFAS, or undervoltage on switchgear 4.16 kV buses NB01 or NB02.

Descriptions of SSIVs are found in the USAR, Section 10.4.7 (Ref. 1), Section 10.4.8 (Ref. 2), and Section 10.3 (Ref. 3).

BASES

APPLICABLE SAFETY ANALYSES

The accident analysis assume that the steam generators are isolated after receiving an isolation signal as discussed in the Background section. Further discussion can be found in the USAR, Chapters 6 and 15.

The SSIVs function to ensure the primary success path for steam line and feed line isolation and for delivery of required auxiliary feedwater flow and, therefore, satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

This LCO provides assurance that SSIVs will isolate the plant's secondary side, following a main feed line or main steam line break and ensures the required flow of auxiliary feedwater to the intact steam generators. The automatic secondary system isolation valves are considered OPERABLE when their isolation times are within limits and they are capable of closing on an isolation actuation signal. OPERABILITY of the automatic SSIVs also requires the OPERABILITY of the auxiliary relays downstream of the Balance of Plant Engineered Safety Features Actuation System (ESFAS) cabinets (the auxiliary relays in the system cabinets are considered to be part of the end devices covered by this LCO).

The locked closed manual valves in the chemical injection flow path are considered OPERABLE when they are locked closed. Locked closed manual SSIVs include steam generator chemical injection isolation valves (AEV0128, AEV0129, AEV0130, and AEV0131).

Automatic secondary system isolation valves include the SGBIVs (BMHV0001, BMHV0002, BMHV0003, and BMHV0004) and the SGBSIVs (BMHV0019, BMHV0020, BMHV0021, BMHV0022, BMHV0065, BMHV0066, BMHV0067, BMHV0068, BMHV0035, BMHV0036, BMHV0037, and BMHV0038), and the main steam low point drain isolation valves (ABLV007, ABLV008, ABLV009, and ABLV010).

APPLICABILITY

The SSIVs must be OPERABLE in MODES 1, 2, and 3, when there is significant mass and energy in the Reactor Coolant System (RCS) and steam generators. When the SSIVs are closed and de-activated, or closed and isolated by a closed manual valve, or the flow path is isolated by a combination of closed manual valve(s) and closed de-activated automatic valve(s), they are performing the specified safety function of isolating the plant's secondary side. The combination provides a means of dual isolation that cannot be affected by a single active failure thus assuring the safety function is met. An air-operated SSIV is de-activated when power and air are removed from its actuation solenoid valves, and a solenoid-operated SSIV is de-activated when power is removed from its associated solenoid valve.

In MODES 4, 5, and 6, the steam generator energy is low. Therefore, the SSIVs are not required for isolation of potential high energy secondary system pipe breaks in these MODES.

BASES

ACTIONS

The ACTIONS are modified by a Note to provide clarification that, for this LCO, separate Condition entry is allowed for each SSIV. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable SSIV. Complying with the Required Actions may allow for continued operation, and subsequent inoperable SSIVs are governed by subsequent Condition entry and application of associated Required Actions.

A second Note has been added to allow SSIVs to be unisolated intermittently under administrative controls. These administrative controls consist of stationing a dedicated operator at the valve controls, who is in continuous communication with the control room. In this way, the SSIV can be rapidly isolated when the need for secondary system isolation is indicated.

A.1 and A.2

With one or more SSIVs inoperable, action must be taken to restore the affected valves to OPERABLE status, or to close or isolate inoperable valves within 7 days. When these valves are closed or isolated, they are performing their specified safety function.

The 7 day Completion Time takes into account the low probability of an event occurring during this time period that would require isolation of the plant's secondary side. The 7 day Completion Time is reasonable, based on operating experience.

Inoperable SSIVs that are closed or isolated must be verified on a periodic basis that they are closed or isolated. This is necessary to ensure that the assumptions in the accident analyses remain valid. The 7 day Completion Time is reasonable based on engineering judgment, in view of valve status indications in the control room, and other administrative controls, to ensure that these valves are in the closed position or isolated.

If the inoperable SSIV is both closed and de-activated, or both closed and isolated by a closed manual valve, or the affected SSIV flow path is isolated by two closed manual valves, or two closed de-activated automatic valves, or one closed manual valve in combination with one closed de-activated automatic valve, the LCO does not apply as discussed in the Applicability. The combination provides a means of dual isolation that cannot be affected by a single active failure thus assuring the safety function is met. For example, BMHV0065 is determined to be inoperable. If BMHV0065 is closed or is open and isolated by BMV0009, then Required Action A.2 must be performed. If BMHV0065 is closed and BMV009 is closed, then the LCO is considered met since BMHV0065 does not meet the Applicability statement.

BASES

ACTIONS (continued)

B.1 and B.2

If the Required Action and associated Completion Time of Condition A is not met, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed at least in MODE *3* within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.19.1

This SR verifies the proper alignment for required automatic SSIVs in the flow path that are used to isolate the plant's secondary side. The SSIV is allowed to be in a nonaccident position provided the valve will automatically reposition within the proper stroke time. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown (which may include the use of local or remote indicators), that valves capable of being mispositioned are in the correct position. This SR does not apply to the locked closed manual valves in the chemical injection flow path since these valves were verified to be in the correct position upon locking.

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

SR 3.7.19.2

This SR verifies that the isolation time of each required automatic SSIV is within limits when tested pursuant to the Inservice Testing Program. The specific limits are documented in the Inservice Testing Program. The SSIV isolation times are less than or equal to those assumed in the accident and containment analyses. The SR is performed only for required SSIVs. This Surveillance does not include verifying a closure time for the steam generator chemical injection isolation valves. An exception is made for the steam generator chemical addition injection isolation valves which are not included in the Inservice Testing Program. These valves are passive and contain a locking device and a check valve in their flow path.

B 3.9 REFUELING OPERATIONS

B 3.9.6 Residual Heat Removal (RHR) and Coolant Circulation - Low Water Level

BASES

BACKGROUND

The purpose of the RHR System in MODE 6 is to remove decay heat and sensible heat from the Reactor Coolant System (RCS), as required by GDC 34, to provide mixing of borated coolant, and to prevent boron stratification (Ref. 1). Heat is removed from the RCS by circulating reactor coolant through the RHR heat exchangers where the heat is transferred to the Component Cooling Water System. The coolant is then returned to the RCS via the RCS cold leg(s). Operation of the RHR System for normal cooldown decay heat removal is manually accomplished from the control room. The heat removal rate is adjusted by controlling the flow of reactor coolant through the RHR heat exchanger(s) and the bypass lines. Mixing of the reactor coolant is maintained by this continuous circulation of reactor coolant through the RHR System.

APPLICABLE SAFETY ANALYSES

If the reactor coolant temperature is not maintained below 200°F, boiling of the reactor coolant could result. This could lead to a loss of coolant in the reactor vessel. Additionally, boiling of the reactor coolant could lead to boron plating out on components near the areas of the boiling activity. The loss of reactor coolant and the subsequent plate out of boron will eventually challenge the integrity of the fuel cladding, which is a fission product barrier. Two trains of the RHR System are required to be OPERABLE, and one train in operation, in order to prevent this challenge.

Although the RHR System does not meet a specific criterion of the NRC Policy Statement, it was identified in 10 CFR 50.36(c)(2)(ii) as an important contributor to risk reduction. Therefore, the RHR System is retained as a Specification.

LCO

In MODE 6, with the water level < 23 ft above the top of the reactor vessel flange, both RHR loops must be OPERABLE.

Additionally, one loop of RHR must be in operation in order to provide:

a. Removal of decay heat;

b. Mixing of borated coolant to minimize the possibility of criticality; and

BASES

LCO (continued)

c. Indication of reactor coolant temperature.

An OPERABLE RHR loop consists of an RHR pump, a heat exchanger, valves, piping, instruments and controls to ensure an OPERABLE flow path and to determine the RCS temperature. The flow path starts in one of the RCS hot legs and is returned to the RCS cold legs. An OPERABLE RHR loop must be capable of being realigned to provide an OPERABLE flow path.

When both RHR loops (or trains) are required to be OPERABLE, the associated Component Cooling Water (CCW) train is required to be OPERABLE. The heat sink for the CCW System is normally provided by the Service Water System or Essential Service Water (ESW) System, as determined by system availability. In MODES 5 and 6, one Diesel Generator (DG) is required to be OPERABLE per LCO 3.8.2, "AC Sources – Shutdown." The same ESW train is required to be capable of performing its related support function(s) to support DG OPERABILITY. However, a Service Water train can be utilized to support CCW/RHR OPERABILITY if the associated ESW train is not capable of performing its related support function(s).

APPLICABILITY

Two RHR loops are required to be OPERABLE, and one RHR loop must be in operation in MODE 6, with the water level < 23 ft above the top of the reactor vessel flange, to provide decay heat removal. Requirements for the RHR System in other MODES are covered by LCOs in Section 3.4, Reactor Coolant System (RCS), and Section 3.5, Emergency Core Cooling Systems (ECCS). RHR loop requirements in MODE 6 with the water level ≥ 23 ft are located in LCO 3.9.5, "Residual Heat Removal (RHR) and Coolant Circulation - High Water Level."

Since LCO 3.9.6 contains Required Actions with immediate Completion Times related to the restoration of the degraded decay heat removal function, it is not permitted to enter this LCO from either MODE 5 or from LCO 3.9.5, "RHR and Coolant Circulation – High Water Level," unless the requirements of LCO 3.9.6 are met. This precludes diminishing the backup decay heat removal capability when the RHR System is degraded.

ACTIONS

A.1 and A.2

If less than the required number of RHR loops are OPERABLE, action shall be immediately initiated and continued until the RHR loop is restored to OPERABLE status and to operation in accordance with the LCO or until ≥ 23 ft of water level is established above the reactor

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B 2.1.1-4	0	Amend. No. 123	2/12/03
B 2.1.2-1	0	Amend. No. 123	12/18/99
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B 3.0-1	34	DRR 07-1057	7/10/07
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B 3.0-4	19	DRR 04-1414	10/12/04
B 3.0-5	19	DRR 04-1414	10/12/04
B 3.0-6	19	DRR 04-1414	10/12/04
B 3.0-7	19	DRR 04-1414	10/12/04
B 3.0-8	19	DRR 04-1414	10/12/04
B 3.0-9	42	DRR 09-1009	7/16/09
B 3.0-10	42	DRR 09-1009	7/16/09
B 3.0-11	34	DRR 07-1057	7/10/07
B 3.0-12	34	DRR 07-1057	7/10/07
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B 3.0-15	34	DRR 07-1057	7/10/07
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B 3.1.1-2	0	Amend. No. 123	12/18/99
B 3.1.1-3	0	Amend. No. 123	12/18/99
B 3.1.1-4	19	DRR 04-1414	10/12/04
B 3.1.1-5	0	Amend. No. 123	12/18/99
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B 3.1.8-3	15	DRR 03-0860	7/10/03
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B 3.2.1-8	48	DRR 10-3740	12/28/10
B 3.2.1-9	29	DRR 06-1984	10/17/06
B 3.2.1-10	48	DRR 10-3740	12/28/10
B 3.2.2-1	48	DRR 10-3740	12/28/10
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B 3.3.1-16	0	Amend. No. 123	12/18/99
B 3.3.1-17	0	Amend. No. 123	12/18/99
B 3.3.1-18	0	Amend. No. 123	12/18/99
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B 3.3.1-20	66	DRR 14-2329	11/6/14
B 3.3.1-21	0	Amend. No. 123	12/18/99
B 3.3.1-22	0	Amend. No. 123	12/18/99
B 3.3.1-23	9	DRR 02-0123	2/28/02
B 3.3.1-24	0	Amend. No. 123	12/18/99
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B 3.3.1-42	20	DRR 04-1533	2/16/05
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B 3.3.2-5	0	Amend. No. 123	12/18/99
B 3.3.2-6	7	DRR 01-0474	5/1/01
B 3.3.2-7	0	Amend. No. 123	12/18/99
B 3.3.2-8	0	Amend. No. 123	12/18/99
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B 3.3.2-13	0	Amend. No. 123	12/18/99
B 3.3.2-14	2	DRR 00-0147	4/24/00
B 3.3.2-15	0	Amend. No. 123	12/18/99
B 3.3.2-16	0	Amend. No. 123	12/18/99
B 3.3.2-17	0	Amend. No. 123	12/18/99
B 3.3.2-18	0	Amend. No. 123	12/18/99
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B 3.3.2-24	39	DRR 08-1096	8/28/08
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B 3.3.2-38	20	DRR 04-1533	2/16/05
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B 3.3.2-42	45	Amend. No. 187 (ETS)	3/5/10
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B 3.3.2-44	20	DRR 04-1533	2/16/05
B 3.3.2-45	20	DRR 04-1533	2/16/05
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B 3.3.2-47	43	DRR 09-1416	9/2/09
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B 3.3.2-52	43	DRR 09-1416	9/2/09
B 3.3.2-53	43	DRR 09-1416	9/2/09
B 3.3.2-54	43	DRR 09-1416	9/2/09
B 3.3.2-55	43	DRR 09-1416	9/2/09
B 3.3.2-56	43	DRR 09-1416	9/2/09
B 3.3.2-57	43	DRR 09-1416	9/2/09
B 3.3.3-1	0	Amend. No. 123	12/18/99
B 3.3.3-2	5	DRR 00-1427	10/12/00
B 3.3.3-3	0	Amend. No. 123	12/18/99
B 3.3.3-4	0	Amend. No. 123	12/18/99
B 3.3.3-5	0	Amend. No. 123	12/18/99
B 3.3.3-6	8	DRR 01-1235	9/19/01
B 3.3.3-7	21	DRR 05-0707	4/20/05
B 3.3.3-8	8	DRR 01-1235	9/19/01
B 3.3.3-9	8	DRR 01-1235	9/19/01
B 3.3.3-10	19	DRR 04-1414	10/12/04
B 3.3.3-11	19	DRR 04-1414	10/12/04
B 3.3.3-12	21	DRR 05-0707	4/20/05
B 3.3.3-13	21	DRR 05-0707	4/20/05
B 3.3.3-14	8	DRR 01-1235	9/19/01
B 3.3.3-15	8	DRR 01-1235	9/19/01
B 3.3.4-1	0	Amend. No. 123	12/18/99
B 3.3.4-2	9	DRR 02-1023	2/28/02
B 3.3.4-3	15	DRR 03-0860	7/10/03
B 3.3.4-4	19	DRR 04-1414	10/12/04
B 3.3.4-5	1	DRR 99-1624	12/18/99
B 3.3.4-6	9	DRR 02-0123	2/28/02
B 3.3.5-1	0	Amend. No. 123	12/18/99
B 3.3.5-2	1	DRR 99-1624	12/18/99
B 3.3.5-3	1	DRR 99-1624	12/18/99

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TAB – B 3.3 INSTRUMENTATION (continued)			
B 3.3.5-4	1	DRR 99-1624	12/18/99
B 3.3.5-5	0	Amend. No. 123	12/18/99
B 3.3.5-6	22	DRR 05-1375	6/28/05
B 3.3.5-7	22	DRR 05-1375	6/28/05
B 3.3.6-1	0	Amend. No. 123	12/18/99
B 3.3.6-2	0	Amend. No. 123	12/18/99
B 3.3.6-3	0	Amend. No. 123	12/18/99
B 3.3.6-4	0	Amend. No. 123	12/18/99
B 3.3.6-5	0	Amend. No. 123	12/18/99
B 3.3.6-6	0	Amend. No. 123	12/18/99
B 3.3.6-7	0	Amend. No. 123	12/18/99
B 3.3.7-1	0	Amend. No. 123	12/18/99
B 3.3.7-2	57	DRR 13-0006	1/16/13
B 3.3.7-3	57	DRR 13-0006	1/16/13
B 3.3.7-4	0	Amend. No. 123	12/18/99
B 3.3.7-5	0	Amend. No. 123	12/18/99
B 3.3.7-6	57	DRR 13-0006	1/16/13
B 3.3.7-7	0	Amend. No. 123	12/18/99
B 3.3.7-8	0	Amend. No. 123	12/18/99
B 3.3.8-1	0	Amend. No. 123	12/18/99
B 3.3.8-2	0	Amend. No. 123	12/18/99
B 3.3.8-3	57	DRR 13-0006	1/16/13
B 3.3.8-4	57	DRR 13-0006	1/16/13
B 3.3.8-5	0	Amend. No. 123	12/18/99
B 3.3.8-6	24	DRR 06-0051	2/28/06
B 3.3.8-7	0	Amend. No. 123	12/18/99
TAB – B 3.4 REACTOR COOLANT SYSTEM (RCS)			
B 3.4.1-1	0	Amend. No. 123	12/18/99
B 3.4.1-2	10	DRR 02-0411	4/5/02
B 3.4.1-3	10	DRR 02-0411	4/5/02
B 3.4.1-4	0	Amend. No. 123	12/18/99
B 3.4.1-5	0	Amend. No. 123	12/18/99
B 3.4.1-6	0	Amend. No. 123	12/18/99
B 3.4.2-1	0	Amend. No. 123	12/18/99
B 3.4.2-2	0	Amend. No. 123	12/18/99
B 3.4.2-3	0	Amend. No. 123	12/18/99
B 3.4.3-1	0	Amend. No. 123	12/18/99
B 3.4.3-2	0	Amend. No. 123	12/18/99
B 3.4.3-3	0	Amend. No. 123	12/18/99
B 3.4.3-4	0	Amend. No. 123	12/18/99
B 3.4.3-5	0	Amend. No. 123	12/18/99
B 3.4.3-6	0	Amend. No. 123	12/18/99
B 3.4.3-7	0	Amend. No. 123	12/18/99
B 3.4.4-1	0	Amend. No. 123	12/18/99
B 3.4.4-2	29	DRR 06-1984	10/17/06
B 3.4.4-3	0	Amend. No. 123	12/18/99
B 3.4.5-1	0	Amend. No. 123	12/18/99
B 3.4.5-2	53	DRR 11-1513	7/18/11
B 3.4.5-3	29	DRR 06-1984	10/17/06
B 3.4.5-4	0	Amend. No. 123	12/18/99

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TAB – B 3.4 REACTOR COOLANT SYSTEM (RCS) (continued)			
B 3.4.5-5	12	DRR 02-1062	9/26/02
B 3.4.5-6	12	DRR 02-1062	9/26/02
B 3.4.6-1	53	DRR 11-1513	7/18/11
B 3.4.6-2	29	DRR 06-1984	10/17/06
B 3.4.6-3	12	DRR 02-1062	9/26/02
B 3.4.6-4	12	DRR 02-1062	9/26/02
B 3.4.6-5	12	DRR 02-1062	9/26/02
B 3.4.7-1	12	DRR 02-1062	9/26/02
B 3.4.7-2	17	DRR 04-0453	5/26/04
B 3.4.7-3	63	DRR 14-1572	7/1/14
B 3.4.7-4	42	DRR 09-1009	7/16/09
B 3.4.7-5	12	DRR 02-1062	9/26/02
B 3.4.8-1	53	DRR 11-1513	7/18/11
B 3.4.8-2	62	DRR 14-1103	4/20/14
B 3.4.8-3	42	DRR 09-1009	7/16/09
B 3.4.8-4	42	DRR 09-1009	7/16/09
B 3.4.9-1	0	Amend. No. 123	12/18/99
B 3.4.9-2	0	Amend. No. 123	12/18/99
B 3.4.9-3	0	Amend. No. 123	12/18/99
B 3.4.9-4	0	Amend. No. 123	12/18/99
B 3.4.10-1	5	DRR 00-1427	10/12/00
B 3.4.10-2	5	DRR 00-1427	10/12/00
B 3.4.10-3	0	Amend. No. 123	12/18/99
B 3.4.10-4	32	DRR 07-0139	2/7/07
B 3.4.11-1	0	Amend. No. 123	12/18/99
B 3.4.11-2	1	DRR 99-1624	12/18/99
B 3.4.11-3	19	DRR 04-1414	10/12/04
B 3.4.11-4	0	Amend. No. 123	12/18/99
B 3.4.11-5	1	DRR 99-1624	12/18/99
B 3.4.11-6	0	Amend. No. 123	12/18/99
B 3.4.11-7	32	DRR 07-0139	2/7/07
B 3.4.12-1	61	DRR 14-0346	2/27/14
B 3.4.12-2	61	DRR 14-0346	2/27/14
B 3.4.12-3	0	Amend. No. 123	12/18/99
B 3.4.12-4	61	DRR 14-0346	2/27/14
B 3.4.12-5	61	DRR 14-0346	2/27/14
B 3.4.12-6	56	DRR 12-1792	11/7/12
B 3.4.12-7	61	DRR 14-0346	2/27/14
B 3.4.12-8	1	DRR 99-1624	12/18/99
B 3.4.12-9	56	DRR 12-1792	11/7/12
B 3.4.12-10	0	Amend. No. 123	12/18/99
B 3.4.12-11	61	DRR 14-0346	2/27/14
B 3.4.12-12	32	DRR 07-0139	2/7/07
B 3.4.12-13	0	Amend. No. 123	12/18/99
B 3.4.12-14	32	DRR 07-0139	2/7/07
B 3.4.13-1	0	Amend. No. 123	12/18/99
B 3.4.13-2	29	DRR 06-1984	10/17/06
B 3.4.13-3	29	DRR 06-1984	10/17/06
B 3.4.13-4	35	DRR 07-1553	9/28/07
B 3.4.13-5	35	DRR 07-1553	9/28/07
B 3.4.13-6	29	DRR 06-1984	10/17/06

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TAB – B 3.4 REACTOR COOLANT SYSTEM (RCS) (continued)			
B 3.4.14-1	0	Amend. No. 123	12/18/99
B 3.4.14-2	0	Amend. No. 123	12/18/99
B 3.4.14-3	0	Amend. No. 123	12/18/99
B 3.4.14-4	0	Amend. No. 123	12/18/99
B 3.4.14-5	32	DRR 07-0139	2/7/07
B 3.4.14-6	32	DRR 07-0139	2/7/07
B 3.4.15-1	31	DRR 06-2494	12/13/06
B 3.4.15-2	31	DRR 06-2494	12/13/06
B 3.4.15-3	33	DRR 07-0656	5/1/07
B 3.4.15-4	33	DRR 07-0656	5/1/07
B 3.4.15-5	65	DRR 14-2146	9/30/14
B 3.4.15-6	31	DRR 06-2494	12/13/06
B 3.4.15-7	31	DRR 06-2494	12/13/06
B 3.4.15-8	31	DRR 06-2494	12/13/06
B 3.4.16-1	31	DRR 06-2494	12/13/06
B 3.4.16-2	31	DRR 06-2494	12/13/06
B 3.4.16-3	31	DRR 06-2494	12/13/06
B 3.4.16-4	31	DRR 06-2494	12/13/06
B 3.4.16-5	31	DRR 06-2494	12/13/06
B 3.4.17-1	29	DRR 06-1984	10/17/06
B 3.4.17-2	58	DRR 13-0369	02/26/13
B 3.4.17-3	52	DRR 11-0724	4/11/11
B 3.4.17-4	57	DRR 13-0006	1/16/13
B 3.4.17-5	57	DRR 13-0006	1/16/13
B 3.4.17-6	57	DRR 13-0006	1/16/13
B 3.4.17-7	58	DRR 13-0369	02/26/13
TAB – B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)			
B 3.5.1-1	0	Amend. No. 123	12/18/99
B 3.5.1-2	0	Amend. No. 123	12/18/99
B 3.5.1-3	0	Amend. No. 123	12/18/99
B 3.5.1-4	0	Amend. No. 123	12/18/99
B 3.5.1-5	1	DRR 99-1624	12/18/99
B 3.5.1-6	1	DRR 99-1624	12/18/99
B 3.5.1-7	16	DRR 03-1497	11/4/03
B 3.5.1-8	1	DRR 99-1624	12/18/99
B 3.5.2-1	0	Amend. No. 123	12/18/99
B 3.5.2-2	0	Amend. No. 123	12/18/99
B 3.5.2-3	0	Amend. No. 123	12/18/99
B 3.5.2-4	0	Amend. No. 123	12/18/99
B 3.5.2-5	41	DRR 09-0288	3/20/09
B 3.5.2-6	42	DRR 09-1009	7/16/09
B 3.5.2-7	42	DRR 09-1009	7/16/09
B 3.5.2-8	38	DRR 08-0624	5/1/08
B 3.5.2-9	38	DRR 08-0624	5/1/08
B 3.5.2-10	41	DRR 09-0288	3/20/09
B 3.5.2-11	41	DRR 09-0288	3/20/09
B 3.5.3-1	56	DRR 12-1792	11/7/12
B 3.5.3-2	56	DRR 12-1792	11/7/12
B 3.5.3-3	56	DRR 12-1792	11/7/12
B 3.5.3-4	56	DRR 12-1792	11/7/12

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TAB – B 3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS) (continued)			
B 3.5.4-1	0	Amend. No. 123	12/18/99
B 3.5.4-2	0	Amend. No. 123	12/18/99
B 3.5.4-3	0	Amend. No. 123	12/18/99
B 3.5.4-4	0	Amend. No. 123	12/18/99
B 3.5.4-5	0	Amend. No. 123	12/18/99
B 3.5.4-6	26	DRR 06-1350	7/24/06
B 3.5.5-1	21	DRR 05-0707	4/20/05
B 3.5.5-2	21	DRR 05-0707	4/20/05
B 3.5.5-3	2	Amend. No. 132	4/24/00
B 3.5.5-4	21	DRR 05-0707	4/20/05
TAB – B 3.6 CONTAINMENT SYSTEMS			
B 3.6.1-1	0	Amend. No. 123	12/18/99
B 3.6.1-2	0	Amend. No. 123	12/18/99
B 3.6.1-3	0	Amend. No. 123	12/18/99
B 3.6.1-4	17	DRR 04-0453	5/26/04
B 3.6.2-1	0	Amend. No. 123	12/18/99
B 3.6.2-2	0	Amend. No. 123	12/18/99
B 3.6.2-3	0	Amend. No. 123	12/18/99
B 3.6.2-4	0	Amend. No. 123	12/18/99
B 3.6.2-5	0	Amend. No. 123	12/18/99
B 3.6.2-6	0	Amend. No. 123	12/18/99
B 3.6.2-7	0	Amend. No. 123	12/18/99
B 3.6.3-1	0	Amend. No. 123	12/18/99
B 3.6.3-2	0	Amend. No. 123	12/18/99
B 3.6.3-3	0	Amend. No. 123	12/18/99
B 3.6.3-4	49	DRR 11-0014	1/31/11
B 3.6.3-5	49	DRR 11-0014	1/31/11
B 3.6.3-6	49	DRR 11-0014	1/31/11
B 3.6.3-7	41	DRR 09-0288	3/20/09
B 3.6.3-8	36	DRR 08-0255	3/11/08
B 3.6.3-9	36	DRR 08-0255	3/11/08
B 3.6.3-10	8	DRR 01-1235	9/19/01
B 3.6.3-11	36	DRR 08-0255	3/11/08
B 3.6.3-12	36	DRR 08-0255	3/11/08
B 3.6.3-13	50	DRR 11-0449	3/9/11
B 3.6.3-14	36	DRR 08-0255	3/11/08
B 3.6.3-15	39	DRR 08-1096	8/28/08
B 3.6.3-16	39	DRR 08-1096	8/28/08
B 3.6.3-17	36	DRR 08-0255	3/11/08
B 3.6.3-18	36	DRR 08-0255	3/11/08
B 3.6.3-19	36	DRR 08-0255	3/11/08
B 3.6.4-1	39	DRR 08-1096	8/28/08
B 3.6.4-2	0	Amend. No. 123	12/18/99
B 3.6.4-3	0	Amend. No. 123	12/18/99
B 3.6.5-1	0	Amend. No. 123	12/18/99
B 3.6.5-2	37	DRR 08-0503	4/8/08
B 3.6.5-3	13	DRR 02-1458	12/03/02
B 3.6.5-4	0	Amend. No. 123	12/18/99
B 3.6.6-1	42	DRR 09-1009	7/16/09
B 3.6.6-2	63	DRR 14-1572	7/1/14

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TAB – B 3.6 CONTAINMENT SYSTEMS (continued)			
B 3.6.6-3	37	DRR 08-0503	4/8/08
B 3.6.6-4	42	DRR 09-1009	7/16/09
B 3.6.6-5	0	Amend. No. 123	12/18/99
B 3.6.6-6	18	DRR 04-1018	9/1/04
B 3.6.6-7	0	Amend. No. 123	12/18/99
B 3.6.6-8	32	DRR 07-0139	2/7/07
B 3.6.6-9	58	DRR 13-0369	2/26/13
B 3.6.7-1	0	Amend. No. 123	12/18/99
B 3.6.7-2	42	DRR 09-1009	7/16/09
B 3.6.7-3	0	Amend. No. 123	12/18/99
B 3.6.7-4	29	DRR 06-1984	10/17/06
B 3.6.7-5	42	DRR 09-1009	7/16/09
TAB – B 3.7 PLANT SYSTEMS			
B 3.7.1-1	0	Amend. No. 123	12/18/99
B 3.7.1-2	0	Amend. No. 123	12/18/99
B 3.7.1-3	0	Amend. No. 123	12/18/99
B 3.7.1-4	0	Amend. No. 123	12/18/99
B 3.7.1-5	32	DRR 07-0139	2/7/07
B 3.7.1-6	32	DRR 07-0139	2/7/07
B 3.7.2-1	44	DRR 09-1744	10/28/09
B 3.7.2-2	44	DRR 09-1744	10/28/09
B 3.7.2-3	44	DRR 09-1744	10/28/09
B 3.7.2-4	44	DRR 09-1744	10/28/09
B 3.7.2-5	44	DRR 09-1744	10/28/09
B 3.7.2-6	44	DRR 09-1744	10/28/09
B 3.7.2-7	44	DRR 09-1744	10/28/09
B 3.7.2-8	44	DRR 09-1744	10/28/09
B 3.7.2-9	44	DRR 09-1744	10/28/09
B 3.7.2-10	44	DRR 09-1744	10/28/09
B 3.7.2-11	44	DRR 09-1744	10/28/09
B 3.7.3-1	37	DRR 08-0503	4/8/08
B 3.7.3-2	50	DRR 11-0449	3/9/11
B 3.7.3-3	37	DRR 08-0503	4/8/08
B 3.7.3-4	37	DRR 08-0503	4/8/08
B 3.7.3-5	37	DRR 08-0503	4/8/08
B 3.7.3-6	37	DRR 08-0503	4/8/08
B 3.7.3-7	37	DRR 08-0503	4/8/08
B 3.7.3-8	37	DRR 08-0503	4/8/08
B 3.7.3-9	66	DRR 14-2329	11/6/14
B 3.7.3-10	66	DRR 14-2329	11/6/14
B 3.7.3-11	37	DRR 08-0503	4/8/08
B 3.7.4-1	1	DRR 99-1624	12/18/99
B 3.7.4-2	1	DRR 99-1624	12/18/99
B 3.7.4-3	19	DRR 04-1414	10/12/04
B 3.7.4-4	19	DRR 04-1414	10/12/04
B 3.7.4-5	1	DRR 99-1624	12/18/99
B 3.7.5-1	54	DRR 11-2394	11/16/11

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TAB – B 3.7 PLANT SYSTEMS (continued)			
B 3.7.5-2	54	DRR 11-2394	11/16/11
B 3.7.5-3	0	Amend. No. 123	12/18/99
B 3.7.5-4	60	DRR 13-2562	10/25/13
B 3.7.5-5	44	DRR 09-1744	10/28/09
B 3.7.5-6	44	DRR 09-1744	10/28/09
B 3.7.5-7	32	DRR 07-0139	2/7/07
B 3.7.5-8	14	DRR 03-0102	2/12/03
B 3.7.5-9	32	DRR 07-0139	2/7/07
B 3.7.6-1	0	Amend. No. 123	12/18/99
B 3.7.6-2	0	Amend. No. 123	12/18/99
B 3.7.6-3	0	Amend. No. 123	12/18/99
B 3.7.7-1	0	Amend. No. 123	12/18/99
B 3.7.7-2	0	Amend. No. 123	12/18/99
B 3.7.7-3	0	Amend. No. 123	12/18/99
B 3.7.7-4	1	DRR 99-1624	12/18/99
B 3.7.8-1	0	Amend. No. 123	12/18/99
B 3.7.8-2	0	Amend. No. 123	12/18/99
B 3.7.8-3	0	Amend. No. 123	12/18/99
B 3.7.8-4	0	Amend. No. 123	12/18/99
B 3.7.8-5	0	Amend. No. 123	12/18/99
B 3.7.9-1	3	Amend. No. 134	7/14/00
B 3.7.9-2	3	Amend. No. 134	7/14/00
B 3.7.9-3	3	Amend. No. 134	7/14/00
B 3.7.9-4	3	Amend. No. 134	7/14/00
B 3.7.10-1	64	DRR 14-1822	8/28/14
B 3.7.10-2	41	DRR 09-0288	3/20/09
B 3.7.10-3	41	DRR 09-0288	3/20/09
B 3.7.10-4	41	DRR 09-0288	3/20/09
B 3.7.10-5	57	DRR 13-0006	1/16/13
B 3.7.10-6	57	DRR 13-0006	1/16/13
B 3.7.10-7	64	DRR 14-1822	8/28/14
B 3.7.10-8	41	DRR 09-0288	3/20/09
B 3.7.10-9	64	DRR 14-1822	8/28/14
B 3.7.11-1	0	Amend. No. 123	12/18/99
B 3.7.11-2	57	DRR 13-0006	1/16/13
B 3.7.11-3	63	DRR 14-1572	7/1/14
B 3.7.11-4	63	DRR 14-1572	7/1/14
B 3.7.12-1	0	Amend. No. 123	12/18/99
B 3.7.13-1	24	DRR 06-0051	2/28/06
B 3.7.13-2	1	DRR 99-1624	12/18/99
B 3.7.13-3	42	DRR 09-1009	7/16/09
B 3.7.13-4	57	DRR 13-0006	1/16/13
B 3.7.13-5	57	DRR 13-0006	1/16/13
B 3.7.13-6	64	DRR 14-1822	8/28/14
B 3.7.13-7	64	DRR 14-1822	8/28/14
B 3.7.13-8	64	DRR 14-1822	8/28/14
B 3.7.14-1	0	Amend. No. 123	12/18/99
B 3.7.15-1	0	Amend. No. 123	12/18/99
B 3.7.15-2	0	Amend. No. 123	12/18/99
B 3.7.15-3	0	Amend. No. 123	12/18/99
B 3.7.16-1	5	DRR 00-1427	10/12/00

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TAB – B 3.7 PLANT SYSTEMS (continued)			
B 3.7.16-2	23	DRR 05-1995	9/28/05
B 3.7.16-3	5	DRR 00-1427	10/12/00
B 3.7.17-1	7	DRR 01-0474	5/1/01
B 3.7.17-2	7	DRR 01-0474	5/1/01
B 3.7.17-3	5	DRR 00-1427	10/12/00
B 3.7.18-1	0	Amend. No. 123	12/18/99
B 3.7.18-2	0	Amend. No. 123	12/18/99
B 3.7.18-3	0	Amend. No. 123	12/18/99
B 3.7.19-1	44	DRR 09-1744	10/28/09
B 3.7.19-2	54	DRR 11-2394	11/16/11
B 3.7.19-3	54	DRR 11-2394	11/16/11
B 3.7.19-4	61	DRR 14-0346	2/27/14
B 3.7.19-5	61	DRR 14-0346	2/27/14
B 3.7.19-6	54	DRR 11-2394	11/16/11
B 3.7.19-7	54	DRR 11-2394	11/16/11
TAB – B 3.8 ELECTRICAL POWER SYSTEMS			
B 3.8.1-1	54	DRR 11-2394	11/16/11
B 3.8.1-2	0	Amend. No. 123	12/18/99
B 3.8.1-3	47	DRR 10-1089	6/16/10
B 3.8.1-4	54	DRR 11-2394	11/16/11
B 3.8.1-5	59	DRR 13-1524	6/26/13
B 3.8.1-6	25	DRR 06-0800	5/18/06
B 3.8.1-7	26	DRR 06-1350	7/24/06
B 3.8.1-8	35	DRR 07-1553	9/28/07
B 3.8.1-9	42	DRR 09-1009	7/16/09
B 3.8.1-10	39	DRR 08-1096	8/28/08
B 3.8.1-11	36	DRR 08-0255	3/11/08
B 3.8.1-12	47	DRR 10-1089	6/16/10
B 3.8.1-13	47	DRR 10-1089	6/16/10
B 3.8.1-14	47	DRR 10-1089	6/16/10
B 3.8.1-15	47	DRR 10-1089	6/16/10
B 3.8.1-16	26	DRR 06-1350	7/24/06
B 3.8.1-17	26	DRR 06-1350	7/24/06
B 3.8.1-18	59	DRR 13-1524	6/26/13
B 3.8.1-19	26	DRR 06-1350	7/24/06
B 3.8.1-20	26	DRR 06-1350	7/24/06
B 3.8.1-21	33	DRR 07-0656	5/1/07
B 3.8.1-22	33	DRR 07-0656	5/1/07
B 3.8.1-23	40	DRR 08-1846	12/9/08
B 3.8.1-24	33	DRR 07-0656	5/1/07
B 3.8.1-25	33	DRR 07-0656	5/1/07
B 3.8.1-26	33	DRR 07-0656	5/1/07
B 3.8.1-27	59	DRR 13-1524	6/26/13
B 3.8.1-28	59	DRR 13-1524	6/26/13
B 3.8.1-29	54	DRR 11-2394	11/16/11
B 3.8.1-30	33	DRR 07-0656	5/1/07
B 3.8.1-31	33	DRR 07-0656	5/1/07
B 3.8.1-32	33	DRR 07-0656	5/1/07
B 3.8.1-33	39	DRR 08-1096	8/28/08
B 3.8.1-34	47	DRR 10-1089	6/16/10

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TAB – B 3.8 ELECTRICAL POWER SYSTEMS (continued)			
B 3.8.2-1	57	DRR 13-0006	1/16/13
B 3.8.2-2	0	Amend. No. 123	12/18/99
B 3.8.2-3	0	Amend. No. 123	12/18/99
B 3.8.2-4	57	DRR 13-0006	1/16/13
B 3.8.2-5	57	DRR 13-0006	1/16/13
B 3.8.2-6	57	DRR 13-0006	1/16/13
B 3.8.2-7	57	DRR 13-0006	1/16/13
B 3.8.3-1	1	DRR 99-1624	12/18/99
B 3.8.3-2	0	Amend. No. 123	12/18/99
B 3.8.3-3	0	Amend. No. 123	12/18/99
B 3.8.3-4	1	DRR 99-1624	12/18/99
B 3.8.3-5	0	Amend. No. 123	12/18/99
B 3.8.3-6	0	Amend. No. 123	12/18/99
B 3.8.3-7	12	DRR 02-1062	9/26/02
B 3.8.3-8	1	DRR 99-1624	12/18/99
B 3.8.3-9	0	Amend. No. 123	12/18/99
B 3.8.4-1	0	Amend. No. 123	12/18/99
B 3.8.4-2	0	Amend. No. 123	12/18/99
B 3.8.4-3	0	Amend. No. 123	12/18/99
B 3.8.4-4	0	Amend. No. 123	12/18/99
B 3.8.4-5	50	DRR 11-0449	3/9/11
B 3.8.4-6	50	DRR 11-0449	3/9/11
B 3.8.4-7	6	DRR 00-1541	3/13/01
B 3.8.4-8	0	Amend. No. 123	12/18/99
B 3.8.4-9	2	DRR 00-0147	4/24/00
B 3.8.5-1	57	DRR 13-0006	1/16/13
B 3.8.5-2	0	Amend. No. 123	12/18/99
B 3.8.5-3	57	DRR 13-0006	1/16/13
B 3.8.5-4	57	DRR 13-0006	1/16/13
B 3.8.5-5	57	DRR 13-0006	1/16/13
B 3.8.6-1	0	Amend. No. 123	12/18/99
B 3.8.6-2	0	Amend. No. 123	12/18/99
B 3.8.6-3	0	Amend. No. 123	12/18/99
B 3.8.6-4	0	Amend. No. 123	12/18/99
B 3.8.6-5	0	Amend. No. 123	12/18/99
B 3.8.6-6	0	Amend. No. 123	12/18/99
B 3.8.7-1	0	Amend. No. 123	12/18/99
B 3.8.7-2	5	DRR 00-1427	10/12/00
B 3.8.7-3	0	Amend. No. 123	12/18/99
B 3.8.7-4	0	Amend. No. 123	12/18/99
B 3.8.8-1	57	DRR 13-0006	1/16/13
B 3.8.8-2	0	Amend. No. 123	12/18/99
B 3.8.8-3	0	Amend. No. 123	12/18/99
B 3.8.8-4	57	DRR 13-0006	1/16/13
B 3.8.8-5	57	DRR 13-0006	1/16/13
B 3.8.9-1	54	DRR 11-2394	11/16/11
B 3.8.9-2	54	DRR 11-2394	11/16/11
B 3.8.9-3	54	DRR 11-2394	11/16/11
B 3.8.9-4	0	Amend. No. 123	12/18/99
B 3.8.9-5	0	Amend. No. 123	12/18/99
B 3.8.9-6	0	Amend. No. 123	12/18/99

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TAB – B 3.8 ELECTRICAL POWER SYSTEMS (continued)			
B 3.8.9-7	0	Amend. No. 123	12/18/99
B 3.8.9-8	1	DRR 99-1624	12/18/99
B 3.8.9-9	0	Amend. No. 123	12/18/99
B 3.8.10-1	57	DRR 13-0006	1/16/13
B 3.8.10-2	0	Amend. No. 123	12/18/99
B 3.8.10-3	0	Amend. No. 123	12/18/99
B 3.8.10-4	57	DRR 13-0006	1/16/13
B 3.8.10-5	57	DRR 13-0006	1/16/13
B 3.8.10-6	57	DRR 13-0006	1/16/13
TAB – B 3.9 REFUELING OPERATIONS			
B 3.9.1-1	0	Amend. No. 123	12/18/99
B 3.9.1-2	19	DRR 04-1414	10/12/04
B 3.9.1-3	19	DRR 04-1414	10/12/04
B 3.9.1-4	19	DRR 04-1414	10/12/04
B 3.9.2-1	0	Amend. No. 123	12/18/99
B 3.9.2-2	0	Amend. No. 123	12/18/99
B 3.9.2-3	0	Amend. No. 123	12/18/99
B 3.9.3-1	24	DRR 06-0051	2/28/06
B 3.9.3-2	51	DRR 11-0664	3/21/11
B 3.9.3-3	51	DRR 11-0664	3/21/11
B 3.9.3-4	53	DRR 11-1513	7/18/11
B 3.9.4-1	23	DRR 05-1995	9/28/05
B 3.9.4-2	13	DRR 02-1458	12/03/02
B 3.9.4-3	25	DRR 06-0800	5/18/06
B 3.9.4-4	23	DRR 05-1995	9/28/05
B 3.9.4-5	33	DRR 07-0656	5/1/07
B 3.9.4-6	23	DRR 05-1995	9/28/05
B 3.9.5-1	0	Amend. No. 123	12/18/99
B 3.9.5-2	32	DRR 07-0139	2/7/07
B 3.9.5-3	32	DRR 07-0139	2/7/07
B 3.9.5-4	32	DRR 07-0139	2/7/07
B 3.9.6-1	0	Amend. No. 123	12/18/99
B 3.9.6-2	63	DRR 14-1572	7/16/09
B 3.9.6-3	42	DRR 09-1009	7/16/09
B 3.9.6-4	42	DRR 09-1009	7/16/09
B 3.9.7-1	25	DRR 06-0800	5/18/06
B 3.9.7-2	0	Amend. No. 123	12/18/99
B 3.9.7-3	0	Amend. No. 123	12/18/99

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Note 1 The page number is listed on the center of the bottom of each page.

Note 2 The revision number is listed in the lower right hand corner of each page. The Revision number will be page specific.

Note 3 The change document will be the document requesting the change. Amendment No. 123 issued the improved Technical Specifications and associated Bases which affected each page. The NRC has indicated that Bases changes will not be issued with License Amendments. Therefore, the change document should be a DRR number in accordance with AP 26A-002.

Note 4 The date effective or implemented is the date the Bases pages are issued by Document Control.