WOLF CREEK
NUCLEAR OPERATING CORPORATION

Stephen E. Hedges
Site Vice President

February 23, 2011

WO 11-0008

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

Subject: Docket No. 50-482: Revision to Technical Specifications (TS) 3.3, "Instrumentation," 3.7, "Plant Systems," and 3.8, "Electrical Power Systems"

Gentlemen:

Pursuant to 10 CFR 50.90, Wolf Creek Nuclear Operating Corporation (WCNOC) hereby requests an amendment to Renewed Facility Operating License NPF-42 for the Wolf Creek Generating Station (WCGS) to incorporate proposed changes into the WCGS Technical Specifications.

The proposed changes will revise Technical Specifications (TSs) 3.3.7, "Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation," 3.3.8, "Emergency Exhaust System (EES) Actuation Instrumentation," 3.7.10, "Control Room Emergency Ventilation System (CREVS)," 3.7.11, "Control Room Air Conditioning System (CRACS)," 3.7.13, "Emergency Exhaust System (EES)," 3.8.2, "AC Sources – Shutdown," 3.8.5, "DC Sources – Shutdown," 3.8.8, "Inverters – Shutdown," and 3.8.10, "Distribution Systems – Shutdown." This amendment will:

- Delete MODES 5 and 6 from the Limiting Condition for Operation (LCO) Applicability for the CREVS and its actuation instrumentation (TS 3.7.10 and TS 3.3.7, respectively). The event that heretofore required these LCOs to be applicable in MODES 5 and 6 (waste gas decay tank rupture) requires no mitigation at WCGS in order to meet General Design Criteria (GDC) 19.

- Delete the Required Action from TS 3.7.10 and TS 3.7.11 that requires verifying that the OPERABLE CREVS/CRACS train is capable of being powered by an emergency power source.

- Revise TS 3.7.13 by incorporating a 7-day Completion Time for restoring an inoperable EES train to OPERABLE status during shutdown conditions (i.e., during movement of irradiated fuel assemblies in the fuel building).

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- Adopt NRC-approved traveler TSTF-36-A for TSs 3.3.8, 3.7.13, 3.8.2, 3.8.5, 3.8.8, and 3.8.10. This change will add an exclusion from LCO 3.0.3 that recognizes that irradiated fuel movement in the fuel building is independent of reactor operation in MODES 1 through 4 and defaulting to LCO 3.0.3 would force an unnecessary plant shutdown.

- Add a more restrictive change to the LCO Applicability for TSs 3.8.2, 3.8.5, 3.8.8, and 3.8.10 such that these LCOs apply not only during MODES 5 and 6, but also during the movement of irradiated fuel assemblies regardless of the MODE in which the plant is operating.

Attachment I provides a description and technical evaluation of the proposed changes, including WCNOC's determination that the proposed changes involve no significant hazards consideration. Attachment II provides the affected existing TS pages marked-up to show the proposed changes. Attachment III provides a copy of the revised TS pages typed with the proposed changes incorporated. Attachment IV provides the affected existing TS Bases pages marked-up to show the associated proposed TS Bases changes (for information only). Final TS Bases changes will be implemented pursuant to TS 5.5.14, "Technical Specification (TS) Bases Control Program," at the time the amendment is implemented. Attachment V contains a marked-up page from the WCGS Updated Safety Analysis Report (USAR) indicating an associated change (for information only).

It has been determined that this amendment application does not involve a significant hazard consideration as determined per 10 CFR 50.92. The amendment application was reviewed by the WCNOC Plant Safety Review Committee. In accordance with 10 CFR 50.91, a copy of this application is being provided to the designated Kansas State official.

WCNOC requests approval of this proposed amendment by February 29, 2012. Once approved, the amendment will be implemented within 90 days of approval.

There are no regulatory commitments associated with this application. If you have any questions concerning this matter, please contact me at (620) 364-4190, or Mr. Gautam Sen at (620) 364-4175.

Sincerely,

Stephen E. Hedges

SEH/rlt

Attachments:
I - Evaluation
II - Markup of Technical Specification Pages
III - Retyped Technical Specification Pages
IV - Proposed TS Bases Changes (for information only)
V - Markup of USAR Page (for information only)

cc: E. E. Collins (NRC), w/a
T. A. Conley (KDHE), w/a
G. B. Miller (NRC), w/a
B. K. Singal (NRC), w/a
Senior Resident Inspector (NRC), w/a

STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Stephen E. Hedges, of lawful age, being first duly sworn upon oath says that he is Site Vice President of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the contents thereof; that he has executed the same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By____________________
Stephen E. Hedges
Site Vice President

SUBSCRIBED and sworn to before me this 23rd day of February, 2011.

OFFICIAL SEAL
RHONDA L. TIEMEYER
MY COMMISSION EXPIRES
January 11, 2014

Rhonda L. Tiemeyer
Notary Public

Expiration Date January 11, 2014

EVALUATION

EVALUATION

1.0 SUMMARY DESCRIPTION

The proposed changes in this amendment application will revise the Wolf Creek Generating Station (WCGS) Technical Specifications (TSs) 3.3.7, "Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation," 3.3.8, "Emergency Exhaust System (EES) Actuation Instrumentation," 3.7.10, "Control Room Emergency Ventilation System (CREVS)," 3.7.11, "Control Room Air Conditioning System (CRACS)," 3.7.13, "Emergency Exhaust System (EES)," 3.8.2, "AC Sources – Shutdown," 3.8.5, "DC Sources – Shutdown," 3.8.8, "Inverters – Shutdown," and 3.8.10, "Distribution Systems – Shutdown." This amendment will:

- Delete MODES 5 and 6 from the Limiting Condition for Operation (LCO) Applicability for the CREVS and its actuation instrumentation (TS 3.7.10 and TS 3.3.7, respectively). The event that heretofore required these LCOs to be applicable in MODES 5 and 6 (waste gas decay tank rupture) requires no mitigation at WCGS in order to meet General Design Criteria (GDC) 19.

- Delete the Required Action from TS 3.7.10 and TS 3.7.11 that requires verifying that the OPERABLE CREVS/CRACS train is capable of being powered by an emergency power source.

- Revise TS 3.7.13 by incorporating a 7-day Completion Time for restoring an inoperable EES train to OPERABLE status during shutdown conditions (i.e., during movement of irradiated fuel assemblies in the fuel building).

- Adopt NRC-approved traveler TSTF-36-A for TSs 3.3.8, 3.7.13, 3.8.2, 3.8.5, 3.8.8, and 3.8.10. This change will add an exclusion from LCO 3.0.3 that recognizes that irradiated fuel movement in the fuel building is independent of reactor operation in MODES 1 through 4 and defaulting to LCO 3.0.3 would force an unnecessary plant shutdown.

- Add a more restrictive change to the LCO Applicability for TSs 3.8.2, 3.8.5, 3.8.8, and 3.8.10 such that these LCOs apply not only during MODES 5 and 6, but also during the movement of irradiated fuel assemblies regardless of the MODE in which the plant is operating.

2.0 DETAILED DESCRIPTION

This amendment application contains five groups of related changes.

2.1 <u>Control Room Emergency Ventilation System (CREVS) and Actuation Instrumentation</u>

TS 3.3.7, "Control Room Emergency Ventilation System Actuation Instrumentation," and TS 3.7.10, "Control Room Emergency Ventilation System (CREVS)," are revised to delete MODE 5 and MODE 6 from the LCO Applicability. The event that heretofore required these LCOs to be applicable in MODES 5 and 6 (waste gas decay tank rupture) requires no mitigation at WCGS in order to meet General Design Criteria (GDC) 19. The specific TS changes are as follows:

- Condition E of TS 3.3.7 is revised to delete "in MODE 5 or 6, or."

- TS Table 3.3.7-1 is revised to delete "5, 6," under the APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS column for Functions 1, 2, and 3.

- The LCO Applicability for TS 3.7.10 is revised to delete "5, and 6," and the word "and" is inserted between "3," and "4."

- Conditions D and E of TS 3.7.10 are revised to delete "in MODE 5 or 6, or."

2.2 <u>Deletion of Required Action from TS 3.7.10 (CREVS) and TS 3.7.11 (CRACS)</u>

TS 3.7.10, "Control Room Emergency Ventilation System (CREVS)," and TS 3.7.11, "Control Room Air Conditioning System (CRACS)," are revised to delete the Required Action that requires verifying that the OPERABLE CREVS/CRACS train is capable of being powered by an emergency power source. The specific TS changes are as follows:

- For TS 3.7.10, Required Action D.1.2 and its associated Completion Time are deleted. The deletion of Required Action D.1.2 results in the deletion of the "<u>AND</u>" logical connector and renumbering Required Action D.1.1 to Required Action D.1.

- For TS 3.7.11, Required Action C.1.2 and its associated Completion Time are deleted. The deletion of Required Action C.1.2 results in the deletion of the "<u>AND</u>" logical connector and renumbering Required Action C.1.1 to Required Action C.1.

In conjunction with the proposed TS changes, a change to Updated Safety Analysis Report (USAR) Section 3.1.2 will be made. Part of the reason for requesting the changes to TS 3.7.10 and TS 3.7.11 is that the Required Actions to be deleted are overly restrictive relative to the provisions of the TSs for electrical TS requirements during shutdown conditions. The basis for the electrical TS requirements during shutdown conditions is that it is not necessary to postulate a single failure concurrent with a loss of all offsite power. The change to be made to the USAR will incorporate a statement of that basis into Section 3.1.2 (which provides a general description of what assumptions are made in the accident analyses for postulated events).

2.3 <u>Incorporate 7-day Completion Time for restoring an inoperable EES train to OPERABLE status during shutdown conditions</u>

TS 3.7.13, "Emergency Exhaust System (EES)," is revised by incorporating a 7-day Completion Time for restoring an inoperable EES train to OPERABLE status during shutdown conditions (i.e., during movement of irradiated fuel assemblies in the fuel building). The specific TS changes are as follows:

- Condition A is revised to state, "One EES train inoperable" by deleting the words "in MODE 1, 2, 3, or 4."

- Condition D is revised by replacing the existing wording with "Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the fuel building."

2.4 TSTF-36-A

TS 3.3.8, "Emergency Exhaust System (EES) Actuation Instrumentation," TS 3.8.2, "AC Sources - Shutdown," TS 3.8.5, "DC Sources - Shutdown," TS 3.8.8, "Inverters - Shutdown," and TS 3.8.10, "Distribution Systems - Shutdown" are revised to add an ACTIONS Note per NRC-approved TSTF-36-A, Revision 4. This Note reads:

"LCO 3.0.3 is not applicable."

For TS 3.7.13, "Emergency Exhaust System (EES)," an ACTIONS Note is added to state: "LCO 3.0.3 is not applicable to the FBVIS mode of operation."

This change will add an exclusion from LCO 3.0.3 that recognizes that irradiated fuel movement in the fuel building is independent of reactor operation in MODES 1 through 4 and defaulting to LCO 3.0.3 would force an unnecessary plant shutdown.

2.5 Electrical Power Systems in MODES 5 and 6 (Shutdown Conditions)

TS 3.8.2, "AC Sources - Shutdown," TS 3.8.5, "DC Sources - Shutdown," TS 3.8.8, "Inverters - Shutdown," and TS 3.8.10, "Distribution Systems - Shutdown" are revised to add the following to the LCO Applicability:

"During movement of irradiated fuel assemblies."

The proposed change is a more restrictive change that recognizes the electrical power system requirements that should be in place even if the plant is not in any MODE per the Definitions of TS 1.1 (no fuel in the reactor vessel).

The TS markups and retyped pages are provided in Attachments II and III, respectively. Corresponding TS Bases changes are provided for information only in Attachment IV.

3.0 BACKGROUND

This section provides background information on the systems affected by the proposed TS changes.

3.1 Control Room Emergency Ventilation (CREVS) and Actuation Instrumentation

As noted previously, the CREVS provides a protected environment from which operators can control the unit following an uncontrolled release of radioactivity. The CREVS consists of two independent, redundant trains that pressurize, recirculate, and filter the control room air. Each CREVS train consists of a filtration system train and a pressurization system train. Each filtration system train consists of a fan, a prefilter, a high efficiency particulate air (HEPA) filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a second HEPA filter follows the adsorber section to collect carbon fines. Each pressurization system train consists of a fan, a moisture separator, an electric heater, a HEPA filter, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a second HEPA filter follows the adsorber section to collect carbon fines. Ductwork, valves or dampers, and instrumentation also form part of the CREVS.

The CREVS is an emergency system that may also operate during normal unit operations. 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 of the control room air through the redundant trains of HEPA and the charcoal filters. The emergency (CRVIS) mode also initiates pressurization and filtered ventilation of the air supply to the control room.

The actuation instrumentation consists of two radiation monitors in the control room air intake and four radiation monitors in the containment purge isolation system. A high radiation signal from any of these gaseous detectors will initiate both trains of the CREVS. The control room operator can also initiate CREVS trains by manual push buttons in the control room. The CREVS is also actuated by a Phase A Isolation signal and a Fuel Building Ventilation Isolation signal.

The control room pressurization system draws in outside air, processing it through a particulate filter charcoal adsorber train for cleanup. This outside air is diluted with air drawn from the cable spreading rooms and the electrical equipment floor levels within the Control Building and distributed back into those spaces for further dilution. The control room filtration units take a portion of air from the exhaust side of the system, upstream of the outside air intake, for dilution with portions of the exhaust air from the control room air-conditioning system and processes it through the control room filtration system adsorption train for additional cleanup. This air is then further diluted with the remaining control room air-conditioning system return air, cooled, and supplied to the control room. This process maintains the control room under a positive pressure of 1/4-inch water gauge (minimum) with respect to the outside atmosphere. This assures exfiltration from the control room, thus preventing any unprocessed contaminants from entering the control room.

The CREVS is designed to maintain the control room environment 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. Applicable design-basis accidents that could cause a radioactivity release and thus demand the safety function provided by CREVS include a loss of coolant accident (LOCA), steam generator tube rupture (SGTR), fuel handling accident (FHA) inside containment, and a FHA in the fuel building. For shutdown conditions, however, only the FHA is of concern and that is the event responsible for requiring CREVS to be OPERABLE during movement of irradiated fuel assemblies. Evaluation Section 4.1 discusses the postulated waste gas decay tank rupture.

Two independent and redundant CREVS trains are required to be OPERABLE per TS 3.7.10 to ensure that at least one is available assuming a single failure disables the other train. Total system failure could result in exceeding a dose of 5 rem to the control room operator in the event of a large radioactive release.

3.2 Control Room Air Conditioning System (CRACS)

The CRACS consists of two independent and redundant trains that provide cooling of recirculated control room air. Each train consists of a prefilter, self-contained refrigeration system (using essential service water as a heat sink), centrifugal fans, instrumentation, and associated controls. The CRACS is a subsystem to the CREVS, as it provides air temperature control for the control room.

The CRACS is an emergency system, which also operates during normal unit operations. A single train will provide the required temperature control to maintain the control room ≤84°F. The design basis of the CRACS is to maintain the control room temperature for 30 days of continuous occupancy.

Two independent and redundant trains of the CRACS are required to be OPERABLE per TS 3.7.11 to ensure that at least one is available, assuming a single failure disables the other train. Total system failure could result in the equipment operating temperature exceeding limits in the event of an accident.

In MODES 1, 2, 3, 4, 5, and 6, and during movement of irradiated fuel assemblies, the CRACS must be OPERABLE to ensure that the control room temperature will not exceed equipment operational requirements. The CRACS is considered to be OPERABLE when the individual components necessary to maintain the control room temperature are OPERABLE in both trains. In addition, the CRACS must be OPERABLE to the extent that air circulation can be maintained. Isolation or breach of the CRACS airflow path can also render the CREVS flow path inoperable.

3.3 Emergency Exhaust System (EES) and Actuation Instrumentation

The EES consists of two independent and redundant trains. Each train consists of a heater, a prefilter, a high efficiency particulate air (HEPA) filter bank, an activated charcoal adsorber section for removal of gaseous activity (principally iodines), and a fan. Ductwork, dampers, and instrumentation also form part of the system. A second bank of HEPA filters follows the adsorber section to collect carbon fines.

The EES serves both the auxiliary building and the fuel building. As described in Section 9.4.2 of the USAR, the EES collects and processes the airborne particulates in the fuel building in the event of an FHA. In the event of a LOCA, the EES processes the atmosphere of the auxiliary building. The EES is thus on standby for an automatic start following receipt of a fuel building ventilation isolation signal (FBVIS) or a safety injection signal (SIS). Although the EES design is based on mitigating the potential consequences of either an FHA or a LOCA, only the FHA mitigation function of the EES (i.e., FBVIS mode) is of concern relative to the proposed changes since only the TS requirements that are applicable during movement of irradiated fuel assemblies in the fuel building are affected by the proposed changes.

The pathway for release of radioactivity for a postulated FHA in the fuel building is initially via the auxiliary/fuel building normal exhaust system. After the fuel building is isolated on a high radiation signal, the release pathway is via the EES emergency filtration system. Thus, if one of the redundant discharge vent radiation monitors indicates that the radioactivity in the vent discharge is greater than prescribed levels, an alarm sounds and the auxiliary/fuel building normal exhaust is switched to the EES to allow the spent fuel pool ventilation to exhaust through the engineered safety-feature charcoal filters of the EES in order to remove most of the halogens prior to discharging to the atmosphere via the unit vent. The supply ventilation system is automatically shut down (via the FBVIS) on an EES demand, thus ensuring controlled leakage to the atmosphere through charcoal absorbers.

The DBA analysis of the FHA assumes that only one train of the EES is functional due to a single failure that disables the other train. The accident analysis thus accounts for the reduction in airborne radioactive material provided by the one remaining train of this filtration system. Accordingly, two independent and redundant EES trains are required to be OPERABLE per TS 3.7.13 to ensure that at least one train is available, assuming a single failure that disables the other train.

3.4 Electrical Power Systems in MODES 5 and 6 (Shutdown Requirements)

AC Sources

The Class IE AC sources consist of the offsite power sources (preferred power sources, normal and alternate) and the onsite standby power sources (train A and train B diesel generators (DGs)). As required by 10 CFR 50, Appendix A, GDC 17, the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the engineered safety feature (ESF) systems. The onsite Class IE AC distribution system is divided into redundant load groups (trains) so that the loss of any one group does not prevent the minimum safety functions from being performed. Each train has connections to its preferred offsite power sources and a single DG. Offsite power is supplied to the plant switchyard from the transmission network by three transmission lines. From the switchyard, two electrically and physically separated circuits provide AC power, through ESF transformers, to the 4.16 kV ESF buses.

An offsite circuit consists of all breakers, transformers, voltage regulation equipment, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite Class IE ESF buses. The onsite standby power source for each 4.16 kV ESF bus is a dedicated DG. DGs NE01 and NE02 are dedicated to ESF buses NB01 and NB02, respectively. A DG starts automatically on a safety injection (SI) signal (initiated by low pressurizer pressure, low steam line pressure, or high containment pressure signals) or on an ESF bus undervoltage signal. After the DG has started, it will automatically tie to its respective bus after offsite power is tripped as a consequence of ESF bus undervoltage or degraded voltage, independent of or coincident with an SI signal. The DGs will also start and operate in the standby mode without tying to the ESF bus on an SI signal alone.

DC Sources

The DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment and preferred AC vital bus power (via inverters). As required by 10 CFR 50, Appendix A, GDC 17, the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure.

The 125 VDC electrical power system consists of two independent and redundant Class IE DC electrical power subsystems (train A and train B). Each DC electrical subsystem consists of two 125 VDC batteries, two battery chargers, one spare battery charger and all the associated control equipment and interconnecting cabling. During normal operation, the 125 VDC load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the DC load is automatically powered from the station batteries. The train A and train B DC electrical power subsystems provide the control power for associated Class IE AC power load groups, 4.16 kV switchgear, and 480 V load centers. The DC electrical power subsystems also provide DC electrical power to the inverters, which in turn power the AC vital buses.

Inverters

The inverters are the preferred source of power for the AC vital buses because of the stability and reliability they achieve. The function of the inverter is to provide AC electrical power to the vital buses. An alternate source of power to the AC vital buses is provided from Class IE constant voltage transformers. The station battery provides an uninterruptible power source for the instrumentation and controls for the Reactor Trip System (RTS) and the Engineered Safety Feature Actuation System (ESFAS).

Distribution Systems

The onsite Class IE AC, DC, and AC vital bus electrical power distribution systems are divided by train into two redundant and independent AC, DC, and AC vital bus electrical power distribution subsystems as defined in TS Bases Table B 3.8.9-1. Train A is associated with AC load group 1; train B, with AC load group 2. The AC electrical power subsystem for each train consists of a 4.16 kV ESF bus and 480 V buses and load centers. Each 4.16 kV ESF bus has one separate and independent offsite source of power as well as a dedicated onsite DG source. Each 4.16 kV ESF bus is normally connected to a preferred offsite source. After a loss of the preferred offsite power source to a 4.16 kV ESF bus, the onsite emergency DG supplies power to the bus. A transfer to the alternate offsite source is accomplished by manually repositioning breakers, if required. Control power for the 4.16 kV breakers is supplied from the Class IE batteries.

The 120 VAC vital buses are arranged in two load groups per train and are normally powered through the inverters from the 125 VDC electrical power subsystem. TS Bases B 3.8.7 has further information on the 120 VAC vital system.

The 125 VDC electrical power distribution system is arranged into two buses per train. TS Bases B 3.8.4 has further information on the 125 VDC electrical power subsystem.

3.5 Overview and Basis for TS Requirements During Shutdown Conditions

The changes proposed for TS 3.7.10 (deletion of Required Action D.1.2), TS 3.7.11 (deletion of Required Action C.1.2) and TS 3.7.13 (incorporating a 7-day Completion Time for restoring an inoperable EES train during shutdown conditions) only affect requirements under these TSs that are applicable during shutdown conditions (i.e., when moving irradiated fuel during such conditions). The proposed TS 3.7.10 and TS 3.7.11 changes are particularly related to the fact that many of the TS requirements for safety related systems and the electrical power sources required to support such systems are relaxed for shutdown conditions, in comparison to the TS requirements that are applicable for the same systems during plant operation. These differences in the TS requirements are due to an important difference in the TS basis assumed for operating and shutdown conditions with regard to single-failure and loss of power conditions that are required to be assumed, as further explained below.

In general, for safety systems or features required to mitigate design-basis events, redundant and independent, 100%-capacity trains or subsystems are typically provided in accordance with the plant design criteria (i.e., 10 CFR 50 Appendix A). This design provision ensures availability of the required safety function in the event of a single active failure. Thus, for example, in order to ensure mitigation of a design basis LOCA, two independent, redundant Emergency Core Cooling System (ECCS) trains are provided such that either (one) train can provide the required mitigation function(s) in the event of a worst-case single failure that disables one train.

Accordingly, the TS ensure the availability of such systems by requiring both trains and/or the full compliment of available equipment to be OPERABLE during applicable MODES, particularly during those MODES in which the most limiting accident is likely to occur (notwithstanding the low probability of occurrence of such an event in absolute terms.) Thus for systems required to mitigate design basis events like the design basis LOCA, both trains of equipment designed or credited for mitigating such an event are required during plant operating MODES (1, 2, 3, and 4) since such an event is most likely to happen during those MODES (as opposed to when the plant is shutdown and the Reactor Coolant System is cooled and depressurized). For shutdown conditions, TS requirements are generally less restrictive than those for operating conditions due to the fact that shutdown conditions are generally less limiting and there is a reduced potential for severe challenges to the plant. For the ECCS, for example, both trains are required to be OPERABLE in MODES 1, 2, and 3 per TS 3.5.1, "ECCS-Operating," but only one train is required during MODE 4 per TS 3.5.2, "ECCS-Shutdown."

In particular, with regard to electrical power source/system requirements, both of the redundant diesel generators and both offsite circuit connections are required to be OPERABLE during plant operating conditions (i.e., during MODES 1, 2, 3, and 4) per TS 3.8.1, "AC Sources-Operating," whereas only one diesel generator and one offsite circuit connection are required during MODES 5 and 6 per TS 3.8.2, "AC Sources-Shutdown." As explained in the Bases for TS 3.8.2 (as well as in the Bases for TS 3.8.5, "DC Sources-Shutdown," TS 3.8.8, "Inverters-Shutdown," and TS 3.8.10, "Distribution Systems-Shutdown") the requirements for operating conditions are based on ensuring mitigation of a design basis event concurrent with a single failure, and assuming a concurrent loss of offsite power. For shutdown conditions, however, the requirements are reduced due to the reduced potential for a severe challenge to the plant, so that it is not necessary to assume a loss of all onsite or offsite power concurrent with a single failure.

While a severe event such as a design basis LOCA is not expected to occur during shutdown conditions, there are some events that are postulated to occur during such conditions, namely a FHA and a waste gas tank rupture, for which mitigating system functions are required or assumed. The FHA, in particular, may be postulated to occur during the movement of irradiated fuel assemblies in the fuel building during shutdown conditions. For events that are postulated to occur during shutdown conditions, it is appropriate that the TSs continue to require both trains of the credited mitigating system(s) to be OPERABLE in order to accommodate a single failure, i.e., a failure of either train in the event of a demand. However, in keeping with the provisions described in the applicable TS Bases for shutdown conditions, it is not necessary to assume that such an event occurs concurrent with a loss of offsite power and a single failure.

The USAR change indicated in Attachment V will be made in connection with this amendment request to clarify the above basis, and to ensure consistency between the licensing basis description in the TS Bases and that in the USAR.

4.0 TECHNICAL EVALUATION

The following provides further technical analysis and discussion of the five groups of related changes in the order presented in Evaluation Sections 1.0 and 2.0 above.

4.1 Deletion of MODE 5 and 6 from TS 3.3.7 and TS 3.7.10 – Control Room Radiological Consequences of a Waste Gas Decay Tank Rupture

The standard Technical Specifications (STS) and STS Bases for Westinghouse plants, NUREG-1431, have brackets around the MODE 5 and MODE 6 Applicability in TS 3.3.7 and TS 3.7.10. Those brackets indicated that individual licensees would adopt MODES 5 and 6 if the waste gas decay tank rupture requires control room staff protection. If that event requires no mitigation or control room habitability protection, then MODES 5 and 6 need not be required in the LCO Applicability for TS 3.3.7 and TS 3.7.10.

The offsite doses for a waste gas decay tank rupture are discussed in USAR Section 15.7.1.5 and are reported in USAR Table 15.7-4; however, that table does not report control room doses. The current analysis of record (AOR) for the radiological consequences of a waste gas decay tank rupture calculated only the doses at the exclusion area boundary and at the low population zone. The control room dose consequences were not included, with the design basis LOCA being perceived as the most limiting design basis accident, with respect to control room habitability. A calculation of the control room dose consequences of a waste gas decay tank rupture with no credit being taken for the mitigation capability of the CREVS has been performed and documented in Calculation No. AN-10-004 (Reference 1).

The waste gas decay tanks are designed to permit the decay of radioactive gases as a means of reducing or preventing the release of radioactive materials to the atmosphere. For this accident it is postulated that there is an accidental release of the contents of one of the waste gas decay tanks resulting from a rupture of the tank or from another cause, such as operator error or valve malfunction. The gaseous waste processing system is so designed that the tanks are isolated from each other during use, limiting the quantity of gas released in the event of an accident by preventing the flow of radioactive gas between the tanks. The principal radioactive components of the waste gas decay tanks are the noble gases krypton and xenon, the particulate daughters of some of the krypton and xenon isotopes, and trace quantities of halogens. The maximum amount of waste gases stored in any one tank occurs after a refueling shutdown, at which time the waste gas decay tanks store the radioactive gases stripped from the reactor coolant. The maximum content of a waste gas decay tank is conservatively assumed for the purpose of computing the noble gas inventory available for release. Rupture of the waste gas decay tank is assumed to occur immediately upon completion of the waste gas transfer, releasing the entire contents of the tank to the radwaste building. For the purposes of evaluating the accident, it is assumed that all the activity is immediately released directly to the environment during the 2-hour period immediately following the accident, with no credit taken for decay, holdup in the radwaste building, mixing, or the operation of the radwaste building ventilation system's non-safety charcoal adsorbers.

In the evaluation of the waste gas decay tank rupture, the fission product accumulation and release assumptions of Regulatory Guide 1.24 (Reference 2) are followed. Note: This is consistent with the current AOR for the radiological consequences of a postulated waste gas decay tank failure event described in USAR Section 15.7.1. The assumptions related to the release of radioactive gases from the postulated rupture of a waste gas decay tank are:

a. It is assumed that all gas tanks (a total of 8 which includes 2 tanks for service at shutdown and startup) are isolated from each other whenever they are in use. Consequently, the entire noble gas and iodine inventories collected in one waste gas decay tank are assumed to be released to the environment; the tank with the maximum inventory is assumed to fail.

b. Tank inventories, based on 1 percent failed fuel for fission products, listed in USAR Table 15.7-3, are used for source terms.

c. It is assumed that the waste gas decay tank fails immediately after the transfer of the noble gases from the reactor coolant to the waste gas decay tank is complete. These assumptions result in the greatest amount of noble gas activity available for release to the environment.

d. Failure of the waste gas tank is assumed to occur immediately upon completion of the waste gas transfer releasing the entire contents of one tank into the radwaste building. For conservatism, all the activity is released to the environment in two hours with no credit for decay, holdup in the radwaste building, mixing in the building, or the operation of the radwaste building non-safety-related ventilation charcoal filter absorbers. This would be the release of the maximum amount of radioactivity to the environment.

e. Since the short term accident dispersion factors for ground level releases from the radwaste building are expected to be approximately same as corresponding factors for releases from the containment, the χ/Q's given in USAR Table 15A-2 are used in this calculation.

f. Decay during release time and transit to off-site locations is conservatively ignored; also credit for iodine removal due to depletion via ground deposit during transit is ignored.

g. The breathing rates, control room occupancy fractions, and dose conversion factors are taken from USAR Tables 15A-1 and 15A-4.

h. The control building and control room ventilation systems are configured in the normal power generation lineup at the time of the accident and remain in this configuration for the duration of a postulated tank failure event. That is, the control room ventilation isolation signal will not be actuated and consequently, the CREVS is not assumed to operate following the initiation of the accident. The parameters assumed in the analysis for the control building and control room, along with their normal ventilation systems are listed in the Table 1.

The radiological consequences resulting from the occurrence of a postulated waste gas decay tank rupture have been conservatively analyzed using the RADTRAD code (Reference 3) based on assumptions and models described above. The analysis results show that the radiological consequences of the postulated waste gas decay tank failure do not exceed a small fraction (i.e., 10 percent) of the exposure limits set forth in 10 CFR 100 for offsite doses and well below the dose acceptance criteria specified in Standard Review Plan Section 6.4, and GDC 19 for the control room, even with no credit taken for the CREVS and its actuation instrumentation. The results are listed in Table 2. As can be seen from the benchmark comparison of the RADTRAD results with the current AOR for the offsite doses, the agreement between the results from two different methods is very good (i.e., < 0.5% difference). This serves to confirm the validity of the RADTRAD models.

Based upon the above calculation results, it is concluded that the calculated doses from a postulated waste gas decay tank failure do not exceed a small fraction of the guideline values of 10 CFR 100, i.e., 10% or 2.5 rem and 30 rem respectively, for the whole-body and thyroid doses. In addition, the control room remains habitable following an accidental release of radioactivity from a postulated waste gas decay tank failure, even if the CREVS and its actuation instrumentation are not operating. This conclusion is drawn based on the calculation results that show the calculated control room doses are well below the guideline values of GDC 19. Thus, the CREVS and its actuation instrumentation are not required to be OPERABLE in MODES 5 and 6.

The considerations provided in Section 7 of Regulatory Issue Summary (RIS) 2001-19 (Reference 4) have been taken into account in performing this control room habitability analysis for the postulated waste gas decay tank failure.

Table 1
Waste Gas Decay Tank, Control Building and Control Room
Parameters Used in Accident Analysis

Waste Gas Decay Tank	
Volume, ft^3	600
Control Building	
Mixing volume, ft^3	239,000
Flow rate for normal Control Building fresh air supply, cfm	13,050
Flow rate for normal Control Building exhaust , cfm	13,150
Filter efficiency, all forms of iodine, %	0
Control Room	
Volume, ft^3	100,000
Flow rate for normal Control Room fresh air supply , cfm	1,950
Flow rate for normal Control Room exhaust , cfm	1,750
Filtered recirculation flow, cfm	20,400
Unfiltered inleakage, cfm	10*
Filter efficiency, all forms of iodine, %	0

* Standard Review Plan Section 6.4 (Reference 5) indicates that an infiltration rate of 10 cfm should be considered to account for opening and closing of the doors associated with such activities as required by the emergency plans and procedures.

Table 2 Calculated Offsite and Control Room Doses from a Postulated Waste Gas Decay Tank Failure

	Current AOR, rem	Updated Analysis using RADTRAD, rem	Difference (%)	Acceptance Criteria, rem
Exclusion Area Boundary				
Thyroid	3.648E-03	3.6598E-03	0.324	30
Whole Body	1.302E-01	1.3060E-01	0.307	2.5
Low Population Zone				
Thyroid	4.867E-04	4.8802E-04	0.271	30
Whole Body	1.736E-02	1.7415E-02	0.317	2.5
Control Room				
Thyroid	N/A	1.4485E-02	--	30
Whole Body	N/A	2.1581E-02	--	5
Beta Skin	N/A	6.2297E-01	--	30

Evaluation of Control Room Habitability during a Hazardous Chemical Release

Releases of hazardous chemicals can result in the control room becoming uninhabitable. A detailed evaluation (Reference 6), based on the guidance provided by Regulatory Guide 1.78, Revision 1, has been performed to assess the habitability of the control room during and after a postulated external release of hazardous chemicals from potential accidents at industrial facilities, materials stored on-site, and transportation sources near the plant. Note: The HABIT1.1 (Computer Codes for Evaluation of Control Room Habitability) computer code modules EXTRAN Version 1.5 and CHEM Program Version 12/15/93 were used in the analysis of these chemicals.

Of the 21 chemical spills analyzed only the sodium hypochlorite release reached concentrations in the control room that were within an order of magnitude of the immediately dangerous to life and health (IDLH) limit (0.0015 gm/m^3 versus 0.01 gm/m^3). In this case the tank is known to be bermed, however because the size of the berm was unknown it was assumed to be a very large (1000 ft^2) thus providing a very large surface area for evaporation. The catastrophic release of 6500 gallons of Sodium Hypochlorite within the circulating water building would probably be discovered within an hour, but this analysis allows the release to continue for 24 hours. In addition, the release is assumed to be transferred from within the building to outside the building to enhance the quantity released to the atmosphere. Even with these very conservative assumptions the maximum calculated control room concentration only reaches 15% of the limitation.

Only the 650-gallon tank of ammonium hydroxide, the 650 and 350-gallon tank of ethanolamine, and the 650-gallon tank of hydrazine located in the Turbine Building generate control room concentrations that could be smelled by an operator and this peak concentration was an order of magnitude below the IDLH limits for the entire time it could be sensed. In addition, the hydrazine, ethanolamine, and the sodium hypochlorite releases reached concentrations in the control room that were well within the IDLH limits.

The results from this analysis prove to be reasonable especially due to the conservatism that was used on several critical inputs. Some of the conservatisms used to build the input decks and create a worst case scenario were as follows: neglecting potential absorption of chemicals into the ground as well as neglecting the presence of drainage systems, assuming that the chemical cloud blew directly from the source to the intake at the environmental conditions that were least turbulent and therefore minimized dispersion of the cloud, the use of a higher ambient temperature (and higher solar radiation for outdoor sources) which increased the evaporation rates which then increases the source term, moving the location of indoor spill sources to the location of the nearest exit, using straight line distances from the source to the control room intake, maximized both air and ground temperature to encourage evaporation and no emergency control room measures were taken.

The evaluation concludes that there is no control room habitability concerns from the potential release of the hazardous chemicals, even with no credit being taken for the mitigation capability of the CREVS.

The results of the calculation (Reference 1) have confirmed that the calculated radiological consequence values for a postulated waste gas tank rupture, with no credit being taken for the mitigation capability of the CREVS, are less than the regulatory limits for control room occupants, therefore, the CREVS and its actuation instrumentation are not required to be OPERABLE in MODES 5 and 6 to protect the control room occupants. As such, deletion of MODES 5 and 6 from the Applicability for TS 3.7.10 and TS 3.3.7 is acceptable.

4.2 Deletion of Required Action from TS 3.7.10 and TS 3.7.11 – Emergency Power Source

As described in Section 2.1, WCNOC proposes to delete Required Action D.1.2 from TS 3.7.10 and Required Action C.1.2 from TS 3.7.1 1. Each of these is the Required Action that may be required to be entered when one CREVS/CRACS train is inoperable for a period longer than specified in Condition A and which requires verifying that the OPERABLE train is capable of being powered by an emergency power source. Under the current TSs, Required Actions D.1.2 and/or C.1.2 may be entered (along with Required Actions D.1.1 and/or C.1.1) when a CREVS/CRACS train is inoperable, in lieu of entering Required Actions D.2.1 and D.2.2 and/or C.2.1 and C.2.2. The latter require suspending CORE ALTERATIONS and the movement of irradiated fuel assemblies. During a refueling outage, entry into the D.1 and/or C.1 Required Actions may be preferred over entry into the D.2 and/or C.2 Required Actions because the latter require halting fuel movement, which is often a "critical path" activity during refueling outages.

During refueling outages, the requirements of TS 3.8.2 (as described in Section 3.3) will be in effect for some portion of the outage, since TS 3.8.2 is applicable during MODES 5 and 6. The requirements of TS 3.7.10 and 3.7.11 will also be in effect since they are applicable during the same MODES as well as during the movement of irradiated fuel assemblies. With these TSs in effect, both trains of CREVS and CRACS are required to be OPERABLE while only one diesel generator is required to be OPERABLE. If a CRACS or CREVS train would be declared inoperable during such conditions and not restored to OPERABLE status within the specified Completion Time of Condition A, compliance with Required Action D.1.2 of TS 3.7.10 or C.1.2 of TS 3.7.11 would require immediately verifying that the OPERABLE CREVS or CRACS train is capable of being powered by an emergency power source. Section 4.1 above proposes to revise the Applicability of TS 3.7.10 by deleting MODES 5 and 6.

Required Action D.1.2/C.1.2 is typically interpreted to mean that the diesel generator in the same separation group as the affected CREVS or CRACS train must be verified to be available. With only one diesel generator OPERABLE per TS 3.8.2, and if the inoperable CREVS or CRACS train were to fail randomly, it is quite possible that the single OPERABLE diesel generator would not be in the same separation group as the OPERABLE CREVS or CRACS train and that the diesel generator associated with the OPERABLE CREVS/CRACS train would be unavailable so that Required Action D.1.2 or C.1.2 could not be met. Without being able to meet this Required Action, the D.2/C.2 Required Actions (under TS 3.7.10/TS 3.7.11, respectively) would have to be entered and met instead, which would require suspending CORE ALTERATIONS and the movement of irradiated fuel. This can have a significant impact on the refueling outage duration.

It may be noted that Required Actions D.1.2 and C.1.2 are not specified in the STS (NUREG-1431) for CREVS and CRACS (which are respectively identified as Control Room Emergency Filtration System (CREFS) and Control Room Emergency Air Temperature Control System (CREATCS) in STS 3.7.10 and STS 3.7.11 of NUREG-1431). These Required Actions are a carryover from the WCGS TSs that were in place prior to conversion to the improved Technical Specifications (ITS) in 1999. With the adoption of the ITS, however, the TS requirements and their basis for shutdown conditions are more clearly defined, making Required Actions D.1.2 and C.1.2 of WCGS's TSs unnecessary or inconsistent with the requirements and basis intended per the STS (as defined in STS 3.8.2, 3.8.5, 3.8.8 and 3.8.10).

Further, the definition of OPERABILITY as contained in the current WCGS TSs and in the STS states, "A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s)." Based on this definition, OPERABILITY of a CRACS or CREVS train is not necessarily dependent on the availability or OPERABILITY of an "emergency power source" since that train is OPERABLE when it has "normal or emergency" electrical power.

Thus, while the requirements of TS 3.8.2, etc. provide for the OPERABILITY of at least one diesel generator and associated batteries, inverters, and distribution in one train, the intent and basis of the TSs is that both CRACS and CREVS trains may be regarded as OPERABLE per TS 3.7.10 and TS 3.7.11 with only the one required electrical train OPERABLE, as this is consistent with the definition of OPERABILITY and its application to the CRACS and CREVS trains.

In conflict with above, Required Actions D.1.2 and C.1.2 can only be assuredly met for the unplanned failure and restoration of one CREVS/CRACS train if both CREVS/CRACS trains initially have their emergency power sources available. Such an initial condition, however, is not one that must be assumed or is required per the TSs for shutdown conditions, i.e., per the requirements and basis of TS 3.8.2, etc. and the definition of OPERABILITY. Removal of

Required Actions D.1.2 and C.1.2 resolves this conflict and is consistent with the TS basis for shutdown conditions.

Additional insight with respect to eliminating the noted Required Actions can be gained by comparing the requirements of TS 3.7.10 and TS 3.7.11 to those of TS 3.7.13. The Required Actions under TS 3.7.13 for an inoperable EES train during shutdown conditions (i.e., during movement of irradiated fuel assemblies in the fuel building) are similar to the Required Actions for an inoperable CREVS/CRACS train during shutdown conditions, with regard to the fact that the Required Actions of TS 3.7.13 provide the option of either placing the OPERABLE EES train in the fuel building ventilation isolation signal mode of operation or suspending movement of irradiated fuel assemblies (in the fuel building). This option is similar to the option allowed for an inoperable CREVS/CRACS train. However, one significant difference is that the Required Action for placing the OPERABLE EES train in operation has no additional Required Action for verifying that the OPERABLE EES train is capable of being powered by an emergency power source. This is notable in light of the fact that EES and CREVS are both credited for mitigating dose potentially incurred from an FHA (even though the former can mitigate both offsite and control room dose, while the latter can only mitigate control room dose). The acceptability of not requiring the OPERABLE (and operating) train to be capable of being powered from an emergency power source is confirmed by the absence of such a requirement in the STS for any of the comparable Technical Specifications, i.e., STS 3.7.10, "Control Room Emergency Filtration System (CREFS)," STS 3.7.11, "Control Room Emergency Air Temperature Control System (CREATCS)," and STS 3.7.13, "Fuel Building Air Cleanup System (FBACS)," the equivalent of EES as discussed in Section 3.2.

Beyond and apart from the requirements of the TSs, plants are required to assess and manage risk for the performance of maintenance activities, including during shutdown conditions (such as during refueling outages), pursuant to 10 CFR 50.65a(4). At WCGS, "safe shutdown" assessments are performed for this purpose, based on the guidance of NUMARC 91-06, "Guidelines for Industry Actions to Address Shutdown Management." These assessments are required to include consideration of defense in depth and contingencies, including provisions for adequate power sources to support required safe-shutdown equipment. Therefore, even with the removal of Required Actions D.1.2 and C.1.2, safe-shutdown assessments performed during plant outages would continue to ensure that shutdown risk is evaluated in the planning of outages and when equipment is declared or rendered inoperable, including unplanned equipment outages, during plant outages. The proposed TS changes impact only what the TSs require as a minimum, and not what may be deemed prudent or appropriate for assessing and managing risk.

4.3 Incorporate 7-day Completion Time for Restoring an Inoperable EES Train to OPERABLE Status During Shutdown Conditions

As described in Section 2.2, WCNOC proposes to incorporate a 7-day Completion Time for restoring an inoperable EES train to OPERABLE status for the special MODE or condition of "during the movement of irradiated fuel assemblies in the fuel building." A 7-day Completion Time is already permitted for restoring an inoperable EES train during MODES 1, 2, 3, and 4 per Condition A (i.e., Required Action A.1) of current TS 3.7.13. The proposed change would modify Condition A so that it may be entered for an inoperable EES train during MODES 1, 2, 3, and 4, OR during the movement of irradiated fuel assemblies in the fuel building (consistent with the Applicability of TS 3.7.13).

The proposed 7-day Completion Time is consistent with the provisions of the STS (NUREG-1431), for a system like the EES. In particular, STS 3.7.13, "Fuel Building Air Cleanup System (FBACS)," provides requirements for such a system, as applicable during the movement of irradiated fuel in the fuel building. In the event that one of two redundant trains of the FBACS is declared inoperable, Condition A of STS 3.7.13 applies in the same manner that Condition A does for an inoperable EES train under WCGS TS 3.7.13 (except that, unlike current WCGS TS 3.7.13, STS Condition A applies for all applicable MODES, including during movement of irradiated fuel assemblies in the fuel building). STS Condition A specifically requires restoring the inoperable train to OPERABLE status within a specified Completion Time of 7 days. As discussed in the Bases for STS 3.7.13, the 7-day Completion Time is based on the risk from an event occurring with one FBACS train already inoperable, thus requiring the remaining FBACS train to provide the required protective function.

The function of the EES at WCGS is identical to that of the FBACS addressed in STS 3.7.13; i.e., the system is designed to filter airborne radioactive particulates from the area of the fuel pool following an FHA. On this basis, STS 3.7.13 should be directly applicable to WCGS and thus equivalent to WCGS's TS 3.7.13. WCNOC is requesting that the same flexibility allowed in NUREG-1431 for FBACS be allowed for EES in the WCGS TSs (i.e., that the same 7-day Completion Time be allowed for restoring an inoperable EES train to OPERABLE status prior to entering the Condition that requires placing the OPERABLE train in operation or suspending the movement of irradiated fuel in the fuel building).

From a risk perspective and as noted above, the acceptability of a 7-day Completion Time for restoring an inoperable EES/FBACS train is qualitatively addressed in the Bases for STS 3.7.13, which notes that the 7-day Completion Time is based on the risk from an event occurring requiring the FBACS function, such that the remaining FBACS train would be expected to provide the required protection. The Bases for STS 3.7.13 note that during this period (i.e., the 7-day Completion Time) the remaining OPERABLE train is adequate to perform the FBACS function.

Further insight into the acceptability of the 7-day Completion Time may be gained from two comparisons.

1. Given that the EES is required to be OPERABLE during MODES 1, 2, 3, and 4 due to its required function for mitigating events that can occur during such MODES, e.g., a LOCA or SGTR, as well as during the movement of irradiated fuel assemblies in the fuel building due to its required FHA mitigation function, it is inconsistent that a 7-day Completion Time is allowed for restoring an inoperable EES train during MODES 1, 2, 3, and 4, while no Completion Time is allowed for restoration during the movement of irradiated fuel assemblies in the fuel building. From a qualitative risk point of view, the risk associated with having an EES train inoperable during MODES 1, 2, 3, and 4 is comparable or greater than the risk associated with an inoperable EES train during the movement of irradiated fuel assemblies, especially during shutdown conditions. Therefore, a Completion Time for restoring an inoperable EES train during the movement of irradiated fuel assemblies should be comparable to that allowed during MODES 1, 2, 3, and 4 (as is the case in the STS).

2. Given that the EES and CREVS/CRACS both serve to mitigate an FHA, so that these systems/functions are similarly required per their associated TSs to be OPERABLE during the movement of irradiated fuel assemblies, they would be expected to have comparable requirements, (even though EES serves to mitigate both offsite and control room dose, while CREVS serves to limit only control room dose). Nevertheless, TS 3.7.10 allows a 7-day Completion Time for restoring an inoperable CREVS train during any of the applicable MODES for that TS, and TS 3.7.11 allows a 30-day Completion Time for restoring an inoperable CRACS train during any of the applicable MODES for that TS. By comparison, TS 3.7.13 specifies MODE-dependent Completion Times for restoring an inoperable EES train such that 7 days is allowed during MODES 1, 2, 3, and 4, while no Completion Time is allowed during the movement of irradiated fuel assemblies in the fuel building. The proposed changes for TS 3.7.1 3 would make this TS more consistent with TS 3.7.10 and TS 3.7.11, in addition to being more consistent with the STS as noted above.

In addition to the above, it should be noted that the proposed change to TS 3.7.13 does not impact compliance with LCO 3.0.4. That is, although the proposed change to TS 3.7.13 would allow up to 7 days for restoring an EES train to OPERABLE status after it has been declared inoperable during the movement of irradiated fuel assemblies in the fuel building, the provisions of LCO 3.0.4 would still apply for entry into that condition. In effect, LCO 3.0.4 would still require that (for entry into the special MODE/condition of "during the movement of irradiated fuel assemblies in the fuel building") either both EES trains are OPERABLE (i.e., that the LCO is met), or that entry is made under the provisions of Required Action D.1 (which confirms the OPERABILITY of the remaining train), or that a risk assessment is performed in accordance with LCO 3.0.4b. These provisions help to assure that an acceptable configuration exists for entering the special MODE/condition regardless of the proposed Completion Time.

Based on the above, and given the acceptability of the provisions specified per the STS for an inoperable FBACS/EES train(s), it may be assumed that adequate availability of the EES function would still be supported by the EES TS as revised. Therefore, there would be no changes to the assumptions or calculated consequences in the analysis of an FHA in the fuel building as provided in USAR Section 15.4.7.

4.4 <u>TSTF-36-A Change to Add LCO 3.0.3 Exceptions to TS 3.3.8, TS 3.7.13, TS 3.8.2, TS 3.8.5, TS 3.8.8, and TS 3.8.10</u>

Technical Specifications 3.3.8 and 3.7.13 currently apply during the movement of irradiated fuel assemblies in the fuel building. The shutdown electrical specifications (TS 3.8.2, TS 3.8.5, TS 3.8.8, and TS 3.8.10) are being revised by this amendment application to also apply during the movement of irradiated fuel assemblies (as discussed in Evaluation Section 4.5 below). Irradiated fuel assemblies stored in the fuel building's spent fuel pool maybe moved during MODES 1-4 for a variety of reasons, such as:

- B.5.b required shuffles
- Fuel shuffles during new fuel receipt
- Fuel movements required to meet TS 3.7.17 and Specification 4.3.1.1 (Region 1 storage vs. Regions 2 and 3)
- Healthy fuel inspections as part of the Institute of Nuclear Power Operations (INPO) Zero by 2010 Initiative (to improve fuel performance)
- Inspections of suspected leaking fuel rods

- Inspections of lead test assemblies (when used)
- Moving fuel to dry cask storage (future activity that might be required)
- Future spent fuel pool re-racks (if needed).

As discussed in the ACTIONS Bases for TS 3.7.15, "Fuel Storage Pool Water Level," TS 3.7.16, "Fuel Storage Pool Boron Concentration," and TS 3.7.17, "Spent Fuel Assembly Storage," the movement of irradiated fuel assemblies while in MODES 1, 2, 3, and 4 is independent of reactor operations. The LCO 3.0.3 exclusion in TSs 3.7.15 through 3.7.17 should also apply to the TSs in the proposed change. There should be no requirement for the plant to experience the perturbations and shutdown transition risk associated with a forced reactor shutdown per LCO 3.0.3 for TSs 3.3.8, 3.7.13, 3.8.2, 3.8.5, 3.8.8, and 3.8.10 in the event of a situation unforeseen by the current TSs or in the event of failure to meet a Required Action or Completion Time in these TSs. These TSs all contain a default Required Action, in the event other Required Actions or Completion Times are not met or for noncompliance with the LCO, to immediately suspend movement of irradiated fuel assemblies. Under a scenario in MODES 1-4 where irradiated fuel movement in the fuel building could not be immediately suspended for some reason, the required response should be to continue taking steps to suspend fuel movement activities, not enter LCO 3.0.3 with its 1 hour for shutdown preparation followed by a shutdown to MODE 5 within 37 hours. In this scenario entering LCO 3.0.3 would be contrary to safety. The desired plant state is one in which an FHA is no longer possible and irradiated fuel movement has been secured. LCO 3.0.3 is intended to position the plant such that the MODES or specified conditions in the Applicability of a given TS are exited. In the affected TSs, the specified condition "During movement of irradiated fuel assemblies" is not exited by virtue of entering LCO 3.0.3.

For TS 3.7.13, "Emergency Exhaust System (EES)," the ACTIONS Note is modified to state: 'LCO 3.0.3 is not applicable to the FBVIS mode of operation." The mechanical functions covered by TS 3.7.13 are split between the safety injection signal (SIS) mode of operation in MODES 1-4, where the concern is auxiliary building ventilation isolation after a LOCA, and the fuel building ventilation isolation signal (FBVIS) mode of operation during movement of irradiated fuel assemblies in the fuel building, where the concern is fuel building ventilation isolation after a fuel handling accident in the fuel building. TSTF-36 was approved by the NRC to apply to STS 3.7.13, "Fuel Building Air Cleanup System (FBACS)," which also contains an LCO Applicability that includes MODES 1-4 [in brackets], which are associated with ECCS leakage after a LOCA, as well as during movement of irradiated fuel assemblies in the fuel building. No limitations were placed on the LCO 3.0.3 exception Note in TSTF-36 with respect to STS 3.7.13 or its Bases. It is not clear that the system covered by STS 3.7.13 has the same dual building isolation functions that the WCGS Emergency Exhaust System performs. Therefore, the proposed change to WCGS TS 3.7.13 is being associated to only the FBVIS mode of operation since Condition C addresses the loss of function in the SIS mode of operation and directs a shutdown to MODE 5 in 36 hours if that function is lost.

NRC approved TSTF-36-A (Reference 7) and it was incorporated into Revision 2 of NUREG-1431.

4.5 Electrical Power Systems in MODES 5 and 6 (Shutdown Conditions)

The STS and STS Bases for Westinghouse plants, NUREG-1431, include the following specified condition in the LCO Applicability for TS 3.8.2, TS 3.8.5, TS 3.8.8, and TS 3.8.10:

"During movement of [recently] irradiated fuel assemblies."

WCGS is not adopting the bracketed "[recently]" portion of that specified condition at this time; it was the subject of a separate traveler (TSTF-51-A). However, the rest of that specified condition would be adopted. During full core offloads, no MODES apply per the TS 1.1 Definitions since there is no fuel in the reactor vessel. However, electrical power requirements should still be observed for the removal of decay heat from the spent fuel pool and to mitigate the potential consequences of a FHA in the fuel building. While the definition of OPERABLE - OPERABILITY addresses the support to supported system relationships, including all necessary attendant electrical power support, questions can arise with respect to whether normal or emergency power is required during full core offloads. In order to conservatively address this concern, the LCO Applicability in the shutdown electrical power system TSs will adopt this as a prudent, albeit more restrictive, change.

5.0 REGULATORY EVALUATION

This section addresses the standards of 10 CFR 50.92 as well as the applicable regulatory requirements and acceptance criteria.

The proposed changes in this amendment application will revise the Wolf Creek Generating Station (WCGS) Technical Specifications (TSs) 3.3.7, "Control Room Emergency Ventilation System (CREVS) Actuation Instrumentation," 3.3.8, "Emergency Exhaust System (EES) Actuation Instrumentation," 3.7.10, "Control Room Emergency Ventilation System (CREVS)," 3.7.11, "Control Room Air Conditioning System (CRACS)," 3.7.13, "Emergency Exhaust System (EES)," 3.8.2, "AC Sources – Shutdown," 3.8.5, "DC Sources – Shutdown," 3.8.8, "Inverters – Shutdown," and 3.8.10, "Distribution Systems – Shutdown." This amendment will:

- Delete MODES 5 and 6 from the Limiting Condition for Operation (LCO) Applicability for the CREVS and its actuation instrumentation (TS 3.7.10 and TS 3.3.7, respectively). The event that heretofore required these LCOs to be applicable in MODES 5 and 6 (waste gas decay tank rupture) requires no mitigation at WCGS in order to meet General Design Criteria (GDC) 19.

- Delete the Required Action from TS 3.7.10 and TS 3.7.11 that requires verifying that the OPERABLE CREVS/CRACS train is capable of being powered by an emergency power source.

- Revise TS 3.7.13 by incorporating a 7-day Completion Time for restoring an inoperable EES train to OPERABLE status during shutdown conditions (i.e., during movement of irradiated fuel assemblies in the fuel building).

- Adopt NRC-approved traveler TSTF-36-A for TSs 3.3.8, 3.7.13, 3.8.2, 3.8.5, 3.8.8, and 3.8.10. This change will add an exclusion from LCO 3.0.3 that recognizes that irradiated fuel movement in the fuel building is independent of reactor operation in MODES 1 through 4 and defaulting to LCO 3.0.3 would force an unnecessary plant shutdown.
- Add a more restrictive change to the LCO Applicability for TSs 3.8.2, 3.8.5, 3.8.8, and 3.8.10 such that these LCOs apply not only during MODES 5 and 6, but also during the movement of irradiated fuel assemblies regardless of the MODE in which the plant is operating.

5.1 Applicable Regulatory Requirements/Criteria

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to include TSs as part of the license. The TSs ensure the operational capability of structures, systems, and components that are required to protect the health and safety of the public. The U.S. Nuclear Regulatory Commission's (NRC's) requirements related to the content of the TSs are contained in Section 50.36 of Title 10 of the *Code of Federal Regulations* (10 CFR 50.36) which requires that the TSs include items in the following specific categories: (1) safety limits, limiting safety systems settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements per 10 CFR 50.36(c)(3); (4) design features; and (5) administrative controls.

GDC 13, *"Instrumentation and control,"* requires that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure adequate safety, including those variables and systems that can affect the fission process, the integrity of the reactor core, the reactor coolant pressure boundary, and the containment and its associated systems.

GDC 17, *"Electric power systems,"* and GDC 18, *"Inspection and testing of electric power systems,"* require that the design of the electrical power systems contain sufficient independence, redundancy, inspection readiness and testability to ensure an available source of power to permit the functioning of structures, systems, and components important to safety.

GDC 19, *"Control room,"* requires that a control room shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent, to any part of the body, for the duration of the accident.

GDC 20, *"Protection system functions,"* requires that the protection system(s) shall be designed (1) to initiate automatically the operation of appropriate systems including the reactivity control systems, to assure that specified acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences and (2) to sense accident conditions and to initiate the operation of systems and components important to safety.

GDC 21, *"Protection system reliability and testing,"* requires that the protection system(s) shall be designed for high functional reliability and testability.

GDC 22, *"Protection system independence,"* GDC 23, *"Protection system failure modes,"* GDC 24, *"Separation of protection and control systems,"* GDC 25, *"Protection system requirements for reactivity control malfunctions,"* and GDC 29, *"Protection against anticipated operational occurrences,"* require various design attributes for the protection system(s), including independence, safe failure modes, separation from control systems, requirements for reactivity control malfunctions, and protection against anticipated operational occurrences.

GDC 61, "*Fuel storage and handling and radioactivity control*," requires that the fuel storage and handling, radioactive waste, and other systems which may contain radioactivity shall be designed to ensure adequate safety under normal and postulated accident conditions.

GDC 64, "*Monitoring radioactivity releases*," requires monitoring the reactor containment atmosphere, spaces containing components for recirculation of loss-of-coolant accident fluids, effluent discharge paths, and the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents.

10 CFR 50.55a(h) requires that the protection systems meet IEEE 279-1971. Section 4.2 of IEEE 279-1971 discusses the general functional requirement for protection systems to assure they satisfy the single failure criterion.

U.S. NRC Regulatory Guide 1.25, "Assumptions Used for Evaluating the Potential Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors," is NRC guidance, which describes the method acceptable to the NRC staff for licensee evaluation of the potential radiological consequences of a fuel handling accident (FHA).

NUREG-0800, "U.S. NRC Standard Review Plan," Section 15.7.4, provides guidance to the NRC staff for the review and evaluation of system design features and plant procedures provided for the mitigation of the radiological consequences of postulated fuel handling accidents.

The regulatory basis for TS 3.7.13, "Emergency Exhaust System (EES)" is to ensure the EES is capable of limiting the dose consequences of a FHA to below the NRC acceptance criteria given in Standard Review Plan (SRP) Section 15.7.4 and GDC 19. This ensures that offsite radiation exposures are maintained well within the requirements of 10 CFR 100.

The parameters of concern and the acceptance criteria applied are based on the requirements of 10 CFR 100 with respect to the calculated radiological consequences of a FHA and GDC 61 with respect to appropriate containment, confinement, and filtering systems.

As noted in the technical analysis presented in Section 4.0, incorporation of the proposed changes to TSs 3.7.10, 3.7.11 and 3.7.13 would not result in any change to the doses at the exclusion area and low population boundaries that are calculated to result from a postulated FHA (or waste gas tank rupture as evaluated in the Updated Safety Analysis Report (USAR) Section 15.7). Therefore, the calculated doses continue to remain well within the limits of 10 CFR 100. In addition, calculated control room doses from a postulated FHA (or waste gas tank rupture) remain unchanged and in compliance with GDC 19. Therefore, the proposed license amendment is in compliance with GDC 61 and 64 as well as Regulatory Guide 1.25, NUREG/CR-5009, and the criteria contained in NUREG-0800, Section 15.7.4.

There will be no changes to the actuation instrumentation, CREVS, EES, or electrical power systems such that compliance with any of the regulatory requirements and guidance documents above would come into question. The above evaluations confirm that the plant will continue to comply with all applicable regulatory requirements.

In conclusion, based on the considerations discussed above, 1) there is a reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, 2) such activities will be conducted in compliance with the Commission's regulations, and 3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.2 Precedent

License Amendment No. 192, dated June 30, 2009, approved changes to the TSs for the Callaway Plant. The approved changes to the TSs include:

- Deletion of MODES 5 and 6 from the Limiting Condition for Operability (LCO) applicability for the Control Room Emergency Ventilation System and its actuation instrumentation (TS 3.7.10 and TS 3.3.7, respectively).

- Adoption of NRC-approved Technical Specification Task Force (TSTF) change traveler TSTF-36, "Addition of LCO 3.0.3 N/A to shutdown electrical power specifications," Revision 4, for TSs 3.3.8, 3.7.13, 3.8.2, 3.8.5, 3.8.8, and 3.8.10. This change will add an exclusion from LCO 3.0.3 to LCO Actions for which the movement of irradiated fuel is independent of reactor operation in MODES 1 through 4.

- Addition of a more restrictive change to the LCO applicability for TSs 3.8.2, 3.8.5, 3.8.8, and 3.8.10 such that these LCOs will also apply during the movement of irradiated fuel assemblies.

The changes being proposed by WCNOC in this amendment request are similar to those approved in the Callaway Plant Amendment No. 192. The primary difference is the plant specific evaluation of the waste gas decay tank rupture event.

License Amendment No. 184, dated May 9, 2007, approved changes to the TSs for the Callaway Plant. The amendment deletes Required Action D.1.2 in TS 3.7.10, "Control Room Emergency Ventilation System (CREVS)," and Required Action C.1.2 in TS 3.7.11, "Control Room Air Conditioning System (CRACS)." For TS 3.7.13, "Emergency Exhaust System (EES)," the amendment also deletes the phrase "in MODE 1, 2, 3, or 4" from Condition A (one EES train inoperable) and revises Condition D to state the following: "Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the fuel building." The changes being proposed by WCNOC in this amendment request are similar to those approved in the Callaway Plant Amendment No. 184.

5.3 Significant Hazards Consideration

WCNOC has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, Issuance of Amendment:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No

   Deleting MODES 5 and 6 from the LCO Applicability of TSs 3.3.7 and 3.7.10 does not significantly increase the consequences of any accident since it has been demonstrated that the radiological consequences to control room occupants from a waste gas decay tank rupture will remain much less than the regulatory limits with no mitigation from the CREVS in MODES 5 and 6. The acceptance criteria for this event will continue to be met.

   Incorporation of a 7-day Completion Time for restoring an inoperable EES train during shutdown conditions (i.e., during movement of irradiated fuel assemblies in the fuel building) and the deletion of Required Actions for verifying the availability of an emergency power source when a CREVS/CRACS train is inoperable during the same conditions, are operational provisions that have no impact on the frequency of occurrence of the event for which the EES, CREVS and CRACS are designed to mitigate. These systems have no bearing on the occurrence of a fuel handling accident as the systems themselves are not associated with any of the potential initiating sequences, mechanisms or occurrences – such as a failure of a lifting device or crane, or an operator error – that could cause an FHA. Since these systems are designed only to respond to an FHA as accident mitigators after the accident has occurred, and they have no bearing on the occurrence of such an event themselves, the proposed changes to the CREVS, CRACS, and EES Technical Specifications have no impact on the probability of an accident previously evaluated.

   With respect to deleting the noted Required Actions in TS 3.7.10 and TS 3.7.11 (for verifying that the OPERABLE CREVS/CRACS train is capable of being powered from an emergency power source when one CREVS/CRACS train is inoperable), such a change does not change the LCO requirement for both CREVS/CRACS trains to be OPERABLE, nor to the LCO requirements of the TS requirements pertaining to electrical power sources/support for shutdown conditions. The change to the Required Actions would thus not be expected to have a significant impact on the availability of the CREVS and CRACS. That is, adequate availability may be still assumed such that these systems would continue to be available to provide their assumed function for limiting the dose consequences of an FHA in accordance with the accident analysis currently described in the USAR.

   With respect to the Completion Time for an inoperable EES train, the consequences of a postulated accident are not affected by equipment Completion Times as long as adequate equipment availability is maintained. The proposed EES Completion Time is based on the Completion Time specified in the Standard Technical Specifications (STS) for which it may be presumed that the specified Completion Time is acceptable and supports adequate EES availability. As noted in the STS Bases, the 7-day Completion Time for restoring an inoperable EES train takes into account the availability of the other train. Since the STS-support Completion Time supports adequate EES availability, it may be assumed that the EES function would be available for mitigation of an FHA, thus limiting offsite dose to within the currently calculated values based on the current accident analysis. On this basis, the consequences of applicable, analyzed accidents (i.e., the FHA) are not increased by the proposed change.

The adoption of TSTF-36-A will not affect the equipment and LCOs needed to mitigate the consequences of a FHA in the fuel building; however, this change will reduce the chances of an unnecessary plant shutdown due to activities in the fuel building that have no bearing on the operation of the rest of the plant and the reactor core inside the containment building.

The adoption of TSTF-36-A will not affect the equipment and LCOs needed to mitigate the consequences of a fuel handling accident in the fuel building; however, this change will reduce the chances of an unnecessary plant shutdown due to activities in the fuel building that have no bearing on the operation of the rest of the plant and the reactor core inside the containment building.

The changes to the shutdown electrical specifications will add an additional restriction that is consistent with the objective of being able to mitigate a fuel handling accident during all situations, including a full core offload, in which such an accident could occur.

Overall protection system performance will remain within the bounds of the previously performed accident analyses since there are no design changes. All design, material, and construction standards that were applicable prior to this amendment request will be maintained. There will be no changes to any design or operating limits.

The proposed changes will not adversely affect accident initiators or precursors nor adversely alter the design assumptions, conditions, and configuration of the facility or the manner in which the plant is operated and maintained. The proposed changes will not alter or prevent the ability of structures, systems, and components (SSCs) from performing their intended functions to mitigate the consequences of an initiating event within the assumed acceptance limits.

The proposed changes do not physically alter safety-related systems nor affect the way in which safety related systems perform their functions. The proposed changes do not alter plant design or operation; therefore, these changes will not increase the probability of any accident.

All accident analysis acceptance criteria will continue to be met with the proposed changes. The proposed changes will not affect the source term, containment isolation, or radiological release assumptions used in evaluating the radiological consequences of an accident previously evaluated. After a postulated release from a waste gas decay tank rupture no CREVS mitigation is required. The applicable radiological dose criteria will continue to be met.

Therefore, the proposed changes will not increase the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any previously evaluated?

Response: No

There are no proposed design changes nor are there any changes in the method by which any safety related plant SSC performs its specified safety function. The proposed changes will not affect the normal method of plant operation or change any operating parameters. Equipment performance necessary to fulfill safety analysis missions will be unaffected. The proposed changes will not alter any assumptions required to meet the safety analysis acceptance criteria.

No new accident scenarios, transient precursors, failure mechanisms, or limiting single failures will be introduced as a result of this amendment. There will be no adverse effect or challenges imposed on any safety related system as a result of this amendment.

The proposed amendment will not alter the design or performance of the 7300 Process Protection System, Nuclear Instrumentation System, or Solid State Protection System used in the plant protection systems.

Therefore, the proposed changes do not create the possibility of a new or different accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No

There will be no effect on those plant systems necessary to assure the accomplishment of protection functions. There will be no impact on the overpower limit, departure from nucleate boiling ratio (DNBR) limits, heat flux hot channel factor (F_Q), nuclear enthalpy rise hot channel factor ($F^N_{\Delta H}$), loss of coolant accident peak cladding temperature (LOCA PCT), peak local power density, or any other margin of safety. The applicable radiological dose consequence acceptance criteria will continue to be met. It has been demonstrated that the CREVS and its actuation instrumentation are not required to mitigate the control room radiological consequences of a waste gas decay tank rupture.

The proposed changes do not eliminate any surveillances or alter the frequency of surveillances required by the Technical Specifications. None of the acceptance criteria for any accident analysis will be changed.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

5.4 Conclusions

Based on the above evaluation, WCNOC concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c) and, accordingly, a finding of "no significant hazards consideration" is justified.

6.0 ENVIRONMENTAL CONSIDERATION

WCNOC has determined that the proposed amendment would not change requirements with respect to the installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. WCNOC has evaluated the proposed change and has determined that the change does not involve (i) a significant hazards consideration, (ii) a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure.

As discussed above, the proposed changes do not involve a significant hazards consideration and the consequences from an FHA inside the fuel building remain bounded by the USAR analysis and well within 10 CFR 100 limits. There is no increase in occupational radiation exposure related to the changes. Accordingly, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Therefore, pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

7.0 REFERENCES

1. Calculation No. AN-10-004, "Control Room Habitability of a Waste gas Decay Tank Failure," March 2010.

2. Regulatory Guide 1.24, "Assumptions used for Evaluating the Potential Radiological Consequences of a Pressurized Water Reactor Radioactive Gas Storage Tank Failure, " March 1972.

3. NUREG/CR-6604, "RADTRAD: A Simplified Model for RADionuclide Transport and Removal And Dose Estimation," April 1998.

4. NRC Regulatory Issue Summary 2001-19, "Deficiencies in the Documentation of Design Basis Radiological Analyses Submitted in Conjunction with License Amendment Requests." October 2001.

5. U.S. Nuclear Regulatory Commission Standard Review Plan, Section 6.4, "Control Room Habitability System," Rev. 2, July 1981.

6. Calculation No. Alion-CAL-WOLF-4617-1, "Evaluation of Wolf Creek Generating Station Control Room Habitability During a Chemical Release Using the Software Code HABIT," October 2008.

7. Technical Specification Task Force, Improved Standard Technical Specifications Change Traveler, TSTF-36-A, Revision 4, "Addition of LCO 3.0.3 N/A to Shutdown Electrical Power Specifications," approved by NRC on November 1, 1999.

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ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time for Condition A, B or C not met in MODE 1, 2, 3, or 4.	D .1	Be in MODE 3.	6 hours
	AND		
	D .2	Be in MODE 5.	36 hours
E. Required Action and associated Completion Time for Condition A, B or C not met ~~in MODE 5 or 6, or~~ during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E .2	Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

------------------------------NOTE------------------------------
Refer to Table 3.3.7-1 to determine which SRs apply for each CREVS Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.7.2	Perform COT.	92 days

(continued)

Table 3.3.7-1 (page 1 of 1)
CREVS Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, ~~5, 6,~~ and (a)	2	SR 3.3.7.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4, ~~5, 6,~~ and (a)	2 trains	SR 3.3.7.3	NA
3.	Control Room Radiation-Control Room Air Intakes	1, 2, 3, 4, ~~5, 6,~~ and (a)	2	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.5	(b)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During movement of irradiated fuel assemblies.
(b) Trip Setpoint concentration value ($\mu Ci/cm^3$) is to be established such that the actual submersion dose rate would not exceed 2 mR/hr in the control room.

3.3 INSTRUMENTATION

3.3.8 Emergency Exhaust System (EES) Actuation Instrumentation

LCO 3.3.8 The EES actuation instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.8-1.

ACTIONS

1. LCO 3.0.3 is not applicable.

(S)

-----NOTE-----

2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1	Place one EES train in the Fuel Building Ventilation Isolation Signal (FBVIS) mode.	7 days

(continued)

3.7 PLANT SYSTEMS

3.7.10 Control Room Emergency Ventilation System (CREVS)

LCO 3.7.10 Two CREVS trains shall be OPERABLE.

-----NOTE-----
The control room envelope (CRE) and control building envelope (CBE) boundaries may be opened intermittently under administrative controls.

---

and

APPLICABILITY: MODES 1, 2, 3, 4, ~~5, and 6,~~
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CREVS train inoperable for reasons other than Condition B.	A.1 Restore CREVS train to OPERABLE status.	7 days
B. One or more CREVS trains inoperable due to an inoperable CRE boundary or an inoperable CBE boundary in MODES 1, 2, 3, or 4.	B.1 Initiate action to implement mitigating actions.	Immediately
	<u>AND</u>	
	B.2 Verify mitigating actions to ensure CRE occupant radiological exposures will not exceed limits and CRE occupants are protected from chemical and smoke hazards.	24 hours
	<u>AND</u>	
	B.3 Restore CRE boundary and CBE boundary to OPERABLE status.	90 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Be in MODE 5.	36 hours
D. Required Action and associated Completion Time of Condition A not met ~~in MODE 5 or 6, or~~ during movement of irradiated fuel assemblies.	D.1~~.1~~	Place OPERABLE CREVS train in CRVIS mode.	Immediately
	~~AND~~		
	~~D.1.2~~	~~Verify OPERABLE CREVS train is capable of being powered by an emergency power source.~~	~~Immediately~~
	OR		
	D.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	D.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CREVS trains inoperable ~~in MODE 5 or 6, or~~ during movement of irradiated fuel assemblies. OR One or more CREVS trains inoperable due to an inoperable CRE boundary or an inoperable CBE boundary ~~in MODE 5 or 6, or~~ during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of irradiated fuel assemblies.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies .	C.1.1 Place OPERABLE CRACS train in operation.	Immediately
	~~AND~~	
	~~C.1.2 Verify OPERABLE CRACS train is capable of being powered by an emergency power source.~~	~~Immediately~~
	OR	
	C.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	C.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
D. Two CRACS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	D.2 Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CRACS trains inoperable in MODE 1, 2, 3, or 4.	E.1 Enter LCO 3.0.3.	Immediately

3.7 PLANT SYSTEMS

3.7.13 Emergency Exhaust System (EES)

LCO 3.7.13 Two EES trains shall be OPERABLE.

---NOTE---
The auxiliary building or fuel building boundary may be opened intermittently under administrative controls.

APPLICABILITY: MODES 1, 2, 3, and 4,
During movement of irradiated fuel assemblies in the fuel building.

---NOTE---
The SIS mode of operation is required only in MODES 1, 2, 3, and 4. The FBVIS mode of operation is required only during movement of irradiated fuel assemblies in the fuel building.

ACTIONS

---NOTE---
LCO 3.0.3 is not applicable to the FBVIS mode of operation.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One EES train inoperable. ~~in MODE 1, 2, 3, or 4.~~	A.1 Restore EES train to OPERABLE status.	7 days
B. Two EES trains inoperable due to inoperable auxiliary building boundary in MODE 1, 2, 3, or 4.	B.1 Restore auxiliary building boundary to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4. OR Two EES trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	C.1 AND C.2	Be in MODE 3. Be in MODE 5.	6 hours 36 hours
D. ~~One EES train inoperable during movement of irradiated fuel assemblies in the fuel building.~~	D.1 OR D.2	Place OPERABLE EES train in operation in FBVIS mode. Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately Immediately
E. Two EES trains inoperable due to inoperable fuel building boundary during movement of irradiated fuel assemblies in the fuel building.	E.1	Restore fuel building boundary to OPERABLE status.	24 hours

(continued)

Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the fuel building.

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources - Shutdown

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem required by LCO 3.8.10, "Distribution Systems - Shutdown"; and

b. One diesel generator (DG) capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystems required by LCO 3.8.10.

c. The shutdown portion of one load shedder and emergency load sequencer (LSELS) associated with the required DG and AC electrical power distribution train.

------------------------------NOTE------------------------------
LCO 3.0.3 is not applicable.

APPLICABILITY: MODES 5 and 6, ~~6~~ or

During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	-------------------NOTE------------------- Enter applicable Conditions and Required Actions of LCO 3.8.10, with the required train de-energized as a result of Condition A. ---	
	A.1 Declare affected required feature(s) with no offsite power available inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS. <u>AND</u>	Immediately

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources - Shutdown

LCO 3.8.5 The Train A or Train B DC electrical power subsystem shall be OPERABLE to support one train of the DC electrical power distribution subsystems required by LCO 3.8.10, "Distribution Systems - Shutdown."

------------------------------NOTE------------------------------
LCO 3.0.3 is not applicable.

APPLICABILITY: MODES 5 and ~~6~~, During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required DC electrical power subsystem inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u>	
	A.2.4 Initiate action to restore required DC electrical power subsystem to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters - Shutdown

LCO 3.8.8 The Train A or Train B inverters shall be OPERABLE to support one train of the onsite Class 1E AC vital bus electrical power distribution subsystems required by LCO 3.8.10, "Distribution Systems - Shutdown."

NOTE
LCO 3.0.3 is not applicable.

APPLICABILITY: MODES 5 and 6, During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required inverters inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u>	
	A.2.4 Initiate action to restore required inverters to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

LCO 3.8.10 The necessary portion of the Train A or Train B AC, DC, and AC vital bus electrical power distribution subsystems shall be OPERABLE to support one train of equipment required to be OPERABLE.

----------NOTE----------
LCO 3.0.3 is not applicable.

APPLICABILITY: MODES 5 and ~~6~~, During movement of irradiated fuel assemblies. (3)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, DC, or AC vital bus electrical power distribution subsystems inoperable.	A.1 Declare associated supported required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u>	
		(continued)

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ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time for Condition A, B or C not met in MODE 1, 2, 3, or 4.	D .1	Be in MODE 3.	6 hours
	AND		
	D .2	Be in MODE 5.	36 hours
E. Required Action and associated Completion Time for Condition A, B or C not met during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E .2	Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.7-1 to determine which SRs apply for each CREVS Actuation Function.

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.7.2	Perform COT.	92 days

(continued)

Table 3.3.7-1 (page 1 of 1)
CREVS Actuation Instrumentation

	FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	SURVEILLANCE REQUIREMENTS	TRIP SETPOINT
1.	Manual Initiation	1, 2, 3, 4, and (a)	2	SR 3.3.7.4	NA
2.	Automatic Actuation Logic and Actuation Relays (BOP ESFAS)	1, 2, 3, 4, and (a)	2 trains	SR 3.3.7.3	NA
3.	Control Room Radiation-Control Room Air Intakes	1, 2, 3, 4, and (a)	2	SR 3.3.7.1 SR 3.3.7.2 SR 3.3.7.5	(b)
4.	Containment Isolation - Phase A	Refer to LCO 3.3.2, "ESFAS Instrumentation," Function 3.a, for all initiation functions and requirements.			

(a) During movement of irradiated fuel assemblies.

(b) Trip Setpoint concentration value (μCi/cm^3) is to be established such that the actual submersion dose rate would not exceed 2 mR/hr in the control room.

3.3 INSTRUMENTATION

3.3.8 Emergency Exhaust System (EES) Actuation Instrumentation

LCO 3.3.8 The EES actuation instrumentation for each Function in Table 3.3.8-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.3.8-1.

ACTIONS

-----------------------------NOTES-----------------------------

1. LCO 3.0.3 is not applicable.
2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel or train inoperable.	A.1 Place one EES train in the Fuel Building Ventilation Isolation Signal (FBVIS) mode.	7 days

(continued)

3.7 PLANT SYSTEMS

3.7.10 Control Room Emergency Ventilation System (CREVS)

LCO 3.7.10 Two CREVS trains shall be OPERABLE.

---NOTE---
The control room envelope (CRE) and control building envelope (CBE) boundaries may be opened intermittently under administrative controls.

APPLICABILITY: MODES 1, 2, 3, and 4,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One CREVS train inoperable for reasons other than Condition B.	A.1	Restore CREVS train to OPERABLE status.	7 days
B. One or more CREVS trains inoperable due to an inoperable CRE boundary or an inoperable CBE boundary in MODES 1, 2, 3, or 4.	B.1	Initiate action to implement mitigating actions.	Immediately
	<u>AND</u>		
	B.2	Verify mitigating actions to ensure CRE occupant radiological exposures will not exceed limits and CRE occupants are protected from chemical and smoke hazards.	24 hours
	<u>AND</u>		
	B.3	Restore CRE boundary and CBE boundary to OPERABLE status.	90 days

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Be in MODE 5.	36 hours
D. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies.	D.1	Place OPERABLE CREVS train in CRVIS mode.	Immediately
	OR		
	D.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	D.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CREVS trains inoperable during movement of irradiated fuel assemblies. OR One or more CREVS trains inoperable due to an inoperable CRE boundary or an inoperable CBE boundary during movement of irradiated fuel assemblies.	E.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	E.2	Suspend movement of irradiated fuel assemblies.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A not met in MODE 5 or 6, or during movement of irradiated fuel assemblies .	C.1	Place OPERABLE CRACS train in operation.	Immediately
	OR		
	C.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	C.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
D. Two CRACS trains inoperable in MODE 5 or 6, or during movement of irradiated fuel assemblies.	D.1	Suspend CORE ALTERATIONS.	Immediately
	AND		
	D.2	Suspend movement of irradiated fuel assemblies.	Immediately
E. Two CRACS trains inoperable in MODE 1, 2, 3, or 4.	E.1	Enter LCO 3.0.3.	Immediately

3.7 PLANT SYSTEMS

3.7.13 Emergency Exhaust System (EES)

LCO 3.7.13 Two EES trains shall be OPERABLE.

-----NOTE-----
The auxiliary building or fuel building boundary may be opened intermittently under administrative controls.

APPLICABILITY: MODES 1, 2, 3, and 4,
During movement of irradiated fuel assemblies in the fuel building.

-----NOTE-----
The SIS mode of operation is required only in MODES 1, 2, 3, and 4. The FBVIS mode of operation is required only during movement of irradiated fuel assemblies in the fuel building.

ACTIONS

-----NOTE-----
LCO 3.0.3 is not applicable to the FBVIS mode of operation.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One EES train inoperable.	A.1 Restore EES train to OPERABLE status.	7 days
B. Two EES trains inoperable due to inoperable auxiliary building boundary in MODE 1, 2, 3, or 4.	B.1 Restore auxiliary building boundary to OPERABLE status.	24 hours

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, 3, or 4. OR Two EES trains inoperable in MODE 1, 2, 3, or 4 for reasons other than Condition B.	C.1	Be in MODE 3.	6 hours
	AND		
	C.2	Be in MODE 5.	36 hours
D. Required Action and associated Completion Time of Condition A not met during movement of irradiated fuel assemblies in the fuel building.	D.1	Place OPERABLE EES train in operation in FBVIS mode.	Immediately
	OR		
	D.2	Suspend movement of irradiated fuel assemblies in the fuel building.	Immediately
E. Two EES trains inoperable due to inoperable fuel building boundary during movement of irradiated fuel assemblies in the fuel building.	E.1	Restore fuel building boundary to OPERABLE status.	24 hours

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.2 AC Sources - Shutdown

LCO 3.8.2 The following AC electrical power sources shall be OPERABLE:

a. One qualified circuit between the offsite transmission network and the onsite Class 1E AC electrical power distribution subsystem required by LCO 3.8.10, "Distribution Systems - Shutdown"; and

b. One diesel generator (DG) capable of supplying one train of the onsite Class 1E AC electrical power distribution subsystems required by LCO 3.8.10.

c. The shutdown portion of one load shedder and emergency load sequencer (LSELS) associated with the required DG and AC electrical power distribution train.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

--NOTE--
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required offsite circuit inoperable.	-------------------NOTE-------------------- Enter applicable Conditions and Required Actions of LCO 3.8.10, with the required train de-energized as a result of Condition A. --	
	A.1 Declare affected required feature(s) with no offsite power available inoperable.	Immediately
	<u>OR</u>	
		(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. (continued)	A.2.1	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	A.2.2	Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>		
	A.2.3	Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u>		
	A.2.4	Initiate action to restore required offsite power circuit to OPERABLE status.	Immediately
B. One required DG inoperable.	B.1	Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>		
	B.2	Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>		
	B.3	Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u>		
	B.4	Initiate action to restore required DG to OPERABLE status.	Immediately

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources - Shutdown

LCO 3.8.5 The Train A or Train B DC electrical power subsystem shall be OPERABLE to support one train of the DC electrical power distribution subsystems required by LCO 3.8.10, "Distribution Systems - Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

-----NOTE-----
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required DC electrical power subsystem inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u>	
	A.2.4 Initiate action to restore required DC electrical power subsystem to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.8 Inverters - Shutdown

LCO 3.8.8 The Train A or Train B inverters shall be OPERABLE to support one train of the onsite Class 1E AC vital bus electrical power distribution subsystems required by LCO 3.8.10, "Distribution Systems - Shutdown."

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

---NOTE---
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required inverters inoperable.	A.1 Declare affected required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u>	
	A.2.4 Initiate action to restore required inverters to OPERABLE status.	Immediately

3.8 ELECTRICAL POWER SYSTEMS

3.8.10 Distribution Systems - Shutdown

LCO 3.8.10 The necessary portion of the Train A or Train B AC, DC, and AC vital bus electrical power distribution subsystems shall be OPERABLE to support one train of equipment required to be OPERABLE.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

------------------------------NOTE------------------------------
LCO 3.0.3 is not applicable.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required AC, DC, or AC vital bus electrical power distribution subsystems inoperable.	A.1 Declare associated supported required feature(s) inoperable.	Immediately
	<u>OR</u>	
	A.2.1 Suspend CORE ALTERATIONS.	Immediately
	<u>AND</u>	
	A.2.2 Suspend movement of irradiated fuel assemblies.	Immediately
	<u>AND</u>	
	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or boron concentration.	Immediately
	<u>AND</u>	
		(continued)

Proposed TS Bases Changes (for information only)

During movement of irradiated fuel assemblies,

BASES

APPLICABLE SAFETY ANALYSES (continued)

~~T~~he radiation monitor actuation of the CREVS ~~in MODES 5 and 6, and~~ ~~during movement of irradiated fuel assemblies~~ is the primary means to ensure control room habitability. ~~in the event of a~~ waste gas decay tank rupture accident ~~or fuel handling accident~~.

No control room habitability mitigation is required for the

The CREVS actuation instrumentation satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

The LCO requirements ensure that instrumentation necessary to initiate the CREVS is OPERABLE.

1. Manual Initiation

The LCO requires two channels OPERABLE. The operator can initiate the CREVS at any time by using either of two push buttons in the control room. This action will cause actuation of all components in the same manner as any of the automatic actuation signals.

The LCO for Manual Initiation ensures the proper amount of redundancy is maintained in the manual actuation circuitry to ensure the operator has manual initiation capability.

Each channel consists of one push button and the interconnecting wiring to the actuation logic cabinet.

2. Automatic Actuation Logic and Actuation Relays (BOP ESFAS)

The LCO requires two trains of Actuation Logic and Relays OPERABLE to ensure that no single random failure can prevent automatic actuation of a control room ventilation isolation signal (CRVIS).

Automatic actuation logic and actuation relays consist of the same features and operate in the same manner as described for BOP ESFAS in the Bases Background for 3.3.2.

BASES

LCO (continued)

3. Control Room Radiation

The LCO specifies two required Control Room Air Gaseous Intake Radiation Monitors (GK RE-04 and -05) to ensure that the radiation monitoring instrumentation necessary to initiate a CRIVS remains OPERABLE.

For sampling systems, channel OPERABILITY involves more than OPERABILITY of channel electronics. OPERABILITY also requires correct valve lineups and sample pump operation, as well as detector OPERABILITY, since these supporting features are necessary for trip to occur under the conditions assumed by the safety analyses.

4. Containment Isolation - Phase A

Control Room Ventilation Isolation is also initiated by all Table 3.3.2-1 Functions that initiate Phase A. Therefore, the requirements are not repeated in Table 3.3.7-1. Instead, refer to LCO 3.3.2, Function 3.a, for all initiating Functions and requirements.

APPLICABILITY

All CREVS Functions must be OPERABLE in MODES 1, 2, 3, and 4. The Manual Initiation, Automatic Actuation Logic and Actuation Relay (BOP ESFAS), and Control Room Radiation Functions are also required OPERABLE ~~in MODES 5 and 6 and~~ during movement of irradiated fuel assemblies. ~~The Functions must also be OPERABLE in MODES 5 and 6 for a waste gas decay tank rupture accident, to ensure a habitable environment for the control room operators.~~

ACTIONS

The most common cause of channel inoperability is outright failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by the unit specific calibration procedures. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a COT, when the process instrumentation is set up for adjustment to bring it within specification. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

BASES

ACTIONS (continued)

E.1 and E.2

Condition E applies when the Required Action and associated Completion Time for Conditions A, B or C have not been met ~~during MODE 5 or 6 or~~ when irradiated fuel assemblies are being moved. Movement of irradiated fuel assemblies and CORE ALTERATIONS must be suspended immediately to reduce the risk of accidents that would require CREVS actuation. This does not preclude movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

A Note has been added to the SR Table to clarify that Table 3.3.7-1 determines which SRs apply to which CREVS Actuation Functions.

SR 3.3.7.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit.

The Frequency is based on operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal, but more frequent, checks of channels during normal operational use of the displays associated with the LCO required channels.

SR 3.3.7.2

A COT is performed once every 92 days on each required channel to ensure the entire channel will perform the intended function. This test

BASES

APPLICABILITY

The manual and automatic EES initiation must be OPERABLE when moving irradiated fuel assemblies in the fuel building, to ensure the EES operates to remove fission products associated with a fuel handling accident.

High radiation initiation of the FBVIS must be OPERABLE during movement of irradiated fuel assemblies in the fuel building to ensure automatic initiation of the EES when the potential for a fuel handling accident exists.

While in any MODE without fuel handling in progress, the EES instrumentation need not be OPERABLE since a fuel handling accident cannot occur.

ACTIONS

The most common cause of channel inoperability is the failure or drift of the bistable or process module sufficient to exceed the tolerance allowed by unit specific calibration procedures. Typically, the drift is found to be small and results in a delay of actuation rather than a total loss of function. This determination is generally made during the performance of a COT, when the process instrumentation is set up for adjustment to bring it within specification. If the Trip Setpoint is less conservative than the tolerance specified by the calibration procedure, the channel must be declared inoperable immediately and the appropriate Condition entered.

INSERT B 3.3.8-3

second

A Note has been added to the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each Function listed in Table 3.3.8-1 in the accompanying LCO. The Completion Time(s) of the inoperable channel(s)/train(s) of a Function will be tracked separately for each Function starting from the time the Condition was entered for that Function.

Placing a EES train(s) in the FBVIS mode of operation isolates normal air discharge from the fuel building and initiates filtered exhaust, imposing a negative pressure on the fuel building. Further discussion of the FBVIS mode of operation may be found in the Bases for LCO 3.7.13, "Emergency Exhaust System," and in Reference 3.

A.1

Condition A applies to the actuation logic train function of the BOP ESFAS, the radiation monitor functions, and the manual function.

INSERT B 3.3.8-3

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

BASES

APPLICABILITY

In MODES 1, 2, 3, 4, 5, and 6, and during movement of irradiated fuel assemblies, the CREVS must be OPERABLE to ensure that the CRE will remain habitable during and following a DBA.

~~In MODE 5 or 6, the CREVS is required to cope with the design basis release from the rupture of a waste gas tank.~~

During movement of irradiated fuel assemblies, the CREVS must be OPERABLE to cope with the release from a design basis fuel handling accident.

ACTIONS

A.1

When one CREVS train is inoperable for reasons other than an inoperable CRE or CBE boundary, action must be taken to restore OPERABLE status within 7 days. In this Condition, the remaining OPERABLE CREVS train is adequate to perform the CRE occupant protection function. However, the overall reliability is reduced because a failure in the OPERABLE CREVS train could result in loss of CREVS function. The 7 day Completion Time is based on the low probability of a DBA occurring during this time period, and ability of the remaining train to provide the required capability.

B.1, B.2, and B.3

If the unfiltered inleakage of potentially contaminated air past a CRE or CBE boundary credited in the accident analysis and into the CRE can result in CRE occupant radiological dose greater than the calculated dose of the licensing basis analyses of DBA consequences (allowed to be up to 5 rem whole body or its equivalent to any part of the body), or inadequate protection of CRE occupants from hazardous chemicals or smoke, the CRE or CBE boundary is inoperable. Actions must be taken to restore the CRE or CBE boundary to OPERABLE status within 90 days.

During the period that the CRE or CBE boundary is considered inoperable, action must be initiated to implement mitigating actions to lessen the effect on CRE occupants from the potential hazards of a radiological or chemical event or a challenge from smoke. Actions must be taken within 24 hours to verify that in the event of a DBA, the mitigating actions will ensure that CRE occupant radiological exposures will not exceed the calculated dose of the licensing basis analyses of DBA consequences, and that CRE occupants are protected from hazardous

BASES

ACTIONS

B.1, B.2, and B.3 (continued)

chemicals and smoke. These mitigating actions (i.e., actions that are taken to offset the consequences of the inoperable CBP boundary) should be preplanned for implementation upon entry into the condition, regardless of whether entry is intentional or unintentional.

The 24 hour Completion Time is reasonable based on the low probability of a DBA occurring during this time period, and the use of mitigating actions. The 90 day Completion Time is reasonable based on the determination that the mitigating actions will ensure protection of CRE occupants within analyzed limits while limiting the probability that CRE occupants will have to implement protective measures that may adversely affect their ability to control the reactor and maintain it in a safe shutdown condition in the event of a DBA. In addition, the 90 day Completion Time is a reasonable time to diagnose, plan and possibly repair, and test most conditions adversely affecting the CRE or CBE boundary.

C.1 and C.2

In MODE 1, 2, 3, or 4, if the inoperable CREVS train or the inoperable CRE or CBE boundary cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes accident risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1~~.1, D.1.2~~, D.2.1, and D.2.2

~~In MODE 5 or 6, or~~ during movement of irradiated fuel assemblies, if the inoperable CREVS train cannot be restored to OPERABLE status within the required Completion Time, action must be taken to immediately place the OPERABLE CREVS train in the CRVIS mode. This action ensures that the remaining train is OPERABLE, that no failures preventing automatic actuation will occur, and that any active failure would be readily detected. ~~Required Action D.1.2 requires the CREVS train placed in operation be capable of being powered by an emergency power source. This action assures OPERABILITY of the CREVS train in the unlikely event of a fuel handling accident or decay tank rupture while shutdown concurrent with a loss of offsite power.~~

BASES

ACTIONS

D.1~~.1, D.1.2~~, 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

~~In MODE 5 or 6, or~~ 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 ≥ 10 continuous hours with the heaters energized. Each filtration system train need only be operated for ≥ 15 minutes to demonstrate the function of the system. The 31 day Frequency is based on the reliability of the equipment and the two train redundancy.

BASES

LCO (continued)

The CRACS is considered to be OPERABLE when the individual components necessary to maintain the control room temperature are OPERABLE in both trains. These components include the refrigeration compressors, heat exchangers, cooling coils, fans, and associated temperature control instrumentation. In addition, the CRACS must be OPERABLE to the extent that air circulation can be maintained. Isolation or breach of the CRACS air flow path also can render the CREVS flowpath inoperable. In these situations, LCO 3.7.10 would also be applicable.

APPLICABILITY

In MODES 1, 2, 3, 4, 5, and 6, and during movement of irradiated fuel assemblies, the CRACS must be OPERABLE to ensure that the control room temperature will not exceed equipment operational requirements.

ACTIONS

A.1

With one CRACS train inoperable, action must be taken to restore OPERABLE status within 30 days. In this Condition, the remaining OPERABLE CRACS train is adequate to maintain the control room temperature within limits. However, the overall reliability is reduced because a single failure in the OPERABLE CRACS train could result in loss of CRACS function. The 30 day Completion Time is based on the low probability of an event requiring control room isolation and the consideration that the remaining train can provide the required protection.

B.1 and B.2

In MODE 1, 2, 3, or 4, if the inoperable CRACS train cannot be restored to OPERABLE status within the required Completion Time, the unit must be placed in a MODE that minimizes the risk. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

C.1~~.1, C.1.2,~~ C.2.1, and C.2.2

In MODE 5 or 6, or during movement of irradiated fuel, if the inoperable CRACS train cannot be restored to OPERABLE status within the required Completion Time, the OPERABLE CRACS train must be placed in

BASES

ACTIONS

C.1~~.1, C.1.2~~, 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. ~~Required Action C.1.2 requires the CRACS train placed in operation be capable of being powered by an emergency power source. This action assures OPERABILITY of the CRACS train in the unlikely event of a fuel handling accident or decay tank rupture while shutdown concurrent with a loss of offsite power.~~

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

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 and verification of unit air

INSERT B 3.7.13-4

BASES

ACTIONS

A.1

5

With one Emergency Exhaust System train inoperable ~~in MODE 1, 2, 3, or 4~~, action must be taken to restore OPERABLE status within 7 days. During this period, the remaining OPERABLE train is adequate to perform the Emergency Exhaust System function. The 7 day Completion Time is based on the risk from an event occurring requiring the inoperable Emergency Exhaust System train, and the remaining Emergency Exhaust System train providing the required protection.

B.1

If the auxiliary building boundary is inoperable such that a train of the Emergency Exhaust System operating in the SIS mode cannot establish or maintain the required negative pressure, action must be taken to restore an OPERABLE auxiliary 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 auxiliary building leakage).

C.1 and C.2

In MODE 1, 2, 3, or 4, when Required Action A.1 or B.1 cannot be completed within the associated Completion Time or when both Emergency Exhaust System trains are inoperable for reasons other than an inoperable auxiliary building boundary (i.e., Condition B), the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in MODE 3 within 6 hours, and in MODE 5 within 36 hours. The Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1 and D.2

~~With one Emergency Exhaust System train inoperable, 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.

When Required Action A.1 cannot be completed within the associated Completion Time during movement of irradiated fuel assemblies in the fuel building,

INSERT B 3.7.13-4

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.2 AC Sources - Shutdown

BASES

BACKGROUND

A description of the AC sources is provided in the Bases for LCO 3.8.1, "AC Sources - Operating."

APPLICABLE SAFETY ANALYSES

The OPERABILITY of the minimum AC sources during MODES 5 and 6, ensures that:

and during movement of irradiated fuel assemblies

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate AC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and design requirements during shutdown conditions are allowed by the LCO for required systems.

During MODES 1, 2, 3, and 4, various deviations from the analysis assumptions and design requirements are allowed within the Required Actions. This allowance is in recognition that certain testing and maintenance activities must be conducted provided an acceptable level of risk is not exceeded. During MODES 5 and 6, performance of a significant number of required testing and maintenance activities is also required. In MODES 5 and 6, the activities are generally planned and administratively controlled. Relaxations from MODE 1, 2, 3, and 4 LCO

BASES

LCO (continued)

The DG must be capable of starting, accelerating to rated speed and voltage, and connecting to its respective ESF bus on detection of bus undervoltage. This sequence must be accomplished within 12 seconds. The DG must be capable of accepting required loads within the assumed loading sequence intervals, and continue to operate until offsite power can be restored to the ESF buses. These capabilities are required to be met from a variety of initial conditions such as DG in standby with the engine hot and DG in standby at ambient conditions.

Initiating an EDG start upon a detected under voltage or degraded voltage condition, tripping of nonessential loads, and proper sequencing of loads, is a required function of load shedder and emergency load sequencer (LSELS) and required for DG OPERABILITY. Only the shutdown sequencer on the train supported by the OPERABLE DG is required to be OPERABLE in MODES 5 and 6. In addition, the LSELS Automatic Test Indicator (ATI) is an installed testing aid and is not required to be OPERABLE to support the sequencer function. Absence of a functioning ATI does not render LSELS inoperable.

It is acceptable for trains to be cross tied during shutdown conditions, allowing a single offsite power circuit to supply all required trains.

APPLICABILITY

The AC sources required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The AC power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.1.

INSERT B 3.8.2-5

BASES

ACTIONS

A.1

An offsite circuit would be considered inoperable if it were not available to one required ESF train. The one train with offsite power available may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS and fuel movement. By the allowance of the option to declare required features inoperable, with no offsite power available, appropriate restrictions will be implemented in accordance with the affected required features LCO's ACTIONS.

A.2.1, A.2.2, A.2.3, A.2.4, B.1, B.2, B.3, and B.4

With the offsite circuit not available to one required train, the option would still exist to declare all required features inoperable. Since this option may involve undesired administrative efforts, the allowance for sufficiently conservative actions is made. With the required DG inoperable, the minimum required diversity of AC power sources is not available. It is, therefore, required to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions that could result in loss of required SDM (MODE 5) of LCO 3.1.1 or boron concentration (MODE 6) of LCO 3.9.1. Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes, including temperature increases when operating with a positive MTC, must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities does not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability or the occurrence of postulated events. It is further required to immediately initiate action to restore the required AC sources and to continue this action until restoration is accomplished in order to provide the necessary AC power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required AC electrical power sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

INSERT B 3.8.2-5

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.5 DC Sources - Shutdown

BASES

BACKGROUND

A description of the DC sources is provided in the Bases for LCO 3.8.4, "DC Sources - Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the USAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume that Engineered Safety Feature systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the diesel generators, emergency auxiliaries, and control and switching during all MODES of operation.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum DC electrical power sources during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate DC electrical power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of occurrence being significantly reduced or eliminated, and in minimal consequences. These deviations from DBA analysis assumptions and

BASES

APPLICABLE SAFETY ANALYSES (continued)

assure that the desired level of minimal risk is maintained (frequently referred to as maintaining a desired defense in depth). The level of detail involved in the assessment will vary with the significance of the equipment being supported. In some cases, prepared guidelines are used which include controls designed to manage risk and retain the desired defense in depth.

The DC sources satisfy Criterion 3 of the 10 CFR 50.36(c)(2)(ii).

LCO

One DC electrical power subsystem and the corresponding control equipment and interconnecting cabling within the train, are required to be OPERABLE to support one train of the DC electrical power distribution systems required by LCO 3.8.10, "Distribution Systems - Shutdown." The required DC electrical power subsystem (Train A or Train B) consists of two DC buses energized from the associated batteries and chargers or spare charger powered from the respective Class 1E 480 V load center and the corresponding control equipment and interconnecting cabling within the train. This ensures the availability of sufficient DC electrical power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents).

The required DC electrical power distribution subsystem is supported by one train of DC electrical power system. When the second DC electrical power distribution train (subsystem) is needed to support redundant required systems, equipment and components, the second train may be energized from any available source. The available source must be Class 1E or another reliable source. The available source must be capable of supplying sufficient DC electrical power such that the redundant components are capable of performing their specified safety functions(s) (implicitly required by the definition of OPERABILITY). Otherwise, the supported components must be declared inoperable and the appropriate conditions of the LCOs for the redundant components must be entered.

APPLICABILITY

The DC electrical power sources required to be OPERABLE in MODES 5 and 6 provide assurance that:

and during movement of irradiated fuel assemblies

a. Required features to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core;

b. Required features needed to mitigate a fuel handling accident are available;

BASES

APPLICABILITY (continued)

c. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The DC electrical power requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.4.

ACTIONS

INSERT B 3.8.5-4

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

By allowing the option to declare required features inoperable with the associated DC power source(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCO ACTIONS. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions that could result in loss of required SDM (MODE 5) of LCO 3.1.1 or boron concentration (MODE 6) of LCO 3.9.1). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes, including temperature increases when operating with a positive MTC, must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC electrical power subsystem and to continue this action until restoration is accomplished in order to provide the necessary DC electrical power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required DC electrical power subsystem should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

INSERT B 3.8.5-4

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.8 Inverters - Shutdown

BASES

BACKGROUND

A description of the inverters is provided in the Bases for LCO 3.8.7, "Inverters - Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the USAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safety Feature systems are OPERABLE. The DC to AC inverters are designed to provide the required capacity, capability, redundancy, and reliability to ensure the availability of necessary power to the Reactor Protection System and Engineered Safety Features Actuation System instrumentation and controls so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the inverters is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum inverters to each AC vital bus during MODES 5 and 6 ensures that:

and during movement of irradiated fuel assemblies

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is available to mitigate events postulated during shutdown, such as a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many Design Basis Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained within the reactor pressure boundary, reactor coolant temperature and pressure, and the corresponding stresses result in the probabilities of

BASES

APPLICABILITY

The inverters required to be OPERABLE in MODES 5 and 6, and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

Inverter requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.7.

ACTIONS

INSERT B 3.8.8-4

A.1, A.2.1, A.2.2, A.2.3, and A.2.4

By the allowance of the option to declare required features inoperable with the associated inverter(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive reactivity additions that could result in loss of required SDM (MODE 5) of LCO 3.1.1 or boron concentration (MODE 6) of LCO 3.9.1). Suspending positive reactivity additions that could result in failure to meet the minimum SDM or boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes, including temperature increases when operating with a positive MTC, must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required inverters and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the unit safety systems.

INSERT B 3.8.8-4

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.10 Distribution Systems - Shutdown

BASES

BACKGROUND

A description of the AC, DC, and AC vital bus electrical power distribution systems is provided in the Bases for LCO 3.8.9, "Distribution Systems - Operating."

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident and transient analyses in the USAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 2), assume Engineered Safety Feature (ESF) systems are OPERABLE. The AC, DC, and AC vital bus electrical power distribution systems are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that the fuel, Reactor Coolant System, and containment design limits are not exceeded.

The OPERABILITY of the AC, DC, and AC vital bus electrical power distribution system is consistent with the initial assumptions of the accident analyses and the requirements for the supported systems' OPERABILITY.

The OPERABILITY of the minimum AC, DC, and AC vital bus electrical power distribution subsystems during MODES 5 and 6 and during movement of irradiated fuel assemblies ensures that:

a. The unit can be maintained in the shutdown or refueling condition for extended periods;

b. Sufficient instrumentation and control capability is available for monitoring and maintaining the unit status; and

c. Adequate power is provided to mitigate events postulated during shutdown, such as a fuel handling accident.

In general, when the unit is shut down, the Technical Specifications requirements ensure that the unit has the capability to mitigate the consequences of postulated accidents. However, assuming a single failure and concurrent loss of all offsite or all onsite power is not required. The rationale for this is based on the fact that many Design Basis Accidents (DBAs) that are analyzed in MODES 1, 2, 3, and 4 have no specific analyses in MODES 5 and 6. Worst case bounding events are deemed not credible in MODES 5 and 6 because the energy contained

BASES

LCO (continued)

supported components must be declared inoperable and the appropriate conditions of the LCOs for the redundant components must be entered.

The required AC vital bus electrical power distribution subsystem is supported by one train of inverters as required by LCO 3.8.8, "Inverters - Shutdown." When the second (subsystem) of AC vital bus electrical power distribution is needed to support redundant required systems, equipment, and components, the second train may be energized from any available source. The available source must be Class 1E or another reliable source. The available source must be capable of supplying sufficient AC electrical power such that the redundant components are capable of performing their specified safety function(s) (implicitly required by the definition of OPERABILITY). Otherwise, the supported components must be declared inoperable and the appropriate conditions of the LCOs for the redundant components must be entered.

APPLICABILITY

The AC and DC electrical power distribution subsystems required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provide assurance that:

a. Systems to provide adequate coolant inventory makeup are available for the irradiated fuel in the core;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition and refueling condition.

The AC, DC, and AC vital bus electrical power distribution subsystems requirements for MODES 1, 2, 3, and 4 are covered in LCO 3.8.9.

ACTIONS

INSERT B 3.8.10-4

A.1, A.2.1, A.2.2, A.2.3, A.2.4, and A.2.5

By allowing the option to declare required features associated with an inoperable distribution subsystem inoperable, appropriate restrictions are implemented in accordance with the affected distribution subsystem LCO's Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies, and operations involving positive

INSERT B 3.8.10-4

LCO 3.0.3 is not applicable while in MODE 5 or 6. However, since irradiated fuel assembly movement can occur in MODE 1, 2, 3, or 4, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operations. Entering LCO 3.0.3, while in MODE 1, 2, 3, or 4 would require the unit to be shutdown unnecessarily.

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no changes this page, included for continuity

3.1.1.4 Passive Component Failures

A passive component failure is the structural failure of a static component which limits the component's effectiveness in carrying out its design function. When applied to a fluid system, this means a breach of the pressure boundary is postulated, resulting in abnormal leakage. Such leakage is limited to that which results from a single sprung flange, a single pump seal failure, a single valve stem packing failure, or other single failure mechanisms considered credible by a systematic analysis of system components. The probability of a large break in a piping system (e.g., rupture of ECCS piping), subsequent to the original large LOCA pipe break, is considered to be sufficiently low that it need not be postulated.

Single failures of passive components in electrical systems are assumed in designing against a single failure.

3.1.2 ADDITIONAL SINGLE FAILURE ASSUMPTIONS

In designing for and analyzing for a DBA (i.e., loss-of-coolant accident, main steam line break, fuel handling accident, or steam generator tube rupture), the following assumptions are made, in addition to postulating the initiating event.

a. The events are assumed not to result from a tornado, hurricane, flood, fire, loss of offsite power, or earthquake.

b. Any one of the following occurs:

    1. During the short term of an accident, a single failure of any active mechanical component. The short term is defined as less than 24 hours following an accident, or

    2. During the short term of an accident, a single failure of any active or passive electrical component, or

    3. A single failure of passive components associated with long-term cooling capability, assuming that a single active failure has not occurred during the short term. Long-term cooling applies to a time duration greater than 24 hours.

c. No reactor coolant system transient is assumed, preceding the postulated reactor coolant system piping rupture.

d. No operator action is assumed to be taken by plant operators to correct problems during the first 10 minutes following the accident.

e. All offsite power is simultaneously lost and is restored within 7 days.

f. For a LOCA, for additional safety no credit is taken for the functioning of nonseismic Category I components.

In the design and analysis performed for provision of protection of safety-related equipment from hazards and events (tornadoes, floods, missiles, pipe breaks, fires, and seismic events) which could reasonably be expected, the following assumptions were made:

a. Should the event result in a turbine or reactor trip, loss of offsite power is assumed, and the plant will be placed in a hot standby condition.

b. If required by a limiting condition for operation (per Technical Specifications or if the recovery from the event will cause the plant to be shutdown for an extended period of time, the plant will be taken to a cold shutdown (CSD) condition.

c. Redundancy or diversity of systems and components is provided to enable continued operation at hot standby or to cool the reactor to a CSD condition. If required, it is assumed that temporary repairs can be made to circumvent damages resulting from the hazard. All available systems, including non-safety-related systems and those systems requiring operator action, may be employed to mitigate the consequences of the hazard.

In determining the availability of the systems required to mitigate the consequences of a hazard and those required to place the reactor in a safe condition, the direct consequences of the hazard are considered. The feasibility of carrying out operator actions are based on ample time and adequate access to the controls, motor control center, switchgear, etc., associated with the component required to accomplish the proposed action.

d. When the postulated hazard occurs and results in damage to one of two or more redundant or diverse trains, single failures of components in other trains (and associated

(except that for events postulated to occur during shutdown conditions, e.g., a fuel handling accident, a loss of all offsite power is not required to be assumed in addition to a single failure).